**Appendices A through I: See the Draft EIR (the appendices attached to this Revised Final EIR have either been revised from the Draft EIR, contain additional information added to the Draft EIR, or are additional Appendices)**

# Appendix D: Air Quality Data

# D-1: Emissions Calculation Methodology

# Air Pollutant Emissions Methodology and Calculations

# TABLE OF CONTENTS

# SECTION 1: INTRODUCTION

## 1.1 - Analysis Tools

This analysis used the following tools that perform project-level air quality assessments. These tools included:

- The California Air Resources Board (ARB) EMFAC2007 model emission rates for on-road mobile sources
- The ARB OFFROAD2007 model emission rates for off-road mobile sources
- The ARB-Approved URBEMIS2007 v.9.2.4 land use model for construction employee-trip, on-road hauling, grading, and earth-disturbing $PM_{10}$ emissions, as well as operational employee-trip emissions.

The above models and their assumptions are described in subsequent sections of this appendix.

## 1.2 - Considerations

Construction emission can vary substantially from day to day, depending on the level of activity, the specific type of activity, and the prevailing weather conditions. The methodology developed for the purposes of quantitative air quality analysis was based on information available at the time of analysis; actual equipment and activity intensity at the time of construction may vary from that analyzed in this document. However, a methodology must be developed to provide CEQA-appropriate emissions analysis.

There were two main considerations for development of the methodology for this air quality analysis. The first consideration was the linear nature of the Project's construction. Each pipeline's construction results in the following:

- Many construction activities will be occurring concurrently, as multiple crews move down the pipeline completing their respective tasks in assembly-line fashion; and,
- Non-concurrent completion of Horizontal Directional Drilling (HDD) and Jack and Bore crossings, as construction crews will address these crossings in a sequential fashion.

The second consideration was the regional air pollutant thresholds recommended by the four air districts. Although differing in quantity, all four air district's regional thresholds are in units of a pounds per day (lbs/day) – not in total tons per year. Therefore, the analysis includes emissions estimates from all phases of the project's construction, and determines the maximum daily emissions that may occur.

## 1.3 - Applicant Proposed Measures/Regulatory Compliance

Implementation of Applicant Proposed Measures (APMs) and compliance with required regulations are included in the emissions analysis as the 'unmitigated' Project emissions. The measures that are incorporated into the Project that reduce air quality impacts are discussed below:

**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 NOX reduction and 45 percent particulate reduction compared to the most recent ARB 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 ARB 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.

### 1.3.1 - Impact of Measures on Potential Emissions.

Off-road vehicle exhaust emissions will be reduced through implementation of APM AQ-1, APM AQ-2, APM AQ-4, APM AQ-5, APM AQ-7 and APM AQ-10.

Fugitive dust emissions will be reduced through implementation of APM AQ-3 and APM AQ-6.

Measure APM AQ-8 reduces potential idling emissions resulting from traffic impacts on nearby roadways.

Measure APM AQ-9 eliminates burning vegetation as a potential emissions source.

Measure APM AQ-11 reduces the Project’s contribution to ambient air pollution on Spare the Air days – days where ozone concentrations are categorized as ‘unhealthy’ or worse on the Air Quality Index during the ozone season of May through October.

### 1.3.2 - Inclusion of Measures in Analysis

Of the measures discussed above, only two have readily quantifiable emissions reductions. The emissions reductions from APM AQ-1 are quantifiable, and were applied as an off-model calculation. Implementation of APM AQ-6 is included in the emissions analysis as an unmitigated control measure in the URBEMIS model. When reviewing the URBEMIS printouts in the appendixes, please note that the URBEMIS output identifies any measure that reduces emissions as “mitigation” regardless if the measure fulfills a requirement or is considered mitigation by CEQA standards.

# SECTION 2: CONSTRUCTION METHODOLOGY

## 2.1 - Base Information

The main construction activities that generate air pollutant emissions are identified in Table 1. The methodology for each construction activity is addressed in the following subsections. Table 2 contains the estimated construction timeline for each pipeline route. Construction of Line 406 is estimated to take 7 months. Line 407W, 407E and the DFM are each expected to be constructed within 6 months.

**Table 1: Construction Activities**

| Activity | Air Pollutant Sources |
|---|---|
| Grading | Equipment Exhaust, Dust Generation |
| Trenching | Equipment Exhaust, Dust Generation |
| Horizontal Directional Drilling (HDD) | Equipment Exhaust, Dust Generation |
| Jack and Bore | Equipment Exhaust, Dust Generation |
| Soil Hauling | Vehicle Exhaust, Entrained Road Dust, Dust from soils transport |
| Pipe Hauling | Vehicle Exhaust, Entrained Road Dust |
| Construction Employee Trips | Vehicle Exhaust, Entrained Road Dust |
| Soil Decompaction | Vehicle Exhaust, Dust Generation |

**Table 2: Construction Timeline by Pipeline and Air District.**

| Air District | Pipe Segment | Construction Timeline |
|---|---|---|
| YSAQMD | 406 | September/October 2009 – February 2010 |
| | 407W (p) | May 2012 - Sept 2012 |
| FRAQMD | 407 W (p) | May 2012 - Sept 2012 |
| | DFM (p) | May 2010 - Sept 2010 |
| | 407E (p) | May 2010 - Sept 2010 |
| PCAPCD | 407E (p) | May 2010 - Sept 2010 |
| SMAQMD | DFM (p) | May 2010 - Sept 2010 |

PG&E provided the estimated fleet mix for the three main construction activities for the pipeline: Trenching, HDD and Jack and Bore. Because of the equipment naming convention in URBEMIS, assumptions were made regarding the type of equipment to be modeled as compared to the equipment list provided by PG&E.

The URBEMIS program was used to estimate dust generation, employee trips and exhaust emissions from a water truck, consistent with APM AQ-6. In addition, the soil hauling trips and pipe hauling trips, as discussed below, were incorporated in the URBEMIS run for each pipeline.

### 2.1.1 - Grading

Per information provided by PG&E, the majority of the Right of Way (ROW) is suitable for construction without grading. However, approximately 30.6 acres of the Dunnigan Hills area (Line 406 in YSAQMD) will require grading. Grading emissions were estimated using URBEMIS v9.2.4 default grading assumptions for 30.6 acres to be disturbed, with one fourth of the total acreage the maximum acreage that may be disturbed on any one day.

### 2.1.2 - Trenching

#### *Equipment Exhaust Emissions*

The estimated construction fleet for trenching was provided by PG&E. Off-road vehicle emission calculated using the EMFAC2007 emission factors, as presented in URBEMIS v9.2.4 for the year of construction activities, the construction equipment mix, and the estimated hours of equipment use day of trenching. URBEMIS contains exhaust emission factors in discrete horsepower ranges for each type of equipment. Therefore, the analysis used emission factors for the closest horsepower range for each piece of equipment. The trenching equipment mix analyzed is listed in Table 3 below. It was assumed that all 18-day crews would operate concurrently.

**Table 3: Trenching Equipment**

| URBEMIS Equivalent | Quantity | Peak Hours/Day | Horsepower | Horsepower Range* |
|---|---|---|---|---|
| **Environmental, Fence & Pothole Crew (60 Days)** | | | | |
| Pump | 1 | 9 | 325 | 250 |
| Off-Highway Truck | 1 | 9 | 230 | 250 |
| **Grade Crew (18 Days)** | | | | |
| Crawler Tractor | 3 | 8 | 265 | 250 |
| Tractors/Loaders/Backhoes | 1 | 8 | 250 | 250 |
| Grader | 1 | 8 | 295 | 250 |
| **Ditch Crew (18 Days)** | | | | |
| Tractors/Loaders/Backhoes | 5 | 8 | 250 | 250 |
| Trencher | 1 | 8 | 200 | 250 |
| **Stringing Crew (18 days)** | | | | |
| Tractors/Loaders/Backhoes | 1 | 8 | 250 | 250 |
| Other Material Handling Equipment | 1 | 8 | 310 | 250 |
| Other Material Handling Equipment | 4 | 8 | 425 | 500 |
| Crawler Tractor | 1 | 8 | 265 | 250 |

| URBEMIS Equivalent | Quantity | Peak Hours/Day | Horsepower | Horsepower Range* |
|---|---|---|---|---|
| **Bending Crew (18 days)** | | | | |
| Other Material Handling Equipment | 2 | 8 | 310 | 250 |
| Other Material Handling Equipment | 1 | 8 | 110 | 120 |
| **Pipe Gang (Bead Welders) (18 days)** | | | | |
| Other Material Handling Equipment | 1 | 8 | 310 | 250 |
| Crawler Tractor | 1 | 8 | 225 | 250 |
| Other Material Handling Equipment | 1 | 8 | 250 | 250 |
| Off-Highway Truck | 1 | 8 | 250 | 250 |
| Welder | 8 | 8 | 15 | 15 |
| **Joint Coating Crew (18 days)** | | | | |
| Other Material Handling Equipment | 1 | 8 | 310 | 250 |
| Air Compressor | 1 | 8 | 8 | 15 |
| Lower-In Crew (18 days) | | | | |
| Other Material Handling Equipment | 3 | 8 | 310 | 250 |
| Tractors/Loaders/Backhoes | 1 | 8 | 250 | 250 |
| Rubber Tired Dozer | 1 | 8 | 265 | 250 |
| Tractors/Loaders/Backhoes | 1 | 8 | 250 | 250 |
| **Tie-In Crew (30 days)** | | | | |
| Other Material Handling Equipment | 3 | 9 | 310 | 250 |
| Tractors/Loaders/Backhoes | 1 | 9 | 250 | 250 |
| Rubber Tired Dozer | 1 | 9 | 265 | 250 |
| **Hydro-Testing Crew (39 days)** | | | | |
| Air Compressor | 2 | 9 | 10 | 15 |
| Other Material Handling Equipment | 1 | 9 | 310 | 250 |
| Pumps | 2 | 9 | 8 | 15 |
| Pumps | 1 | 9 | 8 | 15 |
| **Clean Up Crew (24 days)** | | | | |
| Rubber Tired Dozer | 3 | 9 | 265 | 250 |
| Tractors/Loaders/Backhoes | 2 | 9 | 250 | 250 |
| Grader | 1 | 9 | 300 | 250 |
| Tractors/Loaders/Backhoes | 1 | 9 | 150 | 175 |
| Off-Highway Truck | 1 | 9 | 350 | 500 |
| Notes:<br>* The emission factor for this horsepower range was used. | | | | |

### *Dust Generation, Water Truck, Employee Trips, Soil Hauling*

As stated above, there will be little grading required for construction of the pipelines, excepting for a portion of the Dunnigan Hills, which is included However, the excavation, stockpiling, and replacement of soils will generate fugitive $PM_{10}$ and $PM_{2.5}$ emissions.

Based on typical area of disturbance, 0.25 acre is assumed that the maximum acreage to be disturbed on any one day. As detailed in the project description of the DEIR, trenches will typically be 8 to 9 feet deep and 4 feet wide. It is reasonable to assume that the approximately 600 cubic yards could be moved on-site on any one day.

## 2.1.3 - HDD

### *Equipment Exhaust Emissions*

The estimated construction fleet for HDD operations was provided by PG&E. Off-road vehicle emission calculated using the OFFROAD2007 emission factors, the construction equipment mix, and the hours of equipment use per day. The size of the light plants discussed in the project description was used to estimate the diesel generator horsepower. Two 15 horsepower generator are sufficient to generate the required 8,000-watt capacity (2 light stations at 4,000 watts each). The equipment mix used for the HDD emissions estimate is provided in Table 4.

**Table 4: HDD Equipment**

| URBEMIS Equivalent | Quantity | Hours/Day | Horsepower | Horsepower Range* |
|---|---|---|---|---|
| Bore/Drill Rig | 1 | 10 | 625 | 750 |
| Bore/Drill Rig | 1 | 10 | 400 | 500 |
| Excavator | 1 | 10 | 198 | 250 |
| Off-Highway Truck | 1 | 10 | 300 | 250 |
| Crane | 1 | 10 | 262 | 250 |
| Generator | 2 | 10 | 15 | 15 |
| Other Material Handling Equipment | 3 | 10 | 310 | 250 |
| Notes:<br>* The emission factor for this horsepower range was used. | | | | |

### *Dust Generation*

The amount of soil excavated per HDD is approximately 446 cubic yards, based on the average HDD length, two sumps and a 42 inch ream. It was assumed that 0.25 acres would be the maximum acreage of disturbance on any one day. The URBEMIS program was used to estimate dust generation, employee trips, and an exhaust emissions from a water truck, consistent with APM AQ-6.

### 2.1.4 - Jack and Bore

#### *Equipment Exhaust Emissions*

The estimated construction fleet for jack and bore construction was provided by PG&E. Off-road vehicle emission calculated using the OFFROAD2007 emission factors, the construction equipment mix, and the hours of equipment use per day of construction.

**Table 5: Jack and Bore Equipment**

| Equipment | Quantity | Hours/Day | Horsepower | Horsepower Range* |
|---|---|---|---|---|
| Bore/Drill Rig | 1 | 10 | 120 | 120 |
| Excavator | 1 | 10 | 198 | 250 |
| Other Material Handling Equipment | 1 | 10 | 310 | 250 |
| Notes:<br>* The emission factor for this horsepower range was used. | | | | |

#### *Dust Generation*

Approximately 120 cubic yards will be removed and backfilled per bore. Each bore will take approximately 2 days to complete. It was assumed that 0.25 acres would be the maximum acreage of disturbance on any one day. The URBEMIS program was used to estimate dust generation, employee trips and exhaust emissions from a water truck, consistent with APM AQ-6.

### 2.1.5 - Soil Hauling

The total number of soil hauling trips per line was provided by PG&E, as well as the average length of trips and number of trips per day. A ‘trip’ is considered the one-way travel between the origin and the destination ends. A ‘round trip’ accounts for the trip out from the origin end to the destination end, and then back again to the origin.

The average number of soil hauling trips per day and average length of trips is provided in Table 6, as well as the inputs into the URBEMIS model. The roundtrip length and the number of round trips per day are used to calculate the vehicle miles traveled (VMT). The emissions resulting from soil hauling was generated using the URBEMIS model. The soil-hauling component of URBEMIS is dependant on the volume of soil export and import. Therefore, the volume of soil export and import in the modeling output does not necessarily reflect the actual amount of soil that will be exported.

**Table 6: Soil Hauling Trips**

| Line | Provided by PG&E | | | URBEMIS Input | | |
|---|---|---|---|---|---|---|
| | Total Trips | Average Trip Length* | Number of Trips per Day | Round Trip Length* | Round Trips per Day | Daily VMT |
| L-406 | 89 | 10 | 2 | 20 | 1 | 20 |
| L-407 E | 200 | 10 | 5 | 20 | 2.5 | 50 |

| Line | Provided by PG&E | | | URBEMIS Input | | |
|---|---|---|---|---|---|---|
| | Total Trips | Average Trip Length* | Number of Trips per Day | Round Trip Length* | Round Trips per Day | Daily VMT |
| DFM | 45 | 10 | 1 | 20 | 0.5 | 10 |
| L-407 W | 372 | 10 | 5 | 20 | 2.5 | 50 |
| * Miles | | | | | | |

### 2.1.6 - Pipe Hauling

The total number of pipe hauling trips per line was provided by PG&E, as well as the average length of trips and number of trips per day. The average number trips per day and average length of trips is provided in Table 7. The emissions resulting from pipe hauling was generated using the URBEMIS model. The soil-hauling component of URBEMIS was used to estimate the on-road emissions resulting from pipe hauling. As with soil hauling, the volume of soils export was entered into the model in order to modify the number of round trips per day to reflect the information in Table 6.

**Table 7: Pipe Hauling Trips**

| Line | Provided by PG&E | | | URBEMIS Input | | |
|---|---|---|---|---|---|---|
| | Total Trips | Average Trip Length* | Number of Trips per Day | Round Trip Length* | Round Trips per Day | Daily VMT |
| L-406 | 256 | 30 | 9 | 60 | 4.5 | 270 |
| L-407 E | 254 | 52 | 10 | 104 | 5 | 520 |
| DFM | 14 | 52 | 3 | 104 | 1.5 | 156 |
| L-407 W | 307 | 20 | 10 | 40 | 5 | 200 |
| Notes:<br>* Miles | | | | | | |

### 2.1.7 - Construction Employee Trips

As described in the DEIR, there may be between 90 and 130 construction employees working during construction of the pipelines. Construction employee trip emissions were generated using the URBEMIS program. The URBEMIS output incorporates the construction employee trips into the emissions analysis. Therefore, construction employee trips are not specified as a line item in this analysis.

### 2.1.8 - Paving Emissions

Per information provided by PG&E, approximately 0.14 acre of paving will be replaces as a result of open cut road crossings. The expected paving activities include:

- 5 crossings on L-406

- 11 crossings on L-407 E

Each paving operation will consist of approximately 0.0875 acre of pavement replacement, or approximately 380 square feet of paving per crossing.

### 2.1.9 - Soils Decompaction

PG&E estimates that it will take approximately 2 hours per acres to decompact soils at the construction sites. Assuming an 8 hour workday, approximately 4 acres may be decompacted in any one day. However, it was assumed that soils decompaction would occur following all other emissions generating activities. An emissions estimate for soils decompaction was not generated, as the equipment activity is far less than during other construction activities and the significance analysis is based on a worst-case day input, as the threshold is a daily rate.

# SECTION 3: OPERATIONAL METHODOLOGY

Based on the Project description in the EIR, the Project will likely have up to thirteen inspections/testings per year. PG&E estimates a that maintenance and operational activity will result in approximately 39 round trips per year, at 150 miles traveled per round trip. For the purposes of analyzing the maximum daily operational emissions associated with the Project, it was assumed that trips would be made in a ‘Light-Heavy Truck’ (8,501 – 10,000 lbs). In addition, it was assumed that operational emissions would begin in 2010.

# SECTION 4: EMISSIONS CALCULATIONS

## 4.1 - Maximum Daily Construction Emissions

Emissions were generated for the main construction activities associated with the Project. Based on the emissions output, the worst-day scenario for each line was developed. The emissions output for Line 406, Line 407-E, Line 407-W, and the DFM are provided below in Table 8, Table 9, Table 10, and Table 11, respectively. Not all construction activity will be occurring concurrently. Of the activities for each pipeline, the Trenching-18 Day Crew, Trenching-Remaining, and Pipe Hauling may occur at the same time. Therefore, the maximum daily emissions would be the summation of Trenching – 18 Day Crew, Trenching – Remaining, and Pipe Hauling emissions.

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 8: Daily Construction Emissions for Line 406 (2009)**

| Construction Activity | Pollutant (lbs/day) | | | | |
|---|---|---|---|---|---|
| | $NO_X$ | ROG | CO | $PM_{10}$ | $PM_{2.5}$ |
| Grading – Dunnigan Hills | 35.73 | 4.47 | 19.71 | 61.60 | 14.23 |
| Trenching – Environmental Crew | 29.52 | 2.56 | 7.40 | 0.96 | — |
| Trenching – 18 Day Crews | 357.82 | 35.14 | 101.28 | 13.43 | — |
| Trenching – Tie-In Crew | 16.71 | 6.15 | 16.71 | 2.31 | — |
| Trenching – Hydro Test Crew | 4.91 | 1.72 | 4.91 | 0.66 | — |
| Trenching – Clean Up Crew | 25.68 | 9.01 | 25.68 | 3.43 | — |
| Trenching – Remaining* | 6.31 | 0.63 | 2.05 | 66.50 | 14.05 |
| Pipe Hauling | 9.18 | 0.71 | 3.74 | 0.45 | 0.39 |
| HDD - Off-Road Emissions | 121.13 | 11.04 | 33.45 | 4.22 | — |
| HDD - URBEMIS Output** | 5.63 | 0.58 | 1.77 | 49.71 | 10.52 |
| Paving | 12.69 | 2.16 | 9.22 | 1.10 | 1.01 |
| Jack and Bore - Off-Road Emissions | 31.24 | 3.16 | 11.29 | 1.39 | — |
| Jack and Bore - URBEMIS Output** | 5.63 | 0.58 | 1.77 | 14.22 | 3.12 |
| 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 |

| Construction Activity | Pollutant (lbs/day) | | | | |
|---|---|---|---|---|---|
| | $NO_X$ | ROG | CO | $PM_{10}$ | $PM_{2.5}$ |

Notes:
* Employee Trips, Water Truck Emissions, Fugitive Dust Emissions, Soil Hauling
** Employee Trips, Water Truck Emissions, Fugitive Dust
Calculated Off-Road Emissions did not differentiate $PM_{2.5}$ emissions.
The maximum daily emissions refer to the maximum emissions that would occur in one day; it was assumed that the activities do not occur at the same time; therefore, the maximum emissions are not a straight summation of all emissions.

### Table 9: Daily Construction Emissions for Line 407-E (2010)

| Construction Activity | Pollutant (lbs/day) | | | | |
|---|---|---|---|---|---|
| | $NO_X$ | ROG | CO | $PM_{10}$ | $PM_{2.5}$ |
| Trenching – Environmental Crew | 27.90 | 2.40 | 6.98 | 0.89 | — |
| Trenching – 18 Day Crews | 338.03 | 33.37 | 95.60 | 12.62 | — |
| Trenching – Tie-In Crew | 60.41 | 5.84 | 15.83 | 2.16 | — |
| Trenching – Hydro Test Crew | 15.65 | 1.63 | 4.69 | 0.62 | — |
| Trenching – Clean Up Crew | 82.12 | 8.61 | 24.45 | 3.24 | — |
| Trenching – URBEMIS Output* | 6.70 | 0.64 | 2.16 | 66.51 | 14.06 |
| Pipe Hauling | 15.13 | 0.99 | 5.10 | 0.65 | 0.56 |
| HDD - Off-Road Emissions | 114.79 | 10.61 | 32.45 | 4.02 | |
| HDD - URBEMIS Output** | 5.24 | 0.54 | 1.67 | 49.69 | 10.51 |
| Paving | 20.16 | 2.75 | 11.56 | 67.61 | 15.07 |
| Jack and Bore - Off-Road Emissions | 29.16 | 2.90 | 10.91 | 1.26 | — |
| Jack and Bore - URBEMIS Output** | 5.24 | 0.54 | 1.67 | 14.22 | 3.10 |
| Maximum Daily Emissions | 359.86 | 35.00 | 102.86 | 79.78 | 14.62 |
| FRAQMD Threshold | 25.00 | 25.00 | NA | 80.00 | NA |
| Exceed Significance Threshold? | **Yes** | **Yes** | No | No | No |
| PCAPCD Threshold | 82.00 | 82.00 | 550.00 | 82.00 | NA |
| Exceed Significance Threshold? | **Yes** | No | No | No | No |

Notes:
* Employee Trips, Water Truck Emissions, Fugitive Dust Emissions, Soil Hauling
** Employee Trips, Water Truck Emissions, Fugitive Dust
Calculated Off-Road Emissions did not differentiate $PM_{2.5}$ emissions.
The maximum daily emissions refer to the maximum emissions that would occur in one day; it was assumed that the activities do not occur at the same time; therefore, the maximum emissions are not a straight summation of all emissions.

### Table 10: Daily Construction Emissions for Line 407-W (2012)

| Construction Activity | Pollutant (lbs/day) | | | | |
|---|---|---|---|---|---|
| | $NO_X$ | ROG | CO | $PM_{10}$ | $PM_{2.5}$ |
| Trenching – Environmental Crew | 23.95 | 2.08 | 6.30 | 0.72 | — |
| Trenching – 18 Day Crews | 290.45 | 29.69 | 86.04 | 10.44 | — |
| Trenching – Tie-In Crew | 52.21 | 5.19 | 14.31 | 1.79 | — |
| Trenching – Hydro Test Crew | 13.59 | 1.44 | 4.28 | 0.51 | — |
| Trenching – Clean Up Crew | 71.15 | 7.81 | 22.37 | 2.73 | — |
| Trenching – URBEMIS Output* | 5.56 | 0.57 | 1.92 | 66.46 | 14.02 |
| Pipe Hauling | 4.68 | 0.32 | 1.62 | 0.20 | 0.17 |
| HDD - Off-Road Emissions | 94.09 | 9.42 | 30.48 | 3.13 | — |
| HDD - URBEMIS Output** | 4.39 | 0.49 | 1.52 | 49.66 | 10.48 |
| Jack and Bore - Off-Road Emissions | 24.58 | 2.42 | 10.26 | 0.98 | — |
| Jack and Bore - URBEMIS Output** | 4.39 | 0.49 | 1.52 | 14.18 | 3.07 |
| Maximum Daily Emissions | 300.69 | 30.58 | 89.58 | 77.10 | 14.19 |
| FRAQMD Threshold | 82 | 82 | NA | 150 | NA |
| Exceed Significance Threshold? | **Yes** | No | No | No | No |
| FRAQMD Threshold | 25.00 | 25.00 | NA | 80.00 | NA |
| Exceed Significance Threshold? | **Yes** | **Yes** | No | No | No |

Notes:
* Employee Trips, Water Truck Emissions, Fugitive Dust Emissions, Soil Hauling
** Employee Trips, Water Truck Emissions, Fugitive Dust
Calculated Off-Road Emissions did not differentiate $PM_{2.5}$ emissions.
The maximum daily emissions refer to the maximum emissions that would occur in one day; it was assumed that the activities do not occur at the same time; therefore, the maximum emissions are not a straight summation of all emissions.

### Table 11: Daily Construction Emissions for DFM (2010)

| Construction Activity | Pollutant (lbs/day) | | | | |
|---|---|---|---|---|---|
| | $NO_X$ | ROG | CO | $PM_{10}$ | $PM_{2.5}$ |
| Trenching – Environmental Crew | 27.90 | 2.40 | 6.98 | 0.89 | — |
| Trenching – 18 Day Crews | 338.03 | 33.37 | 95.60 | 12.62 | — |
| Trenching – Tie-In Crew | 60.41 | 5.84 | 15.83 | 2.16 | — |
| Trenching – Hydro Test Crew | 15.65 | 1.63 | 4.69 | 0.62 | — |
| Trenching – Clean Up Crew | 82.12 | 8.61 | 24.45 | 3.24 | — |
| Trenching – URBEMIS Output* | 5.53 | 0.56 | 1.77 | 66.46 | 14.02 |

| Construction Activity | Pollutant (lbs/day) | | | | |
|---|---|---|---|---|---|
| | $NO_X$ | ROG | CO | $PM_{10}$ | $PM_{2.5}$ |
| Pipe Hauling | 4.54 | 0.30 | 1.53 | 0.20 | 0.17 |
| Jack and Bore - Off-Road Emissions | 29.16 | 2.90 | 10.91 | 1.26 | — |
| Jack and Bore - URBEMIS Output** | 5.24 | 0.54 | 1.67 | 14.22 | 3.10 |
| Maximum Daily Emissions | 348.10 | 34.23 | 98.90 | 79.28 | 14.19 |
| FRAQMD Threshold | 25.00 | 25.00 | NA | 80.00 | NA |
| Exceed Significance Threshold? | **Yes** | **Yes** | No | No | No |
| SMAQMD Threshold | 85.00 | NA | NA | CAAQS/ NAAQS | NA |
| Exceed Significance Threshold? | **Yes** | No | No | No | No |

Notes:
* Employee Trips, Water Truck Emissions, Fugitive Dust Emissions, Soil Hauling
** Employee Trips, Water Truck Emissions, Fugitive Dust
Calculated Off-Road Emissions did not differentiate $PM_{2.5}$ emissions.
The maximum daily emissions refer to the maximum emissions that would occur in one day; it was assumed that the activities do not occur at the same time; therefore, the maximum emissions are not a straight summation of all emissions.

## 4.2 - Maximum Daily Operational Emissions

The URBEMIS output for operational emissions are presented in Table 12.

**Table 12: Daily Operational Emissions (2010)**

| Activity | Pollutant (lbs/day) | | | | |
|---|---|---|---|---|---|
| | $NO_X$ | ROG | CO | $PM_{10}$ | $PM_{2.5}$ |
| Maintenance and Operation | 0.38 | 0.08 | 0.69 | 0.26 | 0.05 |

Notes:
URBEMIS Output

## 4.3 - Carbon Dioxide Emissions

### 4.3.1 - Project Construction

Carbon dioxide ($CO_2$) is the main Greenhouse Gas (GHG) generated during construction. The emission inventory of $CO_2$ was generated using the estimated construction equipment and activity provided by PG&E. An inventory for each pipeline was generated in total tons of emissions, using the total number of HDD and Jack and Bore Crossings, and the length of pipeline to be trenched and the equipment mix and activity levels provided by PG&E. The Soil Hauling and Pipe Hauling emissions for each pipeline was calculated using the daily activity output from URBEMIS and the trips lengths and total trips shown in Table 6 and Table 7, respectively. Paving emissions similarly used the URBEMIS output and the known activity for Line 406 and 407-E, as described in section 1.4.8 above. This analysis assumed a 22 working days per month, consistent with the construction assumptions of the URBEMIS model. Emissions from employee trips for the construction of each phase was developed using the known construction length, the assumed construction days per month, and the URBEMIS daily emission rate for employee trips. Table 13 shows the total Project construction GHG generation.

**Table 13: All Construction Greenhouse Gas Generation**

| Year of Construction (Line) | $CO_2$ | |
|---|---|---|
| | Total Tons | $MTCO_2e$ |
| 2009 (Line 406) | 790.33 | 716.99 |
| 2010 (Line 407E) | 970.45 | 880.40 |
| 2010 (DFM) | 199.85 | 181.30 |
| 2012 (Line 407W) | 995.64 | 903.25 |
| total | 2,956.28 | 2,681.94 |
| Notes:<br>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) | | |

### 4.3.2 - Project Operations

Greenhouse gas emissions from Project operations were generated from employee trips as described in the methodology above.

# D-2: Off-Road Calculations

| Trenching | | | 2009 EF | | | | | | 2010 EF | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment | Max HP | Multiplier | lbs/hp/hr | | | | | | lbs/hp/hr | | | | | |
| **Environmental, Fence & Pot Hole Crew** | **(60 days)** | | ROG | CO | NOx | SOx | PM | CO2 | ROG | CO | NOx | SOx | PM | CO2 |
| Pump | 250 | 2164.5 | 1.69 | 5.10 | 20.75 | 0.02 | 0.64 | 576.50 | 1.57 | 4.80 | 19.73 | 0.02 | 0.60 | 2006.79 |
| Off-Highway Truck | 250 | 1179.9 | 0.87 | 2.29 | 8.77 | 0.01 | 0.31 | 842.62 | 0.83 | 2.18 | 8.17 | 0.01 | 0.29 | 842.62 |
| | | | *2.56* | *7.40* | *29.52* | *0.03* | *0.96* | *1,419.12* | *2.40* | *6.98* | *27.90* | *0.03* | *0.89* | *2849.41* |
| **Grade Crew (18 Days)** | | | | | | | | | | | | | | |
| Crawler Tractor | 250 | 4070.4 | 4.23 | 11.86 | 40.31 | 0.04 | 1.63 | 3,263.84 | 4.03 | 11.28 | 38.19 | 0.04 | 1.54 | 3,263.84 |
| Tractors/Loaders/Backhoes | 250 | 1100 | 0.66 | 1.87 | 7.36 | 0.01 | 0.25 | 758.00 | 0.63 | 1.78 | 6.84 | 0.01 | 0.23 | 758.00 |
| Grader | 250 | 1439.6 | 1.19 | 3.32 | 12.16 | 0.01 | 0.45 | 1,100.23 | 1.13 | 3.16 | 11.45 | 0.01 | 0.42 | 1,100.23 |
| | | | *6.08* | *17.05* | *59.83* | *0.06* | *2.33* | *5,122.07* | *5.79* | *16.21* | *56.48* | *0.06* | *2.20* | *5,122.07* |
| **Ditch Crew (18 Days)** | | | | | | | | | | | | | | |
| Tractors/Loaders/Backhoes | 250 | 5500 | 3.31 | 9.33 | 36.78 | 0.05 | 1.24 | 3,789.98 | 3.13 | 8.90 | 34.19 | 0.05 | 1.15 | 3,789.98 |
| Trencher | 250 | 1200 | 1.47 | 4.33 | 14.23 | 0.01 | 0.59 | 1,127.60 | 1.40 | 4.13 | 13.56 | 0.01 | 0.56 | 1,127.60 |
| | | | *4.78* | *13.66* | *51.01* | *0.06* | *1.83* | *4,917.58* | *4.53* | *13.03* | *47.75* | *0.06* | *1.71* | *4,917.58* |
| **Stringing Crew (18 Days)** | | | | | | | | | | | | | | |
| Tractors/Loaders/Backhoes | 250 | 1100 | 0.66 | 1.87 | 7.36 | 0.01 | 0.25 | 758.00 | 0.63 | 1.78 | 6.84 | 0.01 | 0.23 | 758.00 |
| Other Material Handling Equipment | 250 | 1463.2 | 1.16 | 3.08 | 12.50 | 0.01 | 0.43 | 1,081.60 | 1.10 | 2.90 | 11.86 | 0.01 | 0.40 | 1,081.60 |
| Other Material Handling Equipment | 500 | 8024 | 5.74 | 19.42 | 60.75 | 0.05 | 2.16 | 5,931.36 | 5.46 | 17.74 | 57.53 | 0.05 | 2.03 | 5,931.36 |
| Crawler Tractor | 250 | 1356.8 | 1.41 | 3.95 | 13.44 | 0.01 | 0.54 | 1,087.95 | 1.34 | 3.76 | 12.73 | 0.01 | 0.51 | 1,087.95 |
| | | | *8.97* | *28.33* | *94.03* | *0.09* | *3.38* | *8,858.91* | *8.53* | *26.19* | *88.95* | *0.09* | *3.18* | *8,858.91* |
| **Bending Crew (18 Days)** | | | | | | | | | | | | | | |
| Other Material Handling Equipment | 250 | 2926.4 | 2.31 | 6.17 | 24.99 | 0.03 | 0.86 | 2,163.20 | 2.19 | 5.81 | 23.71 | 0.03 | 0.80 | 2,163.20 |
| Other Material Handling Equipment | 120 | 519.2 | 0.94 | 2.88 | 5.28 | 0.00 | 0.50 | 383.79 | 0.89 | 2.85 | 5.04 | 0.00 | 0.48 | 383.79 |
| | | | *3.25* | *9.05* | *30.27* | *0.03* | *1.36* | *2,547.00* | *3.08* | *8.66* | *28.75* | *0.03* | *1.28* | *2,547.00* |
| **Pipe Gang (Bead Welders) (18 Days)** | | | | | | | | | | | | | | |
| Other Material Handling Equipment | 250 | 1463.2 | 1.16 | 3.08 | 12.50 | 0.01 | 0.43 | 1,081.60 | 1.10 | 2.90 | 11.86 | 0.01 | 0.40 | 1,081.60 |
| Crawler Tractor | 250 | 1152 | 1.20 | 3.36 | 11.41 | 0.01 | 0.46 | 923.73 | 1.14 | 3.19 | 10.81 | 0.01 | 0.44 | 923.73 |
| Other Material Handling Equipment | 250 | 1180 | 0.93 | 2.49 | 10.08 | 0.01 | 0.35 | 872.26 | 0.88 | 2.34 | 9.56 | 0.01 | 0.32 | 872.26 |
| Off-Highway Truck | 250 | 1140 | 0.84 | 2.22 | 8.47 | 0.01 | 0.30 | 814.13 | 0.80 | 2.10 | 7.89 | 0.01 | 0.28 | 814.13 |
| Welder | 15 | 518.4 | 0.61 | 2.11 | 3.50 | 0.00 | 0.26 | 292.27 | 0.58 | 2.07 | 3.37 | 0.00 | 0.24 | 292.27 |
| | | | *4.74* | *13.25* | *45.95* | *0.05* | *1.80* | *3,983.99* | *4.50* | *12.61* | *43.49* | *0.05* | *1.68* | *3,983.99* |
| **Joint Coating Crew (18 Days)** | | | | | | | | | | | | | | |
| Other Material Handling Equipment | 250 | 1463.2 | 1.16 | 3.08 | 12.50 | 0.01 | 0.43 | 1,081.60 | 1.10 | 2.90 | 11.86 | 0.01 | 0.40 | 1,081.60 |
| Air Compressor | 15 | 30.72 | 0.04 | 0.13 | 0.22 | 0.00 | 0.02 | 18.47 | 0.04 | 0.13 | 0.21 | 0.00 | 0.02 | 18.47 |
| | | | *1.20* | *3.22* | *12.72* | *0.01* | *0.45* | *1,100.08* | *1.13* | *3.03* | *12.07* | *0.01* | *0.42* | *1,100.08* |
| **Lower-in Crew (18 Days)** | | | | | | | | | | | | | | |
| Other Material Handling Equipment | 250 | 4389.6 | 3.47 | 9.25 | 37.49 | 0.04 | 1.29 | 3,244.80 | 3.29 | 8.71 | 35.57 | 0.04 | 1.20 | 3,244.80 |
| Tractors/Loaders/Backhoes | 250 | 1100 | 0.66 | 1.87 | 7.36 | 0.01 | 0.25 | 758.00 | 0.63 | 1.78 | 6.84 | 0.01 | 0.23 | 758.00 |
| Rubber Tired Dozer | 250 | 1144.8 | 1.33 | 3.74 | 11.81 | 0.01 | 0.52 | 846.24 | 1.28 | 3.58 | 11.29 | 0.01 | 0.49 | 846.24 |
| Tractors/Loaders/Backhoes | 250 | 1100 | 0.66 | 1.87 | 7.36 | 0.01 | 0.25 | 758.00 | 0.63 | 1.78 | 6.84 | 0.01 | 0.23 | 758.00 |
| | | | *6.13* | *16.72* | *64.01* | *0.07* | *2.30* | *5,607.04* | *5.82* | *15.85* | *60.54* | *0.07* | *2.15* | *5,607.04* |
| **Tie-In Crew (30 Days)** | | | | | | | | | | | | | | |
| Other Material Handling Equipment | 250 | 4938.3 | 3.90 | 10.41 | 42.17 | 0.04 | 1.45 | 3,650.40 | 3.70 | 9.80 | 40.02 | 0.04 | 1.35 | 3,650.40 |
| Tractors/Loaders/Backhoes | 250 | 1237.5 | 0.74 | 2.10 | 8.28 | 0.01 | 0.28 | 852.75 | 0.70 | 2.00 | 7.69 | 0.01 | 0.26 | 852.75 |
| Rubber Tired Dozer | 250 | 1287.9 | 1.50 | 4.20 | 13.29 | 0.01 | 0.58 | 952.02 | 1.44 | 4.03 | 12.70 | 0.01 | 0.56 | 952.02 |
| | | | *6.15* | *16.71* | *63.74* | *0.07* | *2.31* | *5,455.17* | *5.84* | *15.83* | *60.41* | *0.07* | *2.16* | *5,455.17* |
| **Hydro-Test Crew (39 Days)** | | | | | | | | | | | | | | |
| Air Compressor | 15 | 86.4 | 0.11 | 0.37 | 0.62 | 0.00 | 0.05 | 51.96 | 0.10 | 0.37 | 0.60 | 0.00 | 0.04 | 51.96 |
| Other Material Handling Equipment | 250 | 1646.1 | 1.30 | 3.47 | 14.06 | 0.01 | 0.48 | 1,216.80 | 1.23 | 3.27 | 13.34 | 0.01 | 0.45 | 1,216.80 |
| Pumps | 15 | 106.56 | 0.20 | 0.71 | 1.18 | 0.00 | 0.09 | 98.80 | 0.20 | 0.70 | 1.14 | 0.00 | 0.08 | 98.80 |
| Pumps | 15 | 53.28 | 0.10 | 0.36 | 0.59 | 0.00 | 0.04 | 49.40 | 0.10 | 0.35 | 0.57 | 0.00 | 0.04 | 49.40 |
| | | | *1.72* | *4.91* | *16.45* | *0.02* | *0.66* | *1,416.95* | *1.63* | *4.69* | *15.65* | *0.02* | *0.62* | *1,416.95* |
| **Clean Up Crew (24 Days)** | | | | | | | | | | | | | | |
| Rubber Tired Dozer | 250 | 3863.7 | 4.49 | 12.61 | 39.87 | 0.03 | 1.75 | 2,856.06 | 4.32 | 12.08 | 38.11 | 0.03 | 1.67 | 2,856.06 |
| Tractors/Loaders/Backhoes | 250 | 2475 | 1.49 | 4.20 | 16.55 | 0.02 | 0.56 | 1,705.49 | 1.41 | 4.01 | 15.38 | 0.02 | 0.52 | 1,705.49 |
| Grader | 250 | 1647 | 1.36 | 3.80 | 13.92 | 0.01 | 0.52 | 1,258.74 | 1.29 | 3.61 | 13.10 | 0.01 | 0.49 | 1,258.74 |
| Tractors/Loaders/Backhoes | 175 | 742.5 | 0.45 | 1.26 | 4.97 | 0.01 | 0.17 | 511.65 | 0.42 | 1.20 | 4.62 | 0.01 | 0.16 | 511.65 |
| Off-Highway Truck | 500 | 1795.5 | 1.23 | 3.82 | 11.69 | 0.01 | 0.44 | 1,282.25 | 1.17 | 3.55 | 10.92 | 0.01 | 0.41 | 1,282.25 |
| | | | *9.01* | *25.68* | *86.99* | *0.09* | *3.43* | *7,614.18* | *8.61* | *24.45* | *82.12* | *0.09* | *3.24* | *7,614.18* |

| | 2009 EF | | | | | | 2010 EF | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | lbs/hp/hr | | | | | | lbs/hp/hr | | | | | |
| | ROG | CO | NOx | SOx | PM | CO2 | ROG | CO | NOx | SOx | PM | CO2 |
| Environmental Crew | 2.56 | 7.40 | 29.52 | 0.03 | 0.96 | 1,419.12 | 2.40 | 6.98 | 27.90 | 0.03 | 0.89 | 2,849.41 |
| All 18-Day Crews | 35.14 | 101.28 | 357.82 | 0.37 | 13.43 | 32,136.66 | 33.37 | 95.60 | 338.03 | 0.37 | 12.62 | 32,136.66 |
| Tie-In Crew | 6.15 | 16.71 | 63.74 | 0.07 | 2.31 | 5,455.17 | 5.84 | 15.83 | 60.41 | 0.07 | 2.16 | 5,455.17 |
| Hydro Test Crew | 1.72 | 4.91 | 16.45 | 0.02 | 0.66 | 1,416.95 | 1.63 | 4.69 | 15.65 | 0.02 | 0.62 | 1,416.95 |
| Clean Up Crew | 9.01 | 25.68 | 86.99 | 0.09 | 3.43 | 7,614.18 | 8.61 | 24.45 | 82.12 | 0.09 | 3.24 | 7,614.18 |
| **Total** | 54.58 | 155.98 | 554.53 | 0.57 | 20.78 | 48,042.08 | 51.85 | 147.53 | 524.12 | 0.57 | 19.53 | 49,472.37 |

| | | | 2009 EF | | | | | | 2010 EF | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HDD | | | lbs/hp/hr | | | | | | lbs/hp/hr | | | | | |
| **Equipment** | **Max HP** | **Multiplier** | **ROG** | **CO** | **NOx** | **SOx** | **PM** | **CO2** | **ROG** | **CO** | **NOx** | **SOx** | **PM** | **CO2** |
| | 500 | 3,000.00 | 1.37 | 5.07 | 16.72 | 0.03 | 0.57 | 2,819.00 | 1.43 | 5.19 | 17.76 | 0.03 | 0.57 | 2,819.00 |
| Bore/Drill Rigs | 750 | 4,687.50 | 2.21 | 7.92 | 27.20 | 0.04 | 0.90 | 4,404.68 | 2.11 | 7.88 | 24.13 | 0.04 | 0.87 | 4,404.68 |
| Cranes | 250 | 1,126.60 | 0.71 | 1.98 | 7.09 | 0.01 | 0.27 | 606.95 | 0.67 | 1.87 | 6.70 | 0.01 | 0.25 | 606.95 |
| Excavator | 250 | 1,128.60 | 0.78 | 2.10 | 8.15 | 0.01 | 0.28 | 805.98 | 0.74 | 2.01 | 7.59 | 0.01 | 0.26 | 805.98 |
| Off-Highway | 250 | 1,710.00 | 1.27 | 3.33 | 12.71 | 0.02 | 0.45 | 1,221.19 | 1.20 | 3.15 | 11.84 | 0.02 | 0.42 | 1,221.19 |
| Other Material Handling Equipment | 250 | 5,487.00 | 4.34 | 11.57 | 46.86 | 0.05 | 1.61 | 4,056.00 | 4.11 | 10.89 | 44.46 | 0.05 | 1.50 | 4,056.00 |
| | | | *10.68* | *31.96* | *118.73* | *0.15* | *4.08* | *13,913.80* | *10.26* | *30.99* | *112.47* | *0.16* | *3.88* | *13,913.80* |

| | | | 2009 EF | | | | | | 2010 EF | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J/B | | | lbs/hp/hr | | | | | | lbs/hp/hr | | | | | |
| **Equipment** | **Max HP** | **Multiplier** | **ROG** | **CO** | **NOx** | **SOx** | **PM** | **CO2** | **ROG** | **CO** | **NOx** | **SOx** | **PM** | **CO2** |
| Bore/Drill Rigs | 120 | 900.00 | 0.94 | 5.34 | 7.47 | 0.01 | 0.57 | 845.70 | 0.79 | 5.28 | 6.75 | 0.01 | 0.50 | 845.70 |
| Excavator | 250 | 1,128.60 | 0.78 | 2.10 | 8.15 | 0.01 | 0.28 | 805.98 | 0.74 | 2.01 | 7.59 | 0.01 | 0.26 | 805.98 |
| Other Material Handling Equipment | 250 | 1,829.00 | 1.45 | 3.86 | 15.62 | 0.02 | 0.54 | 1,352.00 | 1.37 | 3.63 | 14.82 | 0.02 | 0.50 | 1,352.00 |
| | | | *3.16* | *11.29* | *31.24* | *0.04* | *1.39* | *3,003.68* | *2.90* | *10.91* | *29.16* | *0.04* | *1.26* | *3,003.68* |

| Trenching | | | 2012 EF | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | lbs/hp/hr | | | | | |
| **Equipment** | **Max HP** | **Multiplier** | | | | | | |
| **Environmental, Fence & Pot Hole Crew (60 days)** | | | **ROG** | **CO** | **NOx** | **SOx** | **PM** | **CO2** |
| Pump | 250 | 2164.5 | 1.33 | 4.31 | 17.11 | 0.02 | 0.49 | 2006.79 |
| Off-Highway Truck | 250 | 1179.9 | 0.74 | 2.00 | 6.84 | 0.01 | 0.23 | 842.62 |
| | | | *2.08* | *6.30* | *23.95* | *0.03* | *0.72* | *2849.41* |
| **Grade Crew (18 Days)** | | | | | | | | |
| Crawler Tractor | 250 | 4070.4 | 3.64 | 10.27 | 33.49 | 0.04 | 1.31 | 3,263.84 |
| Tractors/Loaders/Backhoes | 250 | 1100 | 0.56 | 1.66 | 5.66 | 0.01 | 0.18 | 758.00 |
| Grader | 250 | 1439.6 | 1.01 | 2.88 | 9.81 | 0.01 | 0.35 | 1,100.23 |
| | | | *5.20* | *14.81* | *48.95* | *0.06* | *1.84* | *5,122.07* |
| **Ditch Crew (18 Days)** | | | | | | | | |
| Tractors/Loaders/Backhoes | 250 | 5500 | 2.79 | 8.29 | 28.28 | 0.05 | 0.92 | 3,789.98 |
| Trencher | 250 | 1200 | 1.26 | 3.75 | 12.07 | 0.01 | 0.48 | 1,127.60 |
| | | | *4.04* | *12.04* | *40.34* | *0.06* | *1.40* | *4,917.58* |
| **Stringing Crew (18 Days)** | | | | | | | | |
| Tractors/Loaders/Backhoes | 250 | 1100 | 0.56 | 1.66 | 5.66 | 0.01 | 0.18 | 758.00 |
| Other Material Handling Equipment | 250 | 1463.2 | 0.96 | 2.59 | 10.20 | 0.01 | 0.33 | 1,081.60 |
| Other Material Handling Equipment | 500 | 8024 | 4.86 | 14.95 | 49.22 | 0.05 | 1.66 | 5,931.36 |
| Crawler Tractor | 250 | 1356.8 | 1.21 | 3.42 | 11.16 | 0.01 | 0.44 | 1,087.95 |
| | | | *7.59* | *22.62* | *76.24* | *0.09* | *2.61* | *8,858.91* |
| **Bending Crew (18 Days)** | | | | | | | | |
| Other Material Handling Equipment | 250 | 2926.4 | 1.92 | 5.18 | 20.41 | 0.03 | 0.65 | 2,163.20 |
| Other Material Handling Equipment | 120 | 519.2 | 0.77 | 2.79 | 4.45 | 0.00 | 0.43 | 383.79 |
| | | | *2.69* | *7.97* | *24.85* | *0.03* | *1.08* | *2,547.00* |
| **Pipe Gang (Bead Welders) (18 Days)** | | | | | | | | |
| Other Material Handling Equipment | 250 | 1463.2 | 0.96 | 2.59 | 10.20 | 0.01 | 0.33 | 1,081.60 |
| Crawler Tractor | 250 | 1152 | 1.03 | 2.91 | 9.48 | 0.01 | 0.37 | 923.73 |
| Other Material Handling Equipment | 250 | 1180 | 0.77 | 2.09 | 8.23 | 0.01 | 0.26 | 872.26 |
| Off-Highway Truck | 250 | 1140 | 0.72 | 1.93 | 6.61 | 0.01 | 0.23 | 814.13 |
| Welder | 15 | 518.4 | 0.52 | 1.99 | 3.09 | 0.00 | 0.21 | 292.27 |
| | | | *4.00* | *11.51* | *37.60* | *0.05* | *1.39* | *3,983.99* |
| **Joint Coating Crew (18 Days)** | | | | | | | | |
| Other Material Handling Equipment | 250 | 1463.2 | 0.96 | 2.59 | 10.20 | 0.01 | 0.33 | 1,081.60 |
| Air Compressor | 15 | 30.72 | 0.03 | 0.13 | 0.20 | 0.00 | 0.01 | 18.47 |
| | | | *0.99* | *2.72* | *10.40* | *0.01* | *0.34* | *1,100.08* |
| **Lower-in Crew (18 Days)** | | | | | | | | |
| Other Material Handling Equipment | 250 | 4389.6 | 2.88 | 7.77 | 30.61 | 0.04 | 0.98 | 3,244.80 |
| Tractors/Loaders/Backhoes | 250 | 1100 | 0.56 | 1.66 | 5.66 | 0.01 | 0.18 | 758.00 |
| Rubber Tired Dozer | 250 | 1144.8 | 1.18 | 3.29 | 10.14 | 0.01 | 0.43 | 846.24 |
| Tractors/Loaders/Backhoes | 250 | 1100 | 0.56 | 1.66 | 5.66 | 0.01 | 0.18 | 758.00 |
| | | | *5.17* | *14.37* | *52.06* | *0.07* | *1.78* | *5,607.04* |
| **Tie-In Crew (30 Days)** | | | | | | | | |
| Other Material Handling Equipment | 250 | 4938.3 | 3.24 | 8.75 | 34.44 | 0.04 | 1.10 | 3,650.40 |
| Tractors/Loaders/Backhoes | 250 | 1237.5 | 0.63 | 1.86 | 6.36 | 0.01 | 0.21 | 852.75 |
| Rubber Tired Dozer | 250 | 1287.9 | 1.32 | 3.70 | 11.41 | 0.01 | 0.49 | 952.02 |
| | | | *5.19* | *14.31* | *52.21* | *0.07* | *1.79* | *5,455.17* |
| **Hydro-Test Crew (39 Days)** | | | | | | | | |
| Air Compressor | 15 | 86.4 | 0.09 | 0.35 | 0.55 | 0.00 | 0.04 | 51.96 |
| Other Material Handling Equipment | 250 | 1646.1 | 1.08 | 2.92 | 11.48 | 0.01 | 0.37 | 1,216.80 |
| Pumps | 15 | 106.56 | 0.18 | 0.67 | 1.04 | 0.00 | 0.07 | 98.80 |
| Pumps | 15 | 53.28 | 0.09 | 0.34 | 0.52 | 0.00 | 0.04 | 49.40 |
| | | | *1.44* | *4.28* | *13.59* | *0.02* | *0.51* | *1,416.95* |
| **Clean Up Crew (24 Days)** | | | | | | | | |
| Rubber Tired Dozer | 250 | 3863.7 | 3.97 | 11.09 | 34.22 | 0.03 | 1.46 | 2,856.06 |
| Tractors/Loaders/Backhoes | 250 | 2475 | 1.25 | 3.73 | 12.72 | 0.02 | 0.41 | 1,705.49 |
| Grader | 250 | 1647 | 1.15 | 3.30 | 11.22 | 0.01 | 0.40 | 1,258.74 |
| Tractors/Loaders/Backhoes | 175 | 742.5 | 0.38 | 1.12 | 3.82 | 0.01 | 0.12 | 511.65 |
| Off-Highway Truck | 500 | 1795.5 | 1.06 | 3.14 | 9.16 | 0.01 | 0.33 | 1,282.25 |
| | | | *7.81* | *22.37* | *71.15* | *0.09* | *2.73* | *7,614.18* |

| | 2012 EF | | | | | |
|---|---|---|---|---|---|---|
| | lbs/hp/hr | | | | | |
| | **ROG** | **CO** | **NOx** | **SOx** | **PM** | **CO2** |
| Environmental Crew | 2.08 | 6.30 | 23.95 | 0.03 | 0.72 | 2,849.41 |
| All 18-Day Crews | 29.69 | 86.04 | 290.45 | 0.37 | 10.44 | 32,136.66 |
| Tie-In Crew | 5.19 | 14.31 | 52.21 | 0.07 | 1.79 | 5,455.17 |
| Hydro Test Crew | 1.44 | 4.28 | 13.59 | 0.02 | 0.51 | 1,416.95 |
| Clean Up Crew | 7.81 | 22.37 | 71.15 | 0.09 | 2.73 | 7,614.18 |
| **Total** | 46.21 | 133.29 | 451.35 | 0.57 | 16.20 | 49,472.37 |

| HDD | | | 2012 EF lbs/hp/hr | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Equipment** | **Max HP** | **Multiplier** | **ROG** | **CO** | **NOx** | **SOx** | **PM** | **CO2** |
| | 500 | 3,000.00 | 1.26 | 5.15 | 13.07 | 0.03 | 0.40 | 2,819.00 |
| Bore/Drill Rigs | 750 | 4,687.50 | 1.91 | 7.82 | 18.61 | 0.04 | 0.62 | 4,404.68 |
| Cranes | 250 | 1,126.60 | 0.60 | 1.66 | 5.80 | 0.01 | 0.21 | 606.95 |
| Excavator | 250 | 1,128.60 | 0.66 | 1.84 | 6.32 | 0.01 | 0.21 | 805.98 |
| Off-Highway | 250 | 1,710.00 | 1.08 | 2.89 | 9.91 | 0.02 | 0.34 | 1,221.19 |
| Other Material Handling Equipment | 250 | 5,487.00 | 3.60 | 9.72 | 38.26 | 0.05 | 1.22 | 4,056.00 |
| | | | *9.10* | *29.07* | *91.97* | *0.16* | *3.00* | *13,913.80* |

| J/B | | | 2012 EF lbs/hp/hr | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Equipment** | **Max HP** | **Multiplier** | **ROG** | **CO** | **NOx** | **SOx** | **PM** | **CO2** |
| Bore/Drill Rigs | 120 | 900.00 | 0.56 | 5.18 | 5.51 | 0.01 | 0.36 | 845.70 |
| Excavator | 250 | 1,128.60 | 0.66 | 1.84 | 6.32 | 0.01 | 0.21 | 805.98 |
| Other Material Handling Equipment | 250 | 1,829.00 | 1.20 | 3.24 | 12.75 | 0.02 | 0.41 | 1,352.00 |
| | | | *2.42* | *10.26* | *24.58* | *0.04* | *0.98* | *3,003.68* |

## D-3: Updated URBEMIS Output

**9/9/2008 6:08:45 PM**

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\mba\Desktop\23440005 PG&E Pipeline AQ\Modeling\PG&E Line 406.urb924

Project Name: Line 406

Project Location: Yolo-Solano AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2009 TOTALS (lbs/day unmitigated) | 6.62 | 48.42 | 28.93 | 0.02 | 169.91 | 3.02 | 170.17 | 35.48 | 2.78 | 35.72 | 4,295.85 |
| 2009 TOTALS (lbs/day mitigated) | 6.62 | 48.42 | 28.93 | 0.02 | 66.27 | 3.02 | 66.53 | 13.84 | 2.78 | 15.24 | 4,295.85 |

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|

**9/9/2008 6:08:45 PM**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 5/4/2009-5/8/2009 Active Days: 5 | <u>**6.62**</u> | <u>**48.42**</u> | <u>**28.93**</u> | 0.00 | 153.02 | <u>**3.02**</u> | 156.03 | 31.96 | <u>**2.78**</u> | 34.73 | <u>**4,295.85**</u> |
| Asphalt 05/04/2009-05/08/2009 | 2.16 | 12.69 | 9.22 | 0.00 | 0.01 | 1.09 | 1.10 | 0.00 | 1.01 | 1.01 | 1,160.55 |
| Paving Off-Gas | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Paving Off Road Diesel | 2.08 | 12.55 | 7.05 | 0.00 | 0.00 | 1.09 | 1.09 | 0.00 | 1.00 | 1.00 | 979.23 |
| Paving On Road Diesel | 0.00 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.37 |
| Paving Worker Trips | 0.07 | 0.12 | 2.17 | 0.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.01 | 178.95 |
| Mass Grading 05/04/2009-05/22/2009 | 4.47 | 35.73 | 19.71 | 0.00 | 153.01 | 1.93 | 154.93 | 31.95 | 1.77 | 33.73 | 3,135.30 |
| Mass Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 153.00 | 0.00 | 153.00 | 31.95 | 0.00 | 31.95 | 0.00 |
| Mass Grading Off Road Diesel | 4.42 | 35.65 | 18.16 | 0.00 | 0.00 | 1.92 | 1.92 | 0.00 | 1.77 | 1.77 | 3,007.48 |
| Mass Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Mass Grading Worker Trips | 0.05 | 0.08 | 1.55 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 127.82 |
| Time Slice 5/11/2009-5/22/2009 Active Days: 10 | 4.47 | 35.73 | 19.71 | 0.00 | 153.01 | 1.93 | 154.93 | 31.95 | 1.77 | 33.73 | 3,135.30 |
| Mass Grading 05/04/2009-05/22/2009 | 4.47 | 35.73 | 19.71 | 0.00 | 153.01 | 1.93 | 154.93 | 31.95 | 1.77 | 33.73 | 3,135.30 |
| Mass Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 153.00 | 0.00 | 153.00 | 31.95 | 0.00 | 31.95 | 0.00 |
| Mass Grading Off Road Diesel | 4.42 | 35.65 | 18.16 | 0.00 | 0.00 | 1.92 | 1.92 | 0.00 | 1.77 | 1.77 | 3,007.48 |
| Mass Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Mass Grading Worker Trips | 0.05 | 0.08 | 1.55 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 127.82 |

**9/9/2008 6:08:45 PM**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 6/1/2009-7/31/2009 Active Days: 45 | 0.68 | 6.99 | 2.33 | 0.00 | 169.91 | 0.26 | 170.17 | 35.48 | 0.24 | 35.72 | 726.50 |
| Fine Grading 06/01/2009-07/31/2009 | 0.68 | 6.99 | 2.33 | 0.00 | 169.91 | 0.26 | 170.17 | 35.48 | 0.24 | 35.72 | 726.50 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 169.90 | 0.00 | 169.90 | 35.48 | 0.00 | 35.48 | 0.00 |
| Fine Grading Off Road Diesel | 0.57 | 5.61 | 1.47 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.18 | 0.18 | 539.89 |
| Fine Grading On Road Diesel | 0.11 | 1.36 | 0.55 | 0.00 | 0.01 | 0.06 | 0.07 | 0.00 | 0.06 | 0.06 | 161.04 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.56 |
| Time Slice 8/3/2009-8/18/2009 Active Days: 12 | 0.58 | 5.63 | 1.77 | 0.00 | 126.94 | 0.20 | 127.14 | 26.51 | 0.18 | 26.69 | 565.46 |
| Fine Grading 08/03/2009-08/18/2009 | 0.58 | 5.63 | 1.77 | 0.00 | 126.94 | 0.20 | 127.14 | 26.51 | 0.18 | 26.69 | 565.46 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 126.93 | 0.00 | 126.93 | 26.51 | 0.00 | 26.51 | 0.00 |
| Fine Grading Off Road Diesel | 0.57 | 5.61 | 1.47 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.18 | 0.18 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.56 |
| Time Slice 8/24/2009-8/25/2009 Active Days: 2 | 0.58 | 5.63 | 1.77 | 0.00 | 35.98 | 0.20 | 36.18 | 7.51 | 0.18 | 7.70 | 565.46 |
| Fine Grading 08/24/2009-08/25/2009 | 0.58 | 5.63 | 1.77 | 0.00 | 35.98 | 0.20 | 36.18 | 7.51 | 0.18 | 7.70 | 565.46 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 35.98 | 0.00 | 35.98 | 7.51 | 0.00 | 7.51 | 0.00 |
| Fine Grading Off Road Diesel | 0.57 | 5.61 | 1.47 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.18 | 0.18 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.56 |

**9/9/2008 6:08:45 PM**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 8/27/2009-8/28/2009 Active Days: 2 | 1.42 | 18.35 | 7.49 | **<u>0.02</u>** | 0.08 | 0.81 | 0.89 | 0.02 | 0.75 | 0.77 | 2,174.04 |
| Fine Grading 08/27/2009-08/28/2009 | 1.42 | 18.35 | 7.49 | 0.02 | 0.08 | 0.81 | 0.89 | 0.02 | 0.75 | 0.77 | 2,174.04 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Off Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading On Road Diesel | 1.42 | 18.35 | 7.49 | 0.02 | 0.08 | 0.81 | 0.89 | 0.02 | 0.75 | 0.77 | 2,174.04 |
| Fine Grading Worker Trips | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

<u>Phase Assumptions</u>

Phase: Fine Grading 6/1/2009 - 7/31/2009 - Trenching Dust

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 300 cubic yards/day; Offsite Cut/Fill: 300 cubic yards/day

On Road Truck Travel (VMT): 40

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/3/2009 - 8/18/2009 - HDD Crossing

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 223 cubic yards/day; Offsite Cut/Fill: 223 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/24/2009 - 8/25/2009 - Jack and Bore Crossing

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 60 cubic yards/day; Offsite Cut/Fill: 60 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/27/2009 - 8/28/2009 - Pipe Hauling

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 540

Off-Road Equipment:

Phase: Mass Grading 5/4/2009 - 5/22/2009 - Dunnigan Hills

Total Acres Disturbed: 30.6

Maximum Daily Acreage Disturbed: 7.65

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 5/4/2009 - 5/8/2009 - Minimal Repaving

Acres to be Paved: 0.01

Off-Road Equipment:

**9/9/2008 6:08:45 PM**

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 5/4/2009-5/8/2009 Active Days: 5 | **6.62** | **48.42** | **28.93** | 0.00 | 59.69 | **3.02** | 62.70 | 12.47 | **2.78** | 15.24 | **4,295.85** |
| Asphalt 05/04/2009-05/08/2009 | 2.16 | 12.69 | 9.22 | 0.00 | 0.01 | 1.09 | 1.10 | 0.00 | 1.01 | 1.01 | 1,160.55 |
| Paving Off-Gas | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Paving Off Road Diesel | 2.08 | 12.55 | 7.05 | 0.00 | 0.00 | 1.09 | 1.09 | 0.00 | 1.00 | 1.00 | 979.23 |
| Paving On Road Diesel | 0.00 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.37 |
| Paving Worker Trips | 0.07 | 0.12 | 2.17 | 0.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.01 | 178.95 |
| Mass Grading 05/04/2009-05/22/2009 | 4.47 | 35.73 | 19.71 | 0.00 | 59.68 | 1.93 | 61.60 | 12.46 | 1.77 | 14.23 | 3,135.30 |
| Mass Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 59.67 | 0.00 | 59.67 | 12.46 | 0.00 | 12.46 | 0.00 |
| Mass Grading Off Road Diesel | 4.42 | 35.65 | 18.16 | 0.00 | 0.00 | 1.92 | 1.92 | 0.00 | 1.77 | 1.77 | 3,007.48 |
| Mass Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Mass Grading Worker Trips | 0.05 | 0.08 | 1.55 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 127.82 |

**9/9/2008 6:08:45 PM**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 5/11/2009-5/22/2009 Active Days: 10 | 4.47 | 35.73 | 19.71 | 0.00 | 59.68 | 1.93 | 61.60 | 12.46 | 1.77 | 14.23 | 3,135.30 |
| Mass Grading 05/04/2009-05/22/2009 | 4.47 | 35.73 | 19.71 | 0.00 | 59.68 | 1.93 | 61.60 | 12.46 | 1.77 | 14.23 | 3,135.30 |
| Mass Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 59.67 | 0.00 | 59.67 | 12.46 | 0.00 | 12.46 | 0.00 |
| Mass Grading Off Road Diesel | 4.42 | 35.65 | 18.16 | 0.00 | 0.00 | 1.92 | 1.92 | 0.00 | 1.77 | 1.77 | 3,007.48 |
| Mass Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Mass Grading Worker Trips | 0.05 | 0.08 | 1.55 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 127.82 |
| Time Slice 6/1/2009-7/31/2009 Active Days: 45 | 0.68 | 6.99 | 2.33 | 0.00 | 66.27 | 0.26 | 66.53 | 13.84 | 0.24 | 14.08 | 726.50 |
| Fine Grading 06/01/2009-07/31/2009 | 0.68 | 6.99 | 2.33 | 0.00 | 66.27 | 0.26 | 66.53 | 13.84 | 0.24 | 14.08 | 726.50 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 66.26 | 0.00 | 66.26 | 13.84 | 0.00 | 13.84 | 0.00 |
| Fine Grading Off Road Diesel | 0.57 | 5.61 | 1.47 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.18 | 0.18 | 539.89 |
| Fine Grading On Road Diesel | 0.11 | 1.36 | 0.55 | 0.00 | 0.01 | 0.06 | 0.07 | 0.00 | 0.06 | 0.06 | 161.04 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.56 |
| Time Slice 8/3/2009-8/18/2009 Active Days: 12 | 0.58 | 5.63 | 1.77 | 0.00 | 49.51 | 0.20 | 49.71 | 10.34 | 0.18 | 10.52 | 565.46 |
| Fine Grading 08/03/2009-08/18/2009 | 0.58 | 5.63 | 1.77 | 0.00 | 49.51 | 0.20 | 49.71 | 10.34 | 0.18 | 10.52 | 565.46 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 49.50 | 0.00 | 49.50 | 10.34 | 0.00 | 10.34 | 0.00 |
| Fine Grading Off Road Diesel | 0.57 | 5.61 | 1.47 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.18 | 0.18 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.56 |

**9/9/2008 6:08:46 PM**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 8/24/2009-8/25/2009 Active Days: 2 | 0.58 | 5.63 | 1.77 | 0.00 | 14.03 | 0.20 | 14.23 | 2.93 | 0.18 | 3.12 | 565.46 |
| Fine Grading 08/24/2009-08/25/2009 | 0.58 | 5.63 | 1.77 | 0.00 | 14.03 | 0.20 | 14.23 | 2.93 | 0.18 | 3.12 | 565.46 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 14.03 | 0.00 | 14.03 | 2.93 | 0.00 | 2.93 | 0.00 |
| Fine Grading Off Road Diesel | 0.57 | 5.61 | 1.47 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.18 | 0.18 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.56 |
| Time Slice 8/27/2009-8/28/2009 Active Days: 2 | 1.42 | 18.35 | 7.49 | **0.02** | 0.08 | 0.81 | 0.89 | 0.02 | 0.75 | 0.77 | 2,174.04 |
| Fine Grading 08/27/2009-08/28/2009 | 1.42 | 18.35 | 7.49 | 0.02 | 0.08 | 0.81 | 0.89 | 0.02 | 0.75 | 0.77 | 2,174.04 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Off Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading On Road Diesel | 1.42 | 18.35 | 7.49 | 0.02 | 0.08 | 0.81 | 0.89 | 0.02 | 0.75 | 0.77 | 2,174.04 |
| Fine Grading Worker Trips | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 6/1/2009 - 7/31/2009 - Trenching Dust

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/3/2009 - 8/18/2009 - HDD Crossing

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/24/2009 - 8/25/2009 - Jack and Bore Crossing

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 5/4/2009 - 5/22/2009 - Dunnigan Hills

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

**9/9/2008 7:06:15 PM**

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\mba\Desktop\23440005 PG&E Pipeline AQ\Modeling\PG&E Line 407E.urb924

Project Name: Line 407-E

Project Location: California State-wide

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2010 TOTALS (lbs/day unmitigated) | 2.75 | 30.26 | 11.56 | 0.04 | 169.92 | 1.33 | 171.25 | 35.49 | 1.22 | 36.71 | 4,187.05 |
| 2010 TOTALS (lbs/day mitigated) | 2.75 | 30.26 | 11.56 | 0.04 | 66.29 | 1.33 | 67.61 | 13.85 | 1.22 | 15.07 | 4,187.05 |

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|

**9/9/2008 7:06:15 PM**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 6/1/2010-6/8/2010 Active Days: 6 | 2.75 | 20.16 | 11.56 | 0.01 | 169.92 | 1.33 | 171.25 | 35.49 | 1.22 | 36.71 | 2,128.03 |
| Asphalt 06/01/2010-06/08/2010 | 2.02 | 12.01 | 8.91 | 0.00 | 0.01 | 1.03 | 1.04 | 0.00 | 0.95 | 0.95 | 1,159.99 |
| Paving Off-Gas | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Paving Off Road Diesel | 1.95 | 11.89 | 6.98 | 0.00 | 0.00 | 1.03 | 1.03 | 0.00 | 0.94 | 0.94 | 979.23 |
| Paving On Road Diesel | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.99 |
| Paving Worker Trips | 0.06 | 0.11 | 1.92 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 178.78 |
| Fine Grading 06/01/2010-07/30/2010 | 0.73 | 8.15 | 2.65 | 0.00 | 169.92 | 0.29 | 170.21 | 35.49 | 0.27 | 35.76 | 968.03 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 169.90 | 0.00 | 169.90 | 35.48 | 0.00 | 35.48 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.19 | 2.91 | 0.98 | 0.00 | 0.01 | 0.11 | 0.13 | 0.00 | 0.10 | 0.11 | 402.60 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |
| Time Slice 6/9/2010-7/30/2010 Active Days: 38 | 0.73 | 8.15 | 2.65 | 0.00 | 169.92 | 0.29 | 170.21 | 35.49 | 0.27 | 35.76 | 968.03 |
| Fine Grading 06/01/2010-07/30/2010 | 0.73 | 8.15 | 2.65 | 0.00 | 169.92 | 0.29 | 170.21 | 35.49 | 0.27 | 35.76 | 968.03 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 169.90 | 0.00 | 169.90 | 35.48 | 0.00 | 35.48 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.19 | 2.91 | 0.98 | 0.00 | 0.01 | 0.11 | 0.13 | 0.00 | 0.10 | 0.11 | 402.60 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |

**9/9/2008 7:06:15 PM**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 8/2/2010-8/18/2010 Active Days: 13 | 0.54 | 5.24 | 1.67 | 0.00 | 126.94 | 0.18 | 127.12 | 26.51 | 0.17 | 26.68 | 565.43 |
| Fine Grading 08/01/2010-08/18/2010 | 0.54 | 5.24 | 1.67 | 0.00 | 126.94 | 0.18 | 127.12 | 26.51 | 0.17 | 26.68 | 565.43 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 126.93 | 0.00 | 126.93 | 26.51 | 0.00 | 26.51 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |
| Time Slice 8/19/2010-8/20/2010 Active Days: 2 | 0.54 | 5.24 | 1.67 | 0.00 | 35.98 | 0.18 | 36.17 | 7.51 | 0.17 | 7.68 | 565.43 |
| Fine Grading 08/19/2010-08/21/2010 | 0.54 | 5.24 | 1.67 | 0.00 | 35.98 | 0.18 | 36.17 | 7.51 | 0.17 | 7.68 | 565.43 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 35.98 | 0.00 | 35.98 | 7.51 | 0.00 | 7.51 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |
| Time Slice 8/23/2010-8/25/2010 Active Days: 3 | 1.97 | **30.26** | 10.20 | **0.04** | 0.15 | 1.15 | 1.30 | 0.05 | 1.06 | 1.11 | **4,187.05** |
| Fine Grading 08/22/2010-08/25/2010 | 1.97 | 30.26 | 10.20 | 0.04 | 0.15 | 1.15 | 1.30 | 0.05 | 1.06 | 1.11 | 4,187.05 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Off Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading On Road Diesel | 1.97 | 30.26 | 10.20 | 0.04 | 0.15 | 1.15 | 1.30 | 0.05 | 1.06 | 1.11 | 4,187.05 |
| Fine Grading Worker Trips | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Phase Assumptions

Phase: Fine Grading 6/1/2010 - 7/30/2010 - Trenching - Remaining

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

**9/9/2008 7:06:15 PM**

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 300 cubic yards/day; Offsite Cut/Fill: 300 cubic yards/day

On Road Truck Travel (VMT): 100

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/1/2010 - 8/18/2010 - HDD Crossing

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 223 cubic yards/day; Offsite Cut/Fill: 223 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/19/2010 - 8/21/2010 - Jack and Bore Crossing

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 60 cubic yards/day; Offsite Cut/Fill: 60 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/22/2010 - 8/25/2010 - Pipe Hauling

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 1040

**9/9/2008 7:06:15 PM**

Off-Road Equipment:

Phase: Paving 6/1/2010 - 6/8/2010 - Minimal Paving Activity

Acres to be Paved: 0.01

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 6/1/2010-6/8/2010 Active Days: 6 | **2.75** | 20.16 | **11.56** | 0.01 | 66.29 | **1.33** | 67.61 | 13.85 | **1.22** | 15.07 | 2,128.03 |
| Asphalt 06/01/2010-06/08/2010 | 2.02 | 12.01 | 8.91 | 0.00 | 0.01 | 1.03 | 1.04 | 0.00 | 0.95 | 0.95 | 1,159.99 |
| Paving Off-Gas | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Paving Off Road Diesel | 1.95 | 11.89 | 6.98 | 0.00 | 0.00 | 1.03 | 1.03 | 0.00 | 0.94 | 0.94 | 979.23 |
| Paving On Road Diesel | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.99 |
| Paving Worker Trips | 0.06 | 0.11 | 1.92 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 178.78 |
| Fine Grading 06/01/2010-07/30/2010 | 0.73 | 8.15 | 2.65 | 0.00 | 66.28 | 0.29 | 66.57 | 13.84 | 0.27 | 14.11 | 968.03 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 66.26 | 0.00 | 66.26 | 13.84 | 0.00 | 13.84 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.19 | 2.91 | 0.98 | 0.00 | 0.01 | 0.11 | 0.13 | 0.00 | 0.10 | 0.11 | 402.60 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |

**9/9/2008 7:06:15 PM**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 6/9/2010-7/30/2010 Active Days: 38 | 0.73 | 8.15 | 2.65 | 0.00 | 66.28 | 0.29 | 66.57 | 13.84 | 0.27 | 14.11 | 968.03 |
| Fine Grading 06/01/2010-07/30/2010 | 0.73 | 8.15 | 2.65 | 0.00 | 66.28 | 0.29 | 66.57 | 13.84 | 0.27 | 14.11 | 968.03 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 66.26 | 0.00 | 66.26 | 13.84 | 0.00 | 13.84 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.19 | 2.91 | 0.98 | 0.00 | 0.01 | 0.11 | 0.13 | 0.00 | 0.10 | 0.11 | 402.60 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |
| Time Slice 8/2/2010-8/18/2010 Active Days: 13 | 0.54 | 5.24 | 1.67 | 0.00 | 49.51 | 0.18 | 49.69 | 10.34 | 0.17 | 10.51 | 565.43 |
| Fine Grading 08/01/2010-08/18/2010 | 0.54 | 5.24 | 1.67 | 0.00 | 49.51 | 0.18 | 49.69 | 10.34 | 0.17 | 10.51 | 565.43 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 49.50 | 0.00 | 49.50 | 10.34 | 0.00 | 10.34 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |
| Time Slice 8/19/2010-8/20/2010 Active Days: 2 | 0.54 | 5.24 | 1.67 | 0.00 | 14.03 | 0.18 | 14.22 | 2.93 | 0.17 | 3.10 | 565.43 |
| Fine Grading 08/19/2010-08/21/2010 | 0.54 | 5.24 | 1.67 | 0.00 | 14.03 | 0.18 | 14.22 | 2.93 | 0.17 | 3.10 | 565.43 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 14.03 | 0.00 | 14.03 | 2.93 | 0.00 | 2.93 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 8/23/2010-8/25/2010 Active Days: 3 | 1.97 | **30.26** | 10.20 | **0.04** | 0.15 | 1.15 | 1.30 | 0.05 | 1.06 | 1.11 | **4,187.05** |
| Fine Grading 08/22/2010-08/25/2010 | 1.97 | 30.26 | 10.20 | 0.04 | 0.15 | 1.15 | 1.30 | 0.05 | 1.06 | 1.11 | 4,187.05 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Off Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading On Road Diesel | 1.97 | 30.26 | 10.20 | 0.04 | 0.15 | 1.15 | 1.30 | 0.05 | 1.06 | 1.11 | 4,187.05 |
| Fine Grading Worker Trips | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 6/1/2010 - 7/30/2010 - Trenching - Remaining

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/1/2010 - 8/18/2010 - HDD Crossing

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/19/2010 - 8/21/2010 - Jack and Bore Crossing

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

**9/9/2008 7:04:16 PM**

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\mba\Desktop\23440005 PG&E Pipeline AQ\Modeling\DFM.urb924

Project Name: DFM

Project Location: California State-wide

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2010 TOTALS (lbs/day unmitigated) | 0.59 | 9.08 | 3.06 | 0.01 | 169.90 | 0.35 | 170.11 | 35.48 | 0.32 | 35.67 | 1,256.11 |
| 2010 TOTALS (lbs/day mitigated) | 0.59 | 9.08 | 3.06 | 0.01 | 66.27 | 0.35 | 66.47 | 13.84 | 0.32 | 14.03 | 1,256.11 |

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

| ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 6/1/2010-7/30/2010 Active Days: 44 | 0.58 | 5.83 | 1.87 | 0.00 | **169.90** | 0.21 | **170.11** | **35.48** | 0.19 | **35.67** | 645.95 |
| Fine Grading 06/01/2010-07/30/2010 | 0.58 | 5.83 | 1.87 | 0.00 | 169.90 | 0.21 | 170.11 | 35.48 | 0.19 | 35.67 | 645.95 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 169.90 | 0.00 | 169.90 | 35.48 | 0.00 | 35.48 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.04 | 0.58 | 0.20 | 0.00 | 0.00 | 0.02 | 0.03 | 0.00 | 0.02 | 0.02 | 80.52 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |
| Time Slice 8/19/2010-8/20/2010 Active Days: 2 | 0.54 | 5.24 | 1.67 | 0.00 | 35.98 | 0.18 | 36.17 | 7.51 | 0.17 | 7.68 | 565.43 |
| Fine Grading 08/19/2010-08/21/2010 | 0.54 | 5.24 | 1.67 | 0.00 | 35.98 | 0.18 | 36.17 | 7.51 | 0.17 | 7.68 | 565.43 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 35.98 | 0.00 | 35.98 | 7.51 | 0.00 | 7.51 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |
| Time Slice 8/23/2010-8/25/2010 Active Days: 3 | **0.59** | **9.08** | **3.06** | **0.01** | 0.04 | **0.35** | 0.39 | 0.01 | **0.32** | 0.33 | **1,256.11** |
| Fine Grading 08/22/2010-08/25/2010 | 0.59 | 9.08 | 3.06 | 0.01 | 0.04 | 0.35 | 0.39 | 0.01 | 0.32 | 0.33 | 1,256.11 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Off Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading On Road Diesel | 0.59 | 9.08 | 3.06 | 0.01 | 0.04 | 0.35 | 0.39 | 0.01 | 0.32 | 0.33 | 1,256.11 |
| Fine Grading Worker Trips | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Phase Assumptions

Phase: Fine Grading 6/1/2010 - 7/30/2010 - Trenching - Remaining

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 300 cubic yards/day; Offsite Cut/Fill: 300 cubic yards/day

On Road Truck Travel (VMT): 20

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/19/2010 - 8/21/2010 - Jack and Bore Crossing

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 60 cubic yards/day; Offsite Cut/Fill: 60 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/22/2010 - 8/25/2010 - Pipe Hauling

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 312

Off-Road Equipment:

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|

**9/9/2008 7:04:16 PM**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 6/1/2010-7/30/2010 Active Days: 44 | 0.58 | 5.83 | 1.87 | 0.00 | 66.27 | 0.21 | 66.47 | 13.84 | 0.19 | 14.03 | 645.95 |
| Fine Grading 06/01/2010-07/30/2010 | 0.58 | 5.83 | 1.87 | 0.00 | 66.27 | 0.21 | 66.47 | 13.84 | 0.19 | 14.03 | 645.95 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 66.26 | 0.00 | 66.26 | 13.84 | 0.00 | 13.84 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.04 | 0.58 | 0.20 | 0.00 | 0.00 | 0.02 | 0.03 | 0.00 | 0.02 | 0.02 | 80.52 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |
| Time Slice 8/19/2010-8/20/2010 Active Days: 2 | 0.54 | 5.24 | 1.67 | 0.00 | 14.03 | 0.18 | 14.22 | 2.93 | 0.17 | 3.10 | 565.43 |
| Fine Grading 08/19/2010-08/21/2010 | 0.54 | 5.24 | 1.67 | 0.00 | 14.03 | 0.18 | 14.22 | 2.93 | 0.17 | 3.10 | 565.43 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 14.03 | 0.00 | 14.03 | 2.93 | 0.00 | 2.93 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |
| Time Slice 8/23/2010-8/25/2010 Active Days: 3 | **0.59** | **9.08** | **3.06** | **0.01** | 0.04 | **0.35** | 0.39 | 0.01 | **0.32** | 0.33 | **1,256.11** |
| Fine Grading 08/22/2010-08/25/2010 | 0.59 | 9.08 | 3.06 | 0.01 | 0.04 | 0.35 | 0.39 | 0.01 | 0.32 | 0.33 | 1,256.11 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Off Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading On Road Diesel | 0.59 | 9.08 | 3.06 | 0.01 | 0.04 | 0.35 | 0.39 | 0.01 | 0.32 | 0.33 | 1,256.11 |
| Fine Grading Worker Trips | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 6/1/2010 - 7/30/2010 - Trenching - Remaining

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

**9/9/2008 7:04:16 PM**

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/19/2010 - 8/21/2010 - Jack and Bore Crossing

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

**9/9/2008 7:14:49 PM**

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\mba\Desktop\23440005 PG&E Pipeline AQ\Modeling\PG&E Line 407W.urb924

Project Name: Line 407-W

Project Location: California State-wide

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2012 TOTALS (lbs/day unmitigated) | 0.65 | 9.36 | 3.24 | 0.01 | 169.92 | 0.35 | 170.15 | 35.49 | 0.32 | 35.71 | 1,610.40 |
| 2012 TOTALS (lbs/day mitigated) | 0.65 | 9.36 | 3.24 | 0.01 | 66.28 | 0.35 | 66.51 | 13.84 | 0.32 | 14.06 | 1,610.40 |

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|

**9/9/2008 7:14:49 PM**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 6/1/2012-7/30/2012 Active Days: 42 | 0.65 | 6.73 | 2.33 | 0.00 | 169.92 | 0.24 | 170.15 | 35.49 | 0.22 | 35.71 | 968.05 |
| Fine Grading 06/01/2012-07/30/2012 | 0.65 | 6.73 | 2.33 | 0.00 | 169.92 | 0.24 | 170.15 | 35.49 | 0.22 | 35.71 | 968.05 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 169.90 | 0.00 | 169.90 | 35.48 | 0.00 | 35.48 | 0.00 |
| Fine Grading Off Road Diesel | 0.48 | 4.38 | 1.28 | 0.00 | 0.00 | 0.15 | 0.15 | 0.00 | 0.14 | 0.14 | 539.89 |
| Fine Grading On Road Diesel | 0.16 | 2.34 | 0.81 | 0.00 | 0.01 | 0.09 | 0.10 | 0.00 | 0.08 | 0.09 | 402.60 |
| Fine Grading Worker Trips | 0.01 | 0.01 | 0.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.56 |
| Time Slice 8/1/2012-8/17/2012 Active Days: 13 | 0.49 | 4.39 | 1.52 | 0.00 | 126.94 | 0.15 | 127.09 | 26.51 | 0.14 | 26.65 | 565.45 |
| Fine Grading 08/01/2012-08/18/2012 | 0.49 | 4.39 | 1.52 | 0.00 | 126.94 | 0.15 | 127.09 | 26.51 | 0.14 | 26.65 | 565.45 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 126.93 | 0.00 | 126.93 | 26.51 | 0.00 | 26.51 | 0.00 |
| Fine Grading Off Road Diesel | 0.48 | 4.38 | 1.28 | 0.00 | 0.00 | 0.15 | 0.15 | 0.00 | 0.14 | 0.14 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.01 | 0.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.56 |
| Time Slice 8/20/2012-8/21/2012 Active Days: 2 | 0.49 | 4.39 | 1.52 | 0.00 | 35.98 | 0.15 | 36.13 | 7.51 | 0.14 | 7.65 | 565.45 |
| Fine Grading 08/19/2012-08/21/2012 | 0.49 | 4.39 | 1.52 | 0.00 | 35.98 | 0.15 | 36.13 | 7.51 | 0.14 | 7.65 | 565.45 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 35.98 | 0.00 | 35.98 | 7.51 | 0.00 | 7.51 | 0.00 |
| Fine Grading Off Road Diesel | 0.48 | 4.38 | 1.28 | 0.00 | 0.00 | 0.15 | 0.15 | 0.00 | 0.14 | 0.14 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.01 | 0.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.56 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 8/22/2012-8/24/2012 Active Days: 3 | 0.65 | 9.36 | 3.24 | 0.01 | 0.06 | 0.35 | 0.41 | 0.02 | 0.32 | 0.34 | 1,610.40 |
| Fine Grading 08/22/2012-08/25/2012 | 0.65 | 9.36 | 3.24 | 0.01 | 0.06 | 0.35 | 0.41 | 0.02 | 0.32 | 0.34 | 1,610.40 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Off Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading On Road Diesel | 0.65 | 9.36 | 3.24 | 0.01 | 0.06 | 0.35 | 0.41 | 0.02 | 0.32 | 0.34 | 1,610.40 |
| Fine Grading Worker Trips | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Phase Assumptions

Phase: Fine Grading 6/1/2012 - 7/30/2012 - Trenching - Remaining

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 300 cubic yards/day; Offsite Cut/Fill: 300 cubic yards/day

On Road Truck Travel (VMT): 100

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/1/2012 - 8/18/2012 - HDD Crossing

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 223 cubic yards/day; Offsite Cut/Fill: 223 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/19/2012 - 8/21/2012 - Jack and Bore Crossing

Total Acres Disturbed: 1

**9/9/2008 7:14:49 PM**

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 60 cubic yards/day; Offsite Cut/Fill: 60 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/22/2012 - 8/25/2012 - Pipe Hauling

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 400

Off-Road Equipment:

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 6/1/2012-7/30/2012<br>Active Days: 42 | 0.65 | 6.73 | 2.33 | 0.00 | 66.28 | 0.24 | 66.51 | 13.84 | 0.22 | 14.06 | 968.05 |
| Fine Grading 06/01/2012-07/30/2012 | 0.65 | 6.73 | 2.33 | 0.00 | 66.28 | 0.24 | 66.51 | 13.84 | 0.22 | 14.06 | 968.05 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 66.26 | 0.00 | 66.26 | 13.84 | 0.00 | 13.84 | 0.00 |
| Fine Grading Off Road Diesel | 0.48 | 4.38 | 1.28 | 0.00 | 0.00 | 0.15 | 0.15 | 0.00 | 0.14 | 0.14 | 539.89 |
| Fine Grading On Road Diesel | 0.16 | 2.34 | 0.81 | 0.00 | 0.01 | 0.09 | 0.10 | 0.00 | 0.08 | 0.09 | 402.60 |
| Fine Grading Worker Trips | 0.01 | 0.01 | 0.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.56 |

**9/9/2008 7:14:49 PM**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 8/1/2012-8/17/2012 Active Days: 13 | 0.49 | 4.39 | 1.52 | 0.00 | 49.51 | 0.15 | 49.66 | 10.34 | 0.14 | 10.48 | 565.45 |
| Fine Grading 08/01/2012-08/18/2012 | 0.49 | 4.39 | 1.52 | 0.00 | 49.51 | 0.15 | 49.66 | 10.34 | 0.14 | 10.48 | 565.45 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 49.50 | 0.00 | 49.50 | 10.34 | 0.00 | 10.34 | 0.00 |
| Fine Grading Off Road Diesel | 0.48 | 4.38 | 1.28 | 0.00 | 0.00 | 0.15 | 0.15 | 0.00 | 0.14 | 0.14 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.01 | 0.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.56 |
| Time Slice 8/20/2012-8/21/2012 Active Days: 2 | 0.49 | 4.39 | 1.52 | 0.00 | 14.03 | 0.15 | 14.18 | 2.93 | 0.14 | 3.07 | 565.45 |
| Fine Grading 08/19/2012-08/21/2012 | 0.49 | 4.39 | 1.52 | 0.00 | 14.03 | 0.15 | 14.18 | 2.93 | 0.14 | 3.07 | 565.45 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 14.03 | 0.00 | 14.03 | 2.93 | 0.00 | 2.93 | 0.00 |
| Fine Grading Off Road Diesel | 0.48 | 4.38 | 1.28 | 0.00 | 0.00 | 0.15 | 0.15 | 0.00 | 0.14 | 0.14 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.01 | 0.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.56 |
| Time Slice 8/22/2012-8/24/2012 Active Days: 3 | 0.65 | 9.36 | 3.24 | 0.01 | 0.06 | 0.35 | 0.41 | 0.02 | 0.32 | 0.34 | 1,610.40 |
| Fine Grading 08/22/2012-08/25/2012 | 0.65 | 9.36 | 3.24 | 0.01 | 0.06 | 0.35 | 0.41 | 0.02 | 0.32 | 0.34 | 1,610.40 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Off Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading On Road Diesel | 0.65 | 9.36 | 3.24 | 0.01 | 0.06 | 0.35 | 0.41 | 0.02 | 0.32 | 0.34 | 1,610.40 |
| Fine Grading Worker Trips | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 6/1/2012 - 7/30/2012 - Trenching - Remaining

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

**9/9/2008 7:14:49 PM**

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/1/2012 - 8/18/2012 - HDD Crossing

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/19/2012 - 8/21/2012 - Jack and Bore Crossing

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

**9/10/2008 8:36:50 AM**

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\mba\Desktop\23440005 PG&E Pipeline AQ\Modeling\PG&E Line 407E_Mitigated.urb924

Project Name: Line 407-E - Mitigated

Project Location: California State-wide

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2010 TOTALS (lbs/day unmitigated) | 2.75 | 30.26 | 11.56 | 0.04 | 169.92 | 1.33 | 171.25 | 35.49 | 1.22 | 36.71 | 4,187.05 |
| 2010 TOTALS (lbs/day mitigated) | 2.75 | 30.26 | 11.56 | 0.04 | 16.19 | 1.33 | 17.52 | 3.38 | 1.22 | 4.60 | 4,187.05 |

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

| ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|

**9/10/2008 8:36:50 AM**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 6/1/2010-6/8/2010 Active Days: 6 | **2.75** | 20.16 | **11.56** | 0.01 | **169.92** | **1.33** | **171.25** | **35.49** | **1.22** | **36.71** | 2,128.03 |
| Asphalt 06/01/2010-06/08/2010 | 2.02 | 12.01 | 8.91 | 0.00 | 0.01 | 1.03 | 1.04 | 0.00 | 0.95 | 0.95 | 1,159.99 |
| Paving Off-Gas | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Paving Off Road Diesel | 1.95 | 11.89 | 6.98 | 0.00 | 0.00 | 1.03 | 1.03 | 0.00 | 0.94 | 0.94 | 979.23 |
| Paving On Road Diesel | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.99 |
| Paving Worker Trips | 0.06 | 0.11 | 1.92 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 178.78 |
| Fine Grading 06/01/2010-07/30/2010 | 0.73 | 8.15 | 2.65 | 0.00 | 169.92 | 0.29 | 170.21 | 35.49 | 0.27 | 35.76 | 968.03 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 169.90 | 0.00 | 169.90 | 35.48 | 0.00 | 35.48 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.19 | 2.91 | 0.98 | 0.00 | 0.01 | 0.11 | 0.13 | 0.00 | 0.10 | 0.11 | 402.60 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |
| Time Slice 6/9/2010-7/30/2010 Active Days: 38 | 0.73 | 8.15 | 2.65 | 0.00 | 169.92 | 0.29 | 170.21 | 35.49 | 0.27 | 35.76 | 968.03 |
| Fine Grading 06/01/2010-07/30/2010 | 0.73 | 8.15 | 2.65 | 0.00 | 169.92 | 0.29 | 170.21 | 35.49 | 0.27 | 35.76 | 968.03 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 169.90 | 0.00 | 169.90 | 35.48 | 0.00 | 35.48 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.19 | 2.91 | 0.98 | 0.00 | 0.01 | 0.11 | 0.13 | 0.00 | 0.10 | 0.11 | 402.60 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |

**9/10/2008 8:36:50 AM**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 8/2/2010-8/18/2010 Active Days: 13 | 0.54 | 5.24 | 1.67 | 0.00 | 126.94 | 0.18 | 127.12 | 26.51 | 0.17 | 26.68 | 565.43 |
| Fine Grading 08/01/2010-08/18/2010 | 0.54 | 5.24 | 1.67 | 0.00 | 126.94 | 0.18 | 127.12 | 26.51 | 0.17 | 26.68 | 565.43 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 126.93 | 0.00 | 126.93 | 26.51 | 0.00 | 26.51 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |
| Time Slice 8/19/2010-8/20/2010 Active Days: 2 | 0.54 | 5.24 | 1.67 | 0.00 | 35.98 | 0.18 | 36.17 | 7.51 | 0.17 | 7.68 | 565.43 |
| Fine Grading 08/19/2010-08/21/2010 | 0.54 | 5.24 | 1.67 | 0.00 | 35.98 | 0.18 | 36.17 | 7.51 | 0.17 | 7.68 | 565.43 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 35.98 | 0.00 | 35.98 | 7.51 | 0.00 | 7.51 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |
| Time Slice 8/23/2010-8/25/2010 Active Days: 3 | 1.97 | **30.26** | 10.20 | **0.04** | 0.15 | 1.15 | 1.30 | 0.05 | 1.06 | 1.11 | **4,187.05** |
| Fine Grading 08/22/2010-08/25/2010 | 1.97 | 30.26 | 10.20 | 0.04 | 0.15 | 1.15 | 1.30 | 0.05 | 1.06 | 1.11 | 4,187.05 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Off Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading On Road Diesel | 1.97 | 30.26 | 10.20 | 0.04 | 0.15 | 1.15 | 1.30 | 0.05 | 1.06 | 1.11 | 4,187.05 |
| Fine Grading Worker Trips | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Phase Assumptions

Phase: Fine Grading 6/1/2010 - 7/30/2010 - Trenching - Remaining

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

**9/10/2008 8:36:51 AM**

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 300 cubic yards/day; Offsite Cut/Fill: 300 cubic yards/day

On Road Truck Travel (VMT): 100

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/1/2010 - 8/18/2010 - HDD Crossing

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 223 cubic yards/day; Offsite Cut/Fill: 223 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/19/2010 - 8/21/2010 - Jack and Bore Crossing

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 60 cubic yards/day; Offsite Cut/Fill: 60 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/22/2010 - 8/25/2010 - Pipe Hauling

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 1040

**9/10/2008 8:36:51 AM**

Off-Road Equipment:

Phase: Paving 6/1/2010 - 6/8/2010 - Minimal Paving Activity

Acres to be Paved: 0.01

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 6/1/2010-6/8/2010 Active Days: 6 | **2.75** | 20.16 | **11.56** | 0.01 | 16.19 | **1.33** | 17.52 | 3.38 | **1.22** | 4.60 | 2,128.03 |
| Asphalt 06/01/2010-06/08/2010 | 2.02 | 12.01 | 8.91 | 0.00 | 0.01 | 1.03 | 1.04 | 0.00 | 0.95 | 0.95 | 1,159.99 |
| Paving Off-Gas | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Paving Off Road Diesel | 1.95 | 11.89 | 6.98 | 0.00 | 0.00 | 1.03 | 1.03 | 0.00 | 0.94 | 0.94 | 979.23 |
| Paving On Road Diesel | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.99 |
| Paving Worker Trips | 0.06 | 0.11 | 1.92 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 178.78 |
| Fine Grading 06/01/2010-07/30/2010 | 0.73 | 8.15 | 2.65 | 0.00 | 16.18 | 0.29 | 16.48 | 3.38 | 0.27 | 3.65 | 968.03 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 16.17 | 0.00 | 16.17 | 3.38 | 0.00 | 3.38 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.19 | 2.91 | 0.98 | 0.00 | 0.01 | 0.11 | 0.13 | 0.00 | 0.10 | 0.11 | 402.60 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |

**9/10/2008 8:36:51 AM**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 6/9/2010-7/30/2010 Active Days: 38 | 0.73 | 8.15 | 2.65 | 0.00 | 16.18 | 0.29 | 16.48 | 3.38 | 0.27 | 3.65 | 968.03 |
| Fine Grading 06/01/2010-07/30/2010 | 0.73 | 8.15 | 2.65 | 0.00 | 16.18 | 0.29 | 16.48 | 3.38 | 0.27 | 3.65 | 968.03 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 16.17 | 0.00 | 16.17 | 3.38 | 0.00 | 3.38 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.19 | 2.91 | 0.98 | 0.00 | 0.01 | 0.11 | 0.13 | 0.00 | 0.10 | 0.11 | 402.60 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |
| Time Slice 8/2/2010-8/18/2010 Active Days: 13 | 0.54 | 5.24 | 1.67 | 0.00 | 12.08 | 0.18 | 12.26 | 2.52 | 0.17 | 2.69 | 565.43 |
| Fine Grading 08/01/2010-08/18/2010 | 0.54 | 5.24 | 1.67 | 0.00 | 12.08 | 0.18 | 12.26 | 2.52 | 0.17 | 2.69 | 565.43 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 12.08 | 0.00 | 12.08 | 2.52 | 0.00 | 2.52 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |
| Time Slice 8/19/2010-8/20/2010 Active Days: 2 | 0.54 | 5.24 | 1.67 | 0.00 | 3.43 | 0.18 | 3.61 | 0.72 | 0.17 | 0.88 | 565.43 |
| Fine Grading 08/19/2010-08/21/2010 | 0.54 | 5.24 | 1.67 | 0.00 | 3.43 | 0.18 | 3.61 | 0.72 | 0.17 | 0.88 | 565.43 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 3.42 | 0.00 | 3.42 | 0.72 | 0.00 | 0.72 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |

**9/10/2008 8:36:51 AM**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 8/23/2010-8/25/2010 Active Days: 3 | 1.97 | **30.26** | 10.20 | **0.04** | 0.15 | 1.15 | 1.30 | 0.05 | 1.06 | 1.11 | **4,187.05** |
| Fine Grading 08/22/2010-08/25/2010 | 1.97 | 30.26 | 10.20 | 0.04 | 0.15 | 1.15 | 1.30 | 0.05 | 1.06 | 1.11 | 4,187.05 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Off Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading On Road Diesel | 1.97 | 30.26 | 10.20 | 0.04 | 0.15 | 1.15 | 1.30 | 0.05 | 1.06 | 1.11 | 4,187.05 |
| Fine Grading Worker Trips | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 6/1/2010 - 7/30/2010 - Trenching - Remaining

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/1/2010 - 8/18/2010 - HDD Crossing

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/19/2010 - 8/21/2010 - Jack and Bore Crossing

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

**9/10/2008 8:36:51 AM**

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/22/2010 - 8/25/2010 - Pipe Hauling

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

**12/10/2008 11:58:20 AM**

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: S:\Projects\23440005 PG&E Line 406-407\AQ Work\Modeling\Operational.urb924

Project Name: Operational Trips

Project Location: California State-wide

On-Road Vehicle Emissions Based on: Version  : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

| | ROG | NOx | CO | SO2 | PM10 | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|
| TOTALS (lbs/day, unmitigated) | 0.08 | 0.38 | 0.69 | 0.00 | 0.26 | 0.05 | 166.33 |

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

| | ROG | NOx | CO | SO2 | PM10 | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|
| TOTALS (lbs/day, unmitigated) | 0.08 | 0.38 | 0.69 | 0.00 | 0.26 | 0.05 | 166.33 |

**12/10/2008 11:58:20 AM**

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

| Source | ROG | NOX | CO | SO2 | PM10 | PM25 | CO2 |
|---|---|---|---|---|---|---|---|
| Operational Trips | 0.08 | 0.38 | 0.69 | 0.00 | 0.26 | 0.05 | 166.33 |
| TOTALS (lbs/day, unmitigated) | 0.08 | 0.38 | 0.69 | 0.00 | 0.26 | 0.05 | 166.33 |

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2010  Temperature (F): 85  Season: Summer

Emfac: Version  : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

| Land Use Type | Acreage | Trip Rate | Unit Type | No. Units | Total Trips | Total VMT |
|---|---|---|---|---|---|---|
| Operational Trips | | 1.00 | acres | 1.00 | 1.00 | 150.00 |
| | | | | | 1.00 | 150.00 |

Vehicle Fleet Mix

| Vehicle Type | Percent Type | Non-Catalyst | Catalyst | Diesel |
|---|---|---|---|---|
| Light Auto | 0.0 | 1.2 | 98.4 | 0.4 |
| Light Truck < 3750 lbs | 0.0 | 2.8 | 91.7 | 5.5 |
| Light Truck 3751-5750 lbs | 0.0 | 0.9 | 98.6 | 0.5 |
| Med Truck 5751-8500 lbs | 0.0 | 1.1 | 98.9 | 0.0 |
| Lite-Heavy Truck 8501-10,000 lbs | 100.0 | 0.0 | 76.5 | 23.5 |
| Lite-Heavy Truck 10,001-14,000 lbs | 0.0 | 0.0 | 50.0 | 50.0 |

**12/10/2008 11:58:20 AM**

Vehicle Fleet Mix

| Vehicle Type | Percent Type | Non-Catalyst | Catalyst | Diesel |
|---|---|---|---|---|
| Med-Heavy Truck 14,001-33,000 lbs | 0.0 | 0.0 | 20.0 | 80.0 |
| Heavy-Heavy Truck 33,001-60,000 lbs | 0.0 | 0.0 | 0.0 | 100.0 |
| Other Bus | 0.0 | 0.0 | 0.0 | 100.0 |
| Urban Bus | 0.0 | 0.0 | 0.0 | 100.0 |
| Motorcycle | 0.0 | 68.6 | 31.4 | 0.0 |
| School Bus | 0.0 | 0.0 | 0.0 | 100.0 |
| Motor Home | 0.0 | 0.0 | 90.0 | 10.0 |

Travel Conditions

| | Residential | | | Commercial | | |
|---|---|---|---|---|---|---|
| | Home-Work | Home-Shop | Home-Other | Commute | Non-Work | Customer |
| Urban Trip Length (miles) | 10.8 | 7.3 | 7.5 | 9.5 | 7.4 | 7.4 |
| Rural Trip Length (miles) | 150.0 | 150.0 | 150.0 | 150.0 | 150.0 | 150.0 |
| Trip speeds (mph) | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 |
| % of Trips - Residential | 32.9 | 18.0 | 49.1 | | | |
| | | | | | | |
| % of Trips - Commercial (by land use) | | | | | | |
| Operational Trips | | | | 2.0 | 1.0 | 97.0 |

# D-4: Line 407 East Mitigated

**10/27/2008 12:22:56 PM**

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: S:\Projects\23440005 PG&E Line 406-407\AQ Work\Modeling\PG&E Line 407E_Mitigated.urb924

Project Name: Line 407-E - Mitigated

Project Location: California State-wide

On-Road Vehicle Emissions Based on: Version  : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2010 TOTALS (lbs/day unmitigated) | 2.65 | 18.71 | 11.07 | 0.02 | 169.92 | 1.27 | 171.19 | 35.49 | 1.17 | 36.66 | 2,093.52 |
| 2010 TOTALS (lbs/day mitigated) | 2.65 | 18.71 | 11.07 | 0.02 | 16.18 | 1.27 | 17.46 | 3.38 | 1.17 | 4.55 | 2,093.52 |

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

| ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|

**10/27/2008 12:22:56 PM**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 6/1/2010-6/8/2010 Active Days: 6 | **2.65** | **18.71** | **11.07** | 0.00 | **169.92** | **1.27** | **171.19** | **35.49** | **1.17** | **36.66** | 1,926.72 |
| Asphalt 06/01/2010-06/08/2010 | 2.02 | 12.01 | 8.91 | 0.00 | 0.01 | 1.03 | 1.04 | 0.00 | 0.95 | 0.95 | 1,159.99 |
| Paving Off-Gas | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Paving Off Road Diesel | 1.95 | 11.89 | 6.98 | 0.00 | 0.00 | 1.03 | 1.03 | 0.00 | 0.94 | 0.94 | 979.23 |
| Paving On Road Diesel | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.99 |
| Paving Worker Trips | 0.06 | 0.11 | 1.92 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 178.78 |
| Fine Grading 06/01/2010-07/30/2010 | 0.64 | 6.70 | 2.16 | 0.00 | 169.91 | 0.24 | 170.15 | 35.48 | 0.22 | 35.70 | 766.73 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 169.90 | 0.00 | 169.90 | 35.48 | 0.00 | 35.48 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.09 | 1.45 | 0.49 | 0.00 | 0.01 | 0.06 | 0.06 | 0.00 | 0.05 | 0.05 | 201.30 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |
| Time Slice 6/9/2010-7/30/2010 Active Days: 38 | 0.64 | 6.70 | 2.16 | 0.00 | 169.91 | 0.24 | 170.15 | 35.48 | 0.22 | 35.70 | 766.73 |
| Fine Grading 06/01/2010-07/30/2010 | 0.64 | 6.70 | 2.16 | 0.00 | 169.91 | 0.24 | 170.15 | 35.48 | 0.22 | 35.70 | 766.73 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 169.90 | 0.00 | 169.90 | 35.48 | 0.00 | 35.48 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.09 | 1.45 | 0.49 | 0.00 | 0.01 | 0.06 | 0.06 | 0.00 | 0.05 | 0.05 | 201.30 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |

**10/27/2008 12:22:56 PM**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 8/2/2010-8/18/2010 Active Days: 13 | 0.54 | 5.24 | 1.67 | 0.00 | 126.94 | 0.18 | 127.12 | 26.51 | 0.17 | 26.68 | 565.43 |
| Fine Grading 08/01/2010-08/18/2010 | 0.54 | 5.24 | 1.67 | 0.00 | 126.94 | 0.18 | 127.12 | 26.51 | 0.17 | 26.68 | 565.43 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 126.93 | 0.00 | 126.93 | 26.51 | 0.00 | 26.51 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |
| Time Slice 8/19/2010-8/20/2010 Active Days: 2 | 0.54 | 5.24 | 1.67 | 0.00 | 35.98 | 0.18 | 36.17 | 7.51 | 0.17 | 7.68 | 565.43 |
| Fine Grading 08/19/2010-08/21/2010 | 0.54 | 5.24 | 1.67 | 0.00 | 35.98 | 0.18 | 36.17 | 7.51 | 0.17 | 7.68 | 565.43 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 35.98 | 0.00 | 35.98 | 7.51 | 0.00 | 7.51 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |
| Time Slice 8/23/2010-8/25/2010 Active Days: 3 | 0.99 | 15.13 | 5.10 | **0.02** | 0.07 | 0.58 | 0.65 | 0.02 | 0.53 | 0.56 | **2,093.52** |
| Fine Grading 08/22/2010-08/25/2010 | 0.99 | 15.13 | 5.10 | 0.02 | 0.07 | 0.58 | 0.65 | 0.02 | 0.53 | 0.56 | 2,093.52 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Off Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading On Road Diesel | 0.99 | 15.13 | 5.10 | 0.02 | 0.07 | 0.58 | 0.65 | 0.02 | 0.53 | 0.56 | 2,093.52 |
| Fine Grading Worker Trips | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Phase Assumptions

Phase: Fine Grading 6/1/2010 - 7/30/2010 - Trenching - Remaining

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

**10/27/2008 12:22:56 PM**

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 300 cubic yards/day; Offsite Cut/Fill: 300 cubic yards/day

On Road Truck Travel (VMT): 50

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/1/2010 - 8/18/2010 - HDD Crossing

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 223 cubic yards/day; Offsite Cut/Fill: 223 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/19/2010 - 8/21/2010 - Jack and Bore Crossing

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 60 cubic yards/day; Offsite Cut/Fill: 60 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/22/2010 - 8/25/2010 - Pipe Hauling

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 520

Off-Road Equipment:

Phase: Paving 6/1/2010 - 6/8/2010 - Minimal Paving Activity

Acres to be Paved: 0.01

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 6/1/2010-6/8/2010 Active Days: 6 | **2.65** | **18.71** | **11.07** | 0.00 | 16.18 | **1.27** | 17.46 | 3.38 | **1.17** | 4.55 | 1,926.72 |
| Asphalt 06/01/2010-06/08/2010 | 2.02 | 12.01 | 8.91 | 0.00 | 0.01 | 1.03 | 1.04 | 0.00 | 0.95 | 0.95 | 1,159.99 |
| Paving Off-Gas | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Paving Off Road Diesel | 1.95 | 11.89 | 6.98 | 0.00 | 0.00 | 1.03 | 1.03 | 0.00 | 0.94 | 0.94 | 979.23 |
| Paving On Road Diesel | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.99 |
| Paving Worker Trips | 0.06 | 0.11 | 1.92 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 178.78 |
| Fine Grading 06/01/2010-07/30/2010 | 0.64 | 6.70 | 2.16 | 0.00 | 16.18 | 0.24 | 16.42 | 3.38 | 0.22 | 3.60 | 766.73 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 16.17 | 0.00 | 16.17 | 3.38 | 0.00 | 3.38 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.09 | 1.45 | 0.49 | 0.00 | 0.01 | 0.06 | 0.06 | 0.00 | 0.05 | 0.05 | 201.30 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |

**10/27/2008 12:22:56 PM**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 6/9/2010-7/30/2010 Active Days: 38 | 0.64 | 6.70 | 2.16 | 0.00 | 16.18 | 0.24 | 16.42 | 3.38 | 0.22 | 3.60 | 766.73 |
| Fine Grading 06/01/2010-07/30/2010 | 0.64 | 6.70 | 2.16 | 0.00 | 16.18 | 0.24 | 16.42 | 3.38 | 0.22 | 3.60 | 766.73 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 16.17 | 0.00 | 16.17 | 3.38 | 0.00 | 3.38 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.09 | 1.45 | 0.49 | 0.00 | 0.01 | 0.06 | 0.06 | 0.00 | 0.05 | 0.05 | 201.30 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |
| Time Slice 8/2/2010-8/18/2010 Active Days: 13 | 0.54 | 5.24 | 1.67 | 0.00 | 12.08 | 0.18 | 12.26 | 2.52 | 0.17 | 2.69 | 565.43 |
| Fine Grading 08/01/2010-08/18/2010 | 0.54 | 5.24 | 1.67 | 0.00 | 12.08 | 0.18 | 12.26 | 2.52 | 0.17 | 2.69 | 565.43 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 12.08 | 0.00 | 12.08 | 2.52 | 0.00 | 2.52 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |
| Time Slice 8/19/2010-8/20/2010 Active Days: 2 | 0.54 | 5.24 | 1.67 | 0.00 | 3.43 | 0.18 | 3.61 | 0.72 | 0.17 | 0.88 | 565.43 |
| Fine Grading 08/19/2010-08/21/2010 | 0.54 | 5.24 | 1.67 | 0.00 | 3.43 | 0.18 | 3.61 | 0.72 | 0.17 | 0.88 | 565.43 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 3.42 | 0.00 | 3.42 | 0.72 | 0.00 | 0.72 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |

**10/27/2008 12:22:56 PM**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 8/23/2010-8/25/2010 Active Days: 3 | 0.99 | 15.13 | 5.10 | **0.02** | 0.07 | 0.58 | 0.65 | 0.02 | 0.53 | 0.56 | **2,093.52** |
| Fine Grading 08/22/2010-08/25/2010 | 0.99 | 15.13 | 5.10 | 0.02 | 0.07 | 0.58 | 0.65 | 0.02 | 0.53 | 0.56 | 2,093.52 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Off Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading On Road Diesel | 0.99 | 15.13 | 5.10 | 0.02 | 0.07 | 0.58 | 0.65 | 0.02 | 0.53 | 0.56 | 2,093.52 |
| Fine Grading Worker Trips | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 6/1/2010 - 7/30/2010 - Trenching - Remaining

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/1/2010 - 8/18/2010 - HDD Crossing

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/19/2010 - 8/21/2010 - Jack and Bore Crossing

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

**10/27/2008 12:22:56 PM**

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/22/2010 - 8/25/2010 - Pipe Hauling

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

## D-5: DFM Mitigated

**10/27/2008 12:22:08 PM**

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: S:\Projects\23440005 PG&E Line 406-407\AQ Work\Modeling\DFM_Mitigated.urb924

Project Name: DFM Mitigated

Project Location: California State-wide

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2010 TOTALS (lbs/day unmitigated) | 0.56 | 5.53 | 1.77 | 0.01 | 169.90 | 0.19 | 170.10 | 35.48 | 0.18 | 35.66 | 628.06 |
| 2010 TOTALS (lbs/day mitigated) | 0.56 | 5.53 | 1.77 | 0.01 | 16.17 | 0.19 | 16.37 | 3.38 | 0.18 | 3.56 | 628.06 |

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

| ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|

**10/27/2008 12:22:08 PM**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 6/1/2010-7/30/2010 Active Days: 44 | **0.56** | **5.53** | **1.77** | 0.00 | **169.90** | **0.19** | **170.10** | **35.48** | **0.18** | **35.66** | 605.69 |
| Fine Grading 06/01/2010-07/30/2010 | 0.56 | 5.53 | 1.77 | 0.00 | 169.90 | 0.19 | 170.10 | 35.48 | 0.18 | 35.66 | 605.69 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 169.90 | 0.00 | 169.90 | 35.48 | 0.00 | 35.48 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.02 | 0.29 | 0.10 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 | 40.26 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |
| Time Slice 8/19/2010-8/20/2010 Active Days: 2 | 0.54 | 5.24 | 1.67 | 0.00 | 35.98 | 0.18 | 36.17 | 7.51 | 0.17 | 7.68 | 565.43 |
| Fine Grading 08/19/2010-08/21/2010 | 0.54 | 5.24 | 1.67 | 0.00 | 35.98 | 0.18 | 36.17 | 7.51 | 0.17 | 7.68 | 565.43 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 35.98 | 0.00 | 35.98 | 7.51 | 0.00 | 7.51 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |
| Time Slice 8/23/2010-8/25/2010 Active Days: 3 | 0.30 | 4.54 | 1.53 | **0.01** | 0.02 | 0.17 | 0.20 | 0.01 | 0.16 | 0.17 | **628.06** |
| Fine Grading 08/22/2010-08/25/2010 | 0.30 | 4.54 | 1.53 | 0.01 | 0.02 | 0.17 | 0.20 | 0.01 | 0.16 | 0.17 | 628.06 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Off Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading On Road Diesel | 0.30 | 4.54 | 1.53 | 0.01 | 0.02 | 0.17 | 0.20 | 0.01 | 0.16 | 0.17 | 628.06 |
| Fine Grading Worker Trips | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Phase Assumptions

Phase: Fine Grading 6/1/2010 - 7/30/2010 - Trenching - Remaining

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 300 cubic yards/day; Offsite Cut/Fill: 300 cubic yards/day

On Road Truck Travel (VMT): 10

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/19/2010 - 8/21/2010 - Jack and Bore Crossing

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 60 cubic yards/day; Offsite Cut/Fill: 60 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/22/2010 - 8/25/2010 - Pipe Hauling

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 156

Off-Road Equipment:

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|

**10/27/2008 12:22:08 PM**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 6/1/2010-7/30/2010 Active Days: 44 | **0.56** | **5.53** | **1.77** | 0.00 | 16.17 | **0.19** | 16.37 | 3.38 | **0.18** | 3.56 | 605.69 |
| Fine Grading 06/01/2010-07/30/2010 | 0.56 | 5.53 | 1.77 | 0.00 | 16.17 | 0.19 | 16.37 | 3.38 | 0.18 | 3.56 | 605.69 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 16.17 | 0.00 | 16.17 | 3.38 | 0.00 | 3.38 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.02 | 0.29 | 0.10 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 | 40.26 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |
| Time Slice 8/19/2010-8/20/2010 Active Days: 2 | 0.54 | 5.24 | 1.67 | 0.00 | 3.43 | 0.18 | 3.61 | 0.72 | 0.17 | 0.88 | 565.43 |
| Fine Grading 08/19/2010-08/21/2010 | 0.54 | 5.24 | 1.67 | 0.00 | 3.43 | 0.18 | 3.61 | 0.72 | 0.17 | 0.88 | 565.43 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 3.42 | 0.00 | 3.42 | 0.72 | 0.00 | 0.72 | 0.00 |
| Fine Grading Off Road Diesel | 0.53 | 5.23 | 1.40 | 0.00 | 0.00 | 0.18 | 0.18 | 0.00 | 0.17 | 0.17 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.54 |
| Time Slice 8/23/2010-8/25/2010 Active Days: 3 | 0.30 | 4.54 | 1.53 | **0.01** | 0.02 | 0.17 | 0.20 | 0.01 | 0.16 | 0.17 | **628.06** |
| Fine Grading 08/22/2010-08/25/2010 | 0.30 | 4.54 | 1.53 | 0.01 | 0.02 | 0.17 | 0.20 | 0.01 | 0.16 | 0.17 | 628.06 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Off Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading On Road Diesel | 0.30 | 4.54 | 1.53 | 0.01 | 0.02 | 0.17 | 0.20 | 0.01 | 0.16 | 0.17 | 628.06 |
| Fine Grading Worker Trips | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 6/1/2010 - 7/30/2010 - Trenching - Remaining

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

**10/27/2008 12:22:08 PM**

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/19/2010 - 8/21/2010 - Jack and Bore Crossing

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/22/2010 - 8/25/2010 - Pipe Hauling

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

# D-6: Proposed Project Greenhouse Gas Calculations

Line 406 CO2 Emissions

**Trenching Emissions**

| Trenching | | | Total lbs |
|---|---|---|---|
| **Equipment** | **Max HP** | **Multiplier** | |
| **Environmental, Fence & Pot Hole Crew (60 days)** | | | **CO2** |
| Pump | 250 | 417 | 110.99 |
| Off-Highway Truck | 250 | 321 | 229.23 |
| | | | *340.22* |
| **Grade Crew (18 Days)** | | | |
| Crawler Tractor | 250 | 811 | 650.23 |
| Tractors/Loaders/Backhoes | 250 | 77 | 53.36 |
| Grader | 250 | 86 | 65.63 |
| | | | *769.22* |
| **Ditch Crew (18 Days)** | | | |
| Tractors/Loaders/Backhoes | 250 | 1936 | 1,333.92 |
| Trencher | 250 | 106 | 99.22 |
| | | | *1,433.13* |
| **Stringing Crew (18 Days)** | | | |
| Tractors/Loaders/Backhoes | 250 | 77 | 53.36 |
| Other Material Handling Equipment | 250 | 83 | 61.40 |
| Other Material Handling Equipment | 500 | 1329 | 982.40 |
| Crawler Tractor | 250 | 90 | 72.25 |
| | | | *1,169.40* |
| **Bending Crew (18 Days)** | | | |
| Other Material Handling Equipment | 250 | 332 | 245.60 |
| Other Material Handling Equipment | 120 | 83 | 61.40 |
| | | | *307.00* |
| **Pipe Gang (Bead Welders) (18 Days)** | | | |
| Other Material Handling Equipment | 250 | 83 | 61.40 |
| Crawler Tractor | 250 | 90 | 72.25 |
| Other Material Handling Equipment | 250 | 83 | 61.40 |
| Off-Highway Truck | 250 | 80 | 57.31 |
| Welder | 15 | 4055 | 2,285.96 |
| | | | *2,538.32* |
| **Joint Coating Crew (18 Days)** | | | |
| Other Material Handling Equipment | 250 | 83 | 61.40 |
| Air Compressor | 15 | 68 | 40.64 |
| | | | *102.04* |
| **Lower-in Crew (18 Days)** | | | |
| Other Material Handling Equipment | 250 | 748 | 552.60 |
| Tractors/Loaders/Backhoes | 250 | 77 | 53.36 |
| Rubber Tired Dozer | 250 | 76 | 56.20 |
| Tractors/Loaders/Backhoes | 250 | 77 | 53.36 |
| | | | *715.51* |
| **Tie-In Crew (30 Days)** | | | |
| Other Material Handling Equipment | 250 | 1495 | 1,105.20 |
| Tractors/Loaders/Backhoes | 250 | 155 | 106.71 |
| Rubber Tired Dozer | 250 | 152 | 112.39 |
| | | | *1,324.30* |

Line 406 CO2 Emissions

| Hydro-Test Crew (39 Days) | | | |
|---|---|---|---|
| Air Compressor | 15 | 676 | 406.39 |
| Other Material Handling Equipment | 250 | 208 | 153.50 |
| Pumps | 15 | 1042 | 965.89 |
| Pumps | 15 | 260 | 241.47 |
| | | | *1,767.25* |

| Clean Up Crew (24 Days) | | | |
|---|---|---|---|
| Rubber Tired Dozer | 250 | 1026 | 758.65 |
| Tractors/Loaders/Backhoes | 250 | 465 | 320.14 |
| Grader | 250 | 129 | 98.45 |
| Tractors/Loaders/Backhoes | 175 | 116 | 80.04 |
| Off-Highway Truck | 500 | 120 | 85.96 |
| | | | *1,343.24* |

| | 2009 |
|---|---|
| | **CO2** |
| Environmental Crew | 340.22 |
| All 18-Day Crews | 7,034.62 |
| Tie-In Crew | 1,324.30 |
| Hydro Test Crew | 1,767.25 |
| Clean Up Crew | 1,343.24 |
| **Total** | 11,809.63 |

**HDD**

| Equipment | Max HP | Multiplier | CO2 |
|---|---|---|---|
| | 500 | 90,000.00 | 84,569.87 |
| Bore/Drill Rigs | 750 | 140,625.00 | 132,140.42 |
| Cranes | 250 | 4,506.40 | 2,427.79 |
| Excavator | 250 | 4,514.40 | 3,223.94 |
| Off-Highway | 250 | 51,300.00 | 36,635.66 |
| Other Material Handling Equipment | 250 | 21,948.00 | 16,224.02 |
| | | | *275,221.69* |

**J/B**

| Equipment | Max HP | Multiplier | CO2 |
|---|---|---|---|
| Bore/Drill Rigs | 120 | 7,200.00 | 6,765.59 |
| Excavator | 250 | 18,057.60 | 12,895.75 |
| Other Material Handling Equipment | 250 | 29,264.00 | 21,632.03 |
| | | | *41,293.37* |

Line 407E CO2 Emissions

| Trenching | | | Total lbs |
|---|---|---|---|
| **Equipment** | **Max HP** | **Multiplier** | |
| **Environmental, Fence & Pot Hole Crew (60 days)** | | | **CO2** |
| Pump | 250 | 309 | 286.33 |
| Off-Highway Truck | 250 | 238 | 169.88 |
| | | | *456.22* |
| **Grade Crew (18 Days)** | | | |
| Crawler Tractor | 250 | 601 | 481.89 |
| Tractors/Loaders/Backhoes | 250 | 57 | 39.54 |
| Grader | 250 | 64 | 48.64 |
| | | | *570.07* |
| **Ditch Crew (18 Days)** | | | |
| Tractors/Loaders/Backhoes | 250 | 1435 | 988.58 |
| Trencher | 250 | 78 | 73.53 |
| | | | *1,062.11* |
| **Stringing Crew (18 Days)** | | | |
| Tractors/Loaders/Backhoes | 250 | 57 | 39.54 |
| Other Material Handling Equipment | 250 | 62 | 45.50 |
| Other Material Handling Equipment | 500 | 985 | 728.06 |
| Crawler Tractor | 250 | 67 | 53.54 |
| | | | *866.65* |
| **Bending Crew (18 Days)** | | | |
| Other Material Handling Equipment | 250 | 246 | 182.02 |
| Other Material Handling Equipment | 120 | 62 | 45.50 |
| | | | *227.52* |
| **Pipe Gang (Bead Welders) (18 Days)** | | | |
| Other Material Handling Equipment | 250 | 62 | 45.50 |
| Crawler Tractor | 250 | 67 | 53.54 |
| Other Material Handling Equipment | 250 | 62 | 45.50 |
| Off-Highway Truck | 250 | 59 | 42.47 |
| Welder | 15 | 3005 | 1,694.14 |
| | | | *1,881.17* |
| **Joint Coating Crew (18 Days)** | | | |
| Other Material Handling Equipment | 250 | 62 | 45.50 |
| Air Compressor | 15 | 50 | 30.12 |
| | | | *75.62* |
| **Lower-in Crew (18 Days)** | | | |
| Other Material Handling Equipment | 250 | 554 | 409.54 |
| Tractors/Loaders/Backhoes | 250 | 57 | 39.54 |
| Rubber Tired Dozer | 250 | 56 | 41.65 |
| Tractors/Loaders/Backhoes | 250 | 57 | 39.54 |
| | | | *530.27* |
| **Tie-In Crew (30 Days)** | | | |
| Other Material Handling Equipment | 250 | 1108 | 819.07 |
| Tractors/Loaders/Backhoes | 250 | 115 | 79.09 |
| Rubber Tired Dozer | 250 | 113 | 83.30 |
| | | | *981.45* |
| **Hydro-Test Crew (39 Days)** | | | |
| Air Compressor | 15 | 501 | 301.18 |

Line 407E CO2 Emissions

| | | | |
|---|---|---|---|
| Other Material Handling Equipment | 250 | 154 | 113.76 |
| Pumps | 15 | 772 | 715.83 |
| Pumps | 15 | 193 | 178.96 |
| | | | *1,309.73* |
| **Clean Up Crew (24 Days)** | | | |
| Rubber Tired Dozer | 250 | 761 | 562.24 |
| Tractors/Loaders/Backhoes | 250 | 344 | 237.26 |
| Grader | 250 | 95 | 72.96 |
| Tractors/Loaders/Backhoes | 175 | 86 | 59.31 |
| Off-Highway Truck | 500 | 89 | 63.71 |
| | | | *995.49* |

| | 2010 |
|---|---|
| | **CO2** |
| Environmental Crew | 456.22 |
| All 18-Day Crews | 5,213.41 |
| Tie-In Crew | 981.45 |
| Hydro Test Crew | 1,309.73 |
| Clean Up Crew | 995.49 |
| **Total** | 8,956.29 |

**HDD**

| Equipment | Max HP | Multiplier | CO2 |
|---|---|---|---|
| | 500 | 225,000.00 | 211,424.67 |
| Bore/Drill Rigs | 750 | 351,562.50 | 330,351.05 |
| Cranes | 250 | 11,266.00 | 6,069.47 |
| Excavator | 250 | 11,286.00 | 8,059.84 |
| Off-Highway | 250 | 128,250.00 | 91,589.14 |
| Other Material Handling Equipment | 250 | 54,870.00 | 40,560.05 |
| | | | *688,054.22* |

**J/B**

| Equipment | Max HP | Multiplier | CO2 |
|---|---|---|---|
| Bore/Drill Rigs | 120 | 9,900.00 | 9,302.69 |
| Excavator | 250 | 24,829.20 | 17,731.66 |
| Other Material Handling Equipment | 250 | 40,238.00 | 29,744.04 |
| | | | *56,778.38* |

DFM CO2 Emissions

**Trenching Emissions**

| Trenching | | | Total lbs |
|---|---|---|---|
| **Equipment** | **Max HP** | **Multiplier** | 2010 |
| **Environmental, Fence & Pot Hole Crew** | **(60 days)** | | **CO2** |
| Pump | 250 | 71 | 65.59 |
| Off-Highway Truck | 250 | 54 | 38.91 |
| | | | *104.50* |
| **Grade Crew (18 Days)** | | | |
| Crawler Tractor | 250 | 138 | 110.38 |
| Tractors/Loaders/Backhoes | 250 | 13 | 9.06 |
| Grader | 250 | 15 | 11.14 |
| | | | *130.58* |
| **Ditch Crew (18 Days)** | | | |
| Tractors/Loaders/Backhoes | 250 | 329 | 226.44 |
| Trencher | 250 | 18 | 16.84 |
| | | | *243.29* |
| **Stringing Crew (18 Days)** | | | |
| Tractors/Loaders/Backhoes | 250 | 13 | 9.06 |
| Other Material Handling Equipment | 250 | 14 | 10.42 |
| Other Material Handling Equipment | 500 | 226 | 166.77 |
| Crawler Tractor | 250 | 15 | 12.26 |
| | | | *198.52* |
| **Bending Crew (18 Days)** | | | |
| Other Material Handling Equipment | 250 | 56 | 41.69 |
| Other Material Handling Equipment | 120 | 14 | 10.42 |
| | | | *52.12* |
| **Pipe Gang (Bead Welders) (18 Days)** | | | |
| Other Material Handling Equipment | 250 | 14 | 10.42 |
| Crawler Tractor | 250 | 15 | 12.26 |
| Other Material Handling Equipment | 250 | 14 | 10.42 |
| Off-Highway Truck | 250 | 14 | 9.73 |
| Welder | 15 | 688 | 388.06 |
| | | | *430.90* |
| **Joint Coating Crew (18 Days)** | | | |
| Other Material Handling Equipment | 250 | 14 | 10.42 |
| Air Compressor | 15 | 11 | 6.90 |
| | | | *17.32* |
| **Lower-in Crew (18 Days)** | | | |
| Other Material Handling Equipment | 250 | 127 | 93.81 |
| Tractors/Loaders/Backhoes | 250 | 13 | 9.06 |
| Rubber Tired Dozer | 250 | 13 | 9.54 |
| Tractors/Loaders/Backhoes | 250 | 13 | 9.06 |
| | | | *121.46* |
| **Tie-In Crew (30 Days)** | | | |
| Other Material Handling Equipment | 250 | 254 | 187.62 |
| Tractors/Loaders/Backhoes | 250 | 26 | 18.12 |
| Rubber Tired Dozer | 250 | 26 | 19.08 |
| | | | *224.81* |

DFM CO2 Emissions

| Hydro-Test Crew (39 Days) | | | |
|---|---|---|---|
| Air Compressor | 15 | 115 | 68.99 |
| Other Material Handling Equipment | 250 | 35 | 26.06 |
| Pumps | 15 | 177 | 163.97 |
| Pumps | 15 | 44 | 40.99 |
| | | | *300.01* |

| Clean Up Crew (24 Days) | | | |
|---|---|---|---|
| Rubber Tired Dozer | 250 | 174 | 128.79 |
| Tractors/Loaders/Backhoes | 250 | 79 | 54.35 |
| Grader | 250 | 22 | 16.71 |
| Tractors/Loaders/Backhoes | 175 | 20 | 13.59 |
| Off-Highway Truck | 500 | 20 | 14.59 |
| | | | *228.03* |

| | 2010 |
|---|---|
| | **CO2** |
| Environmental Crew | 104.50 |
| All 18-Day Crews | 1,194.19 |
| Tie-In Crew | 224.81 |
| Hydro Test Crew | 300.01 |
| Clean Up Crew | 228.03 |
| **Total** | 2,051.54 |

**HDD**

| Equipment | Max HP | Multiplier | CO2 |
|---|---|---|---|
| | 500 | 45,000 | 42,284.93 |
| Bore/Drill Rigs | 750 | 70,313 | 66,070.21 |
| Cranes | 250 | 2,253 | 1,213.89 |
| Excavator | 250 | 2,257 | 1,611.97 |
| Off-Highway | 250 | 25,650 | 18,317.83 |
| Other Material Handling Equipment | 250 | 10,974 | 8,112.01 |
| | | | *137,610.84* |

**J/B**

| Equipment | Max HP | Multiplier | CO2 |
|---|---|---|---|
| Bore/Drill Rigs | 120 | 3,600 | 3,382.79 |
| Excavator | 250 | 9,029 | 6,447.88 |
| Other Material Handling Equipment | 250 | 14,632 | 10,816.01 |
| | | | *20,646.68* |

Line 407W CO2 Emissions

| Equipment | Max HP | Multiplier | CO2 |
|---|---|---|---|
| **Environmental, Fence & Pot Hole Crew (60 days)** | | | |
| Pump | 250 | 406 | 376.86 |
| Off-Highway Truck | 250 | 313 | 223.60 |
| | | | *600.46* |
| **Grade Crew (18 Days)** | | | |
| Crawler Tractor | 250 | 791 | 634.25 |
| Tractors/Loaders/Backhoes | 250 | 76 | 52.05 |
| Grader | 250 | 84 | 64.02 |
| | | | *750.32* |
| **Ditch Crew (18 Days)** | | | |
| Tractors/Loaders/Backhoes | 250 | 1888 | 1,301.14 |
| Trencher | 250 | 103 | 96.78 |
| | | | *1,397.92* |
| **Stringing Crew (18 Days)** | | | |
| Tractors/Loaders/Backhoes | 250 | 76 | 52.05 |
| Other Material Handling Equipment | 250 | 81 | 59.89 |
| Other Material Handling Equipment | 500 | 1296 | 958.26 |
| Crawler Tractor | 250 | 88 | 70.47 |
| | | | *1,140.67* |
| **Bending Crew (18 Days)** | | | |
| Other Material Handling Equipment | 250 | 324 | 239.56 |
| Other Material Handling Equipment | 120 | 81 | 59.89 |
| | | | *299.46* |
| **Pipe Gang (Bead Welders) (18 Days)** | | | |
| Other Material Handling Equipment | 250 | 81 | 59.89 |
| Crawler Tractor | 250 | 88 | 70.47 |
| Other Material Handling Equipment | 250 | 81 | 59.89 |
| Off-Highway Truck | 250 | 78 | 55.90 |
| Welder | 15 | 3955 | 2,229.79 |
| | | | *2,475.94* |
| **Joint Coating Crew (18 Days)** | | | |
| Other Material Handling Equipment | 250 | 81 | 59.89 |
| Air Compressor | 15 | 66 | 39.64 |
| | | | *99.53* |
| **Lower-in Crew (18 Days)** | | | |
| Other Material Handling Equipment | 250 | 729 | 539.02 |
| Tractors/Loaders/Backhoes | 250 | 76 | 52.05 |
| Rubber Tired Dozer | 250 | 74 | 54.82 |
| Tractors/Loaders/Backhoes | 250 | 76 | 52.05 |
| | | | *697.93* |
| **Tie-In Crew (30 Days)** | | | |
| Other Material Handling Equipment | 250 | 1458 | 1,078.04 |
| Tractors/Loaders/Backhoes | 250 | 151 | 104.09 |
| Rubber Tired Dozer | 250 | 148 | 109.63 |
| | | | *1,291.76* |
| **Hydro-Test Crew (39 Days)** | | | |
| Air Compressor | 15 | 659 | 396.41 |
| Other Material Handling Equipment | 250 | 203 | 149.73 |

Line 407W CO2 Emissions

| | | | |
|---|---|---|---|
| Pumps | 15 | 1016 | 942.15 |
| Pumps | 15 | 254 | 235.54 |
| | | | *1,723.83* |
| **Clean Up Crew (24 Days)** | | | |
| Rubber Tired Dozer | 250 | 1001 | 740.01 |
| Tractors/Loaders/Backhoes | 250 | 453 | 312.27 |
| Grader | 250 | 126 | 96.03 |
| Tractors/Loaders/Backhoes | 175 | 113 | 78.07 |
| Off-Highway Truck | 500 | 117 | 83.85 |
| | | | *1,310.23* |

| | |
|---|---|
| | 2012 |
| | **CO2** |
| Environmental Crew | 600.46 |
| All 18-Day Crews | 6,861.76 |
| Tie-In Crew | 1,291.76 |
| Hydro Test Crew | 1,723.83 |
| Clean Up Crew | 1,310.23 |
| **Total** | 11,788.04 |

**HDD**

| Equipment | Max HP | Multiplier | CO2 |
|---|---|---|---|
| | 500 | 180,000.00 | 169,139.74 |
| Bore/Drill Rigs | 750 | 281,250.00 | 264,280.84 |
| Cranes | 250 | 9,012.80 | 4,855.58 |
| Excavator | 250 | 9,028.80 | 6,447.88 |
| Off-Highway | 250 | 9,028.80 | 6,447.88 |
| Other Material Handling Equipment | 250 | 43,896.00 | 32,448.04 |
| | | | *483,619.94* |

**J/B**

| Equipment | Max HP | Multiplier | CO2 |
|---|---|---|---|
| Bore/Drill Rigs | 120 | 8,100.00 | 7,611.29 |
| Excavator | 250 | 20,314.80 | 14,507.72 |
| Other Material Handling Equipment | 250 | 32,922.00 | 24,336.03 |
| | | | *46,455.04* |

# D-7: Alternatives Greenhouse Gas Calculations

## Trenching Construction Hours

Trenching Construction Timeline / Activity

| Equipment List by Phase | Horsepower | Hours Per Foot | HP | | | Pipeline Route | Alternatives: Hours/Alterantive Difference | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Max | Min | Avg | | A | B | C | D | E | F | G | H | I | J | K | L |
| **Environmental, Fence & Pot Hole Crew (60 days)** | | | | | | Trench length | 2,214 | 2,640 | 1,150 | 860 | 3,480.00 | 0 | 0 | (2,943.00) | 2,927.00 | 5,254.00 | 71.50 | -1000 |
| 1 Vacuum Suck Pump (Other Equipment) | 300-350 | 0.008 | 350 | 300 | 325 | | 18 | 21 | 9 | 7 | 28 | - | - | (24) | 23 | 42 | 1 | -8 |
| 1 Flatbed | 200 -260 | 0.008 | 260 | 200 | 230 | | 18 | 21 | 9 | 7 | 28 | - | - | (24) | 23 | 42 | 1 | (8) |
| **Grade Crew (18 Days)** | | | | | | | | | | | | | | | | | | - |
| 3 D-8 Dozers | 230-300 | 0.002 | 300 | 230 | 265 | | 4 | 5 | 2 | 2 | 7 | - | - | (6) | 6 | 11 | 0 | (2) |
| 1 Cat Backhoe | 200-300 | 0.002 | 300 | 200 | 250 | | 4 | 5 | 2 | 2 | 7 | - | - | (6) | 6 | 11 | 0 | (2) |
| 1 Motor Grader | 240-350 | 0.002 | 350 | 240 | 295 | | 4 | 5 | 2 | 2 | 7 | - | - | (6) | 6 | 11 | 0 | (2) |
| **Ditch Crew (18 Days)** | | | | | | | | | | | | | | | | | | |
| 5 Backhoes | 200-300 | 0.002 | 300 | 200 | 250 | | 4 | 5 | 2 | 2 | 7 | - | - | (6) | 6 | 11 | 0 | (2) |
| 1 Ditching Machine | 150-250 | 0.002 | 250 | 150 | 200 | | 4 | 5 | 2 | 2 | 7 | - | - | (6) | 6 | 11 | 0 | (2) |
| **Stringing Crew (18 Days)** | | | | | | | | | | | | | | | | | | |
| 1 Cat Backhoe | 200-300 | 0.002 | 300 | 200 | 250 | | 4 | 5 | 2 | 2 | 7 | - | - | (6) | 6 | 11 | 0 | (2) |
| 1 Cat Sideboom | 310 | 0.002 | 310 | 310 | 310 | | 4 | 5 | 2 | 2 | 7 | - | - | (6) | 6 | 11 | 0 | (2) |
| 4 Stringing Trucks | 380-470 | 0.002 | 470 | 380 | 425 | | 4 | 5 | 2 | 2 | 7 | - | - | (6) | 6 | 11 | 0 | (2) |
| 1 Cat Dozer | 230-300 | 0.002 | 300 | 230 | 265 | | 4 | 5 | 2 | 2 | 7 | - | - | (6) | 6 | 11 | 0 | (2) |
| **Bending Crew (18 Days)** | | | | | | | | | | | | | | | | | | |
| 2 Sidebooms | 310 | 0.002 | 310 | 310 | 310 | | 4 | 5 | 2 | 2 | 7 | - | - | (6) | 6 | 11 | 0 | (2) |
| 1 Bending Machine | 110 | 0.002 | 110 | 110 | 110 | | 4 | 5 | 2 | 2 | 7 | - | - | (6) | 6 | 11 | 0 | (2) |
| **Pipe Gang (Bead Welders) (18 Days)** | | | | | | | | | | | | | | | | | | |
| 1 Sideboom | 310 | 0.002 | 310 | 310 | 310 | | 4 | 5 | 2 | 2 | 7 | - | - | (6) | 6 | 11 | 0 | (2) |
| 1 Tack Rig | 200-250 | 0.002 | 250 | 200 | 225 | | 4 | 5 | 2 | 2 | 7 | - | - | (6) | 6 | 11 | 0 | (2) |
| 1 Tow Cat | 200-300 | 0.002 | 300 | 200 | 250 | | 4 | 5 | 2 | 2 | 7 | - | - | (6) | 6 | 11 | 0 | (2) |
| 1 Skid Truck | 200-300 | 0.002 | 300 | 200 | 250 | | 4 | 5 | 2 | 2 | 7 | - | - | (6) | 6 | 11 | 0 | (2) |
| 8 Gas power welding units | 18 | 0.002 | 18 | 18 | 18 | | 4 | 5 | 2 | 2 | 7 | - | - | (6) | 6 | 11 | 0 | (2) |
| **Joint Coating Crew (18 Days)** | | | | | | | | | | | | | | | | | | |
| 1 Sideboom | 310 | 0.002 | 310 | 310 | 310 | | 4 | 5 | 2 | 2 | 7 | - | - | (6) | 6 | 11 | 0 | (2) |
| 1 Air Compressor | 8 | 0.002 | 8 | 8 | 8 | | 4 | 5 | 2 | 2 | 7 | - | - | (6) | 6 | 11 | 0 | (2) |
| **Lower-in Crew (18 Days)** | | | | | | | | | | | | | | | | | | |
| 3 Sidebooms | 310 | 0.002 | 310 | 310 | 310 | | 4 | 5 | 2 | 2 | 7 | - | - | (6) | 6 | 11 | 0 | (2) |
| 1 Backhoe | 200-300 | 0.002 | 300 | 200 | 250 | | 4 | 5 | 2 | 2 | 7 | - | - | (6) | 6 | 11 | 0 | (2) |
| 1 Dozer | 230-300 | 0.002 | 300 | 230 | 265 | | 4 | 5 | 2 | 2 | 7 | - | - | (6) | 6 | 11 | 0 | (2) |
| 1 Backhoe w/ Clam attachment | 200-300 | 0.002 | 300 | 200 | 250 | | 4 | 5 | 2 | 2 | 7 | - | - | (6) | 6 | 11 | 0 | (2) |
| **Tie-In Crew (30 Days)** | | | | | | | | | | | | | | | | | | |
| 3 Sidebooms | 310 | 0.004 | 310 | 310 | 310 | | 9 | 11 | 5 | 3 | 14 | - | - | (12) | 12 | 21 | 0 | (4) |
| 1 Backhoe | 200-300 | 0.004 | 300 | 200 | 250 | | 9 | 11 | 5 | 3 | 14 | - | - | (12) | 12 | 21 | 0 | (4) |
| 1 Dozer | 230-300 | 0.004 | 300 | 230 | 265 | | 9 | 11 | 5 | 3 | 14 | - | - | (12) | 12 | 21 | 0 | (4) |
| **Hydro-Test Crew (39 Days)** | | | | | | | | | | | | | | | | | | |
| 2 Air Compressors | 10 | 0.005 | 10 | 10 | 10 | | 11 | 13 | 6 | 4 | 17 | - | - | (15) | 15 | 26 | 0 | (5) |
| 1 Cat Sideboom | 310 | 0.005 | 310 | 310 | 310 | | 11 | 13 | 6 | 4 | 17 | - | - | (15) | 15 | 26 | 0 | (5) |
| 2 Fill Pumps | 8 | 0.005 | 8 | 8 | 8 | | 11 | 13 | 6 | 4 | 17 | - | - | (15) | 15 | 26 | 0 | (5) |
| 1 Test Pump | 8 | 0.005 | 8 | 8 | 8 | | 11 | 13 | 6 | 4 | 17 | - | - | (15) | 15 | 26 | 0 | (5) |
| **Clean Up Crew (24 Days)** | | | | | | | | | | | | | | | | | | - |
| 3 Dozers | 230-300 | 0.003 | 300 | 230 | 265 | | 7 | 8 | 3 | 3 | 10 | - | - | (9) | 9 | 16 | 0 | (3) |
| 2 Backhoes | 200-300 | 0.003 | 300 | 200 | 250 | | 7 | 8 | 3 | 3 | 10 | - | - | (9) | 9 | 16 | 0 | (3) |
| 1 Motor Grader | 250-350 | 0.003 | 350 | 250 | 300 | | 7 | 8 | 3 | 3 | 10 | - | - | (9) | 9 | 16 | 0 | (3) |
| 1 Tractor | 100-200 | 0.003 | 200 | 100 | 150 | | 7 | 8 | 3 | 3 | 10 | - | - | (9) | 9 | 16 | 0 | (3) |
| 1 Dump Truck | 300-400 | 0.003 | 400 | 300 | 350 | | 7 | 8 | 3 | 3 | 10 | - | - | (9) | 9 | 16 | 0 | (3) |

## HDD Hours

Equip Mix (including horsepower) Per HDD

| HDD Equipmnet List | Hours per Day | Days of Operation | | | Horse Power | | By Phase: Hours/Alterantive Difference | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | A | B | C | D | E | F | G | H | I | J | K | L |
| | | | | | | No. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| **Drill Rig** | 10 | 15 | | | 625 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 150 |
| **Mud Rig** | 10 | 15 | | | 400 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 150 |
| **Excavator** | 10 | 2 | | | 148 - 248 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 |
| **Dump Truck** | 10 | 15 | | | 300 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 150 |
| **Crane** | 10 | 2 | | | 262 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 |
| **Generator** | 10 | 15 | | | 15 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 150 |
| **3 Side Booms** | 10 | 2 | | | 310 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 |

**Total Tons**

**Emissions Analysis**

| URB Equivalent | | | Equation Factors | | Total Hours | | | | | | | | | | | | Multiplier | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2009 | | | | 2012 | | | 2010 | | | | | 2009 | | | | 2012 | | | 2010 | | |
| Equip | Max HP | No | HP | Load Factor | A | B | C | D | E | F | G | H | I | J | K | L | A | B | C | D | E | F | G | H | I | J | K | L |
| Pump | 250 | 1 | 325 | 0.74 | 18 | 21 | 9 | 7 | 28 | 0 | 0 | -24 | 23 | 42 | 1 | -8 | 4260 | 5079 | 2213 | 1655 | 6696 | 0 | 0 | -5662 | 5632 | 10109 | 138 | -1924 |
| Off-Highway Truck | 250 | 1 | 230 | 0.57 | 18 | 21 | 9 | 7 | 28 | 0 | 0 | -24 | 23 | 42 | 1 | -8 | 2322 | 2769 | 1206 | 902 | 3650 | 0 | 0 | -3087 | 3070 | 5510 | 75 | -1049 |
| Crawler Tractor | 250 | 3 | 265 | 0.64 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -6 | 6 | 11 | 0 | -2 | 2253 | 2686 | 1170 | 875 | 3541 | 0 | 0 | -2995 | 2979 | 5346 | 73 | -1018 |
| Tractors/Loaders/Backhoes | 250 | 1 | 250 | 0.55 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -6 | 6 | 11 | 0 | -2 | 609 | 726 | 316 | 237 | 957 | 0 | 0 | -809 | 805 | 1445 | 20 | -275 |
| Grader | 250 | 1 | 295 | 0.61 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -6 | 6 | 11 | 0 | -2 | 797 | 950 | 414 | 310 | 1252 | 0 | 0 | -1059 | 1053 | 1891 | 26 | -360 |
| Tractors/Loaders/Backhoes | 250 | 5 | 250 | 0.55 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -6 | 6 | 11 | 0 | -2 | 3045 | 3630 | 1581 | 1183 | 4785 | 0 | 0 | -4047 | 4025 | 7224 | 98 | -1375 |
| Trencher | 250 | 1 | 200 | 0.75 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -6 | 6 | 11 | 0 | -2 | 664 | 792 | 345 | 258 | 1044 | 0 | 0 | -883 | 878 | 1576 | 21 | -300 |
| Tractors/Loaders/Backhoes | 250 | 1 | 250 | 0.55 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -6 | 6 | 11 | 0 | -2 | 609 | 726 | 316 | 237 | 957 | 0 | 0 | -809 | 805 | 1445 | 20 | -275 |
| Other Material Handling Equipment | 250 | 1 | 310 | 0.59 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -6 | 6 | 11 | 0 | -2 | 810 | 966 | 421 | 315 | 1273 | 0 | 0 | -1077 | 1071 | 1922 | 26 | -366 |
| Other Material Handling Equipment | 500 | 4 | 425 | 0.59 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -6 | 6 | 11 | 0 | -2 | 4442 | 5296 | 2307 | 1725 | 6981 | 0 | 0 | -5904 | 5872 | 10540 | 143 | -2006 |
| Crawler Tractor | 250 | 1 | 265 | 0.64 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -6 | 6 | 11 | 0 | -2 | 751 | 895 | 390 | 292 | 1180 | 0 | 0 | -998 | 993 | 1782 | 24 | -339 |
| Other Material Handling Equipment | 250 | 2 | 310 | 0.59 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -6 | 6 | 11 | 0 | -2 | 1620 | 1931 | 841 | 629 | 2546 | 0 | 0 | -2153 | 2141 | 3844 | 52 | -732 |
| Other Material Handling Equipment | 120 | 1 | 110 | 0.59 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -6 | 6 | 11 | 0 | -2 | 287 | 343 | 149 | 112 | 452 | 0 | 0 | -382 | 380 | 682 | 9 | -130 |
| Other Material Handling Equipment | 250 | 1 | 310 | 0.59 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -6 | 6 | 11 | 0 | -2 | 810 | 966 | 421 | 315 | 1273 | 0 | 0 | -1077 | 1071 | 1922 | 26 | -366 |
| Crawler Tractor | 250 | 1 | 225 | 0.64 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -6 | 6 | 11 | 0 | -2 | 638 | 760 | 331 | 248 | 1002 | 0 | 0 | -848 | 843 | 1513 | 21 | -288 |
| Other Material Handling Equipment | 250 | 1 | 250 | 0.59 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -6 | 6 | 11 | 0 | -2 | 653 | 779 | 339 | 254 | 1027 | 0 | 0 | -868 | 863 | 1550 | 21 | -295 |
| Off-Highway Truck | 250 | 1 | 250 | 0.57 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -6 | 6 | 11 | 0 | -2 | 631 | 752 | 328 | 245 | 992 | 0 | 0 | -839 | 834 | 1497 | 20 | -285 |
| Welder | 15 | 8 | 18 | 0.45 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -6 | 6 | 11 | 0 | -2 | 287 | 342 | 149 | 111 | 451 | 0 | 0 | -381 | 379 | 681 | 9 | -130 |
| Other Material Handling Equipment | 250 | 1 | 310 | 0.59 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -6 | 6 | 11 | 0 | -2 | 810 | 966 | 421 | 315 | 1273 | 0 | 0 | -1077 | 1071 | 1922 | 26 | -366 |
| Air Compressor | 15 | 1 | 8 | 0.48 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -6 | 6 | 11 | 0 | -2 | 17 | 20 | 9 | 7 | 27 | 0 | 0 | -23 | 22 | 40 | 1 | -8 |
| Other Material Handling Equipment | 250 | 3 | 310 | 0.59 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -6 | 6 | 11 | 0 | -2 | 2430 | 2897 | 1262 | 944 | 3819 | 0 | 0 | -3230 | 3212 | 5766 | 78 | -1097 |
| Tractors/Loaders/Backhoes | 250 | 1 | 250 | 0.55 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -6 | 6 | 11 | 0 | -2 | 609 | 726 | 316 | 237 | 957 | 0 | 0 | -809 | 805 | 1445 | 20 | -275 |
| Rubber Tired Dozer | 250 | 1 | 265 | 0.54 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -6 | 6 | 11 | 0 | -2 | 634 | 756 | 329 | 246 | 996 | 0 | 0 | -842 | 838 | 1504 | 20 | -286 |
| Tractors/Loaders/Backhoes | 250 | 1 | 250 | 0.55 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -6 | 6 | 11 | 0 | -2 | 609 | 726 | 316 | 237 | 957 | 0 | 0 | -809 | 805 | 1445 | 20 | -275 |
| Other Material Handling Equipment | 250 | 3 | 310 | 0.59 | 9 | 11 | 5 | 3 | 14 | 0 | 0 | -12 | 12 | 21 | 0 | -4 | 4860 | 5794 | 2524 | 1888 | 7638 | 0 | 0 | -6459 | 6424 | 11531 | 157 | -2195 |
| Tractors/Loaders/Backhoes | 250 | 1 | 250 | 0.55 | 9 | 11 | 5 | 3 | 14 | 0 | 0 | -12 | 12 | 21 | 0 | -4 | 1218 | 1452 | 633 | 473 | 1914 | 0 | 0 | -1619 | 1610 | 2890 | 39 | -550 |
| Rubber Tired Dozer | 250 | 1 | 265 | 0.54 | 9 | 11 | 5 | 3 | 14 | 0 | 0 | -12 | 12 | 21 | 0 | -4 | 1267 | 1511 | 658 | 492 | 1992 | 0 | 0 | -1685 | 1675 | 3007 | 41 | -572 |
| Air Compressor | 15 | 2 | 10 | 0.48 | 11 | 13 | 6 | 4 | 17 | 0 | 0 | -15 | 15 | 26 | 0 | -5 | 106 | 127 | 55 | 41 | 167 | 0 | 0 | -141 | 140 | 252 | 3 | -48 |
| Other Material Handling Equipment | 250 | 1 | 310 | 0.59 | 11 | 13 | 6 | 4 | 17 | 0 | 0 | -15 | 15 | 26 | 0 | -5 | 2025 | 2414 | 1052 | 786 | 3182 | 0 | 0 | -2691 | 2677 | 4805 | 65 | -915 |
| Pumps | 15 | 2 | 8 | 0.74 | 11 | 13 | 6 | 4 | 17 | 0 | 0 | -15 | 15 | 26 | 0 | -5 | 131 | 156 | 68 | 51 | 206 | 0 | 0 | -174 | 173 | 311 | 4 | -59 |
| Pumps | 15 | 1 | 8 | 0.74 | 11 | 13 | 6 | 4 | 17 | 0 | 0 | -15 | 15 | 26 | 0 | -5 | 66 | 78 | 34 | 25 | 103 | 0 | 0 | -87 | 87 | 156 | 2 | -30 |
| Rubber Tired Dozer | 250 | 3 | 265 | 0.54 | 7 | 8 | 3 | 3 | 10 | 0 | 0 | -9 | 9 | 16 | 0 | -3 | 2852 | 3400 | 1481 | 1108 | 4482 | 0 | 0 | -3790 | 3770 | 6767 | 92 | -1288 |
| Tractors/Loaders/Backhoes | 250 | 2 | 250 | 0.55 | 7 | 8 | 3 | 3 | 10 | 0 | 0 | -9 | 9 | 16 | 0 | -3 | 1827 | 2178 | 949 | 710 | 2871 | 0 | 0 | -2428 | 2415 | 4335 | 59 | -825 |
| Grader | 250 | 1 | 300 | 0.61 | 7 | 8 | 3 | 3 | 10 | 0 | 0 | -9 | 9 | 16 | 0 | -3 | 1216 | 1449 | 631 | 472 | 1911 | 0 | 0 | -1616 | 1607 | 2884 | 39 | -549 |
| Tractors/Loaders/Backhoes | 175 | 1 | 150 | 0.55 | 7 | 8 | 3 | 3 | 10 | 0 | 0 | -9 | 9 | 16 | 0 | -3 | 548 | 653 | 285 | 213 | 861 | 0 | 0 | -728 | 724 | 1300 | 18 | -248 |
| Off-Highway Truck | 500 | 1 | 350 | 0.57 | 7 | 8 | 3 | 3 | 10 | 0 | 0 | -9 | 9 | 16 | 0 | -3 | 1325 | 1580 | 688 | 515 | 2083 | 0 | 0 | -1761 | 1752 | 3145 | 43 | -599 |

**Emissions Analysis**

| URB Equivalent | | | Equation Factors | | Total Hours | | | | | | | | | | | | Multiplier | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equip | Max HP | No | HP | Load Factor | A | B | C | D | E | F | G | H | I | J | K | L | A | B | C | D | E | F | G | H | I | J | K | L |
| Bore / Drill Rig | 750 | 1 | 625 | 0.75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 150 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 70313 |
| Bore / Drill Rig | 500 | 1 | 400 | 0.75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 150 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45000 |
| Excavator | 250 | 1 | 198 | 0.57 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2257 |
| Off-Highway Truck | 250 | 1 | 300 | 0.57 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 150 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25650 |
| Crane | 250 | 1 | 262 | 0.43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2253 |
| Generator | 15 | 2 | 15 | 0.74 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 150 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3330 |
| Other Material Handling Equipment | 250 | 3 | 310 | 0.59 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10974 |

## Off-Road Calcs

### Multiplier

| Equipment | Max HP | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2009 | | | | | 2012 | | | 2010 | |
| **Environmental, Fence & Pot Hole Crew** | **(60 days)** | | | | | | | | | | | | |
| Pump | 250 | 4260 | 5079 | 2213 | 1655 | 6696 | 0 | 0 | -5662 | 5632 | 10109 | 138 | -1924 |
| Off-Highway Truck | 250 | 2322 | 2769 | 1206 | 902 | 3650 | 0 | 0 | -3087 | 3070 | 5510 | 75 | -1049 |
| **Grade Crew (18 Days)** | | | | | | | | | | | | | |
| Crawler Tractor | 250 | 2253 | 2686 | 1170 | 875 | 3541 | 0 | 0 | -2995 | 2979 | 5346 | 73 | -1018 |
| Tractors/Loaders/Backhoes | 250 | 609 | 726 | 316 | 237 | 957 | 0 | 0 | -809 | 805 | 1445 | 20 | -275 |
| Grader | 250 | 797 | 950 | 414 | 310 | 1252 | 0 | 0 | -1059 | 1053 | 1891 | 26 | -360 |
| **Ditch Crew (18 Days)** | | | | | | | | | | | | | |
| Tractors/Loaders/Backhoes | 250 | 3045 | 3630 | 1581 | 1183 | 4785 | 0 | 0 | -4047 | 4025 | 7224 | 98 | -1375 |
| Trencher | 250 | 664 | 792 | 345 | 258 | 1044 | 0 | 0 | -883 | 878 | 1576 | 21 | -300 |
| **Stringing Crew (18 Days)** | | | | | | | | | | | | | |
| Tractors/Loaders/Backhoes | 250 | 609 | 726 | 316 | 237 | 957 | 0 | 0 | -809 | 805 | 1445 | 20 | -275 |
| Other Material Handling Equipment | 250 | 810 | 966 | 421 | 315 | 1273 | 0 | 0 | -1077 | 1071 | 1922 | 26 | -366 |
| Other Material Handling Equipment | 500 | 4442 | 5296 | 2307 | 1725 | 6981 | 0 | 0 | -5904 | 5872 | 10540 | 143 | -2006 |
| Crawler Tractor | 250 | 751 | 895 | 390 | 292 | 1180 | 0 | 0 | -998 | 993 | 1782 | 24 | -339 |
| **Bending Crew (18 Days)** | | | | | | | | | | | | | |
| Other Material Handling Equipment | 250 | 1620 | 1931 | 841 | 629 | 2546 | 0 | 0 | -2153 | 2141 | 3844 | 52 | -732 |
| Other Material Handling Equipment | 120 | 287 | 343 | 149 | 112 | 452 | 0 | 0 | -382 | 380 | 682 | 9 | -130 |
| **Pipe Gang (Bead Welders) (18 Days)** | | | | | | | | | | | | | |
| Other Material Handling Equipment | 250 | 810 | 966 | 421 | 315 | 1273 | 0 | 0 | -1077 | 1071 | 1922 | 26 | -366 |
| Crawler Tractor | 250 | 638 | 760 | 331 | 248 | 1002 | 0 | 0 | -848 | 843 | 1513 | 21 | -288 |
| Other Material Handling Equipment | 250 | 653 | 779 | 339 | 254 | 1027 | 0 | 0 | -868 | 863 | 1550 | 21 | -295 |
| Off-Highway Truck | 250 | 631 | 752 | 328 | 245 | 992 | 0 | 0 | -839 | 834 | 1497 | 20 | -285 |
| Welder | 15 | 287 | 342 | 149 | 111 | 451 | 0 | 0 | -381 | 379 | 681 | 9 | -130 |
| **Joint Coating Crew (18 Days)** | | | | | | | | | | | | | |
| Other Material Handling Equipment | 250 | 810 | 966 | 421 | 315 | 1273 | 0 | 0 | -1077 | 1071 | 1922 | 26 | -366 |
| Air Compressor | 15 | 17 | 20 | 9 | 7 | 27 | 0 | 0 | -23 | 22 | 40 | 1 | -8 |
| **Lower-in Crew (18 Days)** | | | | | | | | | | | | | |
| Other Material Handling Equipment | 250 | 2430 | 2897 | 1262 | 944 | 3819 | 0 | 0 | -3230 | 3212 | 5766 | 78 | -1097 |
| Tractors/Loaders/Backhoes | 250 | 609 | 726 | 316 | 237 | 957 | 0 | 0 | -809 | 805 | 1445 | 20 | -275 |
| Rubber Tired Dozer | 250 | 634 | 756 | 329 | 246 | 996 | 0 | 0 | -842 | 838 | 1504 | 20 | -286 |
| Tractors/Loaders/Backhoes | 250 | 609 | 726 | 316 | 237 | 957 | 0 | 0 | -809 | 805 | 1445 | 20 | -275 |
| **Tie-In Crew (30 Days)** | | | | | | | | | | | | | |
| Other Material Handling Equipment | 250 | 4860 | 5794 | 2524 | 1888 | 7638 | 0 | 0 | -6459 | 6424 | 11531 | 157 | -2195 |
| Tractors/Loaders/Backhoes | 250 | 1218 | 1452 | 633 | 473 | 1914 | 0 | 0 | -1619 | 1610 | 2890 | 39 | -550 |
| Rubber Tired Dozer | 250 | 1267 | 1511 | 658 | 492 | 1992 | 0 | 0 | -1685 | 1675 | 3007 | 41 | -572 |
| **Hydro-Test Crew (39 Days)** | | | | | | | | | | | | | |
| Air Compressor | 15 | 106 | 127 | 55 | 41 | 167 | 0 | 0 | -141 | 140 | 252 | 3 | -48 |
| Other Material Handling Equipment | 250 | 2025 | 2414 | 1052 | 786 | 3182 | 0 | 0 | -2691 | 2677 | 4805 | 65 | -915 |
| Pumps | 15 | 131 | 156 | 68 | 51 | 206 | 0 | 0 | -174 | 173 | 311 | 4 | -59 |
| Pumps | 15 | 66 | 78 | 34 | 25 | 103 | 0 | 0 | -87 | 87 | 156 | 2 | -30 |
| **Clean Up Crew (24 Days)** | | | | | | | | | | | | | |
| Rubber Tired Dozer | 250 | 2852 | 3400 | 1481 | 1108 | 4482 | 0 | 0 | -3790 | 3770 | 6767 | 92 | -1288 |
| Tractors/Loaders/Backhoes | 250 | 1827 | 2178 | 949 | 710 | 2871 | 0 | 0 | -2428 | 2415 | 4335 | 59 | -825 |
| Grader | 250 | 1216 | 1449 | 631 | 472 | 1911 | 0 | 0 | -1616 | 1607 | 2884 | 39 | -549 |
| Tractors/Loaders/Backhoes | 175 | 548 | 653 | 285 | 213 | 861 | 0 | 0 | -728 | 724 | 1300 | 18 | -248 |
| Off-Highway Truck | 500 | 1325 | 1580 | 688 | 515 | 2083 | 0 | 0 | -1761 | 1752 | 3145 | 43 | -599 |

### Total Lbs

| Equipment | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2009 | | | | | 2012 | | | 2010 | |
| **Environmental, Fence & Pot Hole Crew (60 days)** | | | | | | | | | | | | |
| Pump | 1,134.69 | 1,352.86 | 589.31 | 440.70 | 6,207.66 | - | - | (5,249.76) | 5,221.21 | 9,372.14 | 127.54 | (1,783.81) |
| Off-Highway Truck | 1,658.48 | 1,977.35 | 861.35 | 644.14 | 2,606.50 | - | - | (2,204.29) | 2,192.31 | 3,935.22 | 53.55 | (749.00) |
| **Grade Crew (18 Days)** | | | | | | | | | | | | |
| Crawler Tractor | 1,806.76 | 2,154.14 | 938.35 | 701.73 | 2,839.54 | - | - | (2,401.37) | 2,388.32 | 4,287.06 | 58.34 | (815.96) |
| Tractors/Loaders/Backhoes | 419.60 | 500.28 | 217.92 | 162.97 | 659.46 | - | - | (557.70) | 554.66 | 995.63 | 13.55 | (189.50) |
| Grader | 609.05 | 726.15 | 316.32 | 236.55 | 957.20 | - | - | (809.49) | 805.09 | 1,445.15 | 19.67 | (275.06) |
| **Ditch Crew (18 Days)** | | | | | | | | | | | | |
| Tractors/Loaders/Backhoes | 2,098.01 | 2,501.39 | 1,089.62 | 814.85 | 3,297.29 | - | - | (2,788.48) | 2,773.32 | 4,978.14 | 67.75 | (947.50) |
| Trencher | 624.20 | 744.21 | 324.18 | 242.43 | 981.01 | - | - | (829.63) | 825.12 | 1,481.10 | 20.16 | (281.90) |
| **Stringing Crew (18 Days)** | | | | | | | | | | | | |
| Tractors/Loaders/Backhoes | 419.60 | 500.28 | 217.92 | 162.97 | 659.46 | - | - | (557.70) | 554.66 | 995.63 | 13.55 | (189.50) |
| Other Material Handling Equipment | 598.74 | 713.86 | 310.96 | 232.54 | 940.99 | - | - | (795.79) | 791.46 | 1,420.68 | 19.33 | (270.40) |
| Other Material Handling Equipment | 3,283.41 | 3,914.70 | 1,705.27 | 1,275.24 | 5,160.28 | - | - | (4,364.00) | 4,340.27 | 7,790.84 | 106.02 | (1,482.84) |
| Crawler Tractor | 602.25 | 718.05 | 312.78 | 233.91 | 946.51 | - | - | (800.46) | 796.11 | 1,429.02 | 19.45 | (271.99) |
| **Bending Crew (18 Days)** | | | | | | | | | | | | |
| Other Material Handling Equipment | 1,197.48 | 1,427.71 | 621.92 | 465.09 | 1,881.99 | - | - | (1,591.58) | 1,582.92 | 2,841.37 | 38.67 | (540.80) |
| Other Material Handling Equipment | 212.46 | 253.30 | 110.34 | 82.52 | 333.90 | - | - | (282.38) | 280.84 | 504.11 | 6.86 | (95.95) |
| **Pipe Gang (Bead Welders) (18 Days)** | | | | | | | | | | | | |
| Other Material Handling Equipment | 598.74 | 713.86 | 310.96 | 232.54 | 940.99 | - | - | (795.79) | 791.46 | 1,420.68 | 19.33 | (270.40) |
| Crawler Tractor | 511.35 | 609.66 | 265.57 | 198.60 | 803.64 | - | - | (679.63) | 675.94 | 1,213.32 | 16.51 | (230.93) |
| Other Material Handling Equipment | 482.85 | 575.69 | 250.77 | 187.54 | 758.87 | - | - | (641.76) | 638.28 | 1,145.71 | 15.59 | (218.06) |
| Off-Highway Truck | 450.67 | 537.32 | 234.06 | 175.04 | 708.29 | - | - | (598.99) | 595.74 | 1,069.35 | 14.55 | (203.53) |
| Welder | 161.79 | 192.90 | 84.03 | 62.84 | 254.28 | - | - | (215.04) | 213.87 | 383.90 | 5.22 | (73.07) |
| **Joint Coating Crew (18 Days)** | | | | | | | | | | | | |
| Other Material Handling Equipment | 598.74 | 713.86 | 310.96 | 232.54 | 940.99 | - | - | (795.79) | 791.46 | 1,420.68 | 19.33 | (270.40) |
| Air Compressor | 10.23 | 12.19 | 5.31 | 3.97 | 16.07 | - | - | (13.59) | 13.52 | 24.27 | 0.33 | (4.62) |
| **Lower-in Crew (18 Days)** | | | | | | | | | | | | |
| Other Material Handling Equipment | 1,796.22 | 2,141.57 | 932.88 | 697.63 | 2,822.98 | - | - | (2,387.36) | 2,374.39 | 4,262.05 | 58.00 | (811.20) |
| Tractors/Loaders/Backhoes | 419.60 | 500.28 | 217.92 | 162.97 | 659.46 | - | - | (557.70) | 554.66 | 995.63 | 13.55 | (189.50) |
| Rubber Tired Dozer | 468.45 | 558.52 | 243.29 | 181.94 | 736.23 | - | - | (622.62) | 619.24 | 1,111.54 | 15.13 | (211.56) |
| Tractors/Loaders/Backhoes | 419.60 | 500.28 | 217.92 | 162.97 | 659.46 | - | - | (557.70) | 554.66 | 995.63 | 13.55 | (189.50) |
| **Tie-In Crew (30 Days)** | | | | | | | | | | | | |
| Other Material Handling Equipment | 3,592.44 | 4,283.14 | 1,865.76 | 1,395.27 | 5,645.96 | - | - | (4,774.73) | 4,748.77 | 8,524.10 | 116.00 | (1,622.40) |
| Tractors/Loaders/Backhoes | 839.20 | 1,000.56 | 435.85 | 325.94 | 1,318.91 | - | - | (1,115.39) | 1,109.33 | 1,991.26 | 27.10 | (379.00) |
| Rubber Tired Dozer | 936.90 | 1,117.04 | 486.59 | 363.88 | 1,472.46 | - | - | (1,245.24) | 1,238.47 | 2,223.07 | 30.25 | (423.12) |
| **Hydro-Test Crew (39 Days)** | | | | | | | | | | | | |
| Air Compressor | 63.92 | 76.21 | 33.20 | 24.83 | 100.46 | - | - | (84.95) | 84.49 | 151.66 | 2.06 | (28.87) |
| Other Material Handling Equipment | 1,496.85 | 1,784.64 | 777.40 | 581.36 | 2,352.48 | - | - | (1,989.47) | 1,978.65 | 3,551.71 | 48.33 | (676.00) |
| Pumps | 121.53 | 144.90 | 63.12 | 47.20 | 191.00 | - | - | (161.53) | 160.65 | 288.37 | 3.92 | (54.89) |
| Pumps | 60.77 | 72.45 | 31.56 | 23.60 | 95.50 | - | - | (80.77) | 80.33 | 144.19 | 1.96 | (27.44) |
| **Clean Up Crew (24 Days)** | | | | | | | | | | | | |
| Rubber Tired Dozer | 2,108.03 | 2,513.33 | 1,094.82 | 818.74 | 3,313.03 | - | - | (2,801.79) | 2,786.56 | 5,001.91 | 68.07 | (952.02) |
| Tractors/Loaders/Backhoes | 1,258.81 | 1,500.83 | 653.77 | 488.91 | 1,978.37 | - | - | (1,673.09) | 1,663.99 | 2,986.89 | 40.65 | (568.50) |
| Grader | 929.06 | 1,107.69 | 482.52 | 360.84 | 1,460.13 | - | - | (1,234.82) | 1,228.11 | 2,204.47 | 30.00 | (419.58) |
| Tractors/Loaders/Backhoes | 377.64 | 450.25 | 196.13 | 146.67 | 593.51 | - | - | (501.93) | 499.20 | 896.07 | 12.19 | (170.55) |
| Off-Highway Truck | 946.41 | 1,128.38 | 491.53 | 367.58 | 1,487.41 | - | - | (1,257.89) | 1,251.05 | 2,245.64 | 30.56 | (427.42) |
| Total Lbs | 33,314.54 | 39,719.81 | 17,302.19 | 12,939.03 | 56,782.28 | - | - | (48,020.19) | 47,759.12 | 85,728.20 | 1,166.65 | (16,316.75) |
| Total Tons | 16.66 | 19.86 | 8.65 | 6.47 | 28.39 | - | - | (24.01) | 23.88 | 42.86 | 0.58 | (8.16) |

## HDD

| Equipment | Max HP | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2009 | | | | | 2012 | | | 2010 | |
| | 500 | | | | | | | | | | | | 70313 |
| Bore/Drill Rigs | 750 | | | | | | | | | | | | 45000 |
| Cranes | 250 | | | | | | | | | | | | 2257 |
| Excavator | 250 | | | | | | | | | | | | 25650 |
| Off-Highway Trucks | 250 | | | | | | | | | | | | 2253 |
| Generators | 15 | | | | | | | | | | | | 3330 |
| Other Material Handling Equipment | 250 | | | | | | | | | | | | 10974 |

| Equipment | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2009 | | | | | 2012 | | | 2010 | |
| | - | - | - | - | - | - | - | - | - | - | - | 66,070.21 |
| Bore/Drill Rigs | - | - | - | - | - | - | - | - | - | - | - | 42,284.93 |
| Cranes | - | - | - | - | - | - | - | - | - | - | - | 1,216.05 |
| Excavator | - | - | - | - | - | - | - | - | - | - | - | 18,317.83 |
| Off-Highway Trucks | - | - | - | - | - | - | - | - | - | - | - | 1,609.11 |
| Generators | - | - | - | - | - | - | - | - | - | - | - | 3,087.36 |
| Other Material Handling Equipment | - | - | - | - | - | - | - | - | - | - | - | 8,112.01 |
| Total lbs | | | | | | | | | | | | 140,697.51 |
| Total Tons | | | | | | | | | | | | 70.35 |
| Difference | | | | | | | | | | | | 62.19 |

## D-8: Yolo County Line 407 W Emissions

| Trenching | | | 2012 | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Multiplier | Line 407w (part) | | | | | |
| Equipment | Max HP | 407w (part) | lbs total | | | | | |
| **Environmental, Fence & Pot Hole Crew (60 days)** | | | ROG | CO | NOx | SOx | PM | CO2 |
| Pump | 250 | 122,490 | 75.54 | 243.63 | 968.32 | 1.35 | 27.79 | 113564.99 |
| Off-Highway Truck | 250 | 66,771 | 42.06 | 112.95 | 386.95 | 0.59 | 13.24 | 47,684.25 |
| **Grade Crew (18 Days)** | | | | | | | | |
| Crawler Tractor | 250 | 64,785 | 57.94 | 163.39 | 532.98 | 0.57 | 20.83 | 51,947.52 |
| Tractors/Loaders/Backhoes | 250 | 17,508 | 8.87 | 26.38 | 90.01 | 0.15 | 2.93 | 12,064.33 |
| Grader | 250 | 22,913 | 16.00 | 45.88 | 156.15 | 0.20 | 5.55 | 17,511.31 |
| **Ditch Crew (18 Days)** | | | | | | | | |
| Tractors/Loaders/Backhoes | 250 | 87,538 | 44.35 | 131.89 | 450.03 | 0.77 | 14.65 | 60,321.64 |
| Trencher | 250 | 19,099 | 19.98 | 59.74 | 192.04 | 0.21 | 7.66 | 17,946.93 |
| **Stringing Crew (18 Days)** | | | | | | | | |
| Tractors/Loaders/Backhoes | 250 | 17,508 | 8.87 | 26.38 | 90.01 | 0.15 | 2.93 | 12,064.33 |
| Other Material Handling Equipment | 250 | 23,288 | 15.29 | 41.24 | 162.40 | 0.21 | 5.18 | 17,214.84 |
| Other Material Handling Equipment | 500 | 127,711 | 77.36 | 237.98 | 783.42 | 0.84 | 26.44 | 94,403.94 |
| Crawler Tractor | 250 | 21,595 | 19.31 | 54.46 | 177.66 | 0.19 | 6.94 | 17,315.84 |
| **Bending Crew (18 Days)** | | | | | | | | |
| Other Material Handling Equipment | 250 | 46,577 | 30.57 | 82.48 | 324.81 | 0.41 | 10.36 | 34,429.67 |
| Other Material Handling Equipment | 120 | 8,264 | 12.27 | 44.38 | 70.75 | 0.07 | 6.79 | 6,108.49 |
| **Pipe Gang (Bead Welders) (18 Days)** | | | | | | | | |
| Other Material Handling Equipment | 250 | 23,288 | 15.29 | 41.24 | 162.40 | 0.21 | 5.18 | 17,214.84 |
| Crawler Tractor | 250 | 18,335 | 16.40 | 46.24 | 150.84 | 0.16 | 5.90 | 14,702.13 |
| Other Material Handling Equipment | 250 | 18,781 | 12.33 | 33.26 | 130.97 | 0.17 | 4.18 | 13,882.93 |
| Off-Highway Truck | 250 | 18,144 | 11.43 | 30.69 | 105.15 | 0.16 | 3.60 | 12,957.68 |
| Welder | 15 | 8,251 | 8.25 | 31.71 | 49.11 | 0.07 | 3.34 | 4,651.85 |
| **Joint Coating Crew (18 Days)** | | | | | | | | |
| Other Material Handling Equipment | 250 | 23,288 | 15.29 | 41.24 | 162.40 | 0.21 | 5.18 | 17,214.84 |
| Air Compressor | 15 | 489 | 0.52 | 2.00 | 3.10 | 0.00 | 0.21 | 294.04 |
| **Lower-in Crew (18 Days)** | | | | | | | | |
| Other Material Handling Equipment | 250 | 69,865 | 45.86 | 123.73 | 487.21 | 0.62 | 15.54 | 51,644.51 |
| Tractors/Loaders/Backhoes | 250 | 17,508 | 8.87 | 26.38 | 90.01 | 0.15 | 2.93 | 12,064.33 |
| Rubber Tired Dozer | 250 | 18,221 | 18.70 | 52.29 | 161.38 | 0.16 | 6.90 | 13,468.80 |
| Tractors/Loaders/Backhoes | 250 | 17,508 | 8.87 | 26.38 | 90.01 | 0.15 | 2.93 | 12,064.33 |
| **Tie-In Crew (30 Days)** | | | | | | | | |
| Other Material Handling Equipment | 250 | 139,730 | 91.72 | 247.45 | 974.42 | 1.23 | 31.09 | 103,289.02 |
| Tractors/Loaders/Backhoes | 250 | 35,015 | 17.74 | 52.75 | 180.01 | 0.31 | 5.86 | 24,128.66 |
| Rubber Tired Dozer | 250 | 36,441 | 37.40 | 104.59 | 322.76 | 0.32 | 13.81 | 26,937.60 |
| **Hydro-Test Crew (39 Days)** | | | | | | | | |
| Air Compressor | 15 | 3,056 | 3.26 | 12.53 | 19.40 | 0.03 | 1.32 | 1,837.76 |
| Other Material Handling Equipment | 250 | 58,221 | 38.22 | 103.10 | 406.01 | 0.51 | 12.95 | 43,037.09 |
| Pumps | 15 | 3,769 | 6.19 | 23.83 | 36.88 | 0.06 | 2.51 | 3,494.31 |
| Pumps | 15 | 1,884 | 3.10 | 11.91 | 18.44 | 0.03 | 1.25 | 1,747.15 |
| **Clean Up Crew (24 Days)** | | | | | | | | |
| Rubber Tired Dozer | 250 | 81,993 | 84.16 | 235.32 | 726.20 | 0.72 | 31.06 | 60,609.59 |
| Tractors/Loaders/Backhoes | 250 | 52,523 | 26.61 | 79.13 | 270.02 | 0.46 | 8.79 | 36,192.98 |
| Grader | 250 | 34,952 | 24.40 | 69.98 | 238.19 | 0.31 | 8.47 | 26,712.17 |
| Tractors/Loaders/Backhoes | 175 | 15,757 | 7.98 | 23.74 | 81.01 | 0.14 | 2.64 | 10,857.90 |
| Off-Highway Truck | 500 | 38,103 | 22.58 | 66.55 | 194.46 | 0.25 | 7.05 | 27,211.12 |

| | 2012 | | | | | |
|---|---|---|---|---|---|---|
| | lbs Total | | | | | |
| | ROG | CO | NOx | SOx | PM | CO2 |
| Environmental Crew | 117.61 | 356.58 | 1,355.27 | 1.94 | 41.03 | 161,249.25 |
| All 18-Day Crews | 472.60 | 1,369.36 | 4,622.83 | 5.84 | 166.17 | 511,489.11 |
| Tie-In Crew | 146.86 | 404.79 | 1,477.19 | 1.86 | 50.75 | 154,355.27 |
| Hydro Test Crew | 50.76 | 151.37 | 480.73 | 0.63 | 18.03 | 50,116.32 |
| Clean Up Crew | 165.73 | 474.73 | 1,509.88 | 1.88 | 58.01 | 161,583.76 |
| **Total** | 953.56 | 2,756.84 | 9,445.90 | 12.15 | 334.00 | 1,038,793.71 |

| HDD | | | 2012 lbs Total | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Multiplier | | | | | | |
| Equipment | Max HP | 407w (part) | ROG | CO | NOx | SOx | PM | CO2 |
| | 500 | 210,938 | 88.28 | 361.94 | 919.02 | 2.32 | 28.34 | 198,210.63 |
| Bore/Drill Rigs | 750 | 135,000 | 55.01 | 225.10 | 535.84 | 1.19 | 17.84 | 126,854.80 |
| Cranes | 250 | 6,772 | 3.59 | 9.95 | 34.84 | 0.04 | 1.27 | 3,648.15 |
| Excavator | 250 | 76,950 | 45.09 | 125.76 | 430.85 | 0.68 | 14.41 | 54,953.49 |
| Off-Highway | 250 | 6,760 | 4.26 | 11.43 | 39.17 | 0.06 | 1.34 | 4,827.34 |
| Generator | 15 | 19,980 | 28.21 | 126.31 | 191.48 | 0.31 | 11.05 | 18,524.19 |
| Other Material Handling Equipment | 250 | 98,766 | 64.83 | 174.91 | 688.75 | 0.87 | 21.97 | 73,008.09 |
| | | *Subtotal* | *289.27* | *1,035.40* | *2,839.96* | *5.47* | *96.22* | *480,026.68* |

| J/B | | | 2012 lbs Total | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Multiplier | | | | | | |
| Equipment | Max HP | 407w (part) | ROG | CO | NOx | SOx | PM | CO2 |
| Bore/Drill Rigs | 120 | 6,300 | 3.94 | 36.26 | 38.58 | 0.07 | 2.53 | 5,919.89 |
| Excavator | 250 | 15,800 | 9.26 | 25.82 | 88.47 | 0.14 | 2.96 | 11,283.78 |
| Other Material Handling Equipment | 250 | 25,606 | 16.81 | 45.35 | 178.57 | 0.23 | 5.70 | 18,928.02 |
| | | *Subtotal* | *30.01* | *107.43* | *305.61* | *0.43* | *11.18* | *36,131.70* |

**Yolo County Specific OFFROAD Equipment Emissions, Annual**

| | 2012 lbs Total | | | | | |
|---|---|---|---|---|---|---|
| | ROG | CO | NOx | SOx | PM | CO2 |
| Trenching | 953.56 | 2,756.84 | 9,445.90 | 12.15 | 334.00 | 1,038,793.71 |
| HDD | 289.27 | 1,035.40 | 2,839.96 | 5.47 | 96.22 | 480,026.68 |
| J/B | 30.01 | 107.43 | 305.61 | 0.43 | 11.18 | 36,131.70 |
| *Total* | 1,272.83 | 3,899.66 | 12,591.47 | 18.06 | 441.39 | 1,554,952.08 |

| | tons Total | | | | | |
|---|---|---|---|---|---|---|
| | ROG | CO | NOx | SOx | PM | CO2 |
| Trenching | 0.48 | 1.38 | 4.72 | 0.01 | 0.17 | 519.40 |
| HDD | 0.14 | 0.52 | 1.42 | 0.00 | 0.05 | 240.01 |
| J/B | 0.02 | 0.05 | 0.15 | 0.00 | 0.01 | 18.07 |
| *Total* | 0.64 | 1.95 | 6.30 | 0.01 | 0.22 | 777.48 |

**Annual Emissions of Line 407 W (part) in Yolo County**

**Hauling Emissions**

| Descriptor | Total Trips | Trips Analyzed in URBEMIS | multiplier |
|---|---|---|---|
| Soil | 185 | 10 | 18.50 |
| Pipe | 235 | 20 | 11.75 |

Soil = On-Road Diesel emissions from the trenching phase

**J&B Emissions**

| Total No. | Analyzed in URBEMIS | multiplier |
|---|---|---|
| 6 | 1 | 6.00 |

**HDD Emissions**

| Total No. | Analyzed in URBEMIS | multiplier |
|---|---|---|
| 3 | 1 | 3.00 |

**Trenching**

| Duration (Days) | Analyzed in URBEMIS | Multiplier |
|---|---|---|
| 142 | 1 | 142 |

* 92% of time estimated in Yolo County

| Line 407w (portion) | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | lbs/day | | Total Lbs | | Total Tons | |
| **Activity** | **Multiplier** | **ROG** | **NOx** | **ROG** | **NOx** | **ROG** | **NOx** |
| Soil Hauling | 18.50 | 0.16 | 2.34 | 2.96 | 43.29 | 0.00 | 0.02 |
| Pipe Hauling | 11.75 | 0.32 | 4.68 | 3.76 | 54.99 | 0.00 | 0.03 |
| Paving | - | - | - | - | - | - | - |
| J&B (non OFFROAD) | 6.00 | 0.49 | 4.39 | 2.94 | 26.34 | 0.00 | 0.01 |
| HDD (non OFFROAD) | 3.00 | 0.49 | 4.39 | 1.47 | 13.17 | 0.00 | 0.01 |
| Trenching (non OFFROAD) | 142 | 0.49 | 4.39 | 69.58 | 623.38 | 0.03 | 0.31 |
| All OFFROAD Activity | | | | 1,272.83 | 12,591.47 | 0.64 | 6.30 |
| | | | | | Total | 0.68 | 6.68 |

# D-9: Line 406 Mitigated Emissions

**6/19/2009 1:22:18 PM**

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: P:\PROJECTS\PG&E\Revised Modeling\PG&E Line 406.urb924

Project Name: Line 406

Project Location: Yolo-Solano AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2009 TOTALS (lbs/day unmitigated) | 6.62 | 48.42 | 28.93 | 0.01 | 169.90 | 3.02 | 170.13 | 35.48 | 2.78 | 35.70 | 4,295.85 |
| 2009 TOTALS (lbs/day mitigated) | 6.62 | 48.42 | 28.93 | 0.01 | 16.17 | 3.02 | 17.59 | 3.38 | 2.78 | 5.82 | 4,295.85 |

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|

**6/19/2009 1:22:18 PM**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 5/4/2009-5/8/2009 Active Days: 5 | **6.62** | **48.42** | **28.93** | 0.00 | 153.02 | **3.02** | 156.03 | 31.96 | **2.78** | 34.73 | **4,295.85** |
| Asphalt 05/04/2009-05/08/2009 | 2.16 | 12.69 | 9.22 | 0.00 | 0.01 | 1.09 | 1.10 | 0.00 | 1.01 | 1.01 | 1,160.55 |
| Paving Off-Gas | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Paving Off Road Diesel | 2.08 | 12.55 | 7.05 | 0.00 | 0.00 | 1.09 | 1.09 | 0.00 | 1.00 | 1.00 | 979.23 |
| Paving On Road Diesel | 0.00 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.37 |
| Paving Worker Trips | 0.07 | 0.12 | 2.17 | 0.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.01 | 178.95 |
| Mass Grading 05/04/2009-05/22/2009 | 4.47 | 35.73 | 19.71 | 0.00 | 153.01 | 1.93 | 154.93 | 31.95 | 1.77 | 33.73 | 3,135.30 |
| Mass Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 153.00 | 0.00 | 153.00 | 31.95 | 0.00 | 31.95 | 0.00 |
| Mass Grading Off Road Diesel | 4.42 | 35.65 | 18.16 | 0.00 | 0.00 | 1.92 | 1.92 | 0.00 | 1.77 | 1.77 | 3,007.48 |
| Mass Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Mass Grading Worker Trips | 0.05 | 0.08 | 1.55 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 127.82 |
| Time Slice 5/11/2009-5/22/2009 Active Days: 10 | 4.47 | 35.73 | 19.71 | 0.00 | 153.01 | 1.93 | 154.93 | 31.95 | 1.77 | 33.73 | 3,135.30 |
| Mass Grading 05/04/2009-05/22/2009 | 4.47 | 35.73 | 19.71 | 0.00 | 153.01 | 1.93 | 154.93 | 31.95 | 1.77 | 33.73 | 3,135.30 |
| Mass Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 153.00 | 0.00 | 153.00 | 31.95 | 0.00 | 31.95 | 0.00 |
| Mass Grading Off Road Diesel | 4.42 | 35.65 | 18.16 | 0.00 | 0.00 | 1.92 | 1.92 | 0.00 | 1.77 | 1.77 | 3,007.48 |
| Mass Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Mass Grading Worker Trips | 0.05 | 0.08 | 1.55 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 127.82 |

**6/19/2009 1:22:18 PM**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 6/1/2009-7/31/2009 Active Days: 45 | 0.63 | 6.31 | 2.05 | 0.00 | **169.90** | 0.23 | **170.13** | **35.48** | 0.21 | **35.70** | 645.98 |
| Fine Grading 06/01/2009-07/31/2009 | 0.63 | 6.31 | 2.05 | 0.00 | 169.90 | 0.23 | 170.13 | 35.48 | 0.21 | 35.70 | 645.98 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 169.90 | 0.00 | 169.90 | 35.48 | 0.00 | 35.48 | 0.00 |
| Fine Grading Off Road Diesel | 0.57 | 5.61 | 1.47 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.18 | 0.18 | 539.89 |
| Fine Grading On Road Diesel | 0.05 | 0.68 | 0.28 | 0.00 | 0.00 | 0.03 | 0.03 | 0.00 | 0.03 | 0.03 | 80.52 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.56 |
| Time Slice 8/3/2009-8/18/2009 Active Days: 12 | 0.58 | 5.63 | 1.77 | 0.00 | 126.94 | 0.20 | 127.14 | 26.51 | 0.18 | 26.69 | 565.46 |
| Fine Grading 08/03/2009-08/18/2009 | 0.58 | 5.63 | 1.77 | 0.00 | 126.94 | 0.20 | 127.14 | 26.51 | 0.18 | 26.69 | 565.46 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 126.93 | 0.00 | 126.93 | 26.51 | 0.00 | 26.51 | 0.00 |
| Fine Grading Off Road Diesel | 0.57 | 5.61 | 1.47 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.18 | 0.18 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.56 |
| Time Slice 8/24/2009-8/25/2009 Active Days: 2 | 0.58 | 5.63 | 1.77 | 0.00 | 35.98 | 0.20 | 36.18 | 7.51 | 0.18 | 7.70 | 565.46 |
| Fine Grading 08/24/2009-08/25/2009 | 0.58 | 5.63 | 1.77 | 0.00 | 35.98 | 0.20 | 36.18 | 7.51 | 0.18 | 7.70 | 565.46 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 35.98 | 0.00 | 35.98 | 7.51 | 0.00 | 7.51 | 0.00 |
| Fine Grading Off Road Diesel | 0.57 | 5.61 | 1.47 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.18 | 0.18 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.56 |

**6/19/2009 1:22:18 PM**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 8/27/2009-8/28/2009 Active Days: 2 | 0.71 | 9.18 | 3.74 | **0.01** | 0.04 | 0.41 | 0.45 | 0.01 | 0.37 | 0.39 | 1,087.02 |
| Fine Grading 08/27/2009-08/28/2009 | 0.71 | 9.18 | 3.74 | 0.01 | 0.04 | 0.41 | 0.45 | 0.01 | 0.37 | 0.39 | 1,087.02 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Off Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading On Road Diesel | 0.71 | 9.18 | 3.74 | 0.01 | 0.04 | 0.41 | 0.45 | 0.01 | 0.37 | 0.39 | 1,087.02 |
| Fine Grading Worker Trips | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Phase Assumptions

Phase: Fine Grading 6/1/2009 - 7/31/2009 - Trenching Dust

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 300 cubic yards/day; Offsite Cut/Fill: 300 cubic yards/day

On Road Truck Travel (VMT): 20

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/3/2009 - 8/18/2009 - HDD Crossing

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 223 cubic yards/day; Offsite Cut/Fill: 223 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/24/2009 - 8/25/2009 - Jack and Bore Crossing

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 60 cubic yards/day; Offsite Cut/Fill: 60 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/27/2009 - 8/28/2009 - Pipe Hauling

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 270

Off-Road Equipment:

Phase: Mass Grading 5/4/2009 - 5/22/2009 - Dunnigan Hills

Total Acres Disturbed: 30.6

Maximum Daily Acreage Disturbed: 7.65

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 5/4/2009 - 5/8/2009 - Minimal Repaving

Acres to be Paved: 0.01

Off-Road Equipment:

**6/19/2009 1:22:18 PM**

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

| | ROG | NOx | CO | SO2 | PM10 Dust | PM10 Exhaust | PM10 | PM2.5 Dust | PM2.5 Exhaust | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 5/4/2009-5/8/2009 Active Days: 5 | **6.62** | **48.42** | **28.93** | 0.00 | 14.57 | **3.02** | 17.59 | 3.05 | **2.78** | 5.82 | **4,295.85** |
| Asphalt 05/04/2009-05/08/2009 | 2.16 | 12.69 | 9.22 | 0.00 | 0.01 | 1.09 | 1.10 | 0.00 | 1.01 | 1.01 | 1,160.55 |
| Paving Off-Gas | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Paving Off Road Diesel | 2.08 | 12.55 | 7.05 | 0.00 | 0.00 | 1.09 | 1.09 | 0.00 | 1.00 | 1.00 | 979.23 |
| Paving On Road Diesel | 0.00 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.37 |
| Paving Worker Trips | 0.07 | 0.12 | 2.17 | 0.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.01 | 178.95 |
| Mass Grading 05/04/2009-05/22/2009 | 4.47 | 35.73 | 19.71 | 0.00 | 14.57 | 1.93 | 16.49 | 3.04 | 1.77 | 4.81 | 3,135.30 |
| Mass Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 14.56 | 0.00 | 14.56 | 3.04 | 0.00 | 3.04 | 0.00 |
| Mass Grading Off Road Diesel | 4.42 | 35.65 | 18.16 | 0.00 | 0.00 | 1.92 | 1.92 | 0.00 | 1.77 | 1.77 | 3,007.48 |
| Mass Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Mass Grading Worker Trips | 0.05 | 0.08 | 1.55 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 127.82 |

**6/19/2009 1:22:18 PM**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 5/11/2009-5/22/2009 Active Days: 10 | 4.47 | 35.73 | 19.71 | 0.00 | 14.57 | 1.93 | 16.49 | 3.04 | 1.77 | 4.81 | 3,135.30 |
| Mass Grading 05/04/2009-05/22/2009 | 4.47 | 35.73 | 19.71 | 0.00 | 14.57 | 1.93 | 16.49 | 3.04 | 1.77 | 4.81 | 3,135.30 |
| Mass Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 14.56 | 0.00 | 14.56 | 3.04 | 0.00 | 3.04 | 0.00 |
| Mass Grading Off Road Diesel | 4.42 | 35.65 | 18.16 | 0.00 | 0.00 | 1.92 | 1.92 | 0.00 | 1.77 | 1.77 | 3,007.48 |
| Mass Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Mass Grading Worker Trips | 0.05 | 0.08 | 1.55 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 127.82 |
| Time Slice 6/1/2009-7/31/2009 Active Days: 45 | 0.63 | 6.31 | 2.05 | 0.00 | 16.17 | 0.23 | 16.40 | 3.38 | 0.21 | 3.59 | 645.98 |
| Fine Grading 06/01/2009-07/31/2009 | 0.63 | 6.31 | 2.05 | 0.00 | 16.17 | 0.23 | 16.40 | 3.38 | 0.21 | 3.59 | 645.98 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 16.17 | 0.00 | 16.17 | 3.38 | 0.00 | 3.38 | 0.00 |
| Fine Grading Off Road Diesel | 0.57 | 5.61 | 1.47 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.18 | 0.18 | 539.89 |
| Fine Grading On Road Diesel | 0.05 | 0.68 | 0.28 | 0.00 | 0.00 | 0.03 | 0.03 | 0.00 | 0.03 | 0.03 | 80.52 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.56 |
| Time Slice 8/3/2009-8/18/2009 Active Days: 12 | 0.58 | 5.63 | 1.77 | 0.00 | 12.08 | 0.20 | 12.28 | 2.52 | 0.18 | 2.71 | 565.46 |
| Fine Grading 08/03/2009-08/18/2009 | 0.58 | 5.63 | 1.77 | 0.00 | 12.08 | 0.20 | 12.28 | 2.52 | 0.18 | 2.71 | 565.46 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 12.08 | 0.00 | 12.08 | 2.52 | 0.00 | 2.52 | 0.00 |
| Fine Grading Off Road Diesel | 0.57 | 5.61 | 1.47 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.18 | 0.18 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.56 |

**6/19/2009 1:22:18 PM**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Slice 8/24/2009-8/25/2009 Active Days: 2 | 0.58 | 5.63 | 1.77 | 0.00 | 3.43 | 0.20 | 3.63 | 0.72 | 0.18 | 0.90 | 565.46 |
| Fine Grading 08/24/2009-08/25/2009 | 0.58 | 5.63 | 1.77 | 0.00 | 3.43 | 0.20 | 3.63 | 0.72 | 0.18 | 0.90 | 565.46 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 3.42 | 0.00 | 3.42 | 0.72 | 0.00 | 0.72 | 0.00 |
| Fine Grading Off Road Diesel | 0.57 | 5.61 | 1.47 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.18 | 0.18 | 539.89 |
| Fine Grading On Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Worker Trips | 0.01 | 0.02 | 0.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 25.56 |
| Time Slice 8/27/2009-8/28/2009 Active Days: 2 | 0.71 | 9.18 | 3.74 | **0.01** | 0.04 | 0.41 | 0.45 | 0.01 | 0.37 | 0.39 | 1,087.02 |
| Fine Grading 08/27/2009-08/28/2009 | 0.71 | 9.18 | 3.74 | 0.01 | 0.04 | 0.41 | 0.45 | 0.01 | 0.37 | 0.39 | 1,087.02 |
| Fine Grading Dust | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading Off Road Diesel | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fine Grading On Road Diesel | 0.71 | 9.18 | 3.74 | 0.01 | 0.04 | 0.41 | 0.45 | 0.01 | 0.37 | 0.39 | 1,087.02 |
| Fine Grading Worker Trips | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 6/1/2009 - 7/31/2009 - Trenching Dust

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/3/2009 - 8/18/2009 - HDD Crossing

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/24/2009 - 8/25/2009 - Jack and Bore Crossing

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 5/4/2009 - 5/22/2009 - Dunnigan Hills

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

# D-10: Alternatives Emissions Analysis - Yolo County

## Trenching Construction Hours

Trenching Construction Timeline / Activity

| Equipment List by Phase | Horsepower | Hours Per Foot | | HP | | Pipeline Route | Alternatives<br>Hours/Alterantive Difference<br>A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Environmental, Fence & Pot Hole Crew (60 days)** | | | **Max** | **Min** | Avg | Trench length | 2,214 | 2,640 | 1,150 | 860 | 3,480.00 | 0 | 0 | (7,011.00) |
| 1 Vacuum Suck Pump (Other Equipment) | 300-350 | 0.008 | 350 | 300 | 325 | | 18 | 21 | 9 | 7 | 28 | - | - | (56) |
| 1 Flatbed | 200 -260 | 0.008 | 260 | 200 | 230 | | 18 | 21 | 9 | 7 | 28 | - | - | (56) |
| **Grade Crew (18 Days)** | | | | | | | | | | | | | | |
| 3 D-8 Dozers | 230-300 | 0.002 | 300 | 230 | 265 | | 4 | 5 | 2 | 2 | 7 | - | - | (14) |
| 1 Cat Backhoe | 200-300 | 0.002 | 300 | 200 | 250 | | 4 | 5 | 2 | 2 | 7 | - | - | (14) |
| 1 Motor Grader | 240-350 | 0.002 | 350 | 240 | 295 | | 4 | 5 | 2 | 2 | 7 | - | - | (14) |
| **Ditch Crew (18 Days)** | | | | | | | | | | | | | | |
| 5 Backhoes | 200-300 | 0.002 | 300 | 200 | 250 | | 4 | 5 | 2 | 2 | 7 | - | - | (14) |
| 1 Ditching Machine | 150-250 | 0.002 | 250 | 150 | 200 | | 4 | 5 | 2 | 2 | 7 | - | - | (14) |
| **Stringing Crew (18 Days)** | | | | | | | | | | | | | | |
| 1 Cat Backhoe | 200-300 | 0.002 | 300 | 200 | 250 | | 4 | 5 | 2 | 2 | 7 | - | - | (14) |
| 1 Cat Sideboom | 310 | 0.002 | 310 | 310 | 310 | | 4 | 5 | 2 | 2 | 7 | - | - | (14) |
| 4 Stringing Trucks | 380-470 | 0.002 | 470 | 380 | 425 | | 4 | 5 | 2 | 2 | 7 | - | - | (14) |
| 1 Cat Dozer | 230-300 | 0.002 | 300 | 230 | 265 | | 4 | 5 | 2 | 2 | 7 | - | - | (14) |
| **Bending Crew (18 Days)** | | | | | | | | | | | | | | |
| 2 Sidebooms | 310 | 0.002 | 310 | 310 | 310 | | 4 | 5 | 2 | 2 | 7 | - | - | (14) |
| 1 Bending Machine | 110 | 0.002 | 110 | 110 | 110 | | 4 | 5 | 2 | 2 | 7 | - | - | (14) |
| **Pipe Gang (Bead Welders) (18 Days)** | | | | | | | | | | | | | | |
| 1 Sideboom | 310 | 0.002 | 310 | 310 | 310 | | 4 | 5 | 2 | 2 | 7 | - | - | (14) |
| 1 Tack Rig | 200-250 | 0.002 | 250 | 200 | 225 | | 4 | 5 | 2 | 2 | 7 | - | - | (14) |
| 1 Tow Cat | 200-300 | 0.002 | 300 | 200 | 250 | | 4 | 5 | 2 | 2 | 7 | - | - | (14) |
| 1 Skid Truck | 200-300 | 0.002 | 300 | 200 | 250 | | 4 | 5 | 2 | 2 | 7 | - | - | (14) |
| 8 Gas power welding units | 18 | 0.002 | 18 | 18 | 18 | | 4 | 5 | 2 | 2 | 7 | - | - | (14) |
| **Joint Coating Crew (18 Days)** | | | | | | | | | | | | | | |
| 1 Sideboom | 310 | 0.002 | 310 | 310 | 310 | | 4 | 5 | 2 | 2 | 7 | - | - | (14) |
| 1 Air Compressor | 8 | 0.002 | 8 | 8 | 8 | | 4 | 5 | 2 | 2 | 7 | - | - | (14) |
| **Lower-in Crew (18 Days)** | | | | | | | | | | | | | | |
| 3 Sidebooms | 310 | 0.002 | 310 | 310 | 310 | | 4 | 5 | 2 | 2 | 7 | - | - | (14) |
| 1 Backhoe | 200-300 | 0.002 | 300 | 200 | 250 | | 4 | 5 | 2 | 2 | 7 | - | - | (14) |
| 1 Dozer | 230-300 | 0.002 | 300 | 230 | 265 | | 4 | 5 | 2 | 2 | 7 | - | - | (14) |
| 1 Backhoe w/ Clam attachment | 200-300 | 0.002 | 300 | 200 | 250 | | 4 | 5 | 2 | 2 | 7 | - | - | (14) |
| **Tie-In Crew (30 Days)** | | | | | | | | | | | | | | |
| 3 Sidebooms | 310 | 0.004 | 310 | 310 | 310 | | 9 | 11 | 5 | 3 | 14 | - | - | (28) |
| 1 Backhoe | 200-300 | 0.004 | 300 | 200 | 250 | | 9 | 11 | 5 | 3 | 14 | - | - | (28) |
| 1 Dozer | 230-300 | 0.004 | 300 | 230 | 265 | | 9 | 11 | 5 | 3 | 14 | - | - | (28) |
| **Hydro-Test Crew (39 Days)** | | | | | | | | | | | | | | |
| 2 Air Compressors | 10 | 0.005 | 10 | 10 | 10 | | 11 | 13 | 6 | 4 | 17 | - | - | (35) |
| 1 Cat Sideboom | 310 | 0.005 | 310 | 310 | 310 | | 11 | 13 | 6 | 4 | 17 | - | - | (35) |
| 2 Fill Pumps | 8 | 0.005 | 8 | 8 | 8 | | 11 | 13 | 6 | 4 | 17 | - | - | (35) |
| 1 Test Pump | 8 | 0.005 | 8 | 8 | 8 | | 11 | 13 | 6 | 4 | 17 | - | - | (35) |
| **Clean Up Crew (24 Days)** | | | | | | | | | | | | | | |
| 3 Dozers | 230-300 | 0.003 | 300 | 230 | 265 | | 7 | 8 | 3 | 3 | 10 | - | - | (21) |
| 2 Backhoes | 200-300 | 0.003 | 300 | 200 | 250 | | 7 | 8 | 3 | 3 | 10 | - | - | (21) |
| 1 Motor Grader | 250-350 | 0.003 | 350 | 250 | 300 | | 7 | 8 | 3 | 3 | 10 | - | - | (21) |
| 1 Tractor | 100-200 | 0.003 | 200 | 100 | 150 | | 7 | 8 | 3 | 3 | 10 | - | - | (21) |
| 1 Dump Truck | 300-400 | 0.003 | 400 | 300 | 350 | | 7 | 8 | 3 | 3 | 10 | - | - | (21) |

**Total Tons**

**Emissions Analysis**

| URB Equivalent | | | Equation Factors | | Total Hours | | | | | | | | Multiplier | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 2009 | | | | 2012 | | | | 2009 | | | | 2012 | |
| Equip | Max HP | No | HP | Load Factor | A | B | C | D | E | F | G | H | A | B | C | D | E | F | G | H |
| Pump | 250 | 1 | 325 | 0.74 | 18 | 21 | 9 | 7 | 28 | 0 | 0 | -56 | 4260 | 5079 | 2213 | 1655 | 6696 | 0 | 0 | -13489 |
| Off-Highway Truck | 250 | 1 | 230 | 0.57 | 18 | 21 | 9 | 7 | 28 | 0 | 0 | -56 | 2322 | 2769 | 1206 | 902 | 3650 | 0 | 0 | -7353 |
| | | | | | | | | | | | | | | | | | | | | |
| Crawler Tractor | 250 | 3 | 265 | 0.64 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -14 | 2253 | 2686 | 1170 | 875 | 3541 | 0 | 0 | -7134 |
| Tractors/Loaders/Backhoes | 250 | 1 | 250 | 0.55 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -14 | 609 | 726 | 316 | 237 | 957 | 0 | 0 | -1928 |
| Grader | 250 | 1 | 295 | 0.61 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -14 | 797 | 950 | 414 | 310 | 1252 | 0 | 0 | -2523 |
| | | | | | | | | | | | | | | | | | | | | |
| Tractors/Loaders/Backhoes | 250 | 5 | 250 | 0.55 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -14 | 3045 | 3630 | 1581 | 1183 | 4785 | 0 | 0 | -9640 |
| Trencher | 250 | 1 | 200 | 0.75 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -14 | 664 | 792 | 345 | 258 | 1044 | 0 | 0 | -2103 |
| | | | | | | | | | | | | | | | | | | | | |
| Tractors/Loaders/Backhoes | 250 | 1 | 250 | 0.55 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -14 | 609 | 726 | 316 | 237 | 957 | 0 | 0 | -1928 |
| Other Material Handling Equipment | 250 | 1 | 310 | 0.59 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -14 | 810 | 966 | 421 | 315 | 1273 | 0 | 0 | -2565 |
| Other Material Handling Equipment | 500 | 4 | 425 | 0.59 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -14 | 4442 | 5296 | 2307 | 1725 | 6981 | 0 | 0 | -14064 |
| Crawler Tractor | 250 | 1 | 265 | 0.64 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -14 | 751 | 895 | 390 | 292 | 1180 | 0 | 0 | -2378 |
| | | | | | | | | | | | | | | | | | | | | |
| Other Material Handling Equipment | 250 | 2 | 310 | 0.59 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -14 | 1620 | 1931 | 841 | 629 | 2546 | 0 | 0 | -5129 |
| Other Material Handling Equipment | 120 | 1 | 110 | 0.59 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -14 | 287 | 343 | 149 | 112 | 452 | 0 | 0 | -910 |
| | | | | | | | | | | | | | | | | | | | | |
| Other Material Handling Equipment | 250 | 1 | 310 | 0.59 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -14 | 810 | 966 | 421 | 315 | 1273 | 0 | 0 | -2565 |
| Crawler Tractor | 250 | 1 | 225 | 0.64 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -14 | 638 | 760 | 331 | 248 | 1002 | 0 | 0 | -2019 |
| Other Material Handling Equipment | 250 | 1 | 250 | 0.59 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -14 | 653 | 779 | 339 | 254 | 1027 | 0 | 0 | -2068 |
| Off-Highway Truck | 250 | 1 | 250 | 0.57 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -14 | 631 | 752 | 328 | 245 | 992 | 0 | 0 | -1998 |
| Welder | 15 | 8 | 18 | 0.45 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -14 | 287 | 342 | 149 | 111 | 451 | 0 | 0 | -909 |
| | | | | | | | | | | | | | | | | | | | | |
| Other Material Handling Equipment | 250 | 1 | 310 | 0.59 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -14 | 810 | 966 | 421 | 315 | 1273 | 0 | 0 | -2565 |
| Air Compressor | 15 | 1 | 8 | 0.48 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -14 | 17 | 20 | 9 | 7 | 27 | 0 | 0 | -54 |
| | | | | | | | | | | | | | | | | | | | | |
| Other Material Handling Equipment | 250 | 3 | 310 | 0.59 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -14 | 2430 | 2897 | 1262 | 944 | 3819 | 0 | 0 | -7694 |
| Tractors/Loaders/Backhoes | 250 | 1 | 250 | 0.55 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -14 | 609 | 726 | 316 | 237 | 957 | 0 | 0 | -1928 |
| Rubber Tired Dozer | 250 | 1 | 265 | 0.54 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -14 | 634 | 756 | 329 | 246 | 996 | 0 | 0 | -2007 |
| Tractors/Loaders/Backhoes | 250 | 1 | 250 | 0.55 | 4 | 5 | 2 | 2 | 7 | 0 | 0 | -14 | 609 | 726 | 316 | 237 | 957 | 0 | 0 | -1928 |
| | | | | | | | | | | | | | | | | | | | | |
| Other Material Handling Equipment | 250 | 3 | 310 | 0.59 | 9 | 11 | 5 | 3 | 14 | 0 | 0 | -28 | 4860 | 5794 | 2524 | 1888 | 7638 | 0 | 0 | -15388 |
| Tractors/Loaders/Backhoes | 250 | 1 | 250 | 0.55 | 9 | 11 | 5 | 3 | 14 | 0 | 0 | -28 | 1218 | 1452 | 633 | 473 | 1914 | 0 | 0 | -3856 |
| Rubber Tired Dozer | 250 | 1 | 265 | 0.54 | 9 | 11 | 5 | 3 | 14 | 0 | 0 | -28 | 1267 | 1511 | 658 | 492 | 1992 | 0 | 0 | -4013 |
| | | | | | | | | | | | | | | | | | | | | |
| Air Compressor | 15 | 2 | 10 | 0.48 | 11 | 13 | 6 | 4 | 17 | 0 | 0 | -35 | 106 | 127 | 55 | 41 | 167 | 0 | 0 | -337 |
| Other Material Handling Equipment | 250 | 1 | 310 | 0.59 | 11 | 13 | 6 | 4 | 17 | 0 | 0 | -35 | 2025 | 2414 | 1052 | 786 | 3182 | 0 | 0 | -6412 |
| Pumps | 15 | 2 | 8 | 0.74 | 11 | 13 | 6 | 4 | 17 | 0 | 0 | -35 | 131 | 156 | 68 | 51 | 206 | 0 | 0 | -415 |
| Pumps | 15 | 1 | 8 | 0.74 | 11 | 13 | 6 | 4 | 17 | 0 | 0 | -35 | 66 | 78 | 34 | 25 | 103 | 0 | 0 | -208 |
| | | | | | | | | | | | | | | | | | | | | |
| Rubber Tired Dozer | 250 | 3 | 265 | 0.54 | 7 | 8 | 3 | 3 | 10 | 0 | 0 | -21 | 2852 | 3400 | 1481 | 1108 | 4482 | 0 | 0 | -9029 |
| Tractors/Loaders/Backhoes | 250 | 2 | 250 | 0.55 | 7 | 8 | 3 | 3 | 10 | 0 | 0 | -21 | 1827 | 2178 | 949 | 710 | 2871 | 0 | 0 | -5784 |
| Grader | 250 | 1 | 300 | 0.61 | 7 | 8 | 3 | 3 | 10 | 0 | 0 | -21 | 1216 | 1449 | 631 | 472 | 1911 | 0 | 0 | -3849 |
| Tractors/Loaders/Backhoes | 175 | 1 | 150 | 0.55 | 7 | 8 | 3 | 3 | 10 | 0 | 0 | -21 | 548 | 653 | 285 | 213 | 861 | 0 | 0 | -1735 |
| Off-Highway Truck | 500 | 1 | 350 | 0.57 | 7 | 8 | 3 | 3 | 10 | 0 | 0 | -21 | 1325 | 1580 | 688 | 515 | 2083 | 0 | 0 | -4196 |

| | | Multiplier | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Equipment** | **Max HP** | **406** | | | | | | **407w (part)** | |
| **Environmental, Fence & Pot Hole Crew (60 days)** | | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** |
| Pump | 250 | 4,260 | 5,079 | 2,213 | 1,655 | 6,696 | - | - | (13,489) |
| Off-Highway Truck | 250 | 2,322 | 2,769 | 1,206 | 902 | 3,650 | - | - | (7,353) |
| **Grade Crew (18 Days)** | | - | - | - | - | - | - | - | - |
| Crawler Tractor | 250 | 2,253 | 2,686 | 1,170 | 875 | 3,541 | - | - | (7,134) |
| Tractors/Loaders/Backhoes | 250 | 609 | 726 | 316 | 237 | 957 | - | - | (1,928) |
| Grader | 250 | 797 | 950 | 414 | 310 | 1,252 | - | - | (2,523) |
| **Ditch Crew (18 Days)** | | - | - | - | - | - | - | - | - |
| Tractors/Loaders/Backhoes | 250 | 3,045 | 3,630 | 1,581 | 1,183 | 4,785 | - | - | (9,640) |
| Trencher | 250 | 664 | 792 | 345 | 258 | 1,044 | - | - | (2,103) |
| **Stringing Crew (18 Days)** | | - | - | - | - | - | - | - | - |
| Tractors/Loaders/Backhoes | 250 | 609 | 726 | 316 | 237 | 957 | - | - | (1,928) |
| Other Material Handling Equipment | 250 | 810 | 966 | 421 | 315 | 1,273 | - | - | (2,565) |
| Other Material Handling Equipment | 500 | 4,442 | 5,296 | 2,307 | 1,725 | 6,981 | - | - | (14,064) |
| Crawler Tractor | 250 | 751 | 895 | 390 | 292 | 1,180 | - | - | (2,378) |
| **Bending Crew (18 Days)** | | - | - | - | - | - | - | - | - |
| Other Material Handling Equipment | 250 | 1,620 | 1,931 | 841 | 629 | 2,546 | - | - | (5,129) |
| Other Material Handling Equipment | 120 | 287 | 343 | 149 | 112 | 452 | - | - | (910) |
| **Pipe Gang (Bead Welders) (18 Days)** | | - | - | - | - | - | - | - | - |
| Other Material Handling Equipment | 250 | 810 | 966 | 421 | 315 | 1,273 | - | - | (2,565) |
| Crawler Tractor | 250 | 638 | 760 | 331 | 248 | 1,002 | - | - | (2,019) |
| Other Material Handling Equipment | 250 | 653 | 779 | 339 | 254 | 1,027 | - | - | (2,068) |
| Off-Highway Truck | 250 | 631 | 752 | 328 | 245 | 992 | - | - | (1,998) |
| Welder | 15 | 287 | 342 | 149 | 111 | 451 | - | - | (909) |
| **Joint Coating Crew (18 Days)** | | - | - | - | - | - | - | - | - |
| Other Material Handling Equipment | 250 | 810 | 966 | 421 | 315 | 1,273 | - | - | (2,565) |
| Air Compressor | 15 | 17 | 20 | 9 | 7 | 27 | - | - | (54) |
| **Lower-in Crew (18 Days)** | | - | - | - | - | - | - | - | - |
| Other Material Handling Equipment | 250 | 2,430 | 2,897 | 1,262 | 944 | 3,819 | - | - | (7,694) |
| Tractors/Loaders/Backhoes | 250 | 609 | 726 | 316 | 237 | 957 | - | - | (1,928) |
| Rubber Tired Dozer | 250 | 634 | 756 | 329 | 246 | 996 | - | - | (2,007) |
| Tractors/Loaders/Backhoes | 250 | 609 | 726 | 316 | 237 | 957 | - | - | (1,928) |
| **Tie-In Crew (30 Days)** | | - | - | - | - | - | - | - | - |
| Other Material Handling Equipment | 250 | 4,860 | 5,794 | 2,524 | 1,888 | 7,638 | - | - | (15,388) |
| Tractors/Loaders/Backhoes | 250 | 1,218 | 1,452 | 633 | 473 | 1,914 | - | - | (3,856) |
| Rubber Tired Dozer | 250 | 1,267 | 1,511 | 658 | 492 | 1,992 | - | - | (4,013) |
| **Hydro-Test Crew (39 Days)** | | - | - | - | - | - | - | - | - |
| Air Compressor | 15 | 106 | 127 | 55 | 41 | 167 | - | - | (337) |
| Other Material Handling Equipment | 250 | 2,025 | 2,414 | 1,052 | 786 | 3,182 | - | - | (6,412) |
| Pumps | 15 | 131 | 156 | 68 | 51 | 206 | - | - | (415) |
| Pumps | 15 | 66 | 78 | 34 | 25 | 103 | - | - | (208) |
| **Clean Up Crew (24 Days)** | | - | - | - | - | - | - | - | - |
| Rubber Tired Dozer | 250 | 2,852 | 3,400 | 1,481 | 1,108 | 4,482 | - | - | (9,029) |
| Tractors/Loaders/Backhoes | 250 | 1,827 | 2,178 | 949 | 710 | 2,871 | - | - | (5,784) |
| Grader | 250 | 1,216 | 1,449 | 631 | 472 | 1,911 | - | - | (3,849) |
| Tractors/Loaders/Backhoes | 175 | 548 | 653 | 285 | 213 | 861 | - | - | (1,735) |
| Off-Highway Truck | 500 | 1,325 | 1,580 | 688 | 515 | 2,083 | - | - | (4,196) |

| Equipment | 2009 Line 406 - Option A lbs total | | | | | | 2009 Line 406 - Option B lbs total | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Environmental, Fence & Pot Hole Crew (60 days)** | **ROG** | **CO** | **NOx** | **SOx** | **PM** | **CO2** | **ROG** | **CO** | **NOx** | **SOx** | **PM** | **CO2** |
| Pump | 3.32 | 10.04 | 40.85 | 0.05 | 1.27 | 1,134.69 | 3.96 | 11.97 | 48.70 | 0.06 | 1.51 | 1,352.86 |
| Off-Highway Truck | 1.72 | 4.52 | 17.26 | 0.02 | 0.61 | 1,658.48 | 2.05 | 5.39 | 20.58 | 0.02 | 0.73 | 1,977.35 |
| **Grade Crew (18 Days)** | | | | | | | | | | | | |
| Crawler Tractor | 2.34 | 6.57 | 22.31 | 0.02 | 0.90 | 1,806.76 | 2.79 | 7.83 | 26.60 | 0.02 | 1.08 | 2,154.14 |
| Tractors/Loaders/Backhoes | 0.37 | 1.03 | 4.07 | 0.01 | 0.14 | 419.60 | 0.44 | 1.23 | 4.85 | 0.01 | 0.16 | 500.28 |
| Grader | 0.66 | 1.84 | 6.73 | 0.01 | 0.25 | 609.05 | 0.78 | 2.19 | 8.03 | 0.01 | 0.30 | 726.15 |
| **Ditch Crew (18 Days)** | | | | | | | | | | | | |
| Tractors/Loaders/Backhoes | 1.83 | 5.16 | 20.36 | 0.03 | 0.68 | 2,098.01 | 2.18 | 6.16 | 24.27 | 0.03 | 0.82 | 2,501.39 |
| Trencher | 0.82 | 2.40 | 7.87 | 0.01 | 0.33 | 624.20 | 0.97 | 2.86 | 9.39 | 0.01 | 0.39 | 744.21 |
| **Stringing Crew (18 Days)** | | | | | | | | | | | | |
| Tractors/Loaders/Backhoes | 0.37 | 1.03 | 4.07 | 0.01 | 0.14 | 419.60 | 0.44 | 1.23 | 4.85 | 0.01 | 0.16 | 500.28 |
| Other Material Handling Equipment | 0.64 | 1.71 | 6.92 | 0.01 | 0.24 | 598.74 | 0.76 | 2.04 | 8.25 | 0.01 | 0.28 | 713.86 |
| Other Material Handling Equipment | 3.18 | 10.75 | 33.63 | 0.03 | 1.19 | 3,283.41 | 3.79 | 12.82 | 40.09 | 0.03 | 1.42 | 3,914.70 |
| Crawler Tractor | 0.78 | 2.19 | 7.44 | 0.01 | 0.30 | 602.25 | 0.93 | 2.61 | 8.87 | 0.01 | 0.36 | 718.05 |
| **Bending Crew (18 Days)** | | | | | | | | | | | | |
| Other Material Handling Equipment | 1.28 | 3.41 | 13.83 | 0.01 | 0.47 | 1,197.48 | 1.53 | 4.07 | 16.49 | 0.02 | 0.57 | 1,427.71 |
| Other Material Handling Equipment | 0.52 | 1.59 | 2.92 | 0.00 | 0.28 | 212.46 | 0.62 | 1.90 | 3.49 | 0.00 | 0.33 | 253.30 |
| **Pipe Gang (Bead Welders) (18 Days)** | | | | | | | | | | | | |
| Other Material Handling Equipment | 0.64 | 1.71 | 6.92 | 0.01 | 0.24 | 598.74 | 0.76 | 2.04 | 8.25 | 0.01 | 0.28 | 713.86 |
| Crawler Tractor | 0.66 | 1.86 | 6.32 | 0.01 | 0.26 | 511.35 | 0.79 | 2.22 | 7.53 | 0.01 | 0.30 | 609.66 |
| Other Material Handling Equipment | 0.52 | 1.38 | 5.58 | 0.01 | 0.19 | 482.85 | 0.62 | 1.64 | 6.65 | 0.01 | 0.23 | 575.69 |
| Off-Highway Truck | 0.47 | 1.23 | 4.69 | 0.01 | 0.17 | 450.67 | 0.56 | 1.46 | 5.59 | 0.01 | 0.20 | 537.32 |
| Welder | 0.34 | 1.17 | 1.94 | 0.00 | 0.14 | 161.79 | 0.40 | 1.39 | 2.31 | 0.00 | 0.17 | 192.90 |
| **Joint Coating Crew (18 Days)** | | | | | | | | | | | | |
| Other Material Handling Equipment | 0.64 | 1.71 | 6.92 | 0.01 | 0.24 | 598.74 | 0.76 | 2.04 | 8.25 | 0.01 | 0.28 | 713.86 |
| Air Compressor | 0.02 | 0.07 | 0.12 | 0.00 | 0.01 | 10.23 | 0.03 | 0.09 | 0.15 | 0.00 | 0.01 | 12.19 |
| **Lower-in Crew (18 Days)** | | | | | | | | | | | | |
| Other Material Handling Equipment | 1.92 | 5.12 | 20.75 | 0.02 | 0.71 | 1,796.22 | 2.29 | 6.11 | 24.74 | 0.03 | 0.85 | 2,141.57 |
| Tractors/Loaders/Backhoes | 0.37 | 1.03 | 4.07 | 0.01 | 0.14 | 419.60 | 0.44 | 1.23 | 4.85 | 0.01 | 0.16 | 500.28 |
| Rubber Tired Dozer | 0.74 | 2.07 | 6.54 | 0.01 | 0.29 | 468.45 | 0.88 | 2.47 | 7.80 | 0.01 | 0.34 | 558.52 |
| Tractors/Loaders/Backhoes | 0.37 | 1.03 | 4.07 | 0.01 | 0.14 | 419.60 | 0.44 | 1.23 | 4.85 | 0.01 | 0.16 | 500.28 |
| **Tie-In Crew (30 Days)** | | | | | | | | | | | | |
| Other Material Handling Equipment | 3.84 | 10.24 | 41.50 | 0.04 | 1.42 | 3,592.44 | 4.58 | 12.21 | 49.48 | 0.05 | 1.70 | 4,283.14 |
| Tractors/Loaders/Backhoes | 0.73 | 2.07 | 8.14 | 0.01 | 0.27 | 839.20 | 0.87 | 2.46 | 9.71 | 0.01 | 0.33 | 1,000.56 |
| Rubber Tired Dozer | 1.47 | 4.14 | 13.08 | 0.01 | 0.58 | 936.90 | 1.76 | 4.93 | 15.59 | 0.01 | 0.69 | 1,117.04 |
| **Hydro-Test Crew (39 Days)** | | | | | | | | | | | | |
| Air Compressor | 0.13 | 0.46 | 0.77 | 0.00 | 0.06 | 63.92 | 0.16 | 0.55 | 0.91 | 0.00 | 0.07 | 76.21 |
| Other Material Handling Equipment | 1.60 | 4.27 | 17.29 | 0.02 | 0.59 | 1,496.85 | 1.91 | 5.09 | 20.62 | 0.02 | 0.71 | 1,784.64 |
| Pumps | 0.25 | 0.88 | 1.45 | 0.00 | 0.11 | 121.53 | 0.30 | 1.04 | 1.73 | 0.00 | 0.13 | 144.90 |
| Pumps | 0.13 | 0.44 | 0.73 | 0.00 | 0.05 | 60.77 | 0.15 | 0.52 | 0.87 | 0.00 | 0.06 | 72.45 |
| **Clean Up Crew (24 Days)** | | | | | | | | | | | | |
| Rubber Tired Dozer | 3.32 | 9.31 | 29.43 | 0.03 | 1.29 | 2,108.03 | 3.95 | 11.10 | 35.09 | 0.03 | 1.54 | 2,513.33 |
| Tractors/Loaders/Backhoes | 1.10 | 3.10 | 12.22 | 0.02 | 0.41 | 1,258.81 | 1.31 | 3.69 | 14.56 | 0.02 | 0.49 | 1,500.83 |
| Grader | 1.00 | 2.80 | 10.27 | 0.01 | 0.38 | 929.06 | 1.19 | 3.34 | 12.25 | 0.01 | 0.45 | 1,107.69 |
| Tractors/Loaders/Backhoes | 0.33 | 0.93 | 3.66 | 0.00 | 0.12 | 377.64 | 0.39 | 1.11 | 4.37 | 0.01 | 0.15 | 450.25 |
| Off-Highway Truck | 0.90 | 2.82 | 8.63 | 0.01 | 0.32 | 946.41 | 1.08 | 3.36 | 10.28 | 0.01 | 0.38 | 1,128.38 |

| | 2009 lbs Total | | | | | | 2009 lbs Total | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **ROG** | **CO** | **NOx** | **SOx** | **PM** | **CO2** | **ROG** | **CO** | **NOx** | **SOx** | **PM** | **CO2** |
| Environmental Crew | 5.04 | 14.56 | 58.11 | 0.07 | 1.88 | 2,793.17 | 6.01 | 17.36 | 69.28 | 0.08 | 2.24 | 3,330.20 |
| All 18-Day Crews | 19.45 | 56.06 | 198.08 | 0.20 | 7.44 | 17,789.81 | 23.19 | 66.84 | 236.16 | 0.24 | 8.87 | 21,210.19 |
| Tie-In Crew | 6.05 | 16.45 | 62.72 | 0.06 | 2.27 | 5,368.54 | 7.21 | 19.61 | 74.78 | 0.08 | 2.71 | 6,400.73 |
| Hydro Test Crew | 2.11 | 6.04 | 20.24 | 0.02 | 0.81 | 1,743.07 | 2.52 | 7.21 | 24.13 | 0.03 | 0.97 | 2,078.20 |
| Clean Up Crew | 6.65 | 18.96 | 64.21 | 0.07 | 2.53 | 5,619.95 | 7.93 | 22.60 | 76.55 | 0.08 | 3.02 | 6,700.48 |
| **Total Lbs** | 39.31 | 112.07 | 403.36 | 0.42 | 14.93 | 33,314.54 | 46.86 | 133.62 | 480.91 | 0.50 | 17.80 | 39,719.81 |
| **Total Tons** | 0.02 | 0.06 | 0.20 | 0.00 | 0.01 | 16.66 | 0.02 | 0.07 | 0.24 | 0.00 | 0.01 | 19.86 |

| | 2009 | | | | | | 2009 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Line 406 - Option C | | | | | | Line 406 - Option D | | | | | |
| **Equipment** | lbs total | | | | | | lbs total | | | | | |
| **Environmental, Fence & Pot Hole Crew (60 days)** | **ROG** | **CO** | **NOx** | **SOx** | **PM** | **CO2** | **ROG** | **CO** | **NOx** | **SOx** | **PM** | **CO2** |
| Pump | 1.73 | 5.21 | 21.21 | 0.02 | 0.66 | 589.31 | 1.29 | 3.90 | 15.86 | 0.02 | 0.49 | 440.70 |
| Off-Highway Truck | 0.89 | 2.35 | 8.97 | 0.01 | 0.32 | 861.35 | 0.67 | 1.75 | 6.71 | 0.01 | 0.24 | 644.14 |
| **Grade Crew (18 Days)** | | | | | | | | | | | | |
| Crawler Tractor | 1.22 | 3.41 | 11.59 | 0.01 | 0.47 | 938.35 | 0.91 | 2.55 | 8.67 | 0.01 | 0.35 | 701.73 |
| Tractors/Loaders/Backhoes | 0.19 | 0.54 | 2.11 | 0.00 | 0.07 | 217.92 | 0.14 | 0.40 | 1.58 | 0.00 | 0.05 | 162.97 |
| Grader | 0.34 | 0.95 | 3.50 | 0.00 | 0.13 | 316.32 | 0.25 | 0.71 | 2.62 | 0.00 | 0.10 | 236.55 |
| **Ditch Crew (18 Days)** | | | | | | | | | | | | |
| Tractors/Loaders/Backhoes | 0.95 | 2.68 | 10.57 | 0.01 | 0.36 | 1,089.62 | 0.71 | 2.01 | 7.91 | 0.01 | 0.27 | 814.85 |
| Trencher | 0.42 | 1.25 | 4.09 | 0.00 | 0.17 | 324.18 | 0.32 | 0.93 | 3.06 | 0.00 | 0.13 | 242.43 |
| **Stringing Crew (18 Days)** | | | | | | | | | | | | |
| Tractors/Loaders/Backhoes | 0.19 | 0.54 | 2.11 | 0.00 | 0.07 | 217.92 | 0.14 | 0.40 | 1.58 | 0.00 | 0.05 | 162.97 |
| Other Material Handling Equipment | 0.33 | 0.89 | 3.59 | 0.00 | 0.12 | 310.96 | 0.25 | 0.66 | 2.69 | 0.00 | 0.09 | 232.54 |
| Other Material Handling Equipment | 1.65 | 5.58 | 17.46 | 0.02 | 0.62 | 1,705.27 | 1.23 | 4.18 | 13.06 | 0.01 | 0.46 | 1,275.24 |
| Crawler Tractor | 0.41 | 1.14 | 3.86 | 0.00 | 0.16 | 312.78 | 0.30 | 0.85 | 2.89 | 0.00 | 0.12 | 233.91 |
| **Bending Crew (18 Days)** | | | | | | | | | | | | |
| Other Material Handling Equipment | 0.67 | 1.77 | 7.18 | 0.01 | 0.25 | 621.92 | 0.50 | 1.33 | 5.37 | 0.01 | 0.18 | 465.09 |
| Other Material Handling Equipment | 0.27 | 0.83 | 1.52 | 0.00 | 0.14 | 110.34 | 0.20 | 0.62 | 1.14 | 0.00 | 0.11 | 82.52 |
| **Pipe Gang (Bead Welders) (18 Days)** | | | | | | | | | | | | |
| Other Material Handling Equipment | 0.33 | 0.89 | 3.59 | 0.00 | 0.12 | 310.96 | 0.25 | 0.66 | 2.69 | 0.00 | 0.09 | 232.54 |
| Crawler Tractor | 0.34 | 0.97 | 3.28 | 0.00 | 0.13 | 265.57 | 0.26 | 0.72 | 2.45 | 0.00 | 0.10 | 198.60 |
| Other Material Handling Equipment | 0.27 | 0.72 | 2.90 | 0.00 | 0.10 | 250.77 | 0.20 | 0.53 | 2.17 | 0.00 | 0.07 | 187.54 |
| Off-Highway Truck | 0.24 | 0.64 | 2.44 | 0.00 | 0.09 | 234.06 | 0.18 | 0.48 | 1.82 | 0.00 | 0.06 | 175.04 |
| Welder | 0.17 | 0.61 | 1.01 | 0.00 | 0.07 | 84.03 | 0.13 | 0.45 | 0.75 | 0.00 | 0.06 | 62.84 |
| **Joint Coating Crew (18 Days)** | | | | | | | | | | | | |
| Other Material Handling Equipment | 0.33 | 0.89 | 3.59 | 0.00 | 0.12 | 310.96 | 0.25 | 0.66 | 2.69 | 0.00 | 0.09 | 232.54 |
| Air Compressor | 0.01 | 0.04 | 0.06 | 0.00 | 0.00 | 5.31 | 0.01 | 0.03 | 0.05 | 0.00 | 0.00 | 3.97 |
| **Lower-in Crew (18 Days)** | | | | | | | | | | | | |
| Other Material Handling Equipment | 1.00 | 2.66 | 10.78 | 0.01 | 0.37 | 932.88 | 0.75 | 1.99 | 8.06 | 0.01 | 0.28 | 697.63 |
| Tractors/Loaders/Backhoes | 0.19 | 0.54 | 2.11 | 0.00 | 0.07 | 217.92 | 0.14 | 0.40 | 1.58 | 0.00 | 0.05 | 162.97 |
| Rubber Tired Dozer | 0.38 | 1.07 | 3.40 | 0.00 | 0.15 | 243.29 | 0.29 | 0.80 | 2.54 | 0.00 | 0.11 | 181.94 |
| Tractors/Loaders/Backhoes | 0.19 | 0.54 | 2.11 | 0.00 | 0.07 | 217.92 | 0.14 | 0.40 | 1.58 | 0.00 | 0.05 | 162.97 |
| **Tie-In Crew (30 Days)** | | | | | | | | | | | | |
| Other Material Handling Equipment | 2.00 | 5.32 | 21.55 | 0.02 | 0.74 | 1,865.76 | 1.49 | 3.98 | 16.12 | 0.02 | 0.55 | 1,395.27 |
| Tractors/Loaders/Backhoes | 0.38 | 1.07 | 4.23 | 0.01 | 0.14 | 435.85 | 0.28 | 0.80 | 3.16 | 0.00 | 0.11 | 325.94 |
| Rubber Tired Dozer | 0.77 | 2.15 | 6.79 | 0.01 | 0.30 | 486.59 | 0.57 | 1.61 | 5.08 | 0.00 | 0.22 | 363.88 |
| **Hydro-Test Crew (39 Days)** | | | | | | | | | | | | |
| Air Compressor | 0.07 | 0.24 | 0.40 | 0.00 | 0.03 | 33.20 | 0.05 | 0.18 | 0.30 | 0.00 | 0.02 | 24.83 |
| Other Material Handling Equipment | 0.83 | 2.22 | 8.98 | 0.01 | 0.31 | 777.40 | 0.62 | 1.66 | 6.72 | 0.01 | 0.23 | 581.36 |
| Pumps | 0.13 | 0.45 | 0.76 | 0.00 | 0.06 | 63.12 | 0.10 | 0.34 | 0.56 | 0.00 | 0.04 | 47.20 |
| Pumps | 0.07 | 0.23 | 0.38 | 0.00 | 0.03 | 31.56 | 0.05 | 0.17 | 0.28 | 0.00 | 0.02 | 23.60 |
| **Clean Up Crew (24 Days)** | | | | | | | | | | | | |
| Rubber Tired Dozer | 1.72 | 4.83 | 15.28 | 0.01 | 0.67 | 1,094.82 | 1.29 | 3.62 | 11.43 | 0.01 | 0.50 | 818.74 |
| Tractors/Loaders/Backhoes | 0.57 | 1.61 | 6.34 | 0.01 | 0.21 | 653.77 | 0.43 | 1.20 | 4.74 | 0.01 | 0.16 | 488.91 |
| Grader | 0.52 | 1.46 | 5.33 | 0.01 | 0.20 | 482.52 | 0.39 | 1.09 | 3.99 | 0.00 | 0.15 | 360.84 |
| Tractors/Loaders/Backhoes | 0.17 | 0.48 | 1.90 | 0.00 | 0.06 | 196.13 | 0.13 | 0.36 | 1.42 | 0.00 | 0.05 | 146.67 |
| Off-Highway Truck | 0.47 | 1.46 | 4.48 | 0.00 | 0.17 | 491.53 | 0.35 | 1.09 | 3.35 | 0.00 | 0.12 | 367.58 |

| | 2009 | | | | | | 2009 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | lbs Total | | | | | | lbs Total | | | | | |
| | **ROG** | **CO** | **NOx** | **SOx** | **PM** | **CO2** | **ROG** | **CO** | **NOx** | **SOx** | **PM** | **CO2** |
| Environmental Crew | 2.62 | 7.56 | 30.18 | 0.03 | 0.98 | 1,450.66 | 1.96 | 5.65 | 22.57 | 0.03 | 0.73 | 1,084.84 |
| All 18-Day Crews | 10.10 | 29.12 | 102.87 | 0.11 | 3.86 | 9,239.29 | 7.56 | 21.77 | 76.93 | 0.08 | 2.89 | 6,909.38 |
| Tie-In Crew | 3.14 | 8.54 | 32.58 | 0.03 | 1.18 | 2,788.20 | 2.35 | 6.39 | 24.36 | 0.03 | 0.88 | 2,085.09 |
| Hydro Test Crew | 1.10 | 3.14 | 10.51 | 0.01 | 0.42 | 905.28 | 0.82 | 2.35 | 7.86 | 0.01 | 0.31 | 676.99 |
| Clean Up Crew | 3.45 | 9.85 | 33.35 | 0.03 | 1.31 | 2,918.77 | 2.58 | 7.36 | 24.94 | 0.03 | 0.98 | 2,182.73 |
| **Total Lbs** | 20.41 | 58.20 | 209.49 | 0.22 | 7.75 | 17,302.19 | 15.27 | 43.53 | 156.66 | 0.16 | 5.80 | 12,939.03 |
| **Total Tons** | 0.01 | 0.03 | 0.10 | 0.00 | 0.00 | 8.65 | 0.01 | 0.02 | 0.08 | 0.00 | 0.00 | 6.47 |

| Equipment | 2009 Line 406 - Option E lbs total | | | | | | 2012 Line 407w (part) Option H lbs total | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Environmental, Fence & Pot Hole Crew (60 days)** | ROG | CO | NOx | SOx | PM | CO2 | ROG | CO | NOx | SOx | PM | CO2 |
| Pump | 5.22 | 15.78 | 64.20 | 0.07 | 1.99 | 1,783.31 | -8.32 | -26.83 | -106.64 | -0.15 | -3.06 | -12506.30 |
| Off-Highway Truck | 2.70 | 7.10 | 27.13 | 0.03 | 0.96 | 2,606.50 | (4.63) | (12.44) | (42.61) | (0.06) | (1.46) | (5,251.21) |
| **Grade Crew (18 Days)** | | | | | | | | | | | | |
| Crawler Tractor | 3.68 | 10.32 | 35.07 | 0.03 | 1.42 | 2,839.54 | (6.38) | (17.99) | (58.69) | (0.06) | (2.29) | (5,720.70) |
| Tractors/Loaders/Backhoes | 0.58 | 1.62 | 6.40 | 0.01 | 0.22 | 659.46 | (0.98) | (2.90) | (9.91) | (0.02) | (0.32) | (1,328.58) |
| Grader | 1.03 | 2.89 | 10.58 | 0.01 | 0.39 | 957.20 | (1.76) | (5.05) | (17.20) | (0.02) | (0.61) | (1,928.43) |
| **Ditch Crew (18 Days)** | | | | | | | | | | | | |
| Tractors/Loaders/Backhoes | 2.88 | 8.12 | 32.00 | 0.04 | 1.08 | 3,297.29 | (4.88) | (14.52) | (49.56) | (0.08) | (1.61) | (6,642.90) |
| Trencher | 1.28 | 3.77 | 12.38 | 0.01 | 0.51 | 981.01 | (2.20) | (6.58) | (21.15) | (0.02) | (0.84) | (1,976.40) |
| **Stringing Crew (18 Days)** | | | | | | | | | | | | |
| Tractors/Loaders/Backhoes | 0.58 | 1.62 | 6.40 | 0.01 | 0.22 | 659.46 | (0.98) | (2.90) | (9.91) | (0.02) | (0.32) | (1,328.58) |
| Other Material Handling | 1.01 | 2.68 | 10.87 | 0.01 | 0.37 | 940.99 | (1.68) | (4.54) | (17.88) | (0.02) | (0.57) | (1,895.78) |
| Other Material Handling | 5.00 | 16.90 | 52.85 | 0.05 | 1.88 | 5,160.28 | (8.52) | (26.21) | (86.27) | (0.09) | (2.91) | (10,396.19) |
| Crawler Tractor | 1.23 | 3.44 | 11.69 | 0.01 | 0.47 | 946.51 | (2.13) | (6.00) | (19.56) | (0.02) | (0.76) | (1,906.90) |
| **Bending Crew (18 Days)** | | | | | | | | | | | | |
| Other Material Handling | 2.01 | 5.37 | 21.74 | 0.02 | 0.75 | 1,881.99 | (3.37) | (9.08) | (35.77) | (0.05) | (1.14) | (3,791.55) |
| Equipment | 0.81 | 2.51 | 4.60 | 0.00 | 0.44 | 333.90 | (1.35) | (4.89) | (7.79) | (0.01) | (0.75) | (672.69) |
| **Pipe Gang (Bead Welders) (18 Days)** | | | | | | | | | | | | |
| Other Material Handling | 1.01 | 2.68 | 10.87 | 0.01 | 0.37 | 940.99 | (1.68) | (4.54) | (17.88) | (0.02) | (0.57) | (1,895.78) |
| Crawler Tractor | 1.04 | 2.92 | 9.93 | 0.01 | 0.40 | 803.64 | (1.81) | (5.09) | (16.61) | (0.02) | (0.65) | (1,619.07) |
| Other Material Handling | 0.81 | 2.16 | 8.77 | 0.01 | 0.30 | 758.87 | (1.36) | (3.66) | (14.42) | (0.02) | (0.46) | (1,528.85) |
| Off-Highway Truck | 0.73 | 1.93 | 7.37 | 0.01 | 0.26 | 708.29 | (1.26) | (3.38) | (11.58) | (0.02) | (0.40) | (1,426.96) |
| Welder | 0.53 | 1.83 | 3.04 | 0.00 | 0.22 | 254.28 | (0.91) | (3.49) | (5.41) | (0.01) | (0.37) | (512.28) |
| **Joint Coating Crew (18 Days)** | | | | | | | | | | | | |
| Other Material Handling | 1.01 | 2.68 | 10.87 | 0.01 | 0.37 | 940.99 | (1.68) | (4.54) | (17.88) | (0.02) | (0.57) | (1,895.78) |
| Air Compressor | 0.03 | 0.12 | 0.19 | 0.00 | 0.01 | 16.07 | (0.06) | (0.22) | (0.34) | (0.00) | (0.02) | (32.38) |
| **Lower-in Crew (18 Days)** | | | | | | | | | | | | |
| Other Material Handling | 3.02 | 8.05 | 32.61 | 0.03 | 1.12 | 2,822.98 | (5.05) | (13.63) | (53.65) | (0.07) | (1.71) | (5,687.33) |
| Tractors/Loaders/Backhoes | 0.58 | 1.62 | 6.40 | 0.01 | 0.22 | 659.46 | (0.98) | (2.90) | (9.91) | (0.02) | (0.32) | (1,328.58) |
| Rubber Tired Dozer | 1.16 | 3.25 | 10.28 | 0.01 | 0.45 | 736.23 | (2.06) | (5.76) | (17.77) | (0.02) | (0.76) | (1,483.25) |
| Tractors/Loaders/Backhoes | 0.58 | 1.62 | 6.40 | 0.01 | 0.22 | 659.46 | (0.98) | (2.90) | (9.91) | (0.02) | (0.32) | (1,328.58) |
| **Tie-In Crew (30 Days)** | | | | | | | | | | | | |
| Other Material Handling | 6.04 | 16.10 | 65.23 | 0.07 | 2.24 | 5,645.96 | (10.10) | (27.25) | (107.31) | (0.14) | (3.42) | (11,374.66) |
| Tractors/Loaders/Backhoes | 1.15 | 3.25 | 12.80 | 0.02 | 0.43 | 1,318.91 | (1.95) | (5.81) | (19.82) | (0.03) | (0.65) | (2,657.16) |
| Rubber Tired Dozer | 2.32 | 6.50 | 20.56 | 0.02 | 0.90 | 1,472.46 | (4.12) | (11.52) | (35.54) | (0.04) | (1.52) | (2,966.49) |
| **Hydro-Test Crew (39 Days)** | | | | | | | | | | | | |
| Air Compressor | 0.21 | 0.72 | 1.20 | 0.00 | 0.09 | 100.46 | (0.36) | (1.38) | (2.14) | (0.00) | (0.15) | (202.38) |
| Other Material Handling | 2.52 | 6.71 | 27.18 | 0.03 | 0.93 | 2,352.48 | (4.21) | (11.35) | (44.71) | (0.06) | (1.43) | (4,739.44) |
| Pumps | 0.40 | 1.38 | 2.29 | 0.00 | 0.17 | 191.00 | (0.68) | (2.62) | (4.06) | (0.01) | (0.28) | (384.81) |
| Pumps | 0.20 | 0.69 | 1.14 | 0.00 | 0.08 | 95.50 | (0.34) | (1.31) | (2.03) | (0.00) | (0.14) | (192.40) |
| **Clean Up Crew (24 Days)** | | | | | | | | | | | | |
| Rubber Tired Dozer | 5.21 | 14.63 | 46.25 | 0.04 | 2.03 | 3,313.03 | (9.27) | (25.91) | (79.97) | (0.08) | (3.42) | (6,674.61) |
| Tractors/Loaders/Backhoes | 1.73 | 4.87 | 19.20 | 0.03 | 0.65 | 1,978.37 | (2.93) | (8.71) | (29.74) | (0.05) | (0.97) | (3,985.74) |
| Grader | 1.57 | 4.41 | 16.14 | 0.02 | 0.60 | 1,460.13 | (2.69) | (7.71) | (26.23) | (0.03) | (0.93) | (2,941.67) |
| Tractors/Loaders/Backhoes | 0.52 | 1.46 | 5.76 | 0.01 | 0.19 | 593.51 | (0.88) | (2.61) | (8.92) | (0.02) | (0.29) | (1,195.72) |
| Off-Highway Truck | 1.42 | 4.43 | 13.56 | 0.01 | 0.50 | 1,487.41 | (2.49) | (7.33) | (21.41) | (0.03) | (0.78) | (2,996.61) |

| | 2009 lbs Total | | | | | | 2012 lbs Total | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ROG | CO | NOx | SOx | PM | CO2 | ROG | CO | NOx | SOx | PM | CO2 |
| Environmental Crew | 7.92 | 22.88 | 91.33 | 0.11 | 2.96 | 4,389.81 | (12.95) | (39.27) | (149.25) | (0.21) | (4.52) | (17,757.51) |
| All 18-Day Crews | 30.57 | 88.11 | 311.30 | 0.32 | 11.69 | 27,958.89 | (52.04) | (150.80) | (509.09) | (0.64) | (18.30) | (56,327.52) |
| Tie-In Crew | 9.51 | 25.85 | 98.58 | 0.10 | 3.57 | 8,437.33 | (16.17) | (44.58) | (162.67) | (0.20) | (5.59) | (16,998.31) |
| Hydro Test Crew | 3.32 | 9.50 | 31.81 | 0.03 | 1.27 | 2,739.45 | (5.59) | (16.67) | (52.94) | (0.07) | (1.99) | (5,519.04) |
| Clean Up Crew | 10.45 | 29.79 | 100.91 | 0.10 | 3.97 | 8,832.45 | (18.25) | (52.28) | (166.27) | (0.21) | (6.39) | (17,794.34) |
| **Total Lbs** | 61.77 | 176.13 | 633.93 | 0.66 | 23.46 | 52,357.93 | (105.01) | (303.60) | (1,040.23) | (1.34) | (36.78) | (114,396.72) |
| **Total Tons** | 0.03 | 0.09 | 0.32 | 0.00 | 0.01 | 26.18 | (0.05) | (0.15) | (0.52) | (0.00) | (0.02) | (57.20) |

# Appendix H-3: System Safety and Risk of Upset Report

# PG&E Line 406/407
# Natural Gas Pipeline Project

## <u>System Safety and Risk of Upset</u>

## <u>October 21, 2008</u>

Revised <u>October 9</u>~~April 13~~, 2009

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## TABLE OF CONTENTS

# Appendix H-3

# System Safety and Risk of Upset

This appendix H-3~~D~~ presents the potential risks to the public from the proposed PG&E Line 406/407 Natural Gas Pipeline Project. These risks would primarily result from unintentional releases of natural gas and the possibility of subsequent fires and/or explosions which could cause injuries and fatalities.

The risk assessment included as Appendix H-3 of the Draft and Final EIR included risk measurement terminology which was not defined in the document. This resulted in some confusion. This Appendix has been significantly revised to resolve this confusion. The primary revisions to this document from earlier versions are summarized below:

- Earlier versions of Appendix H-3 included a section entitled "Individual Risks". This section presented the anticipated annual likelihood of fatalities from all of the project components (e.g., pipeline, block valves, pig launchers and receivers, etc). The results represented the annual likelihood of an individual fatality along the entire 42.3 mile pipeline system. This has been confused with a common definition of Individual Risk (IR), which relates to the risk of an individual fatality at a specific location.

- The correct terminology for the risk presented in earlier versions of this Appendix is probable loss of life (PLL), or aggregate risk. (Marszal 2001) There are no known significance thresholds for acceptable levels of PLL or aggregate risk.

- Earlier versions of Appendix H-3 correctly stated that a commonly accepted individual risk threshold is an annual likelihood of fatality of one in one-million (1 : 1,000,000). However, the report incorrectly compared the aggregate, or PLL risk, to this individual risk threshold. This version of Appendix H-3 includes a presentation of the individual risks posed by each of the pipeline segments and compares them to the one in one million individual risk threshold.

# RESULTS SUMMARY

The risks to the public posed by each of the pipeline components are presented in this Appendix. The individual risks have been evaluated using two approaches: a simplified and an enhanced approach. The individual risk results are summarized in the table below. These are the maximum individual risk values, which would occur directly over the top of each pipeline. As the distance from each pipeline increases, the individual risk decreases. The individual risk directly over each pipeline segment would be less than the common significance threshold of 1 : 1,000,000. As one moves further from each pipeline, the risk would decrease further below the significance threshold.

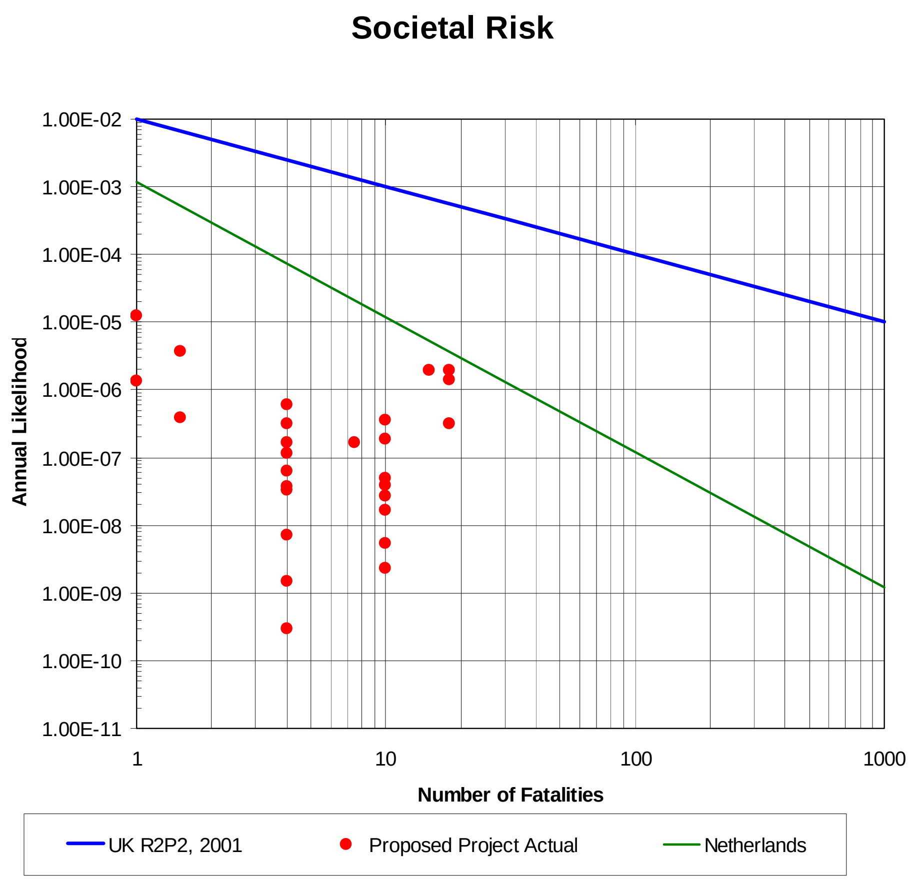
**Individual Risk Result Summary**

| Pipeline Segment | Pre-Mitigation Maximum Annual Risk of Fatality | Pre-Mitigation Maximum Annual Probability of Occurrence | Significance Threshold |
|---|---|---|---|
| **Simplified Analysis** | | | |
| Line 406 | $3.94 \times 10^{-7}$ | 1 : 2,538,000 | 1 : 1,000,000<br>Less Than Significant |
| Line 407 | $3.83 \times 10^{-7}$ | 1 : 2,610,000 | 1 : 1,000,000<br>Less Than Significant |
| Line DFM | $1.61 \times 10^{-7}$ | 1 : 6,219,000 | 1 : 1,000,000<br>Less Than Significant |
| **Enhanced Analysis** | | | |
| Line 406 | $4.68 \times 10^{-7}$ | 1 : 2,137,000 | 1 : 1,000,000<br>Less Than Significant |
| Line 407 | $4.85 \times 10^{-7}$ | 1 : 2,062,000 | 1 : 1,000,000<br>Less Than Significant |
| Line DFM | $2.35 \times 10^{-7}$ | 1 : 4,255,000 | 1 : 1,000,000<br>Less Than Significant |

The proposed mitigation would reduce the individual risk by fifty percent (50%). The post mitigation individual risk results are presented in Table 4.6.2-1.

The societal risks have also been evaluated. Theses risks also fall below the commonly accepted risk threshold, as indicated in the following figure.

## Societal Risk Result Summary



# 1.0 ENVIRONMENTAL SETTING

## 1.1 NATURAL GAS PUBLIC RISKS

Unintentional releases of natural gas from the proposed pipelines and related facilities could pose risks to human health and safety. For example, natural gas could be released from a leak or rupture in one of the pipe segments. If the natural gas was to reach a combustible mixture and an ignition source was present, a fire and/or explosion could occur, resulting in possible injuries and/or deaths.

## 1.2 NATURAL GAS CHARACTERISTICS

Natural gas is comprised primarily of methane. It is colorless, odorless, and tasteless. Methane is not toxic, but is classified as a simple asphyxiate, possessing a slight inhalation hazard. If breathed in high concentration, oxygen deficiency can result in serious injury or death.

Methane has an ignition temperature of 1,000°F and is flammable at concentrations between 5 percent and 15 percent in air. Unconfined mixtures of methane in air are not explosive. However, a flammable concentration within an enclosed space in the presence of an ignition source can explode. Methane is buoyant at atmospheric temperatures and disperses rapidly in air.

# 2.0 REGULATORY SETTING

## 2.1 FEDERAL

The United States Department of Transportation (USDOT) 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.

### 2.1.1 Regulatory Framework

Two statutes provide the framework for the Federal pipeline safety program. The Natural Gas Pipeline Safety Act of 1968 as amended (NGPSA) authorizes the OPS 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 as amended (HLPSA) authorizes the OPS 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 level. The State of California is certified under 49 USC Subtitle VIII, Chapter 601, §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 the Applicant. (The California State Fire Marshal has jurisdiction for hazardous liquid pipelines.)

### 2.1.2 Pipeline Regulations

The Federal pipeline regulations are published in Title 49 of the Code of Federal Regulations (CFR), 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. Other portions of the regulations are prescriptive.

The proposed pipeline segments and ancillary facilities would all be designed, constructed, operated, and maintained in accordance with 49 CFR 192. Since these are intrastate facilities, the CPUC would have the responsibility for 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.

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 220 yards on either side of the centerline of any continuous 1-mile length of pipeline. The four area classifications are defined as follows:

- Class 1 - Location with 10 or fewer buildings intended for human occupancy.
- Class 2 - Location with more than 10 but less than 46 buildings intended for human occupancy.
- Class 3 - Location with 46 or more buildings intended for human occupancy or where the pipeline lies within 100 yards of a building, or small well-defined outside area pipeline any occupied by 20 or more people on at least 5 days a week for 10 weeks in any 12-month.
- Class 4 - 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 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 of 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, inspection and testing of welds, and the frequency of pipeline patrols and leak surveys must also conform to higher standards in more populated areas.

The proposed pipeline facilities would be constructed within Class 1, 2, and 3 locations. Although some increase in population density adjacent to the right-of-way is anticipated, the Applicant would be required to demonstrate compliance with the more stringent requirements, reduce the maximum allowable operating pressure (MAOP) or replace the segment with pipe of sufficient grade and wall thickness to comply with 49 CFR 192 for the new class location if the population density should increase enough to change the Class location. The Applicant is conservatively designing the project as though it were located within higher area class locations, where future development is anticipated within the foreseeable future.

### 2.1.3 Pipeline Integrity Management

49 CFR 192 Subpart O, Pipeline Integrity Management grew out of a series of pipeline incidents with severe consequences. This Subpart requires operators of gas pipeline systems in High Consequence Areas (HCA's) to significantly increase their minimum required maintenance and inspection efforts. For example, all lines located within HCA's 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, 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 and 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. But the actual total costs were likely much higher; the families of the two children settled with the operator for $75 million less than one month prior to trial.

The following major safety issues were identified as factors during the subsequent investigation:

- 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. 12 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 and the figures included in the USDOT database, property and other damages or losses totaled $998,296. However, this figure significantly understates the financial impact to the operator. Although settlements were reached with all of the victims, the only amount disclosed was a $14 million settlement for one of the victims. (Business Weekly)

The major safety issues identified in the NTSB investigation were as follows:

- 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)

**Pipeline Integrity Management Regulations**

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. In 2002, Congress passed an Act to strengthen the 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 high consequence areas (HCA's) were required to develop and follow a written integrity management program that contained all of the elements prescribed in 49 CFR 192.911 and addressed the risks on each covered transmission pipeline segment.

The regulation (68 Federal Register 69778, 69 Federal Register 18228, and 69 Federal Register 29903) defines HCA's as they relate to the different area class locations, 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 HCA's 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 HCA's 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 maximum allowable operating pressure of the pipeline in pounds per square inch gauge (psig), multiplied by the pipeline diameter in inches squared. ($R = 0.69*(MAOP*d^2)^{0.5}$)

The potential impact circle is a circle with a radius equal to the potential impact radius.

Once a pipeline operator has identified the HCA's along its pipeline(s), it must apply the elements of its integrity management program to those segments of the pipeline within the HCA's. The pipeline integrity management rule for HCA's requires inspection of the entire pipeline within HCA's every 7 years.

As noted earlier, the proposed pipeline facilities are located within Class 1, 2 and 3 areas. As a result, using the first HCA definition, the portions of the line within Class 3 areas would be within an HCA. The impact radii are 646-feet and 215-feet for the 30-inch and 10-inch line segments respectively. These values are less than the 660-foot impact radius which might add additional portions to an HCA. As a result, certain portions of the Project will be required to be included in the Applicant's Pipeline Integrity Management Plan. Should the population density increase, additional portions of the pipeline may become located within an HCA, requiring the Applicant to include the affected pipe segments in their Pipeline Integrity Management Plan.

## 2.2 STATE

As noted earlier, these intrastate pipeline facilities 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, §60105.) The State requirements for designing, constructing, testing, operating, and maintaining gas piping systems are stated in CPUC General Order Number 112. These rules incorporate the Federal regulations by reference, but for natural gas pipelines, they do not impose any additional requirements affecting public safety.

# 3.0 SIGNIFICANCE CRITERIA

## 3.1 INDIVIDUAL RISK

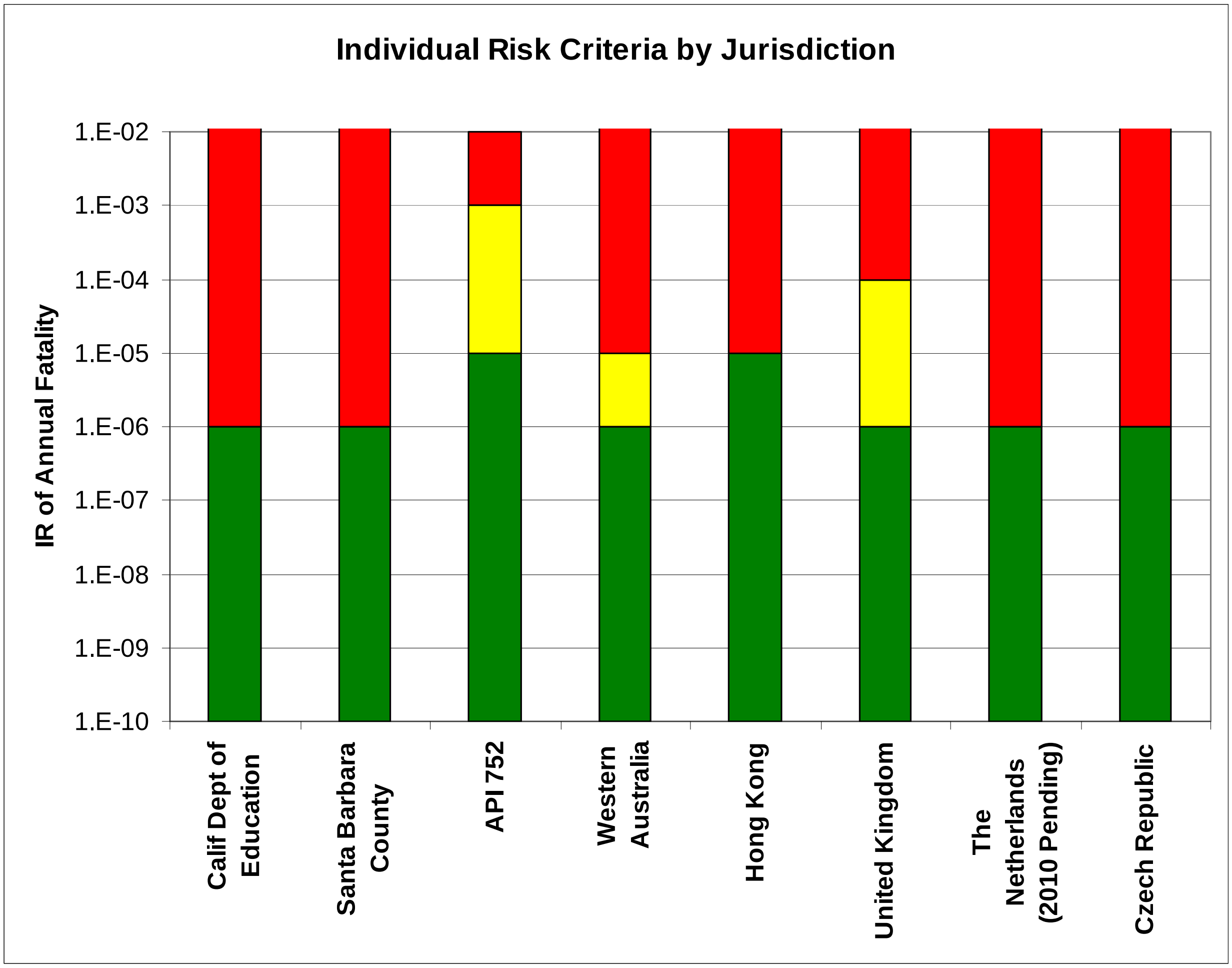
Individual risk (IR) is most commonly defined as the frequency that an individual may be expected to sustain a given level of harm from the realization of specific hazards, at a specific location, within a specified time interval. Individual risk is typically measured as the probability of a fatality per year. The risk level is typically determined for the maximally exposed individual; in other words, it assumes that a person is present continuously – 24 hours per day, 365 days per year. The likelihood is most often expressed numerically, using one of the values shown in Table 2.0-1 below.

**Table 3.1-1 Individual Risk Numerical Values**

| Annual Likelihood of Fatality | Numerical Value | Scientific Notation | Shorthand |
|---|---|---|---|
| 1 in 100 | $1.0 \times 10^{-2}$ | 1.0E-2 | $10^{-2}$ |
| 1 in 1,000 | $1.0 \times 10^{-3}$ | 1.0E-3 | $10^{-3}$ |
| 1 in 10,000 | $1.0 \times 10^{-4}$ | 1.0E-4 | $10^{-4}$ |
| 1 in 100,000 | $1.0 \times 10^{-5}$ | 1.0E-5 | $10^{-5}$ |
| 1 in 1,000,000 | $1.0 \times 10^{-6}$ | 1.0E-6 | $10^{-6}$ |
| 1 in 10,000,000 | $1.0 \times 10^{-7}$ | 1.0E-7 | $10^{-7}$ |
| 1 in 100,000,000 | $1.0 \times 10^{-8}$ | 1.0E-8 | $10^{-8}$ |
| 1 in 1,000,000,000 | $1.0 \times 10^{-9}$ | 1.0E-9 | $10^{-9}$ |

The California Department of Education (CDE) defines individual risk as the probability of fatality for an individual exposed to the physical impact of a hazard, at a specific location, within a specified period of time. (CDE 2007) As noted in the Final EIR, the individual risk threshold most commonly used, where one has been established, is an annual likelihood of fatality of one in one million (1:1,000,000, $1 \times 10^{-6}$, or 1.0E-6 fatalities per year). However, the United States federal and California state governments have not adopted individual risk thresholds; the determination of the acceptable level of risk is left to local decision makers and project proponents. Figure 3.1-1 below presents the individual risk thresholds for a number of jurisdictions, where such thresholds have been adopted.

## Figure 3.1-1 Individual Risk Thresholds by Jurisdiction




Sources: (CDE 2007, SBCO 2008, API 1995, Marszal 2001)

The upper end of the green areas represent the *de minimus*[1] risk values for each jurisdiction; IR risk levels within the green range are considered broadly acceptable. Risks within this green region are considered so low that no further consideration is warranted. In addition, risks within the green band are generally considered so low that it is unlikely that any risk reduction would be cost effective, since extraordinary measures would normally be required to further reduce the risk. As a result, a benefit – cost analysis of risk reduction is typically not undertaken.

[1] Latin term for "of minimum importance" or "trifling." Essentially it refers to something or a difference that is so little, small, minuscule, or tiny that the law does not refer to it and will not consider it. In a million dollar deal, a $10 mistake is de minimus.

The lower end of the red areas represent the *de manifestus*[2] risk values; IR risk levels within the red range are considered unacceptable and the risks are not normally justified on any grounds.

Some jurisdictions have adopted a "grey area', where the risk levels may be negotiated or otherwise considered. The United Kingdom developed the ALARP (as low as reasonably practicable) approach. This approach is depicted by the yellow areas in Figure 3.1-1. Generally, risks within the yellow area may be tolerable only if risk reduction is impractical or if its cost is grossly disproportionate to the risk improvement gained. The underlying concept is to maximize the expected utility of an investment, but not expose anyone to an excessive increase in risk.

The United States government has opposed setting tolerable risk guidelines. The 1997 final report of the Presidential/Congressional Commission on Risk Assessment and Risk Management (Commission), entitled Framework for Environmental Health Risk Management, included the following finding, "There is much controversy about bright lines, "cut points," or decision criteria used in setting and evaluating compliance with standards, tolerances, cleanup levels, or other regulatory actions. Risk managers sometimes rely on clearly demarcated bright lines, defining boundaries between unacceptable and negligible upper limits on cancer risk, to guide their decisions. Congress has occasionally sought to include specified bright lines in legislation. A strict "bright line" approach to decision making is vulnerable to misapplications since it cannot explicitly reflect uncertainty about risks, population within, variation in susceptibility, community preferences and values, or economic considerations – all of which are legitimate components of any credible risk management process." The report states further, "Furthermore, use of risk estimates with bright lines, such as one-in-a-million, and single point estimates in general, provide a misleading implication of knowledge and certainty. As a result, reliance on command-and-control regulatory programs and use of strict bright lines in risk estimates to distinguish between safe and unsafe are inconsistent with the Commission's Risk Management Framework and with the inclusion of cost, stakeholder values, and other considerations in decision-making." (Commission 1997)

[2] The Latin term "de manifestus" is often used in the ALARP (as low as reasonably practical) principle. In this context, the term defines a point where the level of risk is intolerable. Above this level, the risks cannot be justified. In Figure 3.1-1, this is the boundary between the red and yellow areas.

The United States is not alone in its opposition to establishing fixed risk thresholds. The vast majority of nations do not have government established risk tolerance criteria. In these cases, risk tolerance is left to individual owners and other decision makers.

Despite the fact that the United States does not have a bright line individual risk threshold, the country has an exemplary safety record. Many believe that this is due to two factors. First, the free market allows the application of capital where it will produce the most risk reduction benefits. And secondly, the tort system provides a mechanism to determine third party liability costs in the event of an injury or fatality. These factors generally result in sound risk reduction decisions which are normally based on a cost-benefit analysis. (Marszal 2001)

~~For individual fatality risks, the generally accepted significance criterion is an annual likelihood of one in one million (1:1,000,000) (CDE 2007, CPUC 2006).~~

### 3.1.1 California Department of Education

As stated in the California Department of Education's (CDE) Guidance Protocol for School Site Pipeline Risk Analysis, "An IR of 1.0E-06 (one chance in a million each year) has been selected based on regulatory practice for the siting of industrial facilities with hazardous chemicals in the United Kingdom and the Netherlands. In those cases, the IR concept is used as a criterion for determining whether additional mitigation is needed when government authorities are evaluating an industrial asset site. While the situation here is the reverse, siting a school campus site near an existing industrial asset, the risk principles are similar, and CDE concluded that the same criterion is appropriate. If values computed by a standard method described in the Protocol, or similar and well-documented methods, meet the specified criteria, then the proposed school campus site has met the regulatory expectations." (CDE 2007)

## 3.2 AGGREGATE RISK

Aggregate risk, or *probable loss of life* (PLL), is another risk measure used to evaluate projects. Aggregate risk is the total anticipated frequency of a particular consequence, normally fatalities, that could be anticipated over a given time period, for all project components (e.g., the entire 42.3 mile pipeline system). Aggregate risk is a type of risk integral; it is the summation of risk, as expressed by the product of the anticipated consequences and their respective likelihood. The integral is summed over all of the potential events that might occur for all of the project components, over the entire project length. There are no known codified bright line thresholds for acceptable levels of PLL or aggregate risk. The differences between aggregate risk and individual risk are summarized in the following Table. (Marszal 2001)

**Table 3.2-1 Individual Risk (IR) versus Aggregate (PLL) Risk**

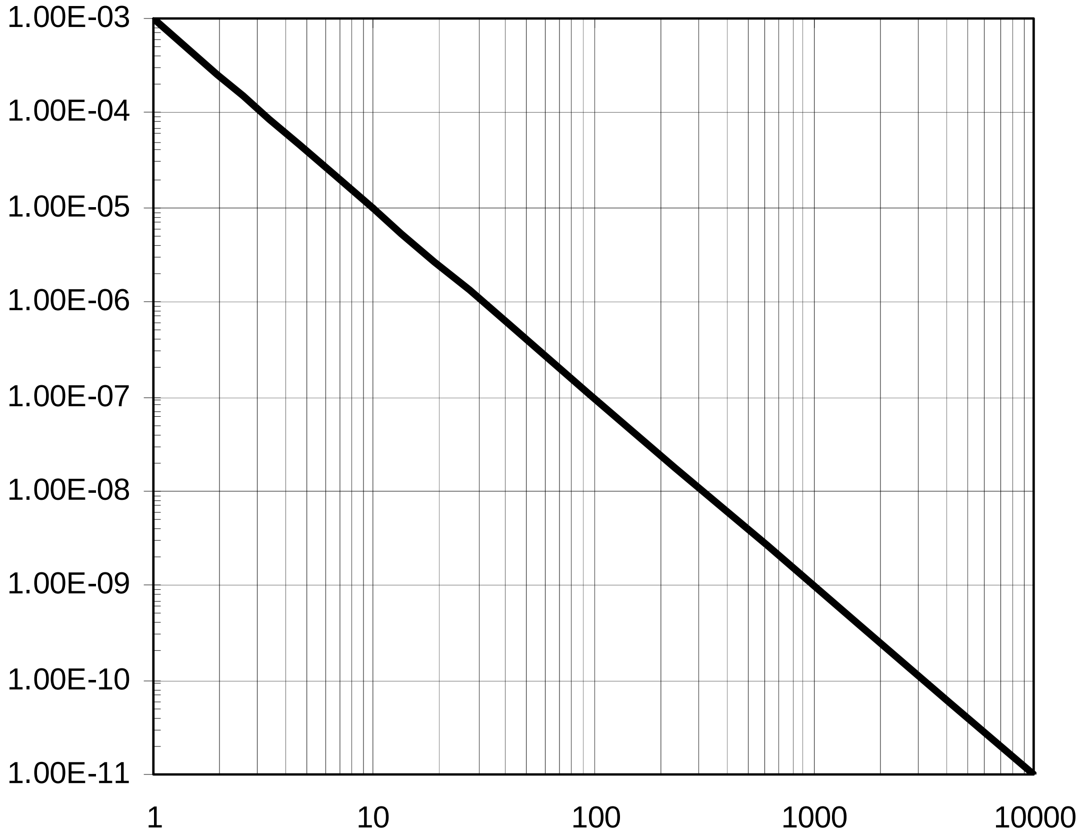
| **Item** | **Individual Risk (IR)** | **Aggregate or PLL Risk** |
|---|---|---|
| **Exposure Location** | Single Specific Location | Cumulative, Along the Length of the Entire Project |
| **Probability of Exposure** | 100%<br>24 hours per day, 365 days per year | Actual Value, Normally Less Than 100%<br>Based on Realistic Probability of Exposure to Specific Hazard |
| **Significance Threshold** | 1 : 1,000,000<br>Some Jurisdictions Only<br>No Established Threshold in U.S. or California | No Known Established or Codified Threshold |

(Marzal 2001)

## ~~3.2~~3.3 SOCIETAL RISK

Societal risk is the probability that a specified number of people will be affected by a given event. The accepted number of casualties is relatively high for lower probability events and much lower for more probable events. However, the acceptable values for societal risk vary greatly, depending on the responsible agency or jurisdiction. Unfortunately, there are no prescribed societal risk guidelines for the United States, nor the State of California. The United Kingdom, considers those events which result in 100 fatalities, with an annual probability of $1.0 \times 10^{-5}$ (1:100,000) or less. The Committee for the Prevention of Disasters~~,~~ uses the criteria as shown in Figure 3.3~~2~~-1 below. This data is the same as the criteria used in the Netherlands~~ and is the most conservative of the published data for Western Europe~~. These criteria have been used to evaluate societal risk in this Appendix~~document~~.

**Figure 3.3~~2~~-1: Societal Risk Criteria**




Source: Committee for the Prevention of Disasters, The Hague

### 3.3.1 California Department of Education

Earlier draft versions of the CDE's Guidance Protocol for School Site Pipeline Risk Analysis (Protocol) included societal risk criteria which were based on the thresholds established by Santa Barbara County. However, the current Protocol uses a simplified approach for evaluating the risk to the student population. As stated in the Protocol, "In addition to IR, some measure of potential impacts based on the population potentially at risk for the school campus site is required. This additional information aids the LEA in their site evaluation. CDE has adopted a simplified approach to evaluating impacts for the campus site in terms of two calculated parameters. The first is the ratio of an average IR across the depth of campus site to the IR at the front property line (or boundary between the usable and unusable portion of the site when the unusable portion faces the pipeline). The second is a site population risk indicator parameter." (CDE 2007)

A complete discussion of these two population risk parameters is beyond the scope of this document. The concepts are described in the cited reference; examples are also provided.

# 4.0 IMPACT ANALYSIS AND MITIGATION

## 4.1 POTENTIAL IMPACTS

The proposed Project could pose additional risks to the public. 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, resulting in possible injuries and/or deaths.

**Impact HAZ-1: Injuries or Fatalities**

**An unintentional release from the proposed Project could result in injuries and/or deaths. (Adverse impact that does not meet or exceed the significance criteria. ~~Significant and Unavoidable,~~ Class III~~I~~).**

### 4.1.1 Fire Impact Discussion

**~~Fire~~**

The physiological effect of fire to humans depends on the rate at which heat is transferred from the fire to the person, and the time the person is exposed to the fire. Skin that is in contact with flames can be seriously injured, even if the duration of the exposure is just a few seconds. Thus, a person wearing normal clothing is likely to receive serious burns to unprotected areas of the skin when directly exposed to the flames from a flash fire (vapor cloud fire).

Humans in the vicinity of a fire, but not in contact with the flames, would receive heat from the fire in the form of thermal radiation. Radiant heat flux decreases with increasing distance from a fire. So those close to the fire would receive thermal radiation at a higher rate than those farther away. The ability of a fire to cause skin burns due to radiant heating depends on the radiant heat flux to which the skin is exposed and the duration of the exposure. As a result, short-term exposure to high radiant heat flux levels can be injurious. But if an individual is far enough from the fire, the radiant heat flux would be lower, likely incapable of causing injury, regardless of the duration of the exposure.

An incident heat flux level of 1,600 Btu/hour-square foot (btu/$ft^2$-hr) is considered by many to be potentially hazardous for people located outdoors and unprotected.

Generally, humans located beyond this heat flux level would not be at risk to injury from thermal radiation resulting from a fire. The radiant heat flux effects to humans are summarized below. The first three endpoints have been used to evaluate the risk of public fatalities from the proposed project.~~:~~

- 12,000 btu/ft$^2$-hr (37.7 kW/m$^2$) – 100% mortality after 30 second exposure (CDE 2007).
- 8,000 btu/ft$^2$-hr (25.1 kW/m$^2$) – 50% mortality after 30 second exposure (CDE 2007).
- 5,000 btu/ft$^2$-hr (15.7 kW/m$^2$) – 1% mortality after 30 second exposure (CDE 2007). In many instances, an able bodied person would increase the separation distance or seek cover during this 30 second period.
- 3,500 btu/ft$^2$-hr (11.0 kW/m$^2$) - Second degree skin burns after ten seconds of exposure, 15% probability of fatality. This assumes that an individual is unprotected or unable to find shelter soon enough to avoid excessive exposure (Quest 2003). Other data sources indicate that a 45 second exposure would result in a 1% chance of mortality (Hynes 1983).
- 1,600 btu/ft$^2$-hr (5.0 kW/m$^2$) - Second degree skin burns after thirty seconds of exposure.
- 440 btu/ft$^2$-hr (1.4 kW/m$^2$) - Prolonged skin exposure causes no detrimental effect (CDE 2007, Quest 2003).

### 4.1.2 Explosion Impact Discussion

As noted earlier, natural gas does not explode unless it is confined sufficiently within a specific range of mixtures with air and is ignited. However, if an explosion does occur, the physiological effects of overpressures depend on the peak overpressure that reaches a person. Exposure to overpressure levels can be fatal. People located outside the flammable cloud when a combustible mixture ignites would be exposed to lower overpressure levels than those inside the flammable cloud. If a person is far enough from the source of overpressure, the explosion overpressure level would be incapable of causing injuries. The generally accepted hazard level for those inside buildings exposed to an explosion is an overpressure of 1.0 psig. This level of overpressure can result in injuries to humans inside buildings, primarily from flying glass and debris. The consequences of various levels of overpressure are outlined in the table below.

**Table 4.1.2~~1~~-1 Explosion Over-Pressure Damage Thresholds**

| Side-On Over-Pressure | Damage Description |
|---|---|
| 0.02 psig | Annoying Noise |
| 0.03 psig | Occasional Breaking of Large Window Panes Under Strain |
| 0.04 psig | Loud Noise; Sonic Boom Glass Failure |
| 0.10 psig | Breakage of Small Windows Under Strain |
| 0.20 psig | Glass Breakage - No Injury to Building Occupants |
| 0.30 psig | Some Damage to House Ceilings, 10% Window Glass Broken |
| 0.50 to 1.00 psig | Large and Small Windows Usually Shattered, Occasional Damage to Window Frames |
| 0.70 psig | Minor Damage to House Structures, Injury, but Very Unlikely to Be Serious |
| 1.00 psig | 1% Probability of a Serious Injury or Fatality for Occupants in a Reinforced Concrete or Reinforced Masonry Building from Flying Glass and Debris<br>10% Probability of a Serious Injury or Fatality for Occupants in a Simple Frame, Unreinforced Building |
| ~~2.30 psig~~ | ~~0% Mortality to Persons Inside Buildings or Persons Outdoors (CDE 2007)~~ |
| ~~3.10 psig~~ | ~~10% Mortality to Persons Inside Buildings (CDE 2007)~~ |
| ~~3.20 psig~~ | ~~<10% Mortality to Persons Outdoors (CDE 2007)~~ |
| 14.5 psig | 1% Mortality to Those Outdoors (LEES) |

Sources: LEES, CDE 2007, Quest 2003

For outdoor explosions, the following endpoints have been used to evaluate potential explosion impacts to the public from the proposed project.

**Table 4.1.2-2 Explosion Overpressure Levels**

| Mortality Rate | Outdoor Exposure (psig) | Indoor Exposure (psig) |
|---|---|---|
| **99% Mortality** | 29 | 13 |
| **50% Mortality** | 13 | 5.7 |
| **1% Mortality** | 2.3 | 2.3 |

(CDE 2007)

## ~~4.1.2~~4.2 BASELINE DATA

In the following paragraphs, the anticipated frequency of unintentional releases and impacts to humans will be estimated using data from the following sources:

- United States Natural Gas Transmission and Gathering Lines (U.S. Department of Transportation [USDOT]) – 1970 through 2007.
- United States Interstate Hazardous Liquid Pipelines (USDOT) - 1984 through 1998.
- California Regulated Interstate and Intrastate Hazardous Liquid Pipelines (Payne, 1993) - 1981 through 1990.

Each of these data sets provides pipeline incident data for reportable incidents. However, the criteria for reporting incidents differ for each source. This makes direct comparison of the individual results difficult. On the other hand, it provides a methodology for estimating incident rates for a variety of consequences.

### 4.2.1 U.S. Natural Gas Transmission Lines - 1970 to June 1984

Since the USDOT natural gas pipeline reporting criteria changed in June 1984, the incident reports beginning in July 1984 have been summarized separately, in the next section of this document. The criteria for natural gas releases to be reported to the USDOT from 1970 through June 1984 were as follows:

- Resulted in a death or injury requiring hospitalization;
- Required the removal from service of any segment of a transmission pipeline;
- Resulted in gas ignition;
- Caused an estimated damage to the property owner, or of others, or both, of $5,000 or more;
- Involved a leak requiring immediate repair;
- Involved a test failure that occurred while testing either with gas or another test medium; or
- In the judgment of the operator, was significant even though it did not meet any of the above criteria.

The frequencies of the various consequences reported during this period are summarized below.

- Reportable Unintentional Releases - 1.3 incidents per 1,000 mile-years.

- Reportable Injuries - 0.096 injuries per 1,000 mile-years (0.007 public injuries per 1,000 mile-years).
- Fatalities - 0.016 fatalities per 1,000 mile-years (0.008 public fatalities per 1,000 mile-years).

It should be noted that during this 14½-year period, 36 (50%) of the total 72 fatalities and 161 (59%) of the total 274 of those injured were employees of the operating company.

### 4.2.2 U.S. Natural Gas Transmission Lines - July 1984 through 2007

In June 1984, the USDOT changed the criteria for reporting natural gas releases. The most significant change was that in general, leaks causing less than $50,000 property damage no longer required reporting to the USDOT. The criteria for natural gas releases to be reported to the USDOT from July 1984 through the present include:

- Events which involved a release of gas from a pipeline, or of liquefied natural gas (LNG) or gas from an LNG facility, which caused: (a) a fatality, or personal injury necessitating inpatient hospitalization; or (b) estimated property damage, including costs of gas lost by the operator, or others, or both, of $50,000 or more.
- An event which resulted in an emergency shut-down of an LNG facility.
- An event that was significant, in the judgment of the operator, even though it did not meet the criteria above.

Since the reporting threshold is now significantly greater than the prior $5,000 reporting criteria, a significant decrease in the resulting reportable incident rate resulted. However, the frequency of reportable injuries and fatalities also decreased, indicating improvements in pipeline safety.

The USDOT also filters the reported incidents and provides reports for "significant" pipeline incidents. These incidents include those which result in:

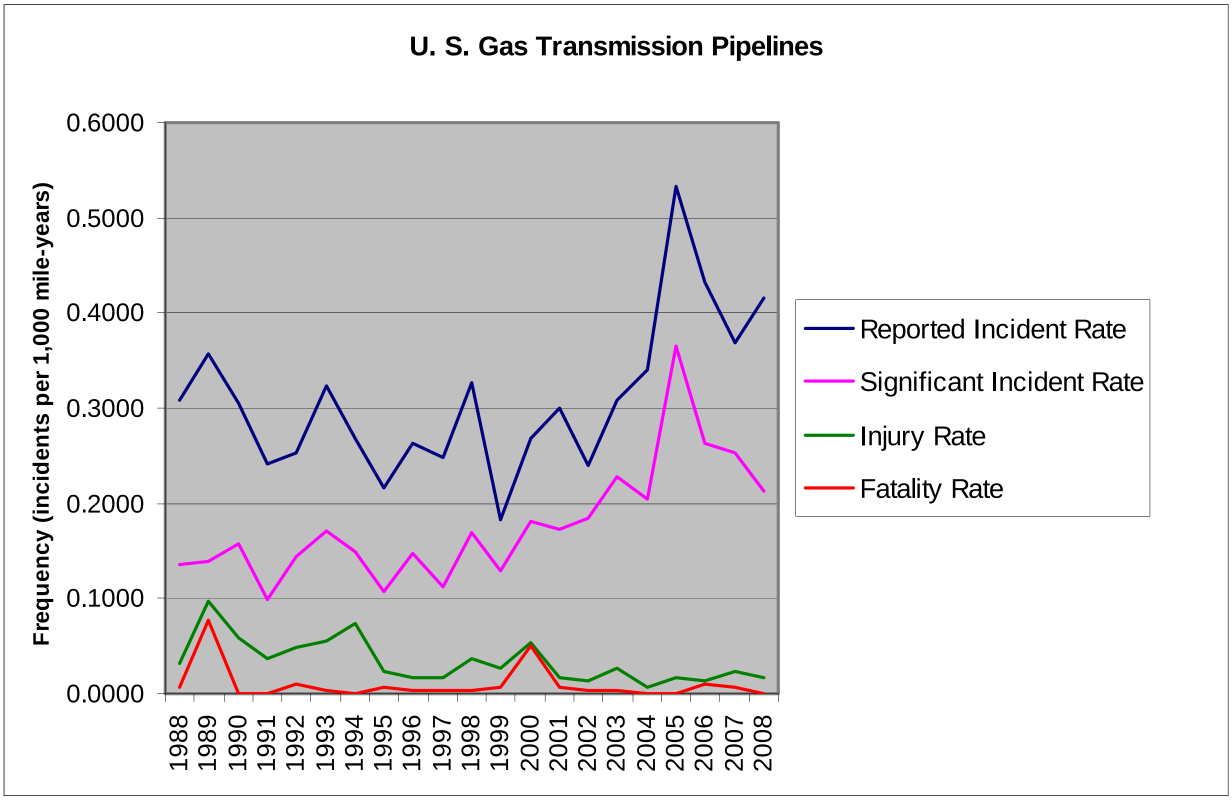
- Fatality or injury requiring in-patient hospitalization,
- $50,000 or more in total costs (measured in 1984 dollars),
- Highly volatile liquid releases of 5 barrels or more or other liquid releases of 50 barrels or more, or
- Liquid releases resulting in an unintentional fire or explosion.

These data are summarized below for the 21~~2~~-year period from January 1, 1988~~6~~ through December 31, 2008~~7.~~ for gas transmission pipelines (including both onshore and offshore segments, but excluding gathering lines).

- Reportable Unintentional Releases - 0.31 incidents per 1,000 mile-years
- Significant Incidents – 0.18 incidents per 1,000 mile-years
- Reportable Injuries - 0.034~~040~~ injuries per 1,000 mile-years
- Fatalities - 0.010 fatalities per 1,000 mile-years

In 2002, the USDOT changed their reporting forms. At this time, operators were required to begin reporting additional data for each reportable release. These changes were significant. Some of the additional reporting fields included the reporting of fires and explosions, which were not required to be identified previously.

For the most recent seven~~six~~ year period, since the change in the USDOT reporting form (January 2002 through December 2008~~7~~), there were a total of 795~~761~~ reported incidents from natural gas transmission pipelines included in the database, including 516 “significant” incidents, 35 reported injuries, and 7 fatalities. The average reported property damage from the 516 “significant” releases was over $1,200,000~~was nearly $820,000~~ per incident. (However, the actual value is likely higher, due to the lag in the settlement of law suits, extended duration of some clean-up and repair efforts, etc. As noted earlier, the actual cost to the operator can be significantly higher than that initially reported to the USDOT.) _The average annual transmission pipeline mileage was 301,625~~373~~ miles for this seven~~six~~ year period. Using these data, the frequency of reportable incidents during this most recent seven~~six~~ year period was up nearly 70~~over 50~~% when compared to the 14~~22~~-year period presented above - 0.38~~42~~ incidents per 1,000 mile-years for 2002 through 2008~~7~~ versus 0.28~~7~~ incidents per 1,000 mile-years for 1988~~6~~ through 2001~~2~~. The frequency of “significant” incidents increased similarly, from 0.14 (1988 through 2001) to 0.24 (2002 through 2008). The injury and fatality rates for the most recent seven~~six~~ year period were 0.017~~9~~ and 0.0033~~4~~ incidents per 1,000 mile-years respectively, down significantly. These data are summarized in the following figure by year.




Source: USDOT, Incident Summary Statistics by Year and Natural Gas Transmission Pipeline Annual Mileage

**Figure 4.2~~1~~.2-1 U.S. ~~Natural~~ Gas Onshore and Offshore Transmission Pipeline Incident Rate History[3]**

It should be noted that the above data, as included on the USDOT Incident Summary Statistics by Year, includes 92 incidents which occurred on lines identified as "Gathering" in the USDOT gas transmission incident database (USDOT). An audit of the USDOT database is beyond the scope of this work. As a result, the reason that these data have been included in the USDOT incident database~~summary statistics~~ is unknown. There are several possible reasons. The operator may have indicated the classification of the line as "Gathering" in error. The USDOT may have inadvertently included the incident data in the wrong database~~report~~.

[3] This figure depicts the data included in the raw USDOT gas transmission pipeline database. The raw database includes incidents which were identified as having occurred on "gathering" lines.

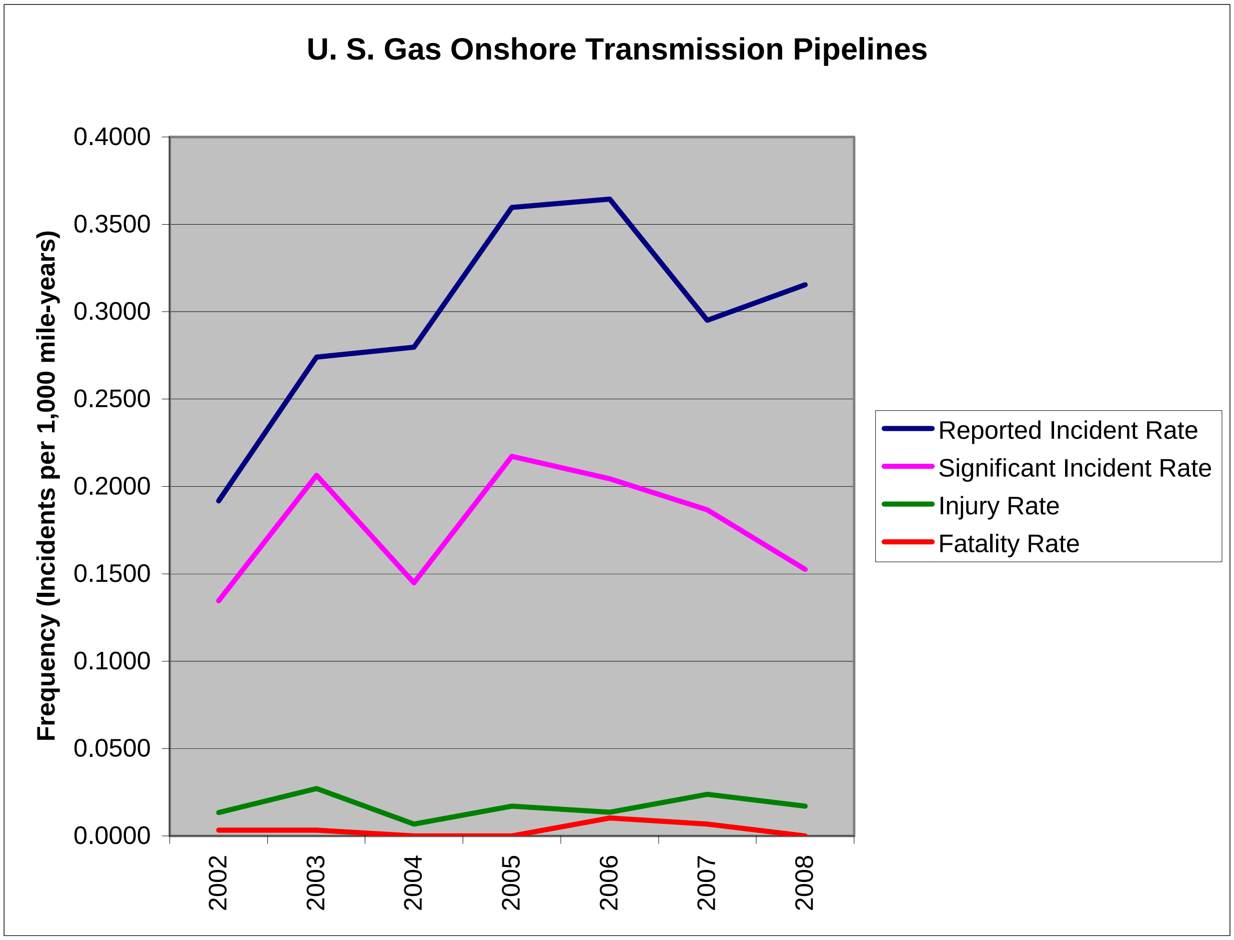
The database also includes incidents which occurred on offshore segments of pipelines. However, making the maximum correction for these incidents does not significantly affect the results. The 2002 through 2008~~7~~ data would be affected as follows, if the ~~92~~ incidents which occurred on lines identified as "Gathering" and those which occurred on "offshore" segments were deleted:

- Reportable Unintentional Releases – This figure would be reduced from 0.38~~42~~ to 0.29~~37~~ incidents per 1,000 mile-years
- Significant Incidents – This figure would be reduced from 0.24 to 0.18 incidents per 1,000 mile-years
- Reportable Injuries - This figure would remain unchanged at ~~be reduced from 0.019 to~~ 0.017 injuries per 1,000 mile-years
- Fatalities – This figure would increase slightly from 0.0033 to 0.0034~~be unchanged at 0.004~~ fatalities per 1,000 mile-years

~~The database also includes incidents which occurred on offshore segments of pipeline. During the six year period between January 2002 and December 2007, there were 216 such incidents. 67 of these occurred on lines identified as "Gathering", while 149 occurred on segments identified as "Transmission". If these offshore releases are also removed from the database, and the mileage is adjusted to only include the onshore mileage, the following incident rates result:~~

- ~~Reportable Unintentional Releases – 0.29 incidents per 1,000 mile-years~~
- ~~Reportable Injuries - 0.017 injuries per 1,000 mile-years~~
- ~~Fatalities – 0.004 fatalities per 1,000 mile-years~~
- ~~Average Property Damage - $520,000~~

The data for onshore gas transmission pipelines only are presented in the following figure.




Source: USDOT

**Figure 4.2.2-2 U.S. ~~Natural~~ Gas Onshore Transmission Pipeline Incident Rate History**

### 4.2.3 U.S. Hazardous Liquid Pipelines - 1984 through 1998

The criteria for hazardous liquid pipeline incidents to be reported to the USDOT for inclusion in this data set were as follows:

- Explosion or fire not intentionally set by the operator;
- Loss of more than 50 barrels (2,100 gallons) of liquid or carbon dioxide;
- Escape to the atmosphere of more than five barrels per day of highly volatile liquid;
- Death of any person;

- Bodily harm to any person resulting in loss of consciousness, necessity to carry the person from the scene, or disability which prevents the discharge of normal duties or the pursuit of normal activities beyond the day of the accident; and/or
- Estimated property damage to the property of the operator, or others, or both, exceeding $5,000, prior to June 1994. After June 1994, this criteria was changed to $50,000, including the cost of clean-up, recovery, and the value of any lost product.

The data for this period are summarized below:

- Reportable Unintentional Releases - 1.29 incidents per 1,000 mile-years
- Reportable Injuries - 0.076 injuries per 1,000 mile-years
- Fatalities - 0.015 fatalities per 1,000 mile-years

It should be noted that the 1994 Annual Report on Pipeline Safety excluded 1,851 individuals who were injured with minor burns and vapor inhalation from the failure and ignition of seven hazardous liquid pipelines during the San Jacinto River floods in mid-October, 1994, near Houston, Texas. These incidents were caused by severe flooding in the area. These injuries are not included in the injury rate shown above.

It is interesting to note that the incident rate for hazardous liquid pipeline releases (prior to 1994) was essentially the same as those for reportable U.S. natural gas transmission and gathering lines from 1970 through June 1984, which had a similar $5,000 property damage reporting requirement.

### 4.2.4 Regulated California Hazardous Liquid Pipelines - 1981 through 1990

This study, undertaken by the California State Fire Marshal, Pipeline Safety Division, included all regulated California interstate and intrastate hazardous liquid pipelines (Payne 1993). It included approximately 7,800 miles of pipeline data, over a ten year period (1981 through 1990). The systems included in this study had complete release records. The major difference for this study, as compared to ones discussed previously, is that all releases, regardless of size, cause, extent of property damage, or extent of injury were included in the study. Also, a complete audit of the pipeline inventory and release data was conducted. As a result, the incident rates resulting from this study were higher than presented in other studies, which only included reported releases fitting a relatively narrow set of criteria. A summary of these results is included below.

- Unintentional Releases - 7.08 incidents per 1,000 mile-years
- Injuries - 0.685 injuries per 1,000 mile-years

- Fatalities - 0.042 fatalities per 1,000 mile-years

### 4.2.5 Summary of Historical Pipeline Consequence Data

In the following table, the available pipeline release data have been summarized.

**Table 4.2.5~~1.2~~-1 Pipeline Release Consequences by Data Source**

| **Consequence** | **U.S. ~~Natural~~ Gas Transmission 1970 to June 1984** | **U.S. ~~Natural~~ Gas Transmission 1988 thru 2008 ~~July 1984 thru 2007~~** ~~(As Reported by USDOT)~~ | **U.S. ~~Natural~~ Gas Onshore Transmission 2002 thru 2008~~7~~** | **U.S. Hazardous Liquid - 1984 thru 1998** | **California Hazardous Liquid - 1981 thru 1990** |
|---|---|---|---|---|---|
| | Incidents per 1,000 mile-years | | | | |
| Reportable Incidents | 1.30<br>($5,000 criteria) | 0.31<br>($50,000 criteria) | 0.29~~29~~<br>($50,000 criteria) | 1.29<br>($5,000 criteria) | 7.08<br>(all incidents, regardless of size and value of property damage) |
| Significant Incidents | N/A | 0.18 | 0.18 | N/A | N/A |
| Injuries regardless of severity | N/A | N/A | N/A | N/A | 0.685 |
| Injury requiring hospitalization | 0.096 | 0.034~~0.040~~ | 0.017 | N/A | N/A |
| Injuries requiring hospitalization, causing loss of consciousness, or preventing discharge of normal duties day following the incident | N/A | N/A | N/A | 0.076 | N/A |
| Fatalities | 0.016 | 0.010 | 0.0034~~004~~ | 0.015 | 0.042 |

## 4.3 BASELINE INCIDENT FREQUENCY~~CONSEQUENCE DATA ~~USED IN ANALYSIS

The USDOT database of natural gas transmission pipeline releases from January 2002 through December 2008~~7~~ has been analyzed. These data will be used to develop the baseline frequency of unintentional releases from the proposed facilities. After deleting all releases noted from "Gathering" lines and "Offshore" lines, there were 614~~520~~ releases remaining from onshore transmission pipelines. Of these, the two major causes of releases were excavation damage and external corrosion. 131~~113~~ (21~~22~~%) of the releases were caused by excavation damage from a third party and the pipeline operator. 83~~71~~ (14%) of the releases were caused by external corrosion. The remaining 400~~336~~ (65~~64~~%) of the releases were caused by a variety of factors, listed in descending order of frequency:

- miscellaneous or unknown – 12%
- malfunction of control or relief equipment – 8~~7~~%
- vehicles not related to excavation – 6%
- internal corrosion – 5%
- butt weld failure – 4~~5~~%
- rain and flooding – 4%
- body of pipe failure – 4%
- incorrect operation – 3%
- pipe weld seam failure – 3%
- ~~earth movement – 2%~~
- component failure – 3~~2~~%
- earth movement – 2%
- joint failure – 2%
- threaded fitting or coupling failure – 2%
- lightning – 1%
- fire and explosions – 1%
- fillet weld failure – 1%
- temperature - <1%
- wind - <1%

- rupture of previously damaged pipe - <1%
- vandalism - <1%

### 4.3.1 Third Party Damage Incident Rate

As noted above, third party damage caused 21~~22~~% of the accidental pipeline releases. The Applicant will be required to implement the following ~~mitigation~~ measures to reduce the frequency of third party caused releases in accordance with applicable laws, ordinances, regulations and standards (LORS):

- One-Call System – The Applicant will subscribe to the USA North underground service alert "one-call" system. A toll free number is available for contractors and others to use before they begin excavations. Once a contractor calls and identifies its proposed excavation location, the organization will notify the Applicant and other underground facility owners in the vicinity. The owners respond to these calls with personal communications with the excavator. If their facilities are nearby, they mark the location of their facilities on the ground, so third party intrusions can be avoided. Participation in a one-call system if required as part of an operator's damage prevention program, per 49 CFR 192.614.
- Line Marking – The Applicant is required by federal regulation (49 CFR 192.707) to install line marker posts such that the pipeline is readily identifiable. In addition, they are required to have warning signs installed at each side of road, railroad, and waterway crossings, and at fence lines across open or agricultural property, crossings of other lines (e.g., irrigation, oil, gas, telephone, utilities) where practical, and where the line is above ground in areas accessible to the public.
- Right-of-Way Patrolling - 49 CFR 192.705 requires each operator to have a patrol program to monitor for indications of leaks, nearby construction activity, and any other factors that could affect safety and operation. The frequency of these inspections is based on a number of factors. For the proposed line, in class 1 and 2 area classifications these patrols must be conducted at least twice each calendar year for road crossings and once each calendar year in other locations; in class 3 locations these patrols must be conducted at least four times each calendar year for road crossings and at least twice each calendar year in other locations
- Leakage Surveys – A leakage survey must be conducted at least once each calendar year for class 1 and 2 locations and at least twice per year for class 3 locations.
- Public Education - 49 CFR 192.616 requires pipeline operators to develop and implement a written continuing public education program that follows the guidance provided in the American Petroleum Institute's (API's) Recommended

Practice 1162 Public Awareness Programs for Pipeline Operators as their public education procedure.

The California study found that the overall frequency of third party damage caused unintentional releases was 1.46 unintentional releases per 1,000 mile-years. For pipelines constructed in the 1950's, the frequency was only 0.88 unintentional releases per 1,000 mile-years; it was even lower for newer lines. These lower values were primarily due to the increased awareness of the threat from third party damage to pipeline facilities; newer lines have benefited from improved line marking, one-call dig alert systems, avoidance of high risk areas, improved documentation, increased depth of cover, and public awareness programs. (Payne 1993)

The Applicant's proposed mitigation to increase the depth of cover to a minimum of five -feet will provide increased protection from third party damage. A European Study found that increasing the pipe depth of cover beyond four feet decreased the risk of third party incidents by about 30% versus the depth of cover required by the 49 CFR 192. (HSE 2001)

Using these data and the baseline frequency of 0.29 reportable unintentional releases per 1,000 mile-years from the U. S. natural gas onshore transmission pipelines (2002 through 2007), the anticipated frequency of third party damage caused USDOT reportable releases is 0.043~~5~~ incidents per 1.000 mile-years (0.29 per 1,000 mile-years baseline x 21~~22~~% caused by third party damage x 70% = 0.043~~5~~ incidents per 1,000 mile-years).

### 4.3.2 External Corrosion Incident Rate

External corrosion of a buried pipe is an electro-chemical reaction, which can occur when bare (un-coated) steel is in contact with the earth. The moist soil surrounding a pipeline can serve as an electrolyte. When this occurs, the pipe can become an anode. The current then flows through the electrolyte, from the anode (pipe) to the cathode (soil). In this instance, the anode (pipe) loses material (corrodes) as this process occurs.

The intent of an effective external corrosion prevention program is twofold. First, the pipe is protected from corrosion by insulating it from contact with the electrolyte (moist soil) using an external coating. Second, in the event that the coating should fail, the pipe is prevented from becoming the anode by introducing some other material into the electrochemical chain that is more anodic than the pipe, or appears to be because of an impressed current. An impressed current or sacrificial anode cathodic protection system makes the current flow through the soil, toward the pipe, instead of away from it; thus, external corrosion is eliminated.

An impressed current system takes alternating current electrical power from a utility source or solar panels. A transformer is used to reduce the voltage. A rectifier then converts the alternating current to a direct current. The direct current flows to and through anodes (graphite, steel, or other material) and into the surrounding earth. At locations where there may be a break in the external pipe coating (holiday), the current will reach the pipeline. It will then flow along the line to the rectifier, completing the circuit, preventing external corrosion at the external pipe coating holiday.

External corrosion typically causes a relatively large percentage of unintentional releases. Often, these releases are relatively small in volume, with low release rates. However, they often can go unnoticed for long periods of time.

The California study found that the frequency of unintentional releases (of all volumes) caused by external corrosion varied significantly by decade of pipe construction and pipeline operating temperature.

During the 1940's and 1950's, significant improvements were made in pipeline construction techniques and materials. Relative to external corrosion, the primary improvements included advances in external coatings and more widespread use of these coatings and cathodic protection systems. These items account for the significant reduction in external corrosion incident rates for modern pipelines, versus pipelines constructed prior to the 1940's. For newer pipelines, it is impossible to isolate the individual affects of pipe age and other improvements (e.g. technology, construction techniques, the more widespread use of high quality external coatings and cathodic protection systems). The table below presents the California data by decade of pipeline construction by incident cause.

**Table 4.3~~1~~.2-1~~2~~ Incident Rates by Decade of Construction**

| Incident Cause | Pre-1940 | 1940-49 | 1950-59 | 1960-69 | 1970-79 | 1980-89 |
|---|---|---|---|---|---|---|
| External Corrosion | 14.12 | 4.24 | 2.47 | 1.47 | 1.24 | 0.00 |
| Internal Corrosion | 0.38 | 0.27 | 0.10 | 0.16 | 0.00 | 0.28 |
| 3rd Party - Construction | 1.96 | 1.06 | 0.68 | 0.66 | 0.25 | 0.28 |
| 3rd Party - Farm Equipment | 0.53 | 1.33 | 0.05 | 0.00 | 0.00 | 0.00 |
| 3rd Party - Train Derailment | 0.00 | 0.00 | 0.00 | 0.05 | 0.25 | 0.00 |
| 3rd Party - External Corrosion | 0.45 | 0.00 | 0.10 | 0.33 | 0.00 | 0.00 |
| 3rd Party - Other | 0.30 | 0.13 | 0.05 | 0.05 | 0.00 | 0.00 |
| Human Operating Error | 0.30 | 0.13 | 0.00 | 0.11 | 0.25 | 0.00 |
| Design Flaw | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.14 |
| Equipment Malfunction | 0.38 | 0.53 | 0.10 | 0.60 | 1.24 | 0.00 |
| Maintenance | 0.00 | 0.00 | 0.24 | 0.00 | 0.00 | 0.00 |
| Weld Failure | 0.38 | 0.27 | 0.15 | 0.44 | 0.25 | 0.00 |
| Other | 0.83 | 0.13 | 0.24 | 0.27 | 0.25 | 0.28 |
| Total | 19.71 | 8.09 | 4.18 | 4.14 | 3.73 | 0.98 |

Source: Payne, 1993

The statistical analyses performed in the California study indicated that operating temperature directly affected the frequency of unintentional releases caused by external corrosion. Considering all pipelines, regardless of decade of construction, those that were operated near ambient temperatures had an external corrosion caused incident rate of 1.33 unintentional releases per 1,000 mile-years. The incident rate rose dramatically as the operating temperature was increased.

The proposed pipeline segment will be operated at ambient temperatures. The table below indicates that the external corrosion incident rates for the California lines operated at various temperatures ranged from 0.48 to 11.36 unintentional releases per 1,000 mile-years. However, the lines operated between 130°F and 159°F had a 1947 mean year of pipeline construction; as discussed earlier, pipe age also significantly affected the incident rate. This effect is also reflected in these data.

**Table 4.3~~1~~.2-2~~3~~ Incident Rates by Design Operating Temperature**

| Incident Cause | 0-69°F | 70-99°F | 100-129°F | 130-159°F | 160°F+ |
|---|---|---|---|---|---|
| External Corrosion | 0.48 | 1.33 | 7.11 | 11.36 | 11.31 |
| Internal Corrosion | 0.00 | 0.21 | 0.32 | 0.57 | 0.08 |
| 3rd Party - Construction | 1.91 | 0.94 | 0.95 | 0.57 | 0.60 |
| 3rd Party - Farm Equipment | 0.00 | 0.30 | 0.47 | 0.00 | 0.08 |
| 3rd Party - Train Derailment | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 |
| 3rd Party - External Corrosion | 0.00 | 0.06 | 0.16 | 0.00 | 0.15 |
| 3rd Party - Other | 0.00 | 0.24 | 0.16 | 0.00 | 0.15 |
| Human Operating Error | 0.00 | 0.11 | 0.00 | 0.00 | 0.23 |
| Design Flaw | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 |
| Equipment Malfunction | 0.00 | 0.24 | 0.16 | 0.57 | 0.98 |
| Maintenance | 0.00 | 0.09 | 0.16 | 0.00 | 0.00 |
| Weld Failure | 0.00 | 0.19 | 0.32 | 0.00 | 0.60 |
| Other | 0.00 | 0.21 | 1.11 | 1.14 | 0.45 |
| Total | 2.39 | 4.00 | 10.92 | 14.21 | 14.63 |

Source: Payne, 1993

To reduce the likelihood of releases caused by external corrosion, the following measures would be implemented by the Applicant in compliance with applicable LORS:

- Modern External Pipe Coating - The proposed pipeline segments will be externally coated with 14 mils of fusion bonded epoxy (FBE). In addition, pipe that will be installed using the horizontal directional drilling (HDD) or hammer bore technique, will have an additional outer abrasion resistant top coating (e.g., 3M 6352, DuPont NapRock, or Powercrete®).
- Impressed Current Protection System - The proposed pipeline will be protected from external corrosion by an impressed current cathodic protection system.
- Monitoring - At least once each calendar year, at intervals not exceeding 15 months, the Applicant will be required to test their cathodic protection system in accordance with 49 CFR 192.465.
- Visual Inspections - Each time buried pipe is exposed for any reason, the Applicant will be required to examine the pipe for evidence of external corrosion in accordance with 49 CFR 192.459. If active corrosion is found, the operator is required to investigate and determine the extent. Pipeline operators are required to maintain records of these USDOT required inspections. They are routinely reviewed by USDOT staff during their inspections.

Using the data presented in the Tables above, an opinion of the anticipated frequency of USDOT reportable unintentional releases due to external corrosion from the proposed pipe segments has been developed. These segments will normally be operated at ambient temperatures, using externally coated pipe, with an impressed current cathodic protection system. The anticipated frequency of third party damage caused USDOT reportable releases is 0.027 incidents per 1.000 mile-years (0.29 per 1,000 mile-years baseline x 14% caused by third party damage x 2/3% = 0.027 incidents per 1,000 mile-years). This frequency is intended to reflect the average value over a 40-year project life. During the early years of operation, the frequency of externally corrosion caused incidents will likely approach zero. It should also be noted that the statistical impact of the new USDOT pipeline integrity regulations are unknown at this time. But they will likely reduce the frequency of releases from the proposed pipeline components located within an HCA which will be included in a Pipeline Integrity Management Plan.

### 4.3.3 Miscellaneous Causes Incident Rate

As noted above, the remaining 65~~4~~% of the incidents not caused by third party damage or external corrosion are caused by a number of factors. Since each of these causes is a relatively small percentage of the total, adjustments were not made to these frequencies individually. A one-third reduction has been made to account for the remaining Applicant proposed mitigation measures and the fact that these facilities will be modern, new systems. A larger adjustment could have been made. However, the resulting frequency is intended to reflect the average value over a 40-year project life. The anticipated frequency of non-third party damage or external corrosion caused USDOT reportable releases is 0.126~~24~~ incidents per 1.000 mile-years (0.29 per 1,000 mile-years baseline x 65~~4~~% x 2/3 = 0.126~~24~~ incidents per 1,000 mile-years).

### 4.3.4 Overall Pipeline Facility Incident Rate

The anticipated frequency of USDOT reportable releases from the proposed facilities is 0.196 incidents per 1.000 mile-years (0.043~~5~~ from third party damage, 0.027 from external corrosion, and 0.126~~4~~ from other causes).

## ~~4.1.3~~4.4 QUALITATIVE AGGREGATE RISK ASSESSMENT

In this section, the anticipated frequency of unintentional releases, injuries and fatalities will be developed using the historical baseline data presented above for the following project components:

- 14-mile long, 30-inch diameter Line 406, including the regulating and metering facilities at Capay Station and Yolo Junction;
- 13.5-mile long, 30-inch diameter Line 407W, including the Power Line Road main line vale site;
- 12-mile long, 30-inch diameter Line 407E, including the Baseline/Brewer main line valve and the Baseline Road Pressure Regulating Station; and the
- 2.5–mile long, 10-inch diameter, DFM, including the Power Line Road regulating station.

### 4.4.1 Anticipated Frequency of Unintentional Releases

Using the baseline data compiled in the previous section, the anticipated frequencies of unintentional releases have been estimated. These data, for the proposed pipeline segments, are shown in Table 4.1.3-1 below. These data also include anticipated releases from the meter stations and other appurtenances, which are also under USDOT jurisdiction and are subject to the pipeline incident reporting requirements. As a result, releases from these facilities have been included in the previously presented baseline data.

**Table 4.4.1~~1.3~~-1 Anticipated Frequency of Unintentional Releases**

| Incident Cause | Incident Rate | Anticipated Number of Incidents Per Year | Likelihood of Annual Occurrence |
|---|---|---|---|
| Total, All Releases, Regardless of Spill Volume | 3.00 per 1,000 mile-years | 0.126 | 1 in 7.9 |
| USDOT Reportable Gas Releases - 1970 thru June 1984 criteria (>$5,000 damage) | 1.30 per 1,000 mile-years | 0.055 | 1 in 18 |
| USDOT Reportable Gas Releases - Current Criteria (>$50,000 damage) | 0.196 per 1,000 mile-years | 0.008 | 1 in 120 |

### 4.4.2 Anticipated Frequency of Injuries and Fatalities

Most unintentional natural gas releases are relatively small and do not cause personal injuries or death. In this section, the likelihood of human injuries and deaths will be estimated using historical baseline data. Later in this document, the human life impacts will be evaluated using a probabilistic approach.

As noted earlier, the primary natural gas component is methane, which is not toxic. Although methane presents a slight inhalation hazard, the primary risk to humans is posed by exposures to fire or explosion. A fire could result from a natural gas release with two conditions present. First, a volume of natural gas must be present within the combustible mixture range (5% to 15% methane in air). Second, a source of ignition must be present with sufficient heat to ignite the air/natural gas mixture (1,000°F). In order for an explosion to occur, a third condition must be present - the natural gas vapor cloud must be confined, to a sufficient degree.

It is difficult to estimate the potential extent of human injury because there are so many variables affecting the size of a fire or explosion: rate of vapor cloud formation (controlled primarily by the release rate), size of the vapor cloud within the combustible range (controlled by weather, including wind and temperature, release rate, etc.), concentration of vapors (varying with wind and topographic conditions), degree of vapor cloud confinement, etc. (These actual conditions will be evaluated later, in Section 4.4.3~~1.4~~ of this Appendix.)

Based on the historical data presented earlier, the following frequencies for human life consequences are anticipated from the pipeline components and associated metering stations, regulating stations, and appurtenances:

Table **4.4.2-1~~1.3-2~~ Human Life Impacts Based on Historical Data**

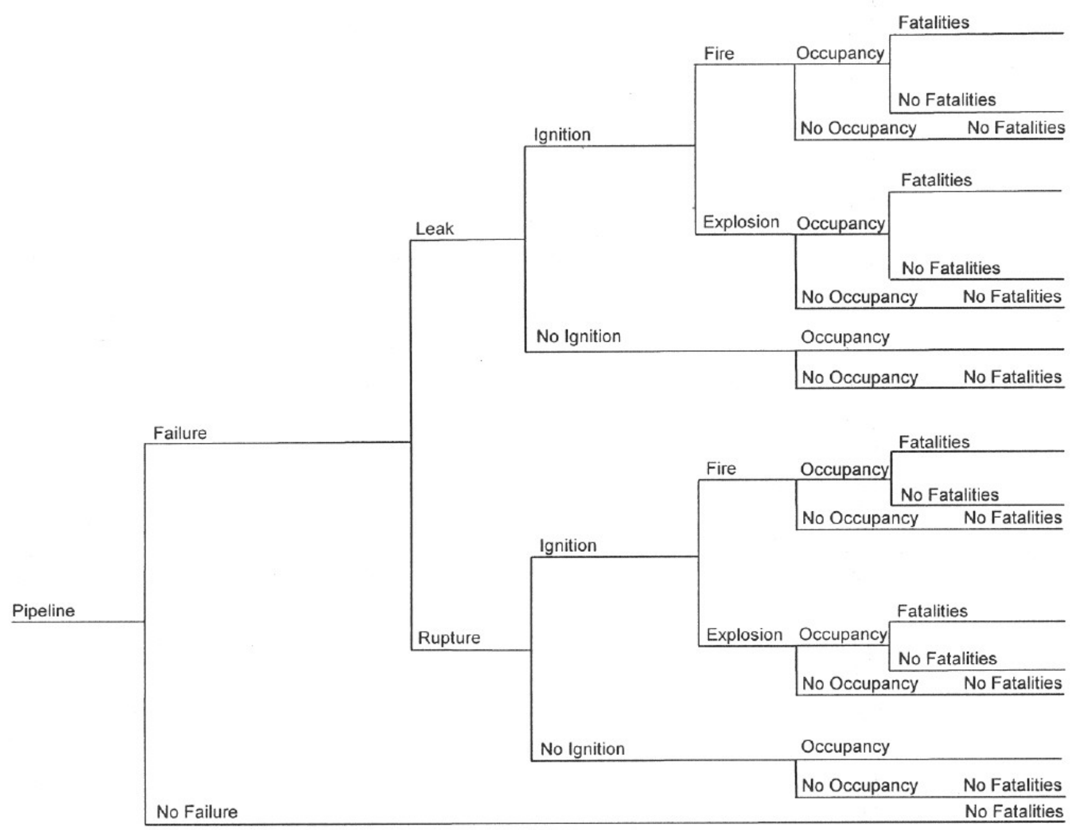
| Consequence | Frequency | Annual Number of Events | Return Interval (Years) |
|---|---|---|---|
| Injuries regardless of severity | 0.700 incidents per 1,000 mile-years | $2.9 \times 10^{-2}$ | 34 |
| Injuries requiring hospitalization | 0.017 incidents per 1,000 mile-years | $7.1 \times 10^{-4}$ | 1,400 |
| Fatalities | 0.004 fatalities per 1,000 mile-years | $1.7 \times 10^{-4}$ | 6,000 |

As indicated in the table above, the annual aggregate probability of a fatality is 1:6,000, based on the qualitative risk assessment. This is the qualitative aggregate risk, as defined earlier in Section 3.2 of this Appendix. This is the estimated likelihood of a fatality along the entire project, considering all of the project components. This aggregate risk should not be confused with individual risk, nor the individual risk thresholds presented earlier in Section 3.1. The individual risk of fatality is the probability of a fatality at a single specific location, whereas the aggregate risk is the probability of a fatality along the entire pipeline. (Reference Table 3.2-1 for a summary of the differences between individual and aggregate risk.) ~~This is significantly higher than the generally accepted significance criterion of one in one million (1:1,000,000) (CDE 2007, CPUC 2006). As a result, this level of risk would generally be considered significant.~~

The anticipated frequencies of injuries and fatalities presented above are useful references. However, they do not facilitate an accurate evaluation of the specific parameters for the proposed pipeline facilities. For example, these summary data do not differentiate between the risks of a relatively benign natural gas pipeline and a ~~liquefied petroleum gas (LPG)~~ pipeline transporting chlorine in a gaseous state, which is much more likely to result in serious impacts due to toxic impacts~~fires and explosions~~. These historical data also do not differentiate between various population densities. For example, a release in an urban area is likely to cause more significant impacts to humans than a release in a rural, undeveloped area. For the rural portion of the proposed facilities, the values shown above overstate the risk to the public; while in the urban areas they likely understate the risk. In the following section, a probabilistic risk assessment will be presented. This analysis will consider the actual environment, pipe contents, pipe diameter, actual operating conditions and the proximity to the public.

### ~~4.1.4~~4.5 QUANTITATIVE RISK ASSESSMENT

In this section, a probabilistic pipeline risk assessment will be presented. This analysis considers the actual site population density, as well as the characteristics of the pipe contents in the event of an unintentional release. This analysis was conducted using the following consequence event tree, with minor modifications to differentiate between flash and torch fires.




### 4.5.1 Baseline Frequency of Unintentional Releases

For this analysis, a baseline frequency of USDOT reportable unintentional releases of 0.196 incidents per 1,000 mile-years has been used. (This baseline frequency of unintentional releases was developed earlier in Section 4.3 of this Appendix.)

### 4.5.2 Conditional Consequence Probabilities

In order to conduct a probabilistic analysis, the conditional probabilities of each fault tree branch must be established. For example:

- What percentage of pipe failures are relatively small leaks versus full bore ruptures?
- What percentage of vapor clouds resulting from leaks and ruptures are ignited?
- What percentages of ignited vapor clouds burn versus explode?
- And in the event of a fire or explosion, do any serious injuries or fatalities result?

In order to evaluate these conditional probabilities, the actual unintentional release data reported to the Department of Transportation, Office of Pipeline Safety (USDOT) have been evaluated. Unfortunately, the USDOT incident reports prior to January 1, 2002 did not include fields for reporting fires or explosions; these fields were added in 2002. Between January 1, 2002 and December 31, 2007, there were 520 onshore transmission pipeline incidents reported to the USDOT. The following data are worth noting:

- 91 (17.5%) of the resulting vapor clouds ignited,
- 56 (61.5%) of the vapor clouds simply burned, and
- 35 (38.5%) of the vapor clouds exploded

In other words, 10.8% of the reported onshore natural gas transmission pipeline incidents resulted in fires while 6.7% resulted in explosions. 361 (69.4%) of the incidents were identified as being released directly from the pipeline, as apposed to other appurtenances (e.g., compressors, regulators, etc.). Of these, 109 (30%) of the pipeline releases were identified as ruptures. 26 (7%) of the pipeline release incidents resulted in fires and 20 (6%) resulted in explosions.

It is interesting to note that between January 1, 2002 and December 31, 2007, 55 (10.6%) of the reported 520 natural gas transmission pipeline incidents occurred in compressor stations; –14 (25%) of these incidents resulted in fires and 10 (18%) resulted in explosions. 50 (9.6%) of the reported incidents occurred at meter and/or regulator stations; 10 (20%) of these resulted in fires and 1 (2%) resulted in an explosion. The remaining 54 incidents were not identified as to which part or component of the pipeline system failed.

The conditional probabilities used in the probabilistic risk assessment are summarized in the following tables.

**Table 4.5.2~~1.4~~-1 Conditional Probabilities**

| Parameter | Conditional Consequence Probability | Value - Source |
|---|---|---|
| Leak Size | Probability of Release (1-inch diameter hole) | 70% - USDOT |
| | Probability of Rupture (complete, full diameter pipe severance) | 30% - USDOT |
| Ignition | Probability of No-Ignition | 82.5% - USDOT |
| | Probability of Ignition | 17.5% - USDOT |
| Fire/Explosion | Probability of Fire Upon Ignition | 61.5% - USDOT |
| | Probability of Explosion Upon Ignition | 38.5% - USDOT |

**Table 4.5.2~~1.4~~-2 Combined Conditional Probabilities, Fires versus Explosions**

| Consequence | Conditional Release Consequence | Value |
|---|---|---|
| Fires | Pipeline Release (1-inch) Resulting in a Fire | 0.70 x 0.175 x 0.615 = 7.5% |
| | Pipeline Rupture Resulting in a Fire | 0.30 x 0.175 x 0.615 = 3.2% |
| Explosions | Pipeline Release (1-inch) Resulting in an Explosion | 0.70 x 0.175 x 0.385 = 4.7% |
| | Pipeline Rupture Resulting in an Explosion | 0.30 x 0.175 x 0.385 = 2.0% |

### Flash Fires versus Torch Fires

The USDOT data does not provide any differentiation regarding the type of fire (torch fire versus flash fire). However, since there are a relatively large number of reported explosions in the USDOT database, it is likely that the number of flash fires is limited. There are also few historical flash fires on record (LEES). The analyses assumed that 10% of the fires would be flash fires and 90% would be torch fires.

### Unignited Vapor Clouds, Flash Fires versus Indoor Explosions

Should the combustible portion of a vapor cloud migrate to nearby residences or commercial buildings before ignition, a flash fire would occur if the ignition was~~were~~ outdoors, or an explosion would occur indoors. Unfortunately, available references provide little data regarding the likelihood of these two occurrences. The analyses assumed that 90% of the fires would be flash fires and 10% would be explosions within the structures.

**Table 4.5.2~~1.4~~-3 Combined Conditional Probabilities, Torch Fires versus Delayed Ignition of Vapor Clouds**

| Consequence | Conditional Release Consequence | Value |
|---|---|---|
| Torch Fires | Release (1-inch)<br>Resulting in a Torch Fire | 7.5% x 0.90 = 6.8% |
| | Rupture<br>Resulting in a Torch Fire | 3.2% x 0.90 = 2.9% |
| Flash Fires<br>(Vapor Cloud Ignition Outdoors) | Release (1-inch)<br>Resulting in a Flash Fire | 7.5% x 0.10 x 0.90 = 0.7% |
| | Rupture<br>Resulting in a Flash Fire | 3.2% x 0.10 x 0.90 = 0.3% |
| Indoor Explosion<br>(Vapor Cloud Ignition Indoors) | Release (1-inch)<br>Indoor Explosion | 7.5% x 0.10 x 0.10 = 0.08% |
| | Rupture<br>Indoor Explosion | 3.2% x 0.10 x 0.10 = 0.03% |

### 4.5.3 Release Modeling Input and Assumptions

In this section, various pipeline release scenarios are presented. The releases were modeled using CANARY, by Quest, version 4.3 software. For vapor cloud explosion modeling, this software uses the Baker-Strehlow model to determine peak side-on over-pressures as a function of distance from a release. CANARY software also uses a torch fire model to determine radiant heat flux as a function of distance from a release. Literally thousands of possible data combinations could be used to evaluate individual releases (e.g., various release angles, various size releases, etc.). However, in order to evaluate the impacts from the proposed facilities using a reasonable amount of resources, the following assumptions were made~~:~~. (It should be noted that the applicant has furnished information regarding the natural gas composition and the installation of the pipeline in a dedicated right-of-way. These changes are noted in the following table as changes to the fuel reactivity and obstacle density.)

### Table 4.1.4-4 Release Modeling Input

| Parameter | Model Input |
|---|---|
| Operating Pressure | 975 psig maximum allowable operating pressure for all line segments |
| Typical Flow Rate | 475 MMSCFD for 30-inch Line 406<br>180 MMSCFD for 30-inch Line 407W and 407E<br>17 MMSCFD for 10-inch DFM Line<br>The actual flow rate will vary considerably, depending on natural gas demands, pressures in other system components, etc. |
| Modeled Releases | 1-inch diameter release<br>Full Bore release |
| Contents | Methane |
| Contents Temperature | 70° F |
| Wind Speed | 2 meters per second (4.5 mph) for vapor cloud explosion modeling<br>20 mph for torch fire modeling<br>Note – See also Section 5.0 of this Appendix which provides an atmospheric condition sensitivity analysis. |
| Stability Class | D assumed<br>Pasquill-Gifford atmospheric stability is classified by the letters A through F. Stability can be determined by three main factors: wind speed, solar insulation, and general cloudiness. In general, the most unstable (turbulent) atmosphere is characterized by stability class A. Stability A occurs during strong solar radiation and moderate winds. This combination allows for rapid fluctuations in the air and thus greater mixing of the released gas with time. Stability D is characterized by fully overcast or partial cloud cover during daytime or nighttime, and covers all wind speeds. The atmospheric turbulence is not as great during D conditions, so the gas will not mix as quickly with the surrounding atmosphere. Stability F generally occurs during the early morning hours before sunrise (no solar radiation) and under low winds. This combination allows for an atmosphere which appears calm or still and thus restricts the ability to actively mix with the released gas. A stability classification of “D” is generally considered to represent average conditions.<br>Note – See also Section 5.0 of this Appendix which provides an atmospheric condition sensitivity analysis. |
| Relative Humidity | 70% |
| Air and Surface Temperature | 72° F |
| Continuous Release Duration | Two (2) hours, or until the pipe segment has been depressurized |

| Parameter | Model Input |
|---|---|
| Duration of Normal Flow after Leak Initiation | Two (2) hours for 1-inch diameter release<br>Fifteen (15) minutes for full bore rupture<br>The applicant has indicated that a severe pipeline rupture would be identified within 10 to 15 minutes. Line 406 could be shut-in remotely between Capay and Yolo Stations. The other line segments would require a physical response. The response could take from 15 minutes to 2 hours, depending on the location of employees and the time of occurrence. It should be noted that the applicant has agreed to install automatically actuated block valves at all locations along the line. As a result, the duration of normal flow assumed for ruptures is likely conservative. |
| Pipe Length Upstream and Downstream of Break | ~~3-miles assumed for 30-inch diameter line segments~~<br>~~1.25-miles assumed for 10-inch diameter line segment.~~<br>The actual pipe segment length has been used in the analysis. All releases were assumed to occur at the mid-point of each line segment. |
| Release Angle | Simplified Analysis - 45° above horizontal, downwind (100% of releases)<br>Enhanced Analysis:<br>15° above horizontal, downwind (20% of releases)<br>45° above horizontal, downwind (20% of releases)<br>Vertical (20% of releases)<br>45° above horizontal, upwind (20% of releases)<br>15° above horizontal, upwind (20% of releases) |
| Fuel Reactivity | Medium~~Low~~<br>Most hydrocarbons have medium reactivity, as defined by the Baker-Strehlow method. Low reactivity fluids include methane, natural gas (98+% methane), and carbon monoxide. The natural gas being transported is likely around 95% methane, which results in medium fuel reactivity. High reactivity fluids include hydrogen, acetylene, ethylene oxide, and propylene oxide. |
| Obstacle Density | Low assumed for rural, residential, commercial, and agricultural areas due to the dedicated right-of-way planned for this installation and relatively low building density around the pipeline. The low obstacle density is also appropriate because the five release angles result in an unconfined, overhead vapor cloud, except for very near the release (low obstacle density). Where the vapor cloud is located at ground level, near the release, the surroundings are relatively open along the entire pipeline alignment (low obstacle density) due to the dedicated right-of-way which will prohibit building construction very near the pipeline.<br>Medium would normally be assumed for residential and commercial developed areas where buildings surround the pipeline, providing a reasonable degree of vapor cloud confinement.<br>This parameter describes the general level of obstruction in the area including and surrounding the confined (or semi-confined) volume. Low density occurs in open areas or in areas containing widely spaced obstacles. High density occurs in areas of many obstacles, such as tightly-packed process areas or multi-layered pipe racks. |

| Parameter | Model Input |
|---|---|
| Flame Expansion | 3 D assumed<br><br>This parameter defines the number of dimensions available for flame expansion. Open areas are 3-D, and produce the smallest levels of overpressure. 2.5-D expansions are used to describe areas that quickly transition from 2-D to 3-D. Examples include compressor sheds and the volume under elevated fan-type heat exchangers. 2-D expansions occur within areas bounded on top and bottom, such as pipe racks, offshore platforms, and some process units. 1-D expansion may occur within long confined volumes such as hallways or drainage pipes, and produce the highest overpressures. |
| Reflection Factor | 2 assumed<br><br>This factor is used to include the effects of ground reflection when an explosion is located near grade. A value of 2 is recommended for ground level explosions. |

### 4.5.4 Explosion Modeling Results

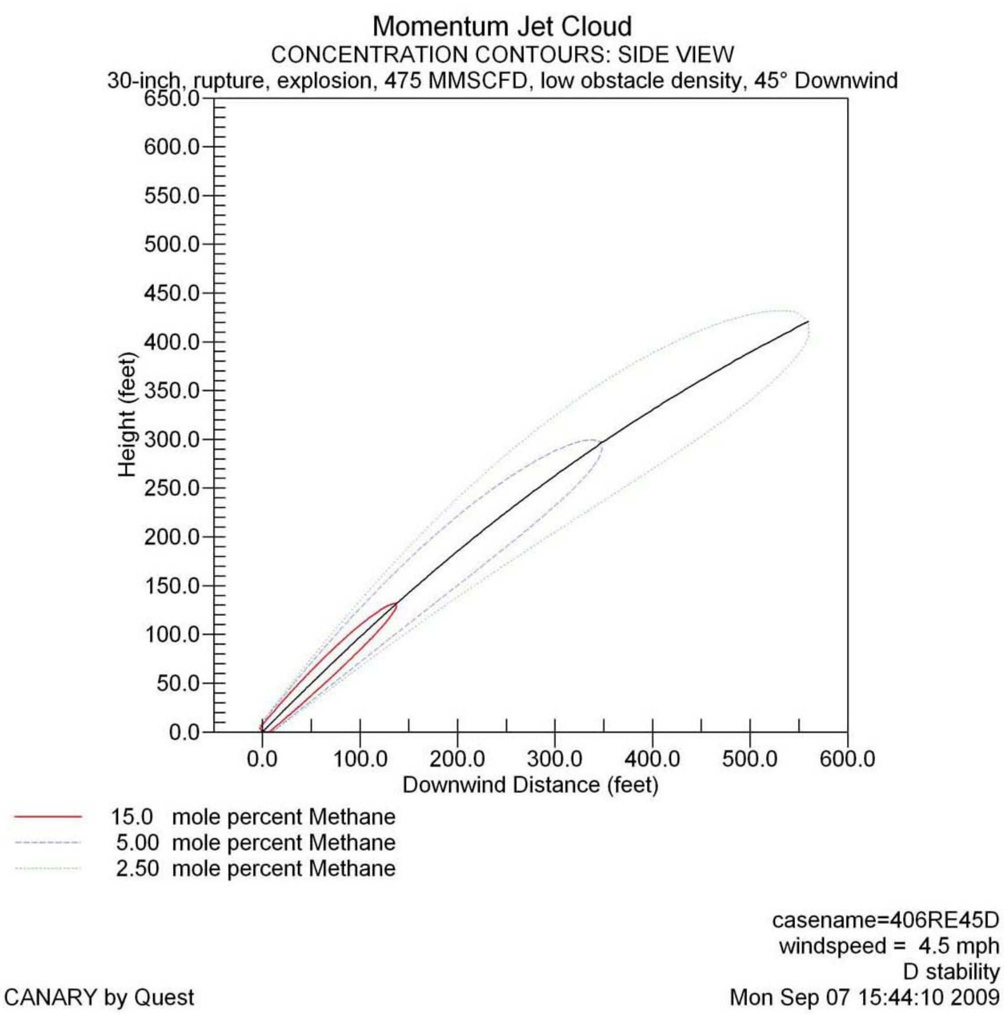
As discussed previously, natural gas generally does not explode, unless the vapor cloud is confined in some manner. The eastern portion of the 30-inch Line 407E and the 10-inch DFM are surrounded by residential and commercial land uses and open space. The other~~remainder of the~~ pipeline segments are surrounded by open, rural land with some road crossings. There is insufficient confinement to cause a significant vapor cloud explosion within the atmosphere in the rural, residential and agricultural areas. Should natural gas migrate into residences or other structures, the overpressures from an explosion within the confined space would be life threatening.

For an outdoor explosion resulting from a release from each of the line segments, ~~Outdoors,~~ the peak overpressure would be~~was~~ only 0.38~~1.5~~ psig ~~for the residential areas~~(medium fuel reactivity and low obstacle density), due to the relatively open development immediately around the pipeline. This overpressure level ~~is~~ would not be high enough to pose potentially fatal risks to the public.~~have a 1% probability of serious injury or fatality to occupants of reinforced concrete or reinforced masonry buildings due to flying glass and debris. There is a 10% probability of serious injuries to occupants of simple frame, unreinforced buildings. This over pressure level would generally not be great enough to cause injuries to those outdoors.~~ For indoor explosions, the peak overpressure level would be 5.9 psig (medium fuel reactivity and high obstacle density).

~~The peak overpressure was only 0.02 psig for the rural and agricultural line segments, due to the very open surroundings and lack of confinement. This level results in an annoying noise.~~

A typical pipeline release is depicted in the figure below. This figure shows an elevation view of a downwind release from a rupture of the 30-inch Line 406, operating at 975 psig at a flow rate of 475 MMSCFD, with the release oriented at 45° above the horizon. The combustible portion of the vapor cloud is between the 5 and 15 mole percent contours. As depicted in this figure, the combustible portion of the vapor cloud is well overhead, where there would not be any confinement to cause an explosion.

**Figure 4.5.4-2 Line 406, Rupture Explosion, Elevation**



**~~Figure 4.1.4-2 Line 406, Rupture Explosion, Elevation~~**

~~The distances to various levels of peak side-on overpressures for each of the pipe segments are summarized in the table below. It is interesting to note that the results for Lines 406 and 407, which are similar except for the flow rate, are essentially the same. Also, the data for the 1-inch diameter releases are the same for all line segments, since the MAOP is the same for each segment. These explosion over-pressure levels are applicable in residential areas only. The overpressure levels are too low to result in injuries or fatalities in rural and agricultural areas.~~

## ~~Table 4.1.4-5 Vapor Cloud Explosion Modeling Results in Residential Areas~~

| ~~**Release**~~ | ~~**Operating Pressure**~~ | ~~**Maximum Width of Combustible Portion of Vapor Cloud (feet)**~~ | ~~**Distance from Unintentional Release (feet) Measured Perpendicular to Pipeline**~~ | | |
|---|---|---|---|---|---|
| | | | ~~**1.00 psig Overpressure**~~ | ~~**0.70 psig Overpressure**~~ | ~~**0.10 psig Overpressure**~~ |
| ~~Line 406~~<br>~~475 MMSCFD~~<br>~~Full Bore Release @ 45° above horizon~~ | ~~975 psig~~ | ~~107~~ | ~~381~~ | ~~544~~ | ~~3,807~~ |
| ~~Line 406~~<br>~~475 MMSCFD~~<br>~~1-inch Diameter Release @ 45° above horizon~~ | ~~975 psig~~ | ~~10~~ | ~~35~~ | ~~50~~ | ~~352~~ |
| ~~Line 407 E & W~~<br>~~180 MMSCFD~~<br>~~Full Bore Release @ 45° above horizon~~ | ~~975 psig~~ | ~~105~~ | ~~377~~ | ~~538~~ | ~~3,771~~ |
| ~~Line 407 E & W~~<br>~~180 MMSCFD~~<br>~~1-inch Diameter Release @ 45° above horizon~~ | ~~975 psig~~ | ~~10~~ | ~~35~~ | ~~50~~ | ~~352~~ |
| ~~DFM~~<br>~~17 MMSCFD~~<br>~~Full Bore Release @ 45° above horizon~~ | ~~975 psig~~ | ~~31~~ | ~~114~~ | ~~162~~ | ~~1,137~~ |
| ~~DFM~~<br>~~17 MMSCFD~~<br>~~1-inch Diameter Release @ 45° above horizon~~ | ~~975 psig~~ | ~~10~~ | ~~35~~ | ~~50~~ | ~~252~~ |

## 4.5.5 Torch Fire Modeling Results

### ~~Torch Fires~~

The torch fire modeling results are presented in the following tables.

### Table 4.5.5-1~~1.4-6~~ Line 406 Torch Fire Modeling Results

| Release Angle | Maximum Operating Pressure | Size of Release | Horizontal Distance from Unintentional Release to Endpoint Measured Perpendicular to Pipeline (feet) / Width of Exposure Measured Parallel to Pipeline (feet) | | |
|---|---|---|---|---|---|
| | | | 12,000 btu/hr-ft$^2$ | 8,000 btu/hr-ft$^2$ | 5,000 btu/hr-ft$^2$ |
| 15° Downwind | 975 psig | Rupture | 626 | 657 | 725 |
| | | | 500 | 620 | 850 |
| 45° Downwind | 975 psig | Rupture | 413 | 505 | 611 |
| | | | 380 | 560 | 800 |
| Vertical | 975 psig | Rupture | 149 | 237 | 374 |
| | | | 250 | 420 | 650 |
| 45° Upwind | 975 psig | Rupture | 63 | 97 | 165 |
| | | | 240 | 400 | 620 |
| 15° Upwind | 975 psig | Rupture | 35 | 48 | 72 |
| | | | 190 | 320 | 550 |
| 15° Downwind | 975 psig | 1-inch | 63 | 66 | 72 |
| | | | 54 | 72 | 92 |
| 45° Downwind | 975 psig | 1-inch | 40 | 48 | 58 |
| | | | 34 | 50 | 72 |
| Vertical | 975 psig | 1-inch | 62 | 67 | 73 |
| | | | 54 | 70 | 92 |
| 45° Upwind | 975 psig | 1-inch | 62 | 67 | 73 |
| | | | 56 | 66 | 92 |
| 15° Upwind | 975 psig | 1-inch | 63 | 67 | 73 |
| | | | 54 | 70 | 92 |

Note – Radiant heat flux values shown are measured at 6-feet above ground surface.

| ~~**Release**~~ | ~~**Maximum Operating Pressure**~~ | ~~**Width of 8,000 btu/hr-ft$^2$ Isopleth (feet)**~~ | ~~**Flame Length (feet)**~~ | ~~**Horizontal Distance from Unintentional Release (feet)**~~ | | |
|---|---|---|---|---|---|---|
| | | | | ~~**8,000 btu/hr-ft$^2$**~~ | ~~**3,500 btu/hr-ft$^2$**~~ | ~~**1,600 btu/hr-ft$^2$**~~ |
| ~~Line 406~~<br>~~475 MMSCFD~~<br>~~Full Bore Release @ 45° above horizon~~ | ~~975 psig~~ | ~~300~~ | ~~527~~ | ~~523~~ | ~~734~~ | ~~946~~ |
| ~~Line 406~~<br>~~475 MMSCFD~~<br>~~1-inch Diameter Release @ 45° above horizon~~ | ~~975 psig~~ | ~~25~~ | ~~52~~ | ~~48~~ | ~~66~~ | ~~87~~ |
| ~~Line 407 E & W~~<br>~~180 MMSCFD~~<br>~~Full Bore Release @ 45° above horizon~~ | ~~975 psig~~ | ~~300~~ | ~~523~~ | ~~519~~ | ~~728~~ | ~~938~~ |
| ~~Line 407 E & W~~<br>~~180 MMSCFD~~<br>~~1-inch Diameter Release @ 45° above horizon~~ | ~~975 psig~~ | ~~25~~ | ~~52~~ | ~~48~~ | ~~66~~ | ~~87~~ |
| ~~DFM~~<br>~~17 MMSCFD~~<br>~~Full Bore Release @ 45° above horizon~~ | ~~975 psig~~ | ~~90~~ | ~~158~~ | ~~161~~ | ~~217~~ | ~~286~~ |
| ~~DFM~~<br>~~17 MMSCFD~~<br>~~1-inch Diameter Release @ 45° above horizon~~ | ~~975 psig~~ | ~~25~~ | ~~52~~ | ~~48~~ | ~~66~~ | ~~87~~ |

## Table 4.5.5-2 Line 407 (Station 1107+00 to 1361+00) Torch Fire Modeling Results

| Release Angle | Maximum Operating Pressure | Size of Release | Horizontal Distance from Unintentional Release to Endpoint Measured Perpendicular to Pipeline (feet) / Width of Exposure Measured Parallel to Pipeline (feet) | | |
|---|---|---|---|---|---|
| | | | 12,000 btu/hr-ft$^2$ | 8,000 btu/hr-ft$^2$ | 5,000 btu/hr-ft$^2$ |
| 15° Downwind | 975 psig | Rupture | 643 | 673 | 746 |
| | | | 520 | 630 | 880 |
| 45° Downwind | 975 psig | Rupture | 422 | 517 | 626 |
| | | | 400 | 580 | 820 |
| Vertical | 975 psig | Rupture | 152 | 241 | 382 |
| | | | 250 | 420 | 660 |
| 45° Upwind | 975 psig | Rupture | 64 | 99 | 168 |
| | | | 260 | 400 | 660 |
| 15° Upwind | 975 psig | Rupture | 36 | 49 | 74 |
| | | | 200 | 320 | 560 |
| 15° Downwind | 975 psig | 1-inch | 63 | 66 | 72 |
| | | | 54 | 72 | 92 |
| 45° Downwind | 975 psig | 1-inch | 40 | 48 | 58 |
| | | | 34 | 50 | 72 |
| Vertical | 975 psig | 1-inch | 62 | 67 | 73 |
| | | | 54 | 70 | 92 |
| 45° Upwind | 975 psig | 1-inch | 62 | 67 | 73 |
| | | | 56 | 66 | 92 |
| 15° Upwind | 975 psig | 1-inch | 63 | 67 | 73 |
| | | | 54 | 70 | 92 |

Note – Radiant heat flux values shown are measured at 6-feet above ground surface.

## Table 4.5.5-3 Line DFM Torch Fire Modeling Results

| Release Angle | Maximum Operating Pressure | Size of Release | Horizontal Distance from Unintentional Release to Endpoint Measured Perpendicular to Pipeline (feet) / Width of Exposure Measured Parallel to Pipeline (feet) | | |
|---|---|---|---|---|---|
| | | | 12,000 btu/hr-ft$^2$ | 8,000 btu/hr-ft$^2$ | 5,000 btu/hr-ft$^2$ |
| 15° Downwind | 975 psig | Rupture | 101 | 205 | 220 |
| | | | 150 | 200 | 260 |
| 45° Downwind | 975 psig | Rupture | 135 | 161 | 195 |
| | | | 120 | 180 | 250 |
| Vertical | 975 psig | Rupture | 51 | 82 | 121 |
| | | | 80 | 130 | 200 |
| 45° Upwind | 975 psig | Rupture | 22 | 34 | 57 |
| | | | 80 | 120 | 200 |
| 15° Upwind | 975 psig | Rupture | 25 | 25 | 25 |
| | | | 60 | 100 | 170 |
| 15° Downwind | 975 psig | 1-inch | 63 | 66 | 72 |
| | | | 54 | 72 | 92 |
| 45° Downwind | 975 psig | 1-inch | 40 | 48 | 58 |
| | | | 34 | 50 | 72 |
| Vertical | 975 psig | 1-inch | 62 | 67 | 73 |
| | | | 54 | 70 | 92 |
| 45° Upwind | 975 psig | 1-inch | 62 | 67 | 73 |
| | | | 56 | 66 | 92 |
| 15° Upwind | 975 psig | 1-inch | 63 | 67 | 73 |
| | | | 54 | 70 | 92 |

Note – Radiant heat flux values shown are measured at 6-feet above ground surface.

The results for a torch fire resulting from a full bore rupture of the 30-inch Line 406 are depicted in the figure below for a vertical release.

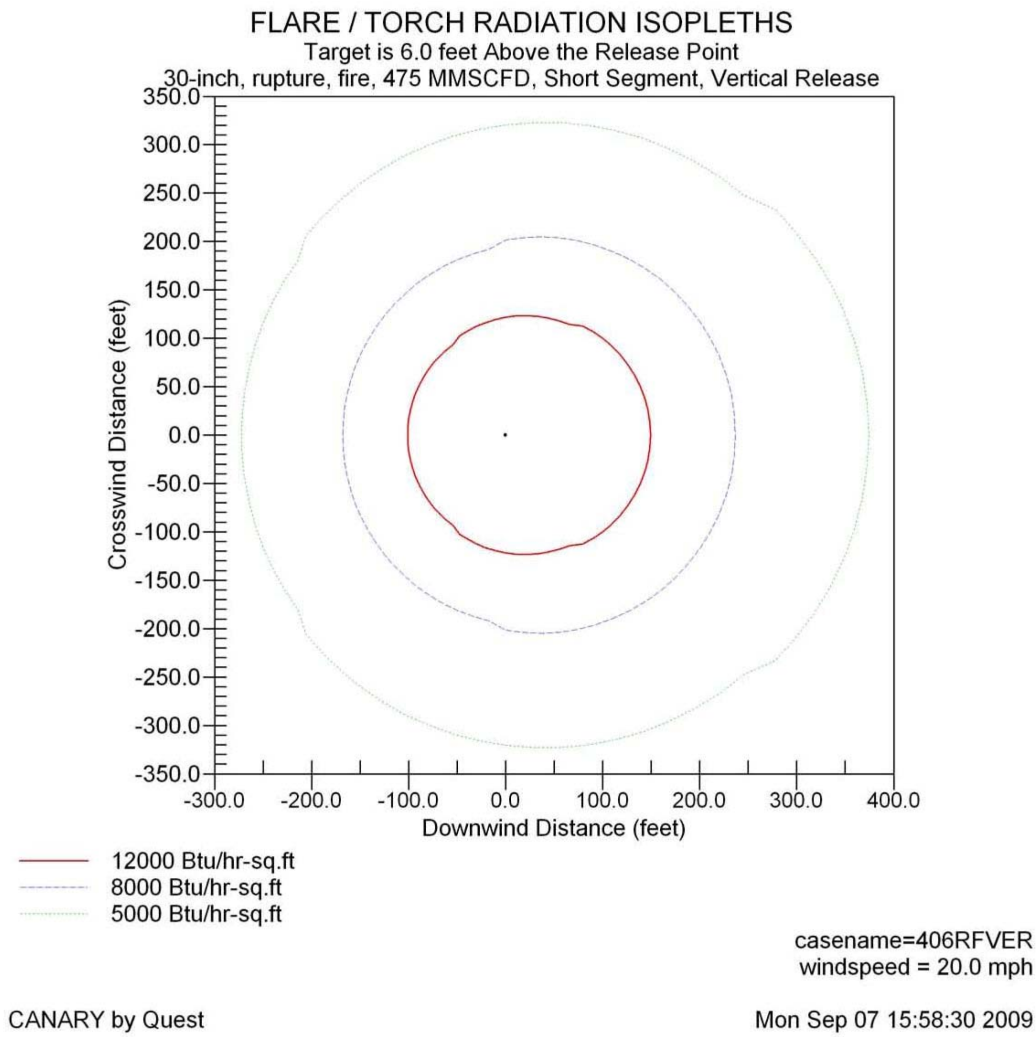



**Figure 4.5.5-1 Line 406, Rupture Torch Fire, Plan**

### 4.5.6 Flash Fire Modeling Results

As discussed previously, flash fires can occur when a vapor cloud is formed, with some portion of the vapor cloud within the combustible range, and the ignition is delayed. (If the ignition is immediate, a torch fire results.) In a flash fire, the portion of the vapor cloud within the combustible range burns quickly. It is assumed that those within the combustible portion of the vapor cloud would likely be seriously injured or killed. Those outside the combustible portion of the vapor cloud would likely be uninjured. In other words, the public would generally be safe if they were too close to the release (over rich mixture, above the upper flammable limit) or beyond the portion of the vapor cloud with concentrations below the lower flammability limit. The results of the flash fire modeling are shown in the tables which follow.~~below:~~

**Table 4.5.6-1~~1.4-7~~ Line 406 Flash Fire Modeling Results**

| Release Angle | Maximum Operating Pressure | Size of Release | Horizontal Distance from Unintentional Release to Lower Flammability Limit (feet) Measured Perpendicular to Pipeline | Width of Exposure (feet) Measured Parallel to Pipeline |
|---|---|---|---|---|
| 15° Downwind | 975 psig | Rupture | 520 | 57 |
| 45° Downwind | 975 psig | Rupture | 347 | 56 |
| Vertical | 975 psig | Rupture | 236 | 56 |
| 45° Upwind | 975 psig | Rupture | 0 | 0 |
| 15° Upwind | 975 psig | Rupture | 0 | 0 |
| 15° Downwind | 975 psig | 1-inch | 49 | 8 |
| 45° Downwind | 975 psig | 1-inch | 32 | 5 |
| Vertical | 975 psig | 1-inch | 4 | 5 |
| 45° Upwind | 975 psig | 1-inch | 0 | 0 |
| 15° Upwind | 975 psig | 1-inch | 0 | 0 |

| ~~**Release**~~ | ~~**Operating Pressure**~~ | ~~**Distance from Unintentional Release (feet) Measured Perpendicular to Pipeline**~~ | |
|---|---|---|---|
| | | ~~**Upper Flammability Limit (UFL)**~~ | ~~**Lower Flammability Limit (LFL)**~~ |
| ~~Line 406~~<br>~~475 MMSCFD~~<br>~~Full Bore Release @ 45° above horizon~~ | ~~975 psig~~ | ~~143~~ | ~~362~~ |
| ~~Line 406~~<br>~~475 MMSCFD~~<br>~~1-inch Diameter Release @ 45° above horizon~~ | ~~975 psig~~ | ~~12~~ | ~~32~~ |
| ~~Line 407 E & W~~<br>~~180 MMSCFD~~<br>~~Full Bore Release @ 45° above horizon~~ | ~~975 psig~~ | ~~141~~ | ~~358~~ |
| ~~Line 407 E & W~~<br>~~180 MMSCFD~~<br>~~1-inch Diameter Release @ 45° above horizon~~ | ~~975 psig~~ | ~~12~~ | ~~32~~ |
| ~~DFM~~<br>~~17 MMSCFD~~<br>~~Full Bore Release @ 45° above horizon~~ | ~~975 psig~~ | ~~41~~ | ~~109~~ |
| ~~DFM~~<br>~~17 MMSCFD~~<br>~~1-inch Diameter Release @ 45° above horizon~~ | ~~975 psig~~ | ~~12~~ | ~~32~~ |

## Table 4.5.6-2 Line 407 (Station 1107+00 to 1361+00) Flash Fire Modeling Results

| Release Angle | Maximum Operating Pressure | Size of Release | Horizontal Distance from Unintentional Release to Lower Flammability Limit (feet) Measured Perpendicular to Pipeline | Width of Exposure (feet) Measured Parallel to Pipeline |
|---|---|---|---|---|
| 15° Downwind | 975 psig | Rupture | 534 | 59 |
| 45° Downwind | 975 psig | Rupture | 357 | 58 |
| Vertical | 975 psig | Rupture | 141 | 58 |
| 45° Upwind | 975 psig | Rupture | 0 | 0 |
| 15° Upwind | 975 psig | Rupture | 0 | 0 |
| 15° Downwind | 975 psig | 1-inch | 49 | 8 |
| 45° Downwind | 975 psig | 1-inch | 32 | 5 |
| Vertical | 975 psig | 1-inch | 4 | 5 |
| 45° Upwind | 975 psig | 1-inch | 0 | 0 |
| 15° Upwind | 975 psig | 1-inch | 0 | 0 |

## Table 4.5.6-3 Line DFM Flash Fire Modeling Results

| Release Angle | Maximum Operating Pressure | Size of Release | Horizontal Distance from Unintentional Release to Lower Flammability Limit (feet) Measured Perpendicular to Pipeline | Width of Exposure (feet) Measured Parallel to Pipeline |
|---|---|---|---|---|
| 15° Downwind | 975 psig | Rupture | 164 | 31 |
| 45° Downwind | 975 psig | Rupture | 108 | 17 |
| Vertical | 975 psig | Rupture | 21 | 31 |
| 45° Upwind | 975 psig | Rupture | 0 | 0 |
| 15° Upwind | 975 psig | Rupture | 0 | 0 |
| 15° Dowwind | 975 psig | 1-inch | 49 | 8 |
| 45° Downwind | 975 psig | 1-inch | 32 | 5 |
| Vertical | 975 psig | 1-inch | 4 | 5 |
| 45° Upwind | 975 psig | 1-inch | 0 | 0 |
| 15° Upwind | 975 psig | 1-inch | 0 | 0 |

## 4.5.7 Risk~~s~~ Analysis Exposure Assumptions and Methodology~~to Humans~~

In order to quantify the potential risk to humans, a number of assumptions must be made; otherwise, the effort required to perform the risk analysis can become unreasonably complex. The following paragraphs outline the assumptions made in estimating the frequency and severity of the potential hazards.

### Exposure Probability

In cases where the exposure to impacts only occurred on one side of the pipeline, the probability was reduced by one-half. For example, where future commercial and industrial structures are proposed on only one side of the pipeline, the probability of exposure was reduced 50%.

### Proximity to Residences and Commercial Buildings

In determining the distances from the pipe segments to existing residences and commercial buildings, the nearest distance from the pipeline to each structure was used. For individuals outside the structures, the analysis assumed that they would be located near the primary building.

### Exposures to Occupants of Residences and Commercial Buildings

*Flash Fires and Indoor Explosions*

Residential Occupants

Should the combustible portion of a vapor cloud migrate to nearby residences before ignition, a flash fire would occur if the ignition occurred~~were~~ outdoors, or an explosion would occur indoors.

The analyses assumed a 100% probability of serious injury or fatality to those exposed to a flash fire. However, those housed within their residences were assumed to be sufficiently protected from an outdoor flash fire to prevent serious injury or fatality. The analyses assumed that those protected inside a residence would be able to evacuate safely should the structure catch fire, after the flash fire subsided. The analyses assumed that occupants of these residences would be outside their homes, exposed to outdoor flash fire effects, an average of 10% of the time (roughly 17 hours per week).

In the event that natural gas were to migrate inside the structure before ignition, the analysis assumed a 100% probability of serious injury or fatality. The analyses assumed a 75% probability that occupants would be evacuated by emergency responders, or evacuate the structure on their own once they identified the gas odorant, before the gas reached a combustible mixture and ignited. The analysis assumed that occupants of these residences would be inside their homes, exposed to potential indoor explosions, an average of 70% of the time (16.8 hours per day). This results in a 17.5% probability of exposure (25% not evacuated x 70% = 17.5%).

Commercial Building Occupants

This analysis is similar to that described above for residential structures, except for the exposure duration. For a 1-inch diameter release, where the exposure width is relatively small, the analyses assumed that occupants of the commercial buildings would be outside the buildings, exposed to flash fire effects, an average of 6% of the time (roughly 10 hours per week, 2 hours per work day). For a flash fire resulting from a rupture, the width of the impact area is much larger and the likelihood of an individual being exposed is much higher. For these cases, the individual risk assessment analyses assumed an outdoor exposure of 50 hours per week (30% of the time); the societal risk assessment assumed an exposure of 6%, as this type of analysis considers the estimated number of people exposed to the hazard~~.~~; in other words, it is less likely that the maximum number of exposed individuals versus a single person would be present at a given location in the event of a rupture.

In the event that natural gas were to migrate inside the structure, the analyses assumed a 100% probability of serious injury or fatality to building occupants. The analyses assumed that occupants would be within the building 50 hours per week (30% of the time), with a 75% probability that occupants would be evacuated by emergency responders, or evacuate the structure on their own once they identified the gas odorant, before the gas reached a combustible mixture. This results in a 7.5% probability of exposure (25% not evacuated x 30% = 7.5%).

*Torch Fires*

Residential Occupants

The simplified individual risk analyses assumed that residents within the 8,000 btu/hr-ft$^2$ heat flux isopleth[4]~~contour~~ would be exposed to a 50% probability of fatality while they are outside their homes (30 second exposure assumed). The enhanced individual risk analyses assumed that 100% of the residents exposed to 12,000 btu/hr-ft$^2$ heat flux would be fatally injured; 50% of those exposed to 8,000 btu/hr-ft$^2$ would be fatally injured, and 1% of those exposed to 5,000 btu/hr-ft$^2$ would be fatally injured while they are outside their homes (30 second exposure assumed). As depicted in Figure 6.0-1,

[4] An isopleth is a line on a chart or map which connects points at which a given variable has a specified constant value, in this case radiant heat flux.

presented later in this Appendix, 75% mortality was assumed between the 12,000 btu/hr-ft$^2$ and 8,000 btu/hr-ft$^2$ heat flux isopleth (average of 100% and 50% mortality); 25% mortality was assumed between the 8,000 btu/hr-ft$^2$. and 5,000 btu/hr-ft$^2$ heat flux contour (average of 50% and 1% mortality). The societal risk analyses assumed that residents within the 12,000 btu/hr-ft$^2$ heat flux isopleth would be exposed to a 75% probability of fatality; 25% of the residents were assumed to move away from the hazard or find protection within 30 seconds; the remaining 75% were assumed to be fatally injured.

The analyses assumed that individuals would be sheltered from injurious radiant heat impacts while inside their homes. The analyses also assumed that those protected inside their residence would be able to evacuate safely should the structure catch fire. For 1-inch diameter releases, where the exposure width is relatively small, the analyses assumed that occupants of these residences would be outside their homes, exposed to torch fire effects, an average of 10% of the time (roughly 17 hours per week). For a torch fire resulting from a rupture, the width of the impact area is much larger and the likelihood of an individual being exposed is much higher. For these cases, the individual risk assessment analyses assumed an outdoor exposure of 50 hours per week (30% of the time); the societal risk assessment assumed an exposure of 6%, as this type of analysis includes the estimated number of people exposed to the hazard; in other words, it is less likely that the maximum number of exposed individuals versus a single person would be present at a given location in the event of a rupture.

Commercial Building Occupants

This analysis is similar to that discussed above for residences. However, the analysis assumed that occupants of these buildings would be outside, exposed to torch fire effects from a 1-inch diameter release, an average of 10 hours per week (6% of the time). The individual risk analyses assumed an exposure of 30% (50 hours per week) for torch fires resulting from full bore ruptures, due to the much larger width of exposure. For the societal risk assessment, an exposure of 6% was used for both 1-inch diameter and full bore releases.

*Explosions*

The analysis assumed a 10% probability of a serious injury or fatality to building occupants exposed to an over-pressure level of 1.00 psig due to flying glass and debris. As described above, residential buildings were assumed to be occupied 70% of the time

(16.8 hours per day) and commercial buildings were assumed to be occupied 30% of the time (50 hours per week). However, as noted earlier, the peak overpressure levels from this project are anticipated to be only 0.38 psig, due to the lack of confinement. As a result, fatalities resulting from explosions are not anticipated from the proposed project. The overpressure levels are expected to be well below the threshold required to cause serious injuries or fatalities to those outdoors.

**Exposures to Vehicle Occupants**

*Flash Fires*

There is little actual or experimental data available for natural gas flash fires. Based on a full bore release at 45° above the horizon at the modeled conditions, the flammable concentration of the vapor cloud would be less than 100-feet wide in all of the modeled scenarios (measured perpendicular to the release). A vehicle traveling at 40 miles per hour perpendicular to the release would only be within the flammable portion of the vapor cloud for about two seconds, unless the vehicle were stopped (e.g., red light, traffic jam, etc.).

Considering the variety of possible release angles, the likely short duration of exposure, and the protection afforded by the vehicle, these analyses assumed that 10% of the occupants of vehicles exposed to the modeled maximum horizontal projection of a flash fire resulting from a pipeline release would be seriously injured or killed.

It should be noted that 100% casualties are assumed for similar analyses used in the United Kingdom. However, there is evidence that those exposed to flash fires can survive. Although natural gas flash fires are rare, an event occurred on October 1982 which is noteworthy. This event is noted in the Report on a Study of International Pipeline Accidents (HSE 2000). In this case an end cap blew off the end of a natural gas pipeline in Pine Bluff, Arkansas. The ignition of the resulting gas cloud was delayed, until the flammable portion of the cloud reached a nearby welding machine. As stated in the report, “All seven persons at the accident site were engulfed in the flash-fire. The two welder-helpers, who were wearing goggles but not welding helmets, and the two company employees standing atop the ditch at the east and south end were placed in intensive care at a local hospital. Another worker on top of the ditch was admitted to the hospital in a serious but stable condition. The two welders, who were under the pipe when the fire erupted and were more sheltered from the fire, were treated and released from the hospital… While none of the workmen were killed, they were not representative of the population as a whole; they were relatively young, fit and wearing working clothes. Children or the elderly (perhaps 50% of the population), or those wearing less protective clothing in a similar fire would probably not have survived."

*Torch Fires*

Because the exposure time to passing vehicles would be limited, the analyses assumed that occupants in passing vehicles would be somewhat protected from the radiant heat due to torch fires. The societal risk analyses assumed that serious injuries and fatalities would only occur to those exposed directly to the flame or those within the 12~~8~~,000 btu/hr-ft$^2$ isopleth. ~~For a full bore rupture, this extends about 520 feet for the 30-inch line segments and 160 feet for the 10-inch line segment. For a 1-inch diameter release, it extends about 50 feet. It should be noted that the flame lengths and distances to the 8,000 btu/hr-ft$^2$ are essentially the same.~~ Due to the variation in the possible release angles (e.g., the flame may be vertical, or pass above the vehicle) and the possibility for vehicle occupants to pass through the hazard area relatively quickly, the societal risk analyses assumed a 10~~25~~% probability of serious injury or fatality~~ was assumed~~.

*Explosions*

The peak overpressures resulting from atmospheric explosions are not anticipated to be sufficient to cause serious injuries or fatalities in areas where residential and commercial development have occurred. However, traffic can create some degree of confinement. The societal risk assessment conservatively assumed a ~~A~~ 10% probability of fatality to those exposed to an explosion.~~rate has been assumed.~~

*Number of Vehicle Occupants Exposed to Release*

The analysis estimated the number of individuals exposed as follows:

- The traffic counts were obtained from Section 4.13~~X~~ of the Final EIR~~is document~~. For roadways where traffic counts were not available, they were assumed as follows: For un-named county roads along each segment, 200 trips per day average was assumed. For roads along Line DFM, 500 trips per day average were assumed. For roads along Phase I of Line 407, 1,000 trips per day average were assumed. For rural highways along Phase II of Line 407, 1,000 trips per day average were assumed.
- An average traffic speed of 40 miles per hour was used, except for I-5 and Highway 505, which assume 70 miles per hour.

- The length of hazard, measured along the roadway, was determined individually for each type of release by modeling.
- The normal stopping distance was determined using a one second reaction time and 15 feet per second rate of deceleration.
- An average vehicle occupancy of 1 was assumed for individual risk and 2 for societal risk.

~~For the individual risk analysis, if the above calculation yielded a number greater than unity, the number exposed was reduced to one individual, consistent with the definition of the individual risk analysis.~~

### ~~4.5.7 Individual Risks~~

**~~Exposures to Occupants of Residences and Commercial Buildings~~**

~~In the following paragraphs, the impacts (e.g., serious injuries and fatalities) have been evaluated for individuals exposed to a fire or explosion. For Line 406, the impacts were assessed considering the existing buildings only; future land development was not considered in the analysis. For Line 407 and Line DFM, the existing conditions, plus the impacts of the following proposed land development projects were considered: Sutter Pointe, Placer Vineyard, Sierra Vista, and Curry Creek. The lengths of pipeline that could result in serious impacts the public are summarized in the table below, for each of the identified conditions.~~

**~~Table 4.1.4-8 Length of Pipeline Posing Risks to Building Occupants~~**

| ~~Release Description~~ | ~~Significant Impact Distance from Release (feet)~~ | ~~Line 406 (feet)~~ | ~~Line 407 Phase I (feet)~~ | ~~Line 407 Phase II (Feet)~~ | ~~Line DFM (feet)~~ |
|---|---|---|---|---|---|
| | ~~Lines 406/407~~ | | | | |
| | ~~Line DFM~~ | | | | |
| ~~Explosion Full Bore Rupture~~ | ~~380~~ | ~~3,650~~ | ~~58,455~~ | ~~15,655~~ | ~~5,100~~ |
| | ~~115~~ | | | | |
| ~~Explosion 1-inch Release~~ | ~~35~~ | ~~60~~ | ~~47,910~~ | ~~0~~ | ~~5,100~~ |
| | ~~35~~ | | | | |

| | | | | | |
|---|---|---|---|---|---|
| ~~Torch Fire~~<br>~~Full Bore Rupture~~ | ~~520~~<br>~~160~~ | ~~4,930~~ | ~~59,350~~ | ~~21,545~~ | ~~5,100~~ |
| ~~Torch Fire~~<br>~~1-inch Release~~ | ~~50~~<br>~~50~~ | ~~120~~ | ~~48,270~~ | ~~800~~ | ~~5,100~~ |
| ~~Flash Fire~~<br>~~Full Bore Rupture~~ | ~~360~~<br>~~110~~ | ~~3,435~~ | ~~58,455~~ | ~~15,565~~ | ~~5,100~~ |
| ~~Flash Fire~~<br>~~1-inch Release~~ | ~~35~~<br>~~35~~ | ~~60~~ | ~~47,910~~ | ~~0~~ | ~~5,100~~ |

~~Note: For Line 407, Phase I, the distribution was assumed to be roughly 50% residential~~

~~As noted above, only a relatively short distance of Line 406 would pose a risk to occupants of existing residences. However, for the eastern portion of the project (Line 407 Phase I), much more of the line would pose a risk to occupants of existing and proposed residences and commercial properties. The resulting frequencies of anticipated serious injuries and fatalities to occupants of residential, commercial, and industrial buildings are summarized in the table below.~~

**~~Table 4.1.4-9 Frequency of Serious Injury or Fatality to Building Occupants~~**

| ~~Release Description~~ | ~~Line 406~~ | ~~Line 407 Phase I~~ | ~~Line 407 Phase II~~ | ~~Line DFM~~ | ~~Total~~ |
|---|---|---|---|---|---|
| ~~Explosion~~<br>~~Full Bore Rupture~~ | ~~$1.9 \times 10^{-7}$~~ | ~~$2.2 \times 10^{-6}$~~ | ~~$8.2 \times 10^{-7}$~~ | ~~$5.7 \times 10^{-8}$~~ | ~~$3.3 \times 10^{-6}$~~ |
| ~~Explosion~~<br>~~1-inch Release~~ | ~~$7.4 \times 10^{-9}$~~ | ~~$4.2 \times 10^{-6}$~~ | ~~0~~ | ~~$1.3 \times 10^{-7}$~~ | ~~$4.3 \times 10^{-6}$~~ |
| ~~Torch Fire~~<br>~~Full Bore Rupture~~ | ~~$8.0 \times 10^{-7}$~~ | ~~$9.6 \times 10^{-6}$~~ | ~~$3.5 \times 10^{-6}$~~ | ~~$4.1 \times 10^{-7}$~~ | ~~$1.4 \times 10^{-5}$~~ |

| | | | | | |
|---|---|---|---|---|---|
| ~~Torch Fire 1-inch Release~~ | ~~$4.5 \times 10^{-9}$~~ | ~~$1.5 \times 10^{-6}$~~ | ~~$3.0 \times 10^{-8}$~~ | ~~$5.8 \times 10^{-8}$~~ | ~~$1.6 \times 10^{-6}$~~ |
| ~~Flash Fire Full Bore Rupture~~ | ~~$4.4 \times 10^{-8}$~~ | ~~$1.4 \times 10^{-6}$~~ | ~~$2.0 \times 10^{-7}$~~ | ~~$8.5 \times 10^{-8}$~~ | ~~$1.7 \times 10^{-6}$~~ |
| ~~Flash Fire 1-inch Release~~ | ~~$1.8 \times 10^{-9}$~~ | ~~$1.1 \times 10^{-6}$~~ | ~~0~~ | ~~$4.4 \times 10^{-8}$~~ | ~~$1.1 \times 10^{-6}$~~ |
| ~~Total Probability Serious Injury or Fatality~~ | ~~$1.05 \times 10^{-6}$~~ | ~~$1.99 \times 10^{-5}$~~ | ~~$4.54 \times 10^{-6}$~~ | ~~$7.00 \times 10^{-7}$~~ | ~~$2.62 \times 10^{-5}$~~ |
| ~~Annual Likelihood of Serious Injury or Fatality~~ | ~~1 : 950,000~~ | ~~1 : 50,000~~ | ~~1 : 220,000~~ | ~~1 : 1,400,000~~ | ~~1 : 26,000~~ |
| ~~Percentage of Total Risk to Building Occupants~~ | ~~4.0 %~~ | ~~76.0 %~~ | ~~17.3 %~~ | ~~2.7 %~~ | ~~100.0 %~~ |

~~As noted a above, the frequency of serious injuries and fatalities caused by explosion for Lines 406, 407 (Phase II), and DFM are extremely low, due to the rural areas where the majority of these lines are being installed. Line 407 (Phase I) poses 76% of the total project risk to occupants of residential, commercial, and industrial buildings, due to the density of existing and planned land development.~~

**~~Exposure to Vehicle Occupants~~**

~~The risks posed to vehicle occupants are summarized in the table below, for each of the line segments.~~

**~~Table 4.1.4-10 Frequency of Serious Injury or Fatality to Vehicle Occupants~~**

| ~~Description~~ | ~~Line 406~~ | ~~Line 407 Phase I~~ | ~~Line 407 Phase II~~ | ~~Line DFM~~ | ~~Total~~ |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| ~~Total Probability of Serious Injury or Fatality~~ | ~~$1.84 \times 10^{-6}$~~ | ~~$2.94 \times 10^{-5}$~~ | ~~$3.21 \times 10^{-6}$~~ | ~~$2.06 \times 10^{-7}$~~ | ~~$3.46 \times 10^{-5}$~~ |
| ~~Annual Likelihood of Serious Injury or Fatality~~ | ~~1 : 540,000~~ | ~~1 : 34,000~~ | ~~1 : 310,000~~ | ~~1: 4,900,000~~ | ~~1 : 29,000~~ |
| ~~Percentage of Total Risk to Building Occupants~~ | ~~5.3 %~~ | ~~84.9 %~~ | ~~9.2 %~~ | ~~0.6 %~~ | ~~100.0 %~~ |

~~It should be noted that the figures presented in the above table somewhat understate the likelihood of risks posed to vehicle occupants. As noted earlier, the length of hazard, measured along the roadway, was determined individually for each type of release; the exposures were calculated using the traffic speed, stopping distance, traffic volume, and the length of actual exposure to the hazard. For example, for a rural county road with an assumed traffic count of 200 trips per day, 40 miles per hour average traffic speed, 232-foot stopping distance, and a potentially hazardous cloud distance of 520-feet, the individual exposure was determined to be 0.03. In other words, given these parameters, the likelihood of an individual vehicle occupant being exposed to the hazard was 3%. However, for unignited vapor clouds, a passing vehicle is often the source of ignition. In these cases, the actual exposure to vehicle occupants would be 100%. Unfortunately, data is not available to support an accurate determination of the frequency in which motorists are the source of ignition. For scenarios with higher traffic counts, greater average traffic speed, etc., the error induced by this methodology is reduced or is eliminated altogether; for example, the likelihood of exposure along many of the heavily traveled roadways (e.g., Baseline Road, Interstate 5, etc.) was 1.00 (100%) for many of the release scenarios. In these cases, the results would not be affected whether the vehicle was the source of ignition, or not.~~

### 4.5.8 Individual Risk Results Simplified Methodology

The individual risk for each of the three project components has been determined using the same methodology that was used to determine the aggregate risk presented in Section 4.1.4 of Appendix H-3 of the Final EIR. (It should be noted that this aggregate risk was incorrectly identified as individual risk in the Final EIR.) The Final EIR analysis was simplified by making the following assumptions:

- A single release angle at 45° above the horizon was used.
- All releases were assumed to be oriented downwind, which resulted in the worst case impact footprint (e.g., greatest length of exposure measured perpendicular to the pipeline).
- For flash fire impacts which were located overhead, the horizontal extent of the hazard was projected to grade level. This results in some overstatement of the impact since an overhead flash fire would not normally impact those on the ground. However, if the release angle were lower that the single 45° release angle assumed, the flash fire could impact those at ground level.

These simplifying assumptions greatly reduced the amount of release modeling required to perform the analysis. As discussed in the following section of this Appendix, the individual risk is slightly lower using this simplified approach very close to the pipeline and at large distances from the pipeline. This is due to the fact that the releases posing 100% mortality near the pipeline and 1% mortality at some distance from the pipeline were not included in the simplified analysis. However, the risk using the simplified methodology is higher between these values, because all of the releases were assumed to result in 50% mortality. Although these differences are noteworthy, they do not appreciably affect the results.

The individual risks posed by Lines 406, 407 and DFM are shown in the following figures. These figures present risk transects which show the annual risk of fatality resulting from a pipeline release as a function of the downwind distance from the pipeline, measured perpendicular to the pipeline. (The upwind distances would be much less.) The results are shown for the pipe segments both before and after mitigation. It should be noted that these data are based on the continuous presence of a person at a specific location (24 hours per day, 365 days per year), consistent with the definition of individual risk presented in the Section 3.1 of this Appendix. It should also be noted that the highest risks are posed directly over the pipelines, as shown in Figures 4.5.8-1, 4.5.8-2 and 4.5.8-3. These maximum annual individual risks of fatality are summarized below:

- Line 406 Annual Maximum Individual Risk of Fatality (Directly Over Pipeline)

  Pre Mitigation - $3.94 \times 10^{-7}$ (1 : 2,538,000)

  Post Mitigation - $1.97 \times 10^{-7}$ (1 : 5,076,000)

- Line 407 Annual Maximum Individual Risk of Fatality (Directly Over Pipeline)

  Pre Mitigation - $3.83x10^{-7}$ (1 : 2,610,000)

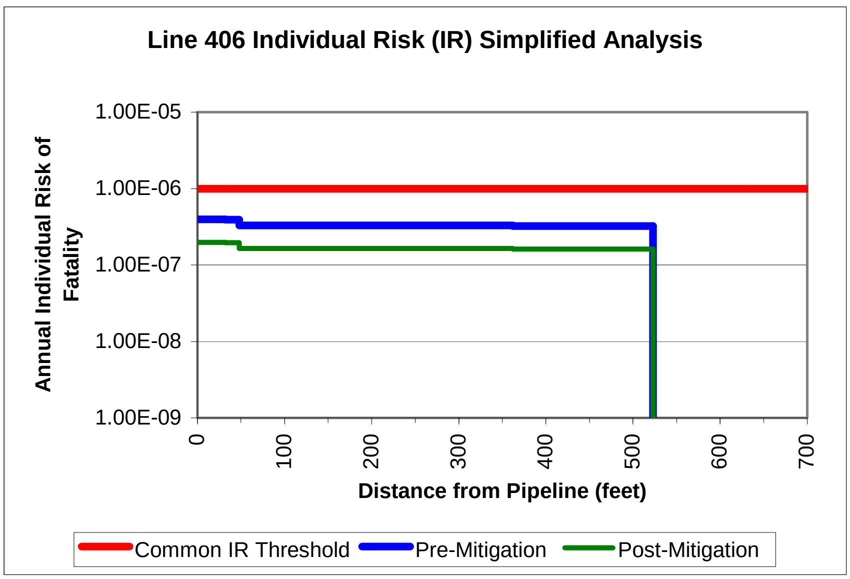
  Post Mitigation - $1.92x10^{-7}$ (1 : 5,220,000)

- Line DFM Annual Maximum Individual Risk of Fatality (Directly Over Pipeline)

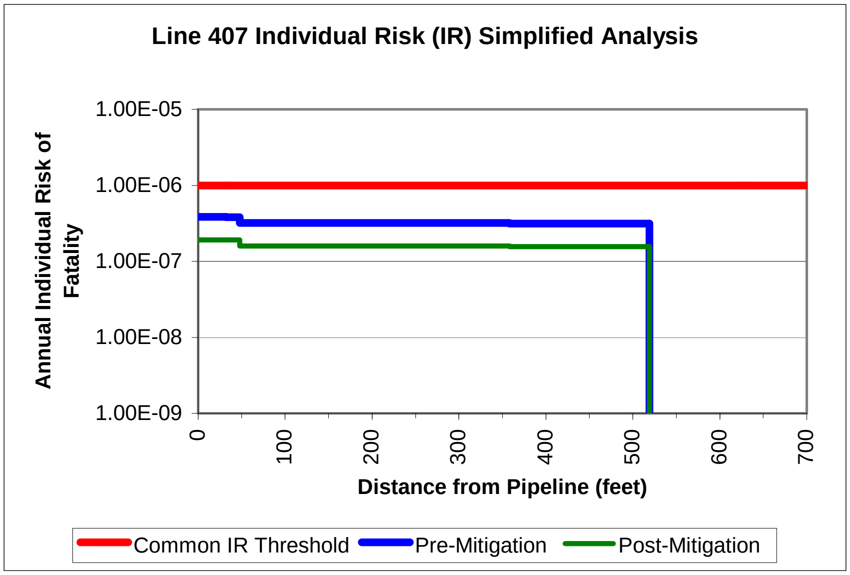
  Pre Mitigation - $1.61x10^{-7}$ (1 : 6,219,000)

  Post Mitigation - $8.04x10^{-8}$ (1 : 12,440,000)

**Figure 4.5.8-1 Line 406 Individual Risk**

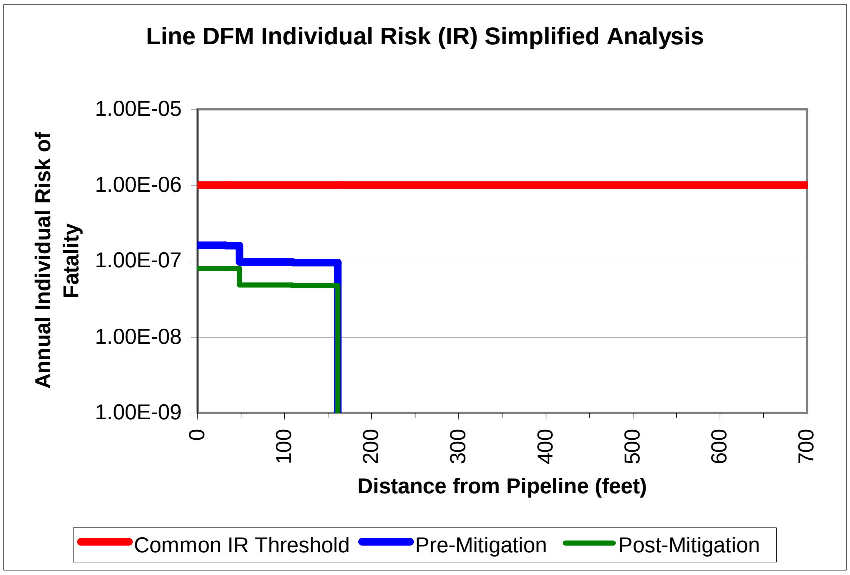


## Figure 4.5.8-2  Line 407 Individual Risk




Note – The analysis results depicted above assumed a typical segment of Line 407.  The line segment was six (6) miles in length, with a block valve located three (3) miles on either side of the release.

## Figure 4.5.8-3  Line DFM Individual Risk




As indicated in the figures above, the individual risks for each of the three pipe segments fall below the individual risk threshold of 1 : 1,000,000.  The highest values are experienced directly over the pipe. The risk levels decrease as the distance from the pipeline increases. The risk level for the Line 406 and 407 segments are essentially the same; they differ only slightly, due to the differing flow rates and segment lengths (475,000,000 standard cubic feet per day for Line 406 and 180,000,000 standard cubic feet per day for Line 407). The impact distances for Line DFM are much shorter, due to the smaller pipe diameter and the much lower mass flow rate in the event of a rupture. However, the required pipe diameter is a function of the required flow rate and the pressure drop within the line. As a result, simply reducing the pipe diameter to reduce the impact distances is not a feasible alternative.

The flow rate through a pipeline can be evaluated using the Weymouth formula; the flow rate is proportional to the pipe diameter to the 2.667 power ($D^{2.667}$). To achieve the same flow rate as a 30-inch diameter line, nineteen (19) 10-inch diameter lines would be required to flow the same volume of gas under the same operating conditions.

### 4.5.9 Individual Risk Results Enhanced Methodology

As noted previously, the analysis presented in the Final EIR, and in the prior Section 4.5.8 of this document, used a single release angle at 45° above the horizon for all release scenarios (e.g., vapor cloud explosions, flash fires and torch fires). The 45° release angle was used in the simplified analysis because it represents a reasonable average release. However, it does not create the worst case situation; a horizontal release normally results in the greatest impact distances. Also, the simplified analysis assumed that all releases were oriented downwind, which resulted in the worst case impact footprint (e.g., greatest length of exposure measured perpendicular to the pipeline). Finally, the simplified analysis used only a single endpoint for torch fire modeling, which accounted for roughly ninety-nine percent (99%) of the overall individual risk. The enhanced analyses included the following additional release modeling.

- Five different release angles were considered: 15° above the horizon downwind, 45° above the horizon downwind, vertical, 45° above the horizon upwind, and 15° above the horizon upwind. (Because the pipeline is buried, 15° above the horizon was assumed to be the lowest feasible release angle.) Twenty percent (20%) of the releases were assumed to be directed at each of these angles.

- The Final EIR used a single end point for torch fire impacts, 50% mortality at 8,000 btu/hr-ft$^2$ for a 30 second exposure. The enhanced analyses included three torch fire end points – 100% mortality at 12,000 btu/hr-ft$^2$, 50% mortality at

8,000 btu/hr-ft$^2$, and 1% mortality at 5,000 btu/hr-ft$^2$ for 30 second exposures. (CDE 2007)

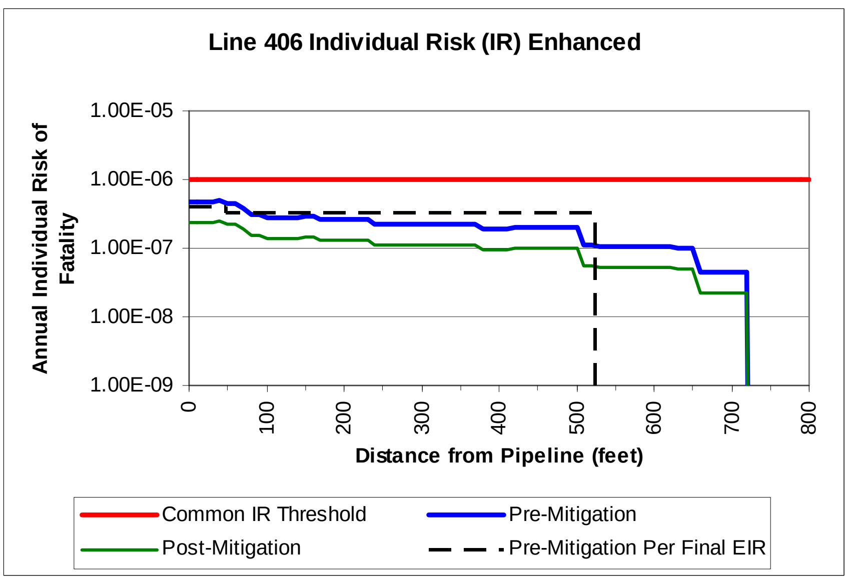
## Line 406

Line 406 would be 30-inches in diameter, 13.9 miles long, would operate at 975 psig at a flow rate of 475 million standard cubic feet per day. There would not be any intermediate block valves within this segment; but an automatically actuated valve would be installed at each end (Capay Station and Yolo Junction Station). The maximum individual risk values posed by this line segment are summarized below. These individual risks would be posed to a person located directly over the pipeline. As the distance from the pipeline increases, the individual risk would be reduced.

- Pre Mitigation Annual Maximum Individual Risk of Fatality - $4.68 \times 10^{-7}$ (1 : 2,137,000)
- Post Mitigation Annual Maximum Individual Risk or Fatality - $2.34 \times 10^{-7}$ (1 : 4,274,000)

The individual risk for this line segment, using the enhanced methodology is presented in the risk transect depicted in the following figure.

**Figure 4.5.9-1 Line 406 Individual Risk, Enhanced Analysis**



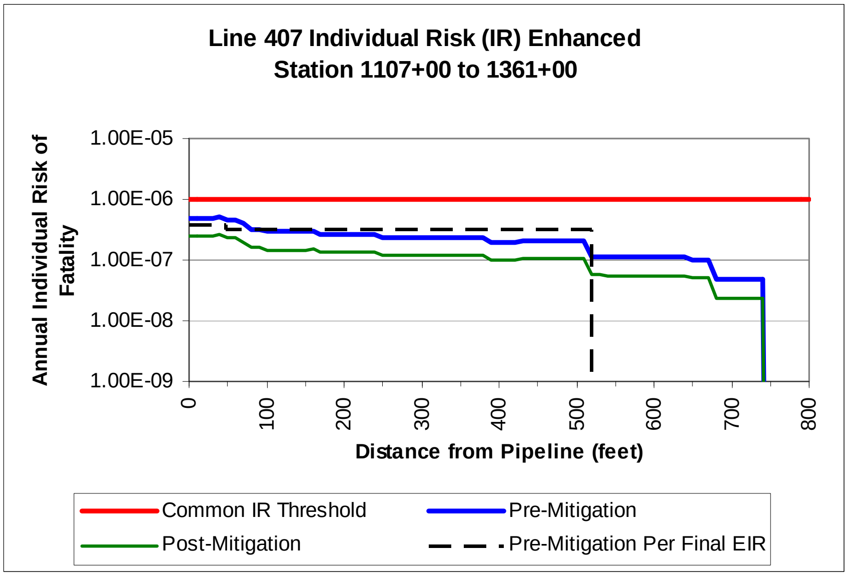
The dashed black line overlays the results using the methodology used in the Final EIR, presented in the preceding section of this Appendix.  As indicated, the individual risk is slightly higher using the enhanced approach very close to the pipeline and beyond about 520-feet.  This is due to the fact that the releases posing 100% mortality near the pipeline and 1% mortality at some distance from the pipeline were not included in the earlier analysis.  However, the risk using the simplified methodology is higher between these values, because all of the releases were assumed to result in 50% mortality. Although these differences are noteworthy, they do not appreciably affect the results.

The annual individual risk of fatality posed by Line 406 is less than the 1 : 1,000,000 threshold used by some jurisdictions.

**Line 407**

Line 407 would be 30-inches in diameter, 26.0 miles long, would operate at 975 psig at a flow rate of 180 million standard cubic feet per day (mmscfd).  There would be three intermediate block valves within this segment, located at Stations 752+00, 1107+00, and 1361+00.  These intermediate block valves would be automatically actuated in accordance with the proposed project mitigation.  These automatic block valves result in the following segment lengths along Line 407 – 14.2 miles, 6.7 miles, 4.8 miles, and 0.3 mile.  The individual risk for the 4.8 mile long segment between Station 1107+00 to 1361+00 is presented in the individual risk transect depicted in the following figure.

**Figure 4.5.9-2 Line 407 (Station 1107+00 to 1361+00) Individual Risk, Enhanced Analysis**




The maximum individual risk values posed by this line segment for an individual located directly over the pipeline are summarized below:

- Pre Mitigation Annual Maximum Individual Risk of Fatality - $4.85 \times 10^{-7}$ (1 : 2,062,000)
- Post Mitigation Annual Maximum Individual Risk of Fatality - $2.43 \times 10^{-7}$ (1 : 4,115,000)

This segment was selected for modeling because it was the shortest (other than the extremely short 0.3 mile segment) and was located in the vicinity of three of the four proposed subdivisions, which are in various stages of planning. For the very short segment of line 407, the risk would be less than shown in Figure 4.5.9-2. For the longer line segments of Line 407, the risk would be in between that shown for this segment of Line 407 and the risk depicted earlier for the longer line Line 406, which are essentially the same.

As indicated above, the individual risk directly over this Line 407 pipeline segment is slightly more than for Line 406 (roughly 4% more). This variation is due to a combination of the lower flow rate (180 mmscfd versus 475 mmscfd) and the shorter length of the line segment (4.8 miles versus 13.9 miles). In this case, the shorter line length, even though it has a lower flow rate, allows the compressed gas to escape faster than it would for the longer line segment, due to the reduced pipe friction losses; this results in a slightly higher mass flow release rate and slightly longer torch fire impact. However, this situation depends on the segment length; if the segment were much shorter, the risk directly over the line would be lower. For example, a one mile line segment would have an individual risk directly over the line roughly twenty percent (20%) lower than that depicted in Figure 4.5.9-2.

Also, the maximum downwind distance to torch fire impacts extend slightly longer for Line 407 than for line 406 (about 746 feet for Line 407 versus about 725 feet for Line 406). This is due primarily to the shorter segment length, which yields a slightly higher mass flow rate in the event of a pipeline rupture.

The annual individual risk of fatality posed by Line 407 is less than the 1 : 1,000,000 threshold used by some jurisdictions.

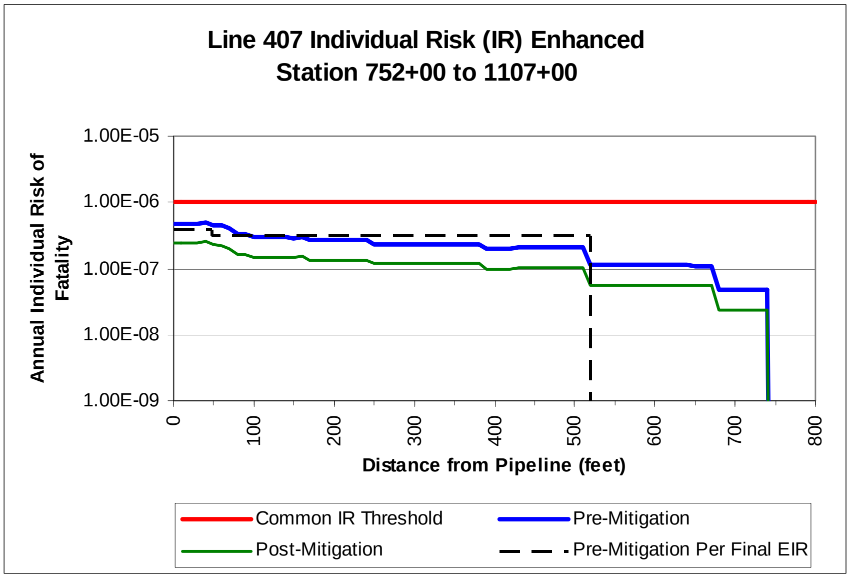
*Planned Developments*

The individual risks near each of the planned future developments (e.g., Sutter Pointe, Placer Vineyard, Sierra Vista, and Curry Creek) are presented in the following paragraphs. As indicated, The annual individual risk of fatality posed by Line 407 to each of these developments is less than the 1 : 1,000,000 threshold.

Sutter Pointe

The Sutter Pointe development is shown on the Sutter Pointe Specific Plan. The development would be located on the north and south sides of Riego Road, on either side of Highway 99/70. The total frontage along Riego Road would be roughly 4.2 miles. The Sutter Point development is proposed between Stations 752+00 and 1107+00 of Line 407; the individual risk along this segment is presented in the following figure. The pre-mitigation individual risk of fatality is $4.81 \times 10^{-7}$ per year for this line segment (1 : 2,100,000). This risk is below the significance threshold of $1.0 \times 10^{-6}$ (1 : 1,000,000) used by some jurisdictions. The post mitigation individual risk of fatality is 2.40x10-7 per year (1 : 4,200,000).

## Figure 4.5.9-3 Line 407 (Station 752+00 to 1107+00) Individual Risk, Enhanced




Placer Vineyards, Curry Creek and Sierra Vista

The Placer Vineyards and Curry Creek developments, as well as the majority of the Sierra Vista development, are located between Stations 1107+00 to 1361+00 of Line 407; Figure 4.5.9-2 presents the individual risk along this segment. (Please reference Exhibit 2-7 of the Revised Final EIR which shows the locations of the proposed block valves.)

The Placer Vineyard development is shown on the Placer Vineyards Land Use Specific Plan. The development would be located on the south side of Baseline Road, on either side of Watt Avenue. The total frontage along Baseline Road would be 5.1 miles. It should be noted that there are two horizontal directionally drilled (HDD) crossings planned within this segment. These crossings would place the pipeline well below the depths that would normally be exposed to third party damage. The mitigation proposed in the Final EIR was intended to reduce the likelihood of third party incidents by one-third. The deeper installation depths will undoubtedly further reduce the likelihood of third party incidents; however the extent is largely unknown.

The Curry Creek development is shown on the Regional University Specific Plan. The development would be located on the north side of Baseline Road, between South Brewer Road and Watt Avenue. In the absence of specific identified land uses within the development, 50% residential and 50% commercial development have been assumed.

The Sierra Vista development is shown on the Sierra Vista Land Use Map. The development would be located on the north side of Baseline Road, west of Fiddymont Road. The total frontage along Baseline Road would be roughly 2.4 miles.

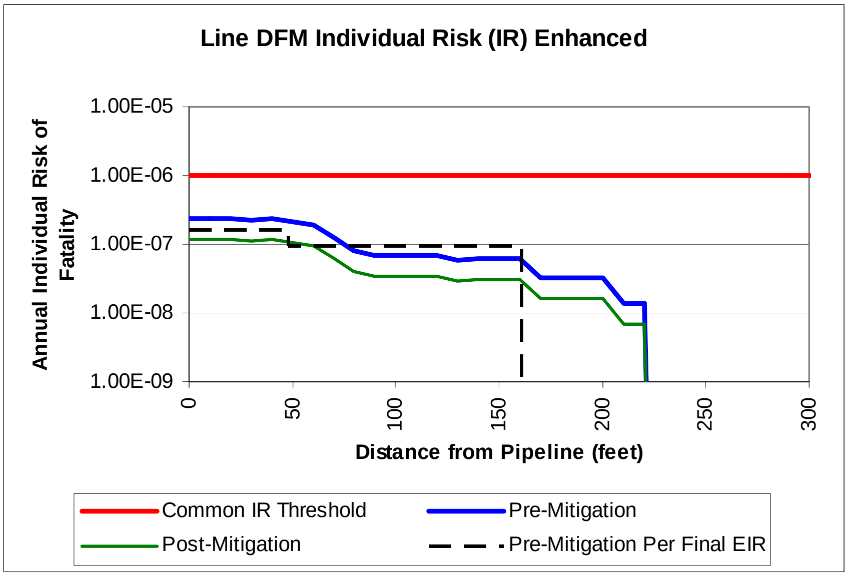
The pre-mitigation individual risk of fatality is $4.85 \times 10^{-7}$ per year for this line segment (1 : 2,060,000). This risk is below the significance threshold of $1.0 \times 10^{-6}$ (1 : 1,000,000) used by some jurisdictions. The post mitigation individual risk of fatality is $2.42 \times 10^{-7}$ per year (1 : 4,120,000).

**Line DFM**

Line DFM would be 10-inches in diameter, 2.44 miles long, and would operate at 975 psig at a flow rate of 17 million standard cubic feet per day (mmscfd). There would not be any intermediate block valves within this segment. The maximum individual risk values posed by this line segment are summarized below; the individual risk for this line segment is presented in the individual risk transect depicted in the following figure.

- Pre-Mitigation Annual Maximum Individual Risk of Fatality - $2.35 \times 10^{-7}$ (1 : 4,255,000)
- Post Mitigation Annual Maximum Individual Risk of Fatality - $1.18 \times 10^{-7}$ (1 : 8,475,000)

## Figure 4.5.9-4 Line DFM Individual Risk, Enhanced Analysis




The risk and impact distances are reduced for this smaller diameter line which has a lower flow rate and much lower stored volume of natural gas. In the event of a rupture, the mass flow rate and resulting size of the flash or torch fires are less than those for the 30-inch segments of Lines 406 and 407.

The annual individual risk of fatality posed by Line DFM is less than the 1 : 1,000,000 threshold used by some jurisdictions.

### ~~Individual Risk Results~~

~~The total exposure to the public from the various pipe segments is summarized in the table below.~~

**~~Table 4.1.4-11 Individual Risk Summary~~**

| ~~Release Description~~ | ~~Line 406~~ | ~~Line 407 Phase I~~ | ~~Line 407 Phase II~~ | ~~Line DFM~~ | ~~Total~~ |
|---|---|---|---|---|---|
| ~~Building Occupants~~ | ~~$1.05 \times 10^{-6}$~~ | ~~$1.99 \times 10^{-5}$~~ | ~~$4.54 \times 10^{-6}$~~ | ~~$7.00 \times 10^{-7}$~~ | ~~$2.62 \times 10^{-5}$~~ |

| | | | | | |
|---|---|---|---|---|---|
| ~~Vehicle Occupants~~ | ~~$1.84 \times 10^{-6}$~~ | ~~$2.94 \times 10^{-5}$~~ | ~~$3.21 \times 10^{-6}$~~ | ~~$2.06 \times 10^{-7}$~~ | ~~$3.46 \times 10^{-5}$~~ |
| ~~Total Probability of Serious Injury or Fatality~~ | ~~$2.89 \times 10^{-6}$~~ | ~~$4.93 \times 10^{-5}$~~ | ~~$7.75 \times 10^{-6}$~~ | ~~$9.06 \times 10^{-7}$~~ | ~~$6.08 \times 10^{-5}$~~ |
| ~~Total 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 %~~ | ~~100.0 %~~ |

~~As presented above, the anticipated individual frequency of serious injury or fatality from the proposed project is is approximately 6.1 x 10~~$^{-5}$~~. This represents a 1:16,000 likelihood of a serious injury or fatality annually. This value is roughly sixty times greater than the generally accepted significance criteria of one in one-million per year (1:1,000,000). As a result, the individual risk posed by the proposed project is considered significant. 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; and for the Line DFM, the individual risk significance is within the tolerance of the assumptions made in this study and should be considered significant.~~

~~It should be noted that this analysis was done based on the existing and stated future level of land development. Should population density or traffic volumes increase over the life of the project beyond these assumptions, the resulting likelihood of serious injuries and fatalities would increase accordingly.~~

### 4.5.10 Societal Risks

Societal risk is the probability that a specified number of people will be affected by a given event. The accepted number of casualties is relatively high for lower probability events and much lower for more probable events.

### Exposures to Occupants of Residences and Commercial Buildings

The following scenarios were considered:

- Flash Fire or Indoor Explosion, 1-inch Diameter Pipeline Release – These impacts could be significant within about 50~~35~~-feet of the proposed line segments. (Reference Tables 4.5.6-1 through 4.5.6-3.) Roughly 4.5 miles of the Line 407, Phase I line segment could pose a hazard to existing or proposed buildings. The width of the vapor cloud within the combustible mixture would be less than ~~roughly~~ 10-feet. As a result, only one structure would likely be exposed. The analysis assumed that one residence or one commercial structure could be affected by a release. A population of up to four per residence and up to ten individuals per commercial building was used.

- Flash Fire or Indoor Explosion, Full Bore Pipeline Release – These impacts could be significant within 164~~110~~-feet for Line DFM and 530~~360~~-feet for Lines 406 and 407. The width of exposure extends roughly 30-feet for Line DFM and 60~~100~~-feet for Lines 406 and 407. (Reference Tables 4.5.6-1 through 4.5.6-3.) Roughly 5.6 miles of the Line 407, Phase I line segment could pose a hazard to existing or proposed buildings. The analyses assumed that one commercial building or one residence could be impacted, with an exposure of up to ten persons (commercial) or four persons (residential).

- Torch Fire, 1-inch Diameter Pipeline Release – These impacts were assumed to ~~could~~ be significant within 63~~50~~-feet of the proposed line segments (12~~8~~,000 btu/hr-ft$^2$ isopleth). The 12,000~~3,500~~ btu/hr-ft$^2$ isopleth extends about 63~~65~~-feet for each of the proposed line segments. The width of the ~~3,500 btu/hr-ft$^2$ isopleth is roughly 80-feet, while the width of the~~ 12~~8~~.000 btu/hr-ft$^2$ isopleth is ~~roughly~~ 54~~80~~-feet. (Reference Tables 4.5.5-1 through 4.5.5-3.) Roughly 4.6 miles of the Line 407, Phase I line segment could pose a hazard to existing or proposed buildings. The analysis assumed that one residence or one commercial structure could be affected by a release. A population of up to four per residence and up to ten individuals per commercial building was used.

- Torch Fire, Full Bore Release – These impacts could be significant within 101~~160~~-feet for Line DFM and 643~~520~~-feet for Lines 406 and 407. The ~~3,500 btu/hr-ft$^2$ isopleth extends about 150-feet and 500-feet on either side of the release, measured perpendicular to the release, for Line DFM and Lines 406 and 407 respectively. The~~ 12~~8~~,000 btu/hr-ft$^2$ isopleth extends about 75~~90~~-feet and 260~~300~~-feet on either side of the release, for Line DFM and Lines 406 and 407 respectively. (Reference Tables 4.5.5-1 through 4.5.5-3.) For Lines 406 and 407, the analysis assumed that up to six~~ten~~ residences (four occupants each) and up to two commercial buildings (ten occupants each) could be affected. For Line DFM, the analysis assumed that up to two residences and one commercial structure could be affected.

- Explosion, 1-inch Diameter Pipeline Release ~~–~~ – The overpressure level is less than 1.00 psig. As a result, explosion impacts are not expected to result in public fatalities. ~~These impacts could be significant within 35 feet from each of the line segments. The analysis assumed that one residence or one commercial~~

~~structure could be affected by a release. A population of up to four per residence and up to ten individuals per commercial building was used.~~

- Explosion, Full Bore Pipeline Release - The overpressure level is less than 1.00 psig. As a result, explosion impacts are not expected to result in public fatalities. ~~These impacts could be significant within 55-feet of Line DFM and 380-feet of Lines 406 and 407. A width of exposure to a 1 psig pressure level of 400-feet was assumed for Lines 406 and 407, resulting in up to four residences, housing four individuals per residence and up to two commercial buildings, with 10 occupants each. A population of one residence (four occupants) or one commercial building (ten occupants) was used for Line DFM.~~

### Exposures to Vehicle Occupants

The societal risk analysis for potential impacts to vehicle occupants used the same methodology as outlined ~~earlier~~above ~~for the individual risk~~. However, an average occupancy of two occupants per vehicle was used, instead of one occupant per vehicle for the individual risk analysis.

### Societal Risk Results

Selected results of the societal risk analyses are presented below. The items presented are the cases that resulted in the highest ratio of site casualties to the societal risk criteria. In other words, these cases are those that presented the risks closest to the stated significance criteria. As indicated, the ratio of site casualties to the societal risk criteria is less than 1.0 for each situation. As a result, the societal risk is not considered significant, using the stated societal risk criteria; the number of anticipated site casualties is less than the societal risk criteria corresponding to the exposure probability.

For example, the probability of a rupture torch fire from Line 407 (Phase I) is 9.6e-06 per year. Based on the societal risk criteria (SRC), 23 people would need to be seriously injured or killed before this incident would be considered significant because the likelihood is relatively low. Should this type of incident occur, the analysis indicates that the number of site casualties (SC) would be 18~~2~~. The resulting SC/SRC ratio is 0.79~~53~~. Since this value is less than 1.00, the societal risks posed by this scenario is not considered significant.

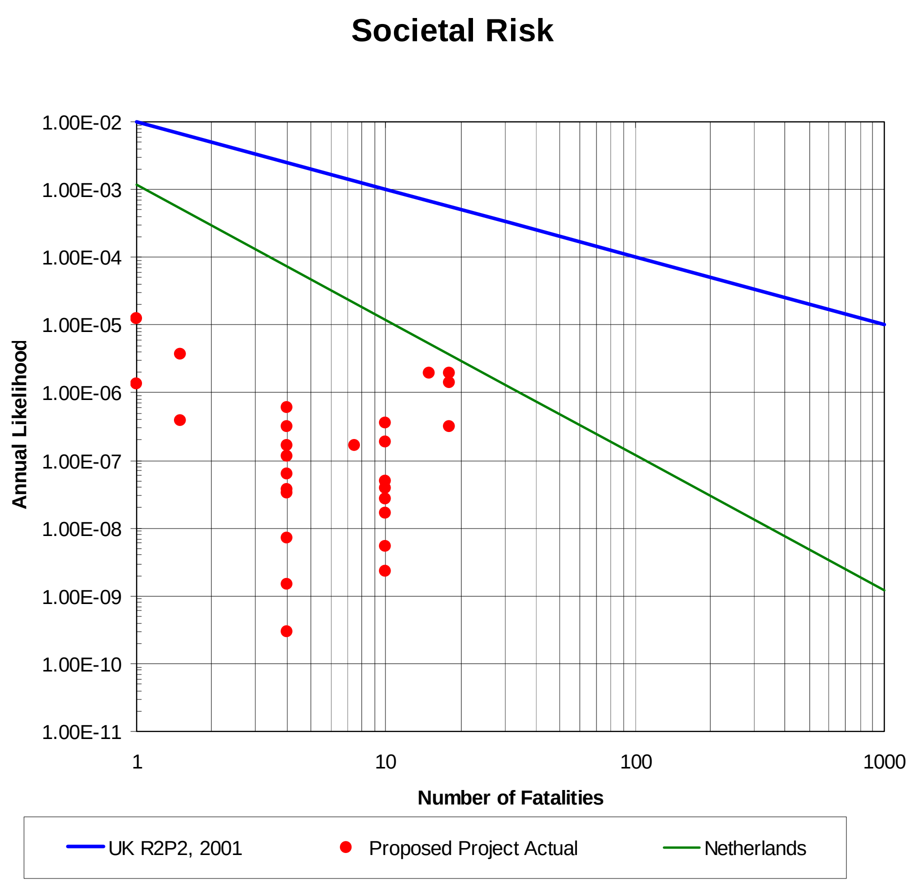
### Table 4.5.10~~1.4-12~~ Societal Risk Summary (Highest Risk Scenarios Only)

| Release | Exposure Probability | Probability of Serious Injury or Fatality to Exposed Individuals | Population Exposed | Number of Site Casualties (SC) | Societal Risk Criteria (SRC) | SC/SRC |
|---|---|---|---|---|---|---|
| **Exposures to Occupants of Residences and Commercial Buildings** | | | | | | |
| Line 406 Rupture Torch Fire Residences | 3.19e-07 | 0.75~~50~~ | 24 | 18~~12~~ | 56 | 0.32~~21~~ |
| Line 407, Phase I Rupture Torch Fire Residences | 9.6e-06 | 0.75~~50~~ | 24 | 18~~12~~ | 23 | 0.79~~53~~ |
| Line 407, Phase I Rupture Torch Fire Commercial | 9.6e-06 | 0.75~~50~~ | 20 | 15~~10~~ | 23 | 0.66~~44~~ |
| **Exposures to Vehicle Occupants** | | | | | | |
| Line 406 Interstate 5 Rupture Explosion | 9.1e-07 | 0.10 | 6 | 0.6 | 33 | 0.02 |
| Line 406 Interstate 5 Rupture Torch Fire | 1.6e-06 | 0.10 | 7 | 0.7 | 25 | 0.03 |
| Line 407 Phase I Baseline Road Rupture Explosion | 1.2e-05 | 0.10 | 3 | 0.3 | 9 | 0.03 |
| Line 407 Phase I Baseline Road Rupture Torch Fire | 1.7e-06 | 0.10 | 4 | 0.4 | 8 | 0.05 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Line 407 Phase I Baseline Road Rupture Flash Fire | 1.9e-06 | 0.10 | 3 | 0.3 | 23 | 0.01 |

These results are presented graphically in the following figure. As indicated, the actual societal risk posed by the proposed project is less than the significance threshold.

**Figure 4.5.10-1 Societal Risk Results**




There are a few release scenarios that could impact both building occupants and vehicle passengers. For example, an explosion along Baseline Road could impact commercial buildings, the residential neighborhood, and vehicle occupants. However, when these data are combined, the resulting societal risk remains below the stated significance threshold.

## 4.6 MITIGATION MEASURES

The following mitigation measures are proposed to reduce the ~~significant~~ impacts posed by this project.

**HAZ-1a.** All pipe to be installed shall meet the following requirements:

- Line pipe shall be manufactured in the year 2000 or later.
- A 6-inch wide polyethylene marker tape shall be installed approximately 12 to 18-inches below the ground surface, above the center of the pipeline. The marking tape shall be brightly colored and shall be marked with an appropriate warning (e.g., Warning – High Pressure Natural Gas Pipeline).
- The pipe wall thickness shall be at least 0.375-inches.
- The depth of cover shall be at least 48-inches.
- 100% of the circumferential welds shall be radiographically inspected in accordance with American Petroleum Institute (API) Standard 1104, Welding of Pipelines and Related Facilities.
- If the in-line inspection required in mitigation measures HAZ-1b below is not implemented because the pipeline is operated below a hoop stress of 40% SMYS, a close interval cathodic protection survey shall be performed at least every seven years on portions of the line not included in the Applicant's Pipeline Integrity Management Program.

**HAZ-1b.** Prior to placing the pipeline system into service, the Applicant shall:

- Submit to the California State Lands Commission (CSLC) and the California Public Utilities Commission (CPUC) an Operation and Maintenance (O&M) manual, prepared in accordance with 49 CFR 192.605. The O&M manual shall address internal and external maintenance inspections of the completed facility, including but not limited to details of integrity testing methods to be applied, corrosion monitoring and testing of the cathodic protection system, and leak monitoring. In addition, the O&M manual shall also include a preventative mitigation measure analysis for the use of automatic shutdown valves per 49 CFR Part 192.935(c) requirements.
- PG&E shall conduct an in-line inspection of the pipeline if the Maximum Allowable Operating Pressure (MAOP) is raised to a pressure that creates a circumferential stress greater than 40% Specified Minimum Yield Strength (SMYS). The in-line inspection tool shall be capable of identifying pipe

anomalies caused by internal and external corrosion and other causes of metal loss.

- A Pipeline Integrity Management Program for High Consequence Area (HCA) portions of the pipeline shall also be prepared in accordance with 49 CFR 192, Subpart O. The Integrity Management Program shall be submitted to the CSLC and CPUC.

**HAZ-1c.** The CSLC shall conduct, or cause to be conducted, an independent, third party design review of the Applicant's construction drawings, supporting calculations, and specifications and shall monitor and observe construction to ensure compliance with all applicable LORS, imposed mitigation, and Applicant proposed mitigation. The Applicant shall make payments to the CSLC for these design reviews, plan checks, and construction inspection services. These design review and construction observation services shall not in any way relieve the Applicant of its responsibility and liability for the design, construction, operation, maintenance and emergency response for these facilities.

### 4.6.1 Rationale for Mitigation

The individual and societal risks are not considered significant. However, there is concern regarding public safety along the pipeline corridor. Measures have been developed which would reduce the likelihood and consequences of unintentional releases. ~~the individual risks identified herein exceed significance thresholds. The significance of these risks is primarily due to the individual risks caused by exposure to possible torch fires and explosions resulting from ruptures within developed areas. The proposed mitigation measures are intended to minimize the likelihood and consequences of pipeline ruptures.~~

The natural gas pipeline incidents, which were identified as "ruptures" in the USDOT database from 2002 through 2006 have been reviewed. The following points are worth noting:

- 46% of the ruptures were considered longitudinal tears or cracks. Of the components where the manufacturing date was provided, the average date of manufacture was 1955 – roughly 50 years old at the time of failure. Roughly three-quarters of these incidents were caused by third party damage and external corrosion, with the remainder being caused by a variety of factors.
- 50% or the ruptures were considered circumferential separation. For these cases, there was not a predominant cause(s).
- 4% or the ruptures were considered "other".

### Third Party Damage Mitigation Effectiveness

In western Europe, the effectiveness of various forms of third party damage mitigation has been studied (HSE 2001). The findings are summarized below:

- Increased Wall Thickness – For 24-inch diameter pipe, a wall thickness of 0.375-inches or greater was found to reduce the frequency of third party caused unintentional releases by 80%. In other words, the incident rate was 20% of the norm. (The Applicant has proposed wall thicknesses that are equal to or greater than 0.375-inches for much of the project.)
- Increased Depth of Cover – Pipelines with a depth of cover of 48-inches or greater experienced a 30% reduction in third party caused incidents. (The incident rate was 70% of the norm.)
- Supplemental Third Party Protection – Pipelines protected with some form of third party warning device (e.g., marker tape, concrete cap, steel plates, etc.) experienced a reduction in third party caused incidents of 10%. (The incident rate was 90% of the norm.)

By implementing the above measures, the frequency of third party caused incidents may be reduced by roughly one-third.

### External Corrosion~~s~~ Mitigation Effectiveness

Although data is not available to quantify the effectiveness of the external corrosion mitigation measures, the qualitative impacts can be summarized as follows:

- Increased Wall Thickness – Although increased pipe wall thickness does not prevent external corrosion, it allows more time to pass before a leak may result. This increased time period increases the likelihood that the anomaly will be identified by the operator before a release occurs.
- In-Line Inspection – Internal inspections of pipelines using modern techniques can identify external corrosion and other pipe wall anomalies, reducing the likelihood of a release.
- Close Interval Survey – Close interval cathodic protection surveys can identify coating defects and potential metal loss before a release is experienced.

### Circumferential Separation

Inspecting 100% of the circumferential welds in accordance with API 1104 will decrease the likelihood of weld defects, which caused a portion of the circumferential separation ruptures noted in the USDOT database.

## 4.6.2 Residual Impacts

With the proposed mitigation, the individual risk would be reduced by roughly one-half, as summarized in the following table. ~~However, the individual risk would still be approximately 1:30,000 which exceeds individual risk significance thresholds by a factor of thirty.~~

~~It should be noted that there are a significant number of similar natural gas pipelines located in similar, and even more heavily urbanized areas. Many of these pipelines pose a greater risk to the public than the proposed line segments. The risks posed by these facilities have been generally accepted as a cost of modern living.~~

**Table 4.6.2-1 Post Mitigation Individual Risk Result Summary**

| Pipeline Segment | Post Mitigation Maximum Annual Risk of Fatality | Post Mitigation Maximum Annual Probability of Occurrence | Significance Threshold |
|---|---|---|---|
| **Simplified Analysis** | | | |
| Line 406 | $1.97 \times 10^{-7}$ | 1 : 5,076,000 | 1 : 1,000,000<br>Less Than Significant |
| Line 407 | $1.92 \times 10^{-7}$ | 1 : 5,220,000 | 1 : 1,000,000<br>Less Than Significant |
| Line DFM | $8.04 \times 10^{-8}$ | 1 : 12,440,000 | 1 : 1,000,000<br>Less Than Significant |
| **Enhanced Analysis** | | | |
| Line 406 | $2.34 \times 10^{-7}$ | 1 : 4,274,000 | 1 : 1,000,000<br>Less Than Significant |
| Line 407 | $2.43 \times 10^{-7}$ | 1 : 4,115,000 | 1 : 1,000,000<br>Less Than Significant |
| Line DFM | $1.18 \times 10^{-7}$ | 1 : 8,475,000 | 1 : 1,000,000<br>Less Than Significant |

## ~~4.1.5~~4.7 IMPACTS OF ALTERNATIVES

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 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 3-2 of the Final EIR.

The identified alternatives have been analyzed in the same manner that was used to analyze the proposed project. From a public risk standpoint, the alternatives present slightly different risks, since each route has slightly different lengths of line which could affect the public in the event of a release and subsequent fire and/or explosion

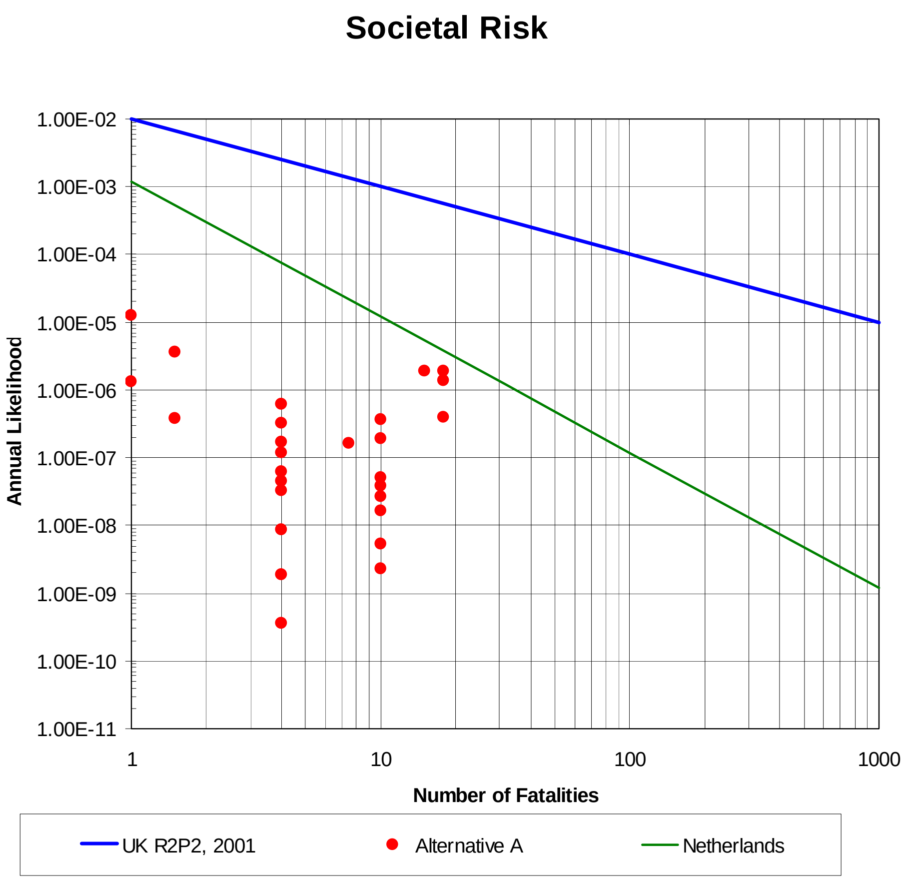
### 4.7.1 No Project Alternative

The "no project" alternative would eliminate the risks posed by the project, provided the operating pressures, sizes, and other operating parameters of existing natural gas facilities were not changed.

### 4.7.2 Option A

This option would realign a portion of Line 406 along County Road 16 and 15B. This would increase the length of Line 406 which would pose an impact to existing residences and roadways. The individual risk would not be affected by this change, since the individual risk is the likelihood of fatality at a specific point along the pipeline; it does not take into account the length of the line segment. The societal risk result would remain below the significance threshold as depicted in the following figure.~~The annual likelihood of serious injury or fatality along Line 406 would increase 22%, from 2.89x10~~$^{-6}$ ~~to 3.52x10~~$^{-6}$~~. The overall likelihood of serious injury or fatality for all of the proposed line segments would increase 1%, from 6.08x10~~$^{-5}$ ~~to 6.16x10~~$^{-5}$~~.~~

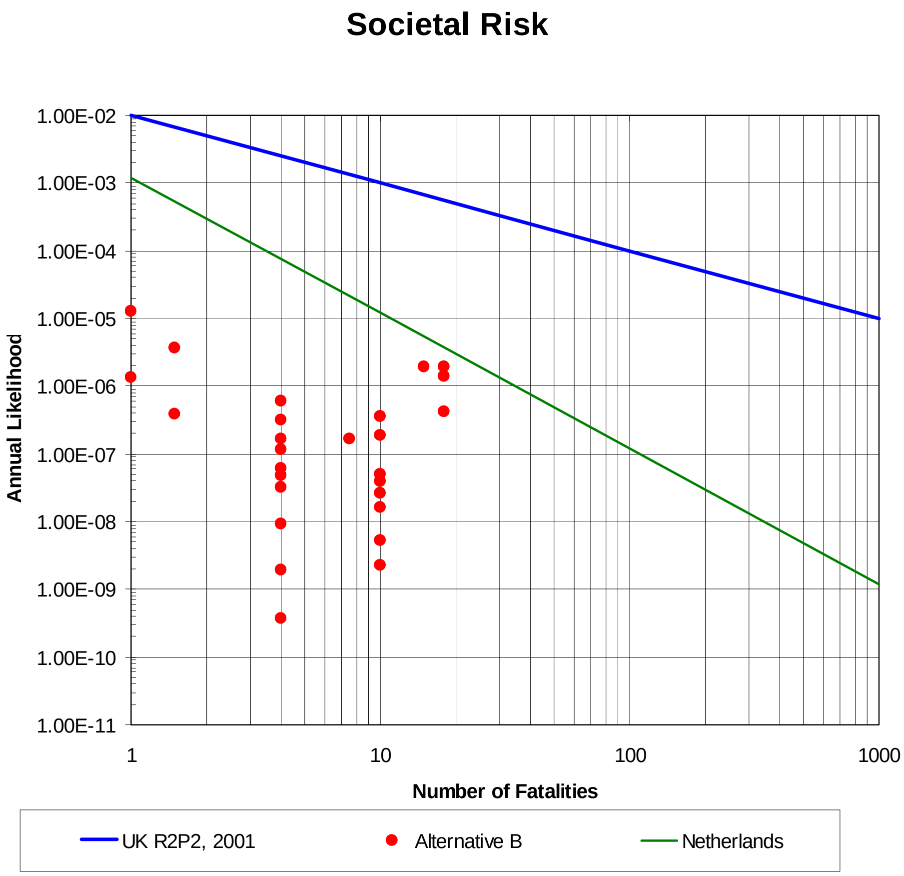
**Figure 4.7.2-1 Option A Societal Risk Results**




## 4.7.3 Option B

Similar to option A, this option 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 individual risk would not be affected by this change, since the individual risk is the likelihood of fatality at a specific point along the pipeline; it does not take into account the length of the line segment. The societal risk result would remain below the significance threshold as depicted in the following figure.~~The annual likelihood of serious injury or fatality along Line 406 would increase 29%, from 2.89x10~~$^{-6}$ ~~to 3.72x10~~$^{-6}$~~. The overall likelihood of serious injury or fatality for all of the proposed line segments would increase 2%, from 6.08x10~~$^{-5}$ ~~to 6.18x10~~$^{-5}$~~.~~

**Figure 4.7.3-1  Option B Societal Risk Results**




## 4.7.4 Option C

The risks posed by this option are essentially the same as the proposed project.

## 4.7.5 Option D

This option would realign a portion of Line 406. The primary change would be to extend the portion of line along County Road 17. This would increase the length of Line 406 which would pose an impact to existing residences and roadways. The individual risk would not be affected by this change, since the individual risk is the likelihood of fatality at a specific point along the pipeline; it does not take into account the length of the line segment. The societal risk result would remain below the significance threshold. The societal risk would be essentially the same as for option B, presented in Figure 4.7.3-1. ~~The annual likelihood of serious injury or fatality along Line 406 would increase 30%,~~

~~from 2.89x10$^{-6}$ to 3.75x10$^{-6}$. The overall likelihood of serious injury or fatality for all of the proposed line segments would increase 2%, from 6.08x10$^{-5}$ to 6.18x10$^{-5}$.~~

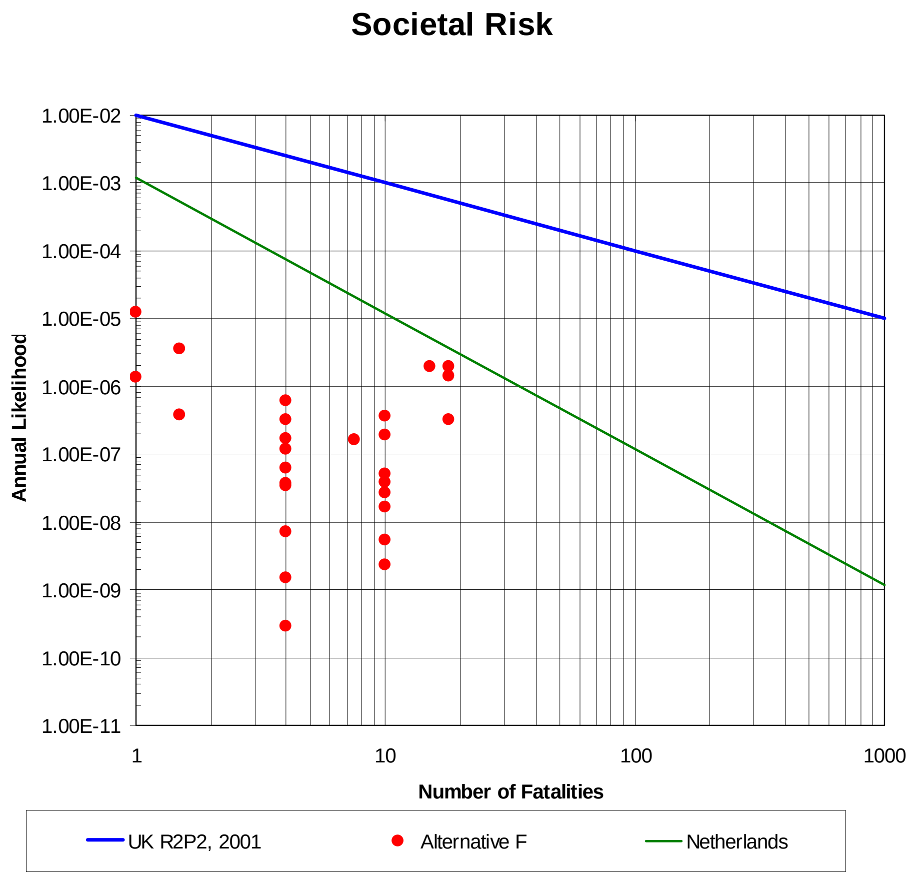
### 4.7.6 Option E

This option would realign a portion of Line 406. The primary change would be to extend the portion of line along County Road 19. This would increase the length of Line 406 which would pose an impact to existing residences and roadways. The individual risk would not be affected by this change, since the individual risk is the likelihood of fatality at a specific point along the pipeline; it does not take into account the length of the line segment. The societal risk result would remain below the significance threshold. The societal risk would be in between that presented for options A and B, as depicted in Figures 4.7.2-1 and 4.7.3-1. ~~The annual likelihood of serious injury or fatality along Line 406 would increase 24%, from 2.89x10$^{-6}$ to 3.57x10$^{-6}$. The overall likelihood of serious injury or fatality for all of the proposed line segments would increase 1%, from 6.08x10$^{-5}$ to 6.16x10$^{-5}$.~~

### 4.7.7 Option F

This option would realign a portion of Line 407, Phase II. The realignment would result in minimal changes to the risks posed to the public. The individual risk would not be affected by this change, since the individual risk is the likelihood of fatality at a specific point along the pipeline; it does not take into account the length of the line segment. The societal risk result would remain below the significance threshold as depicted in the following figure. ~~The annual likelihood of serious injury or fatality along Line 407, Phase II would increase 3%, from 7.75x10$^{-6}$ to 7.99x10$^{-6}$. The overall likelihood of serious injury or fatality for all of the proposed line segments would increase less than 1%, from 6.08x10$^{-5}$ to 6.12x10$^{-5}$.~~

**Figure 4.7.7-1 Option F Societal Risk Results**




## 4.7.8 Option G

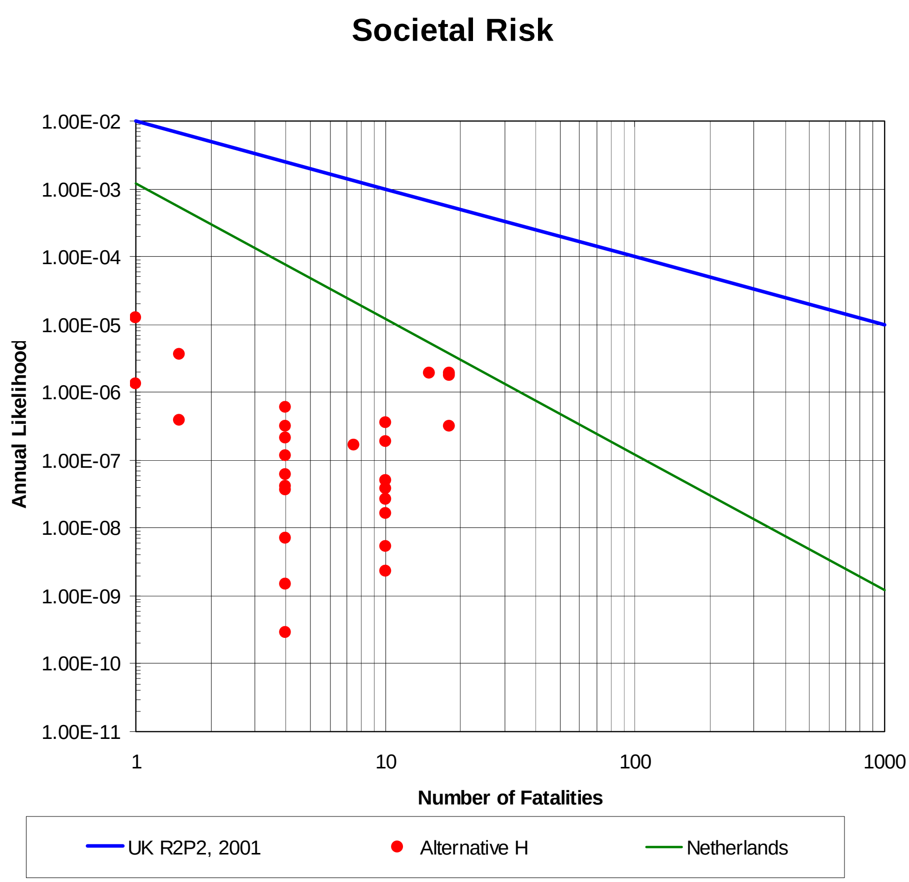
The risks posed by this option are essentially the same as the preferred project.

## 4.7.9 Option H

This option would realign a portion of Line 407, Phase II, adding to the potential impacts to vehicle occupants along Powerline Road and West Elverta Road. The realignment would result in slight increases to the risks posed to the public. The individual risk would not be affected by this change, since the individual risk is the likelihood of fatality at a specific point along the pipeline; it does not take into account the length of the line segment. The societal risk result would remain below the significance threshold as depicted in the following figure. ~~The annual likelihood of serious injury or fatality along Line 407, Phase II would increase 28%, from 7.75x10~~~~$^{-6}$~~ ~~to 9.92x10~~~~$^{-6}$~~~~. The overall~~

~~likelihood of serious injury or fatality for all of the proposed line segments would increase less than 4%, from 6.08x10$^{-5}$ to 6.31x10$^{-5}$.~~

**Figure 4.7.9-1 Option H Societal Risk Results**




## 4.7.10 Option I

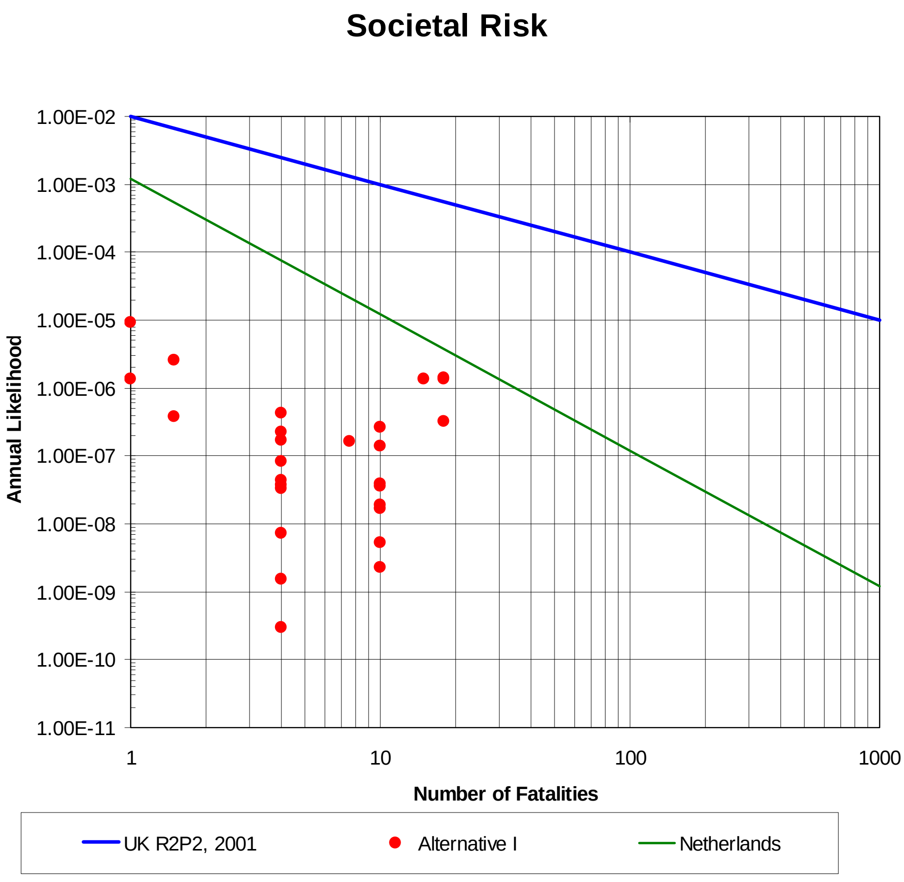
This option would realign a portion of Line 407, Phase I to place the line outside the 1,500-foot buffer zone around a planned high school (PG&E 2009). This alternative would:

- Add approximately 3,000 lineal 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 lineal feet of potential impacts to vehicle occupants along both South Brewer and Country Acres Roads.

- Add impacts to existing rural residences.

The individual risk would not be affected by this change, since the individual risk is the likelihood of fatality at a specific point along the pipeline; it does not take into account the length of the line segment. The societal risk would remain below the significance threshold as depicted in the following figure. ~~The annual likelihood of serious injury or fatality along Line 407, Phase I would decrease 14%, from 1.99x10$^{-5}$ to 1.71x10$^{-5}$. The overall likelihood of serious injury or fatality for all of the proposed line segments would decrease 5%, from 6.08x10$^{-5}$ to 5.80x10$^{-5}$.~~

**Figure 4.7.10-1 Option H Societal Risk Results**




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 proposed natural gas line beyond the specified 1,500-foot school buffer.

### 4.7.11 Option J

This option J is very similar to Option I discussed above. It would realign a portion of Line 407, Phase I to place the line outside the 1,500-foot buffer zone around a planned high school (PG&E 2009). This alternative would:

- Add approximately 5,200 lineal 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 lineal feet of potential impacts to vehicle occupants along South Brewer Road.
- Add roughly 2,000 lineal feet of potential impacts to vehicle occupants along Country Acres Road.
- Add impacts to existing rural residences.

The individual risk would not be affected by this change, since the individual risk is the likelihood of fatality at a specific point along the pipeline; it does not take into account the length of the line segment. The societal risk would remain below the significance threshold. The societal risk would be very similar to that posed for Option I, presented in Figure 4.7.10-1. ~~The annual likelihood of serious injury or fatality along Line 407, Phase I would decrease 10%, from 1.99x10$^{-5}$ to 1.80x10$^{-5}$. The overall likelihood of serious injury or fatality for all of the proposed line segments would decrease 3%, from 6.08x10$^{-5}$ to 5.89x10$^{-5}$. This realignment would place the proposed natural gas line beyond the specified 1,500-foot school buffer.~~

### 4.7.12 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 individual risk would not be affected by this change, since the individual risk is the likelihood of fatality at a specific point along the pipeline; it does not take into account the length of the line segment. The societal risk would remain below the significance threshold. ~~The annual likelihood of serious injury or fatality along Line 407, Phase I would decrease less than 2%, from 1.99x10$^{-5}$ to 1.96x10$^{-5}$. The overall likelihood of serious injury or fatality for all of the proposed line segments would decrease less than 1%, from 6.08x10$^{-5}$ to 6.05x10$^{-5}$.~~

Although this realignment would not 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 1,400~~1,350~~ feet from the school boundary. The distances to various impacts from the proposed pipeline are summarized below. As noted, the impacts are very minor at distances greater than 800 to 1,000 feet.

**Table 4.7.12~~5.1.5~~-1 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% 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.~~ |
| 48~~50~~ feet | 8,000 btu/hr-ft$^2$ heat flux from 1-inch diameter release torch fire, downwind release 45° above horizon. 50% mortality anticipated to those exposed after 30 second exposure. |
| 66 feet | 8,000 btu/hr-ft$^2$ heat flux from 1-inch diameter release torch fire, downwind release 15° above horizon. 50% mortality anticipated to those exposed after 30 second exposure. |
| 70 feet | 3,500 btu/hr-ft$^2$ heat flux from 1-inch diameter release torch fire, downwind 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, downwind release 45° above horizon. Second degree skin burns after thirty seconds of exposure. |
| 357~~60~~ feet | Distance to lower flammability limit (flash fire boundary) from full bore downwind 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% 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% probability of serious injury or fatality to occupants in reinforced concrete or reinforced masonry building from flying glass and debris.~~ |
| 422 feet | 12,000 btu/hr-ft$^2$ heat flux from full bore release torch fire, downwind release 45° above horizon. 100% mortality after 30 second exposure. |
| 517~~520~~ feet | 8,000 btu/hr-ft$^2$ heat flux from full bore release torch fire, downwind release 45° above horizon. 50% mortality anticipated to those exposed after 30 second exposure. |
| 534 feet | Distance to lower flammability limit (flash fire boundary) from full bore downwind release at 15° 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. |
| ~~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.~~ |
| 600 feet | 5,000 btu/hr-ft$^2$ heat flux from full bore release torch fire, downwind release 45° above horizon. California Department of Education uses 1% mortality to those exposed for 30 second exposure. |
| 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. |
| 643 feet | 12,000 btu/hr-ft$^2$ heat flux from full bore release torch fire, downwind release 15° above horizon. 100% mortality after 30 second exposure. |
| 673 feet | 8,000 btu/hr-ft$^2$ heat flux from full bore release torch fire, downwind release 15° above horizon. 50% mortality after 30 second exposure. |
| 730 feet | 3,500 btu/hr-ft$^2$ heat flux from full bore release torch fire, downwind 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% mortality anticipated to those exposed.~~ |
| 746~~820~~ feet | 5,000 btu/hr-ft$^2$ heat flux from full bore release torch fire, downwind release 15° above horizon.~~horizontal release.~~ ~~California Department of Education uses~~ 1% mortality after 30 second exposure~~to those exposed~~. |
| **Boundary of Serious Harm** | |
| 820 feet | Distance to lower flammability limit (flash fire boundary) from full bore downwind 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. |
| **Worst Case Boundary of Serious Harm** | |
| 940 feet | 1,600 btu/hr-ft$^2$ heat flux from full bore release torch fire, downwind 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, downwind 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% window glass breakage. No injuries.~~ |
| 1,370 feet | 440 btu/hr-ft$^2$ heat flux from full bore release torch fire, downwind 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, downwind 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.~~ |

It should be noted that the California Department of Education (CDE), Guidance Document for School Site Pipeline Risk Analysis (Guidance Document) considers 1% mortality (fatality probability of 1%) to be the reasonable estimate of the boundary of serious harm. It is considered the demarcation between threat (1% mortality) and no-threat (0% mortality). Using this criterion, the following boundary distances could be established from the proposed Line 407, Phase I, to proposed school sites:

- Explosion – The peak overpressure level of an outdoor explosion from any of the three pipeline segments is 0.38 psig (medium fuel reactivity and low obstacle density. This overpressure is less than the level required to cause fatalities. ~~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% 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 – 534~~640~~ feet. This is the downwind distance to the lower flammability limit of an unignited vapor cloud from a full bore ~~horizontal~~ release at 15° above the horizon, under the typical conditions outlined in Table 4.1.4-4. 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. (See also Section 5.0, Atmospheric Condition Sensitivity Analysis.)
- Torch Fire – 746~~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% mortality after a 30 second exposure. 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)

### 4.7.13 Option L

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. The estimated baseline risk of unintentional release would be reduced roughly one-third, from 1.96x $10^{-4}$ to 1.2x$10^{-4}$. The individual risk would not be affected by this change, since the individual risk is the likelihood of fatality at a specific point along the pipeline; it does not take into account the length of the line segment. The societal risk probability of exposure along Line 407 Phase I would be decreased less than 3%, remaining below the significance threshold. ~~The annual likelihood of serious injury or fatality along Line 407, Phase I would decrease less than 3%, 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%, from 6.08x10$^{-5}$ to 6.03x10$^{-5}$.~~

~~Summary of Alternatives~~

~~Although most of the alternatives pose slightly higher risks than the proposed project, the various project alternatives pose very minor changes to the overall project risk.~~

**~~Table 4.1.5-1 Summary of Alternatives Risk~~**

| ~~Project Alternative~~ | ~~Annual Risk of Serious Injury or Fatality~~ | ~~Annual Likelihood of Serious Risk or Fatality~~ |
|---|---|---|
| ~~Proposed Project~~ | ~~6.08e-05~~ | ~~1 : 16,000~~ |
| ~~Option A~~ | ~~6.16e-05~~ | ~~1 : 16,000~~ |
| ~~Option B~~ | ~~6.18e-05~~ | ~~1 : 16,000~~ |
| ~~Option C~~ | ~~6.08e-05~~ | ~~1 : 16,000~~ |
| ~~Option D~~ | ~~6.18e-05~~ | ~~1 : 16,000~~ |
| ~~Option E~~ | ~~6.16e-05~~ | ~~1 : 16,000~~ |
| ~~Option F~~ | ~~6.12e-05~~ | ~~1 : 16,000~~ |

| | | |
|---|---|---|
| ~~Option G~~ | ~~6.08e-05~~ | ~~1 : 16,000~~ |
| ~~Option H~~ | ~~6.31e-05~~ | ~~1 : 16,000~~ |
| ~~Option I~~ | ~~5.80e-05~~ | ~~1 : 17,000~~ |
| ~~Option J~~ | ~~5.89e-05~~ | ~~1 : 17,000~~ |
| ~~Option K~~ | ~~6.05e-05~~ | ~~1 : 17,000~~ |
| ~~Option L~~ | ~~6.03e-05~~ | ~~1 : 17,000~~ |

### ~~4.1.6~~4.8 CUMULATIVE PROJECTS IMPACT ANALYSIS

From a system safety perspective, the proposed project has not been considered as to cumulative impacts.

# 5.0 ATMOSPHERIC CONDITION SENSITIVITY ANALYSIS

The release modeling presented herein and in the Final EIR assumed a single combination of wind and stability for flash fires and vapor cloud explosions and a single wind speed for evaluating torch fire impacts. The intent was to select the parameters which depict a conservative average release. While some releases may result in impacts at greater distances from the pipeline, the probability of these events would be relatively small. In most instances, the distances to impacts would be less than those incorporated into the analysis. The following paragraphs present the modeling results for a variety of atmospheric conditions and compare them to those used in the analysis.

## 5.1 FLASH FIRES

The downwind distances to the lower flammability limit (LFL), which would be the maximum downwind distances to the flash fire boundaries are shown in Table 5.1-1 and 5.1-2 below. It should be noted that these are the maximum downwind distances only; they do not take into account the fact that the vapor cloud may be located overhead. For example, for the releases at 45° above grade, the vast majority of the vapor cloud is located well above grade. Specifically, for a rupture release at 45° above the horizon from Line 406, the bottom of the combustible portion of the vapor cloud would be 230-feet above grade at 300-feet from the release. As a result, one would not be exposed to flash fire impacts at this location; the flash fire would be located overhead. The analysis conservatively used the horizontal projection of the overhead vapor cloud in establishing flash impact distances. However, for the pipe segments associated with this project, in both the simplified and enhanced analysis, the risk posed by flash fires is only about one percent (1%) of the total. As a result, although this approach is conservative, it does not appreciably affect the results.

**Table 5.1-1 Line 406, Flash Fire Impact Distances, Rupture, Release 45° Above Horizon, Downwind**

| Atmospheric Stability[5] | Wind Speed | | | | | |
|---|---|---|---|---|---|---|
| | **0 mps 0 mph** | **2 mps 4.5 mph** | **4 mps 8.9 mph** | **6 mps 13.4 mph** | **8 mps 17.9 mph** | **10 mps 22.4 mph** |
| **A** | 571 | 172 | 123 | 100 | 86 | 77 |
| **B** | 571 | 224 | 167 | 139 | 123 | 111 |
| **C** | 571 | 278 | 217 | 186 | 166 | 153 |
| **D** | 571 | **347** | 288 | 255 | 234 | 219 |
| **E** | N/A | 430 | 336 | N/A | N/A | N/A |
| **F** | 571 | 528 | N/A | N/A | N/A | N/A |

Notes:
1. The above horizontal downwind distances are to the lower flammability limit, in feet.
2. mps = meters per second.
3. mph = miles per hour.
4. Shaded cell reflects impact distance used in the Final EIR analysis.
5. N/A indicates wind and stability combinations that do not normally occur.

[5] Pasquill-Gifford atmospheric stability is classified by the letters A through F. Stability can be determined by three main factors: wind speed, solar insulation, and general cloudiness. In general, the most unstable (turbulent) atmosphere is characterized by stability class A. Stability A occurs during strong solar radiation and moderate winds. This combination allows for rapid fluctuations in the air and thus greater mixing of the released gas with time. Stability D is characterized by fully overcast or partial cloud cover during daytime or nighttime, and covers all wind speeds. The atmospheric turbulence is not as great during D conditions, so the gas will not mix as quickly with the surrounding atmosphere. Stability F generally occurs during the early morning hours before sunrise (no solar radiation) and under low winds. This combination allows for an atmosphere which appears calm or still and thus restricts the ability to actively mix with the released gas. A stability classification of "D" is generally considered to represent average conditions.

**Table 5.1-2 Line 406, Flash Fire Impact Distances, 1-inch Diameter, Release 45° Above Horizon, Downwind**

| Atmospheric Stability[4] | Wind Speed | | | | | |
|---|---|---|---|---|---|---|
| | 0 mps<br>0 mph | 2 mps<br>4.5 mph | 4 mps<br>8.9 mph | 6 mps<br>13.4 mph | 8 mps<br>17.9 mph | 10 mps<br>22.4 mph |
| A | 48 | 17 | 12 | 10 | 8 | 7 |
| B | 48 | 22 | 16 | 13 | 11 | 10 |
| C | 48 | 25 | 21 | 17 | 15 | 14 |
| D | 48 | **32** | 27 | 23 | 21 | 20 |
| E | N/A | 36 | 31 | N/A | N/A | N/A |
| F | 48 | 39 | N/A | N/A | N/A | N/A |

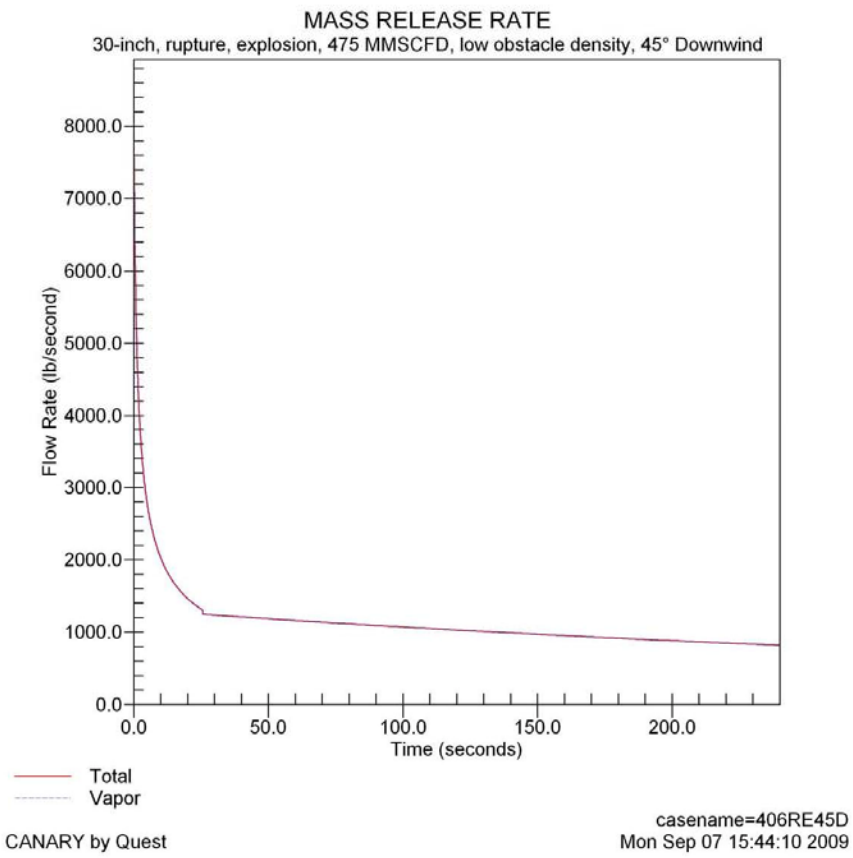
Notes: 1. The above horizontal downwind distances are to the lower flammability limit, in feet.
2. mps = meters per second.
3. mph = miles per hour.
4. Shaded cell reflects impact distance used in the Final EIR analysis.
5. N/A indicates wind and stability combinations that do not normally occur.

## 5.2 TORCH FIRES

In the event that an individual were exposed to radiant heat flux as a result of a continuous fire (e.g., torch fire), the natural reaction would be to increase the distance from the exposure to prevent harmful impacts. In other words, an able bodied individual would be expected to move away from and/or find protection to avoid injury. The analyses presented in the Final EIR and herein assumed a thirty (30) second exposure time in evaluating torch fire impacts; it assumed that those exposed to torch fire impacts would be exposed for thirty (30) seconds and that they would not seek shelter or move further from the hazard. Fatalities could occur from a shorter exposure; but the required radiant heat flux levels would be much higher and the impact distances would be shorter. This method, used herein and in the Final EIR, is consistent with that used by the California Department of Education and others. (CDE 2007)

The analyses presented in the Final EIR and herein conservatively assumed that ignition occurred immediately after the initiation of a release. This results in the longest torch fire impact distances for pipeline ruptures. As shown in Figure 5.2-1 below, the mass flow rate from a given pipeline release decays rapidly after a pipeline rupture, as the pipeline depressurizes. As the mass flow rate decays, the resulting torch flame length becomes shorter and smaller, resulting in shorter distances to a given radiant heat flux level. As a result, when the ignition is delayed, the distances to significant levels of radiant heat flux are reduced. The torch fire impact distances for 1-inch releases are not normally affected by the time between release and ignition, since the mass flow rate is essentially constant, due to the relatively large volume of gas stored within the pipeline.

**Figure 5.2-1 Typical Pipeline Rupture Mass Release Flow Rate**




The downwind torch fire impact distances for pipeline ruptures and 1-inch diameter release are presented in the tables which follow.

## Table 5.2-1 Line 406, Torch Fire Impact Distances, Rupture, Release 45° Above Horizon, Downwind

| Radiant Heat Flux Endpoint 30 Second Exposure | Wind Speed | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 0 mps 0.0 mph | 2 mps 4.5 mph | 4 mps 8.9 mph | 6 mps 13.4 mph | 8 mps 17.9 mph | 10 mps 22.4 mph | 12 mps 26.9 mph | 14 mps 31.4 mph | 16 mps 35.8 mph |
| 100% Mortality 12,000 btu/hr-ft$^2$ | 235 | 297 | 376 | 397 | 409 | 416 | 424 | 445 | 453 |
| 50% Mortality 8,000 btu/hr-ft$^2$ | 409 | 459 | 487 | 496 | 502 | 507 | 512 | 534 | 540 |
| 1% Mortality 5,000 btu/hr-ft$^2$ | 585 | 602 | 606 | 607 | 609 | 612 | 615 | 617 | 619 |

Notes: 1. The above horizontal distances are in feet.
2. mps = meters per second.
3. mph = miles per hour.
4. The Final EIR and the analyses presented herein used a wind speed of 20 mph.

## Table 5.2-2 Line 406, Torch Fire Impact Distances, 1-inch Diameter, Release 45° Above Horizon, Downwind

| Radiant Heat Flux Endpoint 30 Second Exposure | Wind Speed | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 0 mps 0.0 mph | 2 mps 4.5 mph | 4 mps 8.9 mph | 6 mps 13.4 mph | 8 mps 17.9 mph | 10 mps 22.4 mph | 12 mps 26.9 mph | 14 mps 31.4 mph | 16 mps 35.8 mph |
| 100% Mortality 12,000 btu/hr-ft$^2$ | 20 | 38 | 53 | 60 | 62 | 63 | 65 | 64 | 64 |
| 50% Mortality 8,000 btu/hr-ft$^2$ | 29 | 49 | 61 | 65 | 67 | 66 | 66 | 66 | 65 |
| 1% Mortality 5,000 btu/hr-ft$^2$ | 42 | 61 | 70 | 73 | 73 | 72 | 71 | 71 | 70 |

Notes: 1. The above horizontal distances are to the lower flammability limit, in feet.
2. mps = meters per second.
3. mph = miles per hour.
4. The Final EIR and the analyses presented herein used a wind speed of 20 mph.

## 5.3 VAPOR CLOUD EXPLOSIONS

As noted in the Final EIR, the maximum anticipated peak overpressure level was only 0.38 psig. This value is not sufficient to result in fatalities to those located outdoors. In the rural areas and relatively open residential and commercial areas along the pipeline corridor, the peak overpressure levels will range from 0.02 to 0.38 psig, due to the lack of confinement. These overpressure levels will not result in fatalities. The anticipated frequencies of fatalities resulting from explosions are presented in Table 5.3-1 below.

### Table 5.3-1 Explosion Overpressure Levels

| Mortality Rate | Outdoor Exposure (psig) | Indoor Exposure (psig) |
|---|---|---|
| **99% Mortality** | 29 | 13 |
| **50% Mortality** | 13 | 5.7 |
| **1% Mortality** | 2.3 | 2.3 |

(CDE 2007)

## 6.0 MODELING ASSUMPTIONS

A number of assumptions have been made in order to conduct the risk analyses presented herein. For the most part, these assumptions are conservative and tend to result in an overstatement of risk. The major assumptions and methodology which affect the results presented herein are summarized below:

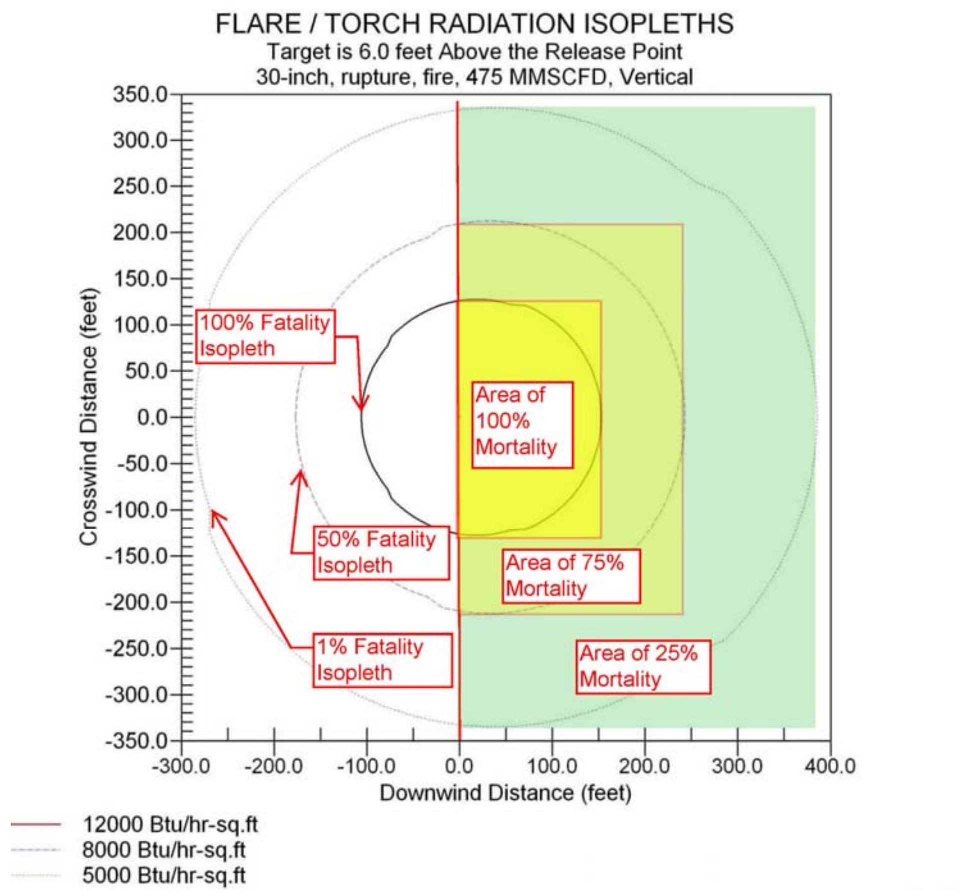
- Wind Direction – For all releases, the wind was assumed to blow perpendicular to the pipeline. This results in the greatest distance to the various impact levels for downwind situations.

- Torch Fire Immediate Ignition – The torch fire analyses assumed that the ignition was immediate after the initiation of a release; in other words, all releases where an ignition source was present that resulted in a torch fire were assumed to result from immediate ignition. This approach results in the longest torch fire impact distances for pipeline ruptures. As shown in Figure 5.2-1 previously, the mass flow rate from a given pipeline release decays rapidly after a pipeline rupture, as the pipeline depressurizes. As the mass flow rate decays, the resulting torch fire flame length becomes shorter and smaller, resulting in shorter distances to a given radiant heat flux level. As a result, when the ignition is delayed, the distances to significant levels of radiant heat flux are reduced. The average mass flow rate for the first sixty seconds of the release was used to determine the mass flow rate for all torch fires. The torch fire impact distances for 1-inch diameter releases are not affected by the time between release and ignition, since the mass flow rate is essentially constant, due to the relatively large volume of gas stored within the pipeline.

- Flash Fires – For flash fire impacts which were located overhead, the horizontal extent of the hazard was projected to grade level. This results in some overstatement of the impact since an overhead flash fire would not normally impact those on the ground. For example, for the releases at 45° above grade, the vast majority of the vapor cloud is located well above grade. Specifically, for a rupture release at 45° above the horizon from Line 406, the bottom of the combustible portion of the vapor cloud would be 230-feet above grade at 300-feet from the release. As a result, one would not be exposed to flash fire impacts at this location; the flash fire would be located overhead. The analyses conservatively used the horizontal projection of the overhead vapor cloud in establishing flash fire impact distances. However, for these pipe segments, the risk posed by flash fires is only a small portion of the total. As a result, although this approach is conservative, it does not appreciably affect the results.

- Quantification of Results – Most of the impact isopleths from a release are in the general shape of an ellipse. For example, the figure below presents the torch fire isopleths for various mortality levels for a vertical release. These isopleths are elliptical. However, in performing the analyses, the areas of mortality were assumed to be rectangular, as shown in the figure. This results in some conservatism, since the area outside the ellipse but inside the rectangle is subject to less risk than assumed in the analyses.

**Figure 6.0-1 Typical Pipeline Rupture Mass Release Flow Rate**




- Torch Fire Exposure - A thirty (30) second exposure was assumed for all individuals exposed to radiant heat flux levels resulting from torch fires. This conservatively assumes that able bodied persons would not take efforts to find shelter or distance themselves from the hazard for the entire duration of the exposure; if they did, the risk would be reduced.

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# Appendix J: Public Hearing Transcripts

PUBLIC MEETING

BEFORE THE

CALIFORNIA STATE LANDS COMMISSION

| | | |
|---|---|---|
| In the Matter of: | ) | |
| | ) | |
| PG&E Line 406 and Line 407 | ) | CSLC EIR No.: 740 |
| Natural Gas Pipeline | ) | |
| CSLC Ref Files: W30169-4, | ) | |
| W26210; R19806 | ) | |
| SCH#: 2007062091 | ) | |

ROSEVILLE SPORTS CENTER/
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MEETING ROOM

1501 PLEASANT GROVE BLVD

ROSEVILLE, CALIFORNIA

WEDNESDAY, JUNE 3, 2009

3:00 P.M.

Reported by:
Ramona Cota, CERT

APPEARANCES

COMMISSION STAFF AND CONTRACTORS

Gail Newton

Crystal Spurr

Kerri Mikkelsen Tuttle
Michael Brandman Associates

ALSO PRESENT

Bill Dibble

Alisa Stephens

Nick Alexander
Representing DF Properties

Norepaul Mouaryang

Mai Neng Yang

INDEX

PROCEEDINGS

3:00 P.M.

MS. SPURR: It's June 3, 2009 and I'm going to start the public meeting to hear comments on the Draft Environmental Impact Report for the PG&E line 406, 407 natural gas pipeline and it's about 3 o'clock.

We're going to have another meeting at 5:30 so you can also stay and provide comments at that meeting. We'll have a meeting, another two meetings in Woodland as well tomorrow evening. We're going to --

MR. DIBBLE: At 3:00 and 5:30?

MS. SPURR: At 3:00 and 5:30, yes. It was on the Notice of Availability of the draft EIR, which I have copies on the back table if you didn't get one.

The next meeting in Woodland will be at St. Luke's Episcopal Church tomorrow.

We're going to transcribe this meeting so that we have a record of your comments and we will be responding to those in the Final Environmental Impact Report.

What I'm going to do first is to go through the CEQA process and then we are going to have a presentation on the Environmental Impact Report itself.

There's a sign-in sheet in the back. We probably have most of your names and addresses on our mailing list. But if we don't please sign in and provide your name and address and we'll send you a copy of the notice when our commission, when this Draft EIR goes to our commission for certification.

We also have speaker slips. I think most of you heard me. If you want to speak please put your name on a speaker slip and hand it to me and I'll call you up one at a time.

The Environmental Impact Report was prepared in accordance with the California Environmental Quality Act or CEQA.

We sent out, this has been a long process on this Draft EIR. We originally sent out a notice of preparation on June 19, 2007.

We had scoping meetings on July 9th and July 10th both in Woodland and in Roseville.

And we responded to those comments that we received, both the transcripts of the meetings and the written comments that we received, and we tried to address those in this Environmental Impact Report.

The comment period, we released this draft report for public comment on April 29, 2009. The public review period will end on June 12, 2009 at 5:00 p.m. So please get your comments in, your written comments. If you have any please get those into me by June 12, 2009 at 5:00 p.m. I accept those by fax, e-mail or you can mail them to me.

Once that comment period ends we will respond to all the comments that we've received in a Final Environmental Impact Report. And I will send copies of that to all our commentors. And you'll receive that 10 to 15 days before the commission meeting.

We're expecting to have a commission meeting in August, sometime in August. We don't have an exact date. We just had a commission meeting June 1st.

So typically every two months our commission will meet. But we don't have that schedule yet.

We will be sending out notices on when the commission meeting will be held for this Environmental Impact Report at least 10 to 15 days prior to that hearing date.

We'll also have on our website, if you check that frequently, we'll have a list of our commission meetings.

And this meeting is merely to be held just to hear comments on the Draft EIR. We're not going to a have question and answer session, although we can do that after the close of this meeting. If you want to stick around we'll be available to talk to you, any other questions that you have.

You won't get the opportunity to comment again on this Draft EIR and the Final EIR before the commission who makes the decision whether to certify the EIR and approve the project.

So this is your first opportunity and your last opportunity before it be the commission.

Does anyone have any questions on the CEQA process?

Okay, I'd like to introduce Kerri Mikkelsen Tuttle. She's with Michael Brandman Associates. And they helped us prepare the Draft Environmental Impact Report. She's going to give a presentation on, a brief presentation, on the Impact Report. And then I'll give you an opportunity to ask specific questions on the Draft Environmental Impact Report before I open it up for public comment.

MS. MIKKELSEN TUTTLE: Thanks Crystal. Can everybody hear me? As many of you who have seen the doorstop-size volume of the Draft EIR, I'm not going to have time to go into a lot of detail. I'll try to hit the highlights of those topics that I think that people will be interested in. So I'll start out with a brief project overview discussing the project location.

I do want to point out that at the close of our presentation in the question and answer session we have some large-scale maps focusing on the Baseline School alternatives, the Hungry Hollow area and the entire project and the options that were considered that are large-scale. They are easier to see than my slides are going to be and I encourage to take a look at those.

The proposed project involves the construction and operation of three new transmission pipelines. Line 406, line 407 East and West and the Powerline Road Distribution Feeder Main. In the EIR that's acronym DFM and I'll use that in my talk today.

Once fully constructed the pipelines would extend 40 miles through four counties, Yolo, Sutter, Placer and Sacramento.

In addition to the pipeline itself PG&E is proposing to construct six above-ground pressure limiting and regulating metering and mainline valve stations along the alignment.

Those are designed to insure that proper pressures are maintained in the transmission system and to reduce the pressure of the gas before it's delivered to the distribution pipeline system.

This is a schematic of the project. The blue boxes, excuse me I don't have a pointer, but with the exception of this blue box which is the existing, the blue boxes here show the proposed above-ground stations along the pipeline route.

In terms of the land requirements of the proposed project, construction is going to be taking place within a 100 foot wide right-of-way.

That consists of a 50 foot permanent easement and a 50 foot temporary easement that will be used during construction.

Additional temporary use areas consist of some staging areas, for the most part are located in industrial-commercial areas adjacent to the proposed project.

Pipe storage facilities, one that's proposed in Arbuckle, one that's proposed just north of the city of Woodland.

The EIR study area and the impact area.  It's evaluated in the document looks at all of those areas that will potentially be disturbed.

In addition the areas that would need to accommodate construction for the HDD and the borer locations, and I'll define those in just a moment, would be larger.  Approximately 18,000 square foot to 19,000 square foot for HDD locations.  And those would be at the entry and exit for those.

PG&E will be taking a 50 foot permanent easement over the proposed alignment.  Within that easement a 50 foot wide area would have restricted agricultural opportunity. Specifically deep-rooted species such as trees and vines would be excluded. Other agricultural uses would be permitted within the 50 foot right-of-way.

And the 50 foot permanent easement is designed to allow for pipeline maintenance throughout the life of the project as well as to minimize potential damage to the pipeline itself.

Construction is going to involve one of three installation methods. The majority of the pipeline, about 91 percent will be installed using conventional trenching. That's basically digging a trench, following it and back filling it.

HDD, horizontal directional drilling comprises about seven percent of the pipeline. That's a hydraulically powered horizontal drilling rig. It tunnels under large sensitive surveyed features such as wetlands, levees, rivers.

Two percent of the pipeline would be installed using conventional hammer and auger or jack-and-boring methods.

Hammer boring basically drives an open-ended pipe for short distances under roadways and smaller features and the auger and jack-and-bore methods install pipes simultaneously with the excavation process.

The sequence of construction is loosely shown on this slide. Land would be cleared and graded where needed. The topsoil and excavated materials would be removed and stored for placement.

The pipe would then be installed and tested. Following the testing topsoil will be replaced and the land will be restored to its original contours and its original vegetation, or to conditions approved by individual landowners.

The trenches won't remain open for more than five days on average and they'll be back filled within 72 hours of the installation of the pipeline. There are about 21 days between the initial grading and back filling in any given location.

And each of the HDD takes approximately two to four weeks to complete.

Construction would occur between 6 a.m. and 6 p.m. Monday through Saturday with the exception of the HDD installation which would occur continuously over 24 hour periods until the construction is complete.

MR. DIBBLE: Did you say 6 a.m. to p.m. or p.m.?

MS. MIKKELSEN TUTTLE: Six a.m. to 6 p.m.

And construction would require about 90 to 130 workers at any given time. They would be dispersed throughout the pipeline alignment depending on where construction is occurring.

I put the main travel routes up here and I'll probably stumble over them but I will read them out. CR-85, CR-87, CR-88A, CR-17 and CR-19 are the main travel routes when Line 406 is being constructed. And CR-16, 16A, 17, Baseline Road, Riego Road, Powerline Road are the major travel routes when Line 407 is being constructed as, well as arterials that intersect with those roadways depending on where construction is occurring.

During the construction period they anticipated that up to 40 trucks a day, which is 80 trips a day back and forth would, temporarily use these roadways, again depending on where construction is occurring. And where construction is occurring.

Line 406 construction is proposed to begin in September or October of this year with an in-service date proposed for February of 2010.

Line 407 east and the Powerline Road distribution feeder main, the DFM, are expected to be constructed in May 2010 or earlier.

The proposed in service date for Line 407 East of the DFM is September 2010.

And Line 407 West is expected to be installed by 2012.

Some of the steps that PG&E will be taking prior to construction will be easement and permit acquisitions, finalizing land surveys, surveys and staking of the construction right-of-way and other temporary use areas, the staging areas that I mentioned earlier.

And they will hold pre-construction meetings in the field for both the permitting agencies and construction workers.

MR. MOUARYANG: May I interrupt?

MS. MIKKELSEN TUTTLE: Okay.

MR. MOUARYANG: With the 407 East and 407 West where it begins and where it ends according to the map.

MS. MIKKELSEN TUTTLE: Do you mind if I answer questions at the end or --

MS. SPURR: Yeah, we'll answer that after the presentation.

MS. MIKKELSEN TUTTLE: Thanks. Because I'll need to go back to the previous slide, I'm not sure that I can tell you on that one. But I'll go back to that slide at the end. Thanks.

CEQA requires that we evaluate alternatives to the proposed project in our Environmental Impact Report.

They require that we evaluate a reasonable range of alternatives that meet or feasibly attain most of the basic project objectives and that avoid or substantially lessen the significant impacts of the proposed project.

In the process of identifying alternatives to the proposed project we identified and eliminated from full consideration in the EIR four alternatives that are on this slide here.

The northern green alternative, which is along the top or northernmost, was eliminated due to increased risks from fault rupture.  And its location on hillsides adjacent to CR-13.

The southern alternative for Line 407, which is shown in purple, that's here, was eliminated due to increased number of crossings and tributaries of Steelhead Creek as well as increased crossings of sensitive vernal pool features.

That southern alternative also was located in close proximity to suburban populations, compared to the proposed project.

The central alternative, which is shown in this diagram in red here, was eliminated due to increased impact to special status species habitat and local water features.

And finally the fourth alternative, the

systems alternatives, which is not pictured, proposed 15 separate projects. And it was determined to be infeasible because it would result in greater construction impacts associated with the larger quantities of pipelines required to construct those 15 separate projects.

The alternatives that are considered in this Environmental Impact Report are shown on this map and I am going to go through them in detail in the following slides but I am just going to summarize them here.

We are going to look at 12 build alternatives, alternative options A through L, in addition to the no project alternative, which is required to the be analyzed under CEQA.

Each alternative option A through L represented a particular segment of the alignment but differed in the location from the proposed project so as to attempt to avoid or substantially lessen one or more of the impacts of the proposed project.

At the conclusion of our evaluation of the alternatives -- and again I am going to go through each of the alternatives in detail. It was determined that none of the options would decrease a Class 1 impact to a Class 2 level. What that means is, none of the alternative options would take a significant impact and with mitigation render it less than significant. Options would only lessen the magnitude of impacts, but again, not make it less than significant.

CEQA also requires that we identify a environmentally superior alternative based on how the alternative fulfills both the project objectives and how it reduces significant unavoidable impacts or reduces environmental impacts of the project.

And the EIR determines that the environmentally superior alternative to the proposed project is implementing the proposed project and options I and options L. And I'll show those options to you on the following slides. Options I and L have been designed to decrease safety impacts.

This slide shows project options, actually A through G but we are going to focus on A through C on this slide. Options A in red, the northernmost, and B in blue, which follows the Option A in red and then juts down to the south here. The EIR determined that these options would result in a greater magnitude of impacts to agricultural, biological and cultural resources, soils and seismicity, risk of upset hazards, land use, traffic. And those two options would also create a new high consequence area or HCA because they would be located in proximity to the Durst Organic Growers.

Options A and B would reduce the magnitude to aesthetics and noise during construction.

Option C is shown in dark green. Option C is here. Option C would result in a greater magnitude of impacts to biological resources and soils and would not reduce any impacts associated with that portion of the proposed project.

This is the same picture but this slide focuses on options D, E, F and G. D is shown in light green. It’s also shown here. Option E is in yellow. Options D and E would result in greater magnitude of impacts to biological resources, cultural resources, soils, aesthetics and noise during construction. It would not reduce impacts associated with that portion of the proposed project.

Option F in maroon is sort of hard to see. It’s here, this dogleg. It was considered in order to avoid heavy terrain at that portion of the project. That option would result in a greater magnitude of impacts to biological resources and would reduce impacts to cultural resources.

Option G is shown in magenta at the bottom here, pulled out in a blow-up. It would result in a greater magnitude of impacts to biological resources but would not reduce any of the impacts associated with that portion of the proposed project.

I’m almost done. Options H through L are shown in this slide. Option H actually travels through the Yolo bypass. The distance of option H is actually linearly less than that portion of the proposed project but it would involve a greater amount of trenching through that section. So it would result in greater impacts to biological resources, potentially to cultural resources, although it would reduce the magnitude of impacts to aesthetics and noise during construction because it would be located further away from residences that are located nearer to the proposed project.

Options I, J, K and L, but I, J and K are quite similar. They are located here. I is turquoise, J is, I’m calling that pink, K is red here and there’s a blow-up here. And then L is gray and it is going to be hard to see. It’s right here.

Those options were proposed to avoid impacts associated with being within a 1500 foot safety buffer around proposed school sites.

Options I, J and K would place the pipeline outside of that buffer, reducing the safety risks. It would also reduce impacts to noise and aesthetics but would increase biological impacts. There are quite a few biological resources that are located along those routes.

Option L is a little bit different. Option L would occur along the proposed project alignment but would extend the proposed HDD at that location deeper and therefore would reduce the safety impacts in that regard.

Now I'm going to talk a little bit about the alternatives that are evaluated. I just want to briefly talk about how the EIR is constructed and what it covers.

The Draft EIR analyzes 14 topical areas that are required to be analyzed under CEQA. I touched on most of these in discussing the alternatives. I am not going to list them out here but I'm happy to answer questions about any of the resource areas that are listed.

The EIR also analyzes environmental justice, cumulative impacts associated with the proposed project, and includes a large volume, which is on the CD, of technical studies and data that support the analyses that are included in the EIR.

I want to focus a little bit here on the mitigation that has been incorporated into the proposed project and in the project EIR in three ways. Both through project design features, APMs -- Those are features that have been proposed and incorporated into the design, the project description section in Chapter 2, in order to avoid or lessen environmental impacts right off the bat.

The second level would be applicant-proposed mitigation measures.  Those are measures that PG&E has proposed to avoid environmental impacts.  All of the applicant-proposed measures that we were provided have been included in the Environmental Impact Report.

What the team of environmental analysts then did was they evaluated the project design features and the applicant-proposed mitigation measures in light of the different CEQA issue areas.  And where it was determined that project design features would not provide sufficient environmental protection additional mitigation measures -- and those would be what I call EIR mitigation measures, are proposed.  That go a little bit above and beyond or in some cases are new, are new areas that are discussed.  Again, to reduce impacts on the environment to less-than-significant levels.

The majority of the potentially significant impacts identified that would result from the proposed project have been mitigated to a less-than-significant level using one of these three methods, or in some cases combinations.  My final slide will discuss the significant but unavoidable impacts of the proposed project.

I am just going to touch briefly on some of the project design features, APMs and mitigation measures. If you have questions on where these are in the document I can assist you in finding them.

The design features include such proposals as increased depth to cover the pipeline beyond what is required by law. A good example would be in agricultural lands there is a minimum three feet depth. PG&E is proposing five feet.

There is a table in Chapter 2, the project description of the EIR, that shows the land classification, the minimum depth of cover, and the depth of cover that PG&E is proposing in each of those areas.

PG&E is also going to be coordinating with landowners. There will be financial compensation for temporary and permanent losses of agricultural areas.

Certain biological resources have been proposed to be avoided in the project description, including giant garter snake, through construction timing to occur outside of the window of sensitivity for that species.

Other project design features: Topsoil

stockpiling and replacement, topographic restoration. Utilization of HDD technologies to cross large waterways, wetlands and vernal pools. Thus keeping those resources intact and avoiding hydrologic and biological impacts to those areas. Including HDD contingency planning in case of accidental upset or spill.

And finally, we are going to see the word BMPs a lot in each of the slides. One of the sets of BMPs that's proposed as part of the proposed project comes from PG&E's water quality construction best management practices manual. Those are designed to avoid impacts to hydrological features by water features and other CEQA issue areas.

Some of the noteworthy applicant-proposed mitigation measures include implementing fugitive dust mitigation plans, minimizing construction areas through fencing, staking, flagging the construction right-of-way to ensure that construction occurs within that and not outside of it. That also includes staking of sensitive resource areas that might lie outside of the construction area but just out of protection for those resources.

Some of the construction operation measures to reduce air quality impacts include things like minimization of vehicle idling or requiring regular tune-ups of construction equipment.

There will be a biological monitor onsite during construction activities.

PG&E will be conducting pre-construction surveys for sensitive wildlife species like burrowing owl, nesting raptors, nesting birds.

There will be erosion control measures, hazardous substance control, emergency response plans and procedures. Noise reduction plans and minimization measures, including construction timing to occur between 6 a.m. and 6 p.m. And traffic management plan and coordination with local entities that govern traffic control and flow in some of the local areas. And again, these are summarized in the applicant-proposed mitigation measures or at least are summarized in the mitigation and monitoring plan, which is located near the back of the hard copy or the PDF of the EIR.

The project mitigation measures are summarized in several places. They are summarized in the executive summary, in the end of each environmental issue area as well as in the mitigation and monitoring.

Some of the notable mitigation measures that the EIR has identified include the requirement for restoration of sensitive habitats. Riparian areas, wetlands. As well as topographic restoration of these areas here to reduce alterations to surface water flows.

Trees will be avoided or replaced following construction to minimize or eliminate aesthetic impacts. There will be a requirement that vegetation be replanted, particularly screening vegetation and the use of light shielding.

Nearby wells will be monitored to ensure groundwater is not impacted.

And again, the BMP word. Construction and vibration noise limitations and BMPs will be implemented.

I should also point out that there have been energy efficiency measures proposed in the EIR to reduce greenhouse gas emissions.

After all of that, the EIR has identified four -- which is loosely four, I'd say three, but four Class 1 impacts that are identified as significant and unavoidable after implementation of all of those mitigation measures that I just discussed. There are two Class 1 impacts in the category of air quality, both of which are related to exceeding standards, local standards or state and federal ambient air quality standards.

And then the hazards and land use sections both discuss the same impact and mitigation that is rendered significant and unavoidable. This is the exposure to unacceptable risks of hazards, which is defined to be greater than one in one million from fires, explosions or release of hazardous materials.

So those are the significant and unavoidable impacts of the project.

That concludes what I have to say here. I do want to point out that, again to reiterate what Crystal said. State Lands is accepting written comments until June 12 at 5 p.m. I'll leave this slide up here.

I am going to go back in my slides to my project map. And I don't see the beginning of 406 and 407 labeled. 406 is at Line 172A. Do you have that graphic in your EIR?

MS. NEWTON: It's 2-2.

MS. MIKKELSEN TUTTLE: Thanks. This one.

MS. SPURR: 406 goes to that point. And then 407 West starts there and goes to the Power Line Road main valve. And then that's where 407 --

MS. MIKKELSEN TUTTLE: That's the DFM portion.

MS. SPURR: Yes, and that's DFM. And then 407 East starts at that point.

MS. MIKKELSEN TUTTLE: So this is -- sorry that that's not more clearly labeled on that map.

So I am going to turn this back over to Crystal.

MS. SPURR: If you would like to -- I have some slips here. There are slips in the back, speaker slips. If you would like to make verbal comments at this time please fill out a speaker slip and give it to me.

MS. NENG YANG: I have a question. Did you pass out the PowerPoint? Can we have a copy of the PowerPoint?

MS. SPURR: I can. Do you need a copy of the EIR?

MS. NENG YANG: Can I have a copy of the PowerPoint?

MS. SPURR: Okay.

MS. NENG YANG: Thank you.

MS. SPURR: I have two hard copies of the EIR if you would like that and I have some discs back there of the entire --

MS. NENG YANG: But you don't have the, you don't pass out the PowerPoint that you presented today?

MS. SPURR: I don't have it today. I could e-mail it to someone but I don't have it. Would you like it e-mailed to you?

MS. NENG YANG: Yes, please.

MS. SPURR: Okay. I'll get your name after the meeting.

Are there any other questions on the draft EIR?

Again, if you would like to speak fill out a -- okay.

MR. DIBBLE: Yeah, I've got a lot of questions.

THE REPORTER: He needs to come up to the microphone.

MS. SPURR: Could you please come up to the mic. We are going to record all the comments and questions. Could you please --

MR. DIBBLE: Oh I can speak loud enough, I guarantee you.

THE REPORTER: Please come up to the microphone for the recording.

MS. NEWTON: We need you at the microphone because it is being transcribed. So did you fill out a speaker card?

MR. DIBBLE: Yes.

MS. NEWTON: Okay.

MR. DIBBLE: Well these were just questions for her.

MS. SPURR: This is a question on the Draft

EIR first before we start the comments, okay.

MR. DIBBLE: Okay. My name is Bill Dibble. I live at 27960 County Route 19 in Esparto.

THE REPORTER: Spell your last name, please.

MR. DIBBLE: D-I-B-B-L-E.

Okay, where do I start? The 406 and 407 gas line is proposed. Chris with PG&E, he told me about the sloughing effect is why they did not choose County Road 16 as an alternate. Have you, since you are the one answering questions, have you driven that route?

PT-1

MS. MIKKELSEN TUTTLE: No.

MR. DIBBLE: Who here has? Anyone?

MS. SPURR: We've gone along it and seen it from the roadway.

MR. DIBBLE: You have driven that route?

MS. SPURR: From the roadway, yeah.

MR. DIBBLE: Could you tell me where on County Road 16 there is any hills to worry about.

MS. SPURR: On County Road 16?

MR. DIBBLE: Yeah. Between 87 and 505.

MS. SPURR: No I can't at this time.

MR. DIBBLE: Because there isn't any, that's why. So sloughing, that is an untruth as far as County Road 16 is involved.

MS. SPURR: Is that in the Draft EIR somewhere that you read?

MR. DIBBLE: Chris with PG&E told me that himself.

MS. SPURR: Okay.

MR. DIBBLE: And if they're worried about sloughing, which apparently they are, what are they going to do when they go through the Dunnigan Hills? There's definitely going to be sloughing there. Because County Road 16 is as flat as your proposal.

PT-1 Cont.

MS. SPURR: There are some seismic issues in the Dunnigan Hills and --

MR. DIBBLE: Okay and I'm --

MS. SPURR: -- we do have, okay.

MR. DIBBLE: -- I'm getting to that.

MS. SPURR: All right.

MR. DIBBLE: Seismic issues. We are approximately two miles away, less than two miles away, from your proposed line to the County Road 16 alternate, okay.

MS. SPURR: Okay.

MR. DIBBLE: Anybody here been around an earthquake, a big one? Two miles isn't a lot. Two miles is nothing if there's an earthquake as we saw in San Francisco. Whenever they have one in LA. So that is, I'd say that's another untruth. That's two miles.

PT-2

Fault rupture. When PG&E sent the geologist out to talk to me, were you with him? Are you the attorney from San Francisco?

MR. MOUARYANG: No

MR. DIBBLE: Okay. They sent an attorney from San Francisco and a geologist out to talk to me. The geologist informed me that this pipeline was 100 percent safe. His words not mine. Okay. PT-3

I went into Google Search. And actually here are just a few of the 22,500 30- to 36-inch gas line ruptures at that have taken place. Another untruth.

The Durst Organic Farm, okay. That was brought up, right? Was there any mention of Chung's Organic Farm? I didn't read or see any. Because this pipeline goes right through Chung's.

Mr. Chung has very limited English. I have talked to his grandson. His grandson is going to see if he can come to the meeting tomorrow. He has started school in Napa. He is not sure if he can. So I want to know if there was any consideration for his organic farm. Was there any consideration for that? PT-4

MS. SPURR: Not to my knowledge.

MR. DIBBLE: No.

MS. SPURR: I haven't heard of Chung's Organic Farm.

MR. DIBBLE: Okay. Well since I'm here, being there's seven small farms along the Hungry Hollow route it is very, very difficult to find somebody to come in and farm small farms.

With this pipeline going through it will greatly limit our ability to make a future income on this land. On our property we made, and this was the best year we ever had, we made between five and six thousand dollars on the whole farm per year. That was last year.

I contacted Muller who is an almond grower and I contacted R. H. Phillips, the grapes. And if anybody, if you've been out there then you know that there's a lot of new orchards going in that area. You've seen them on 87 and you've seen them on 16. You've seen them all over. PT-5

If you irrigate, which everybody does out that way, north to south, you can, I've already talked to these people, they would not even consider putting grapes or almonds in that area.

Grapes, almonds go for $4500 per acre. Grapes go for $4200 dollars per acre. So we could almost make --

MS. STEPHENS: Per year.

MR. DIBBLE: Per year, per year. So if we would put almonds in, which we used to have almonds. You have to let the soil stay without fruit trees for a while because they get some diseases. So if we were to put almonds in you would significantly reduce my income. We barely make enough to pay the taxes now.

PT-5 Cont.

I was an arborist for the city of Woodland. I have seen the damage that natural gas leaks cause. I have seen fully mature trees die in a matter of days and the soil around them is worthless.

PT-6

If this were to happen who is responsible for that? PG&E? Maybe. Who knows?

We were offered $7700. For 50 years actually because that's what the thing says, it's a 50 year project. So PG&E in their generosity is willing to give me a $154 a year which is real generous of them, real generous.

When I mentioned this to Lois Wolk's office, who is a senator, and LaMalfa's office who is the assemblyman, their representatives both laughed. I had to wait a while to carry on a conversation with them so they could finish laughing about the amount PG&E has offered.

PT-7

The habitat, one of your representatives that came out and that I talked to, but he -- his words, you didn't hear this from me. The reason they chose this

PT-8

route is because they didn't want to mess with the hunting club and all the things that go along with it. Hence, your habitat. So, I guess birds have more rights than we do. Snakes have more rights than we do. Or at least that's the way we feel.

PT-8 Cont.

So you have a 50 foot right-of-way that if something happens you could come in at any time whether I had tomatoes growing or whatever growing and destroy what was there. Is that correct?

PT-9

MS. SPURR: As far as I know if there's an emergency --

MR. DIBBLE: That is correct.

MS. SPURR: -- situation.

MR. DIBBLE: Right. So that is correct. It doesn't make any difference what I have growing.

I've got things kind of messed around here so let me. My mother -- I'm a third generation on that land. My mother, I went and talked to her today and asked her if she wanted me to say anything.

As everyone knows the value of land in California is not what it used to be. My mom is so concerned about this pipeline that she is considering selling out after being on that land for 60 years; longer than that, 70 years. But I guess that doesn't make a difference either.

It devalues our land so much.

And one final comment and that's it. It has nothing to do with this project but in a roundabout way it does because we have already been told that -- there's seven of us out there. And if none of us sign this piece of paper to sell that you'll just eminent domain us, we have already been told that. PT-10

When the government took me off of that land and told me I had to go fight for this country in a war I went. I didn't want to go. I didn't want to go at all. But I went to defend our country.

The way this is, the way this is being presented, or forced down our throats shall we say, I feel like I might as well be living in a third world communist country, not the United States of America that I thought I went to defend. That's all I've got.

MS. SPURR: All right, thank you.

The next person I have is Alisa Stephens.

MS. STEPHENS: Well, I am Alisa Stephens. I have property next to Bill Dibble's in the Hungry Hollow area of Yolo County.

Before I start my comments I did have a couple of questions on the unacceptable impacts that are Class 1. What is referred to by noise and vibrations?

MS. SPURR: It's during construction. The construction equipment will generate some noise and vibration.

MS. STEPHENS: And then once the pipeline is finished is there --

MS. SPURR: Operational, yes.

MS. STEPHENS: -- anything emanating from the pipeline itself?

MS. SPURR: No.

MS. STEPHENS: And what is it about the pipeline that unacceptably degrades air quality?

MS. SPURR: Again, it's construction impacts and dust, different emissions from equipment. And you determine those using thresholds from the air districts.

MS. STEPHENS: If there were any natural gas leakage would that be a factor in the air quality degradation?

MS. SPURR: It's mostly a safety risk if there's leakage and whether or not there would. Because I think it dissipates pretty rapidly in air, I don't think it would be an air quality impact. But in case of an explosion or a fire that's when it comes into play.

MS. STEPHENS: I am a co-owner of 58.8 acres in Esparto, north of Esparto. It is a family farm that was purchased by my grandfather in 1924. It is currently in -- excuse me. It is prime cropland and it PT-11 is currently in row crops. We have our family farmhouse on the property.

Which one of these maps is Hungry Hollow?

MS. MIKKELSEN TUTTLE: The far left.

MS. STEPHENS: Okay. So this is Road 19, Road 17, and Road 16 is up here somewhere. This property right here is our property, 58.5 acres. So it is bordered on the north by Road 17. And this right here is our family farm. And right down the middle is Road 88A. So our 58.5 acres is already bisected by Road 88A. And that would be further bisected right -- just about two-thirds of the way down from the north, which would just cut our property basically from two parcels into four parcels, segmenting prime, agricultural land.

Actually I think this map is bigger than my map so I'll put mine away.

I don't feel in reading as much as I could through the proposed EIR that enough emphasis has been placed on the impact on prime agricultural property. This area has been farmed, it's very rich soil. It has been farmed since the late 1800s. It is not necessarily habitat for, you know, different wildlife although there are a lot of birds out there.

So my primary concern and point is the negative impact to the agricultural resources of the

PT-11 Cont.

area. We are going to find it very difficult with the pipeline cutting the property basically into four pieces. We are already a small property. It is going to be much more difficult to find a farmer who is willing to take on that small of a piece of property with the easement in it.

PT-11 Cont.

We too were contemplating in the near future putting in almond orchards or a vineyard, a family vineyard. It would be a good size property to have a small vineyard. But this is -- the pipeline and the easement prohibition on trees and vines would basically make it economically non-viable to put those plans into effect.

PT-12

We do have two wells on our property. We supply our own irrigation water and we supply our own domestic water. A large concern that was raised in the EIR is that there is possible degradation of groundwater. And we use the groundwater, the aquifer under our property, so that is a concern.

PT-13

The pipeline will be in close proximity to our farmhouse. You can see the farmhouse and the pipeline. It is less than, definitely less than a half a mile and probably a little more than 200 feet. But it does create a hazard of leakage and explosion.

PT-14

On the north boundary of the property there

PT-15

are historical eucalyptus trees that were planted in the early 1900s. They were supposed to be used for farm implements but it turned out that the wood was too twisted and didn't work out well for farm implements. But they have been left there as bird habitat.

One of the materials disseminated was a map from the USDA Natural Resources Conservation Service and it shows -- this black mark is our family property here. And there are four red dots in close proximity, which shows that it is prime Swainson's Hawk habitat. There is bird nesting in the row of eucalyptus trees on the north of the property. There is also a lot of other bird life out there like pheasant. Owls nest in the eucalyptus trees. There's red wing blackbird, magpies and valley quail on the property. So the construction and the heavy traffic usage of the road that goes right through our property, County Road 88A, is definitely going to impact the nesting and the bird habitat.

PT-15 Cont.

I don't think that the proposed report has considered the significant, negative impact of the agricultural resources of this area, Hungry Hollow. It is in conflict with the Yolo County General Plan, which is -- Goal AG-1 is to conserve and preserve agricultural lands in Yolo County, especially areas currently farmed or having prime agricultural soils. And rural, outside

PT-16

existing communities and city limits. This is definitely us. This land has been farmed for, you know, over a century, it is prime soil and it is negatively impacting our farm. PT-16 Cont.

The EIR states at paragraph 4.1.1 something that I believe is untrue. It states: 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.

The plan has not considered running the pipeline along existing county roads to the maximum extent feasible. If it did it would run the pipeline along County Road 16. It would not decide to cross right through seven farms when it could go very easily along Road 16. There is, I believe, one house and one tree on County Road 16. PT-17

And going where it is here, it is also feasible to let it go along County Road 17. Because that is not -- I mean, it is just going to go along cropland, it is not going to bisect parcels like it is here. But up here on County Road 16, which is one of the options. If it just runs along County Road 16 it is almost a straight shot right across the, the Interstate 505. It would have a minimum impact on existing farming parcels and cropland, homes and habitat. I mean, it's flat and there's basically nothing up there. And I can't see any justification that even compares to bisecting seven family farms.

I believe that in this area of Yolo County, it may be different for that portion in Sutter and Placer Counties. This is a prime consideration and more consideration should be given to the preservation of intact and leaving intact farm parcels.

PT-17 Cont.

My preferences of options other than the proposed, and I think that these options speak better to preservation of agricultural land currently under agriculture and having the potential for almonds and vineyards would be Option A, following existing County Road I-505. I believe I read in the report there is only one residence within 200 feet of the pipeline. And the proposal, the current proposal for the pipeline runs within 200 feet of eight residences. Option A would cause the least impact on homes and agricultural cropland.

PT-18

I don't know how Durst Organic Farms got a leg up on this but I don't believe that there should be a higher consideration than any other type of cropland. And also the Chung land on Road 17 does have some organic crops in it, as was mentioned by Mr. Dibble.

PT-19

My next preference would be Option F. It runs along County Road 17 and then jogs north through the Dunnigan Hills. This would not bisect fields, agricultural fields. And there are no houses within 200 feet of the pipeline on that option.

The next preference -- and I only have three more. I am not going to go through all of them that you guys have in the report. Option B would be the next preference. That follows County Road 16 again. And that is Figure 3-2B, Map 4. This route results in two miles less bisecting agricultural lands. And it is a sparsely populated area, much less than the current proposal and there are no residences located within 200 feet of the pipeline.

PT-19
Cont.

Option E. Less desirable but it goes along County Road 19, it does not bisect cropland. Which I think really is, should be a prime factor and consideration here. There are less residences impacted under Option E than the proposed pipeline.

And lastly Option D. This would shift a nearly two mile portion of the pipeline from bisecting ten agricultural fields between County Road 17 and County Road 19. And it would just follow along County Road 17.

It’s just inconceivable to me that the

pipeline cannot be run along the roads, especially Road 16, and would not have to cut in halves or in quarters cropland that is currently under use. PT-19 Cont.

So it looks to me that from the proposed route PG&E has simply chosen to make what is basically a straight shot across Yolo County, Sutter and Placer Counties, disregarding the negative impact on cropland. PT-20

The straight shot in my opinion is just to keep the cost as low as possible. More consideration needs to be given to preserving family farms and cropland. As far as aesthetics, please go out and drive on Road 16. Any aesthetic impact would be de minimis, basically nothing.

And I would thank you for your attention and consideration. PT-21

MS. SPURR: Thank you.

The next person is Nick Alexander.

MR. ALEXANDER: Thank you. My name is Nick Alexander. I am representing a landowner named DF Properties. They have 150 acres on the northwest corner of Baseline Road and Fiddyment. I want to thank you for the opportunity to comment as well.

While this area is currently zoned agricultural this area has been targeted for regional growth for some time. It was identified as a regional growth area in the 1994 Placer County General Plan. We PT-22 are currently in the planning process with the city of Roseville for a specific plan known as the Sierra Vista Specific Plan. Our property in particular, we are currently planning a 750,000 square foot power center on that corner.

Our point is that while we are not opposed to, you know, the gas line going in, we would encourage PG&E to locate the ultimate right-of-way or the ultimate gas line underneath the right-of-way of baseline road underneath the pavement. So as to not to create impacts with a potential 50 foot landscape corridor that will be on the north side.

The city of Roseville conditions all landowners in those landscape corridors to plant shade trees in order to, you know, reduce the impacts and provide shading to, you know, black tops.

PT-22 Cont.

This property has been also identified as a regional area for growth in the SACOG blueprint as well.

We would also request that PG&E analyze the ultimate depth of this gas line. Currently with the exception of I believe it's the Watt Avenue/Baseline Road intersection there's five feet of cover. We would ask that a deeper depth be analyzed.

PT-23

Also in particular to our property we noticed that there's a 100 by 150 foot valve cluster. We are

PT-24

just unclear as to what that pertains. Is there any aboveground facilities that are involved with that? We also would request that PG&E coordinate the ultimate location of that, of that valve cluster with us so we don't plan a, you know, a Home Depot or anything on top of it. PT-24

So anyway, thank you for the opportunity to comment on this. We also would encourage you to coordinate, coordinate your efforts with the city of Roseville in Placer County as Baseline Road, the ultimate right-of-way, is planned to be six lanes. PT-25

And then we would also reserve the opportunity to comment further before the 12th. Thank you for your consideration.

MS. SPURR: Okay, thank you.

I just have one person, Norepaul.

MR. MOUARYANG: Thank you. My name is Norepaul Mouaryang. I am one of the property owners in Yolo County on County Road 17. James has contacted me many times about this.

And my concern is the CRP will not allow us to do anything on that. Is it PG&E has more privilege than anyone else and just go and put something under it when the PG&E needs to do. My question is, what is difference between the CRP and PG&E? PT-26

MS. SPURR: The CRP?

MR. MOUARYANG: Yes. It's a conservative property, whatever, that don't allow anyone to touch or do anything or build anything inside the land. That's what they call CRP. Williams CRP or something like that.

MS. SPURR: I'm not sure what coordination PG&E would need to do with the CRP. I'm not sure who has the ability.

MR. MOUARYANG: Yes. The Farm Bureau of Yolo County don't allow anybody to do anything on that land. So they pay us, the owner of the land, not to do anything. Not to farm, not to build, not to do anything. Now my question is, why then -- how come PG&E has the right to do things through that land?

PT-26 Cont.

MS. SPURR: That I'm not sure.

MR. MOUARYANG: Yes. And also James told us that when the pipe go in it will be eight feet under the ground but what I saw, it's only five. Which one is correct, eight or five?

PT-27

MS. SPURR: There's five feet of cover proposed for the pipeline.

MR. MOUARYANG: Now since many of my colleagues here they said about County Road 16 and 17. Which one is the definite option for us over there? To

PT-28

PT-28 Cont.

me it looks like County Road 17 right after 113.

MS. SPURR: Alternative options, is that what you are asking?

MR. MOUARYANG: Yes.

MS. SPURR: All of the alternative options. We have several.

MR. MOUARYANG: So which one will they stand for sure now?

MS. SPURR: There is no decision made yet on which options will be chosen. You will get a chance to speak before the Commission, the State Lands Commission, which is a panel of three people. And when we have our commission meeting, probably in August, everyone who is on our mailing list will get a notice of when that commission meeting is. They make the decision on whether or not to certify the EIR and which options to choose for the project. They will make the final decision.

MR. MOUARYANG: Oh, okay.

MS. SPURR: This is to get your comments. And if there is an option that you think would be better than others you can make your comments known to us.

MR. MOUARYANG: Oh, okay. Now then County Road 17 may not be the option because Yolo County is not going to maintain that road. So if you guys do go

PT-29

through that route are you guys will be the ones that make sure that county road is safe for you to do business or to put your pipe? Because they are not maintaining, it will be out for farming only.

PT-29 Cont.

MS. SPURR: Yes. PG&E would need to work those details out during --

MS. STEPHENS: Yolo County is abandoning --

MS. SPURR: -- the construction.

MS. STEPHENS: They are abandoning Road 17.

MS. SPURR: Oh they are?

MR. MOUARYANG: Yes, a-ha. Thank you.

MS. SPURR: Okay, thank you.

Is there anyone else that would like to speak? Would you mind. You can go ahead, just give your name.

MS. NENG YANG: I just have a question.

MR. MOUARYANG: She is my sister, by the way.

MS. SPURR: Okay.

MS. NENG YANG: My name is Mai Neng Yang and I am also one of the owners with my brother for that land.

MS. SPURR: Okay.

MS. NENG YANG: And I have a question. I don't know much about easement at all so I am going to ask like these people. What happens if we don't sign the thing? What is going to happen? Because we have a gut feeling that this is not a good thing. We don't

PT-30

know exactly what are the bad things that's going to happen but I just have a gut feeling that it's not right. Let's say if we decided not to sign, what's going to happen? Are you guys going to go through anyway?

PT-30 Cont.

MR. MOUARYANG: Is it communist country?

MS. NENG YANG: Can somebody help me here in the audience? Like if you don't sign.

MR. DIBBLE: Eminent domain. Eminent domain for the good of the people. It doesn't make it it's any good for us, it's the good of the majority of the people.

MS. NENG YANG: So it doesn't matter.

MR. DIBBLE: That is what I was told. It doesn't make any difference.

MS. NENG YANG: So if they decide that it's good for the people then regardless of my saying it's no good?

MR. DIBBLE: Yep.

MS. NEWTON: I would recommend that you take up that question with PG&E. And we can provide you --

MR. DIBBLE: I already have.

MS. NEWTON: Okay. Because that's really -- we are working on the environmental document. But as to with regard to whether or not PG&E would ever exercise eminent domain is really something you need to discuss with PG&E.

MR. DIBBLE: And they will, they have already told me that.

MS. NENG YANG: So there is no point of going to meeting and meeting afterwards then.

MS. NEWTON: Yes it is, it is very important. This meeting is in regard to the environmental document. This document will go to largely an elected body. Our commission has two elected people on it and then the third person is a representative of the Governor's Office, the director of finance.

And when it goes to our commission they will make the decision on first of all saying, okay, the document is good.

But also second of all, approving the project. And you need to make your concerns heard to our commission. And that's why all your comments are being recorded here verbal. We have written. And so all that will be part of the record and our commission will see that.

But in addition if you want to, you know, have an even greater impact I would suggest you attend the commission hearing. Which I'm sorry we don't have a date, I apologize. It's hard to get these people pinned down to a date. But as soon as we have a date we will let people know, it will be noticed. And if we have your address you will be noticed directly so you can provide comments.

MS. NENG YANG: Now the other things that I have concerns with is this. I have experience with easement before. Now when they want something, somebody out, some big guy out there wants something, they will offer you some hundreds of dollars. So once you sign that, now when you want something in return you have to go back to them, ask permission. Now you don't just pay hundreds but you have to pay thousands of dollars to get whatever you need to do on that piece of property.

PT-31

So it's like easement, I don't have good feelings about easement so that's my concern. But exactly, I don't know what PG&E have to offer. Or how much are they going to charge me later when I want to do something about the land. But I still have a feeling that I am going to have to pay thousands of dollars in order for me to, let's say, put concrete over from the road to my place.

So those things, those permission, I have to go through lots of steps in order for me to get it done. So I kind of feel like, if it's my property why do I have to go through all that just to get something done.

So those are my concerns at this time. Thank you.

MS. SPURR: Okay, thank you.

MS. STEPHENS: Excuse me, could you say again, I didn't hear, who is the commission made up of?

MS. NEWTON: Our commission is made up of the lieutenant governor, who is John Garamendi, the controller, state controller, John Chiang, and the director of the Department of Finance, which is Michael Genest. But actually he usually has a standing person so that it's very consistent. And the person that Department of Finance sends is Tom Sheehy.

MS. STEPHENS: So Garamendi and Chiang and possibly Sheehy will be present at that hearing?

MS. NEWTON: Right.

MR. DIBBLE: Is it possible to get their e-mail addresses before?

MS. NEWTON: I would go online and just look at the lieutenant governor's website and the controller's website.

MR. DIBBLE: Okay.

MS. NEWTON: I don't have them off the top of my head.

MR. DIBBLE: I can find them.

MS. NEWTON: Yes, I'm sorry. Or you can go to our website and there should be links from our website.

MR. DIBBLE: Lois Wolk's office is working with us and they are going to have two representatives at the meeting tomorrow.

MS. NEWTON: Okay.

MS. SPURR: Are there any other comments?

Okay, I would like to --

MR. DIBBLE: I have one. Not directed to you but to anybody else that is having issues with this as we are. I'd really highly recommend going through your legislators. They have been, they have been more than helpful in this. Whether they do any good or not they can't do you any harm.

MS. SPURR: Okay.

I would like to thank everyone for attending and I am going to go ahead and close the meeting.

We will have another one at 5:30 today.

MR. DIBBLE: Thank you.

MS. SPURR: All right, thank you.

(Thereupon, the Public Meeting was closed at 4:12 p.m.)

CERTIFICATE OF REPORTER

I, RAMONA COTA, a certified electronic reporter and transcriber, do hereby certify that I am a disinterested party herein; that I recorded the foregoing California State Lands Commission Public Meeting dated June 3, 2009; that it was thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said meeting, nor in any way interested in the outcome of said meeting.

IN WITNESS WHEREOF, I have hereunto set my hand, this 18th day of June, 2009.

______________________________

Ramona Cota, CERT *00478

PUBLIC MEETING

BEFORE THE

CALIFORNIA STATE LANDS COMMISSION

| | |
|---|---|
| In the Matter of: ) | |
| ) | |
| PG&E Line 406 and Line 407 ) | CSLC EIR No.: 740 |
| Natural Gas Pipeline ) | |
| CSLC Ref Files: W30169-4, ) | |
| W26210; R19806 ) | |
| SCH#: 2007062091 ) | |
| ______________________________) | |

ROSEVILLE SPORTS CENTER/
MARTHA RILEY COMMUNITY LIBRARY

MEETING ROOM

1501 PLEASANT GROVE BLVD

ROSEVILLE, CALIFORNIA

WEDNESDAY, JUNE 3, 2009

5:30 P.M.

Reported by:
Ramona Cota, CERT

APPEARANCES

COMMISSION STAFF AND CONTRACTORS

Gail Newton

Crystal Spurr

Kerri Mikkelsen Tuttle
Michael Brandman Associates

ALSO PRESENT

No members of the public

INDEX

PROCEEDINGS

5:50 P.M.

MS. SPURR: My name is Crystal Spurr, I am with the California State Lands Commission.

This is the second meeting in Roseville for comments, to receive comments on the Draft EIR for the PG&E Line 406, 407 natural gas pipeline project.

It is 5:50 and the meeting was scheduled to begin at 5:30. We have no commentors so we are going to close the meeting.

(Thereupon, the Public Meeting was closed at 5:50 p.m.)

CERTIFICATE OF REPORTER

I, RAMONA COTA, a certified electronic reporter and transcriber, do hereby certify that I am a disinterested party herein; that I recorded the foregoing California State Lands Commission Public Meeting dated June 3, 2009; that it was thereafter transcribed into typewriting.

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Ramona Cota, CERT *00478

PUBLIC MEETING

BEFORE THE

CALIFORNIA STATE LANDS COMMISSION

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| Natural Gas Pipeline | ) | |
| CSLC Ref Files: W30169-4, | ) | |
| W26210; R19806 | ) | |
| SCH#: 2007062091 | ) | |

ST. LUKE'S EPISCOPAL CHURCH

GUILD HALL

515 SECOND STREET

WOODLAND, CALIFORNIA

THURSDAY, JUNE 4, 2009

3:00 P.M.

Reported by:
Ramona Cota, CERT

APPEARANCES

COMMISSION STAFF AND CONTRACTORS

Gail Newton

Crystal Spurr

Kerri Mikkelsen Tuttle
Michael Brandman Associates

ALSO PRESENT

Howard Lopez

James Bennett

Wilma Stephens Hill

Chris Ochoa

Ed Mast

Fulton Stephens

Paul Smith

Barbara Butterfield
Pacific Gas and Electric Company

John Hulsman

INDEX

PROCEEDINGS

3:02 P.M.

MS. SPURR: All right, I guess we'll go ahead and get started. My name is Crystal Spurr. I'm with the California State Lands Commission. Can't hear? Okay, I'll try to speak really loud. I'm with the California State Lands Commission; my name is Crystal Spurr.

We are the CEQA lead agency in preparing the Draft Environmental Impact Report. We used a consultant to help us prepare that but I managed the preparation of the Environmental Impact Report.

This is a public meeting to hear comments on the Draft Environmental Impact Report for the PG&E Line 406, 407 natural gas pipeline.

We have a court reporter here. We are going to record all the comments that we receive and we will be responding to those in the Final Environmental Impact Report.

So when I do call you up if you could tell your name, speak your name, and then just come up to the podium and tell us your name and you can provide your comments.

I have a sign-in sheet in the back and anyone who has not signed in before or if you haven't received a Notice of Availability or any notices regarding this Draft EIR then we probably don’t have your address and we’d like to get you on our mailing list. We’ll be sending out future notice when we have a commission on this Environmental Impact Report.

The Draft Environmental Impact Report was prepared in accordance with the California Environmental Quality Act, which is also CEQA.

The comment period was 45 days long. And it started on April 29, 2009 and it will end on June 12, 2009 at 5:00 p.m.

So you can provide your comments to me by June 12, 2009 on this Environmental Impact Report. You can do that by fax, e-mail, regular mail. You can hand those comments to me today. On these speaker slips there is room on the back if you want to provide comments today and just write them out and we’ll accept those.

Once the comment period ends on this Draft Environmental Impact Report we will prepare a Final. And we will respond to all the comments that we receive, written comments and verbal comments that we receive on these public meetings.

We had two public meetings in Roseville yesterday and there will be two today here, one at 3:00

o'clock, right now, and one at 5:30.

Once we prepare the Final Environmental Impact Report we will send copies of that to everyone who has made comments on this draft report and we'll also make it available on our web site.

You will receive, we will be sending out notices of our commission hearing. We are hoping that it will be in August. We don't have a schedule yet of when our commissioners meet. But at that time what they will do is they will take everything that we have on record, all of your comments and the Draft and Final Environmental Impact Report and they'll look at everything.

They will have a meeting. You can attend that meeting. You can talk directly to our commissioners who will be making a decision on whether or not the EIR was prepared appropriately. And if they determine that's the case they will certify the EIR. And then after the EIR is certified they will make a decision on the project and whether or not to approve the project and how that project might be approved. Whether it will be approved as proposed or with one of these alternative alignments that we've taken a look at.

So we are looking for your input so that we can determine if maybe one of these alternative alignments would be best. And the commissioners will be looking for your input as well.

So is there any questions on the CEQA process at this time? Okay.

This is Kerri Mikkelsen Tuttle. She's with MBA. And they prepared the Draft Environmental Impact Report.

And she's going to give a presentation, a short presentation with some of the highlights in the Environmental Impact Report. Once she is finished then I'll open it up for comments.

MS. MIKKELSEN TUTTLE: Can you all hear me? Okay.

I'm going to briefly describe the project in general terms, show you some maps of the project. I do encourage to take a look at the maps that we have in the back which show the proposed project, the proposed alternative options to the proposed project. And especially the two graphics here that focus on some of the options that are of most interest to the group here this evening.

I'll also talk about the content of the Environmental Impact Report which many of you have received a copy of and I'll talk about the findings of that document.

Just a general overview of the project to get us started. The project is a 40 mile natural gas pipeline spanning Yolo, Sutter, Sacramento and Placer counties.

There are three proposed transmission pipelines. Line 406, 407 East and West and the Powerline Road Distribution Feeder Main.

The project also proposes to construct six aboveground pressure-limiting and regulating stations along the project alignment.

I know this graphic is difficult to see and I'll put it up at the end if anybody wants to take a closer look. It was in the Environmental Impact Report as one of our exhibits.

But the areas shown in blue, with the exception of this one which is an existing aboveground station, these are the proposed aboveground facilities along the pipeline alignment.

Construction of the proposed pipeline would take place within a 100 foot wide area that consists of a 50 foot wide temporary construction area and a 50 foot wide permanent easement.

Trenching, soil storage, installation of the pipeline, pipeline testing and backfill would all occur within this 100 foot wide area.

Additional areas would be necessary to accommodate HDD and boring locations at the entry and exit points as well as staging for construction vehicles and equipment.

And there are two proposed --

MR. STEPHENS: What is HDD?

MS. MIKKELSEN TUTTLE: HDD, horizontal --

MS. NEWTON: Horizontal directional drilling.

MS. MIKKELSEN TUTTLE: Horizontal directional drilling. Thank you.

Pipeline storage. There are two proposed storage facilities. One is located in Arbuckle and one is located north of the city of Woodland. And the EIR analyzes all of those temporary construction areas or staging areas in the Environmental Impact Report.

I do want to describe briefly, the 50 foot permit wide easement is to prohibit, sorry, 50 foot wide permit easement is proposed to allow PG&E to maintain the pipeline and minimize potential pipeline damage.

Within that 50 foot easement there will be a 15 foot area that would prohibit planting of deep-rooted vegetation, trees and vines. But agricultural uses would be permitted within the 50 foot wide easement.

The pipe will be constructed using three installation methods.

Conventional trenching would be used to install about 91 percent of the pipeline. That involves installing pipe within an open trench and then back filling that trench.

HDD or horizontal directional drilling would be use to install approximately seven percent of the pipeline. That uses a hydraulically powered horizontal drilling rig to tunnel under sensitive, large sensitive features like rivers, roadways, levies, wetlands.

Hammer boring drives an open-ended pipe for shorter distances under smaller roadways, smaller wetland or water features.

And conventional and auger boring would be used to install about two percent of the pipeline.

The construction sequence is shown on this slide. First land would be cleared and graded where needed. The topsoil and other materials that would be excavated will be stored for later back filling.

The pipe would be installed and tested. Following testing the topsoil would be replaced and restored to its original conditions or to conditions that would be approved by individual landowners.

The trenches themselves would typically not remain open for more than five days and they would be back filled within 72 hours of pipeline installation.

At any given point on the pipeline where construction is occurring there would be approximately 20 days between the initial grading and back fill.

The HDDs take a little bit longer to install and those HDD locations would be under construction approximately two to four weeks.

The construction hours would be 6 a.m. to 6 p.m. Monday through Saturday, again with the exception of the HDD locations. At the HDD locations there would be 24 hour operations until installation of the HDD is complete.

At any given time there would be about 90 to 130 construction workers working along, they would be dispersed along the pipeline, the portions that are under construction. And I have listed here, I'll read them out, this text is too small. But the main travel routes that construction workers would use for Line 406 would be CR85, CR87, CR88A, CR17 and CR19.

For Line 407 the major travel routes would include CR16, 16A, 17, Baseline Road, Riego Road and Powerline Road. And the arterials that intersect those roadways would obviously be used as needed to get people to and from the sites daily.

During construction it is anticipated that up to 40 trucks a day or 80 trips back and forth would temporarily use these roadways. Again based on the construction schedule that's in the next slide.

For Line 406 construction is anticipated to begin this fall, September or October, with an in-service date of February 2010.

Line 407 East and the DFM are anticipated to be constructed in May 2010 or earlier if necessary with an in-service date of next fall.

And Line 407 West would be constructed by 2012.

Prior to constructing any of these pipelines PG&E will be completing easement permit acquisitions. They will be finalizing land surveys. Once the land surveys are complete they will survey and stake the construction rights of way and other temporary use areas and they will hold pre-construction meetings in the field for permitting agencies and construction workers.

CEQA requires that we analyze reasonable range of alternatives to the proposed project that meet the basic project objectives and that avoid our substantially lessen one or more of the significant effects of the proposed project.

In evaluating and considering alternatives there are four alternatives shown in this slide that we considered but eliminated from full analysis in the EIR for the following reasons:

The northern alignment, which is shown in green. First I'll point out the proposed alignment here, which is black. The northern green alignment was eliminated due to increased risks from fault rupture and locations on hillsides.

The southern alternative, which is shown in purple, was eliminated because it would have involved increased crossings of tributaries to Steelhead Creek and sensitive vernal pool habitats. It was also located in closer proximity to suburban populations.

The central alternative, which is shown here in red, was eliminated because of increased impacts to special status habitat and water features in that area.

And an alternative that is not pictured but was also eliminated from consideration was called the systems alternatives. It was eliminated because it proposed and would have required 15 separate projects and would have resulted in greater construction impacts associated with the greater quantities of pipelines.

MR. SMITH: I have a question for you. The green alternative was eliminated. Doesn't the existing transmission line exist in that same road?

MS. MIKKELSEN TUTTLE: I don't know. Do you know?

MS. SPURR: I'm not sure where the existing lines, PG&E --

MR. SMITH: Lines 400 and 401.

MS. SPURR: Lines 400 and 401. I think we show it in one of our graphics, I can take a look.

MR. OCHOA: Road 17 is in there too.

MS. NEWTON: While Crystal --

MS. SPURR: They may not go, they are not parallel. Perpendicular to?

MS. MIKKELSEN TUTTLE: I think -- Yes, yes.

MR. SMITH: They are running in a different direction but don't they travel approximately that same route that you're talking to?

MS. NEWTON: Four hundred goes north and south.

MS. MIKKELSEN TUTTLE: Four hundred is north and south, 172 is north and south.

MS. SPURR: Right. And I think they are going --

MR. SMITH: Because the existing pipelines, as far as I know, are in the foothill area.

MS. MIKKELSEN TUTTLE: Well all of these alternatives would have tied into the same PG&E infrastructure that does exist at either end.

MS. NEWTON: They do, yes. They are largely north and south.

MS. SPURR: They are. They are not parallel with the green line but they intersect it.

MR. SMITH: But they are pretty close, right?

MS. NEWTON: Right. But all of those, all of pipelines, according to a map that's in the document, are north/south trending and this is going to tie the west side with the east side. So there is no other pipeline in this vicinity that ties the west side to east side.

MR. SMITH: Well where I'm going with this, isn't it as dangerous where the existing lines are now? Because they seem to be in the vicinity of a fault.

MS. NEWTON: It's not -- this is looking at this project only, we are not going back and looking at prior practices. I understand what you are saying and that would be a good comment to make to us.

MR. SMITH: Okay, I got your message.

MS. NEWTON: Anyway, can we let Kerri finish.

MR. SMITH: Thank you.

MS. MIKKELSEN TUTTLE: The alternatives that are evaluated in the environmental document. There are 12 build alternatives lettered A through L that are alternative options in addition to the no project alternative that is required to be analyzed under CEQA.

Each of these alternative options, which are shown in the maps behind you and I'm going to go into detail with each of the alternative options in the following slides, they represent a particular segment of the alignment but differ in locations from the proposed project in an attempt to avoid or lessen the significant impacts associated with the proposed project.

At the conclusion of our analysis in the EIR it was determined that implementing none of the alternative options would decrease a Class 1 impact to the Class 2 level. What that means is there are significant impacts associated with the proposed project. Implementing mitigation associated with the options would not reduce the significance of those impacts.

CEQA requires us to select an environmentally superior alternative based on how that alternative fulfills the project objectives and how the alternative reduces or minimizes significant unavoidable impacts on the environment.

The environmentally superior alternative that was selected for this project in the Draft Environmental Impact Report would be incorporating the proposed project along with Options I and L, both of which have been proposed to avoid impacts to planned school sites.

Now I'm going to go into just a little bit of detail on each of the alternative options. I encourage you if you are, if you like one of these options, take a look at the Environmental Impact Report, Chapter 3 describes each option in great detail. And if you would like to make a comment regarding any of the alternatives please do so.

Options A and B. This graphic actually shows Options A through G but this -- Option A and B, in red and blue respectively, would result in a greater magnitude of impacts to agricultural, biological and cultural resources, soils, seismicity, risk of upset hazards, land use, traffic. And it would create a new high-consequence area near Durst Organic Farmers. And that is based on the fact that Durst employs 40 year-round employees and 300 employees during peak farming periods.

Option C, which is shown in dark green, would result in a greater magnitude of impacts to biological resources and soils and would not reduce any impacts associated with the proposed project.

MR. SMITH: Does Option B run from A to -- is that north/south the B plan or what?

MS. SPURR: It starts in the same location as

A.

MS. MIKKELSEN TUTTLE: Yes. Option A we start here.

MR. SMITH: Right. Where does the option run below that, where A starts? What is that? Yeah, what option is that?

MS. MIKKELSEN TUTTLE: This is the proposed project. Is that what you are asking?

MR. SMITH: What slide is that? Is that C?

MS. SPURR: The proposed project. Are you talking about the little jog? The little jog in the --

MS. MIKKELSEN TUTTLE: The green here?

MR. SMITH: Yeah.

MS. MIKKELSEN TUTTLE: That's C.

MR. SMITH: That's C.

MS. MIKKELSEN TUTTLE: Yes.

MR. SMITH: When was that added? Recently?

MS. MIKKELSEN TUTTLE: No, it's been in the --

MR. SMITH: From the beginning?

MS. MIKKELSEN TUTTLE: From the beginning.

MR. SMITH: I happen to be at Site A and I don't, I'm not aware of the C site being a possibility. I only discovered this reading the data. So that's not a recent addition then?

MS. MIKKELSEN TUTTLE: No.

MR. SMITH: Because I have already visited Site A with PG&E and I was not made aware of the site below it, which is still on my property. Okay.

MS. MIKKELSEN TUTTLE: Options D and E, light green and yellow respectively, there's a large scale map of these two alternatives in the back, would result in greater impacts, magnitude of impacts to biological resources, soils, cultural resources, aesthetics and noise during construction and would not reduce any of the impacts of the proposed project.

Option F, shown in maroon right here, was considered to avoid hilly terrain, and would result in greater impacts to biological resources, although it would reduce impacts to cultural resources.

And finally Option G on this diagram here would result in greater impacts to biological resources and would not reduce any impacts of the project.

MR. STEPHENS: What are the biological resources that would be impacted?

MS. MIKKELSEN TUTTLE: That varies depending on the option. And I have tried to abbreviate my comment on each option because I could go into great detail. Which option are you specifically referring to?

MR. STEPHENS: D and E, I guess, you know. Things don't change a hell of a lot out in that area.

THE REPORTER: I'm not picking up your comments, sir.

MS. SPURR: We can go over that after the meeting if you want. Because I have a copy of the EIR and we can look and see what those biological specific impacts are.

MS. NEWTON: Typically the biological impacts throughout the alignment deal with either wetland and wetland-associated species, vernal pool or vernal pool-associated species or trees, which is associated with Swainson's nesting. That's in general what they typically are.

MR. STEPHENS: But there are drainage areas --

THE REPORTER: Sir, sir, I'm not picking you up, I'm not picking up your comments.

MR. STEPHENS: That's probably better for me, you can't sue me.

MS. NEWTON: Okay, let's --

MS. SPURR: Well we'll continue. You can come up, you can come up and speak after we're done with the presentation.

MS. NEWTON: Yes. We want to make sure that we capture your comments. These are not mics for projecting sound, they are mics for just receiving. So if you say something when you are not up to the mic we are not going to be able to capture it, is what she is saying.

MR. STEPHENS: Well just on some areas, like our part, it’s right along the drain ditch. It’s water, you know, it’s got water in it. It’s going to be the same in these other places. I think it’s just PG&E wants it to be a damn straight line and don’t care about us.

MS. NEWTON: Well that would be a good comment to make.

MR. STEPHENS: I just made it.

MS. MIKKELSEN TUTTLE: I will make a --

MS. NEWTON: Let’s wait until the end, please.

MS. MIKKELSEN TUTTLE: I will make the comment that during the analysis of the options rather than compare the entire project plus the option, which would be a little unfair to the larger options, what we did was we compared a portion of the proposed project to the equivalent portion of the option. So we were comparing that piece to the proposed piece. And if you want to ask specific questions about the analysis I can go over them with you after the presentation.

Just to quickly finish through the alternatives. Option H is shown in yellow here. It would result in greater impacts to biological resources, predominately because it involves a greater crossing through the Yolo Bypass.

Options I, J and K would reduce the risk of upset hazards to planned school sites as well Option L, excuse me. And Options I, J and K would reduce impacts to aesthetics and noise due to moving a portion of the pipeline to a location with fewer residences. These options would increase impacts to biological resources like seasonal wetlands, vernal pools and creeks and would also increase disturbance to soils.

I'll briefly point these out. Option I is in turquoise here, Option J is in pink here, Option K is here. It's blown up here for better vision. And Option L is fairly difficult to see because it runs along the pipeline. Option L would extend the proposed HDD in that location, which would reduce the safety risks to the planned school site located south of Baseline Road.

In the Draft Environmental Impact Report we analyzed 14 environmental issue areas. And I am not going to repeat them all here, they are on the slide here. I have a copy of the EIR here if anybody would like to look at it. And I touched on a lot of the areas as I was going through the alternatives.

We also analyzed impacts related to environmental justice, cumulative effects of the proposed project. And I do want to point out that the technical studies and the data that supports the analysis that is contained in the EIR are all included a appendices to the Draft EIR.

Part of analyzing and minimizing impacts to the environment involves implementing mitigation measures and we have implemented mitigation measures in three major ways for this project. One, through project design features which are intended to avoid or lessen environmental effects.

The second is applicant-proposed measures, which are measures proposed by PG&E to avoid environmental impacts during construction.

And third is once the EIR consultants and analysts take into account the project design features and the applicant-proposed measures, if there are still areas that are needed to reduce environmental impacts, EIR mitigation measures are proposed.

Those are summarized in the EIR, both in the executive summary and in the mitigation and monitoring plan.

Some of the notable project design features include added cover to prevent damage from outside forces, financial compensation for temporary and permanent losses of agricultural lands. Stockpiling and replacing topsoil. Hazardous materials contingency planning. Utilizing HDD technologies to avoid large, sensitive resources. Implementing best management practices to avoid impacts to hydrology and other resources.

Some of the notable applicant-proposed measures that are included, all of the applicant-proposed measures that PG&E proposed are included as part of the requirements of the project in the EIR.

Some of these include fugitive dust mitigation, construction operation measures to reduce air quality impacts through maintenance of construction equipment, minimizing the idling time of vehicles, et cetera. Minimization of construction areas by staking and fencing and flagging the construction right-of-way, making sure that workers aren't going outside of that 100 foot boundary. In addition there's hazardous substance control, emergency response plans and procedures, traffic management plans, noise reduction and minimization measures.

And as I said earlier, in addition to the project design features and the applicant-proposed measures, some of the EIR mitigation measures that are proposed include the need to restore habitat and topography following construction, replanting screening vegetation and light-shielding to prevent long-term aesthetic impacts. And implementing energy efficiency measures to reduce greenhouse gas emissions, monitoring nearby wells to ensure that groundwater is not impacted, and again, implementing best management practices to control construction vibration and noise.

At the conclusion of the analysis the Environmental Impact Report identified four Class 1 significant but unavoidable impacts. There are two such impacts related to air quality, both of which are related to temporarily exceeding air quality thresholds during construction. The other two impacts are related to hazards and the exposure to an unacceptable risk of hazards from fires, explosion or release.

That concludes my portion of my presentation on the EIR. This is Crystal Spurr’s address and e-mail address. I do encourage you to send your comments to her by June 12.

MS. SPURR: Okay. Again, if anyone would like to speak, provide your comments, could you please just fill out your name and then I’ll call you up one by one. I just have one at this time, Howard Lopez.

MR. H. LOPEZ: Okay. My name is Howard Lopez and I have got a piece of property that is in the projected line that you guys -- the one that you guys PT-32 are saying is the way to go.

PT-32 Cont.

The thing of it is they are cutting right through my property. They are dividing it. They are cutting it in half instead of going along the edge of the county road, okay.

PT-33

That's going to cause a lot of problems. One of them being a financial problem because of the deep-rooted crops. I won't be able to plant almond trees there. Almond trees I found out are $4500 per acre and I'm losing an acre and a half, okay. And over a 15 year period you're looking at over $100,000 that I'll lose on that acre and a half, believe it or not.

And the thing of it is is I'm not the only one that's going to lose income off of losing this acre and a half. The community will, you know, in taxes and in jobs lost. Because some of this, you know, revenue is paid out to vendors and that for the almond trees, okay.

The next thing I'd like to say is I don't know how much this thing cost the taxpayers. I'd like to know.

MS. NEWTON: How much what cost?

MR. H. LOPEZ: How much this report (tapping on binder).

MS. NEWTON: PG&E paid for 100 percent of that.

MR. H. LOPEZ: PG&E paid for that. Well, then I can see why things are the way they are. Because let me tell you. Before you guys sent me this book, this thing, I was offered, I was offered money to sell an easement to them. And I questioned them. I says, well why are you guys trying to buy an easement when it hasn't gone through environmental impact yet? And I didn't get a good straight answer on that. PT-34

Plus there's been a fellow out there that's -- he's a contractor that puts in the pipe. And he's out there on my property looking where this pipe is going to go. And I'm asking him, I say hey, you know, what's the deal here? Why are you -- you guys are acting like this is a done deal. It hasn't gone through environmental impact. He's looking for water lines and things that he's going to have to go under or tear up, see. PT-35

So I don't know if you guys, you know, have got any power that you can turn them away or not. You see what I'm saying? PT-36

MS. NEWTON: As Crystal -- I'm Gail Newton, I'm the chief of the environmental division for State Lands.

As Crystal said in her opening remarks, there's actually two decisions being made here. And the first is on the document, certifying the document. And this will be at our commission hearing, which we will notice you of. So the first one is certifying the document.

But the second decision is on the project. And our commission has the ability to either approve or not approve the project.

MR. H. LOPEZ: Well again, what they are offering us is nothing. What they are offering us is nothing. You can get -- If you have a cell tower on your property they are paying $1200 to $1500 a month for that. And, you know, I've been offered, I don't know, $7,000 for my acre and a half. You know, that's nothing because that's all I'm going to get forever, you know. And I'm not going to get any benefit off this line.

PT-37

And like I say, if they would put it at the end of the field it would be a lot better, along the county road. Because if they put it in the middle of the field what they are doing is they are taking that piece of ground out of production.

PT-38

MS. NEWTON: Is there one of those alternatives that was shown that would include one of those county roads that you think is preferable?

MR. H. LOPEZ: Yes. What I would like to see is the No Option, the no project option, first of all. The second would be, I think it's A. It's the County

PT-39

Road 16 option. Or the County Road -- E, the County Road 19 option. And I own a piece of property on 19 that they would have to go through. And I'd be willing to give them, to work with them on an easement on going through that piece of property if they would do that, where they would stay along the road. Instead of dissecting my property, see.

PT-39 Cont.

Because I am not going to give them an easement, I am not going to sign an easement. And I have already told them that if they come on the property that they are going to be trespassing. And they continue to come onto the property. And when I confront them what they tell me is, oh, we haven't been told to stay off your property. That's what they tell me, see. So the PG&E is just giving me a bad time the whole, this whole thing. This whole, you know, this whole situation.

And another thing. Because I've got some, I've got some property over along the foothills where these two lines run. And there was a problem with one of the lines, it become exposed. So I called the PG&E. They came out and they did some work on it and they made it worse. I have some pictures here to actually show you guys and you guys can keep them. This is what they left me. And this has been going on for four years.

PT-40

This is a wash. See these are the two lines right here. And what happened was right here they had -- the pipe was exposed, the pipe become exposed. So I called them and they came out and they put this little dinky pipe in here and loosened all this ground. Now you see where you've got all this erosion, okay. Two engineers from the PG&E came out.

Here's some more pictures of it. This is what they did to cover up their exposed line. Well you can see it's already washing around the back of that, okay. This is another view of it.

Maybe these people out here would like to look at this. Because this is the way the PG&E maintains their gas lines. And this is -- and I'll tell you, they are not going to change after they put in these gas lines on our property, okay. PT-40 Cont.

This is -- all this is erosion where they didn't do it properly. Because two engineers came out and told me that they didn't do it properly. But they told me that they were out of money. They were out of money and they couldn't -- the initial repair wasn't done right because they didn't have enough money to go to Napa and get the proper rock to rock it. So this is the way the PG&E maintains their gas lines, okay.

And getting back to this thing here. I've read, I've been through this thing. And all that it tells me is that the primary route is the best route because it's the shortest route and it's the cheapest for the PG&E. That's all this book is telling me, I've been through it.

Those alternative routes. You're saying, well there's dust up there and there's noise up there and seismic activity. That's only a mile from the proposed route. You can't tell me that just because it's a mile away that you're going to get dust and you're going to get noise and you're going to get seismic activity. You're going to have all the same things on the proposed route. PT-41

Let's see, I think that's it. Yeah, that's it. I'll never give them an easement.

What I'd like to know though is, what will happen if you guys -- because it looks to me like you guys are going to go with the PG&E. I don't know, that's the feeling I get. And what's going to happen when you guys go with the PG&E? Are they going to force their way through? I'd like to know what's going to happen then. PT-42

MS. NEWTON: We can give you a contact number for PG&E. We are just the lead agency on this. But we can give you a contact number and you can ask those questions of PG&E.

MR. H. LOPEZ: You can't tell me, huh?

MS. NEWTON: Well I know that PG&E has eminent domain powers; I don't know that they have ever exercised them. So that's a conversation that you would have to have with PG&E.

MR. H. LOPEZ: You know, another thing that I was told was talking about the deep-rooted crops. A representative from the PG&E came out. This guy was from the PG&E. I told him -- he says, well what's your complaint, you're going to get, you're going to get compensated for it. And I told him I didn't like the compensation.

And then he told me. I says, well I can't plant, you know, the high dollar crops in here, I won't be able to plant the high dollar crops on this strip of land that you're going to take out of production for me. And he says, oh, like what, trees? I said, yeah. He says, go ahead and plant the trees. He says, after we leave, after we're down the road plant the trees. I said, oh yeah, like that's going to work. That's what he told me. That's the guy from the PG&E. So that's what I've been getting see. PT-43

MS. NEWTON: Thank you for your comments.

MS. SPURR: The next person is James Bennett.

MR. BENNETT: My name is James Bennett. I have a piece of property on the proposed line.

My concern is I have an irrigation well right at where it makes a 90 degree turn and I'm concerned about that, it's a pretty important item. Then also I have a concrete pad that's within that 50 feet from the property line that's there. Is that going to disappear also, you know, during that construction and all that? They're asking for 100 feet for, you know, during the construction. That totally encompasses both the well and the pad. PT-44

And then I have another question about the liability if there is a problem that arises. Who addresses that? Who is responsible for that? PT-45

MS. NEWTON: Well during the construction that would be PG&E.

MR. BENNETT: Okay, and then also during, afterwards?

MS. NEWTON: If it's associated with the pipeline.

MR. BENNETT: Okay. Anything that comes up they're liable for it.

MS. NEWTON: Well, I wouldn't say anything. But that would be in your agreement with them.

MR. BENNETT: Well, anything connected with the pipeline. Okay. That was all I had comments on.

MS. NEWTON: Do we have an address for you?

MR. BENNETT: Yes.

MS. NEWTON: Because I know that PG&E was very interested in where there were wells that were located within the easement. So if we have your address --

MR. BENNETT: There's also a pipe that goes across the road. Where they are actually putting the line in in front of our property is across the road, but then they make a 90 degree turn and come down the property line. And there is a pipe that goes -- before they put the road in there was a pipe that went across the road and we don't really want to lose that. PT-46

But yes, you have my, my address. Thank you.

MS. NEWTON: Thank you very much.

MS. SPURR: Thank you.

Wilma Hill.

MS. HILL: I'm Wilma Mast Hill and have property very close to Howard Lopez.

And this pipeline would cut right through the middle of our property, totally devaluing it for future use and for future sale. If you have, if this easement would go through and if we wanted to sell our property it would devalue it tremendously. And even though -- this little compensation, quote/unquote compensation for PT-47 putting in the line is totally inadequate. If it were a yearly compensation that every year we got compensated because of loss of value of your property I would, it would be something to consider.

PT-47 Cont.

But there is no reason why this pipeline can't be put along Road 19 where it is out of the way and not in people's -- cutting through their land, getting into their wells. And I feel PG&E should accommodate the farmers instead of working against them. And it just seems to me that PG&E is giving people the runaround. At least Howard Lopez has been trying to work with them.

PT-48

And I would like to see some kind of coordination here with us people in this room. I would like to know who was here. I would like us to be able to contact each other and find out from each other what is happening. Because I just feel like this is a game that's going on. We have a huge corporation here, PG&E, that wants to do the cheapest thing they can. And we are not able to -- until we get the impact report. And when we go to the commission I'm sure we'll be able to make our -- but that is not so easily done when you live 70 or 80 miles away like I do.

So I just wanted to put my comments that I would like to know what's going on and I would like to have us know about the meetings. I want to know about

PT-49

when the meetings are and every contact we can have. PT-49 Cont.

MS. SPURR: All right, thank you.

Chris Ochoa.

MR. OCHOA: Chris Ochoa, Klein Family Farms.

I agree with Mr. Lopez, we are having the same problem. We're going right through the middle of our property.

I don't think that's fair that you guys singled out an organic farmer. I mean, our farm is way, way bigger than Durst Farms. I mean, we've got a lot more land affected here. And I think that's not right, just because he's organic and I'm conventional, that you guys go around him. I mean, we've got way more employees and we have more economic to do with this county than he does. PT-50

MS. NEWTON: Do you mind if I ask how many employees?

MR. OCHOA: During harvest/transplant season we could be up there 60, 70 employees. If you took it all year round we could be up there in the hundreds. You know, hoeing crews, everything like that. Like I say, we farm almost 5,000 acres. I know Mr. Durst isn't close to that.

This started for us about two years ago, March two years ago. My guys would call me on the radio and PT-51 say hey, there's people out here putting stakes, holes in the field. No one ever contacted us, no letters. We damaged equipment. Which we finally did get somebody at PG&E for damaged equipment. It's just been recently I'm finally getting phone calls saying, we're going to come out on your property. It took me a year and a half to get that to happen.

PT-51

Another issue that no one has talked about is they are asking for a 100 foot right-of-way right through the middle of our crops. But we've still got to spray and the ag commissioner has buffers for us to spray. So if they are in the middle of our property and we've got a 300, 400 or 500 foot buffer depending on what we're spraying, we can't spray. And I mean, that's in the middle of my own property.

So we might have a 1,000 acre field that, you know, half of we can't spray because they are doing construction out there. And most of these materials nowadays we use are a minimum of 24 to 72 hours reentry. So, I mean, my question is, are they going to shut the project down for 72 hours so I can spray? I doubt it. We have a big impact here on our crops, you know.

PT-52

And another thing I ask is if they do their construction in the summer and not pack our soil any more than they are going to. I mean, they picked their

PT-53

route, they are going to get their route. And, I mean, I don't think there's any way to stop it. And I just, you know, ask that we be compensated, which I know we are not going to be. That's all I have to say. PT-53 Cont.

MS. SPURR: I have a question for you.

MR. OCHOA: Yes.

MS. SPURR: This 913 Ridgeview Drive. Is that the address of Klein Family Farms?

MR. OCHOA: That's -- send it to me and I'll make sure they get it.

MS. SPURR: Well I'm just trying to, I would like to locate it on the map. So is that the address of the farm?

MR. OCHOA: No, it's in town, that's not actually where our farm is. I can go over the map afterwards with you.

MS. SPURR: Okay.

MS. NEWTON: That would be great.

MR. OCHOA: Because we are two miles of this pipeline on our own property. Thank you very much.

MS. SPURR: Thank you.

Ed Mast.

MR. MAST: I'm a neighbor of Howard Lopez and feel the same way that he does. Number one, we are being shafted on the payment. I have got a piece of PT-54 property up on Road 85. We started out with MCI, now it's Verizon, and I'm getting $2500 a year for a piece that big. And you want to offer us practically nothing for trespassing. And this contract goes for 60 years. If you'd come up with something like that for the landowners who have some long-term interest in it, it might sweeten the pot a little bit, I don't know. PT-54 Cont.

But anyway, you're shafting the public, you know, and you're bulldozing your way through and I just don't like it. You're dividing our fields up. I don't know whether we can irrigate a row crop, because we have row crops. If you have a field worker on this property what do we do, shut down the irrigation pumps? I don't know. PT-55

How are we going to be compensated, for the whole field or what's lost? If the pipeline divides the field and we can't irrigate the other half -- if we can't irrigate the whole field where's the compensation come? There's nothing -- But I'm highly opposed to it, thank you.

MS. SPURR: All right, thank you.

Is there anyone else who would like to speak?

MR. STEPHENS: Fulton Stephens, property owner out there. Ours isn't as bad as Mr. Lopez's because it goes along the property line. But it's criminal to just PT-56 divide people's property. It should go down existing roads or property lines. I mean, that's just asinine. I feel that PG&E's mission statement is just to try to screw us the best they can. PT-56 Cont.

And on the compensation, and I don't know if that's you guys' deal or not. But why can't some of the greater good come to us out there. I mean, it's on our property. We'd like to have electricity and gas. You know, not just do the greater good for Roseville or whoever the hell gets it. PT-57

MS. NEWTON: Okay, thank you.

MS. SPURR: Thank you.

MR. SMITH: The name is Paul Smith. I have property right on County Road 85. Actually I'm right there at the junction where the new connection would be at 400 and 401.

Now currently I have gas lines on my property that run about 100 or about one mile or a mile and a half perhaps. So I have already been introduced to the gas lines. PT-58

Now the way I see it, with the connection point on my property I am being introduced to another project on my property. I would prefer that they take that connection point and move it to the north, which I had a question a little bit earlier about. I don't want

PT-58 Cont.

the connection site on my property. I've got enough easements already on my property.

PT-59

Now, and I was just made aware today after reading some of the literature on the boards back here, of the other alternative which is also on my property. I had not been appraised of that, hadn't been made aware of it. I don't even know where they are thinking about putting it on my property except for what I see on the drawing board back there. I have only walked the site that is proposed right now with PG&E.

PT-60

Now, I got a letter, I think a few months back, that I was supposed to sign giving them permission to connect to my area on my property where the pipeline is going to start, the new pipeline. The compensation that they offered for this project was an insult to me. Now I'm sure that other property owners here also have received a similar compensation offer. It's an insult to me and I'm sure to other people.

The fact is that PG&E is going to put this line in and service a lot of people up towards Northern California or up in that direction. They are going to make billions of dollars on this gas; there's no question in my mind. Over a period of years there's going to be billions in return. And they want to offer us a pittance. It's just, it's almost, it's an insult to me what they are offering us.

We become partners with PG&E. We sign over easements to them, we are in partnership with them. And what do we get for it? Practically zero. It's totally unfair. And again, I would rather them take it off my site, get out of my neighborhood. I know that's impossible but this is my sentiment right now.

PT-60 Cont.

I have already had experience thanks to Mr. Lopez acquainting the public here, with the gas line going under Cache Creek that's on my property also. It is an accident waiting to happen. The state may not be aware of it but PG&E has worked on this problem. It's the gas line going into Cache Creek, which happened to be exposed now through erosion. They patched it and patched it and they'll probably continue to do it. It's a mess. So I've already got exposure to what PG&E can do and what they won't do. There's no compensation there to me whatsoever for this gas line on my property which runs -- Cache Creek runs right through my property.

PT-61

The other thing that I would like to comment on is the route for this gas line through all of these properties on up north of here, northeast I guess. Is this going to be considered a hazardous situation throughout these properties? Is it going to be

PT-62

considered a hazardous site on our properties? Is it going to be looked upon?

What if development occurs on any one of our properties and the county steps in and says, well you can't build a development here, you can't do this or you can't do this because you are right here on a hazardous site. Am I looking at this correctly or incorrectly?

PT-62 Cont.

MS. NEWTON: Well there are various -- this is kind of similar to the issue that happens on the east side of the alignment where the proposed route is along Baseline Road and there is proposed development that has already been approved that has school sites right up on that road. And that was reason for some of the options to get outside what the state mandates as an evaluation zone that's 1500 feet.

So if were to, if there were a subdivision to go on one of your pieces of property where the pipeline is, part of the subdivision development that would have to be considered as to if it needed to be upgraded for whatever density, you know, or something like that were to happen. It would be considered, it wouldn't necessarily preclude everything. I don't know all the regulations but it would definitely have to be a consideration.

MR. SMITH: But I think it's --

MR. STEPHENS:  How about a single house?
MR. SMITH:  Pardon me?
MR. STEPHENS:  Excuse me.
MR. SMITH:  Go ahead.
MR. STEPHENS:  Just a single house if it were being put in there.  How far away do you have to stay from the pipeline?
MS. NEWTON:  I don't think there's any guidelines.  I am not certain but I don't think there's any guidelines for a single house.  Whenever it looks at pipelines it looks at density of population.  And so it's when you get into certain densities that there's different criteria.
MR. STEPHENS:  One person, they're expendable, right?
MS. NEWTON:  We all, you know, anybody that has natural gas in their house lives near a pipeline.
MR. SMITH:  Well you guys are representing the state, I presume.
MS. NEWTON:  I'm sorry?
MR. SMITH:  You're not with the counties.
MS. NEWTON:  We are not with the county, we're the state.
MR. SMITH:  Well we live in the county so we, you know.  And I'm not saying that this is going to

PT-63

happen next year but look what's happening in this country right now, things are changing. Five years down the road, ten years down the road if you are on a hazardous site the rules may change. Can anybody guarantee that adjacent to these gas lines that we could build and do anything we want? I doubt it. PT-63 Cont.

MS. NEWTON: No, no one can guarantee that.

MR. SMITH: So that's what we are faced it. It's a consideration, believe me.

MS. NEWTON: You would have to go through the environmental analysis.

MR. SMITH: And that's why I go back to the compensation that's offered to us is an insult to all of us. I don't know what these other people got but mine was a total insult.

I don't know, I could go on and on. I think that's it, thank you.

MS. SPURR: Thank you.

MS. NEWTON: Any additional comments? Once again --

MR. H. LOPEZ: I'd like to say something else.

MS. NEWTON: The written comment period is up until the 12th so you could put some more in writing.

MR. H. LOPEZ: You know, you guys were talking about Jim Durst up there, the organic. One of the PT-64 reasons that you wouldn't use 16 as a, as an option. There's an organic on the proposed route just right next to me, an organic farmer, Capay Fruits and Vegetables. He employs a lot of people out there and you're going to go right through that place, cut it up too.

PT-64 Cont.

MS. NEWTON: Okay. The issue with Durst Organic, you did get it correctly, it's about how many people are there, it is about the risk to people. And so it is about how many employees are on that site and that type of thing. So if you can give us numbers of employees that would be great.

MR. H. LOPEZ: Capay Fruits and Vegetables, they are right next door.

MS. NEWTON: Okay.

MR. H. LOPEZ: They are an organic, he's an organic farmer just up out of Capay.

MS. NEWTON: Thank you.

MS. SPURR: Would anyone else like to make comments at this time?

MR. H. LOPEZ: One other thing. You know, I don't it's appropriate that the PG&E is paying you guys to do this, this project, I really don't. It looks like it would be a conflict of interest. I mean, if they are paying you guys -- Why doesn't the state, the taxpayers pay you guys? Then it would be -- you see what I'm

PT-65

saying?

MS. NEWTON: No, I think -- Okay, so we work for the state, we are the State Lands Commission. And the reason why we are the lead agency, typically if there is any project that goes on in your county, your county is going to be the lead agency.

And the way most counties do this and the way the state does it is we either have our own staff write the document, and PG&E hands us the money to pay our staff. Or what we do is we take PG&E's money and then we go hire a consultant. This is our consultant; this is not PG&E's consultant. They have their own consultants as well. This is our consultant. And PG&E is at arms distance. This is an independent review of the project.

The reason why we are the lead agency instead of the counties is because we have a piece of property, we are a landowner too. We have a piece of property that the line will cross. They have to get a lease from us.

And the way the laws are written -- and you would also have, you also have other counties involved. And so the way the laws are written they ask that only one agency take on the responsibility of lead. And it be the agency that either has to take the first action or has the broadest action. And so rather than Yolo County, Sutter County, Placer County, Sacramento County being the lead, we the state are the lead.

But it is not -- It is PG&E's money, not tax dollars money. It's not your taxes that's paying for our efforts. PG&E is paying for our efforts but it is our consultant and it is our analysis. So it is not PG&E's document, they didn't write this. Kerri and her staff did. I realize it's odd that the state would step in but that's why, there's multiple counties and they also cross our property.

MR. H. LOPEZ: Well I think that what you ought to do, you're going to do an impact report on the environment, you ought to do an impact report on the farmers, the people that live there. I mean, aren't we just as important as the environment?

PT-66

MS. NEWTON: You are as important and that's -- I think it is extremely important that -- that's why we have these public hearings, so we can get your comments. I think it is extremely important to get your comments into the record. And I know that our commissioners, which are -- two of them are elected officials, one is an appointee from the Governor, they are very interested in what the public has to say.

MR. H. LOPEZ: We just get dumped on. That's what happens to us, we get dumped on.

MS. NEWTON: Well your comments, these comments will go directly to our commissioners. And whenever that public hearing is, which we hope it is in August, that's what we are looking for, we are looking for a date where they can all be present. And as long as we have your address you will be noticed about that hearing. That's a good time to make your voice heard.

MR. STEPHENS: Either way we pay for it. PG&E will raise our rates so they can fund fighting us. We're screwed.

MS. HILL: Do any of you work for PG&E? Now you said you don't work for PG&E.

MS. NEWTON: None, none of us here work for PG&E.

MS. HILL: I guess I didn't get that straight at the beginning. I couldn't hear until --

MS. NEWTON: Right.

MS. HILL: None of you, you didn't -- I just thought you worked -- we came here and PG&E was giving us a report.

MS. NEWTON: No, but we can give you some contact names and numbers for PG&E if you have questions with regard to compensation, their rights, whatever. That type of action. We are here for the environmental document.

MS. HILL: Which one of you is Crystal?

MS. SPURR: That's me.

MS. HILL: Oh you're Crystal, okay. And you're the project manager of the California State Lands Commission.

MS. SPURR: Right, right.

MS. NEWTON: Maybe we should have you come up.

MS. BUTTERFIELD: I was just going to say, the people in the audience might be interested in specifically knowing who the commissioners are. PT-67

MS. NEWTON: Sure, certainly. The commissioners, there's three commissioners. One is the Lieutenant Governor, John Garamendi, one is the State Controller, John Chiang. And the third is the Director of Finance who is appointed by the Governor, who is Mike Genest. But he has delegated his responsibility to the commission to his chief deputy director who is Tom Sheehy. And you can access their websites, they all have websites. You can also get to their websites through our website. Which is not up there. Our website would be www.slc, as in State Lands Commission, .ca as in California, .gov as in government.

You know, I really want to encourage you to come up to the mic if you want to talk because otherwise --

MR. HULSMAN: It's just a question.

MS. NEWTON: Okay, a question.

MR. HULSMAN: A general knowledge question. Is anybody from Yolo County government here?

MS. NEWTON: I'm sorry?

MR. HULSMAN: Is anybody from Yolo County, the government here? Did they submit comments or do they even care?

MS. NEWTON: The question was is there anybody from Yolo County here and have they submitted comments.

MS. HULSMAN: Yes.

MS. NEWTON: I don't believe we have received any comments.

MS. SPURR: We have not received any comments from Yolo County. I don't know if anyone is here from Yolo County but they are certainly invited --

MR. H. LOPEZ: Phil Hogan with the RCD sent something to you.

MS. NEWTON: He's RCD, that was NRCD, that's different than the county.

MS. SPURR: That was during the scoping. But I haven't received anything on this particular document. That was during the scoping. We did have scoping meetings and we did get comments on what we should look at in this Draft EIR. But we haven't received anything yet from Yolo County.

MR. HULSMAN: Okay, I was just curious.

MS. SPURR: But we might, we might by June 12.

MS. NEWTON: From all the counties.

MR. OCHOA: Chris Ochoa again, a quick question. I know Yolo County Farm Bureau sent a letter about a year ago.

MS. SPURR: Right.

MR. OCHOA: Supporting the line that you guys took off. And asked to be kept in the loop. And I know we have not been kept in the loop or to work with us to find a route that would be the best for agriculture. PT-68

MS. SPURR: Yes, they are on our mailing list.

MR. OCHOA: They're on our mailing list but we never got, you know, a response back. I mean, the next thing we know the lines just dropped off, you know. They asked to support that line as much as possible. The next thing we know you guys pulled that route, the route off the agenda and that's the last we heard, you know. We asked to work with the Farm Bureau, to work with landowners and farmers to find a good route, or the best route to, you know, support agriculture.

MS. SPURR: Okay.

MR. OCHOA: So I'd like a response on that please.

MS. SPURR: All right.

MR. OCHOA: Thank you.

MR. SMITH: I've got a comment. Wouldn't it make sense that we talk to PG&E before they get to you guys? I know that you have probably the say-so in the matter whether they can proceed with the project. But why don't we give, why aren't we given a chance to talk to speak to PG&E and vent our opinion with them before they pass this package on to you? Is there something wrong with this picture or is it me or what?

PT-69

MS. HILL: That's what I thought, where's PG&E. Why aren't we talking to PG&E?

MR. SMITH: I mean, does that make a little bit of sense?

MS. SPURR: We can give you PG&E's contacts. That might have been something that they could have done themselves and had their own public meetings.

MR. SMITH: Yes. Because see, we haven't had a chance to get our opinions across. And yet we've got a book that's about four inches thick here with the entire proposal. And our comments aren't in that book. How that could be formalized and put together without listening to our side of the picture is beyond me.

MS. NEWTON: Well, you know, once again I want to encourage you to provide comments on some of these alternative options that you think are better, provide comment on those. If you think that something should be tweaked slightly or whatever to go around another high consequence area such as where there is another large number of employees or something, you know, provide those comments. And we will be looking at that prior to the final.

MR. SMITH: Because I know I met with them probably almost two years ago in Woodland at a meeting and it was about the proposal only. We couldn't really vent our opinions and so forth on it. And I believe we were told that there was going to be subsequent meetings where we could attend and participate. I haven't seen it. Well, you've got my comment.

MS. SPURR: Thank you.

Are there any other comments? Any other comments?

All right, I am going to go ahead and close this meeting. It's 4:05 p.m. and I'm going to go ahead and close the meeting.

But we are going to be around and we are going to have -- we are going to just stick around here. We don't mind talking to you after the meeting. You know, in-between the next meeting, between now and -- we'll have another meeting at 5:30 so we are going to be sticking around if you have any questions or would like to go over anything.

MS. NEWTON: Thank you for your time. I know that everyone had to take time out of their days to come here, we really appreciate that.

(Thereupon, the Public Meeting was closed at 4:05 p.m.)

CERTIFICATE OF REPORTER

I, RAMONA COTA, a certified electronic reporter and transcriber, do hereby certify that I am a disinterested party herein; that I recorded the foregoing California State Lands Commission Public Meeting dated June 4, 2009; that it was thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said meeting, nor in any way interested in the outcome of said meeting.

IN WITNESS WHEREOF, I have hereunto set my hand, this 19th day of June, 2009.

______________________________

Ramona Cota, CERT *00478

PUBLIC MEETING

BEFORE THE

CALIFORNIA STATE LANDS COMMISSION

| | | |
|---|---|---|
| In the Matter of: | ) | |
| | ) | |
| PG&E Line 406 and Line 407 | ) | CSLC EIR No.: 740 |
| Natural Gas Pipeline | ) | |
| CSLC Ref Files: W30169-4, | ) | |
| W26210; R19806 | ) | |
| SCH#: 2007062091 | ) | |
| ________________________________ | ) | |

ST. LUKE'S EPISCOPAL CHURCH

GUILD HALL

515 SECOND STREET

WOODLAND, CALIFORNIA

THURSDAY, JUNE 4, 2009

5:30 P.M.

Reported by:
Ramona Cota, CERT

APPEARANCES

COMMISSION STAFF AND CONTRACTORS

Gail Newton

Crystal Spurr

Kerri Mikkelsen Tuttle
Michael Brandman Associates

ALSO PRESENT

Everardo Pete Lopez

Barbara Dibble

INDEX

PROCEEDINGS

5:39 P.M.

MS. SPURR: We will go ahead and start the meeting. If anyone would like to provide comments at this meeting if you could fill out a speaker slip at the back table. Write your name on it and then give it to me and I'll call each of you up to the podium one by one.

My name is Crystal Spurr and I'm with the California State Lands Commission. We are the lead agency preparing the Draft Environmental Impact Report for the PG&E Line 406/407 natural gas pipeline project.

Gail Newton is going to speak a little bit and then I'll come back. Gail Newton, the chief of environmental planning and management with the State Lands Commission.

MS. NEWTON: I thought I would take just a real quick moment to explain our function in this process.

(Mr. E. Lopez moved from the back of the room to the front.)

MS. NEWTON: So to give you an understanding, of the process here. We are the State Lands Commission. And typically if there is a project proposed a county would often be the lead agency. However, this project spans four counties and also spans our jurisdiction, some of our land. And therefore since we have one of the earliest actions and also one of the broadest jurisdictions we are the lead agency.

And that means that we have hired an independent consultant to work for us. This is Michael Brandman Associates. The money to do this process was provided by PG&E but it is our consultant that is working for us that has prepared the document to analyze the environmental impacts associated with this project.

So we are an independent commission within the state. There are three commissioners. And what will happen is we are hoping in August there will be a public hearing. We haven't a confirmed date yet. But at that public hearing the environmental document will be considered for certification. And once it is certified, then our commission can make a decision on whether or not to approve the project. So there are two independent decisions being made there.

And our commission is, once again, the State Lands Commission. The commissioners are two elected officials and one appointed. The elected officials are John Garamendi who is the Lieutenant Governor, John Chiang who is the State Controller. And then the appointed gentleman actually works for the Department of

Finance and his name is Tom Sheehy and in essence he is representing the Governor. So those are our three commissioners.

And I want to encourage you to not only participate in the process during the draft environmental document and the final environmental document, but also participate at the commission hearing. And if we have your name and address on our sheet we'll notice you about the hearing.

And with that I'd like to turn it back to Crystal.

MS. SPURR: Okay, we are going to be transcribing this meeting and all of your comments so that we can respond to those in the Final Environmental Impact Report, which will be a consolidation of all of the comment letters that we receive. And if you want to write a letter you can send it by mail, e-mail, fax. It was on the Notice of Availability that was mailed out to everyone. If you didn't get one of those let me know. The Final EIR will have all those letters and our responses to all of your comments, including any comments that you make here, that's why we are transcribing this.

There is a sign-in sheet. If you haven't been to any of our meetings before or you are not sure if you are on our mailing list if you would sign in and provide your address we'll make sure that you are on that mailing list for the notice of the commission meeting.

The comment period is 45 days on this Draft Environmental Impact Report and it started on April 29, 2009 and it will end on June 12, 2009 at 5:00 p.m. So make sure you get your written comments to me by June 12 at 5 p.m.

We are going to have a short presentation on the Environmental Impact Report just going over some of the highlights of what is in this document and some of the alternative options that we looked at. Kerri Mikkelsen Tuttle is from MBA and she will be providing that.

MS. MIKKELSEN TUTTLE: As Crystal and Gail mentioned I work for a company called Michael Brandman Associates and we have been assisting the States Lands Commission to prepare this Draft Environmental Impact Report.

Today I am going to give a brief overview of what that document contains, a few details about the project. I am going to discuss the options, the alternative options that were considered in the document and evaluated, and discuss some of the document's findings.

Just a brief overview. The project is a 40 mile gas pipeline that would extend across Sutter, Yolo, Placer and Sacramento counties.

There are three new transmission pipelines that are being proposed, Line 406, Line 407 East and West and the Powerline Road Distribution Feeder Main.

In addition to -- I'm actually going to show you the graphic as I talk through this. In addition to the pipeline itself the project is proposing to construct six aboveground pressure limiting and regulating stations along the project alignment. Those are shown on this graphic in blue, with the exception of this, which is an existing below ground station.

At the western terminus of the project a new major connection point would be added to existing Lines 400 and 401. The Capay Metering Station in here. From that point the project would construct a large diameter, 30-inch pipeline across the valley, essentially bisecting the existing loop system that is already in place.

Construction of the pipeline would take place within a 100 foot wide area, which consists of a 50 foot permanent easement and a 50 foot temporary construction area.

Additional temporary areas that would be used during construction for staging purposes would be located predominately in existing commercial and industrial areas. There are two pipe storage facilities that are proposed to be used to store pipe during construction, one in Arbuckle and one north of the city of Woodland.

And the areas that would be required to be used for installing the horizontal directional drill pipeline that will be installed using HDD technology would require about 19,000 square foot temporary use areas. The area that is evaluated in the EIR encompasses all of those temporary construction areas.

Within the 50 foot permanent easement that would remain to allow PG&E the freedom to come and maintain the pipeline as well as minimize potential pipeline damage. Deep-rooted plants such as trees and vines will be prohibited within 15 feet of the pipeline centerline.

But agricultural operations could continue within that 50 foot permanent easement as long as not that 50 foot area.

Project construction would install pipe using three methods.

Conventional trenching, which is digging a trench and back filling it, would comprise about 91 percent of construction.

The horizontal directional drilling methods, which use a hydraulically-powered horizontal drilling rig to tunnel under large features, levees, roads, rivers, wetlands, would be use to install about seven percent of the pipeline.

And then conventional hammer and auger boring or jack-and-bore would be used to install approximately two percent of the pipeline.

The sequence of construction activities will begin with land being cleared and graded where necessary.

Topsoil and other excavated materials will be removed and stored while the pipe is being installed. The pipe would be installed and tested.

And subsequently the topsoil will be replaced and restored to its original conditions, both re-vegetated and restored topography.

The trenches will typically not remain open for more than five days. And once the pipe is installed they would be back filled within 72 hours.

There would be approximately 21 days between initial grading and back filling of any given location.

And each HDD takes approximately two to four weeks to complete.

Construction hours will be 6 a.m. to 6 p.m. Monday through Saturday, except for the HDD construction which would require 24 hour operations until the HDD construction is complete.

During construction about 90 to 130 workers will be working along the pipeline alignment. At any given time they would be dispersed along the alignment depending on where construction was occurring at that time.

The main travel routes are shown here. For Line 406 those travel route would be CR-85, CR-87, CR-88A, CR-17 and CR-19. And during construction up to 40 trucks a day would use these roadways temporarily and that would be 80 trips back and forth.

Line 406 construction is slated to begin in September or October of this year with a proposed in-service date of February 2010.

The other pipelines, Line 407 East and the DFM, are expected to be constructed in May of 2010 or earlier if possible. Proposed in-service date for Line 407 East and the DFM is September 2010.

And then Line 407 West is expected to be installed by 2012.

Prior to constructing any of the pipelines, PG&E would complete easement and permit acquisitions, they'll finalize land surveys, they'll survey and stake the construction right-of-way, that 100 foot corridor, as well as other temporary use areas that they will be using for staging. And they will hold pre-construction meetings in the field.

CEQA requires that we analyze, excuse me, feasible alternatives to the proposed project that meet the project objectives and that avoid or substantially lessen one or more of the significant environmental impacts of the proposed project.

For this project we analyzed and eliminated from full evaluation in the Environmental Impact Report four alternatives that are shown on this slide. The northern, green alternative here was eliminated due to increased risk from fault rupture and the location of portions of this alignment along hillsides.

The southern alternative, which is shown here in purple, was eliminated due to an increased number of crossings of tributaries to Steelhead Creek as well as increased crossings of vernal pools. That alternative, the southern alternative, would have also placed the pipeline in closer proximity to a large number of people.

The central alternative, shown in red, was eliminated due to increased impacts to special status species habitat and other local hydrologic features.

And the fourth alternative that was eliminated, the systems alternative is not pictured. It was eliminated because it proposed 15 separate projects and would have resulted in greater construction impacts associated with the greater lengths of pipelines.

The alternatives that are fully evaluated in the Environmental Impact Report. There are 12 build alternatives; alternative options A through L. And I am going to go through them briefly on the following slides in addition to the no project alternative, which is required to be analyzed under CEQA.

Each option represents a particular segment of the proposed project that has been proposed because it differs in location and may avoid or substantially lessen one or more of the project impacts.

CEQA also requires that we select an environmentally superior alternative based on how that alternative fulfills the project objectives and how it reduces significant unavoidable impacts or substantially reduces impacts associated with the proposed alignment.

For this project the environmentally superior alternative that has been identified in the draft document is incorporating the proposed project as well as Options I and L, and I'll show you those options next.

I'll briefly run through -- Basically as part of the environmental analysis when we looked at options we analyzed the option and the equivalent portion of the proposed project.

And what I am going to go through here is what is the difference between Option A, which is shown in red, and the equivalent portion of the proposed project. And B, which is shown in blue, and the equivalent portion of the proposed project. Is that Options A and B would result in a greater magnitude of impacts to agricultural, biological or cultural, soils, seismicity, risk of upsets, land use, traffic, and would create a new high-consequence area near the Durst Organic Farm that would not occur under the similar portion of the project.

Option C, which is shown in dark green here, was proposed to avoid segmenting an agricultural field there. That would have resulted in a greater magnitude of impacts to biological resources and soils and would not reduce any of the impacts of the proposed project.

This slide shows options D, E, F and G. D is in light green. This is the Hungry Hollow area. E is in yellow; it's the southern portion there. Those options would result in a greater magnitude of impacts to biological resources, soils, cultural resources, and aesthetics and noise during construction compared to the similar portion of the proposed project.

Option F, which is very small, shown here in maroon, was considered in order to avoid hilly terrain located just to the west. And that option would result in a greater magnitude of impacts to biological resources, although it would reduce impacts to cultural resources.

And then finally on this slide Option G here is shown in magenta. It's located here along the pipeline. It would result in greater impacts to biological resources compared to the equivalent portion of the proposed project.

Project options H through L are shown on this slide. Can you guys see that? Okay. H, Option H is here. It would require a greater crossing through the Yolo Bypass and therefore it would result in greater impacts to biological resources.

Options I, J and K as well as L. This is I, J, K and L is here, you can't see that one. They are all being proposed to avoid impacts to proposed school sites and therefore would reduce the risk of safety hazards to proposed schools by placing the -- for Options I, J and K, placing the proposed pipeline outside of the 1500 foot buffer.

Just a very brief overview of the layout of the Draft EIR. The Draft EIR analyzes 14 topical areas. I've mentioned many of them in my discussion in the previous slides. It also evaluates environmental justice and cumulative effects. And I do want to point out that the technical studies and data that underlie the analysis are located in the technical appendices to the EIR.

There are several ways that potential impacts of the proposed project have been mitigated to less-than significant levels including project design features that are intended to avoid or lessen environmental impacts, applicant-proposed measures, which are measures taken by PG&E to avoid potential environmental impacts during construction. All of the APMs that PG&E proposed are included in the EIR. When it was determined that implementation of project design features and applicant-proposed measures were not sufficient to substantially reduce impacts to less-than significant levels the EIR proposes additional mitigation measures in the document.

I'll briefly, briefly, briefly go through some of the project design features that are noteworthy.

PG&E is proposing added cover to prevent damage from outside forces along the pipeline alignment.

And a good example of that is there’s a three feet minimum in agricultural areas, PG&E is proposing five feet of cover.

PG&E is also proposing financial compensation for temporary and permanent losses of agricultural areas.

Soil will be stockpiled and replaced following construction.

And HDD technologies will be used to cross sensitive features.

Some of the notable applicant-proposed mitigations include managing fugitive dust, maintaining construction equipment and minimizing idling, which reduce air quality impacts during construction. Restoring the construction area within the right-of-way following construction. And planning for emergency responses and controlling hazardous substances during construction.

Some of the noteworthy measures that the EIR identifies are habitat and topographic restoration following construction, replanting screening vegetation and light shielding during construction to minimize aesthetic impacts. Emergency plan measures and measures to minimize hazards. Monitoring the nearby wells located along the alignment to ensure that groundwater is not impacted.

The EIR identifies four significant unavoidable, which we call Class 1 impacts. Two of those are related to air quality and they are related to temporarily exceeding air quality thresholds during construction. The other two are related to hazards and they are described in two places in the EIR, in the hazards and the land use section, and they are related to exposure to an unacceptable risk of hazards from fire, explosion or release.

And I'm sorry, that was a lightning tour through the document. I'm happy to answer questions after this entire presentation is over but I'll now turn it over to Crystal.

MS. SPURR: All right.

Do we have anyone that would like to provide comments at this time on record?

Would you like to?

MS. NEWTON: We put a mic right there so if you would like to --

MS. SPURR: If you would just state your name and then provide your comments.

MR. E. LOPEZ: What am I supposed to say?

MS. SPURR: If you could provide your name and then --

MR. E. LOPEZ: What am I supposed to say?

MS. SPURR: Any kind of comment that you had on the project.

MR. E. LOPEZ: I just barely hear you.

MS. SPURR: Do you have any comments on the project or the Draft Environmental Impact Report?

MS. NEWTON: Basically when we talked to you at the beginning of the meeting and we talked about the map, you had some preferences.

MR. E. LOPEZ: Yes.

MS. NEWTON: So this is the time to put those preferences into the record. Because this is being transcribed. So this would be the time to put your preferences that you voiced earlier into the record.

MR. E. LOPEZ: Yes. Well, I just have to, I just have to figure things out more. You know, more, more of what's going on, before I can say that I agree on it.

MS. NEWTON: All right. Maybe I could get, can you write down your name so we can know who was speaking, or tell me, whichever.

MR. E. LOPEZ: You want me to write it down?

MS. NEWTON: Sure, that would be fine.

MS. SPURR: Is there anyone else who would like to provide comments at this time?

Okay, if you could come up to the podium and just state your name.

MS. DIBBLE: My name is Barbara Dibble and I believe you spoke with my husband yesterday at the last meeting. I'm sure he pretty much covered everything but I have a few questions of my own. And one of them is, where exactly is the original PUE?

MS. SPURR: PUE?

MS. DIBBLE: Your public utilities easement.

MS. SPURR: That would be a question for PG&E. You are asking about PG&E's public utility easement?

PT-70

MS. DIBBLE: Yes.

MS. SPURR: I can provide you after the meeting with contact information for PG&E.

MS. DIBBLE: Okay. Because my understanding is it's from the street on. It should be -- I think it's like 15 feet. And I'm just wondering why you don't go that way.

I mean, I don't want it -- Don't get me wrong because I don't want it on my property at all because I'm scared to death of this. And I have seen many, many -- I have gone on-line and researched it and I have looked and I have seen those explosions. And it doesn't matter where it's going to be, whether it's in the front or the back of my property. When that thing goes it's

PT-71

going to take us all. PT-71 Cont.

MS. SPURR: There is a risk, yes. We talked about that in the EIR.

MS. DIBBLE: But my thing is you are trying to tell me that you are going to do the best you can not to contaminate my water, you are going to do the best you can to make sure that there's no explosions. How can you guarantee that? I mean, how do you guarantee that? How is that safe for my family right there? PT-72

MS. NEWTON: The document does do a risk analysis and it says that there is a risk. And that's why one of our unavoidable impacts is the risk for fire and explosions and that's what is evaluated. And that's why it's unavoidable and that's why it's pointed out as such.

And because there is an unavoidable impact in the document, if our commission adopts the document they have to make specific findings and a statement of override saying that we know there's a risk here and we can't mitigate it. It's still going to be significant, there is a risk for the people, but we find that it is more important to approve the project. And that will be part of the public record if that decision is made.

MS. DIBBLE: Okay. So this is like, for the good of the people, right?

MS. NEWTON: Well that would be the --

MS. DIBBLE: But we're people too. We're people too.

MS. NEWTON: Right. And that's why we are holding this public hearing because we want to get this into the record and that's what this is all about.

MS. DIBBLE: Okay, well I still do not feel safe. I mean, having this great big pipe go through my property does not make me feel safe.

And you're doing this for the good of the people. You're going someplace where there is no people yet. Am I wrong? You're putting this pipe over there to put in new housing; is that not right?

PT-73

MS. NEWTON: At the beginning of the meeting I talked about how we are the lead agency. We actually are not PG&E. So we are evaluating the project and our commission will make a decision.

MS. DIBBLE: So you have no representation here from PG&E?

MS. NEWTON: We can give you phone contacts for PG&E and numbers and you can speak to them directly about that.

MS. DIBBLE: Well I have a lot of concerns about that because I see these houses that are foreclosing all over the place and yet they still want to build. I don't understand that.

MS. NEWTON: So probably the best way to state that is, who are they serving?

MS. DIBBLE: Basically yes.

And another thing is that I have, I have owls in my barn. They have been there for a very long time. And I have hawks, a hawk family that is up in my eucalyptus trees, which keep my rodents down.

Now you bring all that equipment in there and it's going to chase them off. And you're telling me that you're supposed to go away from other areas to save animals, right? Is that not it? Because my husband said something about snakes.

PT-74

MS. NEWTON: Part of the environmental review process is trying --

MS. DIBBLE: Well what about my --

MS. NEWTON: -- to minimize impacts to other species, especially listed species.

MS. DIBBLE: Well what about my owls and my hawks?

MS. NEWTON: That is part of the evaluation.

MS. DIBBLE: I mean, because I really don't want to see them go.

All right. So my husband pretty much covered everything else but those are my concerns that are, you know.

And I really think that this whole project should go down 16. And if you have ever gone down there you would see that it is flat. And I don't see how any of that is going to move or cause any problems for your pipe. I mean, there's one house that I have seen on County Road 16, that's it. I mean, there's nothing out there, you can't farm it.

So, I mean, you're going through prime farmland. And I don't think that we should be, you know, take the burden on our shoulders so that you can -- I mean, I just don't understand it.

PT-75

And I looked at the map and you've got it coming down and right down 19 and then back up. Why don't you go straight through? I don't understand it. That's prime farmland. We are the third generation in that house.

PT-76

And as far as the rest of it, I mean. Our crops and stuff that we put in, we're not going to get the revenue for that because you are limiting our ability to plant what we like to plant. So now I can't put grapes in, and I can't put almond trees in.

PT-77

And honestly, I just, I don't feel safe about this.

My husband pretty much filled out the rest of it so -- but those are my thoughts.

MS. SPURR: Thank you.

MS. NEWTON: Thank you.

MS. SPURR: Any other commentors? Anyone else?

All right, we are going to go ahead and close this meeting then. I want to thank everyone for attending.

MS. NEWTON: And as long as we have your address you will get noticed about the Commission hearing.

I want to thank everyone for attending.

(Thereupon, the Public Meeting was closed at 6:07 p.m.)

CERTIFICATE OF REPORTER

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Ramona Cota, CERT *00478