**I.12-01-007, I.11-02-016, I.11-11-009.**

**PG&E'S REQUEST FOR OFFICIAL NOTICE**

# EXHIBIT 4

**California Office of the State Fire Marshal, Pipeline Failure Investigation Report (June 20, 2005)**

# *Pipeline Failure Investigation Report*

Pipeline System: **LS-16 (Concord to San Jose)** Operator: **Kinder Morgan Energy Partners**

Location: **Walnut Creek, Contra Costa County, CA** Date of Occurrence: **9 November 2004**

Medium Released: **Premium Gasoline** Quantity: **564 Barrels**

CSFM Arrival Time & Date: **1545 hours 11/09/04** Total Damages $ **TBD**

Investigation Responsibility: ☒ State ☐ OPS ☐ NTSB Other _____

*Company Reported Apparent Cause:*

☐ Corrosion ☒ Excavation

☐ Natural Forces ☐ Incorrect Operation ☐ Other Outside Force Damage

☐ Material and/or Welds ☐ Equipment and Operations ☐ Other _____

| | | | | | |
|---|---|---|---|---|---|
| Rupture | ☒ Yes | ☐ No | | | |
| Leak | ☒ Yes | ☐ No | | | |
| Fire | ☒ Yes | ☐ No | | | |
| Explosion | ☒ Yes | ☐ No | | | |
| Evacuation | ☒ Yes | ☐ No | Number of Persons **270** | Area | _____ |

## *Narrative Summary*

Short summary of the Incident/Accident which will give interested persons sufficient information to make them aware of the basic scenario and facts.

**At 1322 hours on 9 November 2004, excavation equipment operated by Mountain Cascade, Inc., struck Kinder Morgan's LS-16 pipeline, a 51.4 mile long intrastate products pipeline that travels from Concord to San Jose. The excavator was working on a large-diameter water supply expansion project in Walnut Creek, CA for the East Bay Municipal Utility District (EBMUD).**

**Upon puncture of the Kinder Morgan pipeline, gasoline under high pressure was immediately released into the surrounding area. Kinder Morgan control center operators in Concord immediately noticed the large pressure drop and started to shut the pipeline down. Several seconds after the line was hit, the gasoline streaming out of the line was ignited by welders employed by Matamoros Pipelines, Inc. who were also working on the new water supply pipeline. The ensuing explosion and fire resulted in the deaths of five workers and significant injury to four others. One nearby two-story structure was burned and other property was damaged.**

**The direct cause of the accident was the excavator's bucket striking the pipeline and puncturing through the wall of the pipe. However, there were several factors that significantly contributed to this accident. These include inadequate line locating, inadequate project safety oversight and communication, and failure to follow the one-call law.**

Region/State: **Western/California** Reviewed by: **Robert Gorham**

Principal Investigator: **Linda Zigler** Title: **Supervising Pipeline Safety Engineer**

Date: **17 June 2005** Date: **20 June 2005**

# *Pipeline Failure Investigation Report*

## *Failure Location & Response*

Location (City, Township, Range, County/Parish): (Acquire Map)
**Walnut Creek, Contra Costa County, California**

| Address or M.P. on Pipeline: (1) | Type of Area (Rural, City): (1) |
|---|---|
| **MP 8.48; South Broadway between Newell Street and Rudgear Road** | **Urban; Residential** |
| Date: **9 November 2004** | Time of Failure: **1322 hours** |
| Time Detected: **1322 hours** | Time Located: **1322 hours** |

How Located: **Contra Costa County Fire Protection District**

| OES Report #: (Attach Report) | Time Reported to OES: | Reported by: |
|---|---|---|
| **#04-5845** | **1358** | **Kinder Morgan** |

**Type of Pipeline:**

| Gas Distribution | Gas Transmission | Hazardous Liquid | LNG |
|---|---|---|---|
| ☐ LP | ☐ Interstate Gas | ☐ Interstate Liquid | ☐ LNG Facility |
| ☐ Municipal | ☐ Intrastate Gas | ☒ Intrastate Liquid | |
| ☐ Public Utility | ☐ Jurisdictional Gas Gathering | ☐ Offshore Liquid | |
| ☐ Master Meter | ☐ Offshore Gas | ☐ Jurisdictional Liquid Gathering | |
| | ☐ Offshore Gas - High $H_2S$ | ☐ $CO_2$ | |

Pipeline Configuration (Regulator Station, Pump Station, Pipeline, etc.):
**10-inch products pipeline**

## *Operator/Owner Information*

| Owner: **Kinder Morgan Energy Partners** | Operator: **Kinder Morgan Energy Partners** |
|---|---|
| Address: | Address: |
| **500 Dallas St #1000**<br>**Houston TX 77002** | **500 Dallas St #1000**<br>**Houston TX 77002** |
| Company Official: **Ron McClain** | Company Official: **Ron McClain** |
| Phone No.: **(713) 369-9152** Fax No.: **(713) 495-2735** | Phone No. **(713) 369-9152** Fax No. **(713) 495-2735** |

Drug and Alcohol Testing Program Contacts ☒ N/A

Drug Program Contact & Phone:
Alcohol Program Contact & Phone:

1 Photo documentation

# *Pipeline Failure Investigation Report*

| *Damages* | | | |
|---|---|---|---|
| Product/Gas Loss or Spill[2] | **564 barrels** | Estimated Property Damage $ | **TBD** |
| Amount Recovered | **60 barrels** | Associated Damages[3] $ | **TBD** |
| Estimated Amount $ | **$35, 379.72** | | |

Description of Property Damage:
**One two-story house burned; construction vehicles were burned; windows broken in other surrounding structures**

Customers out of Service: ☐ Yes ☒ No Number: _____
Suppliers out of Service: ☐ Yes ☒ No Number: _____

***Fatalities and Injuries***

| | | | | | |
|---|---|---|---|---|---|
| Fatalities: | ☒ Yes | ☐ No | Company: **-0-** | Contractor: **-5-** | Public: **-0-** |
| Injuries - Hospitalization: | ☒ Yes | ☐ No | Company: **-0-** | Contractor: **-4-** | Public: **-0-** |
| Injuries - Non-Hospitalization: | ☐ Yes | ☒ No | Company: **-0-** | Contractor: **-0-** | Public: **-0-** |
| Total Injuries (including Non-Hospitalization): | | | Company: **-0-** | Contractor: **-4-** | Public: **-0-** |

| Name | Job Function | Yrs w/ Comp. | Yrs. Exp. | Type of Injury |
|---|---|---|---|---|
| ***See Page 13*** | | | | |
| | | | | |
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| | | | | |
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| | | | | |
| | | | | |

***Drug/Alcohol Testing*** ☒ *N/A*

Were all employees that could have contributed to the incident, post-accident tested within the 2 hour time frame for alcohol or the 32 hour time frame for all other drugs?
☐ Yes ☐ No

| Job Function | Test Date & Time | Location | Results | | Type of Drug |
|---|---|---|---|---|---|
| | | | Pos | Neg | |
| | | | ☐ | ☐ | |
| | | | ☐ | ☐ | |
| | | | ☐ | ☐ | |
| | | | ☐ | ☐ | |

2 Initial volume lost or spilled
3 Including cleanup cost

# *Pipeline Failure Investigation Report*

## *System Description*

Describe the Operator's System:
**LS-16 is a 51.39 mile long, 10-inch products pipeline that delivers refined products from Kinder Morgan's Concord Pump Station to their San Jose Terminal. There is one downstream intermediate booster pump located at Dougherty Road in the City of Dublin, CA.**

## *Pipe Failure Description* ☐ *N/A*

Length of Failure (inches, feet, miles): **1" (about the size of a quarter)** (1)

| Position (Top, Bottom, include position on pipe, 6 O'clock): (1) | Description of Failure (Corrosion Gouge, Seam Split): (1) |
|---|---|
| **3 o'clock position** | **100% through wall puncture (from rock tooth of excavation bucket)** |

Laboratory Analysis: ☐ Yes ☐ No

Performed by: **Metallurgical tests are pending**

Preservation of Failed Section or Component: ☒ Yes ☐ No

If Yes - Method: **Puncture was covered with a temporary clamp and wrapped in plastic.**

In Custody of: **Anamet, Inc., Hayward, CA - metallurgical test laboratory (for CalOSHA)**

Develop a sketch of the area including distances from roads, houses, stress inducing factors, pipe configurations, etc. Bar Hole Test Survey Plot should be outlined with concentrations at test points. Direction of Flow.

## *Component Failure Description* ☒ *N/A*

Component Failed: (1)

| Manufacturer: | Model: |
|---|---|
| Pressure Rating: | Size: |

Other (Breakout Tank, Underground Storage):

## *Pipe Data* ☐ *N/A*

| Material: **Steel** | Wall Thickness/SDR: **0.188 inch** |
|---|---|
| Diameter (O.D.): **10.750 inch** | Installation Date: **1965 for original line**<br>**1987 for accident site section** |
| SMYS: **52,000 psi** | Manufacturer: **Unknown** |
| Longitudinal Seam: **High Frequency ERW** | Type of Coating: **Polyken Tape** |

Pipe Specifications (API 5L, ASTM A53, etc.): **API 5L X-52 ERW**

## *Joining* ☒ *N/A*

| Type: | Procedure: |
|---|---|
| NDT Method: | Inspected: ☐ Yes ☐ No |

## *Pressure @ Time of Failure @ Failure Site* ☐ *N/A*

| Pressure @ Failure Site: **973 psig** | Elevation @ Failure Site: **164 feet** |
|---|---|

| Pressure Readings @ Various Locations: | | | Direction from Failure Site | |
|---|---|---|---|---|
| Location/M.P./Station # | Pressure (psig) | Elevation (ft msl) | Upstream | Downstream |
| **Concord Station** | **1165 psig** | **+23 feet** | **X** | |
| | | | | |
| | | | | |

| *Upstream Pump Station Data* ☐ *N/A* | |
|---|---|
| Type of Product: **Premium Gasoline** | API Gravity: **59.6** |
| Specific Gravity: **0.74** | Flow Rate: **4483 bph** |
| Pressure @ Time of Failure [4] **1165 psig** | Distance to Failure Site: **8.48 miles** |
| High Pressure Set Point: **1360 psig** | Low Pressure Set Point: **None** |
| *Upstream Compressor Station Data* ☒ *N/A* | |
| Specific Gravity: | Flow Rate: |
| Pressure @ Time of Failure [] | Distance to Failure Site: |
| High Pressure Set Point: | Low Pressure Set Point: |
| *Operating Pressure* ☐ *N/A* | |
| Max. Allowable Operating Pressure: **1310 psig** | Determination of MAOP: **Hydrostatic pressure test** |
| Actual Operating Pressure: **1165 psig** | |
| Method of Over Pressure Protection: **pressure switch and transmitter** | |
| Relief Valve Set Point: **San Jose Terminal – 800 psig** | Capacity Adequate? ☒ Yes ☐ No |
| *Integrity Test After Failure* ☐ *N/A* | |
| Pressure Test Conducted in place? (Conducted on Failed Components or Associated Piping): ☒ Yes ☐ No | |
| If NO, Tested after removal? ☐ Yes ☐ No | |
| Method: **static pressure of 525 psi was held for one hour as a stand up test after replacement pipe was installed** | |
| Describe any failures during the test.<br>**None** | |
| *Soil/water Conditions @ Failure Site* ☐ *N/A* | |
| Condition of and Type of Soil around Failure Site (Color, Wet, Dry, Frost Depth): **Da m p** | |
| Type of Backfill (Size and Description): | |
| Type of Water (Salt, Brackish): | Water Analysis [5] ☐ Yes ☒ No |

4 Obtain event logs and pressure recording charts
5 Attach copy of water analysis report

# *Pipeline Failure Investigation Report*

| *External Pipe or Component Examination* ☐ *N/A* | |
|---|---|
| External Corrosion? ☐ Yes ☒ No (1) | Coating Condition (Disbonded, Non-existent): (1) **Good condition** |
| Description of Corrosion: **N/A** | |
| Description of Failure Surface (Gouges, Arc Burns, Wrinkle Bends, Cracks, Stress Cracks, Chevrons, Fracture Mode, Point of Origin): **100% through wall puncture** | |
| Above Ground: ☐ Yes ☒ No (1) | Buried: ☒ Yes ☐ No (1) |
| Stress Inducing Factors: (1) | Depth of Cover: **About 60 inches at accident site** (1) |
| *Cathodic Protection* ☒ *N/A* | |
| P/S (Surface): | P/S (Interface): |
| Soil Resistivity: pH: | Date of Installation: |
| Method of Protection: **Impressed current – last cathodic protection survey was completed in August 2004** | |
| Did the Operator have knowledge of Corrosion before the Incident? ☐ Yes ☐ No | |
| How Discovered? (Close Interval Survey, Instrumented Pig, Annual Survey, Rectifier Readings, ECDA, etc): | |
| *Internal Pipe or Component Examination* ☒ *N/A* | |
| Internal Corrosion: ☐ Yes ☒ No (1) | Injected Inhibitors: ☐ Yes ☐ No |
| Type of Inhibitors: | Testing: ☐ Yes ☐ No |
| Results (Coupon Test, Corrosion Resistance Probe): | |
| Description of Failure surface (MIC, Pitting, Wall Thinning, Chevrons, Fracture Mode, Point of Origin): | |
| Cleaning Pig Program: ☐ Yes ☐ No | Gas and/or Liquid Analysis: ☐ Yes ☐ No |
| Results of Gas and/or Liquid Analysis (6) | |
| Internal Inspection Survey: ☐ Yes ☐ No | Results (7) |
| Did the Operator have knowledge of Corrosion before the Incident? ☐ Yes ☐ No | |
| How Discovered? (Instrumented Pig, Coupon Testing, ICDA, etc.): | |

6 Attach copy of gas and/or liquid analysis report
7 Attach copy of internal inspection survey report

# *Pipeline Failure Investigation Report*

| *Outside Force Damage* ☐ *N/A* | |
|---|---|
| Responsible Party: **Mountain Cascade, Inc.** | Telephone No.: **(925) 373-8370** |
| Address: **555 Exchange Court, P.O. 5050, Livermore, CA 94551-5050** | |
| Work Being Performed: **Excavation of ditch for installation of 72-inch (OD) water line for East Bay Municipal Utility District** | |
| Equipment Involved: **Track hoe excavator** (1) | Called One Call System? ☒ Yes ☐ No |
| One Call Name: **USA North** | One Call Report # (8) |
| Notice Date: | Time: |
| Response Date: | Time: |
| Details of Response:<br><br>**---Refer to Narrative Section - attached** | |
| Was Location Marked According to Procedures? ☐ Yes ☐ No | |
| Pipeline Marking Type: (1) | Location: (1) |
| State Law Damage Prevention Program Followed? ☐ Yes ☐ No ☐ No State Law | |
| Notice Required: ☐ Yes ☐ No | Response Required: ☐ Yes ☐ No |
| Was Operator Member of State One Call? ☐ Yes ☐ No | Was Operator on Site? ☐ Yes ☐ No |
| Is OSHA Notification Required? ☐ Yes ☐ No | |
| *Natural Forces* ☒ *N/A* | |
| Description (Earthquake, Tornado, Flooding, Erosion): | |

8 Attach copy of one-call report

# *Pipeline Failure Investigation Report*

| ***Failure Isolation*** ☐ *N/A* | |
|---|---|
| Squeeze Off/Stopple Location and Method: (1)<br>**stopple installed downstream of puncture; hot tap installed upstream of puncture** | |
| Valve Closed - Upstream: **Concord Outgoing Block Valve**<br>Time: **1730 hours 11 November 2004** | I.D.:<br>M.P.: **00.00** |
| Valve Closed - Downstream: **Hillgrade Block Valve**<br>Time: **1415 hours 9 November 2004** | I.D.:<br>M.P.: **10.098** |
| Pipeline Shutdown Method: ☒ Manual ☐ Automatic ☐ SCADA ☐ Controller ☐ ESD | |
| Failed Section Bypassed or Isolated: | |
| Performed By: **Kinder Morgan** | Valve Spacing: **10.098 miles between these two block valves** |

| ***Odorization*** ☒ *N/A* | | |
|---|---|---|
| Gas Odorized: ☐ Yes ☐ No | Concentration of Odorant (Post Incident at Failure Site): | |
| Method of Determination: ☐ Yes ☐ No | % LEL: ☐ Yes ☐ No | % Gas In Air: ☐ Yes ☐ No |
| | Time Taken: ☐ Yes ☐ No | |
| Was Odorizer Working Prior to the Incident?<br>☐ Yes ☐ No | Type of Odorizer (Wick, By-Pass): | |
| Odorant Manufacturer:<br>Model: | Type of Odorant: | |
| Amount Injected: | Monitoring Interval (Weekly): | |
| Odorization History (Leaks Complaints, Low Odorant Levels, Monitoring Locations, Distances from Failure Site): | | |

| ***Weather Conditions*** ☐ *N/A* | |
|---|---|
| Temperature: **High 60°'s** | Wind (Direction & Speed): |
| Climate (Snow, Rain): **Cloudy – rain expected** | Humidity: |
| Was Incident preceded by a rapid weather change ? ☐ Yes ☒ No | |
| Weather Conditions Prior to Incident (Cloud Cover, Ceiling Heights, Snow, Rain, Fog): | |

# *Pipeline Failure Investigation Report*

| ***Gas Migration Survey*** ☒ *N/A* | |
|---|---|
| Bar Hole Test of Area: ☐ Yes ☐ No | Equipment Used: |
| Method of Survey (Foundations, Curbs, Manholes, Driveways, Mains, Services) [9] [1] | |
| ***Environment Sensitivity Impact*** ☒ *N/A* | |
| Location (Nearest Rivers, Body of Water, Marshlands, Wildlife Refuge, City Water Supplies that could be or were affected by the medium loss): [1] | |
| OPA Contingency Plan Available? ☐ Yes ☐ No | Followed? ☐ Yes ☐ No |
| ***Class Location/High Consequence Area*** ☐ N/A | |
| Class Location: 1 ☐ 2 ☐ 3 ☐ 4 ☐<br>Determination: _____ | HCA Area? ☐ Yes ☐ No ☐ N/A<br>Determination: _____ |
| Odorization Required? ☐ Yes ☐ No ☐ N/A | |

| ***Pressure Test History*** ☐ **N/A** | | | | | | |
|---|---|---|---|---|---|---|
| | Req'd [10] Assessment Deadline Date | Test Date | Test Medium | Pressure (psig) | Duration (hrs) | % SMYS |
| Installation | N/A | **1965** | **Water** | **1760** | **8** | |
| Nex t | | | | | | |
| Nex t | | | | | | |
| Most Recent | | | | | | |
| Describe any problems experienced during the pressure tests. | | | | | | |

| ***Internal Line Inspection/Other Assessment History*** ☐ **N/A** | | | | | |
|---|---|---|---|---|---|
| | Req'd [10] Assessment Deadline Date | Assessment Date | Type of ILI Tool [11] | Other Assessment Method [12] | Indicated Anomaly If yes, describe below |
| Initial | | | | | ☐ Yes ☐ No |
| Next | | | | | ☐ Yes ☐ No |
| Next | | | | | ☐ Yes ☐ No |
| Most Recent | | | | | ☐ Yes ☐ No |
| Describe any previously indicated anomalies at the failed pipe, and any subsequent pipe inspections (anomaly digs) and remedial actions.<br>**A smart pig inspection was conducted in August 2001. NOTE: a geometry tool inspection was also conducted on 15 November 2004 (after the accident) to ensure the pipeline's integrity** | | | | | |

9 Plot on site description page
10 As required of Pipeline Integrity Management regulations in 49CFR Parts 192 and 195
11 MFL, geometry, crack, etc.
12 ECDA, ICDA, SCCDA, "other technology," etc.

# *Pipeline Failure Investigation Report*

| ***Pre-Failure Conditions and Actions*** ☒ N/A |
|---|
| Was there a known pre-failure condition requiring [10] the operator to schedule evaluation and remediation?<br>☐ Yes (describe below or on attachment) ☐ No |
| If there was such a known pre-failure condition, had the operator established and adhered to a required [10] evaluation and remediation schedule? Describe below or on attachment. ☐ Yes ☐ No ☐ N/A |
| Prior to the failure, had the operator performed the required [10] actions to address the threats that are now known to be related to the cause of this failure? ☐ Yes ☐ No ☐ N/A<br>List below or on an attachment such operator-identified threats, and operator actions taken prior to the accident. |
| Describe any previously indicated anomalies at the failed pipe, and any subsequent pipe inspections (anomaly digs) and remedial actions. |

| ***Maps & Records*** ☐ N/A |
|---|
| Are Maps and Records Current? [13] ☒ Yes ☐ No<br>Comments: |

| ***Leak Survey History*** ☒ N/A |
|---|
| Leak Survey History (Trend Analysis, Leak Plots): |

| ***Pipeline Operation History*** ☒ N/A | | | | |
|---|---|---|---|---|
| Description (Repair or Leak Reports, Exposed Pipe Reports): | | | | |
| Did a Safety Related Condition Exist Prior to Failure? | ☐ Yes | ☐ No | Reported? | ☐ Yes ☐ No |
| Unaccounted For Gas: | | | | |
| Over & Short/Line Balance (24 hr., Weekly, Monthly/Trend): | | | | |

13 Obtain copies of maps and records

# *Pipeline Failure Investigation Report*

| *Operator/Contractor Error* ☒ *N/A* | |
|---|---|
| Name: | Jo bFu n tio n : |
| Title: | Years of Experience: |
| Training (Type of Training, Background): | |
| Was the person "Operator Qualified" as applicable to a precursor abnormal operating condition? ☐ Yes ☐ No ☐ N/A | |
| Type of Error (Inadvertent Operation of a Valve): | |
| Procedures that are required: | |
| Actions that were taken: | |
| Pre-Job Meeting (Construction, Maintenance, Blow Down, Purging, Isolation): | |
| Pre-Job Meeting (Construction, Maintenance, Blow Down, Purging, Isolation): | |
| Prevention of Accidental Ignition (Tag & Lock Out, Hot Weld Permit): | |
| Additional Actions (Contributing factors may include number of hours at work prior to failure or time of day work being conducted): | |
| Training Procedures: | |
| Operation Procedures: | |
| Controller Activities: | |

| Name | Title | Experience | Hours on Duty Prior to Failure | Shift |
|---|---|---|---|---|
| | | | | |
| | | | | |

| |
|---|
| Alarm Parameters: |
| High/Low Pressure Shutdown: |
| Flow Rate: |
| Procedures for Clearing Alarms: |
| Type of Alarm: |
| Company Response Procedures for Abnormal Operations: |
| Over/Short Line Balance Procedures: |
| Frequency of Over/Short Line Balance: |
| Additional Actions: |

***Additional Actions Taken by the Operator*** ☐ *N/A*

Make notes regarding the emergency and Failure Investigation Procedures (Pressure reduction, Reinforced Squeeze Off, Clean Up, Use of Evacuators, Line Purging, closing Additional Valves, Double Block and Bleed, Continue Operating downstream Pumps):

**At 1322 hours on 9 November 2004, Mountain Cascade's excavator punctured Kinder Morgan's products pipeline. At 1326 hours, Kinder Morgan's control center in Concord shut the line down. They drained down into both their Concord Pump Station and their San Jose Terminal. At 1415 hours, the downstream block valve (Hill Grade) was closed; the block valve at the Concord Station was kept open so that gasoline could continue to drain back to the station.**

**A stopple plug was inserted into the pipeline south of the rupture (downstream) and a hot tap was installed in the pipeline north of the rupture (upstream) giving Kinder Morgan the ability to remove the residual gasoline in the line. By 0430 hours on 11 November 2004, Kinder Morgan was able to recover 60 barrels of gasoline and a temporary clamp was installed over the puncture site. At 1730 hours, the upstream valve at Concord Station was closed.**

**The pipe containing the rupture was removed by cold cutting and pre-tested replacement pipe was welded into place. Repairs were finished at about 2000 hours on 13 November 2004. At 2050 hours on that same evening, LS-16 was pressured to 525 psi for a one hour static pressure test. The line was put back into service at 2221 hours later that night although Kinder Morgan only operated at 80% of their maximum operating pressure (1045 psi). They also ran a gauge plate/sizing plate that night from the Concord Station to the San Jose Terminal to confirm its integrity and make sure that no undetected third party damage had occurred.**

**Attachments:**

**Roster of Deceased/Injured Workers**
**Narrative Report (20041109LMZ1)**
**Illustration 1 – Walnut Creek Accident Site**
**Illustration 2 – Map of Rupture Site**
**Photo A – LS-16 pipeline with through-wall puncture**
**Photo B – LS-16 pipeline with temporary clamp over puncture**
**Photo C – LS-16 pipeline offset at original location**
**Photo D – LS-16 pipeline offset section removed**
**Photo E – Mountain Cascade excavator bucket with rock teeth**
**Item 1 – Kinder Morgan Pipeline Alignment Sheet 16-7D**
**Item 2 – Carollo drawing showing Note 2**
**Item 3 – USA/North Ticket Data**

**Title:** **Kinder Morgan LS-16 / Walnut Creek**
**Date of Accident:** **9 November 2004**
**Investigator:** **Linda Zigler, Pipeline Safety Engineer**

**Deceased Workers**:
The victims listed below died as a result of burns received from the pipeline explosion/fire.

| | | | | |
|---|---|---|---|---|
| 1. | Tae Chin Im | Age 47 | Foreman | Mountain Cascade |
| 2. | Javier Ramos | Age 35 | Laborer | Mountain Cascade |
| 3. | Israel Fernandez | Age 36 | Welder | Matamoros Pipelines |
| 4. | Miguel Reyes | Age 43 | Foreman | Matamoros Pipelines |
| 5. | Victor Rodriguez | Age 26 | Welder | Matamoros Pipelines |

**Injured Workers**:
The victims listed below were severely injured and were hospitalized as a result of burns received from the pipeline explosion/fire.

| | | | | |
|---|---|---|---|---|
| 1. | Miguel Angel Fuentes | Age 28 | Laborer | Mountain Cascade |
| 2. | Martin Topete | Age 48 | Laborer | Mountain Cascade |
| 3. | Jeremy Knox | Age 26 | Welder | Matamoros Pipelines |
| 4. | Roger Paasch | Age 27 | Welder | Matamoros Pipelines |

# Supplemental Narrative

**Title:** **Kinder Morgan LS-16 / Walnut Creek**
**Date of Accident:** **9 November 2004**
**Investigator:** **Linda Zigler, Pipeline Safety Engineer**

**SUMMARY:**
At 1322 hours on 9 November 2004, excavation equipment operated by Mountain Cascade, Inc., struck Kinder Morgan's LS-16 pipeline, a 51.4 mile long intrastate products pipeline that travels from Concord to San Jose. The excavator was working on a large-diameter water supply expansion project in Walnut Creek, CA for the East Bay Municipal Utility District (EBMUD).

Upon puncture of the Kinder Morgan pipeline, gasoline under high pressure was immediately released into the surrounding area. Kinder Morgan control center operators in Concord immediately noticed the large pressure drop and started to shut the pipeline down. Several seconds after the line was hit, the gasoline streaming out of the line was ignited by welders employed by Matamoros Pipelines, Inc. who were also working on the new water supply pipeline. The ensuing explosion and fire resulted in the deaths of five workers and significant injury to four others. One nearby two-story structure was burned and other property was damaged.

The direct cause of the accident was the excavator's bucket striking the pipeline and puncturing through the wall of the pipe. However, there were several factors that significantly contributed to this accident. These include inadequate line locating, inadequate project safety oversight and communication, and failure to follow the one-call law.

**FOCUS OF INVESTIGATION:**
The lead agency in this accident investigation is the California Department of Industrial Relations, Division of Occupational Safety and Health (CalOSHA). Although the State Fire Marshal's Pipeline Safety Division (SFM) participated with CalOSHA staff as they conducted their investigation, the authority for SFM to conduct its own accident investigation is derived from Section 13107.5 of the California Health and Safety Code which states: "The State Fire Marshal may investigate every break, and shall investigate every explosion or fire, involving a pipeline reported by a local agency pursuant to Chapter 5.5 (commencing with Section 51010) of Division 1 of Title 5 of the Government Code…".

The SFM investigation is limited to the determination of whether there had been any violations of 49 Code of Federal Regulations (Part 195); Section 4216 of the California Government Code; and, Sections 51010-51019.1, of the California Government Code.

# DESCRIPTION OF ACCIDENT

**NOTIFICATION AND RESPONSE:**
At approximately 1430 hours on 9 November 2004, SFM Supervising Pipeline Safety Engineer Bob Gorham, received notification from the Emergency Warning Center at the Governor's Office of Emergency Services that Kinder Morgan had reported a potential leak on their pipeline in the City of Walnut Creek. Gorham immediately assigned SFM Pipeline Safety Engineer Linda Zigler to respond to the accident site and assume responsibility as SFM Lead Investigator. Zigler arrived on scene at 1545 hours. The following additional SFM personnel responded to or assisted with the accident investigation: State Fire Marshal Ruben Grijalva; Division Chief Nancy Wolfe; Supervising Pipeline Safety Engineer Bob Gorham; Pipeline Safety Engineers Doug Allen, Chuck MacDonald and Emmett Cooper; and Senior Deputy State Fire Marshal Tin Tran.

**ACCIDENT EVENTS:**
As part of a project for East Bay Municipal Utilities District (EBMUD), Mountain Cascade was in the process of digging a trench for the installation of a new 72-inch diameter water pipeline along South Broadway between Newell Avenue and Rudgear Road in Walnut Creek, CA. The Kinder Morgan pipeline, which was buried about 60 inches deep in this area, deviated from a straight line to form a curved "offset" or "point of intersection" (PI) at this location (Kinder Morgan Mile Post 8.48). When the pipeline was constructed, the PI was installed to accommodate the location of a large oak tree; at some later time, the tree was cut down. The remaining stump and root ball were covered by soil and not readily visible at the time of the accident.

EBMUD identified early on in the design process that there was a hazardous liquid pipeline in the vicinity of the proposed water line and that special measures were to be taken to prevent damage to the pipeline. EBMUD and their engineering consultants had been in contact with Kinder Morgan in October 2000 regarding general alignment and drawings of the petroleum pipeline. Kinder Morgan provided as-built drawings to EBMUD that clearly indicated the offset between Stations 100+00 and 101+00.

EBMUD and its engineering contractors provided design drawings to excavating contractor Mountain Cascade who had taken over the project in August 2004. (EMBUD had cancelled its contract with Modern Continental, the original excavator, in May 2004.) These design drawings showed a potential conflict between the installation of the new water line and the existing petroleum pipeline. Although the field marking of the offset was not present at time of the excavation, construction drawing DWG W-8780-36, Note 2, states "Contractor shall verify location of 10" petroleum lines prior to any construction between pipe stations 100+00 to 101+00 …" Mountain Cascade workers did not expose the petroleum pipeline by hand tools at this location to positively locate the Kinder Morgan pipeline.

At 1322 hours on 9 November 2004, the operator of the Mountain Cascade excavator struck Kinder Morgan's 10-inch products pipeline (LS-16) with one of the rock teeth from the excavation

bucket. Premium gasoline, which was being shipped at the time from Kinder Morgan's Concord Pump Station to their San Jose Terminal, streamed from the pipeline into the surrounding area. The hole made by the excavator was approximately one-inch in diameter (about the size of a quarter). The pressure for LS-16 at the failure site at the time of the accident was 973 PSI.

Several seconds after the pipeline was hit, the gasoline was ignited by welders who were also working on the new water line project. The subsequent explosion and fire resulted in the deaths of five workers and severe injury to four others. A nearby two-story house was severely burned and other property was damaged. A total of 564 barrels of gasoline was released, none of which found its way into any waterways.

**KINDER MORGAN'S EMERGENCY ACTIONS:**

At 1322 hours on 9 November 2004, Kinder Morgan's operators monitoring LS-16 from the Concord Pump Station received an alarm indicating a large pressure drop on the line. At 1326 hours, the controllers shut down LS-16 and started draining the product to the San Jose Terminal and Concord Pump Station.

By 1400 hours, Kinder Morgan officials arrived at the accident site and joined the Unified Command staff. The Hill Grade block valve downstream from the accident site (at Mile Post 10.098) was closed at 1415 hours. The upstream block valve at the Concord Station was kept open to facilitate draining product from the line.

Kinder Morgan installed a stopple plug in the pipeline south of the rupture and a hot tap north of the rupture so that the residual gasoline could be removed from the line. This took two days to accomplish due to fire department safety concerns, but by 0430 hours on 11 November 2004, Kinder Morgan was able to recover 60 barrels of gasoline. In addition, a temporary clamp was installed over the puncture. At 1730 hours on 11 November 2004, the upstream valve at the Concord Station was closed. No gasoline escaped to any waterway during this emergency.

**REPAIR OF PIPELINE / BACK TO SERVICE DATE:**

At 0640 hours on 13 November 2004, the section of LS -16 containing the rupture was removed by cold cutting and saved as evidence. This pipe section was replaced by pre-tested pipe stenciled with the following information: "9-06-02" (date pipe was pressure tested); "CSFM 02-190" (the CSFM test ID number); and "10 .250 X52" (the pipe's specifications).

Two certified welders from contractor ARB welded the new pipe section in place. High Mountain Inspection Company nondestructively tested the pipe welds and at 1535 hours on 13 November 2004, High Mountain reported that the two repair welds were acceptable to API Standard 1104. The replacement pipe section was then coated with Polyken primer and double wrapped with 910 Polyken tape.

On 13 November 2004, Kinder Morgan developed written procedures for resuming operations of LS-16 and submitted them to SFM Pipeline Safety Engineer Emmett Cooper for review and

approval. With Cooper observing, Kinder Morgan implemented each step of these procedures. A static pressure test of 525 PSI successfully held for one hour. The San Jose Terminal opened the incoming block valve and the Concord Station started pumping with three pumps at 80% of maximum operating pressure (1045 PSI). After the line leveled out, a gauge plate/sizing plate was run through the pipeline from the Concord Station to the San Jose Terminal to check for undetected third-party damage. The pipeline went back into service at 2221 hours on 13 November 2004.

Kinder Morgan personnel were present at the accident location throughout the night of 13-14 November 2004 to monitor the pipeline. Cooper left the site at 0300 hours on 14 November 2004. The line remained at 80% MOP until a geometry tool could be used to confirm the pipeline's integrity and that no undetected damage had occurred.

**CHAIN OF CUSTODY:**

From 1730 hours on Friday, 12 November 2004, until 0700 hours on 13 November 2004, SFM Pipeline Safety Engineers Doug Allen and Chuck MacDonald and Senior Deputy State Fire Marshal Tin Tran took turns observing that the excavator bucket was not moved or tampered with until it was taken into custody along with the damaged section of pipe containing the rupture.

At 0700 hours, 13 November 2004, both the bucket and 30-foot section of LS-16 containing the rupture were taken into custody by SFM. The rock tooth bucket was labeled #04-5845-1; the piece of pipe was labeled #04-5845-2. Both pieces of evidence were carefully loaded and secured on an ARB trailer and taken to Anamet, Inc., a metallurgical testing lab located in Hayward, CA. where it was met by Ken Pytlewski, Director of Engineering and Laboratories for Anamet. The loading and transportation of the evidence was observed by SFM Pipeline Engineers Linda Zigler and Chuck MacDonald.

When the load arrived at Anamet at 1730 hours on 12 November 2004, the trailer driver reported that the bucket and pipe could not be safely offloaded because of the orientation of the truck's front boom to the laboratory's storage garage. Zigler then contacted the California Department of Forestry and Fire Protection (CDF) Sacramento Command Center to arrange for on-site security for the trailer which was disconnected from the tractor but still had the pipe and bucket secured to it. At 0005 hours on 14 November 2004, CDF Fire Captain Greg Latronica took custody of the pipe and bucket from Zigler and MacDonald. At 0728 hours on 14 November 2004, Fire Captain Eric Wood took custody of the evidence from Captain Latronica.

Later on 14 November 2004, Zigler made arrangements to have a CDF tractor relocate the evidence and trailer from Anamet to the CDF Mobile Equipment Facility in Davis, CA. Captain Wood remained with the evidence as it was transported to Davis where he transferred custody to CDF Equipment Manager Richard Armstrong at 2239 hours on 14 November 2004. The pipe and bucket remained secured at this facility from 14 November 2004 until 17 March 2005.

On 17 March 2005, Ken Pytlewski of Anamet, SFM Pipeline Engineer Linda Zigler and SFM Senior Deputy Tin Tran met Richard Armstrong at the CDF Davis

Facility for the purpose of inspecting the teeth of the excavation bucket and transporting the evidence back to Anamet's storage and lab facility in Hayward. Richard Armstrong transferred custody of the evidence to Zigler at 1207 hours on 17 March 2005. Assisting with the transportation of the materials were John Perry (truck driver) and Joe Driscoll (heavy equipment operator). Both Perry and Driscoll are employees of Mountain Cascade.

During inspection of the excavation bucket, John Leahy of Cal OSHA (via telephone), Pytlewski, Tran and Zigler all agreed that a tooth from the bucket's right side was most likely to have punctured the pipeline. Eleven teeth from the right side of the bucket were each systematically removed and numbered from #0 to #10 before being placed in a box which was secured in Tran's vehicle.

After the pipe and remaining portions of the bucket were secured to Mountain Cascade's trailer, the evidence was driven by Perry to Anamet's facilities in Hayward. Tran and Zigler monitored the evidence transport from Tran's vehicle. Heavy-duty equipment was provided by Mountain Cascade at Anamet's storage facility to offload the pipe from the trailer. The pipe was secured in the storage garage with the box containing the eleven rock teeth from the bucket. The remaining portion of the bucket itself were returned to its owner (Mountain Cascade). The final transfer of custody took place at Anamet at 1410 hours on 17 March 2005 when the pipe and bucket teeth were transferred to the care of Ken Pytlewski.

**METALLURGICAL TESTING:**
Both the section of pipe containing the rupture site and eleven rock teeth removed from the excavator bucket remain secured at Anamet's laboratory in Hayward, CA. Metallurgical testing is currently pending.

## INVESTIGATION FINDINGS

**Line Locating:**
Kinder Morgan violated CFR 49 Part 195.442(a) which states: "each operator of a buried pipeline must carry out, in accordance with this section, a written program to prevent damage to that pipeline from excavation activities". Kinder Morgan did not mark the location of LS-16 as required by the company's damage prevention program and as required by Section 4216 of the California Government Code. Specifically, Kinder Morgan did not mark the approximate location of the pipeline to within 24 inches of either side of the exterior surface of the subsurface location at KM Station 447+90 to Station 448+18 (EBMUD Station ±100+15).

Kinder Morgan staff did not follow the company's line locating procedure found in Chapter 4, Section 4.2 of their Maintenance Manual which states: "Prior to beginning any maintenance work or excavation work, the location of the pipeline shall be reviewed by the local Line Rider or other company representative and verified by drawings and a pipeline locating device." A Kinder Morgan representative was present on 2 November 2004 to observe benching operations. Neither this contract representative nor the Kinder Morgan Line Rider reviewed and verified by the use of drawings and pipeline locating devices that the location of the pipeline was correctly marked.

**California Underground Service Alert "One Call" Law**

Mountain Cascade violated Section 4216.4 (a) of the California Government Code (Underground Service Alert "One Call" Law) in that the company failed to determine the exact location of the subsurface installations (10-inch pipeline) that was in conflict with the excavation. Construction drawing DWG W-8780-36, Note 2, states "Contractor shall verify location of 10" petroleum lines prior to any construction between pipe stations 100+00 to 101+00 …" (NOTE: "Verify" in this context refers to Section 4216.4 of the California Government Code, which requires exposing the petroleum pipeline by hand tools to positively locate the line). Although the field marking of the offset was not present at time of the excavation, the location of the offset was previously provided to Mountain Cascade and was noted on their construction drawings.

**Project Safety Oversight:**

EBMUD identified early on in the design process that there was a hazardous liquid pipeline in the vicinity of the proposed water line and that special measures were to be taken to prevent damage to the pipeline. EBMUD and their engineering consultants had been in contact with Kinder Morgan in October 2000 regarding general alignment and drawings of the petroleum pipeline. Kinder Morgan provided as-built drawings to EBMUD that clearly indicated the offset between Stations 100+00 and 101+00.

Mountain Cascade replaced the previous contractor in September 2004. EBMUD should have taken a more active role in ensuring that the new contractor, Mountain Cascade, was made fully aware of the petroleum pipeline's location including offsets and its potential for conflict with the installation of the new water line.

# RECOMMENDATIONS

It is recommended that Kinder Morgan:

1. Require that each inspector observing an excavation in the vicinity of the company's pipelines takes all available measures to properly locate the pipeline and/or verify previous location activities.

2. Ensure that all employees involved with line riding, excavation and inspection activities related to one-call notifications follow all of the damage prevention program procedures (including Kinder Morgan policies/procedures, Operator Qualifications protocols and One-Call Damage Prevention requirements).

3. Provide adequate supervision/oversight to ensure that each response made by an employee or contract representative to an excavation notification is handled correctly and that line locating procedures are properly followed.

4. Consider modifications to the company's Operator Qualification Program (OQ). In particular, it is recommended that the company review the adequacy of covered tasks involving line locating, one-call notifications and inspection of excavation activities. Additionally, it is necessary that the company review the adequacy of required training, evaluation and qualification methods for each of these covered tasks to ensure that each employee and/or contractor representative is OQ qualified to perform that task.