

Pipeline Safety in Alamo, and surrounding areas within Contra Costa County, California



Pipeline Safety Report to the Alamo Improvement Association

Produced by the Pipeline Safety Trust
September 2015

ACKNOWLEDGEMENTS

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Together, the four people mentioned above gave countless hours as part of the AIA Technical Assistance Grant for pipeline safety, ad-hoc working group, and we thank them all for their dedication.

Numerous county, state, and federal agency employees, and pipeline operator staff members, spent time giving us information used in this report, and we appreciate their willingness to help.

The Pipeline Safety Trust promotes pipeline safety through education and advocacy, increased access to information, and partnerships with residents, safety advocates, government, and industry, resulting in safer communities and a healthier environment.

The work of the Pipeline Safety Trust would not be possible without the guidance and diligent work of the following people:

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LIST OF ACRONYMS

AIA – Alamo Improvement Association
ASV – Automatic Shutoff Valve
CAER – Community Awareness and Emergency Response
CalEPA – California Environmental Protection Agency
CAO – Corrective Action Order
CATS – Community Assistance and Technical Services, PHMSA Pipeline Safety outreach staff
CCC – Contra Costa County
CDE – California Department of Education
CPUC – California Public Utilities Commission
CUPA – Certified Unified Program Agency, as authorized under CalEPA
DCD – Contra Costa County Department of Conservation and Development
EFRD – Emergency Flow Restricting Devices, or valves
EPA – Environmental Protection Agency
FERC – Federal Energy Regulatory Commission
HCA – High Consequence Area
HL – Hazardous Liquid
HSD – Contra Costa County Health Services Department
IHC – Iron Horse Corridor
LS – Line Segment, specifying a number that identifies a specific segment of a pipeline
NTSB – National Transportation Safety Board
OSFM – California Office of the State Fire Marshal
OSPR – California Department of Wildlife, Office of Spill Prevention and Response
PHMSA – U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration
PST – Pipeline Safety Trust, also referred to in this report as “the Trust”
RCV – Remote Control Valve
SFPP – Santa Fe Pacific Pipeline system that is operated by Kinder Morgan
TAG – PHMSA Community Technical Assistance Grant

EXECUTIVE SUMMARY

The Pipeline Safety Trust reviewed Contra Costa County hazardous liquid pipelines, with a particular focus on the Alamo area and the Iron Horse Corridor. In this report, we provide general information on pipeline regulations and risks, as well as more detailed information on concerns of particular interest to the Alamo community.

We make a number of recommendations interspersed throughout the report and summarized here that in our opinion – if adopted by the various agencies and stakeholder groups mentioned – would make pipelines in Contra Costa County even safer.

These recommendations are organized under the agency or group to which they are directed. We have purposefully not prioritized our recommendations, as implementation may be affected by any number of factors including budgets and workloads of the agencies involved. All our recommendations are summarized here:

The Federal Pipelines and Hazardous Materials Safety Administration Could:

- Make information about a pipeline's High Consequence Area designation easily available to the public.
- Adopt regulations to implement the NTSB recommendations regarding needed improvements to the Integrity Management requirements for both gas and hazardous liquid pipelines.
- Adopt stronger regulations requiring automated valves consistent with the NTSB recommendations.
- Adopt stronger regulations that require better leak detection systems in hazardous liquid pipelines that could affect high consequence areas, and provide a clear performance standard for computational pipeline monitoring systems.

The State of California Could:

- Enforce excavation damage prevention laws. Currently authority is held with the Attorney General's office, but there is not adequate staffing or resources to respond to notifications of alleged violations or to investigate. Other agencies respond on a fragmented basis depending on the damaged utility involved.
- Work with the California Department of Education (CDE) on ways to implement CDE's suggestions for reducing the probability of a pipeline product release on schools, and reducing the severity and consequences of pipeline releases on schools.

The California Office of the State Fire Marshal Could:

- Make their maps, incident and inspection information accessible to the public by posting it online.
- Make information about a pipeline's High Consequence Area designation easily available to the public.

- Adopt regulations to implement the NTSB recommendations regarding needed improvements to the Integrity Management requirements that apply to intrastate hazardous liquid pipelines.
- Adopt stronger regulations for intrastate pipelines requiring automated valves that apply to hazardous liquid pipelines along the lines of the NTSB recommendations.
- Adopt stronger regulations for intrastate pipelines that require better leak detection systems in high consequence areas, and that provide a clear performance standard for computational pipeline monitoring systems.

The California Department of Education Could:

- Expand School Site Pipeline Risk Analysis and the Potential Pipeline Hazard Mitigation/Management guidance in coordination with emergency response agencies to offer help for schools that already exist in close proximity to pipelines. Lead coordination efforts among the myriad of agencies that offer crisis planning assistance to schools, and suggest minimum information that should be included in these plans regarding pipelines.

The Contra Costa Board of Supervisors Could:

- Ensure the single staff point-of-contact for citizens (especially along the Iron Horse Corridor) with concerns about multiple utility issues and right of way questions has technical training on safety concerns, adequate resources to conduct regular and broad community outreach, and resources to work in close coordination with other related departments and advisory groups.
- Request appropriate staff conduct an analysis of all congregate facilities (i.e. schools, recreation facilities, hospitals, nursing facilities, etc.) located in close proximity to transmission pipelines; Work with other emergency response agencies to develop a list of resources for emergency and evacuation planning expertise for congregate facilities near pipelines that can include potential hazards from a pipeline incident, and mitigation strategies for those hazards based on site-specific considerations.
- Consider adding goals and policies regarding pipelines to the General Plan, and amending Contra Costa County Zoning Code 82-2.010 so that all gas and hazardous liquid transmission pipelines would be subject to (and not exempt from) the General and Land Use District regulations (divisions 82 and 84). Consider additional ordinance(s) pertaining to zoning and land use permitting for hazardous liquid pipelines and possibly also intrastate gas transmission pipelines that are proposed for construction, replacement, modification, or abandonment.

- Adopt clear policies and deterrents regarding preventing encroachment including the review of setback variances by municipal advisory councils or committees and department staff so that properties and vegetation along utility corridors do not encroach on pipelines.
- Work in coordination with pipeline operators to develop a technical advisory body that can review the integrity management plans (similar to the Santa Barbara County System Safety Reliability Review Committee) and other technical assessments of the pipelines in order to cultivate informed technical expertise in the county and increase public trust and awareness.

The Contra Costa County Department of Conservation and Development Could:

- Consider adding goals and policies regarding pipelines to the General Plan, and amending Contra Costa County Zoning Code 82-2.010 so that all gas and hazardous liquid transmission pipelines would be subject to (and not exempt from) the General and Land Use District regulations (divisions 82 and 84). Consider additional ordinance(s) pertaining to zoning and land use permitting for hazardous liquid pipelines and possibly also intrastate gas transmission pipelines that are proposed for construction, replacement, modification, or abandonment.
- Review all development applications for opportunities to improve existing ingress/egress where currently limited, and where possible, include conditions on approvals to improve connectivity and avoid exacerbation of access problems.

The Contra Costa County Health Services Department Could:

- Expand the scope of the Hazardous Materials Ombudsman and the Hazardous Materials Commission regarding pipelines to provide an ongoing review of pipeline operators' emergency plans and an active role in possible county efforts regarding additional coordinated technical review of pipeline integrity management planning.

The Contra Costa County Public Works Department Could:

- Plan emergency evacuation ingress/egress for areas in Alamo west of Danville Boulevard and the Iron Horse Corridor where a single east-west pipeline-crossing road is the only access for numerous homes and facilities (e.g., Hemme Road, Camille Road) with the goal of creating public accessibility across these 'dead-end' neighborhoods that necessitate crossing the pipeline to access any services.
- Ensure the county has complete and accurate records of corridor and right of way locations and widths. Continue to coordinate with Kinder Morgan and other utilities on resolution of encroachments into pipeline rights of way.

The Contra Costa County Office of Public Education & Local School Districts Could:

- Expand emergency preparedness resources to include information about pipelines and pipeline-specific risks. Assist individual schools in developing crisis plans and emergency preparedness plans that include pipelines on the emergency maps and assess how ingress/egress may be affected by a pipeline incident.

The Contra Costa County Community Awareness and Emergency Response (CAER) Group Could:

- Include specific reference to oil and gas pipelines in the list of potential hazards listed in the hazard assessment in the next update to the Model Emergency Plan for Schools.

Pipeline Operators Could:

- Reach out to the schools along pipeline easements and offer to provide technical assistance assessing pipeline risks and evacuation strategies given possible incidents that could occur in close proximity to the schools.
- Consistently undertake assessments of existing Right of Way encroachments to determine whether there are safety implications. Coordinate with Contra Costa County to resolve encroachments with neighboring property owners.
- Become members of the Contra Costa County Community Awareness and Emergency Response Group, and participate consistently in quarterly meetings and responses.
- Contract for an independent technical seismic vulnerability study on HCA pipelines affected by potentially active faults to feed into the pipeline risk analysis, and make the study available to the public.
- Work in coordination with the Board of Supervisors to develop a technical advisory body that can review the integrity management plan (similar to the Santa Barbara County System Safety Reliability Review Committee) and other technical assessments of the pipelines in order to cultivate informed technical expertise in the county and increase public trust and awareness.

Local Fire Districts Could:

- Designate a single point-of-contact to coordinate with pipeline operators, familiarize themselves with the operators' emergency response and spill response plans, know the facilities where people congregate (schools, churches, hospitals, nursing facilities, etc.) in close proximity to the pipeline, and be involved with any emergency planning done by those facilities.

INTRODUCTION

Background

Contra Costa County has over 1 million people and covers approximately 805 square miles. The city of Martinez is the county seat, and one of nineteen incorporated cities within the county. Oil refineries operate along the western and northern coastlines: Phillips 66, Chevron, Shell Oil, and Tesoro, with associated petroleum storage and transportation infrastructure. Most of the hazardous liquid pipelines in the county transport product to or from a storage facility or refinery.

A Board of Supervisors governs the County, with representatives elected from five districts; the Alamo area is part of District II, and is unincorporated with about 15,000 residents. The homeowners association – the Alamo Improvement Association – is quite active, with an elected board and committees. In addition, the Alamo Municipal Advisory Council serves a formalized role with the county as an advisory body to the Board of Supervisors and the County planning agency, providing review and recommendations for a variety of activities that impact the Alamo area.

One of the areas of particular interest to the Alamo community is the Iron Horse Corridor. This is an historic rail corridor managed as a regional multiuse trail that runs roughly north-south from Concord in northern Contra Costa County to beyond the Alameda County line to the south, cutting Contra Costa County roughly in half and traversing the county for about 20 miles. Utilities and private infrastructure also run along the corridor, including a refined oil pipeline referred to as the San Jose line that is part of the Kinder Morgan Santa Fe Pacific Pipeline (SFPP) system. Conversations in the Alamo community precipitated a renewed interest in this pipeline, and prompted the Alamo Improvement Association (AIA) to seek technical assistance and commission this report on pipeline safety.

Purpose and Scope of Report

The Alamo Improvement Association (AIA) contracted with the Pipeline Safety Trust in February 2015 to provide services intended to educate and inform the community about hazardous liquid pipelines and pipeline safety. That included presentations at two community workshops in June 2015, as well as the production of this report.



Hazardous Liquid Pipeline Safety Workshop held on June 3, 2015 in Alamo, CA

The funding for these services came from a Community Technical Assistance Grant (TAG) awarded by the Pipeline and Hazardous Materials Safety Administration (PHMSA), a division of the U.S. Department of Transportation. AIA applied for this grant in the spring of 2014 to include pipeline safety public outreach and education, as well as training for local first responders, and outreach regarding the national 811 Call Before You Dig program. The grant period ran from October 2014 – September 2015. Roger

Smith, President of the Alamo Improvement Association was the primary point of contact for the TAG award and contract for services with the Trust.

From January through August 2015, Pipeline Safety Trust staff participated in periodic conference calls with two representatives of the Alamo Improvement Association, a field representative in Contra Costa County District II Supervisor Anderson's office, and the Hazardous Materials Ombudsman within the Contra Costa County Health Services Department. This ad-hoc group was highly engaged with planning the two hazardous liquid pipeline safety workshops that took place in June,¹ and continued to be involved through the report process. Pipeline Safety Trust staff also engaged in one-on-one conversations with these same individuals as well as others from Contra Costa County Departments of Health Services, Public Works, Conservation and Development; local emergency services; California State offices of the Fire Marshal and the Office of Spill Prevention and Response; Kinder Morgan; and from the federal Pipeline and Hazardous Materials Safety Administration.

AIA asked the Trust to report broadly on pipeline issues affecting the entire county as well as the role of federal and state agencies, and to focus in on issues specific to petroleum pipelines and particularly the pipeline concerns of people in the Alamo area. All the data shown in charts or graphs in this report is from PHMSA as of August 2015, unless otherwise noted.

¹ The second of these two public forums was captured on video by CCTV, and is available to watch here: http://contra-costa.granicus.com/MediaPlayer.php?publish_id=935921b6-0eea-11e5-b5ce-00219ba2f017

PIPELINE BASICS AND TECHNICAL ISSUES

What kinds of pipelines are in Contra Costa County?

There are three main types of pipelines in Contra Costa County, and it is important to understand what the different types are since they have different safety considerations and are regulated by different agencies under different rules.

The three main types are:

Hazardous Liquid Lines: These are the lines that move crude oil to the local refineries and then move refined products (gasoline, jet fuel, diesel, etc.) from the refineries to other markets.

Natural Gas Transmission Lines: These are the relatively larger, higher-pressure pipelines that move gas from production or storage to where the gas is distributed to our homes and businesses. They operate at pressures in the range of 300 to over 1500 pounds per square inch.

Natural Gas Distribution Lines: A distribution line is a relative small, lower pressure pipeline used to supply natural gas directly to our homes and businesses. A distribution line is located in a network of piping located downstream of a natural gas transmission line. The “city gate” is where a transmission system feeds into a lower pressure distribution system. Gas distribution pipelines comprise by far the most mileage of pipes; they carry odorized gas (with the characteristic smell of rotten eggs) throughout urban areas.

Two other important distinctions are **interstate pipelines** compared to **intrastate pipelines**. Interstate pipelines are typically longer transmission pipelines that cross state lines; intrastate pipelines are transmission pipelines that lie wholly within a single state.²

² State lines are not the sole determiner for the inter/intrastate distinction. For details see 49 CFR 195, Appendix A.

Where are the pipelines in Contra Costa County?

The US has over 2.6 million miles of pipelines. Most of these (approximately 92%) carry gas – predominantly natural gas – and the rest (approximately 8%) carry hazardous liquids. Hazardous liquid and natural gas pipelines are governed by separate regulations. Whether and how pipelines are regulated also depends on what product is carried and where the pipeline is located.

Regulated Pipeline Mileage - U.S. and California		
Miles of Pipelines	U.S.	California
Gas Transmission & Gathering	319,350	11,861
Gas Distribution	2,167,270	200,262
Hazardous Liquid	198,778	7,139
Total	2,685,398	219,262

Data from PHMSA as of 8/5/2015

There are over 4,000 miles of natural gas pipelines in Contra Costa County, 260 miles of which are transmission lines, and the rest are distribution lines and services.³ All the natural gas distribution pipelines are operated by Pacific Gas & Electric under the jurisdiction of the California Public Utility Commission.

Hazardous liquid (HL) transmission pipelines in Contra Costa County total close to 500 miles.⁴ Roughly two-thirds of the HL pipelines carry refined products, and about one-third carry crude oil.

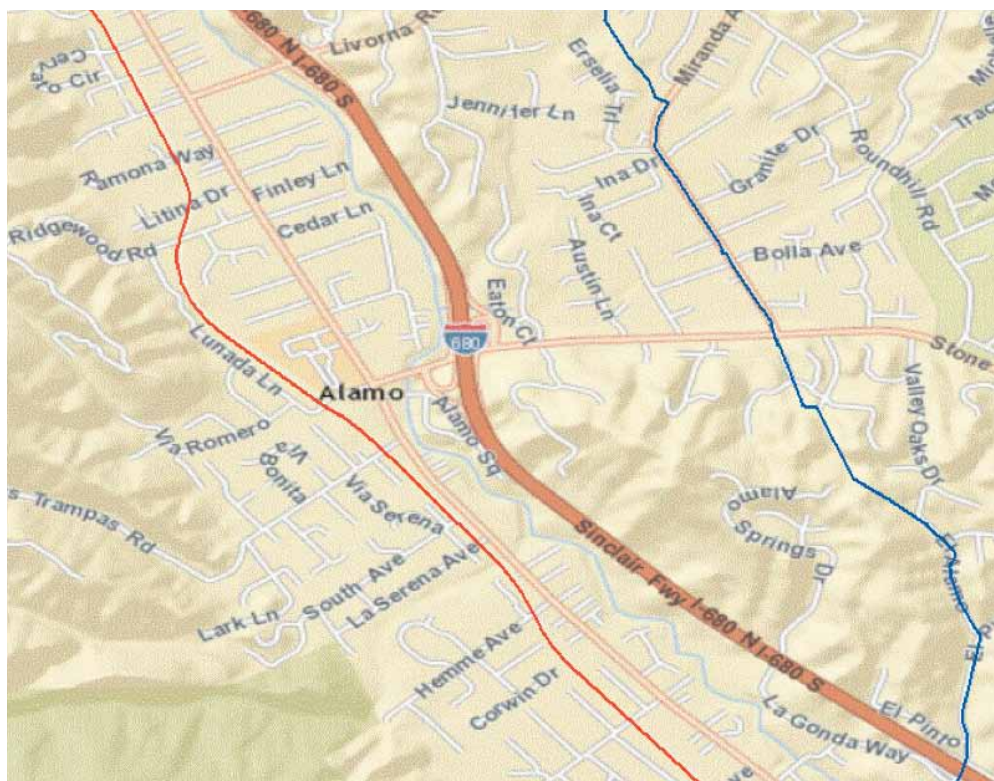
³ Data on gas pipeline mileage is from the California Public Utilities Commission (July 2015).

⁴ Data on HL pipeline mileage in Contra Costa County from OSFM staff, and does not include empty or abandoned lines.

The map below from the National Pipeline Mapping System⁵ shows the general location of the hazardous liquid (red) and the gas transmission (blue) pipelines in Contra Costa County.



Anyone can access these maps to see where hazardous liquid and gas transmission pipelines run through their community. The map below shows the two main pipelines running through the Alamo area – the Kinder Morgan San Jose Line in red and the PG&E natural gas line in blue. The “public viewer” for the maps is available online at: <https://www.npms.phmsa.dot.gov/PublicViewer/>.



5 <https://www.npms.phmsa.dot.gov/PublicViewer/>

The system takes practice to navigate, but once a person figures it out it is possible to zoom in to get an idea of where these types of pipelines are generally located and some basic information about the pipelines themselves. While these types of maps can provide a general idea of where pipelines are located they should never be used as an indication of where it might be safe to dig. The One Call system is the only way to identify the exact location of a pipeline, and is discussed in more detail later in this report.

Details about the San Jose Pipeline

AIA is particularly interested in the Kinder Morgan SFPP pipeline, especially the portion of that pipeline that runs for nearly 20 miles along the Iron Horse Corridor in central Contra Costa County; this segment of the SFPP system is also called the “San Jose line” or LS-16 (line segment 16). This line carries refined oil products and is the focus of this report because of its location along the Iron Horse Corridor from Concord south through Alamo to the Contra Costa – Alameda county line and beyond to San Jose. LS-16 is ten inches in diameter and classified as an intrastate pipeline, meaning it is regulated by the Office of the State Fire Marshal under a certification from PHMSA, and it operates under a rate structure approved by the California Public Utilities Commission (CPUC). The San Jose line is subject to federal regulations with regard to integrity management (discussed elsewhere in this report) as a release from the line could affect a high consequence area.

The San Jose line delivers petroleum products from a pump station in Concord to the Kinder Morgan San Jose terminal – a total of 51.4 miles – and was installed in the mid-1960s, with portions of the pipe replaced through the decades as a result of maintenance activities. The maximum allowable operating pressure on the San Jose line is 1310 pounds per square inch gauge (psig), and the typical operating pressure at the originating Concord station is 1165 psig (operating pressure varies by elevation and distance from pump stations). The line throughput is generally about 4483 barrels per hour.⁶

There are five valves along the length of this line segment that serve to further isolate sections of the pipeline in the event of a release, located on average every 10 miles.⁷ These valves include three manual gate valves and two motor operated remote control valves. There are no automatic shut-off valves on this line.

The original easement for this pipeline was between SFPP and the South Pacific Railroad, and existed at the time the county acquired the right-of-way from the Railroad in the 1980s.

6 Information about the San Jose line (LS-16) was gleaned from the following sources: PHMSA accident report database; OSFM pipeline failure investigation report; OSFM review of KM Integrity Management Program; PHMSA 5-2005-5025H case files; and presentation by KM Operations Manager June 2015.

7 The distance is greater than 10 miles in some places, with original placement impacted by topography and elevation.

Who regulates pipeline safety?

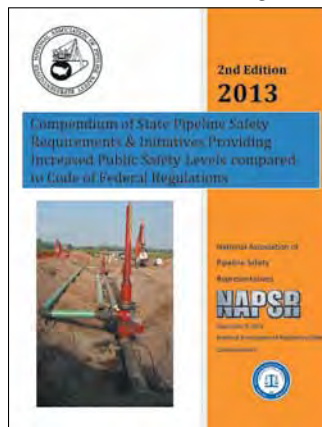
Federal Oversight

Ultimately the U.S. Congress has responsibility for setting the framework under which pipeline safety regulations operate in the country. The U.S. Department of Transportation through the Pipeline and Hazardous Materials Safety Administration (PHMSA) is primarily responsible for issuing and enforcing the minimum pipeline safety regulations. Most of these regulations are performance-based. For example, pipeline operators are required by the federal regulations to operate and repair pipelines in a safe manner so as to prevent damage to persons or property, but the way in which they do so is generally not spelled out prescriptively. This allows pipeline operators to prioritize pipeline inspections and repairs in areas with higher populations or higher risk factors, but it also makes the regulations ambiguous and challenging to enforce.

State Oversight

The federal pipeline safety laws allow for states to accept the responsibility to regulate, inspect, and enforce safety rules over intrastate pipelines within their borders under an annual certification from PHMSA. If a state receives such intrastate authority they can set regulations that are more stringent than those PHMSA sets as long as the state rules do not conflict with the federal regulations. PHMSA also can enter into an agreement with the state pipeline regulator to carry out inspections on interstate pipelines. Local governments are not allowed to create rules to regulate the operational safety of pipelines, though they may have involvement in spill response, routing and siting issues, and franchise or easement agreements.

California has authority for intrastate pipelines, which is carried out through the Office of the State Fire Marshal (OSFM) for hazardous liquid pipelines, and through the California Public Utilities Commission (CPUC) for natural gas pipelines. The OSFM also had authority to act as an interstate agent for PHMSA on hazardous liquid interstate pipelines through 2012, but ended that agreement to focus better on the intrastate pipelines due to an inability to retain enough qualified inspectors on staff. The California State Legislature is currently working to address this pay scale problem.⁸



NAPSAR Compendium of State Pipeline Safety Requirements & Initiatives (2013). See <http://www.napsr.org/compendium>.

California has adopted both hazardous liquid and natural gas pipeline regulations that are more stringent than the federal minimum regulations for the intrastate pipelines. Some of those stronger hazardous liquid rules include better information sharing, incident reporting, and planning outreach to fire departments; more frequent pipeline inspections or testing, additional pressure testing requirements in certain situations including for

8 See SB-295 Pipeline safety: inspections (2015-2016).

pipelines that have experienced certain kinds of leaks; better protection of pipeline easements from encroachment; and an internal comprehensive database and mapping system.⁹

City and County Governmental Powers

For the most part the federal pipeline safety law precludes local government from adopting any regulation that requires a pipeline operator to take any action regarding the safe operation of a pipeline. There is nothing in state or federal law that restricts a local government's ability to ask for increased safety measures as part of their negotiations regarding the use of public rights-of-way or other public property. While local government may not be able to require or enforce such measures, cities nationwide have been able to obtain increased safety measures through such voluntary requests, especially when such safety measures are well thought out, supported by the public, and do not conflict with federal or state regulations. One area in which local government has considerable ability to increase pipeline safety is through their land use and zoning authority. Details of this option are discussed in the Land Use Planning section later in this report.

How much risk is there from the pipelines in Contra Costa County?

Risk is one of those things that one person cannot really define for another, since each person thinks about risks in their own personal way. While some feel that skydiving is a risk worth taking, others won't even go up in the airplane. In other words it is not possible for us to say whether the pipelines in Contra Costa County are safe enough. All we can do is to try to provide enough information so individuals can make that decision on their own, and then work with others in their community to set policies based on the beliefs of as many people as possible.

Risk is made up of two different factors both of which need to be carefully considered when deciding how risky an activity is. Those factors are the probability that an event will occur (chance a pipeline will rupture or leak), and the possible consequences if it does.

Probability

First let's take a look at some of the publicly available data to try to get a sense of the probability of a hazardous liquid pipeline incident occurring in Contra Costa County or along the Iron Horse Corridor.

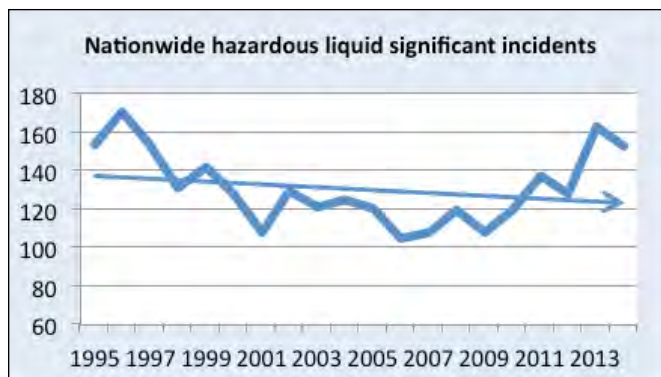
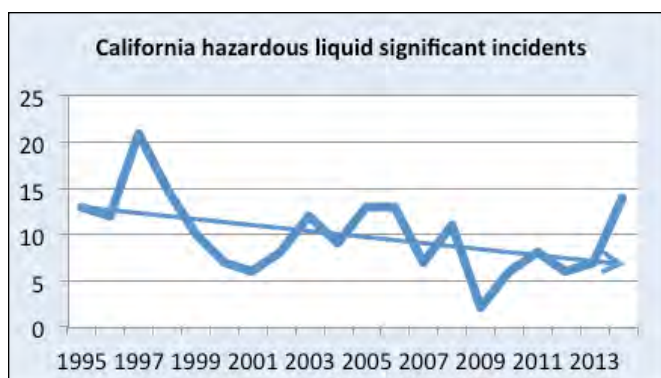
PHMSA maintains a publicly accessible database of reported pipeline incidents.¹⁰ Hazardous liquid pipeline operators are required to file an incident report when there is a release that results in any of the following:

1. death or injury requiring hospitalization;
2. estimated property damage exceeding \$50,000;
3. an unintentional explosion or fire; or
4. a release of 5 gallons or more off of company property

or the pipeline right-of-way or causing water pollution, or a release of 5 barrels (210 gallons) or more confined to company property or pipeline right-of-way and not causing water pollution.¹¹

A subset of all these reported incidents are considered 'significant' if they result in items 1, 2, or 3 above or result in the release of 50 barrels (2,100 gallons) or more of hazardous liquids. A further subset of 'serious' incidents are those that result in a death or injury requiring hospitalization.¹²

Here are two graphs that show the numbers of significant incidents each year both throughout the U.S. and in California. As you can see in both cases the number of incidents is relatively small, and the overall trend is a decreasing number of incidents. The troubling part of these graphs is that in both cases over the past 6-8 years this trend seems to be turning around and the numbers of significant incidents are increasing.



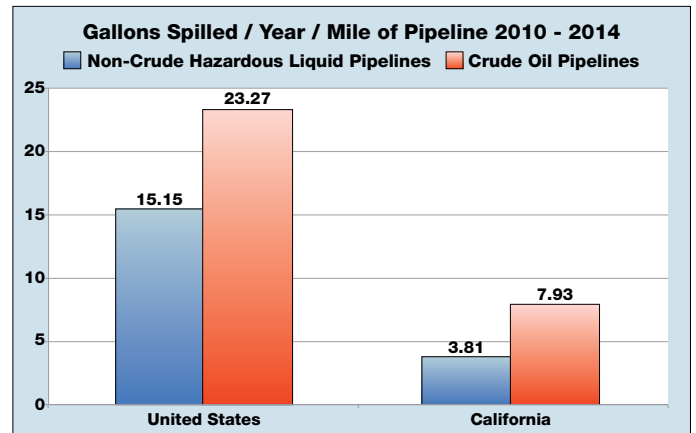
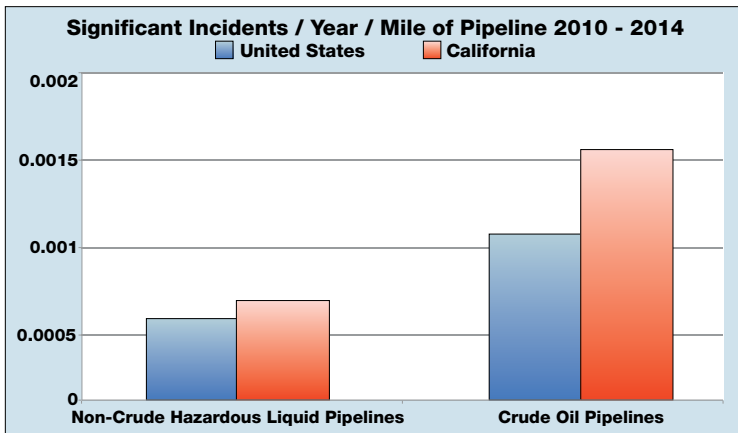
But raw numbers of incidents is a pretty rough way of looking at probability because the number of miles of pipelines changes, and the different types of products the pipelines carry have different failure rates. If we take the mileage of pipelines into consideration, and break the type of products these hazardous liquid pipelines carry down into the two main types – crude oil and other products – we start to get a more refined look at probabilities. The following graph shows that crude oil pipelines have a higher incident rate than product pipelines, and that both types of pipelines have a higher incident rate in California than in the rest of the country.

11 See 49 CFR § 195.50 and 195.52 for hazardous liquid accident reporting requirements.

12 For a complete description of these categories for all pipelines, see <http://www.phmsa.dot.gov/pipeline/library/datastatistics/pipelineincidenttrends>

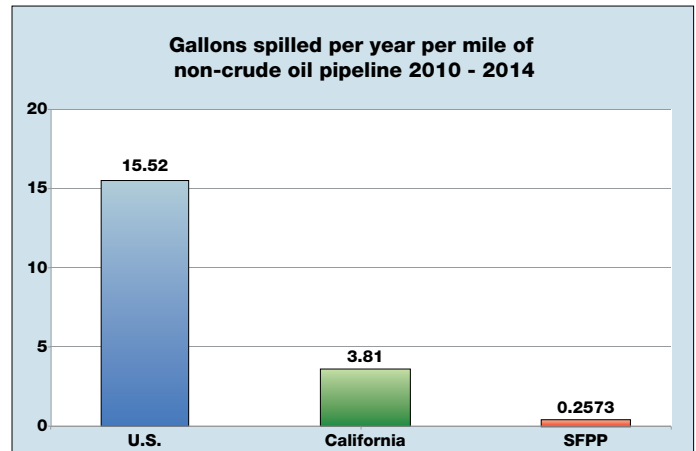
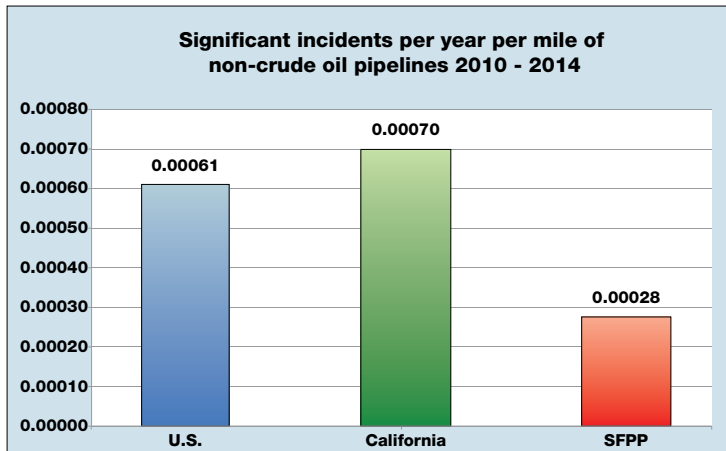
9 California GOV Code § 51010 et. seq.

10 See <http://www.phmsa.dot.gov/pipeline/library/data-stats> for both online pipeline incident data and downloadable files.



Incident rate alone does not really portray the consequence of an incident very well, so we also compare the *amount spilled* per incident per mile of pipe (see bar graph on upper right), which makes California's higher rate of incidents look quite different. As you can see what this shows us is that while California may have more incidents per mile of pipeline than the national average, the amount spilled is considerably less than the national average.

It is also possible to use these same rates to look at how individual pipeline companies compare to national averages. For instance, in the following graphs we compare the incident rate per mile of similar pipeline and gallons spilled nationally and in California with the rate of failures and gallons spilled that have occurred on the entire Kinder Morgan SFPP system, a portion of which runs along the Iron Horse Corridor.



As can be seen from these graphs over the past five years the Kinder Morgan SFPP pipeline system has had fewer incidents and spilled far fewer gallons of product than other comparable pipelines throughout the U.S. and in California. SFPP is one of a number of pipeline systems in Contra Costa County, so trying to determine the probability of an incident within the county requires looking beyond the SFPP numbers. If we take the SFPP 5-year average incident rate as one bound (0.00028), and the California 5-year average incident rate as another bound (0.00070), we can use those together with the roughly 350 miles of non-crude hazardous pipelines in the county to estimate the likely frequency of incidents on these pipelines. Currently it could be expected that a significant incident would occur somewhere between once every 4 years (CA average) to once every 10 years (SFPP average).

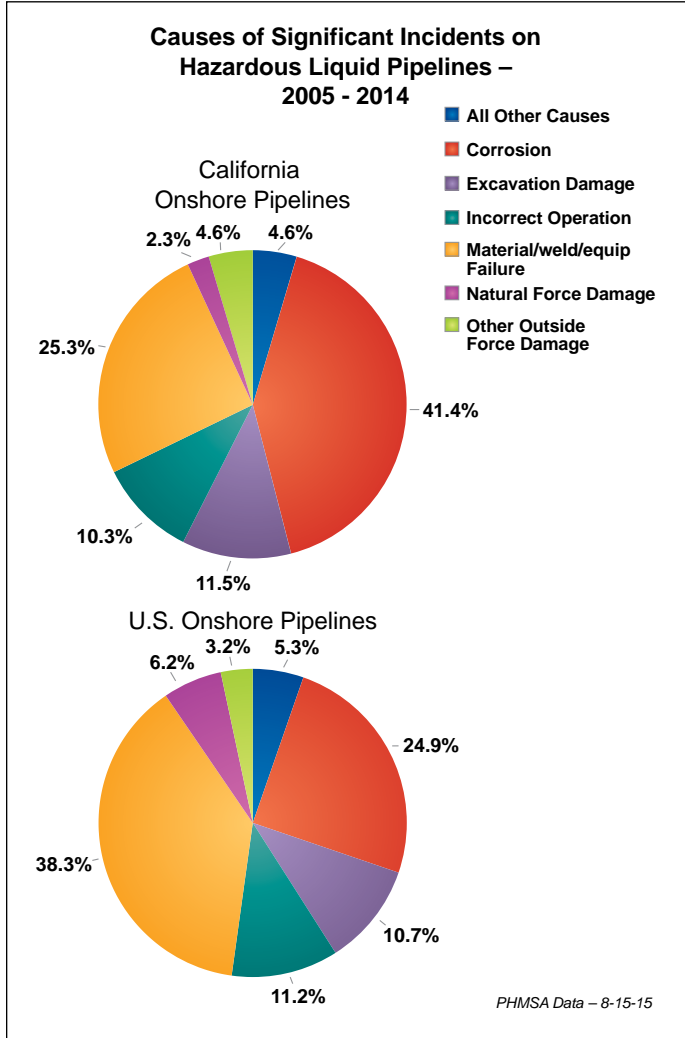
In Appendix D we have provided a list of all reported incidents in Contra Costa County, and from a look at that list it is clear that the frequency of significant incidents occurring in the county is higher than should be expected from these statistics. In the past five years alone there have been five significant incidents on these types of non-crude liquid pipelines in the County. One possible explanation for this higher rate is the high number of facilities processing fuel in the county. Such facilities are associated with pipelines, and therefore incidents related to the facilities also are incorporated with the pipeline incident statistics. These facilities have very high numbers of fittings, valves, and other appurtenances that tend to have higher failure rates, and often these failures are more contained on company owned property and do not affect the public and private rights-of-way through which longer pipelines travel.¹³

One other data set that provides some information about probability of failures is the cause of such failures. Following is a chart that shows the causes of significant incidents both nationally and in California. California hazardous liquid pipeline incidents appear

¹³ OSFM also maintains PHMSA incident data that they further separate for certain public presentations. For example, they may present only incidents occurring on the pipeline right-of-way and leave out those that occur within associated facilities; or they may remove data that includes idled or abandoned pipelines. OSFM does not provide these internal statistics to the public.

to be more frequently caused by corrosion when compared to those across the US as a whole. Corrosion is the dominant cause of pipeline incidents in California, followed by Material/Weld/Equipment failure. Both of these causes together lead to nearly two-thirds of all hazardous liquid pipeline incidents in both California (67%) and the U.S. as a whole (63%).

These charts and graphs should provide some measure of the probability of a pipeline incident happening and some of



Example of a Potential Impact Radius of a pipeline incident shown on an aerial map (assumes the pipeline rupture occurs at the center of the circle)

the consequences if it does. It is fairly clear from the data that the chance of a pipeline failing in any particular spot is very, very small, but of course if you ask the families of any of the 360 people who were killed by pipeline incidents over the past twenty years in United States they would

tell you that the consequences are huge. So what are the possible consequences of pipeline failures, and how can they be quantified?

Consequences

For natural gas pipelines it is fairly easy to predict the impact zone around a pipeline failure that explodes. There is a formula used in the federal regulations, based on the size and pressure of the pipeline that predicts the “potential impact radius,” and that radius is then used to define some elements of the regulations. The picture in the previous column shows how that radius might appear on a particular pipeline.

For hazardous liquid pipelines predicting the consequence area is much more difficult because of the different products involved and because the products may flow long distances



based on the terrain and whether they reach water. While each pipeline operator is required to do an analysis of whether a leak along any section of the pipeline could affect a high

consequence area, that information is not shared with the public. The best that the public can do is to look at their own area and compare that with the consequences of past liquid failures.



The National Transportation Safety Board investigates many of the most significant incidents and the reports of their investigations can be found at: <http://www.nts.gov/investigations/AccidentReports/Pages/pipeline.aspx>.

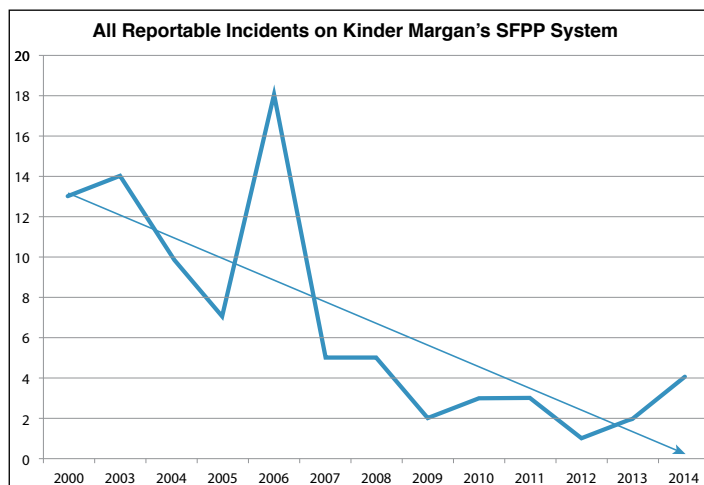
We can also look at pictures like the ones above to see what can happen in the unlikely event that a hazardous liquid pipeline fails in a particular area.

Past Incidents on the San Jose Line

An incident occurred on the SFPP, San Jose line (LS-16) in Walnut Creek on November 9, 2004, in which five workers were killed and four others significantly injured from a pipeline rupture and explosion. Property damage was sustained nearby including a two-story structure that burned. The pipeline ruptured when it was struck by excavation equipment operating as part of a water supply

expansion project. The gasoline released from the pipeline was soon after ignited by welders also working on the new water supply pipeline. According to the OSFM Pipeline Failure Investigation Report, several contributing factors led up to the excavator bucket striking the pipeline, including “inadequate line locating, inadequate project safety oversight and communication, and failure to follow the one-call law” (page 14).¹⁴ OSFM made recommendations to Kinder Morgan that included improvements to the way in which employees observe and respond to one-call excavation notifications, and modifications to the company’s Operator Qualification Program related to line locating and excavation notifications.

PHMSA issued a Corrective Action Order (CAO) for Kinder Morgan in 2005 with respect to its entire Pacific Operations unit of hazardous liquid pipeline systems, covering 3,900 miles across six states, and including the SFPP pipeline system and the San Jose line. The CAO was in response to eight accidents within the previous 16 months that released petroleum products into or near high consequence areas. Seven of the eight occurred in California, and two within Contra Costa County: the November 9, 2004 incident mentioned above on LS-16, and a November 7, 2004 incident in Martinez that occurred on LS-47. PHMSA called out “a widespread failure of Kinder Morgan to adequately detect and address the effects of outside force damage and corrosion” (page 2), and ordered the operator to take immediate corrective actions with respect to all Pacific Operations unit hazardous liquid pipeline systems.¹⁵ PHMSA subsequently replaced the CAO with a 14-page Consent Agreement entered into on April 4, 2006 by both parties. The Consent Agreement also delineated specific actions to be taken by Kinder Morgan to improve its pipeline operations and integrity management and to be completed within ten years. On May 11, 2015, PHMSA issued a closure letter to Kinder Morgan, stating that all the required action had been completed and the terms of the Agreement were satisfied, thereby closing the case.¹⁶ In the next column is a graph that shows all reportable incidents on the Kinder Morgan SFPP system including the San Jose Pipeline that runs through Contra Costa County during the period that this corrective action order covered. This graph appears to support that the actions that Kinder Morgan took as part



of the consent decree have helped reduce the number of incidents on this line.

Pipeline Construction, Operations and Maintenance

Many of the pipelines in place today were constructed before regulations existed for pipelines. Some of the current regulations have to do with ongoing operations and maintenance, and apply to both existing and new lines. Existing ‘grandfathered’ pipelines built prior to 1979 for hazardous liquid lines, or prior to 1968 for gas pipelines, may not have been constructed according to the current regulations. What are pipeline operators required to do to maintain safe pipelines? In this section, we go through basic information, and dive more deeply into some technical issues about which the Alamo community expressed particular concern.

Construction

The construction phase of pipeline installation is a critically important time to ensure the long-term integrity of the pipeline. Transmission pipelines are most commonly made of steel, and the pipes are fabricated and inspected to meet industry and government safety standards. Differing soil conditions and geographic or population characteristics of the pipeline route will dictate different requirements for pipe size, strength, wall thickness and coating material. Hazardous liquid pipelines must be buried between 18 and 48 inches below the surface, depending on location and soil properties. The prescribed depth must be adhered to at the time of burial, but regulations do not require it to be maintained over time. Operators must use qualified welders, and most welds on the pipe are evaluated and inspected in the field; a proper weld is stronger than the pipe itself.

Corrosion Protection

Corrosion is a serious issue for all steel pipelines. Without corrosion protection every steel pipe will eventually deteriorate, weaken, and become unsafe. With proper corrosion protection, steel pipelines can remain safely operating for many decades. Pipeline operators use three common methods to control corrosion:

14 California Office of the State Fire Marshal. Pipeline Failure Investigation Report, Form-11. Kinder Morgan Energy Partners, LS-16 rupture in Walnut Creek, 9 November 2004.

15 U.S. Department of Transportation, PHMSA Office of Pipeline Safety. Corrective Action Order re: case No. 5-2005-5025H, August 24, 2005.

16 Multiple technical documents were required to be submitted to PHMSA in accordance with the Consent Agreement, however these are not publicly available. Requests for information through Freedom of Information Act (FOIA) requests (<http://www.phmsa.dot.gov/about/foia>) take many months for PHMSA to respond, and even when documents are received they often contain many redactions. Therefore the public is left with having little to go on to verify how PHMSA has followed through and been given adequate assurances that each item in the Consent Agreement has been completed.

- Pipeline coatings and linings defend against corrosion by protecting the bare steel from coming in direct contact with corrosive conditions.
- Corrosion inhibitors are substances that may be added to the commodity running through the pipe to decrease the rate of attack of internal corrosion.
- Cathodic protection (CP) systems use direct electrical current to counteract the normal external corrosion that occurs due to soil and moisture conditions. On new pipelines, CP can help prevent corrosion from starting; on existing pipelines, CP can stop existing corrosion from getting worse.



Cathodic protection test point along the Iron Horse Corridor

These corrosion control methods may all be used at the same time; pipeline engineers must carefully consider the specific operating conditions, and pipeline and commodity characteristics to maintain the necessary corrosion protection for each particular pipeline segment.

High Consequence Areas and Integrity Management

Hazardous liquid pipelines that could affect High Consequence Areas (HCAs), which include high population areas, certain drinking water sources, or some ecologically sensitive areas, must prepare integrity management plans and adhere to stricter rules than pipelines outside of such HCAs.¹⁷ For example, pipelines that could affect an HCA have to be physically inspected by the pipeline company on a regular basis, whereas pipelines that could not affect an HCA never are required to be inspected. Currently about 43% of all hazardous liquid pipelines in the U.S. and 68% in California could affect HCAs and fall under these requirements.

Operators subject to integrity management must do a risk analysis of the segments of the pipeline that could affect HCAs, and then implement a plan to inspect and maintain that pipeline segment using methods appropriate to the specific risk factors impacting the pipeline. The minimum re-inspection interval for hazardous liquid pipelines is every five years; the integrity management plan and risk analysis may indicate certain pipelines or pipeline segments need to be re-inspected more frequently. The most commonly performed inspections are done with internal in-line

¹⁷ See 49 CFR § 195.450 and references therein for the definition of a high consequence area, and 49 CFR § 195.452 for the regulations concerning pipeline integrity management in high consequence areas.

inspection devices referred to as ‘smart pigs’ that record problems such as corrosion, dents, and gouges as they move through the pipeline. The inspections are typically performed by a third party contractor that also interprets the inspection results, and submits both the results and their interpretation to the pipeline operator in the form of a report. Federal and OSFM regulators may review these internal inspection reports during their own regulatory inspections of a pipeline operator.

Information about which pipeline segments are and are not within HCAs is not easily publicly available. However, it does appear that the vast majority of hazardous liquid pipelines in Contra Costa County are covered under the stricter integrity management rules that apply to the hazardous liquid pipelines that could affect an HCA. The portion of the San Jose line within the county is operating under these rules.

The development and implementation of the Integrity Management Program in the last decade represented a major improvement in risk analysis and ongoing testing and maintenance of pipelines that fall under those requirements. However, with nearly a decade of performance data under the new rules numerous shortcomings in the current Integrity Management Program have been identified by a variety of groups including both PHMSA and the National Transportation Safety Board (NTSB). The NTSB recently released a report¹⁸ that made numerous recommendations for improving Gas Transmission Integrity Management to make it clearer exactly what pipeline operators are required to do. PHMSA appears to be working on some of these improvements for both gas and hazardous liquid pipelines through various inquiries and rule makings, but as of this report no new or proposed rules have been released for public review.

RECOMMENDATION TO OFFICE OF THE STATE FIRE MARSHAL AND PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION: Adopt regulations to implement NTSB recommendations regarding needed improvements to the Integrity Management requirements.

RECOMMENDATION TO OFFICE OF THE STATE FIRE MARSHAL AND PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION: Make information about a pipeline’s HCA designation easily available to the public.

Valves

Valves must be installed along the pipeline to control the flow “at locations along the pipeline system that will minimize damage or pollution from accidental discharge, as appropriate for the terrain in open country, for offshore

¹⁸ Safety Study: Integrity Management of Gas Transmission Pipelines in High Consequence Areas, NTSB, 1/27/2015 <http://www.nts.gov/safety/safety-studies/Documents/SS1501.pdf>

areas, or for populated areas” (49 CFR § 195.260(c)).¹⁹ Valves must also be “installed in a location that is accessible to authorized employees and that is protected from damage or tampering” (49 CFR § 195.258(a)). Valves must be maintained in good working order at all times, and fully inspected and tested at least twice each year to ensure they are functioning properly.²⁰

Some valves have to be operated manually by pipeline personnel, some valves can be operated remotely from a control room, and some valves are designed to operate automatically if certain conditions occur on the pipeline. If a pipeline should fail, how quickly the valves can be closed and the distance between the valves are two of the main determinants for how much fuel is released. PHMSA has concluded that whether an operator should install automatic shutoff valves or remote control valves (operated from a far-away control room) in newly constructed or fully replaced pipelines needs to be evaluated on a case-by-case basis.²¹ Existing pipeline operators subject to integrity management rules must evaluate the type and location of valves as part of their risk assessment.²²

Pipelines that operate according to integrity management (due to their location affecting an HCA) have an additional requirement to take measures to prevent and mitigate the consequences of a pipeline failure. Actions to enhance public safety or environmental protection may be warranted based on a risk analysis of the pipeline segment, and could include installing Emergency Flow Restricting Devices (EFRDs) – additional valves – on the pipeline. In determining whether an EFRD is needed, “... an operator must, at least, consider the following factors – the swiftness of leak detection and pipeline shutdown capabilities, the type of commodity carried, the rate of potential leakage, the volume that can be released, topography or pipeline profile, the potential for ignition, proximity to power sources, location of nearest response personnel, specific terrain between the pipeline segment and the high consequence area, and benefits expected by reducing the spill size” (49 CFR § 195.452(i)(4)). Beyond the specific requirements for valves at certain water crossings and pump stations, etc., noted above, the regulations give the operator wide latitude in determining the necessity and location of additional valves.

Nineteen years ago an Edison, New Jersey accident occurred and it took two and a half hours to shut off the flow of gas

19 Valves must also be installed in proximity to pipeline facilities and appurtenances, and on both sides of certain water crossings and drinking water reservoirs. See 49 CFR § 195.260 for details.

20 See 49 CFR § 195.420. This section also contains language about the need for operators to protect valves from unauthorized operation and vandalism, which PHMSA views as doing more than simply chaining and locking the valves.

21 U.S. Dept of Transportation, Pipeline and Hazardous Materials Safety Administration (2012). Studies for the Requirements of Automatic and Remotely Controlled Shutoff Valves on Hazardous Liquids and Natural Gas Pipelines with Respect to Public and Environmental Safety (ORNL/TM-2012/411). Prepared by Oak Ridge National Laboratory, managed by UT-Battelle for the U.S. Dept of Energy.

22 See 49 CFR § 195.452(i)(1) and (4).

that fed the fireball due to the lack of a remotely controlled shut off valve. After the 2010 San Bruno tragedy where it took the pipeline operator over an hour and a half to drive to and close a manual valve the NTSB recommended that PHMSA “**Amend Title 49 Code of Federal Regulations 192.935(c) to directly require that automatic shutoff valves or remote control valves in high consequence areas and in class 3 and 4 locations be installed and spaced at intervals that consider the factors listed in that regulation.**” Most recently the spill of at least 20,000 gallons of crude oil into the ocean near Santa Barbara has again reiterated the need for new rules regarding these types of valves to help limit the damage from pipeline failures. PHMSA conducted a study²³ that in 2012 found “**installing ASVs and RCVs in pipelines can be an effective strategy for mitigating potential consequences of unintended releases because decreasing the total volume of the release reduces overall impacts on the public and to the environment.**” PHMSA is working on rule makings that may address this issue, but as of this report no new or proposed rules have been released for public review.

San Jose Pipeline Valves

Alamo community members have expressed concerns about the type, spacing, vulnerability and maintenance of the San Jose pipeline valves (or EFRDs) along the Iron Horse Corridor. Until recently, a manual valve was exposed above ground with no protection except a chain; that valve was enclosed within a fence following a vandalism incident in June 2015, but the example serves to justify the community concerns about vulnerability and safety. The community also has concerns about the potential volume released if a hazardous liquid spill were to occur, and the degree to which the valves will minimize the spill volume.



Manual valve inside protective cage in Alamo along Iron Horse Corridor

The OSFM inspection report discussed earlier describes the Kinder Morgan integrity management and risk

assessment process, some of which focuses on this type of detailed analysis. A key piece of the risk assessment that analyzes EFRDs is the operator’s Preventive and Mitigative Measures analysis performed in order to determine what threats exist on a pipeline, and if additional measures should be implemented to manage those threats. The Preventive and Mitigative Measures analysis may or may not determine the need for an additional Engineering Analysis focused on valves, depending on many factors affecting the pipeline: pipeline segment characteristics, proximity to an HCA, time to detect and isolate a leak, location of nearest response personnel, risk assessment results, and desired capabilities and improvements. An

23 Oak Ridge National Laboratory, October 31, 2012, http://www.phmsa.dot.gov/pv_obj_cache/pv_obj_id_2C1A725B08C5F72F30568E943053A96232AB200/filename/Final%20Valve_Study.pdf

initial Leak Detection System Analysis is completed on each pipeline, determining the maximum potential release volume.²⁴

Kinder Morgan evaluated the need for modification to existing valves on the San Jose line in 2010, and considered the following factors: swiftness of leak detection and pipeline shutdown capabilities; type of commodity carried; rate of potential leakage; volume that can be released; topography or pipeline profile; potential for ignition; proximity to power sources; location of nearest response personnel; specific terrain between the pipeline segment and the high consequence area; and benefits expected by reducing the spill size. The San Jose line has an existing computerized leak detection system that uses line balance, flow deviation, volume balance, thermal monitoring, and volume in and out to alert control room staff to potential leaks. After consideration of these factors, Kinder Morgan determined the existing valves and leak detection system exceeded their requirement that a 15-minute response time and isolation of a leak could be assured on the San Jose line.²⁵

Kinder Morgan's evaluation necessarily included many assumptions. These are not spelled out in the analysis, but would include such things as how quickly an employee could physically arrive at and close a manual valve, how quickly an operator could install temporary plugs or other means to stop the flow out of the pipe, and how quickly any remote personnel could make a correct decision based on computerized information to shut the pipeline down in the event of a rupture; as well as factors that determine in their eyes what the risks are and what level of risk is acceptable. These assumptions are not transparent to the public, but depending on what is assumed, the outcome of the analysis could vary widely. The assumptions are also necessary to carry out the regulation-required risk analysis and come to conclusions; regulations that require this type of behind-the-scenes decision-making process and lack prescriptive requirements are called performance-based regulations, and they often leave gray areas for the public because we often cannot know what went into the assumptions and decision-making.

Unfortunately, like the implementation of most risk- or performance-based regulations, this Kinder Morgan valve and leak detection analysis does little to eliminate the gray area on this issue. The regulations leave the consideration and determination to each operator in the context of an integrity management plan the public will never see. While the public may not be allowed to see the information used to make risk calculations, the public can make rough calculations of the impacts from a spill based on available information.

24 This detailed technical analysis on leak detection that informs the pipeline operator's risk assessment is not available to the public.

25 See page 12 of the OSFM inspection report dated June 2014 for detailed discussion of the San Jose line/LS-16. The report does not clarify how long of a segment of the pipeline would be isolated in this time - that is, it is not clear whether the operator could close the two closest valves on either side of a failure in that time frame, or just two valves at some unspecified distance. Given the time required to get staff to a manual valve and get it closed, a 15 minute time to isolation appears to be very optimistic.

For example, the size of the pipeline means that it holds a little more than 21,000 gallons of product per mile of pipe. If the pipeline should rupture, most all of the product between the rupture site and the next valve that is at a higher elevation than the rupture would drain out between the valves regardless of how quickly the pipeline was shut down or valves were closed, unless the operator is able to install emergency plugs or hot taps very quickly. If the valves are 10 miles apart that could mean that more than 200,000 gallons could be released if the rupture is at the lowest point in that stretch. This figure does not include any additional product continuing to be pushed through the line if valve closing or shut-off is delayed. So Kinder Morgan as part of their risk analysis must have concluded that with the small chance that the pipeline will actually rupture, and their response capabilities, this is an acceptable risk. If they had not come to that conclusion they would have been required to install more valves to decrease the distance and potential spill volume. If informed people in the community were given the same information would they come to the same acceptable risk conclusion? Currently there is no opportunity for the public to review these risk analyses, or to comment on the level of risk to which they are being exposed.

RECOMMENDATION TO CONTRA COSTA COUNTY BOARD OF SUPERVISORS: Work in coordination with pipeline operators to develop a technical advisory body that can review the integrity management plans (similar to the Santa Barbara County System Safety Reliability Review Committee) and other technical assessments of the pipelines in order to cultivate informed technical expertise in the county and increase public trust and awareness.

RECOMMENDATION TO OFFICE OF THE STATE FIRE MARSHAL AND PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION: Adopt stronger regulations requiring automated valves along the lines of the NTSB recommendations.

Pipeline Monitoring and Leak Detection

A supervisory control and data acquisition (SCADA) system is a pipeline computer system designed to gather information such as flow rate through the pipeline, operational status, pressure, and temperature readings. This information allows operators to know what is happening along the pipeline during normal operations, and allows for quicker reactions to equipment malfunctions, failures and releases. Some SCADA systems also incorporate the ability to remotely operate certain equipment, including compressors, pump stations, and valves; allowing operators in a control center to adjust flow rates in the pipeline as well as to isolate certain sections of a pipeline. Many SCADA systems also include leak detection systems – called computational pipeline monitoring (CPM) programs – based on the pressure and mass balance in the pipelines. Unfortunately, remote computerized systems are not yet capable of identifying most leaks; PHMSA data from 2010-present show that only about

11% of U.S. hazardous liquid pipeline significant incidents were initially detected by SCADA or CPM; and that number drops to 2% when looking only at California hazardous liquid pipeline significant incidents in the same timeframe. On-the-ground personnel working for the pipeline operator (as employees or contractors) are the ones most likely to initially identify an incident, but the public and first responders from the local communities are also likely to be the first to identify a significant incident (18% of the time in the U.S.; 25% of the time in California).²⁶

In the Pipeline Safety, Regulatory Certainty, and Job Creation Act of 2011, Congress asked the Secretary of Transportation to provide a report within one year on the technical limitations of current leak detection systems, the practicability of developing standards for the capabilities of leak detection systems, and the costs and benefits of requiring pipeline operators to use such systems. PHMSA completed an in-depth study²⁷ of leak detection systems in December of 2013. That study found that for hazardous liquid pipelines:

- Emergency responders or a member of the public were currently the most likely means of discovering a pipeline release.
- “There is no technical reason why several different leak detection methods cannot be implemented at the same time. In fact, a basic engineering robustness principle calls for at least two methods that rely on entirely separate physical principles.”²⁸
- “External sensors have the potential to deliver sensitivity and time to detection far ahead of any internal system.”

PHMSA has been working on a rule making that may address this leak detection issue for nearly five years now, but as of this report no new or proposed rules have been released for public review.

RECOMMENDATION TO OFFICE OF THE STATE FIRE MARSHAL AND PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION: Adopt stronger regulations that require better leak detection systems in high consequence areas, and that provide a clear performance standard for computational pipeline monitoring systems.

Alamo Technical Pipeline Safety Concerns

Community members raised concerns about a number of specific issues related to pipeline safety on the San Jose pipeline. Pipeline Safety Trust staff also noticed some issues during their visit. This section details technical issues that warrant particular attention.

²⁶ See PHMSA Incident Reports. Percentages based on PST analysis of PHMSA HL 2002-2009 and 2010-present incident data files (as of Aug 3, 2015).

²⁷ Kiefner & Associates, Inc., Leak Detection Study, December 10, 2012, http://www.phmsa.dot.gov/pv_obj_cache/pv_obj_id_4A77C7A89CAA18E285898295888E3DB9C5924400/filename/Leak%20Detection%20Study.pdf



The San Jose line inside protective sleeve traveling above ground across a seasonal stream along the Iron Horse Corridor.

Earthquakes – In 2007, the United States Geological Survey collaborated with William Lettis & Associates on a technical report analyzing Northern Calaveras Fault data.²⁸ This fault bisects Contra Costa County, and is not the only fault impacting ground movement in the area. Residents are concerned that hazardous liquid pipelines are properly protected in the event of an earthquake.

Hazardous Liquid pipeline operators subject to integrity management are required to consider many threats in the risk assessment that is part of their integrity management plan. A number of these pertain to earthquakes and ground movement, though earthquake risk is not mentioned in the regulations as something that requires its own analysis and mitigation. Earthquakes are listed as one factor for an operator to consider in determining whether a pipeline is likely to affect a high consequence area (and therefore be subject to integrity management at all);²⁹ but for pipelines already clearly affecting a high consequence area (as is the pipeline through Alamo), earthquakes are only included in the context of the broader risk assessment required. For example, in determining the schedule to use in regularly assessing a pipeline segment, geotechnical hazards must be considered;³⁰ and PHMSA offers further guidance on risk factors that should be considered in the frequency of assessment, including “location related to potential ground movement...”³¹ but the regulations do not specify how they are considered, any technical specifications to use when considering their risk, or specific ways to mitigate that risk. When PHMSA inspectors review a California operator’s risk assessment,

²⁸ Kelson, Keith I. and Sundermann, Sean T. Digital compilation of Northern Calaveras Fault Data for the Northern California Map Database: Collaborative Research with William Lettis & Associates, Inc., and the U.S. Geological Survey. October 2007.

²⁹ See 49 CFR § 195 Appendix C I.B.(12)

³⁰ See 49 CFR § 195.452(e).

³¹ See 49 CFR § 195, Appendix C. II.A.(11)

they would expect to see seismic-related activity (ground movement, unstable soils, landslides, etc.) listed as a threat, and if not, they would dig deeper.³² In the 2011 updates to the federal pipeline safety laws, Congress specifically included “seismicity of the area” as one threat that a pipeline operator must consider when evaluating threats to a pipeline segment under Parts 192 and 195 of Title 49.³³

We saw no evidence in our review of the OSFM report on Kinder Morgan’s integrity management program that earthquakes factored in to their risk assessment. They did list one action item for most of the intrastate pipelines in the county including the San Jose line that relates to earthquake activity (“monitor wash outs and unstable slopes”), and there may be more listed in the integrity management plan of the operator that is not available for the public to view.

Pipelines worldwide have generally performed relatively well in past earthquakes,³⁴ and ‘natural force damage’ (the cause category under which earthquake-related pipeline failures would fall) is the cause of relatively few pipeline failures nationwide (7%) and in California (2%).³⁵ However both old and new pipelines can sustain damage from earthquakes that is “typically concentrated in areas of unstable soils with permanent ground deformation (PGD) and/or liquefaction, including at river crossings and landslides,” according to an *Earthquake Risk Study for Oregon’s Critical Energy Infrastructure Hub* submitted in 2012.³⁶ A technical handbook on seismic risk analysis stresses the importance of estimating the extent of permanent ground deformation in assessment of pipeline system vulnerability: “In particular, adequate knowledge of site-specific soil and groundwater conditions is critical to the success of the design and installation of pipelines, as well as in predicting its anticipated performance under field conditions” (page 692).³⁷

Both the technical handbook and the Oregon report list options for mitigation measures to improve the performance of a pipeline. The categories of mitigation measures as summarized by the handbook are: “(a) avoid the hazard by relocation; (b) isolate the pipeline from the hazard; (c) accommodate the hazard by strengthening the pipeline or increasing the flexibility; and (d) mitigate the hazard using ground improvement” (page 702). The Oregon study states mitigation options as: “soil improvement, increasing the load

32 Correspondence with PHMSA Pipeline Safety Western Region Office CATS staff, August 2015.

33 Section 29, Pipeline Safety, Regulatory Certainty and Job Creation Act of 2011.

34 Wang, Yumei, Bartlett, Steven F., and Miles, Scott B. *Earthquake Risk Study for Oregon’s Critical Energy Infrastructure Hub* (Final Report to Oregon Department of Energy & Oregon Public Utility Commission). Oregon Department of Geology and Mineral Industries, August 2012.

35 See PHMSA data shown in graphs earlier in report entitled “Causes of HL Significant Incidents.”

36 Wang, et. al. IBID (Page 82).

37 Honegger, D.G. and Wijewickreme, D. (2013). Seismic risk assessment for oil and gas pipelines. In Tesfamariam, S., Goda, K. (Eds.), *Handbook of Seismic Risk Analysis and Management of Civil Infrastructure Systems* (pages 682-715). Cambridge: Woodhead Publishing Limited, 2013.

carrying capacity of the pipe system, reducing the friction between the pipe and soil, relocating the pipe, anchors to prevent uplift from buoyant forces, or special pipe joints or fittings that allow greater joint deflection, extension, or compression” (Page 84).

Seismic vulnerability studies can be conducted on pipelines or pipeline segments to assess pipeline performance and suggest mitigation measures appropriate to the specific situation. We found no evidence that Kinder Morgan or any other operator has conducted such a study related to the pipelines in Contra Costa County.

**RECOMMENDATION TO PIPELINE OPERATORS:
Contract for an independent technical seismic vulnerability study on HCA pipelines affected by potentially active faults to feed into the pipeline risk analysis, and make the study available to the public.**

Iron Horse Corridor Above-Ground Stream Crossings – In two places along the Iron Horse Corridor in Alamo, the San Jose line spans seasonal streams above-ground. (see photo on page 19) Community members have raised concerns about the adequacy of the span supports, potential vulnerability of these spans and the overall safety of these crossings.

Both the above-ground pipeline spans contain a metal sleeve over the pipeline itself, and it is this sleeve that is secured to the supporting infrastructure. These types of above-ground pipeline spans are fairly common, though there are many different types of supportive infrastructure that can secure the pipeline in these situations. One additional concern with supported above-ground spans is the erosion that can occur on either side, potentially increasing the length of the unsupported portion of the span. Some different types of above-ground supports are depicted in the accompanying photos.



Examples of other pipelines crossing steam areas in California and Washington States.

Land Use Planning and Pipelines

For the siting of nearly all new pipelines, the pipeline company decides on a general route they prefer for their pipeline, and possibly some alternative routes. Once they feel fairly confident with the feasibility of their chosen route, the more formal process with various government agencies begins. That process is not consistent for various types of pipelines, but varies greatly based on the type of pipeline and where it is to run.

Example of California local authority for new and replaced pipelines: Santa Barbara County

Santa Barbara County requires pipeline operators to submit a Development Plan permit for new and replaced pipelines, often in conjunction with a Conditional Use Permit (if located in the Coastal Zone and impacting environmentally sensitive areas).¹ The permit review process includes analysis of submitted information (maps, mitigation measures, emergency response plan, etc.) against standards, and requires specific findings as well as an Environmental Impact Review in accordance with the California Environmental Quality Act (CEQA).² Pipeline operators with existing lines may need to obtain a grading permit prior to digs that expose pipe,³ and operators with a development permit on file submit results of any anomaly digs to the county. Santa Barbara County is unique in their use of a System Safety Reliability Review Committee⁴ made up primarily of technical staff who work in collaboration with pipeline operators (and other oil and gas facility operators) to review project information and operations.

- 1 See Santa Barbara County Land Use & Development Code, Article 35.5.
- 2 See CA Public Resource Code § 21000 et. seq.
- 3 See Santa Barbara Grading Code (Chapter 14).
- 4 For more information on the System Safety Reliability Review Committee, including committee makeup, minutes, and agendas, see <http://www.sbcountyplanning.org/energy/permits/ssrrc.asp>.

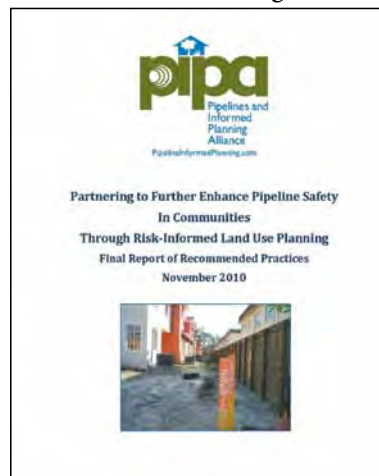
Interstate natural gas pipeline companies must apply to the Federal Energy Regulatory Commission (FERC) for construction and route approval.

There is no comprehensive federal permitting process for the routing of hazardous liquid pipelines or of intrastate natural gas pipelines. Assuming the pipeline is wholly within the U.S., the responsibility for approval of the pipeline route falls on the individual states. Since California does not have a statute at the time of this writing that addresses pipeline routing and siting, the responsibility falls to the regular land use authority of local governments along the pipeline route, some of which exercise this authority, and others do not.

Local governments can also coordinate and regulate new development near existing pipelines with their land use authority. Many pipelines existed prior to development, and

housing density has increased in many areas near pipelines that once were predominantly undeveloped rural areas. Local governments can enact regulations governing the type of buildings and construction that can occur near existing pipelines, requiring consultation with the pipeline operator, establishing setbacks or enacting a variety of other land use permit requirements.

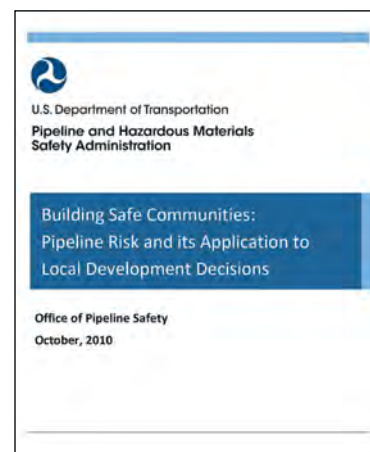
In 2010, PHMSA published the final report of the Pipelines and Informed Planning Alliance (PIPA), a three-year effort



to provide information and recommendations on the types of tools local governments can use to regulate new development near existing pipelines. Forty-three recommended practices are contained in the report, and twenty-nine of them speak specifically to local governments about things they can do to encourage safety near transmission

pipelines. Recommendations stress: the need to have a relationship with local pipeline operators that includes open communication, incorporating the existence of pipelines into planning processes and infrastructure projects, and the importance of safe excavation practices. One example of a specific recommendation is the use of consultation areas or zones that require early consultation among stakeholders when any development is proposed within a specified distance from a transmission pipeline. All recommendations and associated documents can be found through the PIPA link at: <http://primis.phmsa.dot.gov/comm/pipa/LandUsePlanning.htm>.

Contra Costa County local government agencies also have a role to play in pipeline safety and oversight. Federal and state regulations generally preclude local governments from adopting any regulations that require a pipeline operator to take any actions regarding the safe operation of a pipeline. That said, pipeline operators might willingly enter into development



agreements or mitigation agreements that include additional safety aspects in certain situations, in response to local conditions. There are things that local governments do that are not precluded, such as negotiated rights-of-way agreements, spill and emergency preparations and response, or land use and zoning provisions. Contra Costa County agencies are actively involved in some of these areas, and minimally involved in others.

Right-of-way Franchise and Easement Agreements

Easements and franchise agreements specify information about the access the pipeline operator has to land that is owned by private parties or government entities. They are typically negotiated agreements in exchange for payment, and lay out allowed and disallowed activities for the pipeline operator and the landowner within the area covered by the agreement. The area covered may be narrow or wide, depending on the pipeline and the context at the time the agreement was signed.

When a pipeline goes through county-owned public property or public rights-of-way, Contra Costa County Public Works Department has authority over the granting of franchise or easement agreements. Agreements between the county and pipeline operator must proceed in accordance with the Pipeline Franchise Ordinance.³⁸ Ordinances that establish regulations for granting these franchise agreements have been in place since 1964, with amendments in 1992 and 2013. As of this writing, the public works department staff is working to get all existing franchise agreements updated to be consistent with the most recent ordinance. The pipeline franchise ordinance covers the unincorporated portions of the county, and individual cities negotiate easements and franchise agreements according to their own ordinances or policies.

There are examples from around the country where local governments through these franchise agreements have been able to obtain safety improvements and greater liability insurance and indemnification than is required by state or federal rules.³⁹

The Iron Horse Corridor – Multiple Uses

Some pipelines were in place prior to the first county franchise ordinance and operate according to easements that were already in place. This is the situation with most of the Kinder Morgan SFPP- San Jose line along the Iron Horse Corridor, which was constructed in the mid-1960s during the time that the Southern Pacific Railroad owned and operated rail lines.

The entire Iron Horse Corridor right-of-way varies from about 30 to 100 feet in width along the route, and contains numerous utilities and facilities through easements, license agreements, and leases, including the easement for the SFPP - San Jose pipeline, which only covers a portion of the corridor right of way. Because of the history of the San Jose line and the Iron Horse Corridor, much of the land through



Multiple utilities exist in the Iron Horse Corridor

which the pipeline travels is public and not private land, so the predominance of the easement area is covered by a single agreement between the pipeline operator and the county, rather than many individual easements between the pipeline operator and private property owners. That easement agreement specifies the property involved (generally a strip of land 10 feet wide, specifically described in the easement documents), and the right of the operator to construct, reconstruct, renew, maintain and operate the pipeline and appurtenances on the easement.⁴⁰

Landowners have in the past encroached onto the Iron Horse Corridor with fence lines, landscaping, and other property improvements. This type of activity presents a potential safety threat to the pipeline and is against the law.

The Elder California Pipeline Safety Act of 1981 specifies in § 51014.6:

“(a) Effective January 1, 1987, no person, other than the pipeline operator, shall do any of the following with respect to any pipeline easement:

(1) Build, erect, or create a structure or improvement within the pipeline easement or permit the building, erection, or creation thereof.

(2) Build, erect, or create a structure, fence, wall, or obstruction adjacent to any pipeline easement which would prevent complete and unimpaired surface access to the easement, or permit the building, erection, or creation thereof.

(b) No shrubbery or shielding shall be installed on the pipeline easement. This subdivision does not prevent the revegetation of any landscape disturbed within a pipeline easement as a result of constructing the pipeline and does not prevent the holder of the underlying fee interest or the holder’s tenant from planning and harvesting seasonal agricultural crops on a pipeline easement.

(c) This section does not prohibit a pipeline operator from performing any necessary activities within a pipeline easement, including, but not limited to, the construction, replacement, relocation, repair, or operation of the pipeline.”

Numerous other utilities share the right-of-way with the hazardous liquid pipeline. Operators install utility lines according to specific standards that specify vertical and horizontal separation distances that vary depending on the type of utility.⁴¹ Colocation of energy transmission systems within designated energy ROWs is common, but may result in some interference between the systems or other hazards that would not exist except for the physical proximity of the two transmission systems.

40 There are gaps in the easement and memoranda documentation the Trust was able to acquire from the county and Kinder Morgan. We don’t know if this reflects missing documentation or uncertainty about the pipeline right-of-way, but recommend there be a complete set of documentation describing the right-of-way and property affected that is available to the public.

41 See 49 CFR § 195.250; also see operator guidelines for additional specifics on horizontal and vertical separation distances.

38 Governed by Contra Costa County Code, Title 10, Chapter 1004-2.

39 See examples of these franchise agreements at: <http://pstrust.org/about-pipelines1/local-governments/franchise-agreements/>

Encroachments into the Iron Horse Corridor may or may not encroach into the portion of the corridor over which Kinder Morgan or other utilities hold an easement. Assessing and remedying these encroachments will require coordination among all parties with ownership interests in the corridor.

The community is involved in the management of the corridor, and has numerous public participation opportunities with regard to planning its use.⁴² Keeping the pipeline and pipeline safety in mind during these public discussions can serve to remind nearby residents that the Iron Horse Corridor needs to be respected as a protective buffer for the utilities within it, as well as enjoyed for its recreational offerings.

RECOMMENDATION TO CONTRA COSTA COUNTY BOARD OF SUPERVISORS: Adopt clear policies and deterrents regarding preventing encroachment including the review of setback variances by municipal advisory councils or committees and department staff, so that properties and vegetation along utility corridors do not encroach on pipelines. Ensure the single staff point-of-contact for citizens with concerns about multiple utility issues and right of way questions has technical training on safety concerns, adequate resources to conduct regular and broad community outreach (especially along the Iron Horse Corridor), and resources to work in close coordination with other related departments and advisory groups.

RECOMMENDATION TO CONTRA COSTA COUNTY PUBLIC WORKS: Ensure county has complete and accurate records of corridor and right of way locations. Continue to coordinate with Kinder Morgan and other utilities on resolution of encroachments into pipeline Rights of Way.

RECOMMENDATION TO PIPELINE OPERATORS: Consistently undertake assessments of existing Right of Way encroachments to determine whether there are safety implications. Coordinate with Contra Costa County Public Works to resolve encroachments with neighboring property owners.

Land Use and Zoning Provisions

Land use and zoning authority in the unincorporated portions of the county lies within Contra Costa County Department of Conservation and Development (DCD)

⁴² The East Bay Regional Park District covering Alameda and Contra Costa Counties manages the Iron Horse Trail (with an elected board of directors and an appointed advisory committee), and the Contra Costa County Board of Supervisors appoints an IHC Advisory Committee with representation from communities along the corridor. The IHC Advisory Committee has embarked on various projects that have involved additional public input opportunities, including the creation of the Management Program and its Landscape Element in 2000.

jurisdiction. The county does not address pipelines in the General Plan goals or policies. Apart from limited involvement with certain high-hazard proposals (as rated by Hazardous Materials Program staff), the county does not review pipelines under their land use authority. They have a specific exemption for pipelines and other utilities stating:

The use of land for rights-of-way for the construction, maintenance and repair of public utilities and publicly owned utilities and for privately owned pipelines for the transportation of oil, gas, water, and other substances transportable by pipelines, is not regulated or restricted by Divisions 82 and 84. Accessory and appurtenant structures forming a part of public utilities, publicly owned utilities and pipelines are not regulated or restricted by Divisions 82 and 84, except for setback regulations. (Contra Costa County Zoning Code § 82-2.010)

Divisions 82 and 84 referred to in the above citation are, respectively, the General Regulations and Land Use Districts divisions of the County Zoning Code.⁴³

There are examples in California of other counties that do not exempt privately owned transmission pipelines from land use regulations (see sidebar on Santa Barbara County on page 21). Using land use and zoning authority to require permits for HL pipeline construction, replacement, modification, or abandonment may allow a local government to conduct California Environmental Quality Act (CEQA) review if warranted, and negotiate conditions and mitigation requirements with certain permits.

RECOMMENDATION TO CONTRA COSTA COUNTY BOARD OF SUPERVISORS AND DEPARTMENT OF CONSERVATION AND DEVELOPMENT: Consider adding goals and policies to the General Plan,⁴⁴ and amending Contra Costa County Zoning Code 82-2.010 so that all privately owned pipelines and appurtenant structures are not exempt, but rather only privately owned gas distribution pipelines under 12” in diameter are exempt from the General and Land Use District regulations (divisions 82 and 84).⁴⁵ Consider additional ordinance(s) pertaining to zoning and land use permitting for hazardous liquid pipelines and possibly also intrastate gas transmission pipelines that are proposed for construction, replacement, modification, or abandonment.

⁴³ See https://www.municode.com/library/ca/contra_costa_county/codes/ordinance_code?nodeId=TIT8ZO

⁴⁴ See the Trust’s Local Government Guide to Pipelines for specific suggestions about what kind of General Plan (also called Comprehensive Plan) language may be used relating to pipelines and pipeline safety.

⁴⁵ Language can be written specifically to exempt most distribution pipelines. For example, “only gas distribution pipelines under 12” in diameter or under an operating pressure of 80 psig are exempt from the zoning code provisions.”

Damage Prevention and Public Awareness Programs

A nationwide utility locator system is available for free in every state, to anyone planning hand or machine excavation, in order to prevent damage to pipelines and other utilities. By calling 811 at least two working days before digging, a utility locator will come identify and mark buried utilities, including cables and pipelines for fuel, water and sewer. This is a requirement by law in California (see GOV Code § 4216 et. seq.) with civil penalties associated with noncompliance, yet California lacks enforcement for this law.⁴⁶ Pipeline operators must participate in this program. In communities that do not have other types of consultation zones or setback regulations, the “One-Call ticket” (as operators refer to the resulting notification from someone calling 811) is likely to be the first notice the pipeline operator has that someone is intending to dig close to their pipeline. Kinder Morgan has a robust damage prevention program, with membership in the Common Ground Alliance, staff training, and staff encouraged to actively follow up on any observed violations.

Pipeline operators also are required by federal law to have a Public Awareness Program.⁴⁷ This program must describe what the operator does to inform the public of the presence of the pipeline and potential hazards, and how they do it. For instance, the operator must identify and communicate with local emergency personnel, government officials, school districts, businesses, and the public, and tell them specific things such as how to recognize pipeline location markers, what kind of precautions they should take, what kind of properties the commodity being transported in the pipeline has, and how to recognize and respond to a pipeline emergency.

RECOMMENDATION TO THE STATE OF CALIFORNIA: Enforce excavation damage prevention laws. Currently authority is held with the Attorney General’s office, but there is not adequate staffing or resources to respond to notifications of alleged violations or to investigate. Other agencies respond on a fragmented basis depending on the damaged utility involved.

Local Opportunities for Public Involvement, Education and Awareness

The Contra Costa County Hazardous Materials Ombudsman is a useful single point of contact for information regarding hazardous materials including pipelines; part of the ombudsman’s role is to help people in the county be good advocates for themselves by providing information. The public can also attend Hazardous

⁴⁶ California is one of a few states without enforcement for excavation damage prevention – see PHMSA 2014 state damage prevention program characterization.

⁴⁷ For hazardous liquid pipelines, see 49 CFR § 195.440; for gas pipelines, see 49 CFR § 192.616.

Materials Commission meetings or apply to be one of the 13 members (some of these are public seats).

All of the agencies discussed in this report also provide additional information on their websites (those addresses are listed in Appendix A).

The county also has a Community Awareness and Emergency Response (CAER) group, which is a non-profit public benefit corporation of public emergency response agencies, local government officials and facilities and businesses that use, store, handle, produce or transport hazardous materials. All of these entities can be members of CAER; membership is voluntary, and while most of the waterfront industrial facility operators are members, Kinder Morgan is not. CAER works to actively enhance public health and safety, and includes public representatives on its board of directors. CAER efforts focus on the waterfront areas from Richmond to Antioch where industrial facilities are concentrated but their expertise and public outreach model also support inland areas of county affected by hazardous materials transport through pipelines.

The Contra Costa County Board of Supervisors raised questions and concerns about Kinder Morgan intrastate pipelines in a letter to OSFM dated March 11, 2014. In response to this letter, OSFM staff inspected the Kinder Morgan Integrity Management Program related to their intrastate pipelines in Contra Costa County (including the San Jose line / LS-16) in June 2014. This inspection included a review of integrity management procedures, inspections, and associated repairs for the eleven Kinder Morgan intrastate pipelines operating in Contra Costa County, and resulted in a report submitted to the county in the spring of 2015 that details the process Kinder Morgan undergoes to ensure the integrity of these lines. The county has this information, but having this information is not the same as having a clear process and expertise in place to analyze it and make recommendations in coordination with the operators and OSFM.

RECOMMENDATION TO OFFICE OF THE STATE FIRE MARSHAL: Make information – maps, incident and inspection information – accessible to the public by posting it online.

RECOMMENDATIONS TO PIPELINE OPERATORS: Participate as members in CAER with consistent attendance at quarterly meetings by appropriate management staff. Work in coordination with the Board of Supervisors and appropriate county departments to develop a technical advisory body that can review the integrity management plan (similar to the Santa Barbara County System Safety Reliability Review Committee) and other technical assessments of the pipeline in order to cultivate informed technical expertise in the county and increase public trust and awareness.

Emergency Response, Spill Response & Prevention

Oil spill prevention and emergency response authority differs depending on what area the spill is likely to affect (coastal or inland), whether it is part of a larger facility (e.g., a refinery), and what part of the process is the focus (prevention, preparedness, environmental spill response, or emergency assistance to communities). When a spill occurs, many state, federal and local agencies work together under a ‘unified command’ structure on clean-up and response.

Hazardous liquid pipeline spill response agencies in California

The U.S. EPA has authority to direct cleanup and rehabilitation of areas affected by spills of hazardous liquid releases. The U.S. EPA can also bring actions for civil penalties under the Oil Pollution Act against operators for each barrel of oil where releases have entered navigable waters, as defined under the Clean Water Act. Additional recovery is available to the state and federal governments for damages done to natural resources by a spill.

The California Department of Fish and Wildlife, Office of Spill Prevention and Response (OSPR) also exercises jurisdiction over oil spills. This authority was expanded greatly in 2014 to cover all state surface waters at risk of oil spills from any source, including pipelines and production facilities.⁴⁸ The development of the regulations for this expanded statutory authority is underway as of this writing, with OSPR coordinating with local, state and federal government along with industry and non-governmental organizations to do so. OSPR requires operators to submit spill response plans for approval, and conducts spill drills (they are authorized to conduct both announced and unannounced drills). Operator spill response plans for pipelines that could effect marine waters are currently posted on the OSPR website, and presumably similar plans will be made available to the public in the future for those operators with pipelines that could effect any waters of the state once the new regulations are completed and implemented.

The California Environmental Protection Agency (CalEPA) regulates hazardous waste and materials through a Unified Program that incorporates a number of local and regional Certified Unified Program Agencies (CUPAs) for implementation, of which the Contra Costa County Health Services Department is one. In general, CUPAs are most interested in facilities handling hazardous waste and materials, and not focused at all on the transportation of those materials. However if an incident occurs and hazardous materials spill, a local CUPA will be involved in the response to that spill, whether it comes from a facility or a pipeline. More information about the CUPA role is included in the following section focused on Contra Costa County.

All pipeline operators are required to have an emergency response plan, and to share that plan with local first responders. The plan should contain detailed information about what the pipelines hold, and how pipeline company personnel and emergency response agencies such as fire and sheriff or police departments will implement pre-planned responses in case of an emergency. PHMSA assesses the written procedures contained in these plans during their inspections of interstate operators, and OSFM reviews portions of the plans during their standard inspections (once every five years) for intrastate pipelines, but operators are not required to submit these plans to either PHMSA or OSFM.

Operators that fall under the jurisdiction of the federal Oil Pollution Act, whose pipelines may significantly harm water bodies if there were to be a release of oil or a refined product, must also prepare a facility response plan, sometimes called a spill response plan, to outline how a release from the facility will be responded to and where response resources will be stored near the pipeline and where staff and contractors will be responding from. These plans must meet the requirements of federal law and regulations and be approved by PHMSA.⁴⁹

Pipeline accident investigations occur separately from the spill clean-up and response. The National Transportation Safety Board conducts accident investigations of some of the most significant pipeline incidents. PHMSA may conduct a pipeline failure investigation on a pipeline within its jurisdiction, depending on the cause or failure mode, the severity of the consequences, and the history of the pipeline system. OSFM conducts its own investigations, in accordance with Section 13107.5 of the California Health and Safety Code. Other agencies may also conduct investigations, including the California Department of Industrial Relations, Division of Occupational Safety and Health, or a local Certified Unified Program Agency.

Following the May 2015 spill onto Refugio Beach near Santa Barbara, additional changes were proposed to California laws to increase the usage of automatic shut-off systems and improve leak detection technology on hazardous liquid lines, as well as to improve the response times to begin clean up efforts by allowing local fishing boats to be trained as spill responders. At the time of this publication, it was not yet certain whether either of these bills would pass.

Contra Costa County Spill and Emergency Preparations and Response

Contra Costa County Health Services Department (HSD) is designated as a Certified Unified Program Agency (CUPA), and their Hazardous Materials Program has been involved in protecting the community from hazardous materials releases for well over two decades. The state and county rules governing hazardous materials apply very little to pipelines, as the state hazardous materials law specifically exempts the *transportation* of hazardous materials.⁵⁰ However once hazardous materials are released from a pipeline, they are no longer considered

48 Senate Bill 861 authorized the expansion and provided the additional statutory and regulatory authority, for the prevention, preparedness and response activities in the new inland areas of responsibility. See also Cal. GOV Code § 8670.

49 See 49 C.F.R. Part 194.

50 Specific authority given to the HSD as a CUPA is described in CA HS Code, § 25404 and § 25531 et. seq.; the Contra Costa County Industrial Safety Ordinance is found in CCC Code, Title 4, Chapter 450.

to be part of the transportation system. In concert with these rules, the Hazardous Materials Program concerns itself with all storage and processing of hazardous materials (including at water treatment facilities, refineries, and the like), but pipelines mainly draw their attention once the hazardous materials are no longer part of the transportation system, i.e., there is an incident where oil is spilled. All releases of hazardous materials (including pipeline releases) are reported on by the Hazardous Materials Program, and available on the department's website.⁵¹

The Health Services Department has a designated staff Hazardous Materials Ombudsman whose job is to respond to questions and concerns from the public, as well as independently and impartially conduct investigations, solve problems, and make recommendations regarding the program. The Department also supports the Hazardous Materials Commission, a group consisting of 13 appointed members representing a diversity of stakeholders. The Commission is tasked with advising the Board of Supervisors on hazardous materials planning, management, and implementation, while obtaining broad public input and working to build consensus.⁵² The Health Services Department incorporate concerns with pipelines along with facilities as part of a broad focus on protecting the community from dangers of hazardous materials.

Contra Costa County is highly populated, and many people live and work in close proximity to the pipelines in the region. A dozen schools are located in very close proximity to the Kinder Morgan pipeline along the section of the Iron Horse Corridor from Concord to San Ramon. While individual schools have emergency or crisis plans in place, we did not see mention of the unique hazard presented by proximity to the pipeline if a pipeline incident were to occur. The California Department of Education (CDE) offers useful guidance to Local Educational Agencies (i.e. school districts and other related entities) in siting new facilities; one piece of this guidance is their "Guidance Protocol for School Site Pipeline Risk Analysis" which is a tool to aid Local Educational Agencies and the CDE in evaluating the suitability of new school sites located near pipelines as defined in the regulations.⁵³ CDE also offers guidance under their "Potential Pipeline Hazard Mitigation/Management" heading, including suggestions for reducing the probability of a pipeline product release and for reducing the severity of consequences of pipeline releases on schools.⁵⁴

These resources could be expanded to offer mitigation and modernization recommendations for existing schools in proximity to pipelines, looking at evacuation routes, coordination with local first responders and pipeline operators, and education of individual school staff using resources such as the School Pipeline Safety Partnership offered by the Danielle

Dawn Smalley Foundation.⁵⁵ In addition, the Contra Costa County Office of Public Education maintains online resources on emergency preparedness,⁵⁶ and the Contra Costa County CAER has a *Model Emergency Plan for Schools*,⁵⁷ both of which can be used as additional resources when developing a comprehensive emergency or crisis plan. These resources do not specifically mention the potential hazards of oil and gas pipelines as something to learn about and pay attention to, or as a potential risk for which to plan and develop mitigation measures, though they do provide helpful guidance for the important process of emergency planning.

At a minimum, those agencies who help schools develop safety plans should coordinate with one another (E.G. school districts, the CA Department of Education, county Office of Public Education, and CAER) and suggest each crisis plan include the following information about pipelines:

- Where is the pipeline? (include it in any maps, and specify distance from school facilities)
- What pipeline markers look like.
- Name of pipeline operator, product transported, and both emergency and non-emergency contact information for a pipeline operator representative.
- How and where to evacuate in a pipeline emergency, including routes that avoid pipelines and pipeline rights-of-way.
- Overview of the indications of a pipeline emergency.

At least one of the schools adjacent to the Iron Horse Corridor and Kinder Morgan pipeline has no access to emergency services or evacuation except via a single road that crosses the pipeline. Rancho Romero Elementary School is located in Alamo, and can only be reached via Hemme Road off of Danville Boulevard by crossing over the pipeline. In the unlikely event that a pipeline incident occurs adjacent to the school in such a way as to block the Hemme Road access, numerous problems could arise, as all road access to and from the school would be blocked. All emergency services are on the other side of the pipeline; the current relocation site listed in the school's crisis plan is the Creekside Community Church, also on the other side of the pipeline. The pipeline is not depicted on the emergency map for the school, and is not mentioned in the safety plan where ingress/egress is discussed, or anywhere else in the crisis plan.

There may be a timely opportunity to work with developers to address the issue of school and neighborhood connectivity in conjunction with current plans for development in this area. Every effort should be made to create publicly accessible access across these 'dead-end' neighborhoods that necessitate crossing the pipeline to access any services.⁵⁸

55 See <http://smalleyfnd.org/services/pipeline-education/schools>

56 See http://www.ccoec.k12.ca.us/about/resources_emergency.html

57 See http://www.cococaer.org/prepare_plans_school.html

58 The Trust has seen the "Ball Estate" development plan that is currently under review and includes possible gated emergency vehicle access in this area via a private Ironwood Place connector. Contra Costa County should ensure that any emergency vehicle access is sufficient in width and access to have unimpeded passing emergency vehicles and whatever other needs may be requested by the Fire Department.

51 As of this writing, website access to the reports had been suspended pending HSD website's realignment with the CA Environmental Reporting System, but will soon be available again through links here: <http://cchealth.org/hazmat/incident-response.php>.

52 See <http://cchealth.org/hazmat/hmc/>

53 See <http://www.cde.ca.gov/ls/fa/sf/protocol07.asp>

54 See <http://www.cde.ca.gov/ls/fa/sf/mitigation.asp>

As mentioned earlier, resources exist for school emergency planning. In addition, assistance or funding may be available from those same agencies or the pipeline operator to receive specialized technical assistance to assess the pipeline risks and offer suggested mitigation and evacuation strategies pertinent to the specific school situation.

Two fire districts cover the central region of the county that includes the Iron Horse Corridor: the Contra Costa County Fire Protection District, and the San Ramon Valley Fire Protection District. As mentioned previously, pipeline operators are required to have both an emergency response plan, and a public awareness plan, and to have a designated liaison and make information available to local first responders such as fire departments and sheriff or police departments. Because of the workload and turnover in most fire districts, it is difficult to have a single point-of-contact who is familiar with the pipeline, the operator and the emergency response plan. While pipeline operators invite district personnel to annual training events, it is up to the district to prioritize planning for a pipeline emergency.

RECOMMENDATION TO CONTRA COSTA COUNTY HEALTH SERVICES DEPARTMENT: Expand the scope of the Hazardous Materials Ombudsman and the Hazardous Materials Commission to provide an ongoing review of pipeline operators' emergency plans and possible county efforts regarding additional coordinated technical review of pipeline integrity planning.

RECOMMENDATION TO THE STATE OF CALIFORNIA: Work with the California Department of Education (CDE) on ways to implement CDE's suggestions for reducing the probability of a pipeline product release on schools, and reducing the consequences of pipeline releases on schools.⁵⁹

RECOMMENDATION TO CONTRA COSTA COUNTY BOARD OF SUPERVISORS: Request appropriate staff conduct an analysis of all congregate facilities (i.e. schools, recreation facilities, hospitals, nursing facilities, etc.) located in close proximity to transmission pipelines; Work with other emergency response agencies to develop a list of resources for emergency and evacuation planning expertise for congregate facilities near pipelines that can include potential hazards from a pipeline incident, and mitigation strategies for those hazards based on site-specific considerations.

RECOMMENDATION TO CONTRA COSTA COUNTY PUBLIC WORKS: Plan emergency evacuation ingress/egress for areas in Alamo west of Danville Boulevard and the Iron Horse Corridor where a single east-west pipeline-crossing road is the only access for numerous homes and facilities (e.g. Hemme Road, Camille Road) with the goal of creating public accessibility across these 'dead-end' neighborhoods that necessitate crossing the pipeline to access any services.

RECOMMENDATION TO CONTRA COSTA COUNTY Department of Conservation and Development: Review all development applications for opportunities to improve existing ingress/egress where currently limited, and where possible, include conditions on approvals to improve connectivity and avoid exacerbation of access problems.

RECOMMENDATION TO DEPARTMENT OF EDUCATION: Expand School Site Pipeline Risk Analysis and the Potential Pipeline Hazard Mitigation/Management guidance in coordination with emergency response agencies to offer help for schools that already exist in close proximity to pipelines. Lead coordination efforts among the myriad of agencies that offer crisis planning assistance to schools, and suggest minimum information that should be included in these plans regarding pipelines.

RECOMMENDATION TO CONTRA COSTA COUNTY OFFICE OF PUBLIC EDUCATION AND SCHOOL DISTRICTS: Expand emergency preparedness resources to include information about pipelines and pipeline-specific risks. Assist individual schools in developing crisis plans and emergency preparedness plans that include pipelines on the emergency maps and assess how ingress/egress may be affected by a pipeline incident.

RECOMMENDATION TO CONTRA COSTA COUNTY CAER: Include specific reference to oil and gas pipelines in the list of potential hazards listed in the hazard assessment in the next update to the *Model Emergency Plan for Schools*.

RECOMMENDATION TO PIPELINE OPERATORS: Reach out to the schools along the pipeline easement and offer to provide technical assistance assessing pipeline risks and evacuation strategies given possible incidents that could occur in close proximity to the schools.

RECOMMENDATION TO FIRE DISTRICTS: Designate a single point-of-contact to coordinate with pipeline operators, familiarize themselves with the operators' emergency response and spill response plans, know the facilities where people congregate (schools, churches, hospitals, nursing facilities, etc.) in close proximity to the pipeline, be involved with any emergency planning done by those facilities, and advise County DCD and PW on sufficiency of proposed ingress/egress for new developments in areas where there is currently single access that crosses the San Jose line.

⁵⁹ See CDE's Potential Pipeline Hazard Mitigation/Management website at <http://www.cde.ca.gov/ls/fa/sf/mitigation.asp>

APPENDICES

Appendix A. Agency listing and Resources for more information

Appendix B. Community education meetings

Appendix C. Additional information reviewed for report

Appendix D. All Reported Incidents in Contra Costa County

Appendix E. All Reported Incidents on Kinder Morgan's SFPP Pipeline System

Appendix A. Agency listing and resources for more information

Alamo Improvement Association: www.alamoca.org

CA Dept of Education, Guidance Protocol - School Site Pipeline Risk: www.cde.ca.gov/ls/fa/sf/protocol07.asp

CA Office of the State Fire Marshal, Pipeline Safety Division: osfm.fire.ca.gov/pipeline/pipeline.php

CA Dept of Fish & Wildlife, Office of Spill Response and Prevention: www.wildlife.ca.gov/OSPR

CA Environmental Protection Agency, Unified Program: www.calepa.ca.gov/CUPA/

Contra Costa County Board of Supervisors: www.cccounty.us/193/Board-of-Supervisors

Contra Costa County Department of Conservation and Development: www.cccounty.us/dcd

Contra Costa County Health Services Department, Hazardous Materials Programs: cchealth.org/hazmat/

Contra Costa County Public Works Department, Transportation Engineering Division

Iron Horse Corridor Management: www.co.contra-costa.ca.us/413/Iron-Horse-Corridor

Franchise Administration: www.contracosta.ca.gov/475/Franchise-Administration

Contra Costa County Office of Education, Crisis Planning & Emergency Preparedness:

www.cccoe.k12.ca.us/about/resources_emergency.html

Contra Costa County Community Awareness & Emergency Response (CAER): www.cococaer.org

Danielle Dawn Smalley Foundation, Pipeline Safety and Awareness Training for Schools:

smalleyfnd.org/services/pipeline-education/schools

Federal Pipeline Safety Regulations: www.ecfr.gov/ecfrbrowse/Title49/49CISubchapD.tpl

National Transportation Safety Board: www.nts.gov

Pipeline Safety Trust website: pstrust.org

Landowner's Guide to Pipelines: pstrust.org/log

Local Government Guide to Pipelines: pstrust.org/lgg

Online "SafePipelines" discussion group: groups.yahoo.com/neo/groups/safepipelines

U.S. Dept of Transportation, Pipeline and Hazardous Materials Safety Administration

Incident and Annual Pipeline Data: phmsa.dot.gov/pipeline/library/data-stats

National Pipeline Mapping System: www.npms.phmsa.dot.gov/PublicViewer

Office of Pipeline Safety: phmsa.dot.gov/pipeline

Pipelines and Informed Planning Alliance: primis.phmsa.dot.gov/comm/pipa/landuseplanning.htm

Appendix B. Community education meetings

The Alamo Improvement Association and the Contra Costa County Hazardous Materials Commission jointly sponsored two hazardous liquid pipeline safety workshops in June of 2015, with funding from the PHMSA Community Technical Assistance Grant received by the Alamo Improvement Association. Michael Kent, Hazardous Materials Ombudsman, moderated the meetings, and the following four individuals presented information and slides to the group:

- Carl Weimer, Executive Director of the Pipeline Safety Trust
- Bob Gorham, Division Chief of Pipeline Safety, Office of the State Fire Marshal
- Pete Murphy, Operations Manager at Kinder Morgan
- Carry Ricci, Customer Services Coordinator at Contra Costa County Public Works Department

The Pipeline Safety Trust hosts a webpage with all the presentations available for download: <http://pstrust.org/trust-initiatives-programs/work-in-other-communities/alamo/>. In addition, the second workshop was captured on video by CCTV, and is available to watch here: http://contra-costa.granicus.com/MediaPlayer.php?publish_id=935921b6-0eea-11e5-b5ce-00219ba2f017.

The workshops were held in Alamo and Martinez, with advertising and press coverage in the preceding month. About 70 people attended the June 3rd workshop in Alamo, and about 45 attended the June 6th workshop in Martinez. Three Pipeline Safety Trust staff worked along side the members of the Alamo Improvement Association Technical Assistance Grant, ad-hoc working group to prepare for and carry out these workshops. Audience members submitted written questions throughout the meeting, which were then asked by the moderator to the panelists during a question and answer period at the end of the meeting. This report focuses on questions of concern to local citizens, including those submitted at the workshops or by email to members of the ad-hoc working group.

CONTRA COSTA COUNTY PIPELINE SAFETY



- ❖ *What types of petroleum pipelines are in Contra Costa County?*
- ❖ *Who is responsible for the pipelines in Contra Costa?*
- ❖ *What are the risks associated with our pipelines?*
- ❖ *How can you help keep your community safe from pipeline risks?*
- ❖ *Get your questions answered by private and public agencies that deal with petroleum pipelines.*

Learn About Pipeline Safety in Contra Costa

WHEN: Saturday, June 6, 2015, 10:00AM
WHERE : 651 Pine Street, Martinez, CA 94553
Board of Supervisors Chambers

WHO: California State Fire Marshal's Office, Contra Costa County Hazardous Materials Commission, Kinder Morgan Pipeline Owner/Operator, Pipeline Safety Trust, Alamo Improvement Association

Learn more at: www.alamoca.org

HAZARDOUS LIQUID PIPELINE SAFETY WORKSHOP AGENDA

June 3, 2015, 6:30 – 8:30 PM in Alamo
Creekside Community Church (1350 Danville Blvd)

June 6, 2015, 10 AM – 12 PM in Martinez
County Administration Building, Board of Suervisors Chambers (651 Pine St)

Facilitated by Pipeline Safety Trust staff, and Contra Costa County Hazardous Materials Ombudsman Michael Kent

Introductions (10 Minutes)

Agency, Kinder Morgan, and Pipeline Safety Trust staff

Why care about pipeline safety? Pipelines 101 (20 minutes)

Pipeline Safety Trust staff

Kinder Morgan Presentation (20 Minutes)

Pete Murphy, Operations Manager, Kinder Morgan

Fire Marshal Presentation (20 Minutes)

Bob Gorham, Division Chief, Pipeline Safety, CA Office of the State Fire Marshal

Increasing Safety - Pipeline Safety Trust Staff, Michael Kent, & Carrie Ricci (15 Minutes)

Communications

County involvement – Public Works & Hazardous Materials Advisory Board

Faciliated Question & Answer Panel – Michael Kent, facilitator (30 Minutes)

Closing (5 Minutes) AIA - Roger Smith

MEETING SPONSORS:



**Contra Costa County
Hazardous Materials
Commission**

**Pipeline Safety
TRUST**
Credible. Independent. In the public interest.

PARTICIPATING STAKEHOLDERS:



KINDER MORGAN

 Pipeline and Hazardous
Materials Safety Administration

Appendix C. Additional information reviewed for report

- City of Richmond, Pipeline Franchise Ordinance 27-10 (2010). Online: www.ci.richmond.ca.us/ArchiveCenter/ViewFile/Item/3143.
- Contra Costa County Code (including Industrial Safety Ordinance, and Zoning Ordinance). Online: www.municode.com/library/ca/contra_costa_county/codes/ordinance_code.
- Contra Costa County, Flood Control & Water Conservation District – PG&E 1994 Easement for 24 inch gas pipeline.
- Contra Costa County General Plan (2014). Online: www.co.contra-costa.ca.us/4732/General-Plan.
- Contra Costa County Health Services, Hazardous Materials Program – Incident report ConocoPhillips pipeline (vandalism) in Byron 2011 Aug 27 – includes Environmental Site Assessment Report.
- Contra Costa County Health Services, Hazardous Materials Program – Incident report ConocoPhillips pipeline (corrosion) at MOTC (Marine Ocean Terminal Concord, formerly Naval Weapons Station) 2011 Nov 7.
- Contra Costa County Health Services memo (Randy Sawyer) to Contra Costa County Board of Supervisors re: Nov 7, 2014 ConocoPhillips pipeline leak in Concord (crude).
- Contra Costa County Iron Horse Corridor Management Program Landscape Element (2000). Online: www.co.contra-costa.ca.us/2579/Landscape-Element.
- Contra Costa County Pipeline Franchise Ordinance 2013-19 & Fee Resolution (2013). Online: <http://pstrust.org/wp-content/uploads/2015/04/Pipeline-Franchise-FINALweb-09172013.pdf>.
- Contra Costa County Public Works memo to Contra Costa County Board of Supervisors recommending requesting the Office of the State Fire Marshal report of Kinder Morgan Integrity Management program review. Approved by Board of Supervisors (2015 Jan 6).
- Honegger, D.G. and Wijewickreme, D. (2013). Seismic risk assessment for oil and gas pipelines. In Tesfamariam, S., Goda, K. (Eds.), Handbook of Seismic Risk Analysis and Management of Civil Infrastructure Systems (pages 682-715). Cambridge: Woodhead Publishing Limited, 2013.
- Kelson, Keith I. and Sundermann, Sean T (2007). Digital compilation of Northern Calaveras Fault Data for the Northern California Map Database: Collaborative Research with William Lettis & Associates, Inc., and the U.S. Geological Survey. Online: earthquake.usgs.gov/research/external/reports/05HQGR0023.pdf
- National Association of Pipeline Safety Representatives (2013). Compendium of State Pipeline Safety Requirements and Initiatives Providing Increased Public Safety Levels compared to Code of Federal Regulations – second edition. Online: www.napsr.org/Pages/Comp2013.aspx.
- Office of the State Fire Marshal Pipeline Failure Investigation Report, 2004 Nov 9 Walnut Creek Kinder Morgan incident.
- Office of the State Fire Marshal report on review of Kinder Morgan Integrity Management Program for pipelines in Contra Costa County (2014 June 2).
- Office of the State Fire Marshal PowerPoint presentation re: Kinder Morgan Integrity Management Program (2014 Dec 4). Online: 64.166.146.155/docs/2015/BOS/20150106_514/20327_ContraCostaCounty2014.pdf.
- Office of the State Fire Marshal letter (Bob Gorham) to Contra Costa County Board of Supervisors re: Kinder Morgan inspection/audit (2014 May 8).
- PHMSA corrective action order 2005 Aug 24 re: Kinder Morgan Pacific Operations (CAO 5-2005-5025H).
- PHMSA consent agreement 2006 March 29 re: Kinder Morgan Pacific Operations (CPF 5-2005-5025H). Online: primis.phmsa.dot.gov/comm/reports/enforce/documents/520055025H/CPF_NO_5_2005-5025H.pdf.
- PHMSA closure of consent agreement 2015 May 11 re: Kinder Morgan Pacific Operations (CPF 5-2005-5025H). Online: primis.phmsa.dot.gov/comm/reports/enforce/documents/520055025H/520055025H_closure%20letter_05112015.pdf.
- Pipeline and Informed Planning Alliance (2010). Partnering to Further Enhance Pipeline Safety in Communities through Risk-Informed Land Use Planning Final Report of Recommended Practices. Online: primis.phmsa.dot.gov/comm/publications/pipa/pipa-report-final-20101117.pdf
- Southern Pacific Transportation Company – Southern Pacific Pipe Lines, Inc. 1979 Easement (for Concord-San Jose pipeline).
- Southern Pacific Railroad – Santa Fe Pacific Pipelines 1994 Amended Easement (for Concord-San Jose pipeline, references original easement from June 5, 1970 that was not found).

U.S. Dept of Transportation, Pipeline and Hazardous Materials Safety Administration (2012). Studies for the Requirements of Automatic and Remotely Controlled Shutoff Valves on Hazardous Liquids and Natural Gas Pipelines with Respect to Public and Environmental Safety (ORNL/TM-2012/411). Prepared by Oak Ridge National Laboratory, managed by UT-Battelle for the U.S. Dept of Energy. Online: www.phmsa.dot.gov/pv_obj_cache/pv_obj_id_2C1A725B08C5F72F305689E943053A96232AB200/filename/Final%20Valve_Study.pdf

Wang, Yumei, Bartlett, Steven F., and Miles, Scott B (2012). Earthquake Risk Study for Oregon's Critical Energy Infrastructure Hub (Final Report to Oregon Department of Energy & Oregon Public Utility Commission). Oregon Department of Geology and Mineral Industries. Online: www.oregongeology.org/sub/earthquakes/cei-hub-report.pdf

Appendix D. All Reported Incidents in Contra Costa County

All Reported Incidents in Contra Costa County - 2002 to present (as of 4/1/15)

Significant Incidents are highlighted in yellow

Significant	Date	Name	City	Commodity spilled	Gallons spilled	Fatalities	Injuries	Property damage	Cause
Yes	1/8/2002	Sfpp, lp	Concord	Gasoline	168	0	0	\$183,180	Other
Yes	3/31/2002	Sfpp, lp	Richmond	Diesel fuel	3,360	0	0	\$230,290	Material and/or weld failures
No	4/21/2002	Sfpp, lp	Concord	Diesel fuel	546	0	0	\$9,639	Incorrect operation
Yes	6/21/2002	Pacific gas & electric co	Concord	Natural gas	N/a	0	0	\$151,000	Damage by outside forces
No	7/4/2002	Equilon pipeline co	Concord	Crude oil	10	0	0	\$7,508	Material and/or weld failures
No	8/14/2002	Sfpp, lp	Concord	Gasoline/diesel fuel	126	0	0	\$9,119	Equipment
Yes	9/7/2002	Sfpp, lp	Richmond	Gasoline	1,260	0	0	\$262,750	Material and/or weld failures
No	10/15/02	Venoco, inc	Pittsburg	Natural gas	N/a	0	0	\$24,000	Excavation damage
No	3/29/2003	Sfpp, lp	Concord	Turbine fuel	20	0	0	\$10,859	Equipment
Yes	4/1/2003	Sfpp, lp	Concord	Gasoline	22,260	0	0	\$162,287	Material and/or weld failures
Yes	4/14/2003	Sfpp, lp	Concord	Transmix	30,450	0	0	\$1,390,073	Corrosion
No	5/30/2003	Sfpp, lp	Concord	Gasoline	60	0	0	\$230	Incorrect operation
No	9/8/2003	Sfpp, lp	Concord	Turbine fuel	20	0	0	\$667	Incorrect operation
Yes	11/11/2003	Pacific gas & electric co	Walnut creek	Natural gas	N/a	0	0	\$750,000	Other
No	9/28/2004	Sfpp, lp	Concord	Gasoline/distillate mixture	126	0	0	\$54,202	Material and/or weld failures
Yes	11/7/2004	Sfpp I.P.	Martinez	Jet fuel	12,558	0	0	\$139,130	Excavation damage
Yes	11/9/2004	Sfpp I.P.	Walnut creek	Gasoline	23,688	5	3	\$734,449	Excavation damage
Yes	4/30/2006	Sfpp I.P.	Concord	Gasoline	3,234	0	0	\$499,493	Material and/or weld failures
No	6/5/06	Venoco inc.	Pittsburg	Natural gas	N/a	0	0	\$70,000	Corrosion
No	6/19/06	Pacific gas & electric co	Pittsburg	Natural gas	N/a	0	0	\$65,200	Excavation damage
Yes	9/8/2007	Pacific atlantic terminals llc	Martinez	Gasoline/reformate	7,056	0	0	\$547,084	Incorrect operation
No	3/5/2008	Pacific atlantic terminals llc	Martinez	Gasoline	10	0	0	\$3,908	Other
Yes	5/23/2008	Sfpp, lp	Richmond	Gasoline	168	0	0	\$114,815	Corrosion
No	6/24/2008	Pacific atlantic terminals llc	Martinez	Hydrotest water/oil mixture	21	0	0	\$64,712	Material and/or weld failures
No	11/5/2009	Plains marketing, I.P.	Martinez	Diesel fuel	168	0	0	\$34,800	Corrosion
Yes	8/23/2011	Sfpp, lp	Brentwood	Refined product	1,596	0	0	\$410,000	Equipment failure
Yes	8/27/2011	Conocophillips	Byron	Crude oil	2,352	0	0	\$1,275,040	Excavation damage

Yes	11/7/2011	Conocophillips	Concord	Crude oil	1,890	0	0	\$1,839,410	Corrosion failure
Yes	7/3/2012	Shell pipeline co., L.P.	Martinez	Refined product	546	0	0	\$176,000	Equipment failure
No	10/17/2012	Chevron pipe line co	Byron	Refined product	10	0	0	\$26,200	Equipment failure
Yes	8/8/2013	Sfpp, lp	Concord	Refined product	57	0	0	\$427,913	Material failure of pipe or weld
No	6/20/14	Pacific gas & electric co	Antioch	Natural gas	N/a	0	0	\$70,021	Excavation damage
No	6/21/2014	Sfpp, lp	Concord	Refined product	302	0	0	\$34,453	Incorrect operation
No	6/21/2014	Nustar terminals	Crockett	Refined product	1,554	0	0	\$52,000	Incorrect operation
No	9/14/2014	Sfpp, lp	Concord	Refined product	536	0	0	\$80,967	Incorrect operation
Yes	9/15/14	Pacific gas & electric co	Lafayette	Natural gas	N/a	0	0	\$115,315	Excavation damage
No	9/17/2014	Phillips 66 pipeline llc	Richmond	Refined product	89	0	0	\$5,000	Equipment failure
Yes	12/9/2014	Sfpp, lp	Concord	Refined product	0.42	0	0	\$150,501	Equipment failure
Yes	1/12/2015	Sfpp, lp	Richmond	Refined product	2,474	0	0	\$550,497	Equipment failure
Totals					116,716	5	3	\$10,732,712	

Appendix E. All Reported Incidents on Kinder Morgan's SFPP Pipeline System

All incidents, 2006 - present. Significant Incidents are highlighted in yellow.

Date	City	State	County	Cause	Fatalities	Injuries	Property Damage	Gallons Spilled
5/23/2015	Rocklin	Ca	Placer	Material/weld/equip failure	0	0	\$5,578	0
2/23/2015	Long beach	Ca	Los angeles	Material/weld/equip failure	0	0	\$178,131	0
1/12/2015	Richmond	Ca	Contra costa	Material/weld/equip failure	0	0	\$550,497	2,436
12/9/2014	Concord	Ca	Contra costa	Material/weld/equip failure	0	0	\$150,501	0
10/6/2014	Brisbane	Ca	San mateo	Incorrect operation	0	0	\$16,169	0
9/14/2014	Concord	Ca	Contra costa	Incorrect operation	0	0	\$80,967	504
6/21/2014	Concord	Ca	Contra costa	Incorrect operation	0	0	\$34,453	294
8/8/2013	Concord	Ca	Contra costa	Material/weld/equip failure	0	0	\$427,913	42
1/8/2013	West sacramento	Ca	Yolo	Material/weld/equip failure	0	0	\$2,429	0
10/16/2012	Long beach	Ca	Los angeles	Material/weld/equip failure	0	0	\$16,012	252
8/23/2011	Brentwood	Ca	Contra costa	Material/weld/equip failure	0	0	\$410,000	1,596
8/10/2011	Colfax	Ca	Placer	Material/weld/equip failure	0	0	\$2,046	0
4/25/2011	Live oak	Ca	Sutter	Material/weld/equip failure	0	0	\$27,301	336
11/4/2010	Pomona	Ca	Los angeles	Material/weld/equip failure	0	0	\$64,964	84
7/19/2010	Rocklin	Ca	Placer	Material/weld/equip failure	0	0	\$49,500	0
3/16/2010	Sacramento	Ca	Sacramento	Corrosion	0	0	\$480,000	2,016
5/18/2009	Bloomington	Ca	San bernardino	Material/weld/equip failure	0	0	\$72,147	462
5/1/2009	Phoenix	Az	Maricopa	All other causes	0	0	\$33,684	714
9/18/2008	Deming	Nm	Luna	Material/weld/equip failure	0	0	\$2,431	0
6/4/2008	Indio	Ca	Riverside	Excavation damage	0	0	\$222,245	31,542
5/23/2008	Richmond	Ca	Contra costa	Corrosion	0	0	\$114,815	168
3/29/2008	Phoenix	Az	Maricopa	Material/weld/equip failure	0	0	\$5,212	42
2/15/2008	Phoenix	Az	Maricopa	Material/weld/equip failure	0	0	\$7,172	84
10/2/2007	Reno	Nv	Washoe	Material/weld/equip failure	0	0	\$4,055,353	35,742
4/8/2007	Long beach	Ca	Los angeles	Material/weld/equip failure	0	0	\$8,209	84
2/26/2007	El paso	Tx	El paso	Material/weld/equip failure	0	0	\$47,066	0
2/26/2007	Long beach	Ca	Los angeles	All other causes	0	0	\$144,063	126
1/12/2007	Rocklin	Ca	Placer	Material/weld/equip failure	0	0	\$249	0
11/28/2006	Long beach	Ca	Los angeles	Incorrect operation	0	0	\$5,030	0
10/23/2006	El paso	Tx	El paso	Incorrect operation	0	0	\$0	0
9/27/2006	Rocklin	Ca	Placer	Material/weld/equip failure	0	0	\$6,421	126
9/27/2006	El paso	Tx	El paso	Corrosion	0	0	\$177,110	84
9/11/2006	Carson	Ca	Los angeles	All other causes	0	0	\$11,158	0

Date	City	State	County	Cause	Fatalities	Injuries	Property Damage	Gallons Spilled
8/24/2006	Soda springs	Ca	Nevada	Corrosion	0	0	\$1,608,202	4,074
8/23/2006	West sacramento	Ca	Yolo	Material/weld/equip failure	0	0	\$52,488	0
7/24/2006	Stockton	Ca	San joaquin	Material/weld/equip failure	0	0	\$223,391	504
6/22/2006	Dublin	Ca	Alameda	Other outside force damage	0	0	\$1,845,651	672
6/10/2006	El paso	Tx	El paso	Material/weld/equip failure	0	0	\$557	84
6/9/2006	Long beach	Ca	Los angeles	Material/weld/equip failure	0	0	\$520	0
5/26/2006	Long beach	Ca	Los angeles	Incorrect operation	0	0	\$32,937	1,134
5/21/2006	Rocklin	Ca	Placer	All other causes	0	0	\$50,512	168
5/16/2006	Deming	Nm	Luna	Material/weld/equip failure	0	0	\$5,142	84
4/30/2006	Concord	Ca	Contra costa	Material/weld/equip failure	0	0	\$499,493	3,234
3/17/2006	El paso	Tx	El paso	Material/weld/equip failure	0	0	\$25,093	42
3/13/2006	Tucson	Az	Pima	Incorrect operation	0	0	\$173	0
1/27/2006	Portland	Or	Multnomah	Corrosion	0	0	\$30,145	84
Totals					0	0	\$11,783,130	86,814

