



Pipeline Incident Report

Minnesota Office of Pipeline Safety
444 Cedar Street, Suite 147
St. Paul, Minnesota 55101-5147
(651) 296-9636

Case Number:

005199

Report Date:

May 25, 2005

Case Description:

Animal Doctor Veterinary Clinic Explosion
902 State Highway 29 N.
Alexandria, MN



| Table of Contents | Page |
|----------------------------|-------------|
| Fact Sheet | 3 |
| Synopsis | 4 |
| Background..... | 4 |
| Incident | 5 |
| Investigation | 7 |
| Gas Migration | 9 |
| Conclusions | 11 |

| Fact Sheet | |
|--|--|
| Case Number: | 005199 |
| Report Date: | May 25, 2005 |
| Incident Date: | December 7, 2004 |
| Incident Time: | 7:30 p.m. |
| Address: | 902 State Highway 29 N Alexandria Minnesota (NE Corner of of Sunnyside Dr and Robert St) |
| County: | Douglas |
| Pipeline Operator: Inspection Unit: Address: | CenterPoint Energy Alexandria-Brainerd-Willmar Area (ID# 75) 800 LaSalle Avenue South, Floor 11 Minneapolis MN, 55459 |
| Pipeline Operator Contacts: | Richard Decker, O&M Supervisor Jim Zilka, Supervisor, Home Service Plus Dean Headlee, Manager Andrew Balgobin |
| Property Loss: | \$650,000 building structure (Form 7001.1) |
| Injured: | None |
| Deceased: | None – 10 Animals Killed |
| Gas Facility: | Natural Gas Service Main |
| Pressure: | 50 p.s.i.g. operating pressure |
| Size & Material: | 2-inch Steel |
| Other Agencies: | State Fire Marshal Division John Steinbach Deputy Fire Marshal Alexandria Fire Department Shane Schmidt, Chief |
| Lead Inspector: | Boyd Haugrose, Engineering Specialist |
| Supervisor: | Michael J. McGrath, Chief Engineer |

Synopsis

On December 7, 2004, at 7:30 p.m., the Animal Doctor veterinary clinic in Alexandria, MN exploded. Natural gas leaking from a two inch 50 psig (pounds per square inch gauge) steel main migrated into the building through the concrete block foundation wall. The gas was leaking as a result of unreported damage caused by prior excavation at the intersection of Sunnyside Drive and Robert Street. It is not known how long the gas was leaking. A leak survey had been conducted using flame ionization equipment on August 8, 2004. The last known excavation at this location was on May 10, 2004.

Background

December 6, 2004

At approximately 8:13 a.m. on December 6, 2004, employees in the Animal Doctor veterinary clinic discovered a fire in the utility room and called 911. The Alexandria Fire Department responded immediately. The first responder, **Chris Janke**, was on the scene at 8:15 a.m. Mr. Janke is an employee of Minnesota Electric facilities immediately north of the veterinary clinic, and was at work when the call came in. According to the incident report filed by Mr. Janke, he ran to the building and entered through the main entrance on the west side of the building and smelled smoke. He went directly to the utility room where he noticed mostly blue flames and grey smoke emanating from a hole in the floor immediately adjacent to the wall on the south side of the building. He extinguished the flames with a dry chemical fire extinguisher by the time the fire engine arrived on the scene. Four other firemen responded to the site by 8:20 a.m. One of the firemen turned off the gas meter. According to the incident reports filed by each responder they noticed scorched wall board on the wall on the west side of the utility room and some smoke emanating from an area next to the water pressure tank and a water heater mounted adjacent to the west wall. They went into the next room (X-Ray room) moved the x-ray machine, opened up the wall, and found smoldering fire on the wall studs. They hosed this area down and examined it with an infrared camera and found no further evidence of fire. The responders suspected leaking natural gas as the fuel and either the boiler or the water heater as the ignition source. Prior to leaving the site, the firemen advised the veterinarian, **Dr William Kraker, DVM**, to have a heating contractor come on site to find and repair the suspected leak. The firemen left with the gas meter shut off. No one notified Center Point Energy (CPE) of the suspected leak.

JV Schmidt Heating & AC Company was hired to check for leaks. **Wayne Radtke** and **Ken Spence** were the technicians who arrived at the site on December 6, 2004, between 10:00 and 11:00 AM. They found a leak by soap testing the threads of a fitting connecting a valve located just inside the wall where the customer owned fuel line entered the utility room. They replaced the pipe between the exterior of the wall and the valve they found leaking and installed a new valve. They pressure tested the fuel line and it could not hold pressure. They observed that the copper fuel line downstream of the gas meter ran on the ground for a short distance and then entered the ground and traversed under a concrete pad. The pipe then exited the ground, ran vertically up the wall, turned horizontally to the east, and ran under the steel siding in an area that is believed to have been at one time a garage door that was sheeted over. The pipe then exited from under the sheeting and penetrated through the wall into the utility room at an approximate height of 24 inches. After the technicians could not get the fuel line to hold pressure, they installed a new fuel line from the outlet of the meter attached to the wall at a height of approximately 18 inches. The new fuel line was pressure tested for 30 minutes at 60 psig and passed. They made the assumption that it was the customer owned fuel line that had leaked, causing the fire that morning. They also noted while on the site that there was a hole knocked into the concrete block foundation wall that had two pieces of PEX tubing sticking up from the voids in the concrete block. It was later determined that this tubing was part of an abandoned slab heating system to prevent snow and ice build-up. The hole where the tubing penetrated the foundation was never sealed, allowing direct ground contact into the utility room. The two technicians completed the installation and testing and left the building sometime after 5:00 PM on December 6, thinking that the building had been made safe. At no time did anyone notify CPE that there had been a gas leak.

Incident

December 7, 2004

Michael McGrath, Chief Engineer, MNOPS received notification of the incident at 7:58 p.m. He contacted Boyd Haugrose, Engineering Specialist, at his home in Ogema, MN, at 8:00 pm and informed him of the ongoing incident. At 8:30 p.m., McGrath dispatched Haugrose to the scene. Haugrose arrived at the scene at 10:00 p.m. The temperature was 29 degrees with a moderate wind blowing from the southeast. **Jon Steinbach**, Deputy State Fire Marshal, was already on the scene, as well as the Alexandria Fire Department, the Alexandria Police Department, and crewmen from CPE. Haugrose was briefed by Steinbach, **Shane Schmidt**, Fire Chief, **Jim Zilka**, the On-Call CPE supervisor, **James Headlee**, CPE Operations Manager and a representative of the Alexandria PD. As CPE personnel were finding high gas in air concentrations during bar holing operations, it was believed that the incident was a result of migrating natural gas.

The Alexandria Fire Department received the 911 call at 7:30 p. m. and was on site within 4 minutes. Debris from the steel building was scattered in an approximate 100 yard area. No walls were left standing. The building immediately north of the site is a steel structure housing a wholesale electrical outlet (Minnesota Electric Supply) and had debris, that struck it, lying on the ground. The next morning it was found that there was internal damage in this building as suspended fluorescent fixtures shook loose and collapsed on the floor of the electrical warehouse.

At the time Haugrose arrived, CPE personnel had been bar holing the area and were finding 90% gas in air readings throughout an extended area. The Police Department was evacuating residents from their homes in a 2 block area. The Police Department had barricaded and rerouted traffic on State Highway 29, which ran N/S 100 yards to the west of the incident site. On the west side of Highway 29, a McDonald's restaurant and a gasoline/convenience store were closed down (Figure 9 - Site Map, page 12). The fire was extinguished, but hot spots would occasionally flare up. Fire Department personnel were on standby and occasionally doused the flare ups and hot spots.

After the briefing, Haugrose witnessed CPE personnel taking gas detector readings at a water main shutoff valve located adjacent to the intersection of Sunnyside Drive and Robert Street at the SW corner and in cracks in the pavement along Robert Street to the west, where it intersects State Highway 29. All readings were at 90% gas in air. Haugrose observed CPE contract personnel (Ferguson Brothers) digging with a backhoe to expose the main that ran E/W under Robert Street between Sunnyside Drive and State Highway 29. CPE personnel picked this spot to excavate in search of the leak. After exposing approximately 20 feet of the main, CPE personnel decided to install stopple fittings at this location. When the CPE welder struck an arc, the soil caught on fire. The welder was able to extricate himself from the ditch without injury. The blue flames were not of a violent nature, burning at a consistent height of 6 – 12 inches, but rather extensively in the bellhole (see figure 1).



Figure 1 - Gas burning in bell hole

CPE personnel believed the flames would burn out in a few minutes as the saturation burned off. However, after a period of 30 – 45 minutes, the flames remained consistent, indicating the soil was continuously being fed natural gas. After this amount of time, CPE personnel decided to have Ferguson Brothers continue excavating upstream from this bell hole with the flames still emanating from the ground. At this point, Haugrose intervened and strongly suggested to Mr. Zilka and Mr. Headlee that CPE shut off all gas to this area prior to continuing any further excavating. He proposed two options to them; one - going upstream and shutting off the nearest mainline valve or bar holing upstream along the main until a point was reached where there was no indication of gas in the ground, and at that point excavating and installing stopple equipment to stop the flow of gas. CPE elected to install the stopple equipment upstream, as shutting off the nearest valve would interrupt service to a large number of customers in 29 degree weather.

Haugrose observed CPE personnel bar holing and taking gas detector readings upstream along the main, and within 200 feet, a point was selected that had no gas in air readings. At this point a bellhole was excavated, and by 4:00 a.m. a stopple valve was installed and closed. Almost immediately, the flames in the original bell hole extinguished. More bar hole readings were taken and the concentration dropped quickly.

When it became apparent that the leak was contained, the search for the leak source began once again. The CPE personnel had knowledge of certain excavation work that was done in the summer of 2004 at the intersection of Sunnyside Drive and Robert Street, so they elected to excavate at this location. They soon uncovered a two inch Dresser Style Tee fitting that ran to the north under Sunnyside Drive from the E/W running main under Robert Street. The fitting had some deteriorated coating and CPE personnel decided that this was the leak site and prepared to cut out the fitting. Steinbach was observing this operation and couldn't determine if this fitting was leaking by looking at it. He challenged CPE's assessment and Haugrose had CPE crack open the stopple valve. It became apparent that although the coating had deteriorated, the fitting was not leaking. The excavation continued upstream and by 5:00 a.m. another compression was found that ran to the south under Sunnyside Drive, and about two feet upstream of this fitting, the leak source was identified. The two inch main had evidence of coating damage, and the pipe was kinked. A crack had developed beginning at 0 degrees to almost 180 degrees looking upstream at the main. The tee fitting had the sleeve pulled apart approximately 4 – 6 inches in a northerly direction. It was obvious that some mechanized equipment had hooked the main and pulled it in a northerly direction. CPE had never been informed of any damage to the main. (See figure 2.)

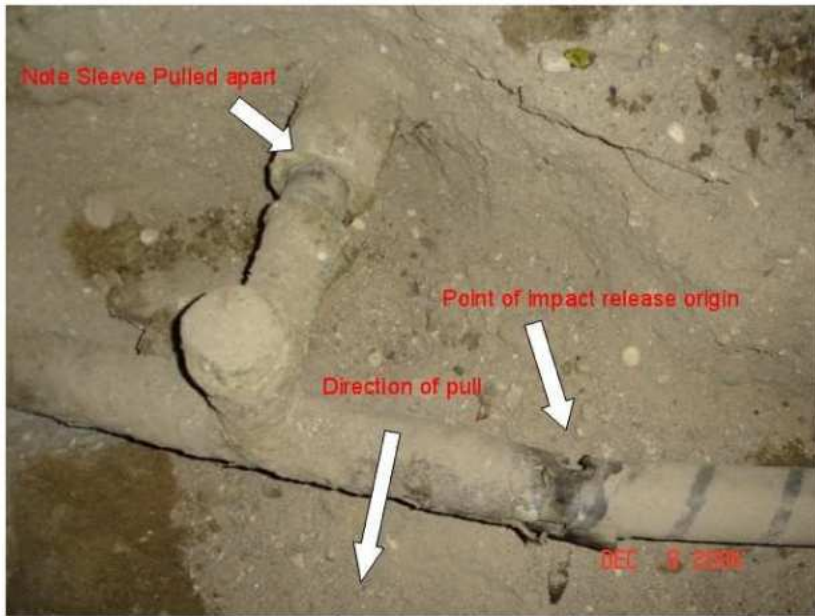


Figure 2 – Leaking natural gas main

noon. The emergency response personnel retired from the site. Ferguson Brothers and CPE crews finished backfilling the excavations and retired by 5:00 p.m. on December 8, 2004.

CPE then cut away the affected area in three locations, including the Dresser style tee, bagged it, and took it into custody for storage and testing. New pipe and a new tee fitting were fabricated on site and tested to 100 psig with Haugrose observing the test. The fabrication was then installed in the cutout portion of the main (Figure 3). The new piping was properly coated and existing coating was repaired as necessary (Figure 4). The service line to the affected building was capped, and the repaired installation was pressure tested to 100 psig for one hour. After completion of the test, the service line was cut away and abandoned in place. The service tee was capped, the stopple valve was opened, and the line was purged of air and put back into service. The affected customers in the area were relit and the evacuees were allowed back into their homes. The traffic barriers were opened by



Figure 3



Figure 4

Investigation

Discussions with involved parties determined that Quam Construction of Willmar, MN, was a contractor hired by the City of Alexandria to install water mains and services in this area during 2004. A search of prior Gopher State One Call (GSOC) excavation notifications found that ticket number 40156193 was issued to Quam Construction on 4/29/04 (copy of the ticket is in the MNOPS case file). The ticket indicated the type of work was the installation of water mains and services. It called for a meet at the intersection of Robert Street and Sunnyside Drive for work to take place within a 500 foot radius of the intersection. The ticket requested an appointment for 2:45 p.m. on May 3, 2004.

Interviews with CPE personnel indicate the location of natural gas facilities were marked May 3-4, 2004, and that employees Glenn Bergs and Ervin Klimek were on site numerous times throughout the project. Neither Bergs nor Klimek were on site at the time that the damaged facilities had been exposed. They had reported no problems with Quam Construction during the project, and had the sense the project was proceeding smoothly. CPE provided records of a subsequent leakage survey conducted August 5, 2004, in which no leaks were detected over the entire affected area. Copies of these records are contained in the MNOPS Case File.

Interviews with Quam Construction personnel, and the inspection supervisor from Widseth, Smith, Nolting (WSN) did not identify anyone who admitted knowledge of damage to the gas main. The construction records indicate the water facilities were installed on May 10, 2004, and the assigned inspectors were George Jordan and Tim Koos. Inspectors did not note any damage to the natural gas facilities, but acknowledge not being on site 100% of the time.

Terry Quam is the President of Quam Construction. In a December 15, 2004, telephone interview, Mr. Quam denied any involvement by his company associated with damage to the gas main. He stated that his company was working in the intersection in May and the incident occurred in December, so therefore it would be impossible for his company to be involved. When apprised that his personnel were the last persons to excavate in that intersection he inquired as to potential courses of action by MNOPS. Mr. Quam stated that his company had never been involved in any type of action with MNOPS and was unaware of how any procedures would be conducted. It was subsequently determined that Quam Construction had paid a civil penalty to MNOPS in 1999 for a series of incidents in New London (MNOPS Case #2037, 9/23/99). When Mr. Quam was reminded of that fact, he said that he didn't think MNOPS would check back that far. He also said he had fired that crew long ago, as he had nothing but trouble with them not only in New London, but also in Ortonville, with some incidents there that MNOPS was unaware of. Mr. Quam was requested to provide a list of personnel involved with the project, but only did so after receiving a formal request from MNOPS. On January 28, 2005, MNOPS received the response from Quam Construction, including a hand written list of the employees, including any known addresses and telephone numbers.

Quam Construction had numerous employees involved in the project at various times. Initial excavation for installation of the water lines was performed by Kevin Peterson, a backhoe operator. In a telephone interview, Mr. Peterson stated he has been an equipment operator doing utility work for approximately 30 years, and that he performed the initial excavation in the affected area. He stated that he did not come into contact with any buried gas facilities.

Eric Miller was the pipe fitter for Quam Construction. Mr. Miller stated in a telephone interview that he remembered working at that location, and was sure the pipe was not damaged by Kevin Peterson. His work immediately follows the excavation. He further stated that backfill operations are typically performed by a different equipment operator than the one performing the initial excavation. When asked who backfilled the excavation at the affected intersection, he said he wasn't sure, but believed it was a person named Corey, and added that he didn't know him well, because he didn't work around him.

Corey Rood was the person that did the back filling and compaction operations for Quam Construction, after the water mains were installed by the crew of Kevin Peterson and Eric Miller. In a telephone interview, he recalled doing the back fill operation at the affected intersection. He said he used a rubber tired backhoe to fill the excavation and employed a sheepsfoot to do the compaction. He said he worked alone at the intersection, changing from one piece of equipment to the other as the need arose. According to Mr. Rood there were no other Quam employees at the site when he did this operation and he did not recall seeing any inspectors from WSN or any CPE personnel when he was doing the work. He denied seeing any damaged gas main and further denied striking the natural gas main. The scope of his work in the intersection was to backfill and compact the soil to the level where asphalt would be installed to finish off the road repair. According to all available records, Ferguson Brothers then installed asphalt over the area to complete the work.

A telephone interview was conducted with one other Quam Construction employee named Al Ehlers. According to Mr. Ehlers, his job was as the black dirt man. In other words, after all of the backfilling/compacting actions were finished, he came along with black dirt, grass seed and whatever items were needed to restore the areas that may have been excavated under grass. He did not typically see any of the excavations. They were covered up when he did his function. He did remember working in the area, but as stated, he did not see any excavation. He did not recall if he noticed if the intersection had been blacktopped when he was there.

Gas Migration

The fuel source was provided by the leaking natural gas main, and the gas migrated into the building through the foundation wall, where it was ultimately ignited by a piece of equipment, most likely a gas fired boiler, or water heater, in the utility room. This is supported by observations of the foundation and building wreckage, which indicate open webs in the concrete block, as well as abandoned tubing which provided a direct conduit from the soil through the foundation wall. Figures 5-8 illustrate open webs in the concrete block as well the abandoned PEX tubing.

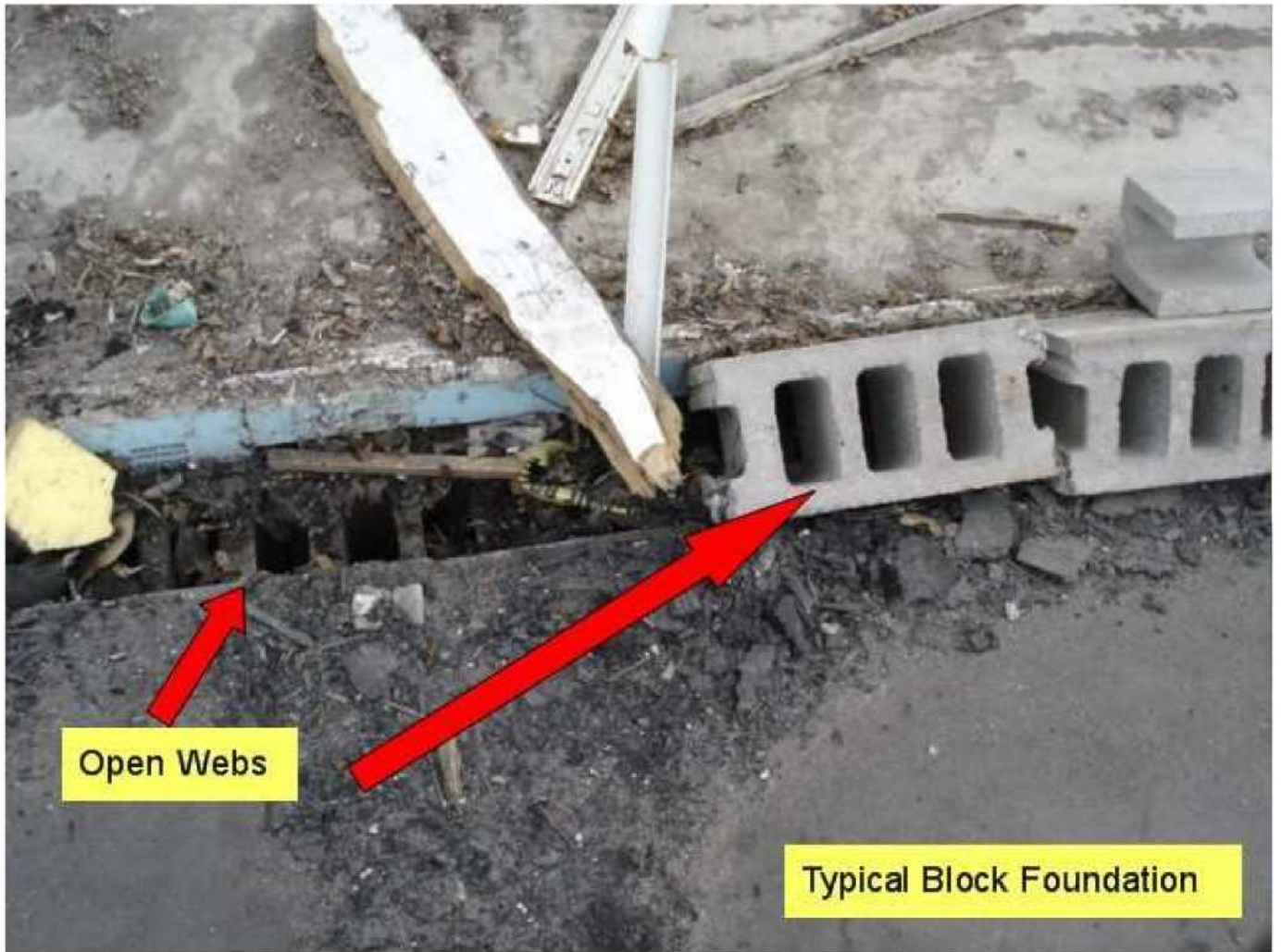


Figure 5

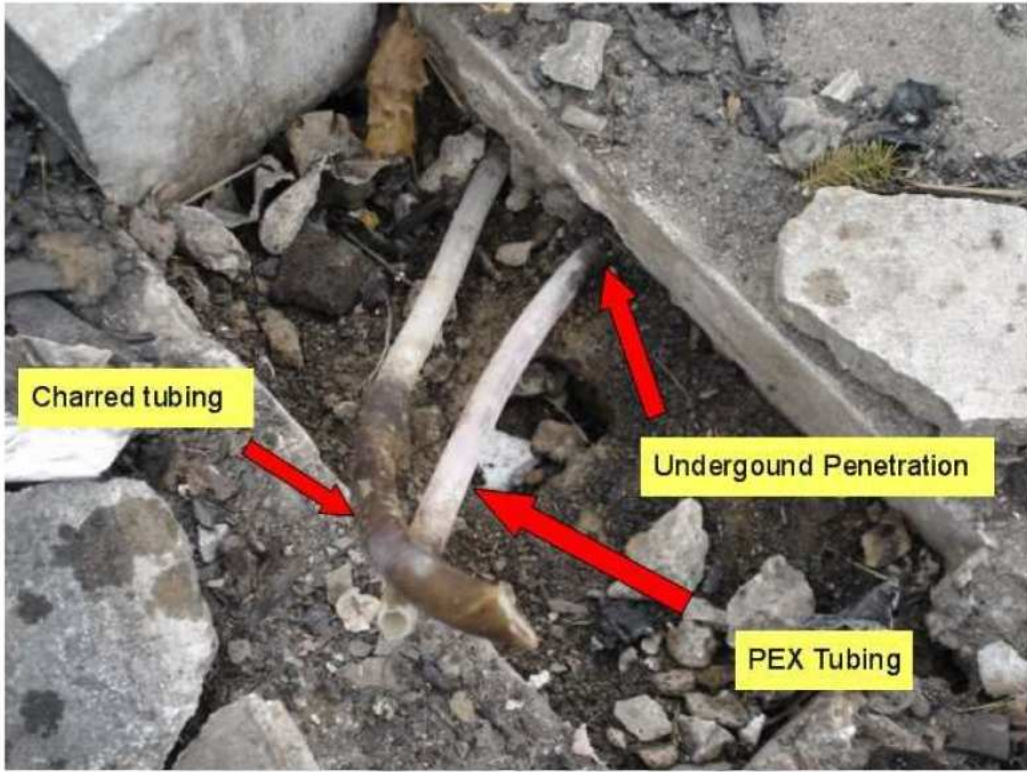


Figure 6

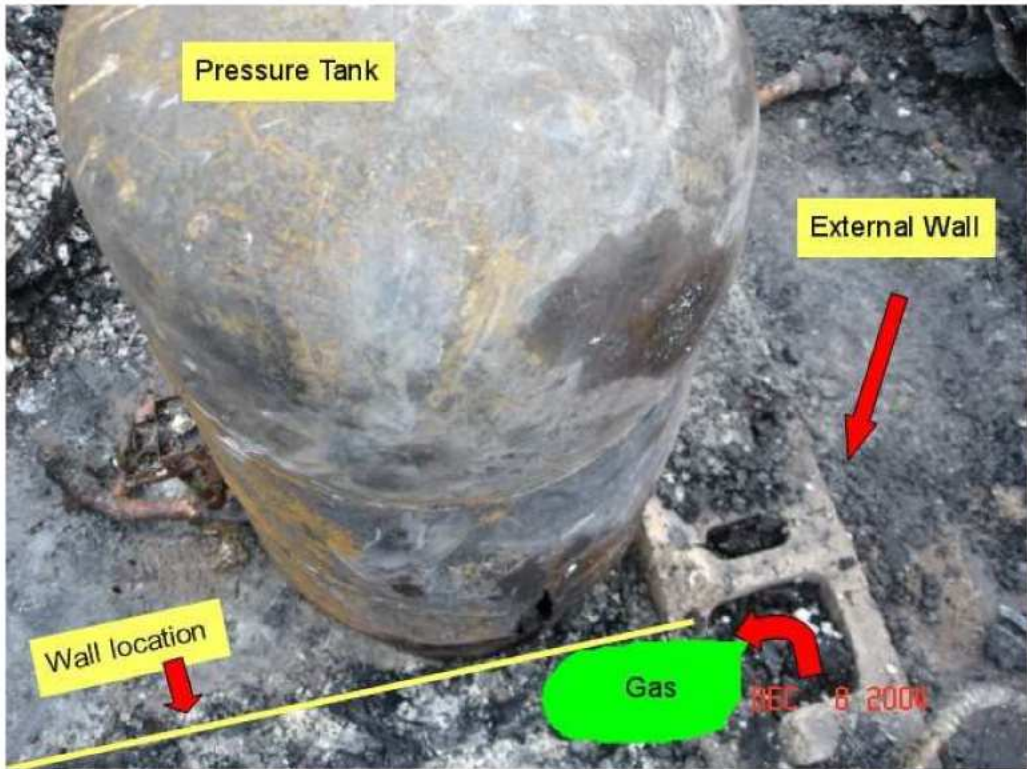


Figure 7

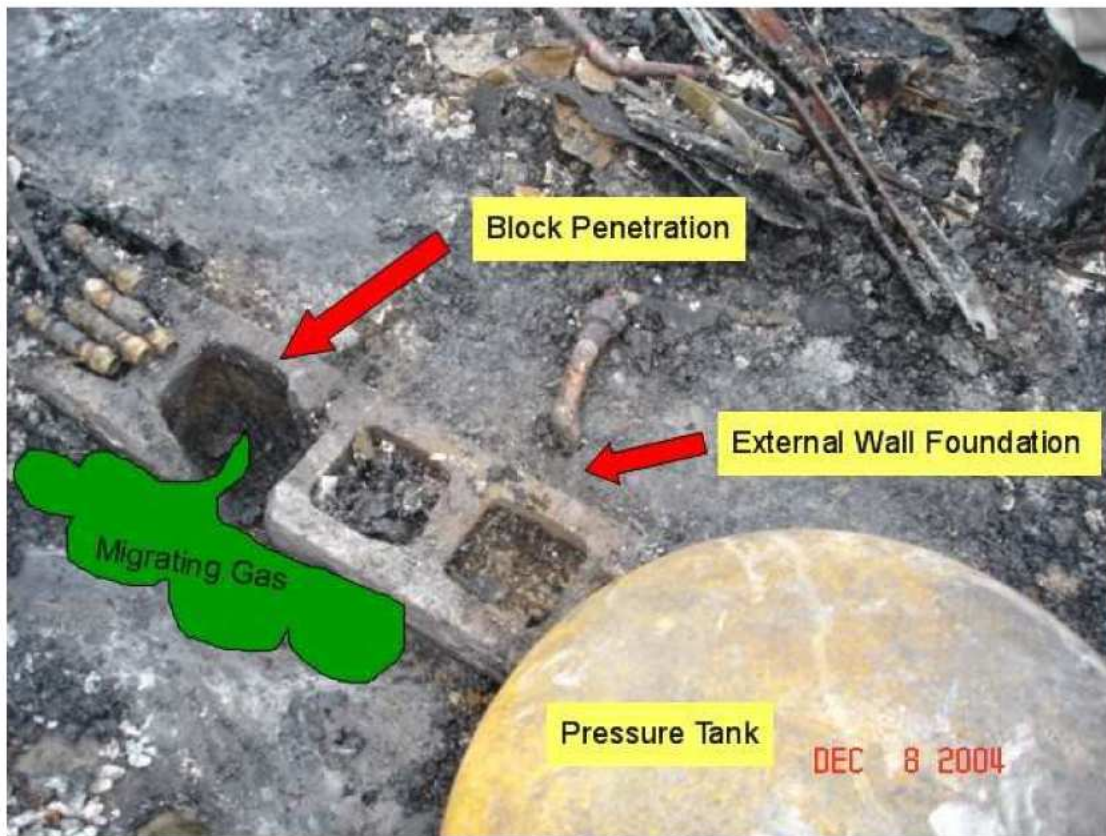


Figure 8

Conclusion

The building explosion occurred as a result of a leaking natural gas main which allowed gas to migrate into the building through the foundation wall. The natural gas leak was caused by unreported excavation damage to the two inch steel main that most likely occurred in May of 2004. It is not unusual for a steel distribution main that is damaged, without being inspected and repaired, to fail at some point in the future. The time to failure depends on a variety of factors, but can be as little as hours, to as long as days, months, or years.

There was a small fire in the utility room on the previous day that the Alexandria Fire Department responded to. The fire resulted in the ultimate replacement of the customer's fuel line, as the existing line would not hold pressure. This most likely did not contribute to the explosion because the explosion did not occur until approximately 26 hours after the leaks on the customer's fuel system were repaired. The incident did, however, provide an opportunity to involve the natural gas service provider, but due to the fact that problems were found and corrected on the customer's piping, there was no reason to suspect additional problems existed on any CPE piping. CPE was, therefore, not contacted as a result of the previous day's fire.

The only known excavation in the preceding months in the affected area was performed by Quam Construction, in May of 2004. Interviews have been conducted with personnel involved in the project, but no one has admitted damaging the pipe, or seeing the damaged pipe. Quam Construction has a previous history of violations associated with M.S.216D, Minnesota's excavation notification system.

The Minnesota Office of Pipeline Safety has good cause to believe that Quam Construction violated MS216D.05 (3), .06 Sub 1 (a), .06 Sub 1 (b) and .06 Sub 1 (c).

As a result of the investigation, the Minnesota Office of Pipeline Safety has issued a Notice of Probable Violation to Quam Construction, dated April 25, 2005. The notice includes a proposed civil penalty of \$3000.00.

Figure 9 - Site map

