

Incident Summary (Reference #5617320)

SUPPORTING INFORMATION	Incident Date		June 1, 2017	
	Location		Burnaby	
	Regulated industry sector		Gas – Natural gas system	
	Impact	Injury	Qty injuries	0
			Injury description	NA
		Injury rating	None	
	Damage	Damage description	An underground ¾” steel gas line was pulled apart from a mechanical coupling resulting in an uncontrolled release of gas.	
		Damage rating	Major	
Incident rating		Major		
Incident overview		While a construction company was installing new storm and sanitary services in a residential back alley, one underground gas service line was damaged, resulting in the evacuation of 18 homes until the leak could be located and repaired by the utility.		
INVESTIGATION CONCLUSIONS	Site, system and components		<p>Natural gas is distributed by the utility through a series of underground trunk and branch lines to gas meters at customer locations. These lines can be steel or polyethylene plastic.</p> <p>The gas service at this location was a ¾” steel gas line that came off of the buried main running parallel down the alley. Before the steel gas service enters the property line a mechanical slip joint coupling is installed on the line. The slip joint coupling uses mechanical force from tightened threaded caps to compress gaskets around the outside of the steel pipe. This slip joint acts as a “weak link” in the system allowing the gas line to come apart in the event of a line strike avoiding the chance that the gas line could break at a building or gas meter.</p> <p>When backfilling an excavated trench, the material filling the hole needs to be compacted by some form of a compaction tool. This prevents the backfill material from sagging over time. The method of compacting the backfilled material at this site was a hydraulic vibratory compactor known as a “hoe pack” A hoe pack is installed in the place of a bucket on the end of an excavator. It uses hydraulic pressure to vibrate a steel plate. The excavator can place and push down on the steel plate to compact the backfill material.</p>	
	Failure scenario(s)		A construction company was excavating down a residential back alley to install new storm and sanitary service lines at a depth of 3-4 meters. Gas service lines cross the excavation to the homes on the North side of the alley at a depth of approximately 1 meter. A gas line was exposed while the new storm and sanitary services were installed underneath it. The excavation was then backfilled, the location of the gas	

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	<p>line was identified with marking paint and the backfill material was compacted on either side with a hoe pack. The excavation was backfilled to a height of .5 meter above the gas service line. The backfilled excavation in the alley was then used for heavy equipment and dump truck traffic. The gas service line pulled out of the mechanical slip joint coupling underground approximately 1 meter outside of the excavation area.</p>
<p>Facts and evidence</p>	<p>Witness statements</p> <p>Site Supervisor- He told me that during construction work that day they had exposed the gas line and worked around it. He said that the line was not hit, pulled or compromised during the excavation procedure. He told me that they backfilled that portion of the excavation and were carrying on further down the alley. He said that later on that evening he received a phone call that there was a strong smell of gas in the alley behind the homes and that technicians from the gas utility were on site trying to find the source of the leak.</p> <p>Pipe Foreman He told me that when they backfilled around gas lines exposed during the excavation that he would identify the location of the gas line with construction marking paint and the equipment operator would not pack the area above the gas line with the vibratory packer on the excavator within 1 meter of either side of the marking.</p> <p>Gas Utility technician manager He told me that the utility technicians that were on site found the source of the leak was the steel gas line had pulled out of the slip joint coupling approximately 1 meter to the North of the edge of the prior excavation.</p> <p>Photos</p> <ul style="list-style-type: none"> • Location of slip joint coupling outside of excavation area • Original bury depth of line • Amount of backfill above line over excavated area • Heavy equipment tracks above backfilled line • Paint mark on fence identifying the location of the gas service <p>Email</p> <ul style="list-style-type: none"> • Construction companies request to the gas utility for locations of gas services in area <p>Utility Site report</p> <ul style="list-style-type: none"> • Detailed information of the location of the gas services in construction area <p>Construction companies Safe work procedure</p> <ul style="list-style-type: none"> • The companies detailed written procedures for locating, exposing and backfilling around utility services.
<p>Causes and contributing factors</p>	<p>It is very likely that insufficient care while backfilling the excavation around the gas line led to excessive downward force on the line from the heavy equipment travelling above it pulling the line out of the mechanical slip joint coupling causing the leak.</p>

Photos or diagrams (if necessary)









Example of a “hoe pack”