

The Elephant in the Sewer:



Cross Bore Findings Through Sewer Investigation

Ron Thomann



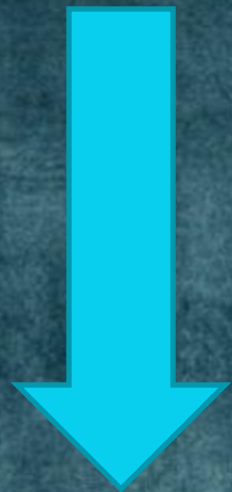
Who is TREKK Design Group...



TREKK Design Group, LLC (TREKK) is a certified Women Business Enterprise (D/WBE), founded in 2002 with the primary objective to provide quality civil engineering services while meeting the budgets and scheduled deadlines of our clients.

What we have done...

- Completed over 150 sewer inspection projects.
- Inspected over 50,000 sewer structures (manholes, mains, and service laterals).
- Conducted over 4,000 service lateral inspections
- Televised over 1,000,000 lf of sanitary sewers.







10/22/09 14:21

6 FT
START : 032600
STOP : 032600

Distance: 74.0
TBA: Tap Break-in Active

Clock from: 0

Clock to:

Rating:

S/M/L:

Dimension 1:

Dimension 2:

3

Remarks:



Distance: 0.0

ANH: Manhole

Block from:

Block to:

Rating:

S/M/L:

Dimension1

Dimension2

3

Remarks: 130-103076













BLAH

blah
blah
blah

BLAH

4 BLAH

BLAH

Blah BLAH

BLAH

blah

BLAH

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blah
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B

BLAH

blah

Blah

Blah

BLAH

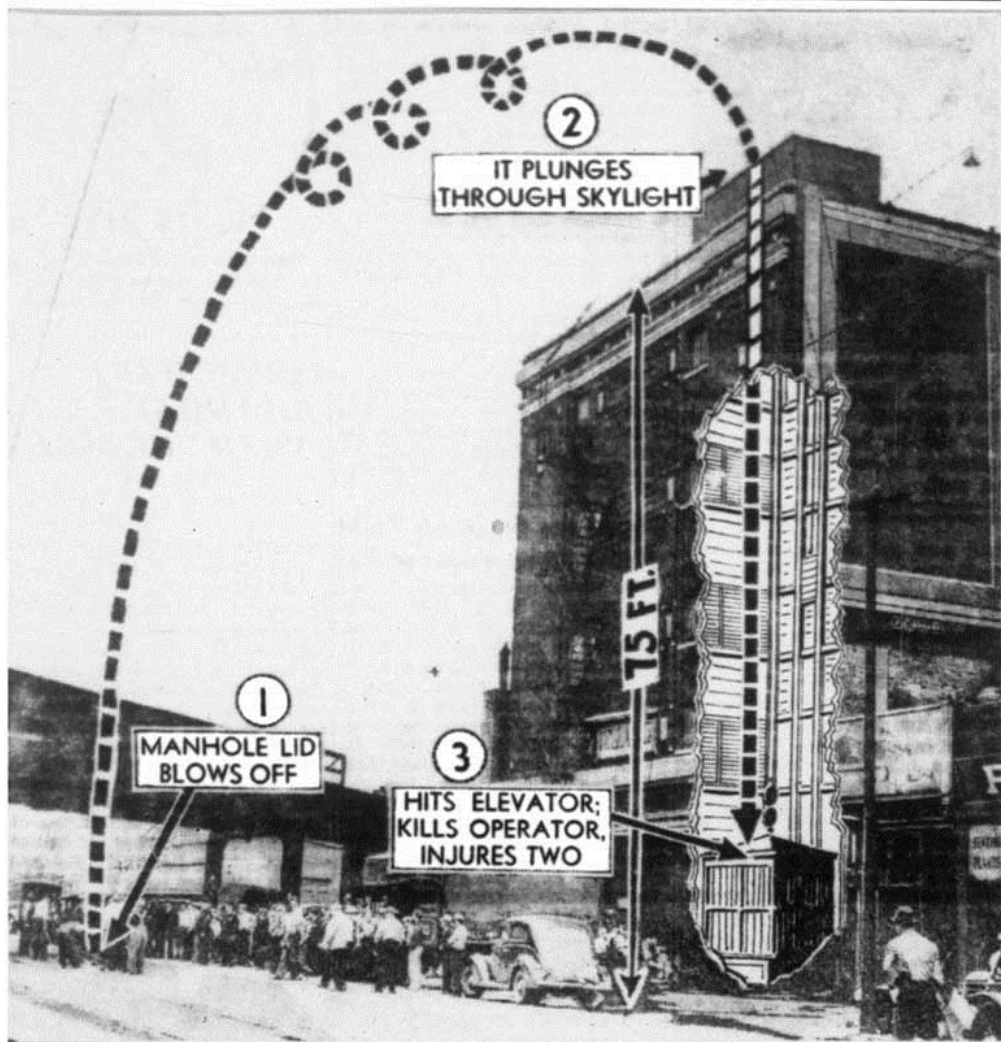
BLAH

blah

BLAH

Hazards of Working in the Sewers

ONE KILLED WHEN BLAST FLIPS MANHOLE COVER



When a subterranean explosion tossed many manhole covers on Fullerton avenue into the air yesterday, one of the lids was blown high and crashed down the elevator shaft of the Hollander Storage and Moving company at 2418 Milwaukee avenue, killing the elevator operator, A. C. Day, 57 years old, of 5642 Melrose street. Two others on the freight elevator were slightly injured. Dotted line shows missile's path.

One dead, one missing in Collin County sewer accident

Rescue crews were able find the first man after about two hours and confirmed his death around 10 a.m.

By CHRISTINA ROSALES



Staff Writer

crosales@dallasnews.com

Published: 03 November 2011 10:16 AM

FAIRVIEW — One man was killed and another was missing after they were overcome by fumes and a lack of oxygen while working on a stormwater treatment pipeline Thursday morning in this Collin County town north of Allen.

9/03/92

ACCIDENT IN MANHOLE

Water-line inspector dies

■ A 31-year-old water-line inspector for Kansas City was killed Thursday morning after he apparently ran out of oxygen while working in a manhole.

The body of Steven B. Cheaqui, 31, of Kansas City, North, was found inside the manhole by a motorist, who noticed nothing had changed at the Northland work site during the morning.

Preliminary findings from an autopsy conducted Thursday afternoon showed Cheaqui died from accidental oxygen deprivation, said Rich Mreen, an investigator with the Clay County medical examiner's office.

High levels of carbon dioxide and low levels of oxygen were found in the manhole after the accident.

www.tulsaworld.com

WEDNESDAY

AUGUST 11, 2004

TULSA WORLD

SINCE 1905

Gas fumes at plant overcome 6; 1 dies

► A construction worker remains critical, and four emergency workers are treated and released.

By **MATT ELLIOTT**
Word Staff Writer

One construction worker died, another was critically injured and four emergency responders also were injured Tuesday after they were overcome by sewer gas at a wastewater treatment plant.

The emergency workers — two EMSA medics and two firefighters —

were treated at a hospital, Fire Capt. Hubert Rouse said.

A concentration of hydrogen sulfide gas, produced from decaying organic matter, first affected L&L Construction Co. employees who were testing an epoxy on concrete in a manhole, officials said.

Initial reports suggested that the two men who were critically injured

were wearing filter respirators, but it was not clear if they had malfunctioned, said Capt. Adam Balogh, a supervisor with the Fire Department's Hazardous Materials Unit.

One of the two men later died at a Tulsa hospital.

"We've got a lot of different information coming in," Rouse said during a press briefing at the plant in the 5300 block of South Elwood Avenue. "The incident will have to be investigated."

Authorities were called to the plant

about 5:20 p.m., apparently to a call that someone had fallen in a manhole.

The construction workers were demonstrating the epoxy for city workers, applying it to concrete in the manhole when they were affected by the gas, said Bill Reynolds, the plant's maintenance supervisor. The epoxy is used to combat the gas' corrosive affects on concrete.

One of the workers had not been able to get out of the manhole.

"It'll kill you," Reynolds said of the gas.

The two EMSA medics — the first two medical personnel at the scene — were taken to Tulsa Regional Medical Center in fair condition, EMSA spokeswoman Tina Wells said. They were released later. The firefighters also were treated at a Tulsa hospital and released, Rouse said.

Firefighters entered the hole and retrieved the man who was inside before sealing it and moving the second critically injured worker away from the gas above the manhole.

SEE FUMES p. 74

Man Critically Hurt After Swept Through Sewers *Rescuers Say 'Miracle' Worker Survived Ordeal*

UPDATED 8:04 AM CDT Oct 12, 2010

RAYMORE, Mo. —

A worker who was swept away in a manhole in Raymore was found alive after an extensive and intense search on Tuesday morning.

Emergency crews said Daniel Collins, 30, was found near the 15th green at the Creekmoor Golf Course, which is about a mile away from where he entered the sewer system in the 600 block of West Foxwood Drive. [Click here to see how far the worker traveled.](#)

Authorities told KMBC's Kerri Stowell that the worker was in a 27-inch sanitary sewer line, and was able to stop himself in the trap just before the line went under the lake at the golf course. Collins was curled into a fetal position.

"When we walked over the grates, he said, 'Guys, I'm down here. Can you help me?' Of course, I was happy because, you know, crews are looking for him," said firefighter and paramedic Antonio D. Smith. "We noticed that the guy was weak. You know, he didn't have any more strength left in his body -- traveling that far and being under those circumstances -- I had to make a decision to go down there and get him."

Smith said crews topside helped him lift Collins out of the hole while Smith put him over his shoulder.

Is he a millionaire?
 Oklahoma is accused of
 paying \$100 million for
 medical care



Young singer downloads a record deal
Convicted rapist gets shortened sentence
KU suspends two players for one game

TEEN/18
LOCAL/1C
SPORTS/1D



making a difference
 with the
Community Bank & Trust



TUESDAY

August 24, 2010

THE TOPEKA CAPITAL-JOURNAL

www.kcapitaljournal.com

CONSTRUCTION ACCIDENT

Two manhole workers die

Third critically injured; cause of tragedy at housing development investigated

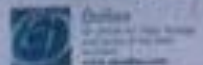


Investigators gathered at the scene of a fatal construction accident at a housing development in Topeka, Kan., on Monday. Two workers died and a third was critically injured when a manhole cover fell on them. The cause of the accident is under investigation.

The two men were working on a manhole cover when it fell on them. The third worker was injured when he was struck by a piece of equipment. The cause of the accident is under investigation.

The investigation is ongoing. The cause of the accident is under investigation. The workers were not wearing proper safety gear.

The investigation is ongoing. The cause of the accident is under investigation. The workers were not wearing proper safety gear.



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Pessimism on budget surplus fuels debate

WASHINGTON — The new budget and how it will be funded will have the government in the red for years to come, leaving the state with a budget deficit, according to a report released by a panel of experts.

The panel says the state will have a budget deficit of \$1.5 billion in 2011, and the deficit will grow to \$2.5 billion by 2015, according to the report.

- Dwindling surplus**
- The state's budget surplus is expected to decline from \$1.5 billion in 2009 to \$1 billion in 2010.
 - The surplus is expected to reach zero by 2011.
 - The deficit is expected to reach \$1.5 billion by 2015.

The report says the state's budget is in a state of "precariousness" and that the state will have to raise taxes or cut spending to avoid a budget deficit.

The report also says that the state's budget is "unsustainable" and that the state will have to make significant changes to its budget.

Rules to bar donors in time

Tuesday,
June 13,
1995

Kansas City Star.

Death in manhole considered accident

**Worker died from
asphyxiation in sewer
vault, officials believe.**

By CHRISTINE VENDEL
Staff Writer

Overland Park police said they have no reason to suspect anything but an accident in the death of a man whose body was found early Saturday in an underground vault.

Kent D. Gash, 39, of Olathe, was found by relatives about 3:30 a.m. in a valve inspection vault for a water line south of 135th Street and Quivira Road. He worked for Black & Veatch and had been conducting an investigation in the underground chamber for the Johnson County Water District No. 1.

Police said he had lifted a manhole cover and descended about 6 feet into the vault.

"Apparently there wasn't enough air down there to sustain him for the time he was down there," said Overland Park Capt. Jeffery Dysart. "More than likely, he was overcome by the fact that he had

no oxygen."

Preliminary autopsy results showed Gash died of asphyxiation, Dysart said. He said toxicology results have yet to be completed, but no gas or toxins were found in the underground chamber.

Gash's wife called police after her husband failed to return home from work Friday. He had left at 10 a.m.

An Overland Park officer searched the area about 1:50 a.m., but found nothing.

Gash's brother and brother-in-law then went to the site, saw Gash's truck and later heard a pager sounding somewhere in the dark. Thinking the pager might belong to Gash, they called his pager number and heard it sound again.

They repeatedly dialed his pager number and followed the noise until they found his body.

A spokeswoman for Black & Veatch said Gash had worked as a resident project representative for the firm since April 24. She said the company is investigating its policies and trying to determine if the procedures were followed.

We have seen a lot of strange things in the sewers...





9/13/2013

182.2 FT

Upstream manhole No: STM1

Downstream manhole No: STM2

Cam Dir: Downstream

What is a Cross Bore...

An intersection of an existing underground utility or underground structure by a second utility resulting in a direct contact between the transitions of the utilities that compromises the integrity of either utility or underground structure.

How Cross Bores Happen...

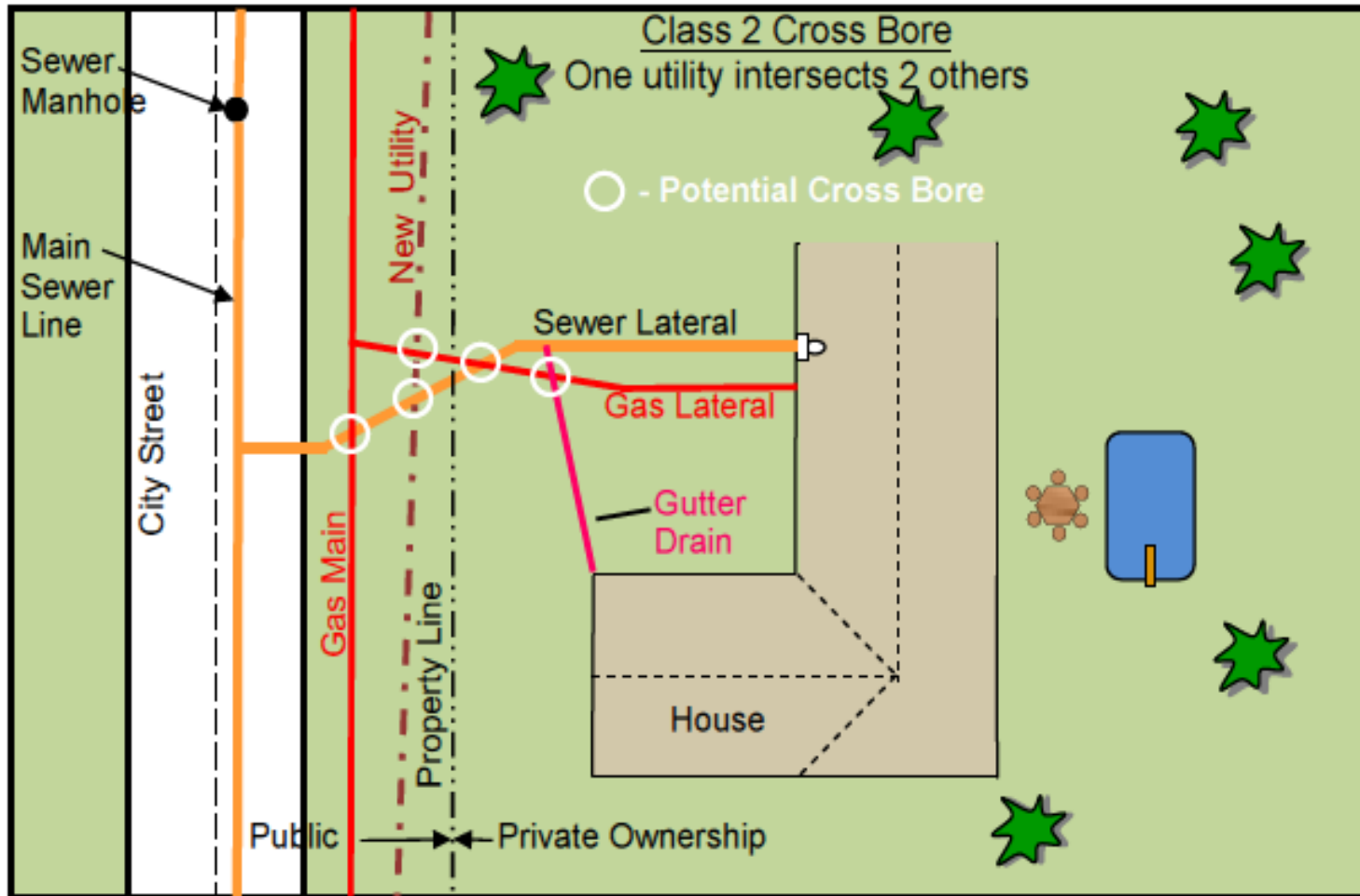
More utilities are being installed or updated underground.


Limited width to work within due to utility easement size.

Only choice is to go deeper – results in boring through mains and service laterals.

Utilities are cut or damaged when lines are cleared.

Cross Bores Types





10/13/98 11:42
591.6 FT.



Slide nut is included

USMH: 0016S0197

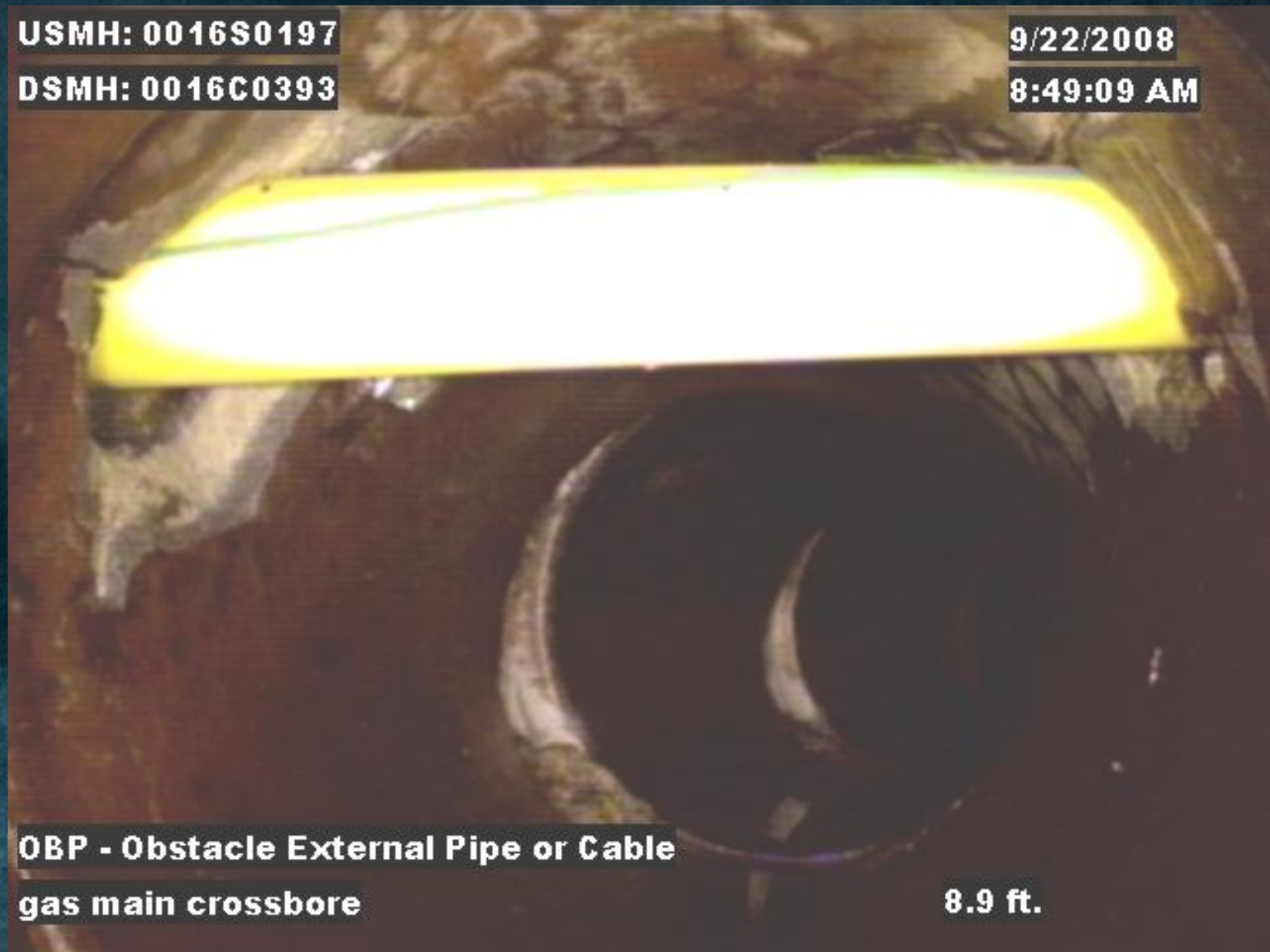
9/22/2008

DSMH: 0016C0393

8:49:09 AM

**OBP - Obstacle External Pipe or Cable
gas main crossbore**

8.9 ft.





Dangers of Cross Bores...

Gas bores the biggest danger due to the potential for explosion

Detection of a cross bore may go unnoticed for decades

Plumbers can unknowingly cut a plastic line while clearing a “blockage”

Death, injury and property damage all can be a result

Metropolitan Utilities District – Omaha, Nebraska



Sanitary Sewer Lateral CCTV Inspections
Metropolitan Utilities District - Omaha, NE

Study Area II

- Sewer Mains Requiring Inspection (15,577 ft)
- Properties Requiring Lateral Inspection (402)

1 inch = 325 feet



Safety Alert

from the metropolitan utilities district

Natural gas utilities across the country have discovered situations where natural gas pipes (mains and services) inadvertently were installed through sewer pipes (laterals).

As long as a natural gas pipe intersecting a sewer pipe is not damaged, it poses no safety hazard. However, the equipment used to unclog sewer pipes can damage the natural gas pipe and lead to the dangerous release of natural gas.

Who owns the sewer pipe (lateral)?

The property owner owns the pipe from the house/building to the pipe in the street. Your city owns the sewer pipe in the street.

I have a sewer obstruction. What should I do?

Call a reputable contractor or licensed plumber who uses procedures to safely clean a sewer.

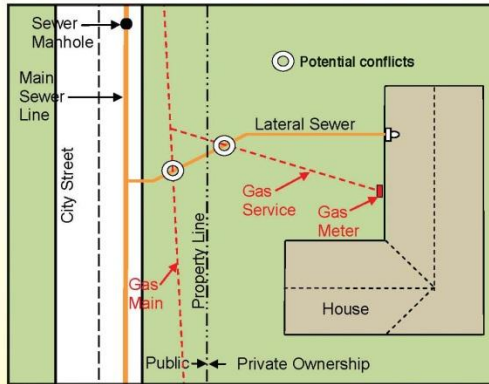


Illustration courtesy of Cross Bore Safety Association

Este informe contiene información muy importante. Tradúzcalo ó hable con alguien que lo entienda bien.

What should I do if I smell gas?

We add mercaptan to natural gas to make it smell like rotten eggs. If you smell gas, whether it's sewer gas or natural gas, call M.U.D.'s emergency number 402.554.7777. There is no charge to check a gas leak.

What if I decide to rent or use equipment to clean my sewer pipe?

You risk cutting a pipe. If there is an obstruction (like a natural gas pipe) in the sewer pipe and you hit the natural gas pipe, natural gas may leak into your home and cause a serious safety issue such as an explosion.

Call a reputable contractor or a licensed plumber who uses procedures to safely clean sewer pipes.

What is M.U.D. doing to correct the problem?

We are reviewing maps and records to identify and correct conflicts between our natural gas mains and your sewer pipes. We hired Roto Rooter to help with the initial investigation. If our review shows a conflict, either Roto Rooter or M.U.D. will contact you and/or the property owner.

If it is determined that M.U.D.'s natural gas main or service is in your sewer pipe, the District will pay to make the correction.

What if a contractor contacts me about a potential problem?

If you don't have a problem with your sewer or have not been contacted by M.U.D. or Roto Rooter, do not let anyone into your home without calling M.U.D., 402.554.7777, to verify whether a potential problem has been identified on your property.

If you have any other questions, call 402.554.6666.

**No charge to check gas leaks. Call
402.554.7777 – 24/7**



J-55547
250M/211man



Dear Valued Customer,

TREKK Design Group ("TREKK") is in your geographical area inspecting sanitary sewer mainlines and sewer laterals on behalf of Metropolitan Utilities District. A sanitary sewer mainline is the city owned sewer pipe that typically is located under the middle of the street while a sanitary sewer lateral is the customer owned pipe that connects a home to the sanitary sewer mainline. TREKK is doing this work to check for natural gas pipes that may have inadvertently been installed through or caused damage to sewer laterals during a trenchless installation. This is referred to as a cross bore.

A Safety Alert about cross bores was sent to all of our customers with their April 2011 billing statements. Cross bores are not limited to the Omaha area or the natural gas industry but occur with various utilities nationwide. This problem occurs because privately owned sewer laterals are not located during the standard "Call Before You Dig" process.

We prefer trenchless installations for gas pipes because it limits the invasiveness of construction in developed areas of the city. This installation method requires a hole to be dug at the start of the pipe and one at the end which makes it safer than having an open trench the entire length of the pipe. It is also better for property owners because there are not large trenches dug across their property.

We take many precautions to avoid damaging other utilities when we install pipe. When the "Call Before You Dig" process has been completed, our construction crews dig a hole in any area where our new pipe will cross another utility during the installation. This allows our personnel to visually verify that no damage has been done to that utility as our new pipe crosses it. Since sewer laterals are not located during the "Call Before You Dig" process, we cannot visually verify these pipes.

Cross bores are not a frequent occurrence as the industry average is just 2 to 3 cross bores per mile of installed pipe nationwide. Cross bores also are not an immediate safety concern. The normal contents within a sewer lateral pose no threat to a gas pipe. Damage to the gas pipe can occur when someone attempts to clean a sewer lateral using mechanical cleaning equipment. This can lead to the gas pipe being severed and natural gas can leak into the home.

Because this is a new issue to the natural gas industry, we have implemented procedures to inspect sewer laterals immediately following future trenchless pipe installations. We have also identified the areas in our system where we installed natural gas pipes using trenchless installation methods over the past 15 years. TREKK is currently in your area performing one of these inspections.

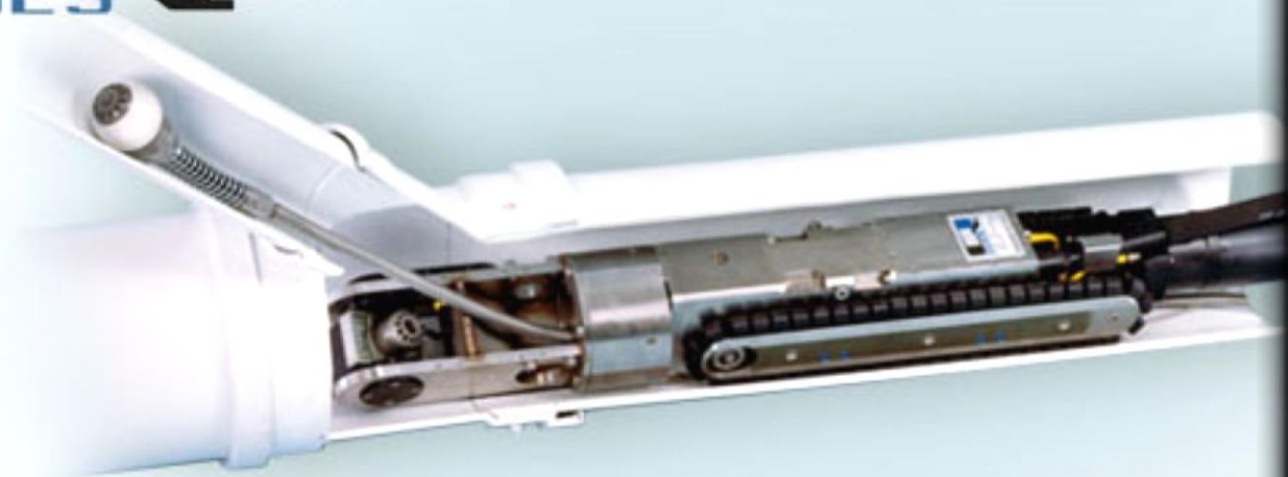
If you have any questions or would like to speak with one of our Engineers about this issue, please call our Engineering Department's main line at 402.504.7901 and ask the operator to speak with somebody about sewer lateral inspections or cross bores. Thank you for your cooperation during these inspections!

Metropolitan Utilities District

"The Standard of the Industry"



LATERAL & MAINLINE PROBE (LAMP)





*Maximum clearance in
a 6" mainline!*





SEWER LATERAL INSPECTION FORM

Date:	9/26/2011
Time Arrived:	2:21:53 PM
Time Complete:	2:25:42 PM

Address:	3162 CURTIS AV	Lateral:	1 of 1	City:	Omaha, NE
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Structure Type:	<input checked="" type="checkbox"/> Residential <input type="checkbox"/> Business	Business Name (if applicable):	
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Inspection Company:	TREKK Design Group
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Technician Last Name:	Cook	Technician #:	U-408-6547	Technician Last Name:		Technician #:	
-----------------------	------	---------------	------------	-----------------------	--	---------------	--

Sewer Lateral Inspection Entry Point:	<input type="checkbox"/> Building <input checked="" type="checkbox"/> Sewer Main
---------------------------------------	--

Inspection Results (only clear lateral if entire pipe was successfully televised):	<input type="checkbox"/> Lateral Clear <input checked="" type="checkbox"/> Cross Bore Present <input type="checkbox"/> Inspection Failed
--	--

If Inspection Failed, Reason for Failure:	
---	--

Description of Work (include details of all work performed outside of camera work):



Upstream Manhole:	0080028	Downstream Manhole:	0080023	Building Photo:	9
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Parts Replaced During Inspection:	
-----------------------------------	--

If a potential cross bore is discovered please fill out the following fields.

M.U.D. Employee Contacted:	Doug Stubbs	Time:	2:22:35 PM	X, Y, Z Location (measure X, Y off house line or curbline; Z=depth)	X=2.5' WEBL, Y=4' NNCL, Z=4'
----------------------------	-------------	-------	------------	---	------------------------------

For M.U.D. personnel use only to clear failed inspections.

Approved by:		Date:	
--------------	--	-------	--

Reason Lateral Cleared by M.U.D.:	
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GraniteXP Observation Report with Still Images

Project segment ref: MAPLE ST_MAIN	Project Name: NORTH Bend	Start date/time: 10/25/2012 9:35:04 AM	Number: 3	Surveyed by: TREKK/COLE
Upstream manhole No: MAPLE ST	Downstream manhole No: MAIN	Total length:		
Address info:				

Observations

Distance	Length	Code	Reviewed	Check Pos.	Severity	Comment
16.0		OBP	No	11 / 2		





SEWER LATERAL INSPECTION FORM

Date:	9/28/2011
Time Arrived:	10:02:16 AM
Time Complete:	10:04:51 AM

Address:	3035 CURTIS AV	Lateral: 1 of 1	City: Omaha, NE
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Structure Type:	<input checked="" type="checkbox"/> Residential <input type="checkbox"/> Business	Business Name (if applicable):
-----------------	---	--------------------------------


Inspection Company:	TREKK Design Group
---------------------	--------------------

Technician Last Name:	Cook	Technician #:	U-408-6547	Technician Last Name:		Technician #:	
-----------------------	------	---------------	------------	-----------------------	--	---------------	--

Sewer Lateral Inspection Entry Point:	<input type="checkbox"/> Building <input checked="" type="checkbox"/> Sewer Main
---------------------------------------	--

Inspection Results (only clear lateral if entire pipe was successfully televised):	<input type="checkbox"/> Lateral Clear <input checked="" type="checkbox"/> Cross Bore Present <input type="checkbox"/> Inspection Failed
--	--

If Inspection Failed, Reason for Failure:	FOUND CABLE THROUGH SERVICE.
---	------------------------------

Description of Work (include details of all work performed outside of camera work):	
---	---

Upstream Manhole:	0080019	Downstream Manhole:	0080005	Building Photo:	2
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Parts Replaced During Inspection:	
-----------------------------------	--

If a potential cross bore is discovered please fill out the following fields.

M.U.D. Employee Contacted:	Doug Stubbs	Time:	10:04:26 AM	X, Y, Z Location (measure X Y off houseline or curbline; Z=depth)	X=6' SSCL, Y=8' EEEL, Z=9.2'
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For M.U.D. personnel use only to clear failed inspections.

Approved by:		Date:	
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Reason Lateral Cleared by M.U.D.:	
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GraniteXP Lateral Observation Report with Still Images

EndPoint/Label	Label for ENDPOINT/TYPE	Project Name	Start date/time	Weather	Surveyed by:
0607009_067 008	Mainline	mud phase 4	10/18/2012 2:09:15 PM	3	TREKK/COLE

LSR	Tap location	Start manhole	Check position	Total length
3428 U ST - 5	191.6	Upstream node	9	

Additional info:

Observations

Distance	Length	Code	Reversed	Dock Pos.	Severity	Comment
47.5		OSP	Yes	9 /		CROSS BORE





SEWER LATERAL INSPECTION FORM

Date:	8/31/2011
Time Arrived:	2:52:27 PM
Time Complete:	2:53:38 PM

Address:	2590 LAUREL AV	Lateral: 2 of 2	City: Omaha, NE
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Structure Type:	<input checked="" type="checkbox"/> Residential <input type="checkbox"/> Business	Business Name (if applicable):
-----------------	---	--------------------------------

Inspection Company:	TREKK Design Group
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Technician Last Name:	Cook	Technician #:	U-408-6547	Technician Last Name:		Technician #:	
-----------------------	------	---------------	------------	-----------------------	--	---------------	--

Sewer Lateral Inspection Entry Point:	<input type="checkbox"/> Building <input checked="" type="checkbox"/> Sewer Main
---------------------------------------	--

Inspection Results (only clear lateral if entire pipe was successfully televised):	<input type="checkbox"/> Lateral Clear <input checked="" type="checkbox"/> Cross Bore Present <input type="checkbox"/> Inspection Failed
--	--

If Inspection Failed, Reason for Failure:	
---	--

Description of Work (include details of all work performed outside of camera work):

FOUND A CRSS BORE IN THE SERVICE.



Upstream Manhole:	0054017	Downstream Manhole:	0054016	Building Photo:	24
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Parts Replaced During Inspection:	
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If a potential cross bore is discovered please fill out the following fields.

M.U.D. Employee Contacted:	Doug Stubbs	Time:	2:53:23 PM	X, Y, Z Location (measure X Y off houseline or curbline; Z=depth)	X=2' WWBL, Y=9' NNCL, Z=5'
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For M.U.D. personnel use only to clear failed inspections.

Approved by:		Date:	
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Reason Lateral Cleared by M.U.D.:	
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GraniteXP Lateral Observation Report with Still Images

EndPoint/Label: 0607006_060 7007	Label for ENDPOINTTYPE: Mainline	Project Name: MUD PHASE 4	Start date/time: 10/24/2012 11:31:30 AM	Weather: 6	Surveyor In: TREKK/KEVIN
--	-------------------------------------	------------------------------	---	---------------	-----------------------------

SR: 3519 U ST - 6	Tap location: 142.9	Start manhole: Upstream node	Clock position: 1	Total length: 33.8
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Additional info:

Observations

Distance	Length	Code	Revised	Clock Pos.	Severity	Comment
0.0		MWL	Yes	/		







Based on information from the North American Society of Trenchless Technology, field experience suggests that there are 2 to 3 cross-bores per running mile of installed pipe within high risk areas.

Distance: 23.3
OBP: Obstacle External Pipe or Cable
Clock from: 10 Clock to: 2
Rate:
Comments:

23.3 FT.
MH START:
MH STOP:



USMH: WCMH001705

OSMH: WCMH001714

3/30/2010

4:36:01 PM



OBI - Obstacle Intruding Thru Wall
gas line hit

37.2 ft.

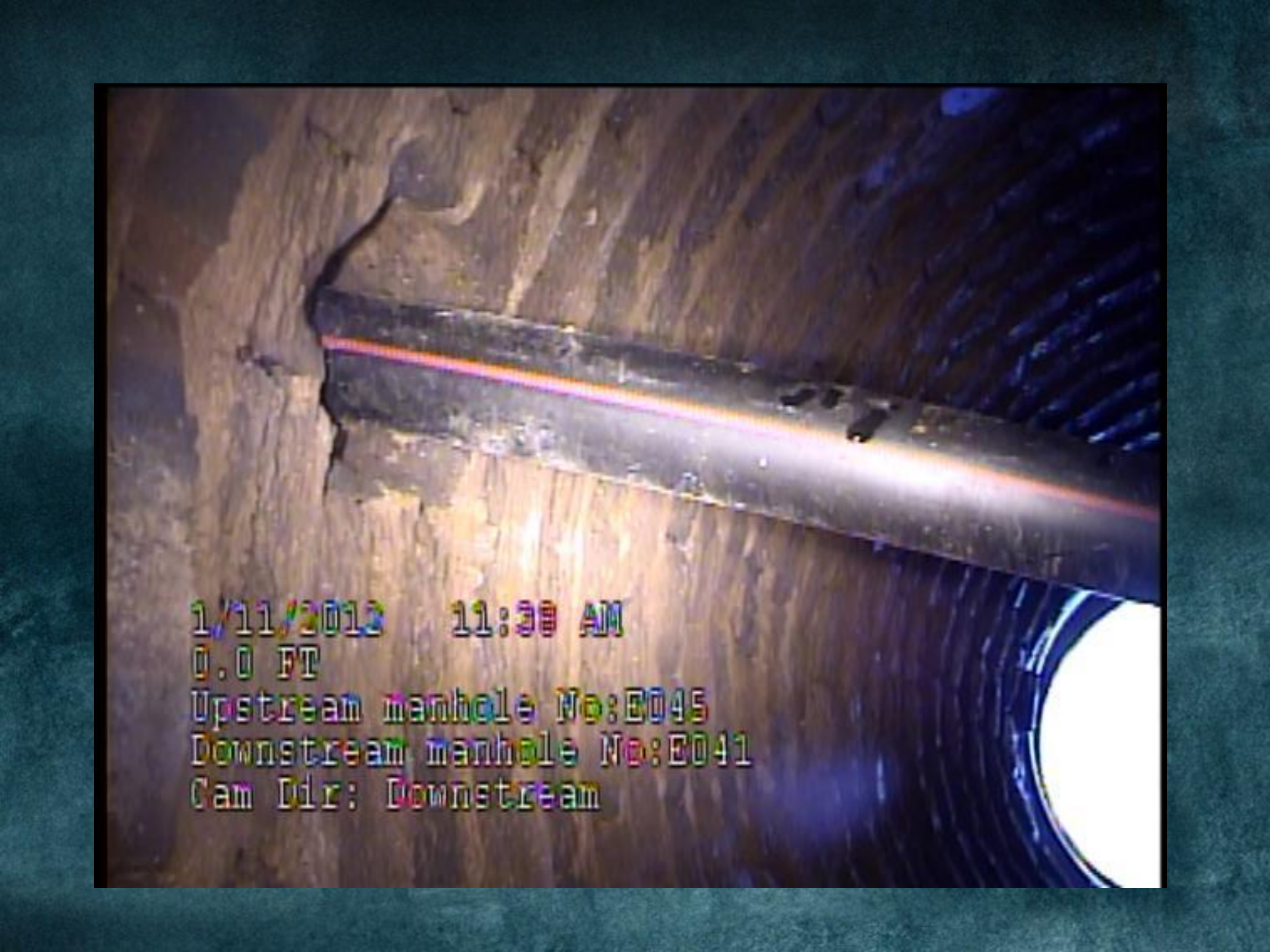
MOD 12-019 PFB-3312 PARKER ST - 11-3312 PARKER ST

6/7/2012

63.7 FT

Lateral ID: 3312 PARKER ST - 11

Cam Dir: Upstream

A photograph taken from inside a manhole, looking down a pipe. A red laser line is projected along the length of the pipe. The pipe is surrounded by a corrugated metal structure. The text overlay provides the following information:

1/11/2013 11:38 AM
0.0 FT
Upstream manhole No: E045
Downstream manhole No: E041
Cam Dir: Downstream



6/10/2013

79.9 FT

Lateral ID: 3026 FRANKLIN ST - 17

Cam Dir: Upstream



3/27/2012 11:10 AM
23.4 FT
Lateral ID: 0114 N 318T BT = 0
Cam Dir: Upstream

Distance: 26.1

OBP: Obstacle External Pipe or Cable

Clock from: 10 Clock to: 2

Rating:

Comments: LAT FAIL CROSS BORE

A



05/24/12 11:03
59.2 FT.
MH START: 0145041
MH STOP: 0145031

USMH: 001680197

OSMH: 0016C0355

9/22/2008

8:49:09 AM

HSV - Hole Soil Visible

3.4 ft.



LATERAL
11/28/01 11:34
17.4 FT.

