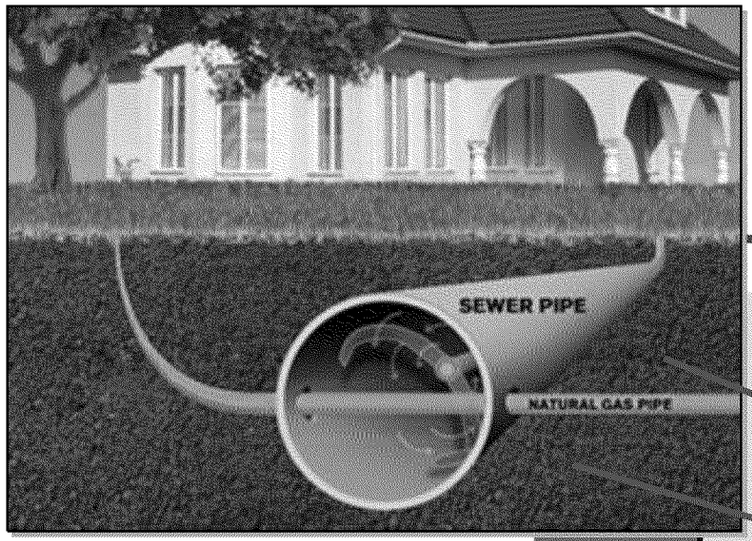
Cross Bores Inspections

Distribution Integrity Management

May, 2014

What is a Cross Bore?

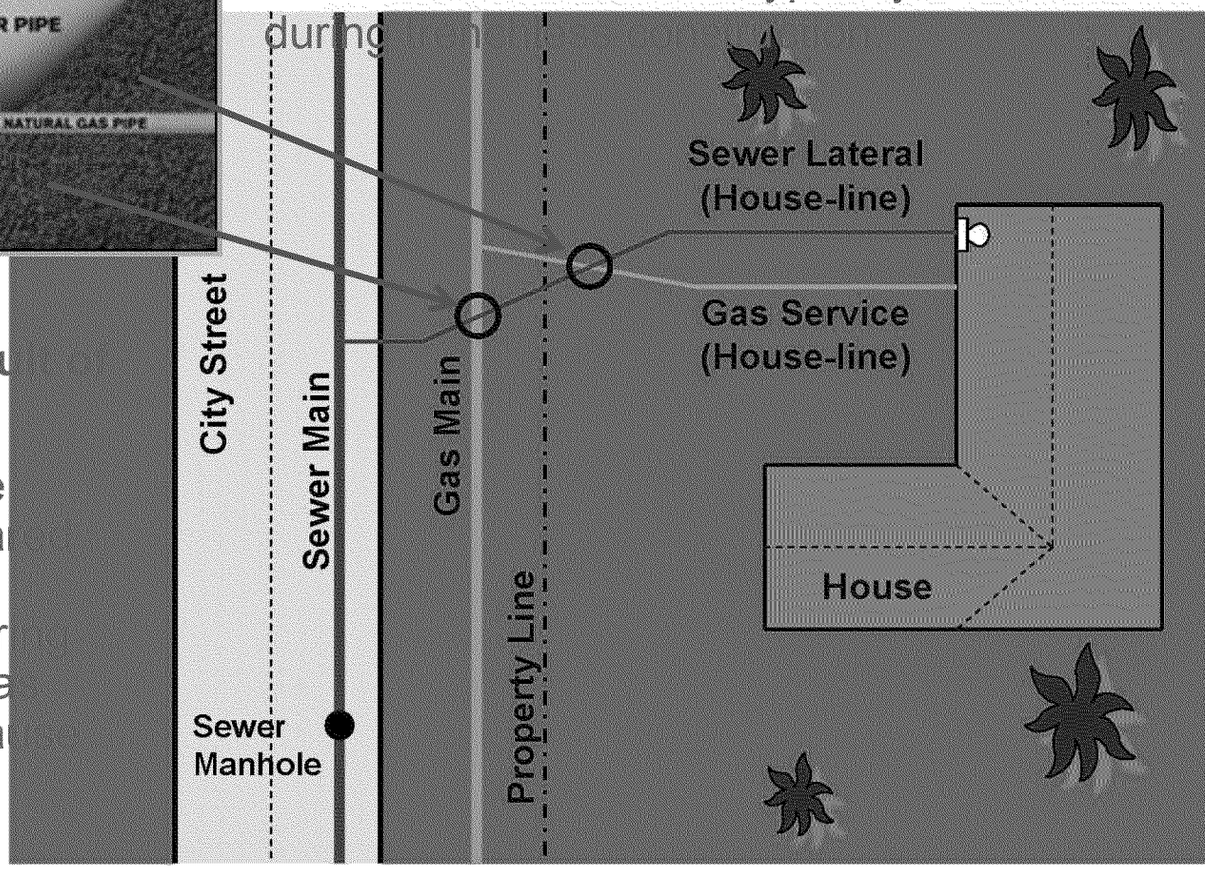


What is a cross bore?

A cross bore is the inadvertent placement of a gas main or service through a sewer line. Sewer cross bores typically occur during

What can happen as a resu a cross bore?

The sewer line may become blocked and need to be clea by a plumber or the building owner with mechanical clear tools. This may cause the ga line to be cut which could ca a release of gas.



Cross Bores – An Industry Issue

1976: First recorded instance of a Cross Bore
- Kenosha Wisconsin
- Fire, explosion, four injuries, one home destroyed and two adjacent homes damaged
- Investigated by NTSB

2002: Minneapolis Minnesota
- Fire, explosion and two homes destroyed

2004: Phoenix Arizona
- Fire, explosion, four injuries one home destroyed

New York State
- Fire, explosion, one fatality, one home destroyed

2008: Cross Bore Safety Association formed, a non-profit organization of construction, pipe manufacturer, inspectors and utility professionals

2010: St. Paul Minnesota
- Fire, explosion, one injury, one home destroyed

AGA publishes report on Gas Pipelines and Unmarked Sewer Lines.

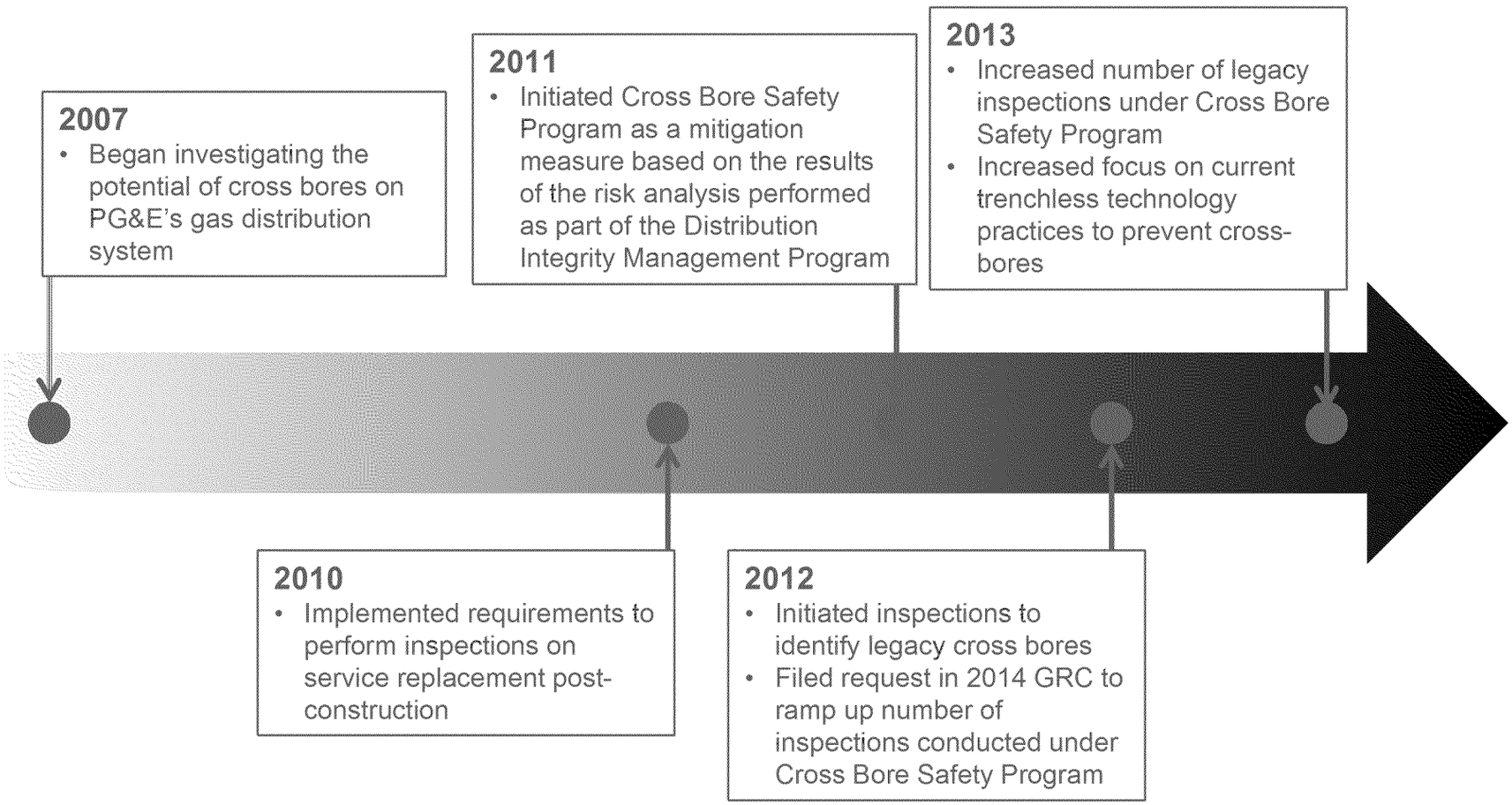
2012: Gas Technology Institute (GTI) publishes report on Cross-Bores Best Practice and Outreach Program

Best practices focus on:
- Compliance, resources, awareness, records and risk assessment and mitigation

- Eighteen known cross bore incidents in U.S. since 2002[1]
- Industry average cross bores estimated at 2-3 per mile of gas pipe and can be higher regionally, especially if sewer and gas lines are installed at the same depth[2]
- Incident in Minnesota resulted in a state mandated program to address cross bores[3]

[1] GTI "Mitigating the Risk of Cross-Bores", presentation to Northeast Gas Association, October 4, 2012
[2] Cross Bore Safety Association (CBSA), Legacy Cross Bores
[3] Minnesota Department of Public Safety, State Fire Marshal and Pipeline Safety, Alert Notice, May 10, 2010

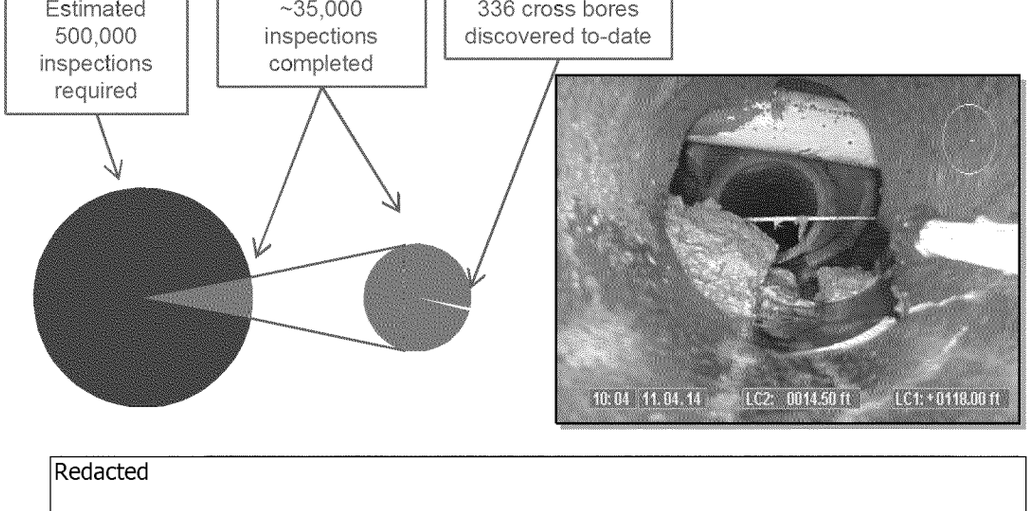
PG&E's History with Cross Bores



PG&E's Cross Bore Safety Program

Legacy Inspections

- Camera inspections of sewer mains and laterals to locate potential legacy cross bores
- Risk-based prioritization of inspections based on public assembly locations and population density (e.g., schools, hospitals)
- Inspections focused on known locations of boring technology use
- Rigorous tracking of inspected parcels



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Inspection Methods

Camera equipment is either

- Inserted into a sewer manhole and launched up each individual sewer lateral
- Inserted through a toilet, trap, or cleanout at the house and pushed to the street

Tracking, Notification and Repair Process

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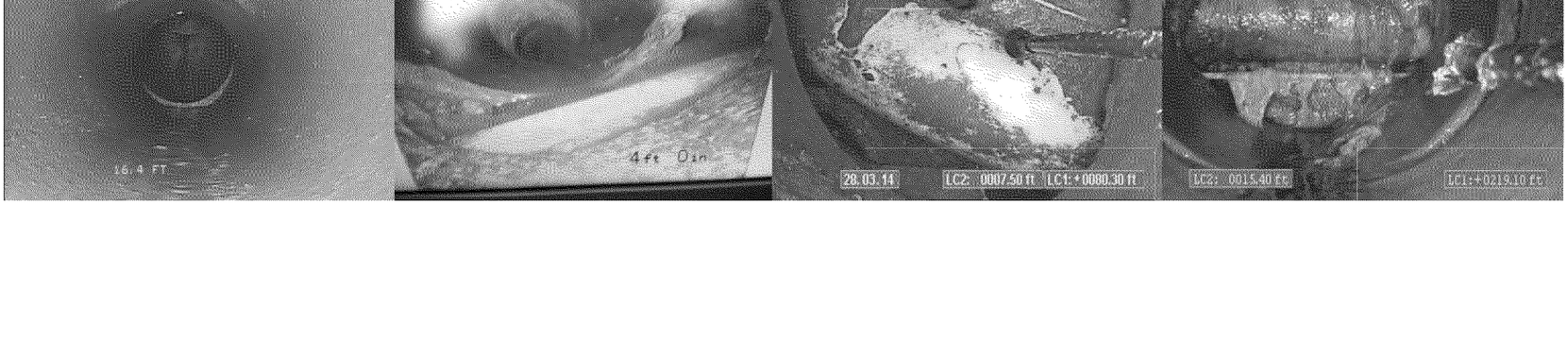
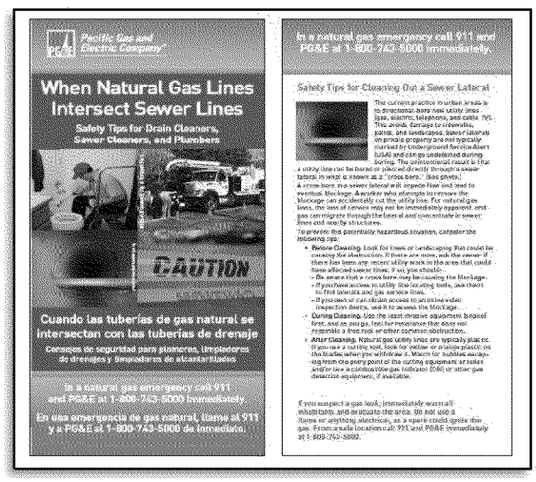
When a cross bore is identified:

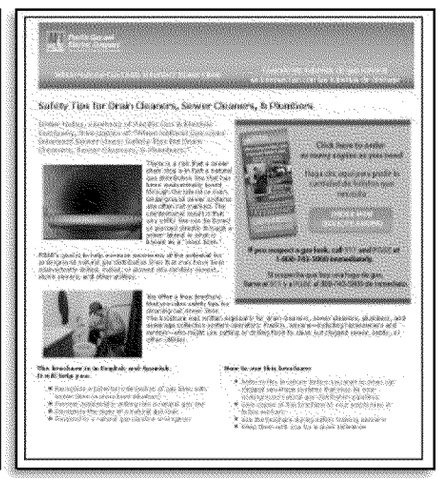
- Owner of sewer notified
- PG&E crews dispatched if blockage condition exists
- Gas line relocated out of sewer lateral
- Sewer repaired by licensed plumber
- Find rate is approximately 1 per 1,000 inspections or roughly 2 per mile of main, consistent with industry experience

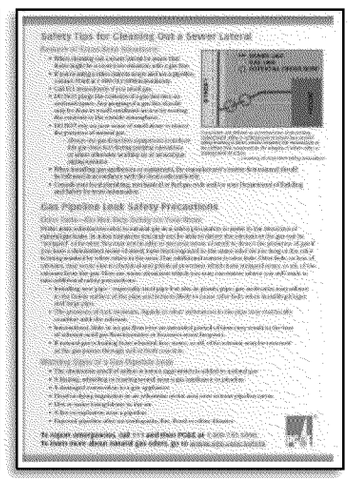


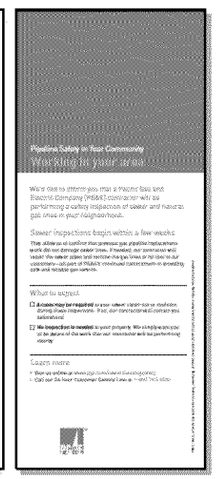
Outreach and Education

- Materials distributed to key stakeholders explaining cross bores and requesting appropriate action when a cross bore is suspected.
- In 2012, PG&E sent safety brochures on Cross Bores to 12,500 sewer districts, public works agencies, plumbers, and equipment rental stores.
- In 2013, we completed two notifications totaling 25,000 brochures with an additional 283 mailings to sewer agencies and plumber unions.
- In 2014, in addition to our stakeholder mailings, we included cross bore information in March as a bill insert.

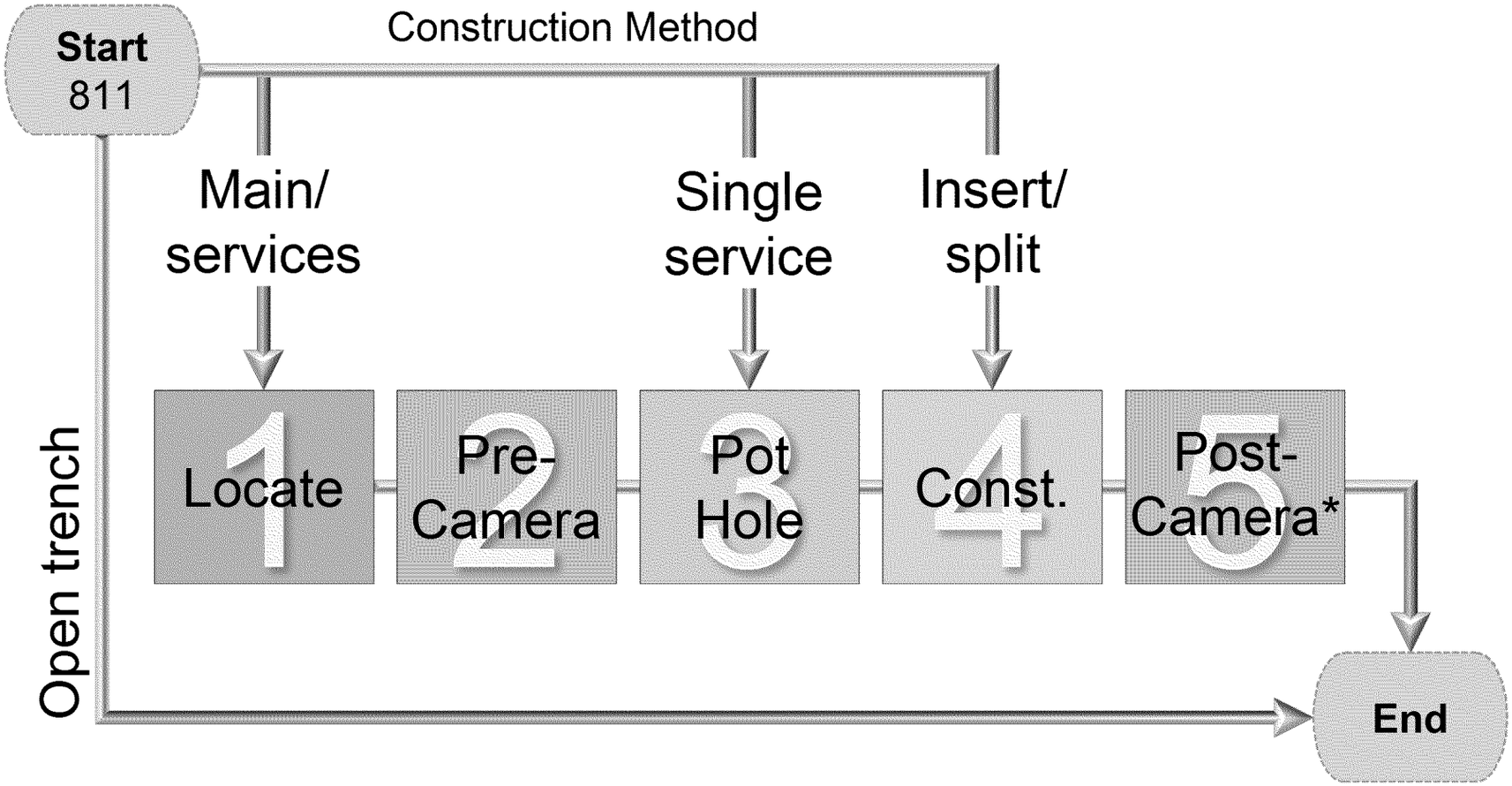








Cross Bore Prevention Process



*Perform before job closeout if pre-locate was completed.
Perform within 24 hours if NO pre-locate was completed.

Benchmark Results

Program	Benchmark Source	Comments
Legacy	American Gas Association Survey	PG&E provides public outreach consistent with the industry best practices. Not all utilities have legacy inspection programs.
Prevention	American Gas Association Survey Gas Technology Institute (GTI) Local and National Contractors	PG&E's new procedures implements best practices to ensure crossbores are not created given the combination of the pre-camera, pothole and post-camera inspections.
	Other Major US Utilities	PG&E is not only consistent with practices followed by other major US utilities but also meets best practices outlined in GTI's "Cross Bore Best Practices – Best Practices Guide".