

Feeder Line Replacement Refresher

Questar Gas Company
Meeting with Utah PSC
March 27, 2013

From our 2012 discussion of the Feeder Line Replacement Program

- We have an aggressive and proactive program to replace Vintage Feeder Line Pipe.
- Replacement is prioritized by risk evaluation.
- Feeder Lines deliver gas to the IHP distribution system.

- Risk = Threat x Consequence
 - Medium threat and high consequence vs. high threat and low consequence
 - Threats
 - Pressure Test, Reconditioning, Manufacturing, Construction, Subject Matter Experts
 - Consequences
 - Population Density
 - High Consequence Areas
- Continuing to evaluate pre-1970s pipelines

Feeder Line (FL) and Intermediate High-Pressure (IHP) Replacement Programs

	FL Replacement	IHP Replacement*
Typical Pipe	8" to 24" Steel Pipe	8" to 24" Steel Pipe
Typical Operating Pressures	300 - 400 psig	45 psig
Target Pipe Vintage	Pre-1970	Pre-1970
Population Density	Medium-High	High
Regulatory Integrity Management Programs	Gas Transmission Pipeline Integrity Management (TIMP) Effective 2005	Gas Distribution Pipeline Integrity Management Program (DIMP) Effective 2011

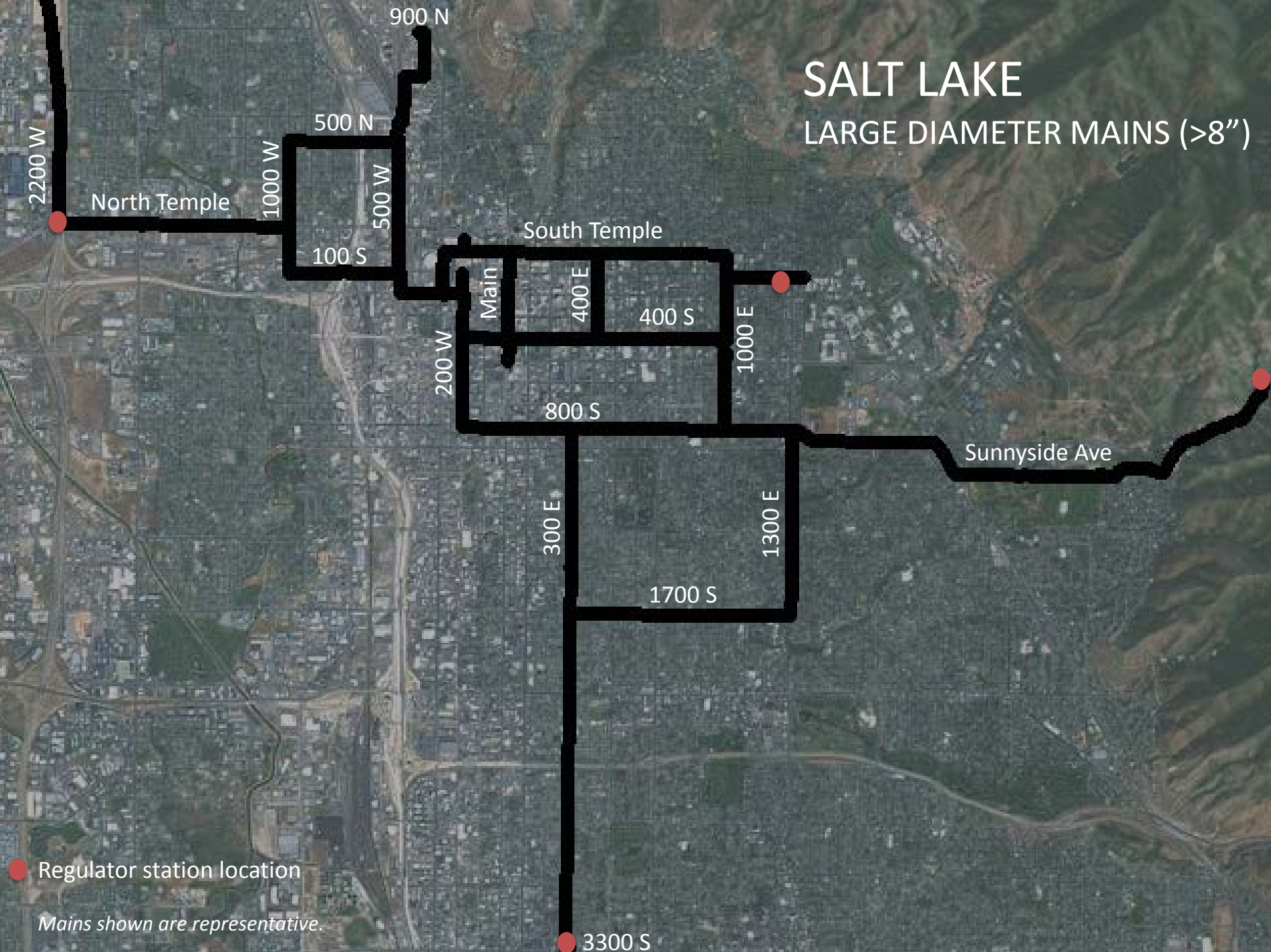
Vintage Large Diameter IHP Main Replacement Program

Background

- Questar began installing large diameter steel mains in 1929, operating at intermediate high pressure (IHP)
- These mains were the backbone which fed the low pressure system.
- Today, they continue to provide critical feed to Salt Lake, Provo, and Ogden.

SALT LAKE

LARGE DIAMETER MAINS (>8")



1700 N.

Provo

LARGE DIAMETER MAINS (>8")

800 W.

Provo

400 S.

State St.

● Regulator station location

Mains shown are representative.

Ogden

LARGE DIAMETER MAINS ($\geq 8''$)



● Regulator station location

Mains shown are representative.

IHP Large Diameter Mains ($\geq 8''$)

Original Install Date	1929	1930-39	1940-49	1950-59	1960-69	Total
Miles of Main*	15	4	8	27	16	70 miles

** Questar is evaluating and mileage to replace may change.*

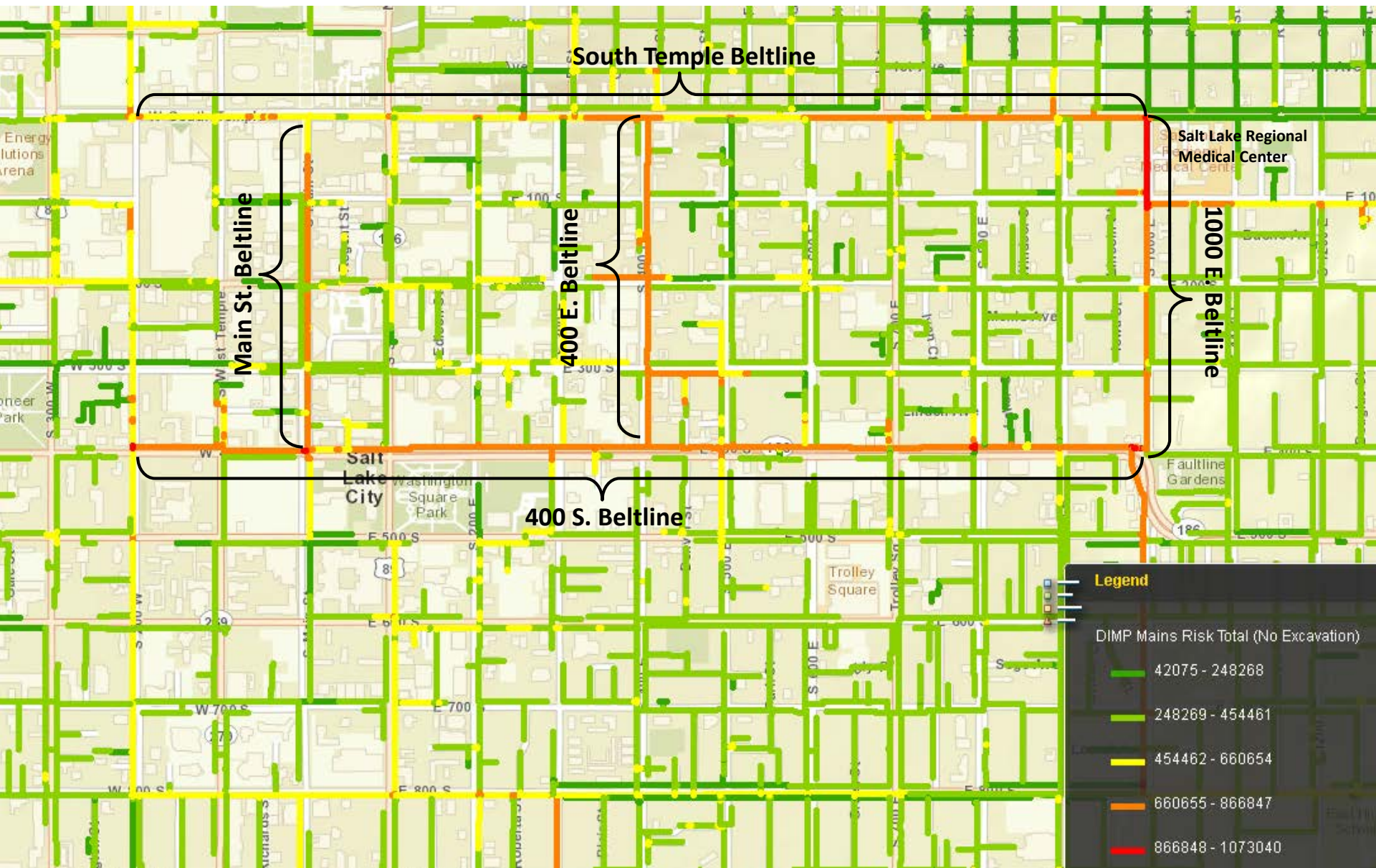
Distribution Integrity Management

- Distribution Integrity Management Plan (DIMP) implemented August 2011.
- Requires operators to assess and manage risks to pipelines.
- Vintage large diameter IHP mains were identified to have highest risk score.

DIMP Risk Model

- Geographic Information System (GIS) based risk model
 - Utilizes internal and publically available data
- Calculates risk on the IHP system
- Risk = Threats x Consequences
 - Threats
 - Corrosion, excavation damage, incorrect operations, equipment failure, natural forces, other outside force damages, and material, weld and joint failure
 - Consequences
 - Population density, main diameter, critical facilities (hospitals, schools, nursing homes, and churches)

DIMP Risk Model



Justification for Replacement

- Aging infrastructure. Some mains are 80+ years old.
- Reconditioned pipe. 15 miles of IHP pipe is known to be reconditioned.
- Shallow cover within city streets and unmitigated fault line crossings.
- Consequence of failure.
 - High population density, multi-story buildings, and critical facilities.
 - Potential for large gas release due to diameter and difficulty of shutdown.

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DIRECT EXAMINATION DATA REPORT

Form F11-1

Environmental/Safety Worksite Review

Line: Belt Line Dig ID: 800 S



Site Map

Work Site Review:

Work site is in close proximity to the following:

- ☐ Homes, apartments, etc.
- ☐ Identified sites
- ☐ Streams, Rivers, washes, wetlands, or similar
- ☐ Roads, highways, railroads, or similar
- ☐ Historical sites
- ☐ Other potential environmental and or safety risks

Environmental Review:

Na

Safety Review:

Na

Permits Required: ☐ Yes ☐ No

(if Yes, attach copy of permits to report)

Landowner/ Public Notifications Required:


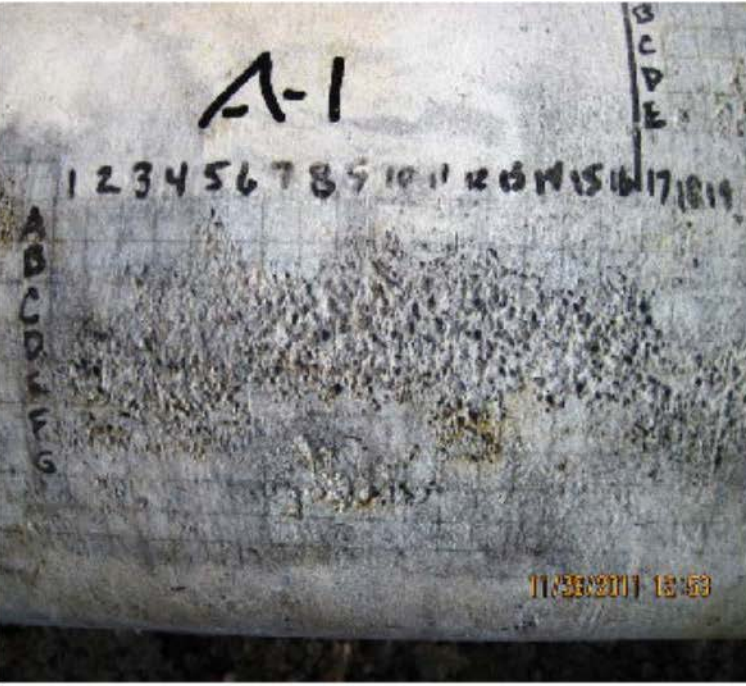
☐ Yes ☐ No

Comments:

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DIRECT EXAMINATION DATA REPORT

Photo Report

Line: IHP Dig ID: 800 S 7th E and 9th E SLC


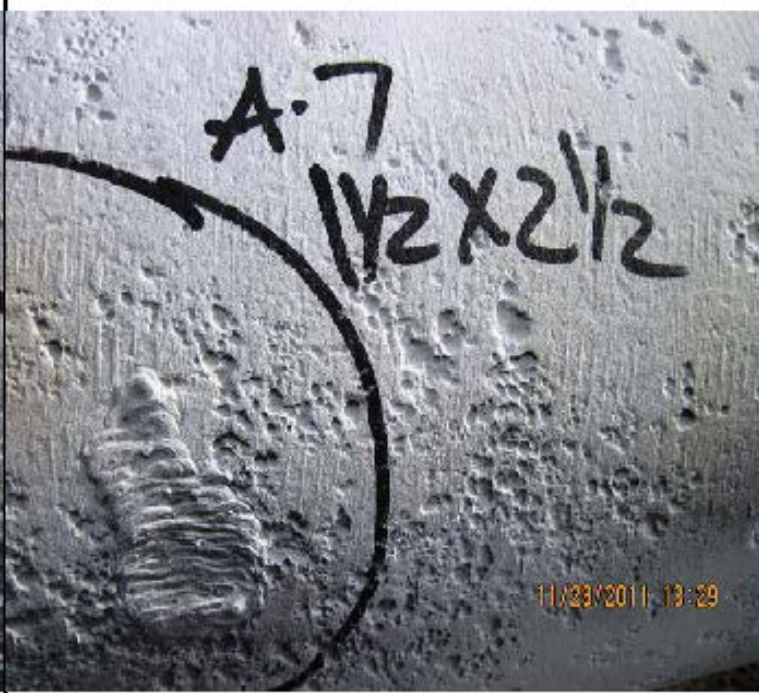
	
patch weld	A1 Pit Corrosion through out the whole section of pipe. Pick the deepest area to examine of 240' that was available removed from the ground.

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Photo Report

Line: IHP

Dig ID: 800 S 7th E and 9th E SLC



	
A6 Puddle Welds over general corrosion, Magnetic Particle no linear indications found.	A7 Puddle Welds over general corrosion, Magnetic Particle no linear indications found.

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Photo Report

Line: IHP

Dig ID: 800 S 7th E and 9th E SLC

	
A-9 Acetylene Weld	A-9 Acetylene Weld

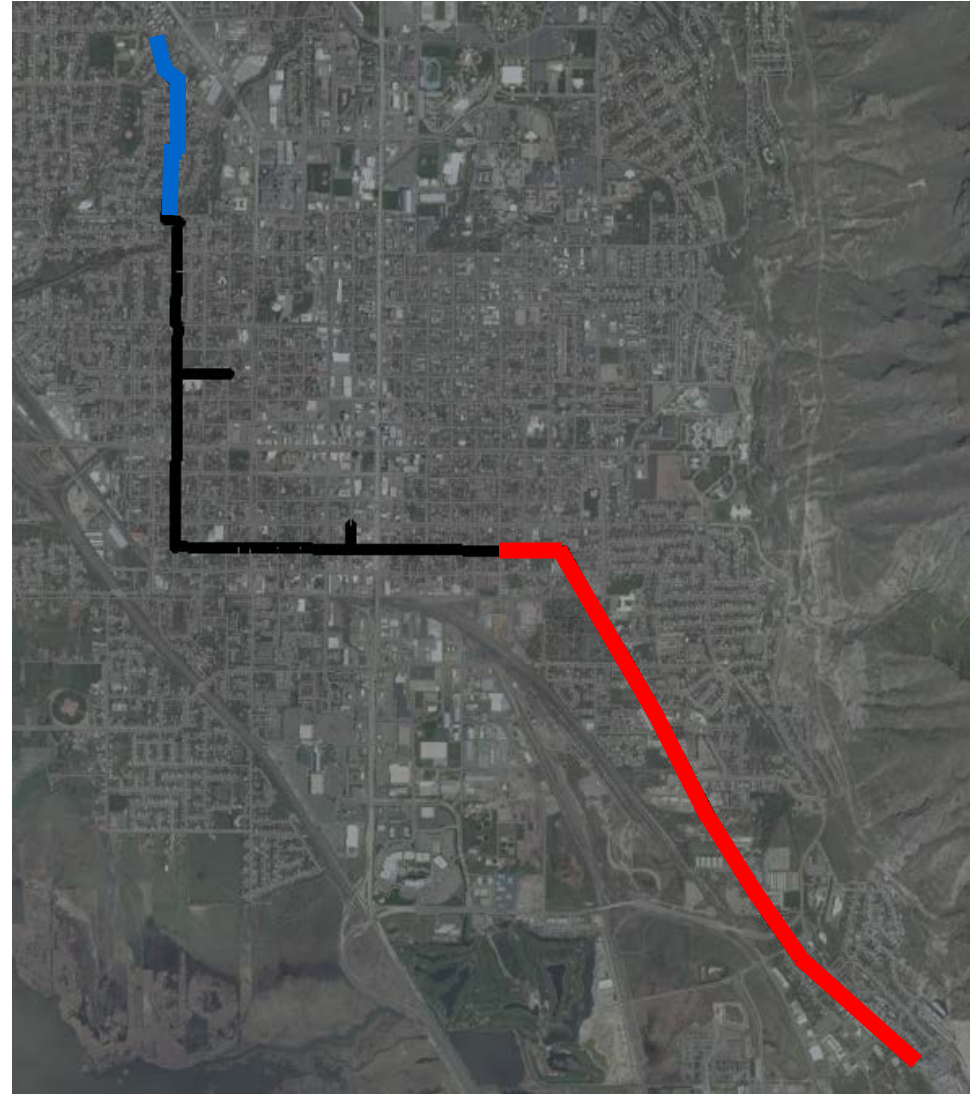
Provo Replacement

2011 Replacement

- 800 W. 900 N. – 1700 N.
- Replaced 4,000 LF of 10" steel main with 8" plastic

2012 Replacement

- State St. 400 S. – 2700 S.
- Replaced 14,000 LF of 16" steel main with 4,000 LF of 10" steel and 10,000 LF of 8" plastic



Provo Replacement

2013 Replacement

- 900 S. State St. – 500 E.
Install 2,500 LF of 10" steel main to new regulator station
- Provo River crossing
Replace 1,000 LF of 10" steel main with 8" plastic

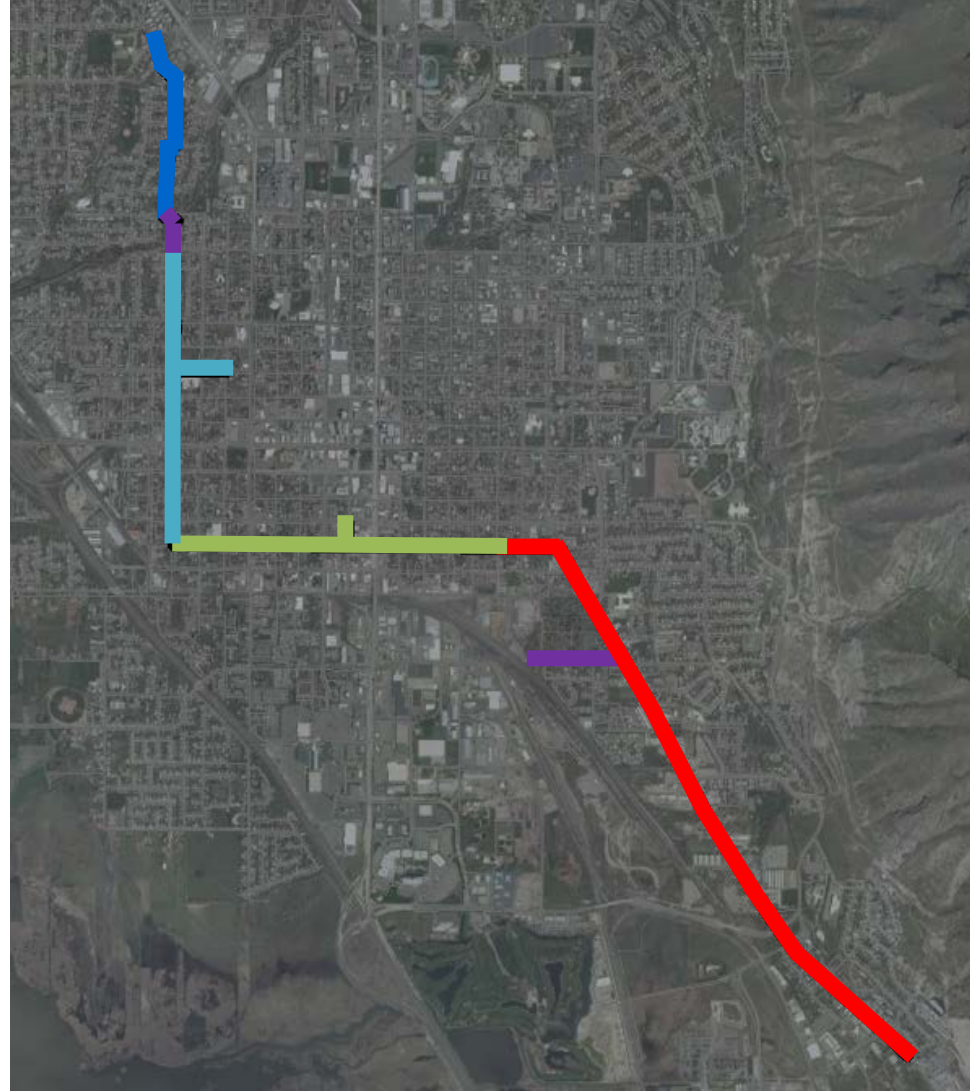
2014 Replacement

- 400 S. 800 W. – State St.
- Replace 5,500 LF of 10" steel main

2015 Replacement

- 800 W. 400 S. – Provo River south
- Replace 6,855 LF of 10" steel main with 8" plastic

COMPLETE!



Salt Lake Replacement

2011 Replacement

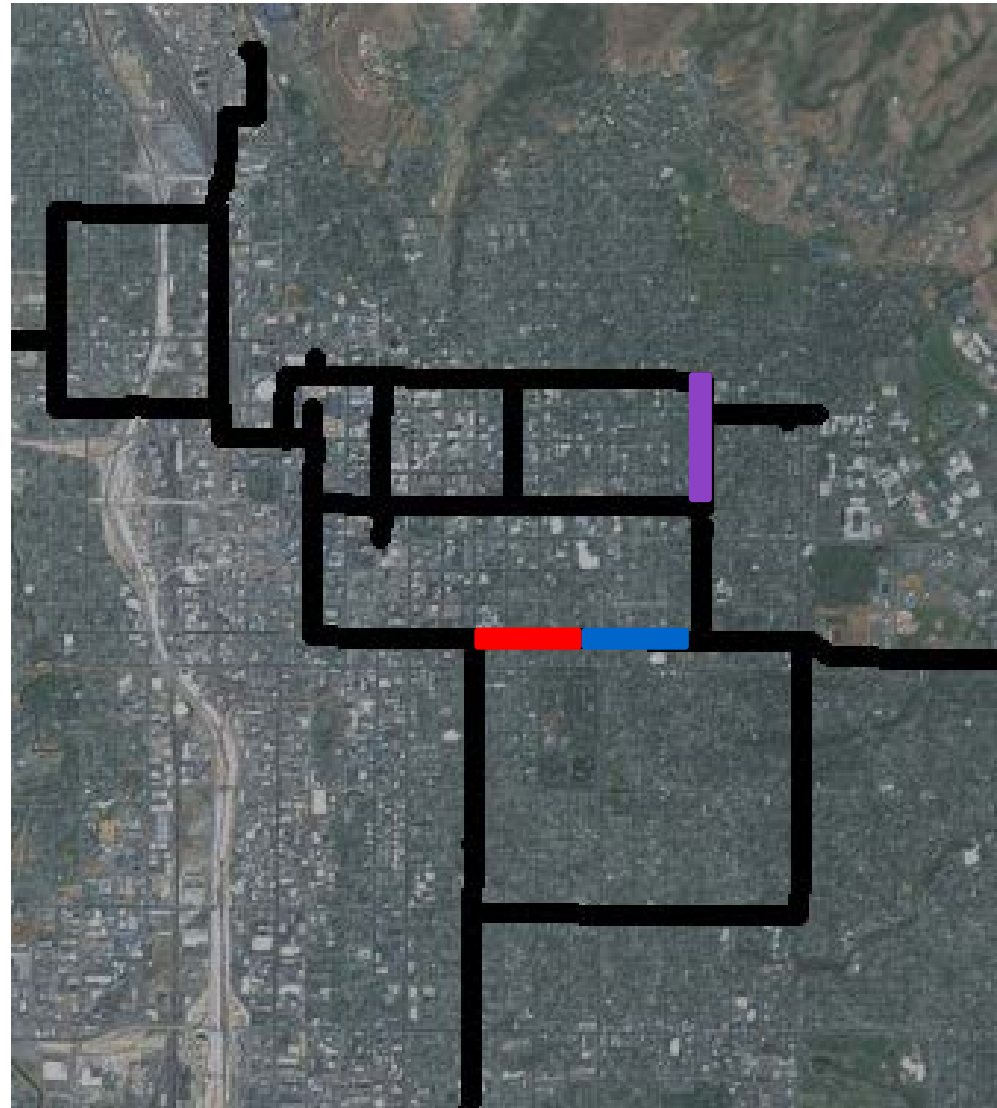
- 800 S. 1000 E. – 700 E.
- Replaced 2,200 LF of 16" steel main (also installed 3,000 LF of 2" plastic)

2012 Replacement

- 800 S. 700 E. – 300 E.
- Replaced 3,300 LF of 16" steel main (also installed 5,500 LF of 2" plastic)

2013 Replacement

- 1000 E. South Temple – 400 S.
- Replace 2,300 LF of 16" steel main (also install 4,500 LF of 2" plastic)



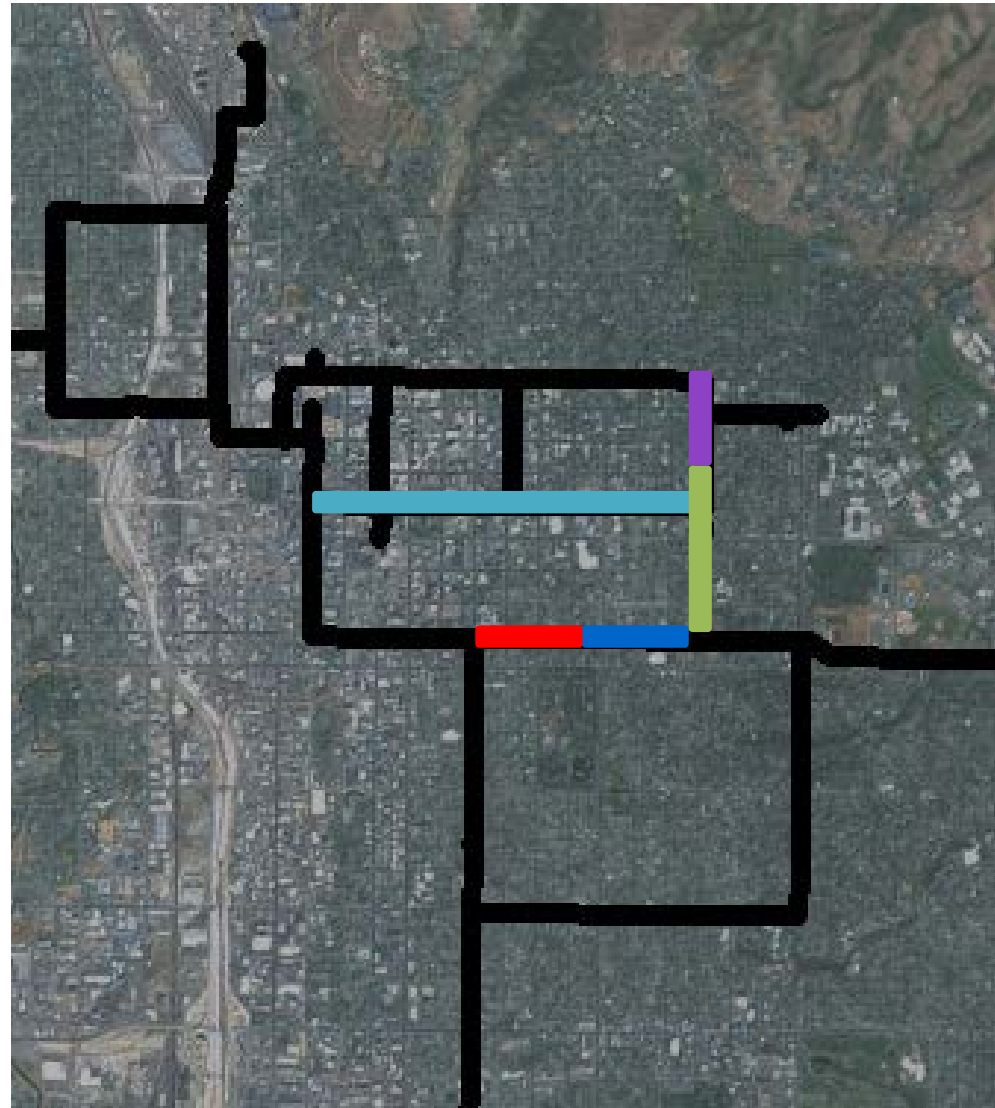
Salt Lake Replacement

2014 Replacement

- 1000 E. 400 S. – 800 S.
- Replace 4,100 LF of 16" steel main (also install 3,000 LF of 2" plastic)

2015 Replacement

- 400 S. 900 E. – 200 W.
- Replace 8,700 LF of 10" steel main with 8" plastic



Summary

- DIMP identifies vintage large diameter IHP mains to have the highest risk score.
- 70 miles of vintage large diameter mains.
- Replacement programs are underway.
- At current rate, replacement will take over 30 years to complete.
- Accelerated replacement warranted.