



# SB 555: Water Loss Performance Standards

Public Stakeholder  
Workgroup Meeting #2

Characterizing Water Loss Control Technologies



# Monitoring

## Desktop analysis

Water  
loss audit



Identifying  
high pressure  
zones



## + Field records

Component  
analysis



Leak flow  
calculations



Leakage/Pressure/Transient  
management software



Advanced metering



Geographic Information Systems

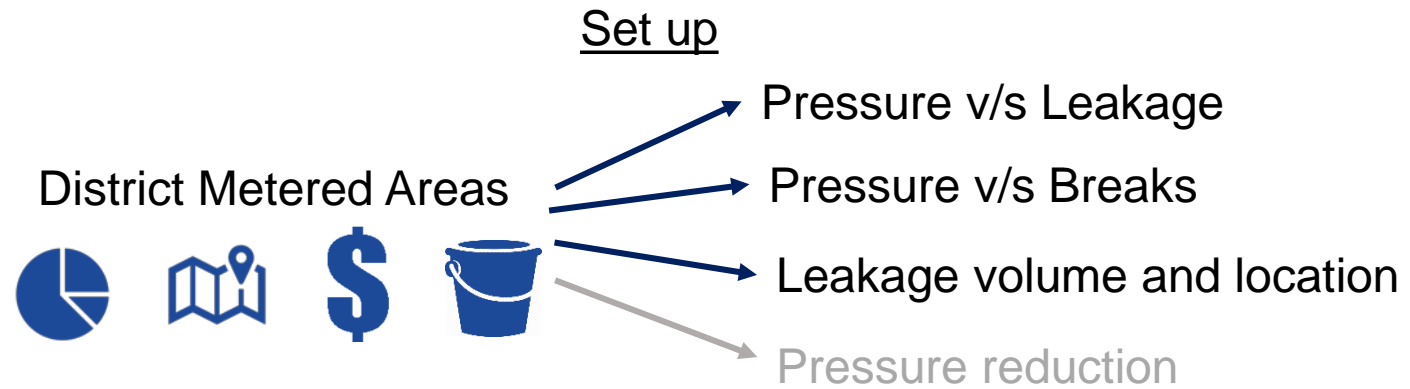


SCADA (Telemetry)

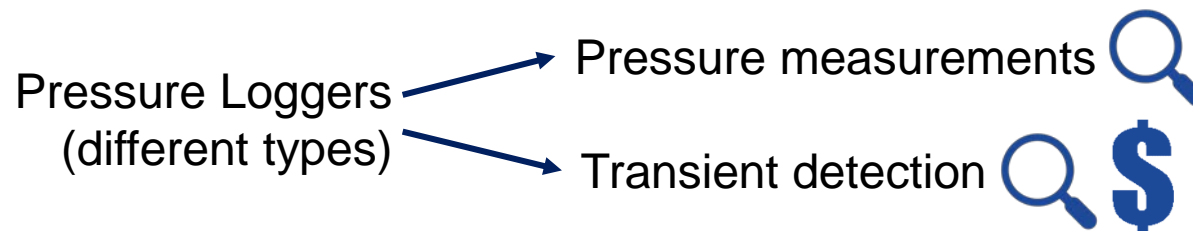


# Monitoring

## Field measurements



## Instruments



Factor is a constraint

Factor is not a constraint except for (text in box)...

Factor is not a constraint

Monitoring

Is it a constraint?	Approach	Factors →	Cost	Hilly terrain	Non metallic pipe material	Clayey soil or Soft surface	Large service area	Large number of pressure zones	High CII/night-time use	Pipe size
Water loss and infrastructure	District Metered Areas								Multiple inflows/ high off-peak use	
	Desktop analysis									
	Software									
	AMI									
	Telemetry/GIS									
Operational pressure	Pressure logging		Large pressure zones*					Cost per end-user		
	Leakage v/s pressure (Pressure Step Test)		Large pressure zones*							
	Breaks v/s pressure							Cost per end-user		
	Software									
Pressure surges	High frequency pressure logging						Cost per end-user	Cost per end-user		

*\*substantially more than 3000 connections in a zone*

# Real Loss Interventions

## Detection

### Acoustic

Ground microphone



Probes



Correlators



Loggers



Transmitters



### Imaging

Ground Penetrating Radar

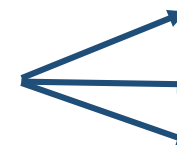


### In-pipe methods

Tracer gas detection



Inline leak detection



Camera

Pressure-based

Acoustic 

**Quick response to repairs and improved recording**

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Control

Is it a constraint?	Approach	Factors →	Cost	Hilly terrain	Non metallic pipe material	Clayey soil or Soft surface	Large service area	Large number of pressure zones	High CII/night-time use	Pipe size	
Leak detection	Inline (Pressure or image-based)									Depends on instrument	
	Gas tracing										
	Acoustic	Ground microphone			Need low frequency detectors						Noise signal lost in transmission pipes (16" or larger)
		Probes									
		Correlator									
		Loggers									
		Transmitters						Cost per end-user			
	Inline						Cost per end-user			Depends on instrument	
Imaging by Radar											
Repairs	Reduce response time + Record-keeping					Cost per end-user	Cost per end-user				

# Pressure Management

## Operational Pressure Reduction

Pressure v/s Leakage  
Pressure v/s Breaks  
Leakage volume and location

District Metered Areas



+ Pressure reduction valves \$

+ Booster stations \$

## Pressure Surges

Operational changes



Avoid rapid closing and opening of valves

Correct level controls for tanks/reservoirs

## Retrofits/Installations

Flywheel

*Slow down pump responses*


Surge tanks


*Divert excess water/pressure*


Relief valves

Check valves

*Slow valve closure*

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Control

Is it a constraint?	Approach	Factors →	Cost	Hilly terrain	Non metallic pipe material	Clayey soil or Soft surface	Large service area	Large number of pressure zones	High CII/night-time use	Pipe size
Operational pressure	Pressure reducing valves			High elevation zones			Cost per end-user	Cost per end-user		
	Booster pumps						Cost per end-user	Cost per end-user		
Pressure surges	Flywheel pumps									
	Backup pump						Cost per end-user			
	Relief valves						Cost per end-user			
	Surge tanks						Cost per end-user			
	Start-stop practices						Cost per end-user			