

Manhole Cover Impact on I&I, SSO's Public Enemy #1

Presented By Eric J. Dupre'

CEO Texas Infra Group, LLC.

**NACE Chairman, SSPC Certified, ACI Certified,
and NASSCO Member**



Presentation Purpose

Discuss the negative impacts of leaking cast-iron manhole covers have on existing sanitary sewer collection systems. How bad can it actually be??

- Costs of Leaking Manholes
- SSO Prevention
- Health & Environmental Impact



What is an SSO's?

Sanitary **sewer overflow (SSO)** is a condition in which **untreated sewage** is discharged from a sanitary **sewer** into the environment prior to reaching **sewage** treatment facilities. Currently we are on the honor system for tracking and reporting.



ASCE Wastewater Report Card



The wastewater letter grade is the lone area of decrease on the Texas Infrastructure Report Card, **dropping from a C- in 2012 to a D in 2017**. This is not just a trend in Houston it's a State problem. Multiple cities in Texas are currently under Federal Court Order CD to fix this same exact problem! Nation wide we have D.

Environmental Impact



Environmental Impact



Environmental Impact



Environmental Impact



Environmental Impact



Environmental & Health Impact



Large City Example City of Houston

LEAKS LEAKS and some more LEAKS!
Where and How Bad?

**The COH collection system has approximately
127,000 existing leaking manhole covers. How
bad do they leak? 45 GPM**

**In a 24hour rain event that's a potential of
8.2 Billion Gallons of Inflow**



New Manhole Cover Compliance Design Standards

Chapter 217.55 Subchapter C

Manhole Covers

- (A) A manhole where personnel entry is anticipated requires a clear opening with at least a *30 inch diameter*.
- (B) A manhole located within a 100-year flood plain must be *gasketed and bolted down to prevent inflow*.
- (C) A manhole cover must be constructed of impervious material with *no holes* that could *allow inflow*.
- (D) A manhole cover that is located in a roadway must meet or exceed the American Association of State Highways and Transportation Officials standard *M-306 for load bearing*

Currently those 127,000 manhole covers do not meet this new code/design standard! In the US there are approx. 22,000,000 existing manholes.

3rd Party Tested by Trenchless Technology Center



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TECHNOLOGY
CENTER.

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2019

LEAK AND LIVE LOAD TESTING OF
MANHOLE LIDS



Key Issues with Manhole Cover Rapid I&I

What does a 45 GPM leak look like???



<https://www.youtube.com/watch?v=SlUjMvKs2o4>

Importance of Material Selection In New Design/Replacement



The majority existing manhole covers are at or beyond life cycle



100% Non-corrosive and
100% Water Tight



Upgrade Options?



I&I Economics 101 \$\$\$

45-85 GPM Leaking reported by SAWS EPA bench flow tests on cast iron vented manholes.

1440 Minutes in 24hr. Rain event period can produce up to **64,800** per single manhole! For every manhole upgraded you get the Highest ROI and make EPA happy.

Cost of current manhole cover asset:

- ✓ Electrical Pumping Costs
- ✓ EPA/TCEQ Fines
- ✓ Chemical Costs at Plants
- ✓ Private Damage Costs
- ✓ Safety Liability Costs
- ✓ Expanding Plant Capacity



ROI Excel Work Sheet \$\$\$

Description	Units	Quantity
Total Defective No. of Leaking Manhole Covers	Each	100,000.00
Leak Rate Per Each Cover GPM	Gallons	45.00
Minutes in 24hr Rain Event Above 1"	Minutes	1,440.00
Total Annual 24hr Rain Events Above 1"	Days	15.00
Total Annual Amount of I&I	Gallons	97,200,000,000.00
Cost To treat, pump, process per 1000 gallons	US Dollar	\$ 1.25
Annual cost of Manhole I&I Leaks	US Dollar	\$ 121,500,000.00
Annual Cost in SSO Fines	US Dollar	\$ 5,000,000.00
Annual Cost of Vehicle/Private Damages	US Dollar	\$ 1,000,000.00
Annual Cost of Owning Each Defective Cover	US Dollar	\$ 1,275.00
Average Cost to Upgrade to SuperCover	US Dollar	\$ 4,500.00
ROI Time Frame	Years	3.53

Recap/Conclusion

1. Stop the “bleeding” aka massive fast moving manhole inflow leaks.
2. Upgrade Manhole Covers to leak free non-corrosive.
3. Update your old outdated design specs and standards.

Better for your:

- ✓ Sewer System
- ✓ Environment / Health
- ✓ Tax Dollars



What a City Sewer Utility Director has to say about it



[https://www.facebook.com/cityofgalveston/
videos/458815206138431](https://www.facebook.com/cityofgalveston/videos/458815206138431)



**Special thanks to UCT for allowing me to
present at such a great industry event.**

Any Questions or comments???

More info at
TexasInfraGroup@gmail.com
Eric Dupre'

