

Goodbye I&I

Challenges & Lessons Learned Fighting I&I

By: Truckee Sanitary District



PRESENTERS



Blake Tresan, P.E.
General Manager



Raymond Brown, P.E.
District Engineer



Eric Sundale
O&M Superintendent

Presentation Outline

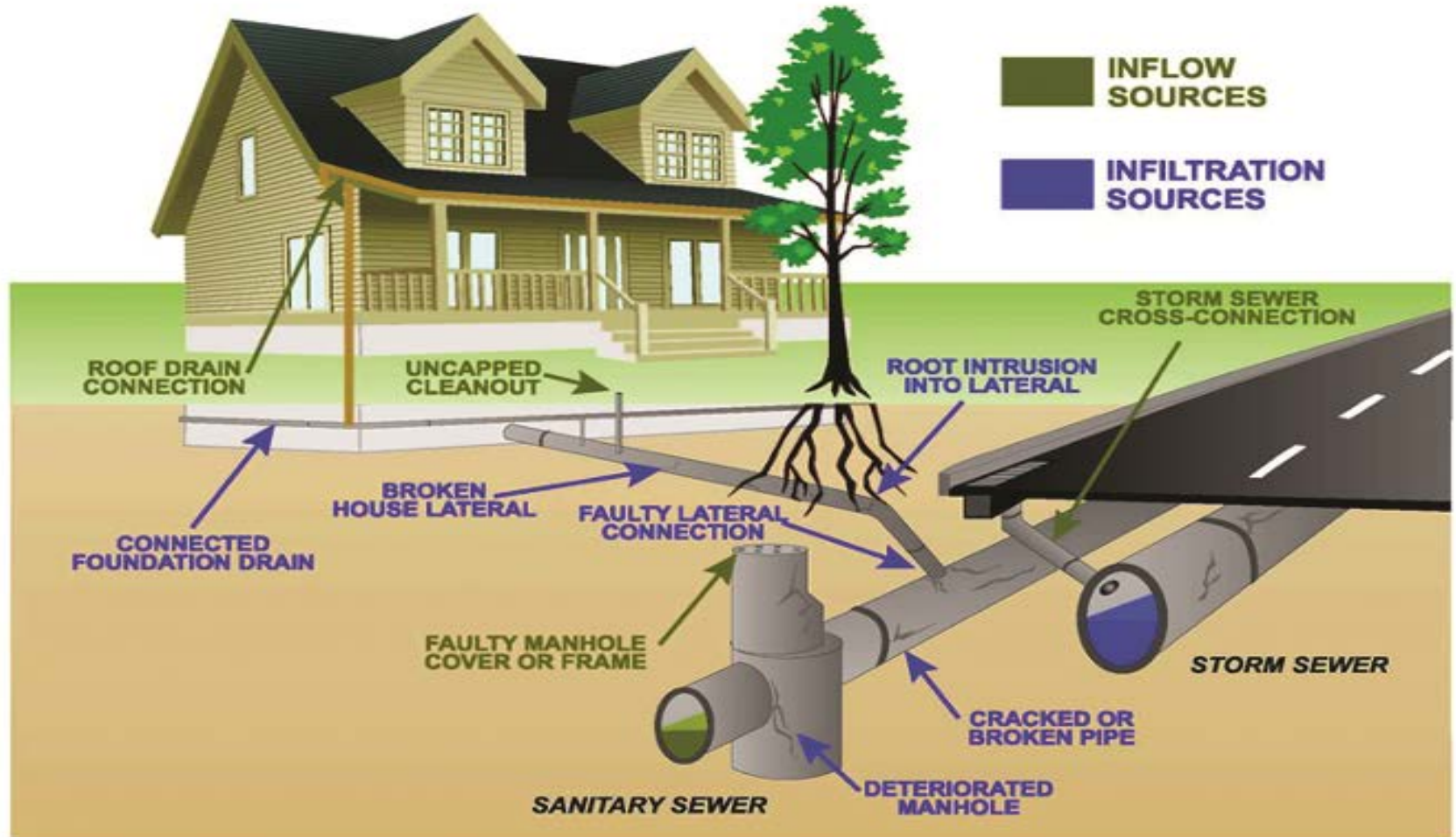
- What is I&I and Why is it a Problem
- Who is TSD
- TSD I&I Monitoring
- TSD I&I Prevention
- Take Home Message
- Questions

What is I&I?

Infiltration / Inflow Services

**INFLOW
SOURCES**

**INFILTRATION
SOURCES**



Problems with I&I

- Spills
- Backups
- Costly Oversizing & Operation of:
 - Collection System
 - Pumping Station
 - Treatment System
- Fines & Claims
- Public Perception / Trust

October 24, 2021 Rain Event

CIWQS

- 118 SSO Locations
- 15,000,000 Gallons Spilled
- 9,000,000 Gallons Reached Surface Water

California Integrated Water Quality System Project (CIWQS)

Spill Public Report – Summary Page

Here is the summary page with the results of your spill public report search. These results correspond to the following search criteria:

SEARCH CRITERIA: [REFINE SEARCH](#)

- Spill Type (No. 0411_23)
- Start Date (10/23/2021)
- End Date (10/26/2021)

Please see the [Glossary of Terms](#) for explanations of the search results column headings. [More information about the report is found at the bottom of this page.](#)

Note: For the "Collection System Performance Report" column, the Performance report will only show the most recent 12 months of data if in the original SSO Interactive Report search the date range was not specified.

[VIEW PRINTER FRIENDLY VERSION](#) [REPORT THIS REPORT TO ECHO](#) [REPORT ALL SPILL DETAILS TO ECHO](#)

Region	Responsible Agency	Collection System	Total Number of SSO Locations	Total Vol of SSO (Gall)	Total Vol Recovered (Gall)	Total Vol Beach Surface Water (Gall)	Percent Beach Surface Water Recovered	Percent Beach Surface Water Spilled	Miles Sewer	Miles Gravity Sewer	Miles of Laterals	Number of Pump Stations	WQID	Collection System Performance Report
1	Headlands City	Headlands City CA	1	14	14	0	100	0	2.9	54.0	54.0	10	138010037	Operational Performance
2	Benicia City	Benicia City CA	2	3,450	3,450	0	100	0	8.0	145.0	22.0	23	288010095	Operational Performance
2	Burlingame City PWD	Burlingame City CA	1	73,500	0	73,500	0	100	6.1	81.4	31.0	7	255010099	Operational Performance
2	Central Contra Costa Sanitary District	Central Contra Costa Sanitary District CA	2	3,305	0	3,305	0	100	25.0	1,512.0	0.0	18	288010105	Operational Performance
2	City of Pacifica	City of Pacifica CA	2	2,983,036	0	2,983,036	0	100	4.2	96.0	0.0	5	255010100	Operational Performance
2	East Bay MUD (CS & SSOs)	East Bay MUD (CS & SSOs) CA	1	15,000	0	15,000	0	100	9.0	29.0	0.0	15	255010131	Operational Performance
2	Fairfield City	Fairfield City CA	1	10,754	0	10,754	0	100	0.0	259.0	156.0	0	255010134	Operational Performance
2	Las Gaitinas Valley Sanitary District	Las Gaitinas Valley Sanitary District CA	2	3,975	0	3,975	0	100	6.7	105.0	0.0	20	255010147	Operational Performance
2	Marin City Sanitary District 5	Marin City Sanitary District 5 CA	4	1,550	25	1,500	1	96	2.4	28.5	0.0	22	255010151	Operational Performance
2	Millbrae City	Millbrae City CA	1	204,200	0	204,200	0	100	1.0	55.0	22.0	3	255010155	Operational Performance
2	Mt View City	Mt View City CA	2	3,808	0	3,808	0	100	2.0	73.0	0.0	4	288010158	Operational Performance
2	Napa Sanitation District	Napa Sanitation District CA	1	9,175	0	9,175	0	100	1.0	271.0	147.0	4	255010159	Operational Performance
2	Novato Sanitary District	Novato Sanitary District CA	1	1,240	0	1,240	0	100	23.0	212.0	0.0	39	288010162	Operational Performance
2	Oakland City DPW	Oakland City DPW CA	10	1,039,275	374	1,031,421	0	99	1.4	931.3	0.0	11	288010204	Operational Performance
2	Palo Alto City	Palo Alto City CA	2	365	360	0	98	0	0.3	217.0	86.0	1	255010164	Operational Performance
2	Petaluma City PWD	Petaluma City PWD CA	8	224,325	0	224,325	0	100	4.73	191.37	0.0	9	288010165	Operational Performance
2	Piedmont City	Piedmont City CA	1	70	0	0	0	0	0.0	48.7	0.0	0	288010166	Operational Performance
2	Pleasanton City	Pleasanton City CA	1	1,000	500	0	50	0	0.3	50.0	1.0	2	255010112	Operational Performance
2	Richmond City	Richmond City CA	4	1,050,645	0	1,050,645	0	100	4.1	103.0	0.0	13	255010170	Operational Performance
2	Ross Valley SSO	Ross Valley SSO CA	4	153,300	0	153,300	0	100	7.39	196.0	0.0	19	255010172	Operational Performance
2	San Bruno City	San Bruno City CA	1	3,600	0	3,600	0	100	7.0	87.0	0.0	6	288010176	Operational Performance
2	San Francisco Public Utilities Commission	San Francisco Public Utilities Commission CA	2	7,400,000	6,000,000	1,400,000	81	10	12.0	947.0	1,046.0	25	255010193-C	Operational Performance
2	San Jose City	San Jose City CA	1	1,250	144	1,106	11	88	11.0	2,030.0	0.0	17	288010179	Operational Performance
2	San Mateo City	San Mateo City CA	1	1,250	144	1,106	11	88	11.0	2,030.0	0.0	17	288010179	Operational Performance

CIVIL LIABILITY for SSO's

\$10,000/day

Plus

\$10/gal for SSO's > 10,000gal

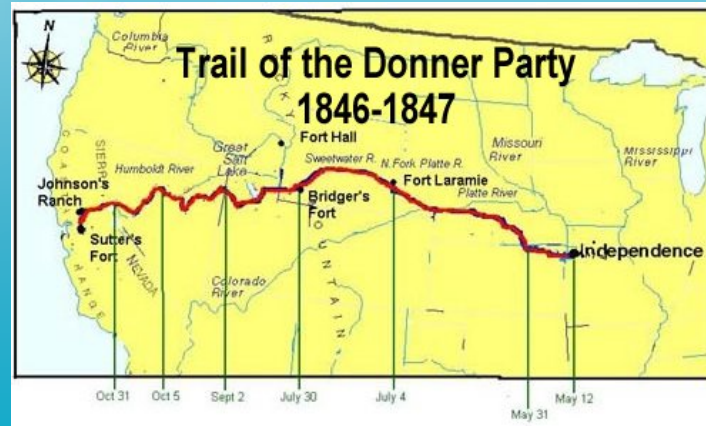
Example:

1 Day 500,000 gal SSO = \$10,000 + \$4,990,000 = \$5.0M

TRUCKEE SANITARY DISTRICT

Formed in 1906

TSD
California





No. 6. South Cesspool, Truckee Sanitary District
Looking Upstream.
(Taken by C.G. Gillespie, Oct. 20, 1917.)

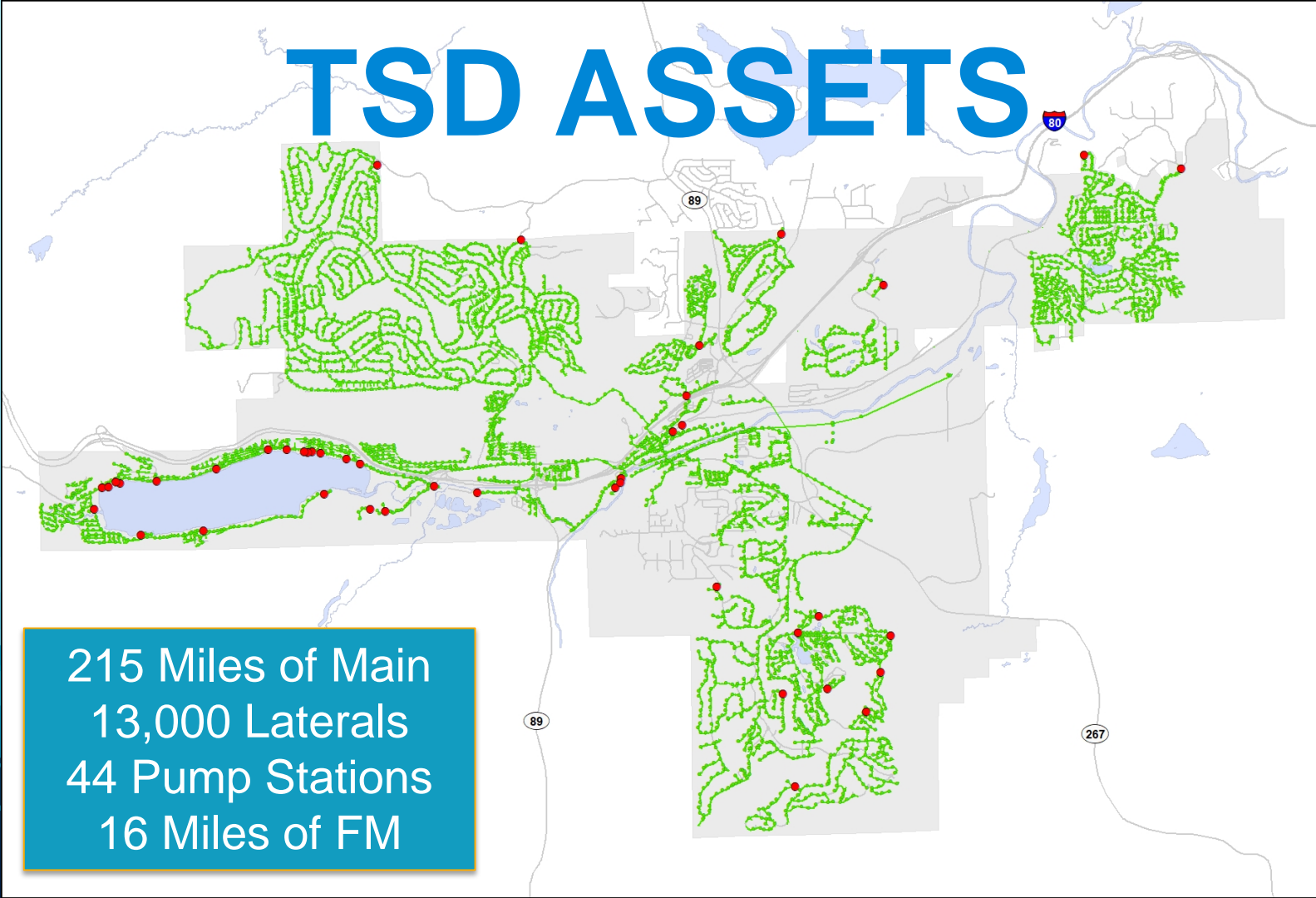
Picture is reversed. Note pond, formed by
a Power dam just below.



TRUCKEE RIVER & DONNER LAKE



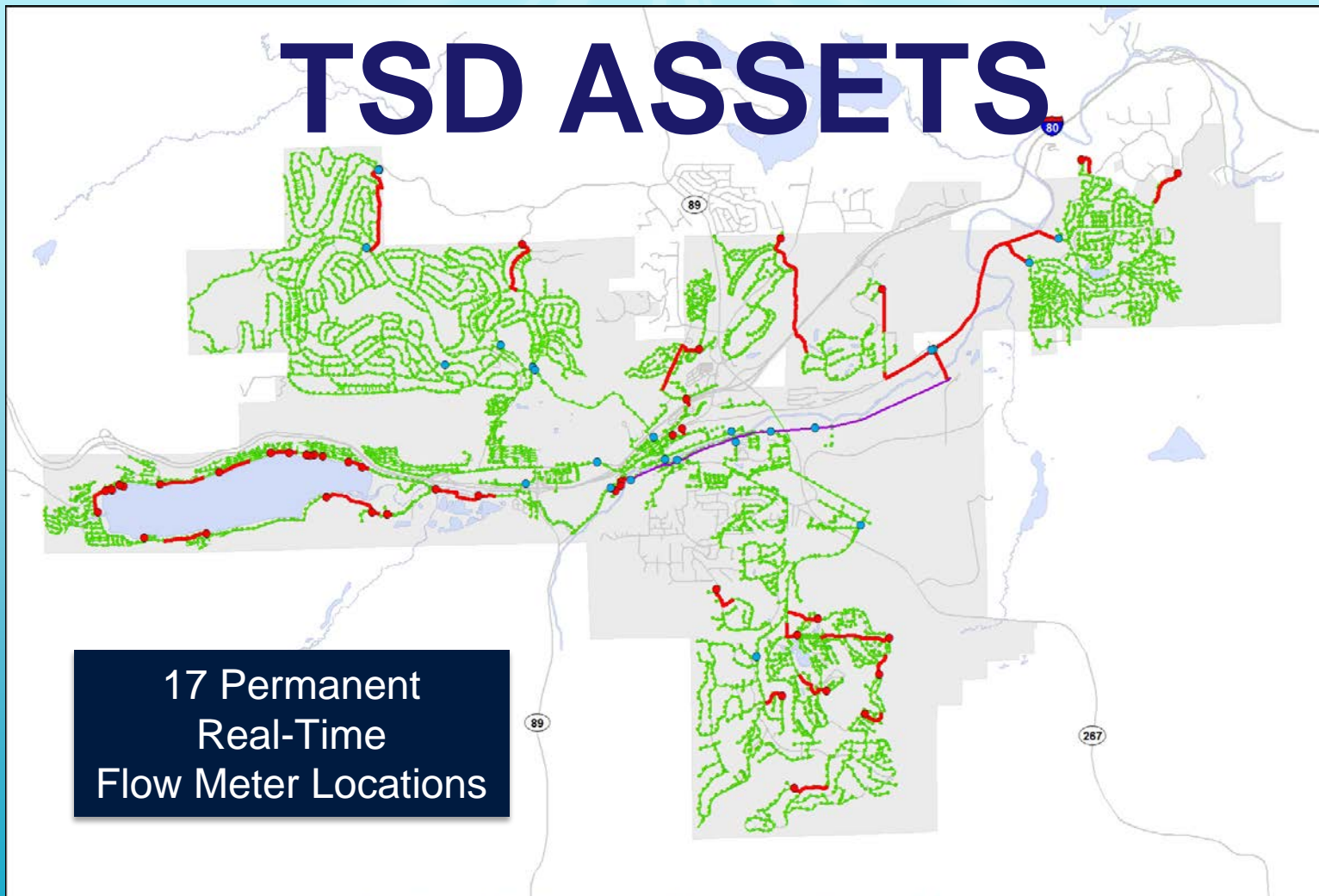
TSD ASSETS

A map showing the distribution of TSD assets. Green lines represent the main sewer lines and laterals, forming a complex network across the area. Red dots indicate the locations of 44 pump stations. The map includes major roads like Highway 89, Highway 80, and Highway 267, as well as several bodies of water. The assets are spread across various land parcels, some of which are shaded in light gray.

215 Miles of Main
13,000 Laterals
44 Pump Stations
16 Miles of FM

TSD ASSETS

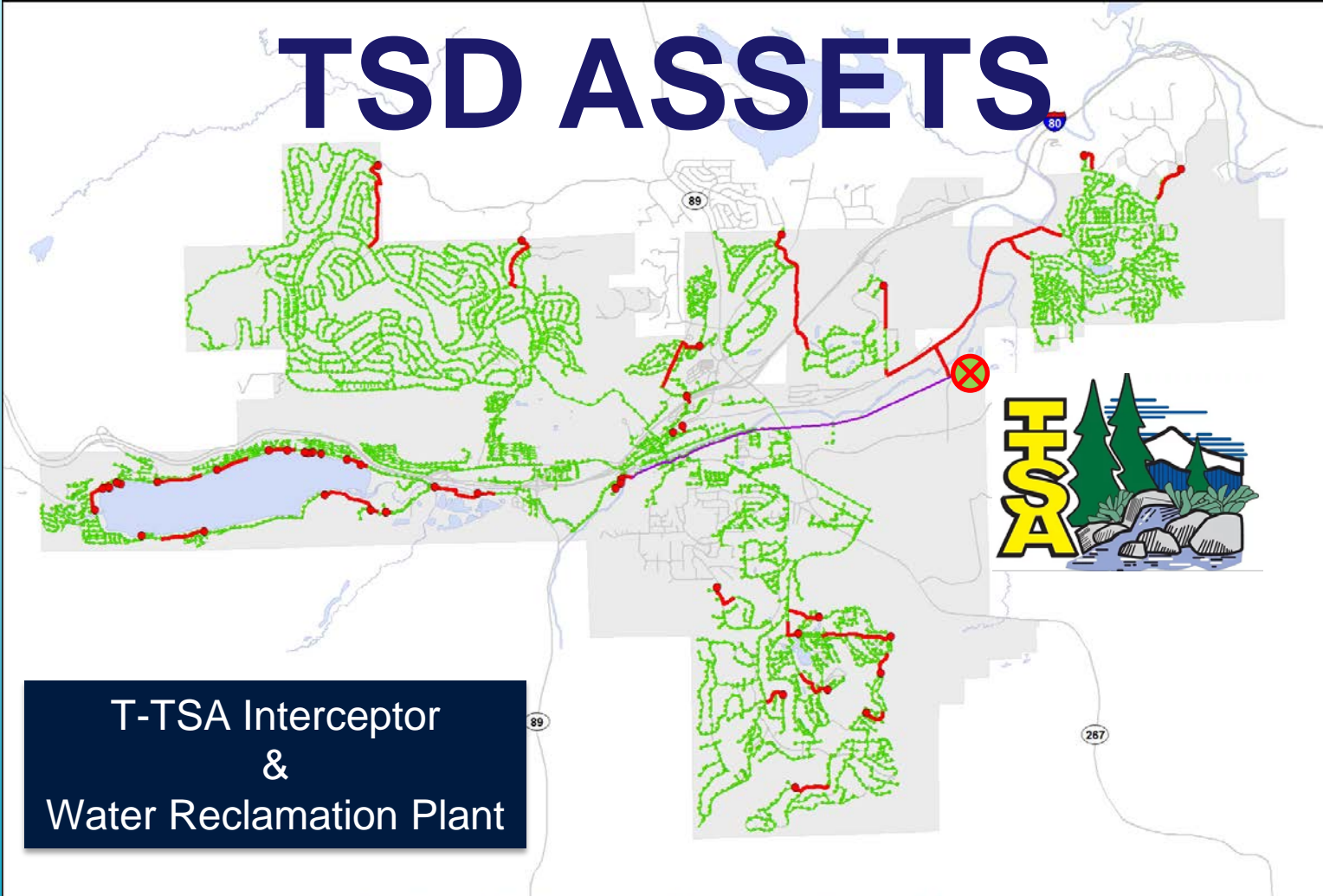
17 Permanent
Real-Time
Flow Meter Locations



Lift Stations



TSD ASSETS



T-TSA Interceptor
&
Water Reclamation Plant

I&I Prevention



New Construction

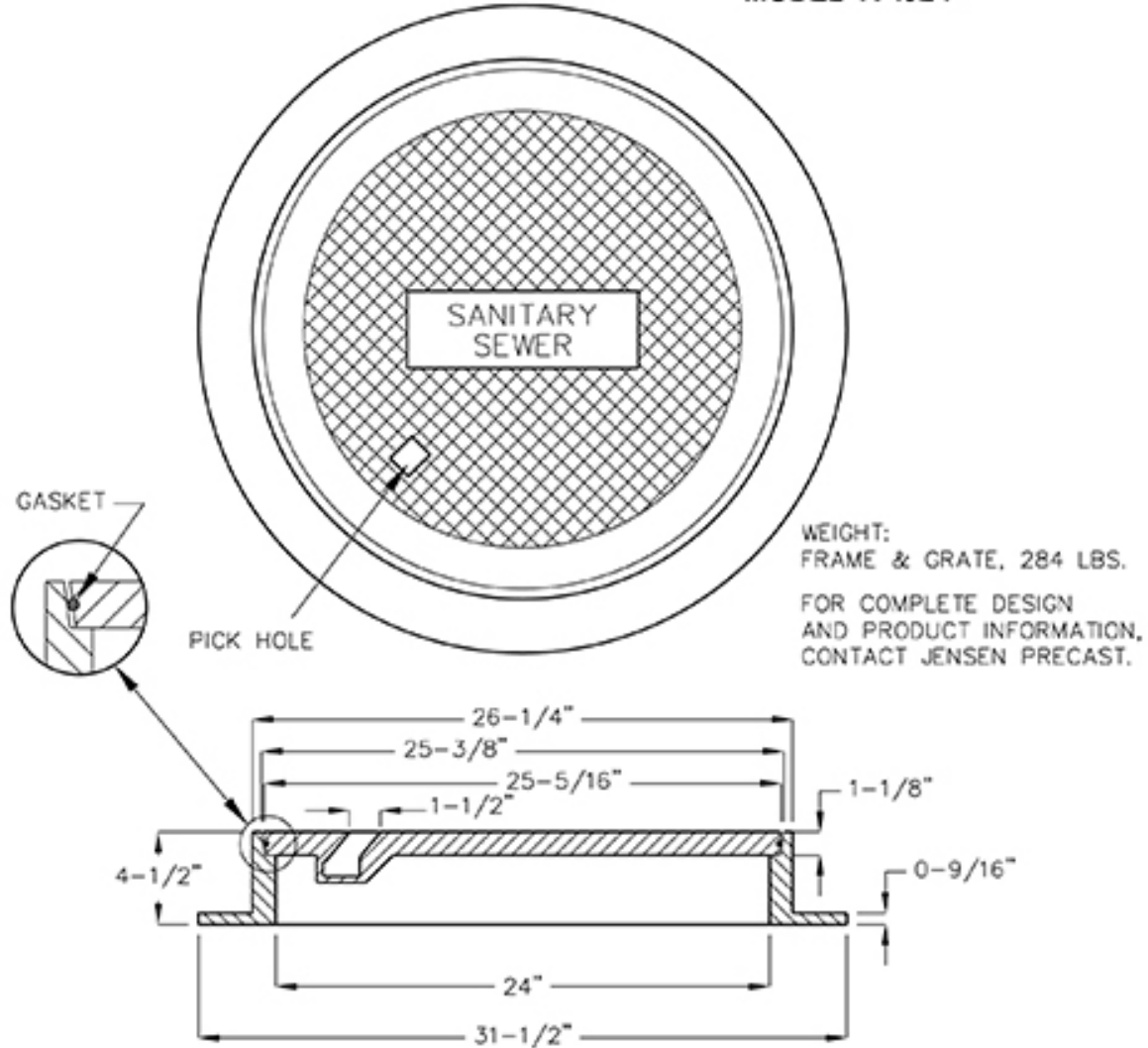
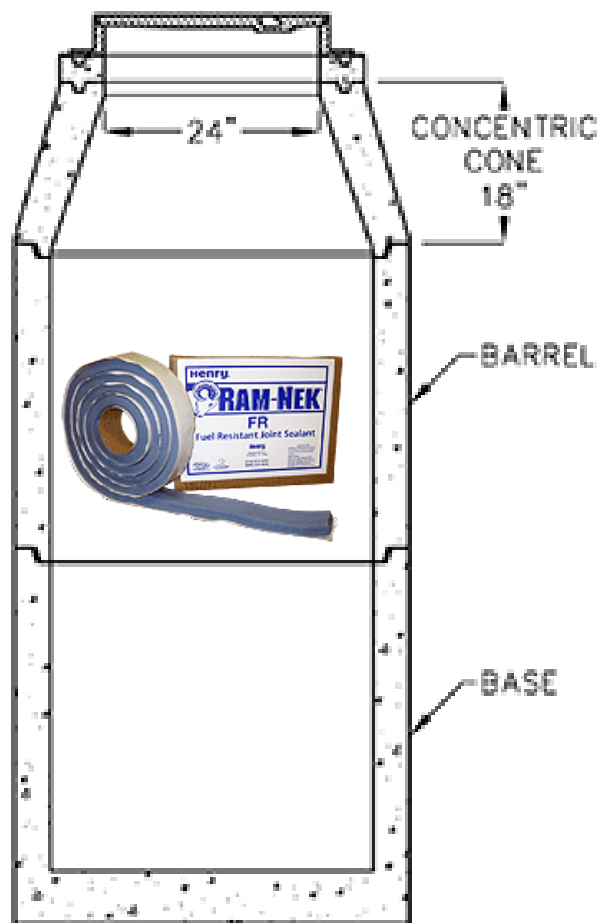
Specifications

Inspection

→ Visual

→ Pressure

→ Tele vise

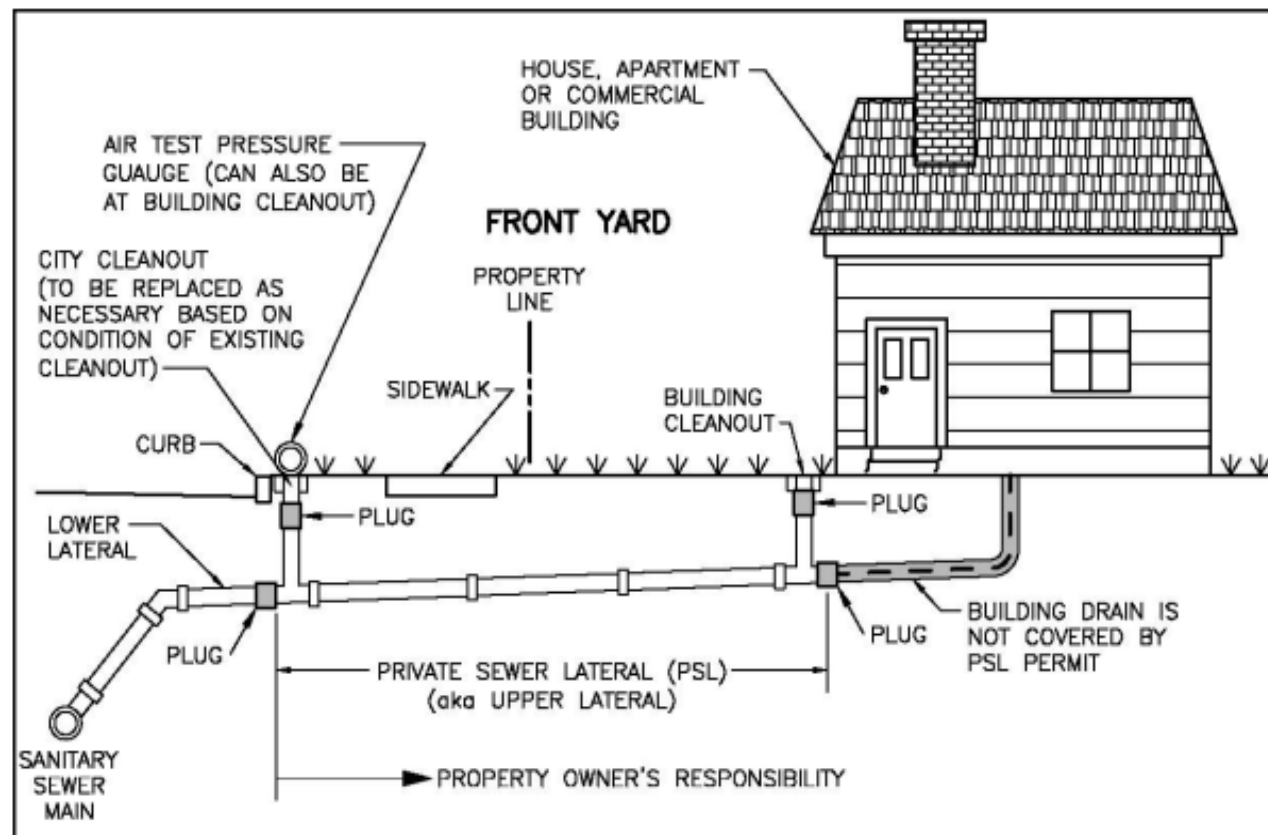


I&I Prevention Chimney Seals





Private Lateral Testing Program



1. Point of Sale
2. Construction
3. Reasonable Cause

I&I Prevention – Conditional Assessment

Mains

Manholes

Laterals



I&I Prevention

Manholes

Drill & Grout

Sewer Mains

Dig & Replace

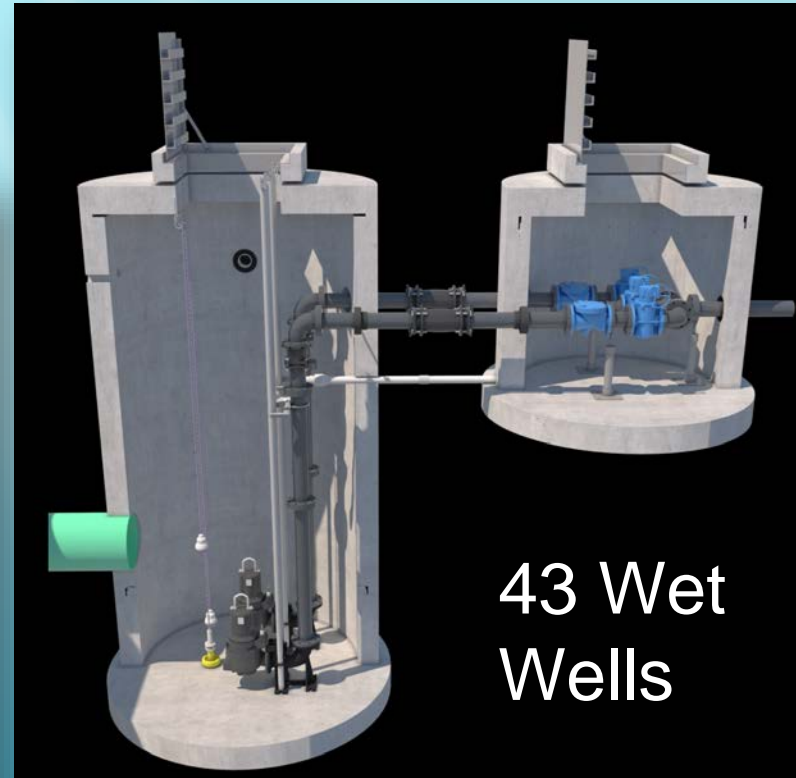
Liners

Sectional Liners



FLOW MONITORING

23 Flow Meters



43 Wet Wells

Sewer Flows Influenced by Tourism

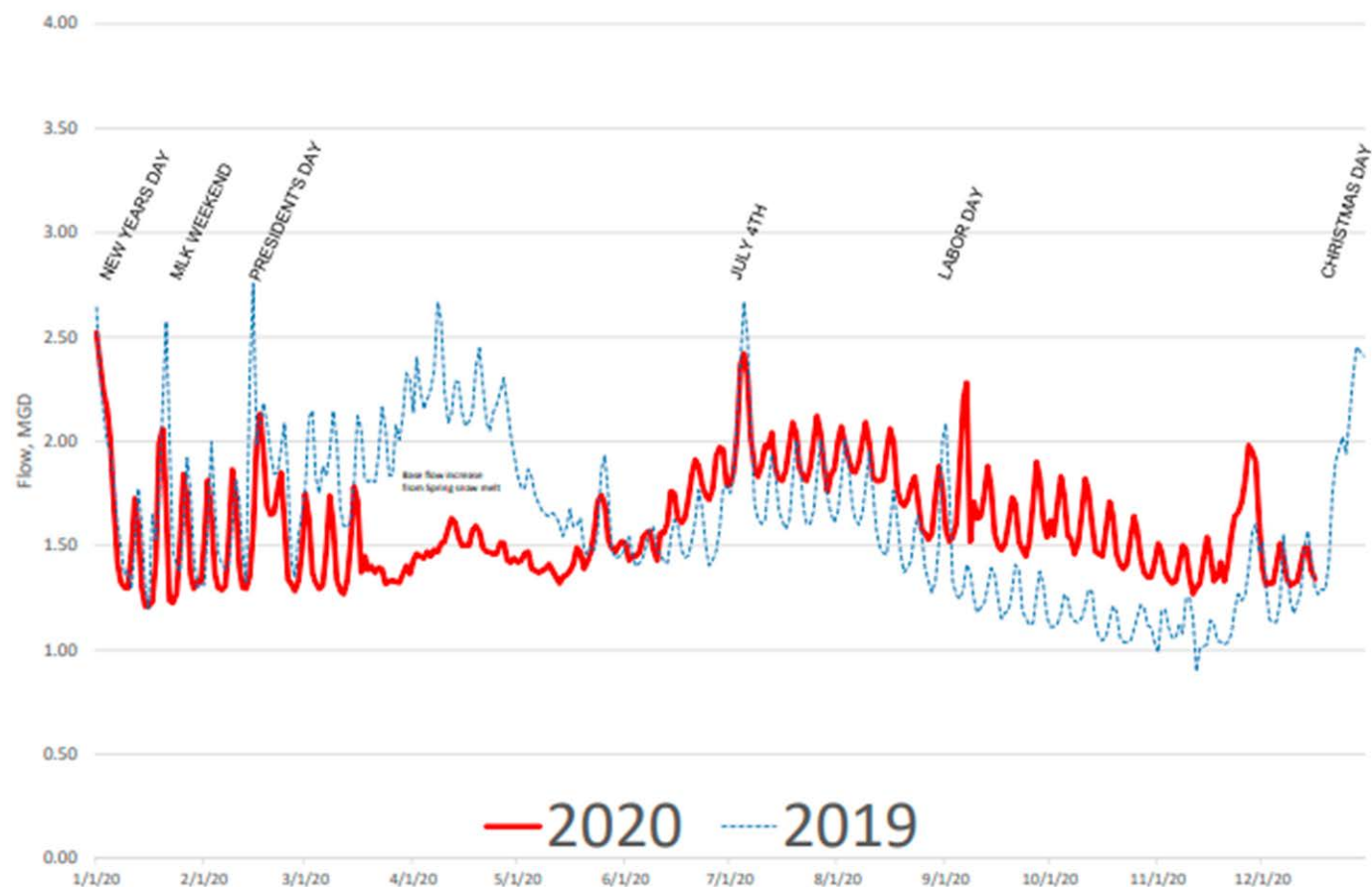
Weather (I&I)

Rain, Snow, Rain on Snow, Snow Melt



TSD Sewer Flows

TRUCKEE SANITARY DISTRICT DAILY FLOWS



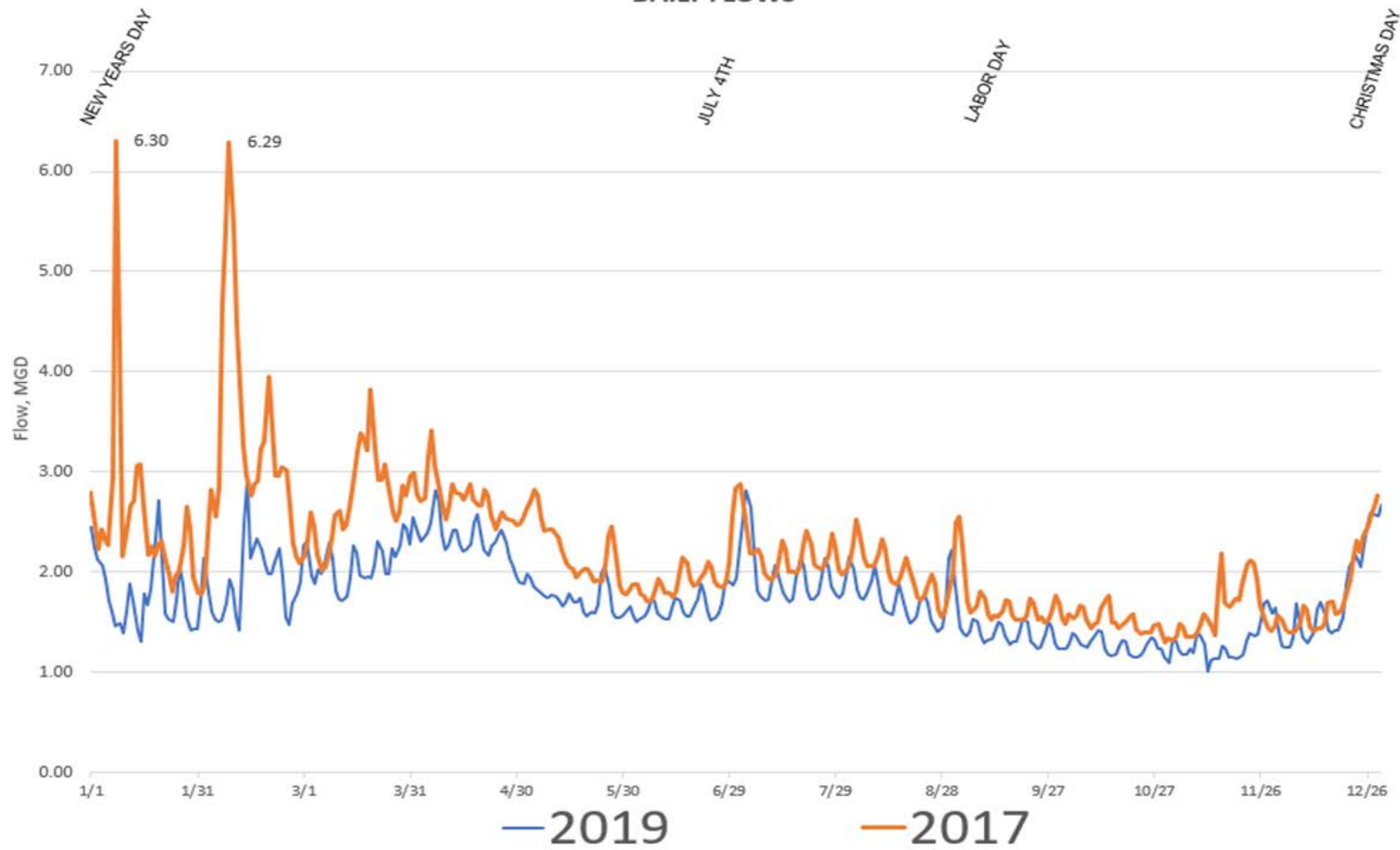
I&I Analysis

Read Charts (Daily)

After Storm Events

1. Total Flow by Meters
2. I&I Flow by Basin (Subtract DWF)
3. I&I Flow by Basin per MH
4. I&I Flow by Basin per MH per Rainfall Intensity

TRUCKEE SANITARY DISTRICT DAILY FLOWS

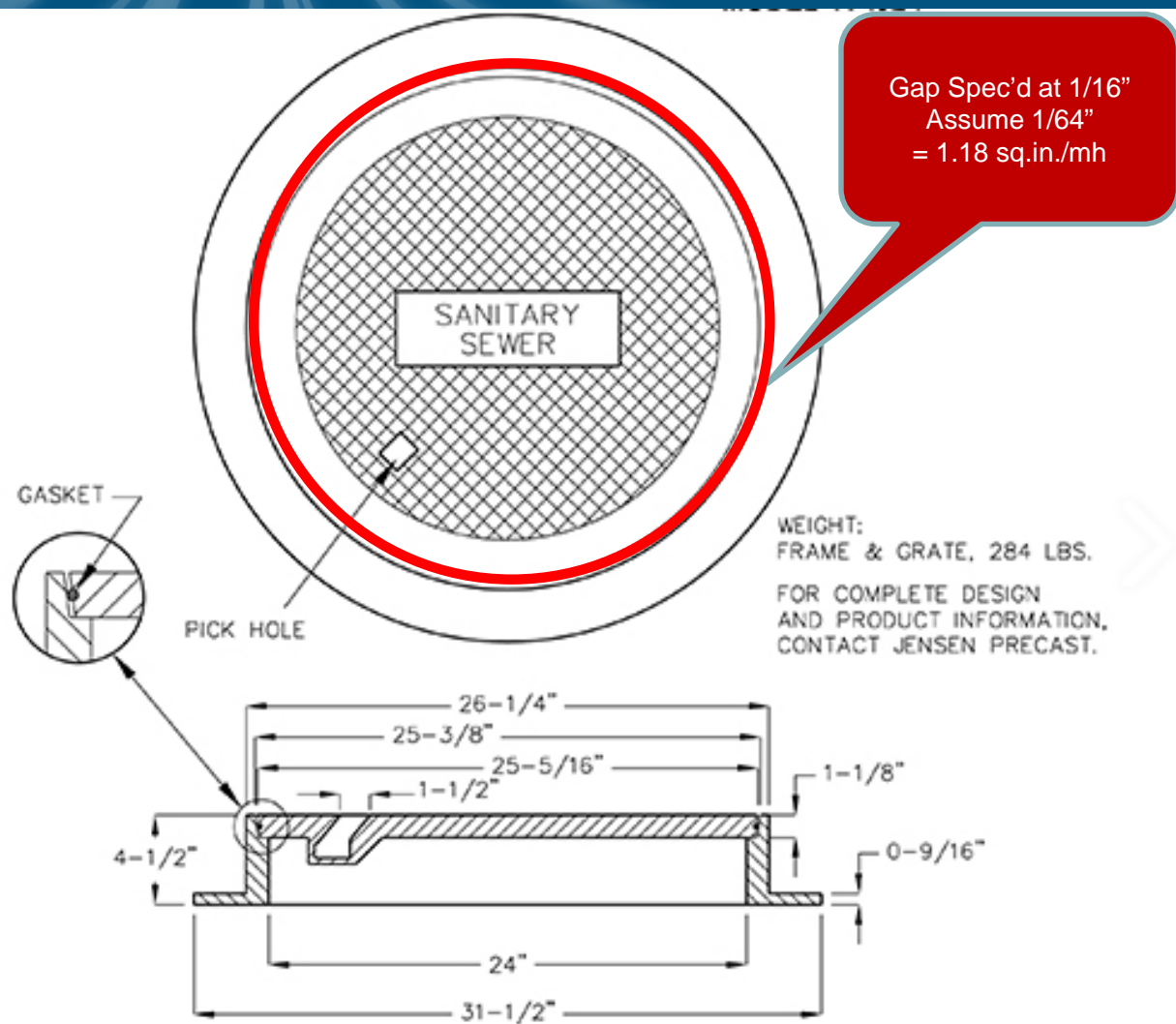
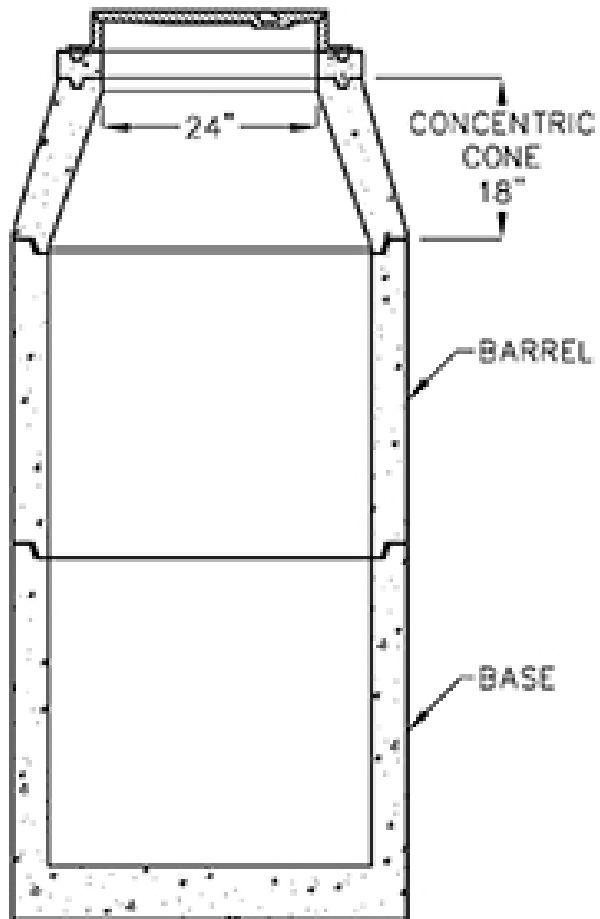


I&I Meeting

I&I Flow Response Associated with PPT Events

- ✓ Lateral Cleanouts
- ✓ Roof Drain Connections
- ✓ Sump Pumps
- ✓ Mahole Covers
- ✓ Manhole Chimneys













343.4 FT.

04:59 AM
06/18/11



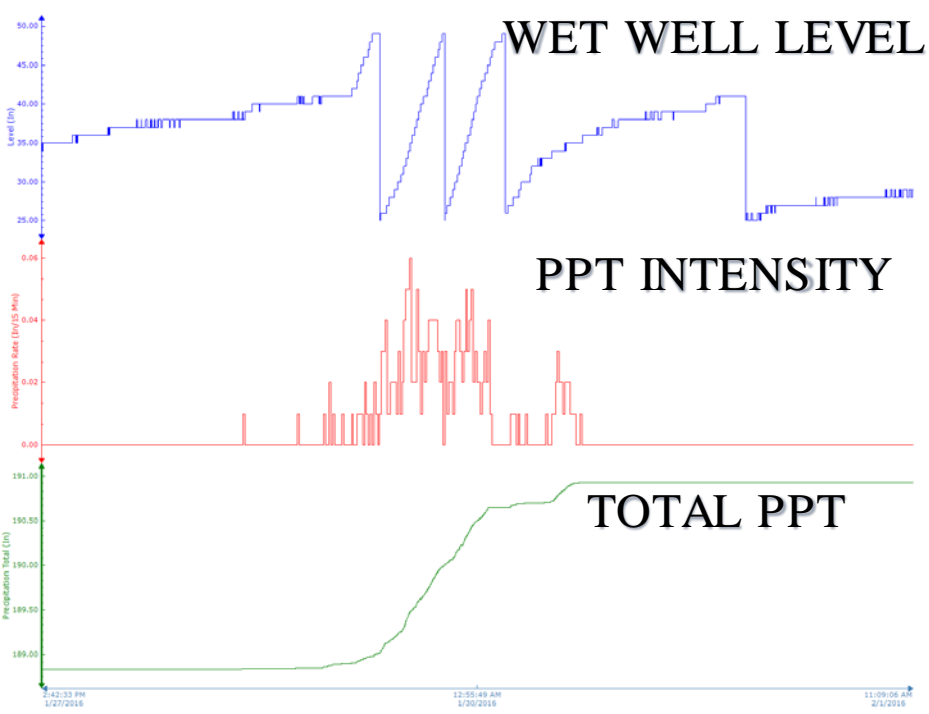




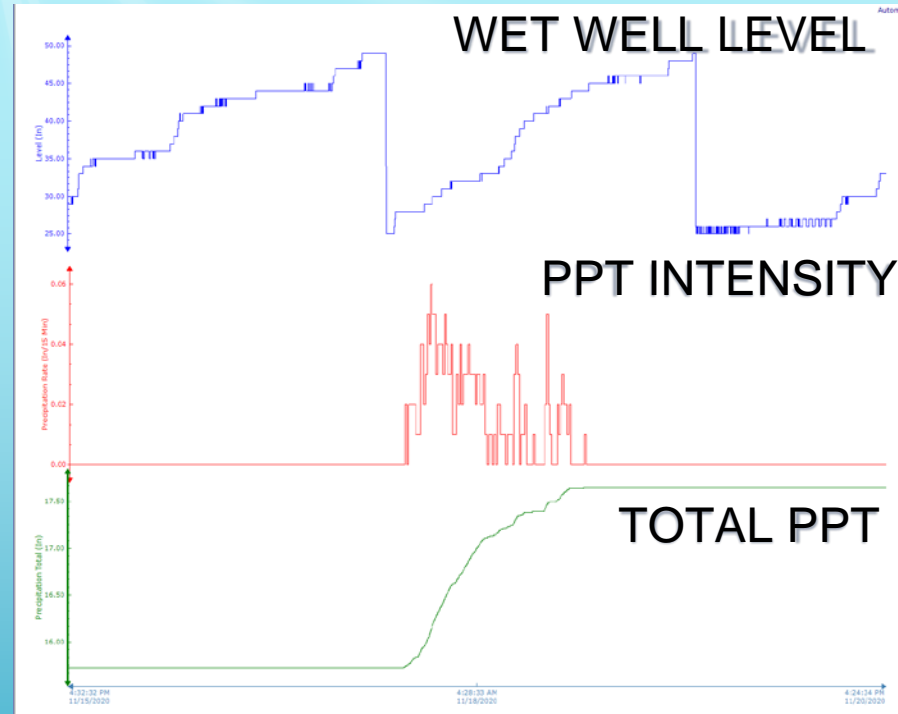
3 RESIDENCES

12 MANHOLES

PUMP STATION



BEFORE



AFTER

Effect Of MH Sealant 2 - inch Rain Event


Neck/Shoulder Strain

Back Strain

Stuck
Covers?

CSRMA REPORTED OVER 25 CLAIMS FROM STUCK MH COVERS SINCE
2020 AT APPROXIMATE \$15K PER CLAIM





IDEA PORTAL

Have an Idea?

Are you a Plumber that has invented a new product (or tool) that solves a problem at the jobsite? Are you an inventor that has created a new plumbing product that will improve people's lives? If the answer is yes, Oatey would like to hear from you. Oatey encourages and welcomes unsolicited ideas. We love the opportunity to review new inventions and patents from our customers and inventor community to see if we can collaborate together and bring a great new innovation to market. Please use the form below to submit your idea to Oatey.

How it works:

Step 1:

Submit Your Solutions:

Simply complete our Idea Submission Form, Agree to Terms/Conditions and click Submit. You will immediately receive an e-mail confirmation that Oatey has received your idea submission.

Timeline: Minutes

Step 2:

Initial Evaluation:

Once your idea is received, it is forwarded to our Idea Review Council. The council reviews your idea to see if it is a fit with our strategy, product lines and other metrics. If there is a fit, your idea will move onto step 3.

Timeline: 6-8 Weeks

Step 3:

Business Team Review:

After passing the initial review with our Idea Review Council, your idea will move into the business teams for a more in-depth evaluation. At this time, Oatey may enter into a nondisclosure agreement with you to enable sharing of confidential information between both parties. The team will perform an intensive evaluation of the opportunity and develop a business plan to determine if the idea could be launched as a marketable product.

Step 4:

Agreements and Commercialization:

We would seek to form the proper business agreement with you. These agreements can take many different forms including development agreements, licensing deals, etc. With the proper agreements in place, the team would work towards commercialization and distribution of the product.

Timeline: 6+ Months



SELL SHEET

SHUTOUT™

Manhole Lubricant & Sealant

Hercules Shutout seals and lubricates manhole covers to reduce inflow. Shutout is a safe, jobsite ready solution compatible with most manhole installations.**

PRODUCT HIGHLIGHTS

Stops Inflow

Significantly reduces inflow at application*

Safety

Lubrication aids in easy removal of manhole covers enhancing safe removal for maintenance

Universal Application

Compatible with most existing manhole installations** including those with or without a gasket, and can be applied to wet and dry surfaces between 30°F and 150°F

Jobsite Ready

Allows for easy transportation on the road, no measurements or planning needed ahead of time

Easy Application

Application offers immediate benefits with little to no training needed



*At initial application. Monitor to reapply as needed

**Not compatible with the revolutionary access design and some t-style gaskets

Part Number	Description	Case Pack	UPC
25420	10 OZ HERCULES SHUTOUT	12	032628254206



Call your Oatey Sales Representative
for more information.

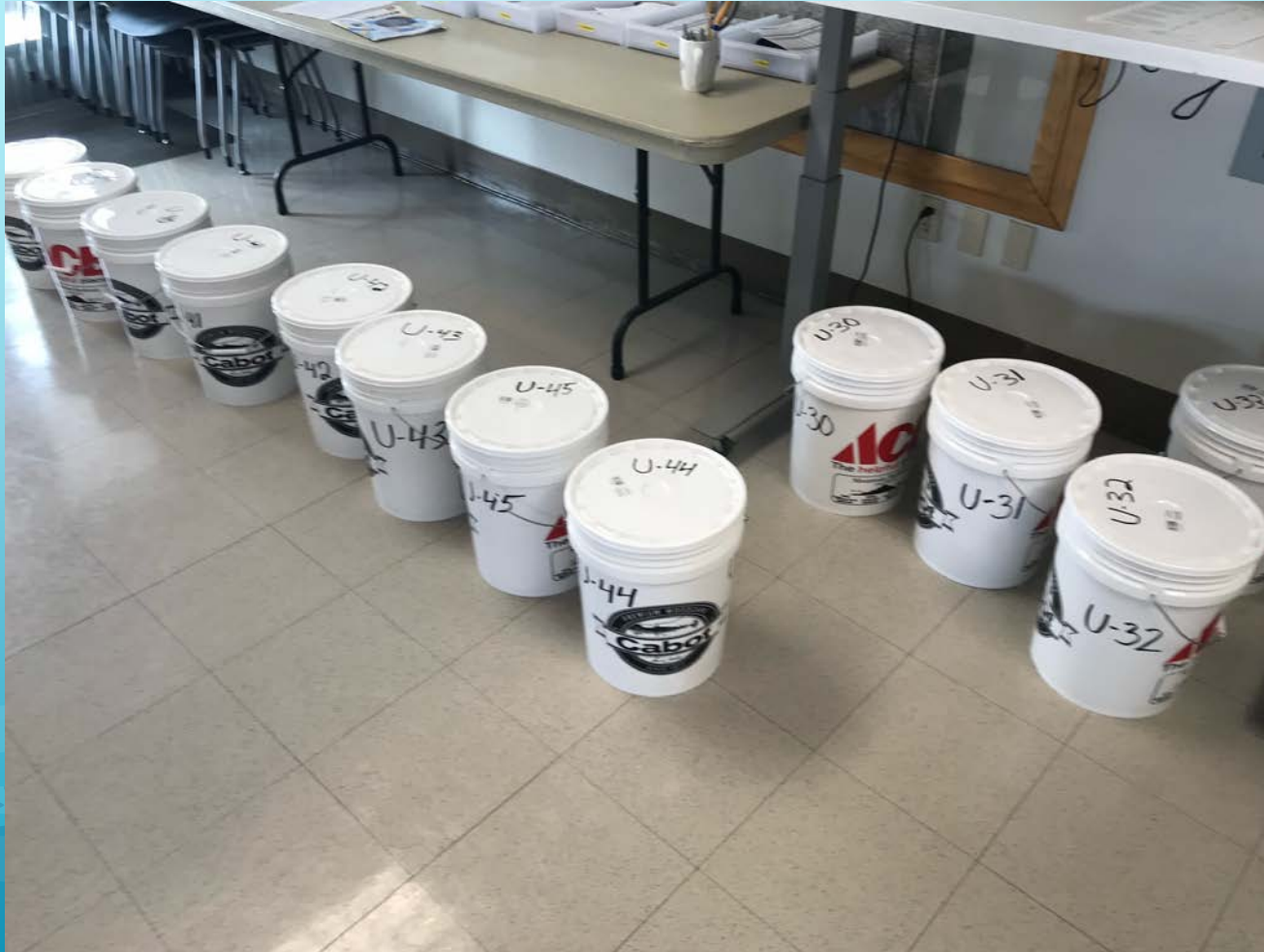
Find us on [Facebook](#) [Twitter](#) [Instagram](#) [YouTube](#)

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Standard Operating Procedures

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The Goodbye I/I Award

Matt Ruge, Ryan Clifton, Rene Lopez, Mike Donchez, Eric Sundale, Ray Brown, and Blake Tresan
for
Re-purposing thread-sealing compound to eliminate inflow and infiltration and prevent odors

TAKE HOME LESSONS

- ❖ I&I is a problem – spills, backups, costly oversizing
- ❖ Rainfall induced inflow is responsible for the largest I&I flow spikes
- ❖ The gap in manhole covers and frames is a potentially significant source of rainfall induced inflow
- ❖ A manhole sealant/lubricant seals this gap with minimal material and labor costs
- ❖ Manhole sealant/lubricant also stops odors and can reduce worker injuries due to stuck lids

I&I TAKE HOME LESSONS

“An Ounce of Prevention is Worth a Pound of Cure”

- Have Good Specs
- Inspect before Accepting
- Adopt a Private Lateral Testing Program
- Seal Manholes

Monitor Flows & Prioritize Problem Areas

- Flow Meters
- Pump Stations
- Smoke Testing

Thank You!



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Eric Sundale, O&M
Superintendent

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esundale@truckeesan.org

An underwater scene with a light blue background. Sunbeams radiate from the top center. The bottom is dark blue with silhouettes of coral, seaweed, and rocks. Several small fish are swimming. Bubbles are visible on the left and right sides.

Q&A