

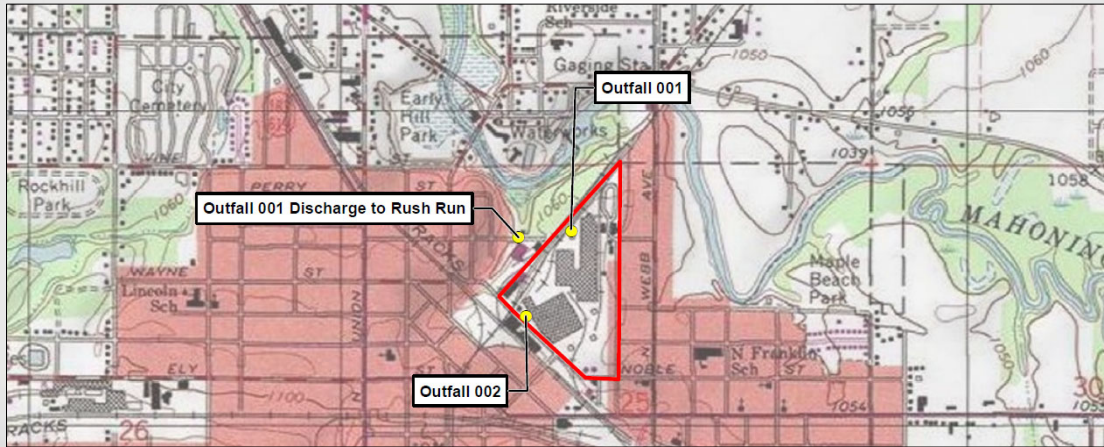


Using Multiple Techniques to Investigate Potential Total Residual Chlorine (TRC) Sources at an Active Tubular Steel Mill

Presented by Baylee Kushner, GIT



Site: ABC Tubular Steel



Project Objectives

1. Find the source(s) of city water discharge to the stormwater system.
2. How feasible is it to meet Practical Quantification Limit (PQL) of 0.050 mg/l?
3. Strategies to meet the PQL:
 - a) Rerouting existing pipes.
 - b) Alternate cooling water source.
 - c) Point of entry dechlorination system.
4. Submit plans for 1-3.
5. Notify Ohio EPA when starting construction.
6. Complete construction ASAP--within 12 months.
7. Notify Ohio EPA when construction is complete.



Objective 1: Finding TRC Sources

How do we look for TRC at a facility? How do we better understand the underground piping network?

1. TRC Field Measurements
2. CCTV Camera Work
3. Smoke Testing
4. Qualitative Dye Tracer Testing



An informed, quality pipe survey ties this data together!



TRC Field Measurements



How to measure TRC

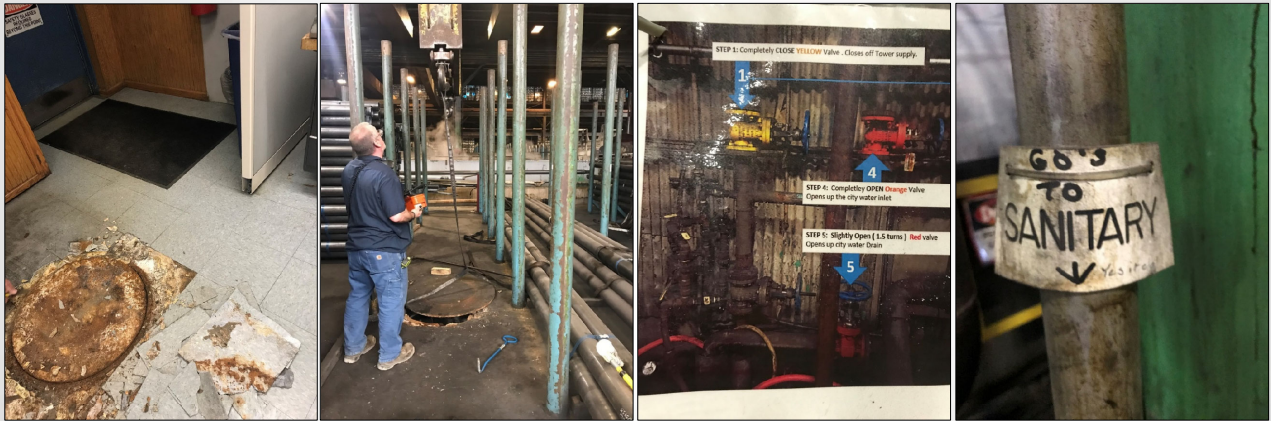
1. Split one water sample into two vials
2. Vial 1: Zero reading
3. Vial 2: TRC reading

Advantages: fast, adaptable

Limitations: colored/oily water, hot water can reduce accuracy



Adventures in Sample Collection



CCTV Camera Work

Crawler Cameras: P350 Flexitrax, Versatrac VT100 (two sizes)

Advantages: locate buried inlets

Limitations: pipe terrain, debris, mobilization of generator, site flow and temperature conditions





Smoke Testing



Advantages:

1. Smoke source: Petroleum distillate or smoke candles
2. Verify roof drain and downspout connections
3. Smoke traceable even in closed manhole/drain
4. Padding or tarps can adapt drain shapes

Limitations:

1. High smoke fuel consumption if no line isolation
2. Noise and smoke disturbances to facility
3. Difficult to rent, need to ship liquid smoke
4. Cannot route directly into pipes (easily)

Give courtesy call to local dispatch and water/sewer authority

Smoke Comes in All Shapes and Sizes



Qualitative Dye Tracer Testing

Advantages: inexpensive, fast

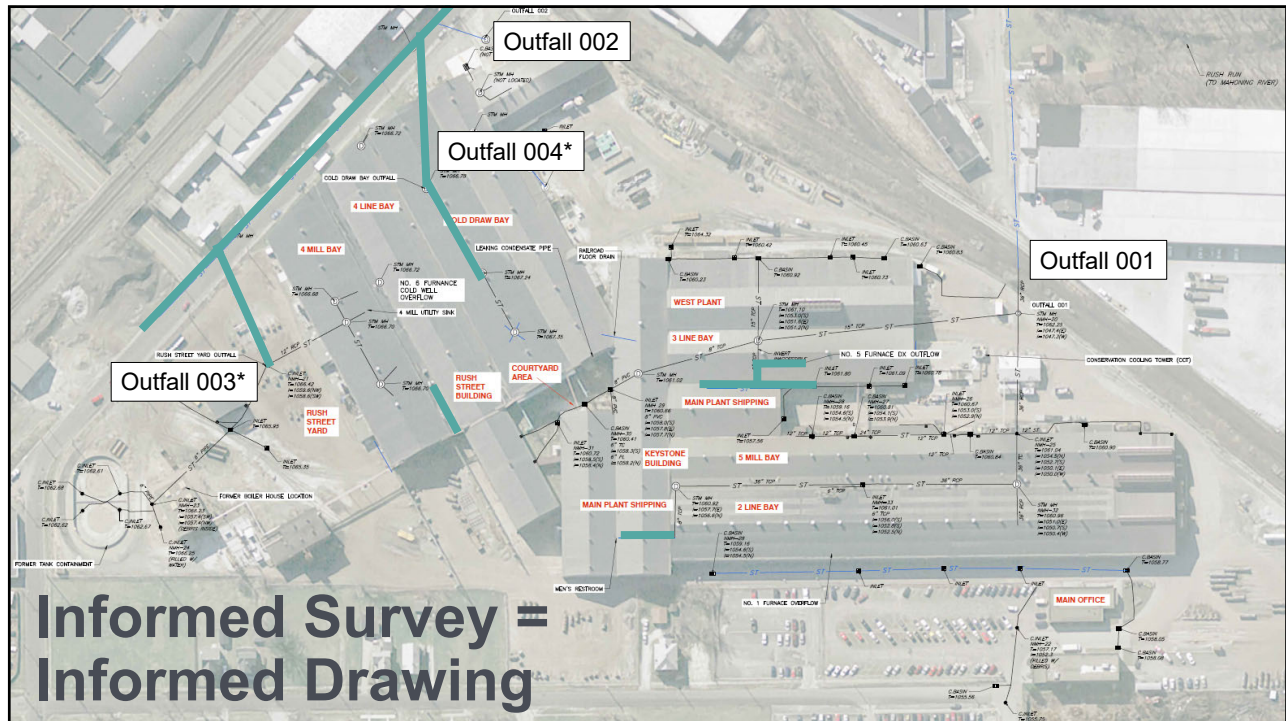
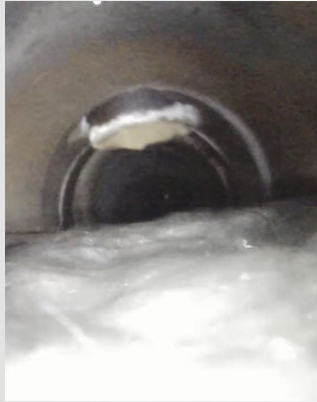
Limitations: cannot quantify water mixing

Right image: surprise sewage, straight into the stormwater line!

Courtesy call local water, sewage, 911 dispatch (like smoke testing)



Summary of TRC Source Types Identified



Objective 2: Feasible to meet the PQL?

- 12 non-stormwater TRC sources identified across the facility
- Preliminary rerouting reduced TRC concentrations at Outfall 001 by 50% (from ~1 to about ~0.5 mg/L) between March 2022 and July 2022
- Based on this, CEC believes rerouting can reduce TRC concentrations below the PQL



Objective 3: Strategies to meet the PQL

- Based on preliminary rerouting work, CEC concluded that rerouting should be sufficient to meet the PQL at Outfall 001
- Preliminary dechlorination designs were made, but needed information from the numerous city water intakes at the facility



Future Work



1. Permitting and establishing sample collection for new Outfall 003 and new Outfall 004

2. Potential design for dechlorination system



Summary

1. Find the source(s) of city water discharge to the stormwater system.
 - a) TRC Field Measurements
 - b) **CCTV Camera Work **Verified buried inlets to Outfall 001**
 - c) **Smoke Testing **Found/Verified Outfall 003 and Found Outfall 004**
 - d) Qualitative Dye Tracer Testing
2. How feasible is it to meet PQL of 0.050 mg/l?
 - a) Rerouting work March-July 2022 already reduced TRC by 50% at Outfall 001
 - b) CEC believes further rerouting and repairs can meet PQL at the site
3. Strategies to meet the PQL
 - a) Rerouting existing pipes
 - b) Point of entry dechlorination system (preliminary design)



Presenter: Baylee Kushner, GIT



- BS Slippery Rock University, 2016; MS University of Oklahoma, 2018
- Assistant Project Manager (Environmental Practice), Pittsburgh, PA
- UST removal and reporting, Act 2 groundwater sampling, CCR Rule data management and reporting, Phase 2 ESA sampling
- Published in Geosphere November 2022



QUESTIONS?

