

Pretreatment Horror Story

City of Greensboro

2023 NC-PC Annual Conference

Greensboro TZ Osborne POTW Background Information 2020

- Permitted Capacity: 40 MGD
 - Avg Flow CY 2020: 36.2 MGD (~36 hr DT)
- Activated Sludge Tertiary POTW
 - 5-Stage BNR/56 MGD expansion underway
- 2 Influent: TZO and North Buffalo
- Sludge Disposal: Fluidized Bed Incinerators



Unique POTW Situations

- TZO POTW has 2 EQ tanks = 8.0 MGD total
- North Buffalo POTW closed in 2017 and became a pump station (NBPS) to TZO
 - NBPS flow enters TZO after influent sampler
 - NBPS has on-site EQ tank = 3.0 MGD
- NBPS flow can be sent to TZO EQ as well



SIU Accidental Discharge

Friday, June 5, 2020

- Hose from plating solution filtering system broke loose
 - ~298 Gallons of Nickel Plating solution accidentally discharged to sanitary sewer
- President/owner of company notified City Industrial Waste Staff *immediately*



SIU: Job Shop Electroplater

- Subject to 40 CFR Part 413 (<10,000 gpd)
- SIU Permit Information
 - Categorical limits for Cd, Pb, CN, TTO
 - Local allocations for Cr, Cu, Ni, Zn
 - Flow Limit = 0.004 MGD (4000 gpd)
 - Average Flow = ~0.003 MGD (3000 gpd)



POTW Initial Response

- Staff Gathered (Manager, ORC, PT, Lab)
Immediately to Formulate a Plan:
 - Reviewed initial information from SIU
 - Notified NCDEQ WSRO
 - Consulted WR Engineering for Flow Time
 - Status of POTW EQ tanks (NB and TZO)
 - “Can we capture *most or all* of it in the EQ tanks? We’re going to try...”



POTW Next Steps

- SIU Flow Time = 3.3-4.0 hours (to NBPS)
- Decide on flow diversion schedule
- ORC confers with operations staff
- Plating solution sample to commercial lab
- PT staff reviews HWA data (Ni MAHL)
- Calculations from SIU re: estimated loading
- Follow-up with NCDEQ WSRO

Flow Diversion Plan

To Isolate Nickel Release

- *All flow* to NBPS was diverted to the 3 MG NB EQ Tank for 3 hours starting at 11:15 a.m. on day of release (~2.2 MG)
- Flow at TZO (combined NB/TZO flow) was diverted to TZO EQ tanks on Friday and Saturday as additional safety measure
- All 3 EQ tanks were sampled for nickel



Nickel HWA Info (DEQ app. 4-16-19)

- POTW Design Flow = 40 MGD
 - HWA Flow = 32.61 MGD
- WQS Pass-Through AHL = 69.01 lbs/day
 - WQS = 0.088 mg/l, RR = 63.9%
- Act. Sludge Inhibition AHL = 67.98 lbs/day
 - Based on 0.25 mg/l EPA Literature
- **Nickel MAHL = 67.98 lbs/day**

So Where is the Nickel?

Tank	Lbs of Ni	Actions Taken by TZO Operational Staff
TZO EQ Tank #1 (3MG)	0.65 pounds	Discharged back to the TZO treatment train over 20 hours starting at 12 noon Tuesday, June 9
TZO EQ Tank #2 (4 MG)	6.98 pounds	Discharged back to the TZO treatment train over 48 hours beginning at 8:00 a.m. on Wednesday, June 10.
NB EQ Tank (3 MG)	182.4 pounds	Ultimately the diverted flow in the NB EQ tank was returned to the TZO treatment train over a period of more than a month.

Nickel Recovery Calculations

Tank	Nickel concentration/calculation	Lbs of Nickel
NB EQ Tank	7.29 mg/l nickel * 8.34 * 3.0 MG =	182.4
TZO EQ Tank #2	0.186 mg/l nickel * 8.34 * 4.5 MG =	6.98
TZO EQ Tank #1	0.026 mg/l nickel * 8.34 * 3.0 MG =	0.65
<i>Nickel Recovered</i>	<i>Total</i>	<i>190.0</i>
TZO Eff Comp. of June 7, 2020	0.071 mg/l * 8.34 * 32.167 MGD =	19.0
TZO Eff Comp of June 8, 2020	0.047 mg/l * 8.34 * 32.651 MGD =	12.8
	Total Nickel TZO Mass-Balance	222 pounds
	Total Nickel in Accidental Release	~242 pounds

TZO Dewatered Sludge

TZO Sludge Sample Date	Nickel (mg/kg)
May 26-27, 2020	24.5
June 9, 2020	25.8
June 15-26, 2020	18.3
June 22-23, 2020	21.1
June 29-30, 2020	16.4
July 6-7, 2020	16.3
August 30-31, 2020	21.2
September 23-24, 2020	19.2

Applicability

- Not all POTWs have EQ tanks
- But if you do, note that EQ tanks can be used in emergency situation
- Greensboro ERP has different tier of enforcement for SIUs that self-report spills because we may be able to mitigate some “pretreatment horrors” given timely notification

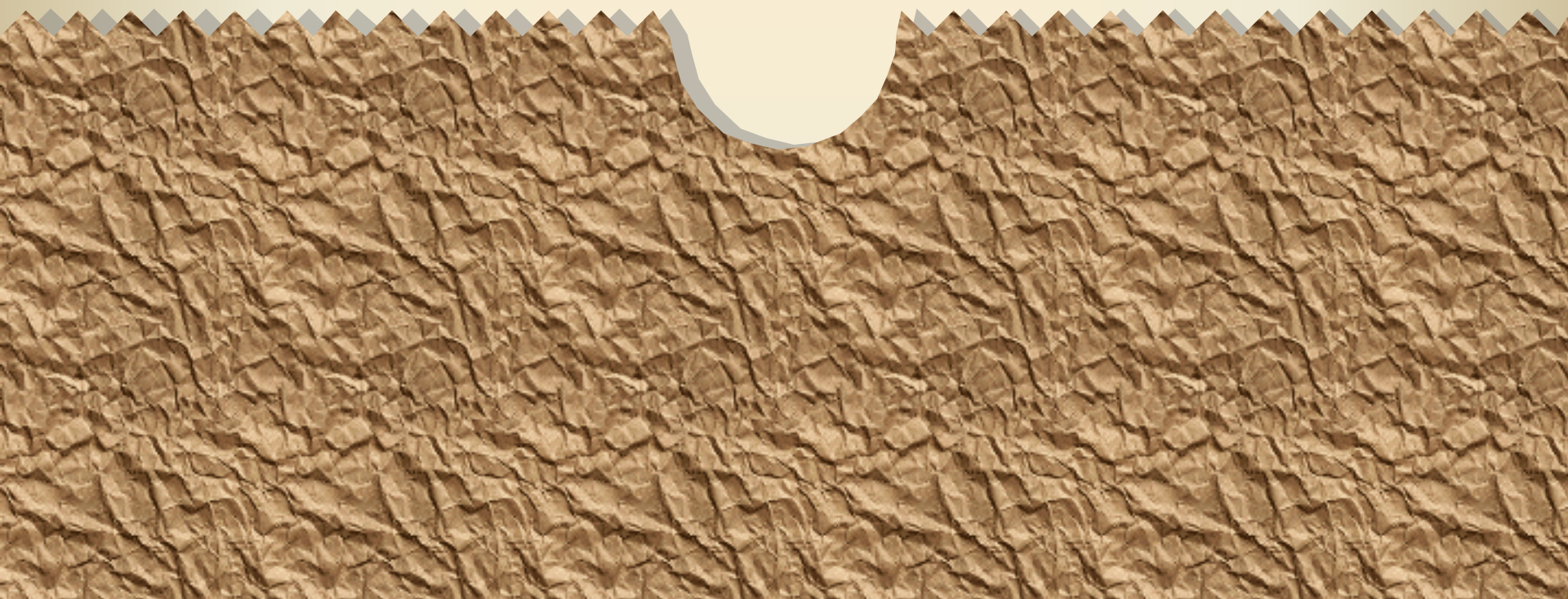


Greensboro Collection System Flow Time Study/Model

- Initially developed for use in 1,4-dioxane source investigations
- Contractor completed Model with info/input from WR Engineering and PT staffs
 - Times for low flow and high flow conditions
- Model/map has SIUs & flow times to TZO
- Great resource for any future horrors!



Questions?



Pretreatment Horror Stories: Q&A: Session Speakers

- City of High Point
 - Carrie Hyler carrie.hyder@highpointnc.gov
- Charlotte Water
 - Bill Gintert bill.gintert@charlottenc.gov
- City of Greensboro
 - Martie Groome martie.groome@greensboro-nc.gov
- EPA Region 8
 - Al Garcia garcia.al@epa.gov

