



LIFE AFTER CLEAN-UP



Kristen Brown
September 2, 2022

Overview

- ❑ **A few facts about Charlotte Water**
- ❑ **Our WIMS Structure**
- ❑ **Critical Systems Team ... who are these people?**
- ❑ **Holy Chaos Batman!**
- ❑ **Which way do we go?**
- ❑ **Chaos = Opportunity**
- ❑ **What we did**
- ❑ **Life after Cleanup**
- ❑ **The future looks bright**

CLTWater Facts & Figures (FY22)

▶ Population Served

- 1,110,356

▶ Water Treatment

- Average daily pumped: 117.5 MG
- Total Design Capacity (3 WTPs): 174 MGD

▶ Wastewater Treatment

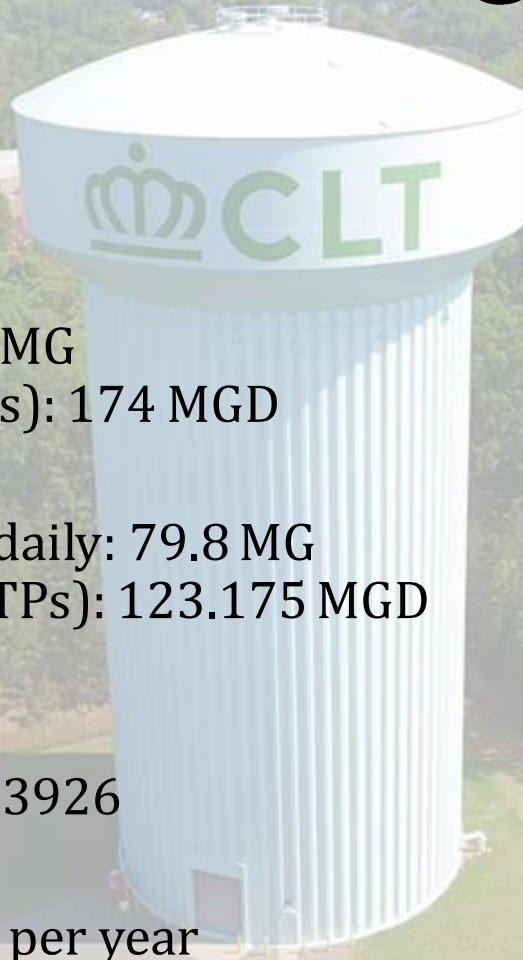
- Average Wastewater Treated daily: 79.8 MG
- Total Design Capacity (7 WWTPs): 123.175 MGD

▶ System Protection

- Permitted Industries: 54
- FSEs inspected by FOG Team: 3926

▶ Laboratory Services

- Analyses performed: 170,000 per year



WIMS Structure

❑ Enterprise System

❑ Facilities

- 7 WWTPs
- Drinking Water
- Distribution
- Collection
- Septage

❑ Interfaces

- Labworks LIMS (4)
- CSV Imports





Kristen Brown



Stefanie Tatum



Bryan Werth

Critical Systems Team



Holy Chaos Batman !!!



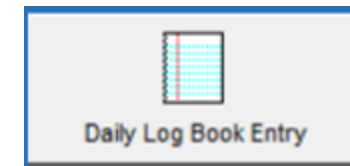
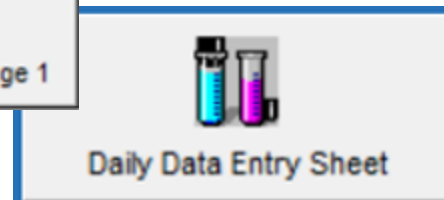
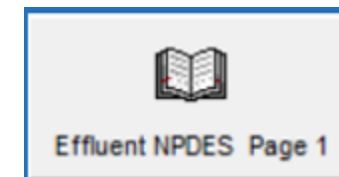
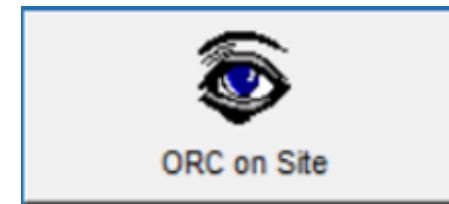
What the h
variable
1/S-LSC2/

**I can't find
anything!**

What is Larry and
did he build this

opping
mns my
ry form!!!

-Loc -ation -Tree





In the midst of chaos,
there is also opportunity



What we did...

- **Variables**
 - **Renamed**
 - **Added where needed**
 - **Grouped by location then type**
 - **Renumbered**
- **Location Tree Developed**
- **Entry Forms and Reports**
 - **Deleted unnecessary reports**
 - **Renamed those left**
 - **Updated and created new ones**
 - **Organized into Folders by use or type**
- **Users dropped into Profiles**
- **Functional Dashboards created**



Life After Clean-up

- **Adapting to changes in the workforce**
 - **Training**
 - **Empowerment**
 - **Working smarter not harder**
 - **Streamlined processes**
 - **Creating Efficiency**
- **Functionality across departments**
 - **Multifacility Reports**
 - **Cross-functional Data**

Chemical Usage and Cost

549	619	620	551	552	553	555	556	557	560	561	562	
A- Ferric Chloride S. Dewatering, Specific Gravity	A- Ferric Chloride South Dewatering Delivery, lb	620 - A- Ferric Chloride South Dewatering Delivery, gal {gal (Day Calculated)} $V619/(V549*8.34)$									A- Ferric Chloride S Dewatering Tank3 After Fill	
N/A	lbs										gal	
			5243.53			7435.15			7142.60			
			4425.20			7427.74			7140.12			
			150	151	152	153	154	155	156	157	158	159
			A- Polymer Delivery, Centrifuge Bldg	A- Polymer Centrifuge Bldg, Tank1 Level	A- Polymer Centrifuge Bldg, Tank1 Before Fill	A- Polymer Centrifuge Bldg, Tank1 After Fill	A- Polymer Centrifuge Bldg, Tank1 Used	A- Polymer Centrifuge Bldg, Tank2 Level	A- Polymer Centrifuge Bldg, Tank2 Before Fill	A- Polymer Centrifuge Bldg, Tank2 After Fill	A- Polymer Centrifuge Bldg, Tank2 Used	A- Polymer Centrifuge Bldg, Total Used
1.407	45300.00	3860.45										
1.406	43920.00	3745.51										
			lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs	lbs
154 - A- Polymer Centrifuge Bldg, Tank1 Used {lbs} (Day Calculated) $TULP(C151,C152,C153)$											3587.09	3587.09
											1778.95	1771.65
											26.77	80.30
											967.34	963.69
											3581.01	3581.01
											3633.33	3622.38
											1488.13	4204.00
											32.86	3347.40
											-80.31	919.89
											-7.30	310.28
											58.40	1346.98
											2.44	2560.12
45040.00	49783.68		62764.36			2715.87	19460.10					
			59449.84			3314.54	19427.24					
			58449.64			1000.20	19507.55					
			58132.06			317.58	19514.85					
			56843.48			1288.58	19456.45					
			54285.80			2557.68	19454.01					
						4502.12	19460.10	19383.44	63822.98	-6.09		4496.03

	A	B	C	D	E	F	G	H
1								
2	Note: Need to update VarNum 2532 to Eqn WGMC24(c2070) when available. Until then check max weekly fecal on application against values below.							
3								
4		Month	Start Date	End Date	WGM			
5		Dec	12/27/2020	1/2/2021	1			
6		Jan	1/3/2021	1/9/2021	1			
7			1/10/2021	1/16/2021	1			
8			1/17/2021	1/23/2021	1			
9			1/24/2021	1/30/2021	2			
10			1/31/2021	2/6/2021	2			
11		Feb	2/7/2021	2/13/2021	17			
12			2/14/2021	2/20/2021	2			
13			2/21/2021	2/27/2021	6			
14			2/28/2021	3/6/2021	7			
15		Mar	3/7/2021	3/13/2021	2			
16			3/14/2021	3/20/2021	2			
17			3/21/2021	3/27/2021	4			
18			3/28/2021	4/3/2021	30			
19		Apr	4/4/2021	4/10/2021	3			
20			4/11/2021	4/17/2021	13			
21			4/18/2021	4/24/2021	14			
22			4/25/2021	5/1/2021	5			

* Please indicate the agency and facility names as they should appear on the award certificate, also:

1. Agency Name*: Char...
2. Facility Name*: Sug...
3. Facility Address: 530...
4. Contact: Jose...
5. Phone/Email: 704-...
6. Please Summarize the Facility's Performance:

Flow
BOD
CBOD
TSS
Ammonia-Nitrogen
Phosphorus

Peak Performance Application

Peak Performance Application Weekly Max Fecal Check

Text AutoCal

Whole Effluent Toxicity	Chronic	P/F	Pass	Pass	Pass	Pass	Pass	Pass

Notes: Please indicate the agency and facility names as they should appear on the award certificate, also:

- 1) Include all parameters specified in NPDES (or other federal/state) permit (add rows if necessary)
- 2) If NPDES (or other federal/state) permit includes seasonal limits, indicate and include

NACWA Awards



Sep Eff	Oct Eff	Nov Eff	Dec Eff	# of Vio.		
14.0	13.5	13.2	13.4	0		
0.0	0.0			0		
0.0	0.0			0		
		0.0	0.0	0		
		0.0	0.0	0		
100.0	100.0	100.0	100.0	0		
0.0	0.0	0.0	0.0	0		
0.5	0.0	0.0	0.0	0		
99.8	100.0	100.0	100.0	0		
0.39	0.69	1.02	0.87	0		
0.13	0.28	0.30	0.11	0		
		0.40	0.68	0		
		0.27	0.26	0		
25	20	60	15	17	9	0
10	7	19	8	7	2	0
5	5	8	5	2	2	0
7.2	6.6	6.9	7.1	6.7	6.8	0
7.6	7.7	7.5	7.6	7.5	7.5	0
8.0	7.9	7.9	8.0	8.4	8.8	0

Data Compilation and Analysis

Sugar Creek WWTP Headworks

Report Start Date: Start Date: 7/1/2022
 Report End Date: End Date: 7/31/2022

NOTE:

Sugar Creek WWTP RPA

Data

Parameter (all units = ug/L, except Mercury = ng/L)	Allowable Cw Considering %WC			Max Predicted Cw	Count (#)
	Fish Cons., HH	Chronic	Acute		
Arsenic	25.2	166.5	371.1	No Detects	1
Beryllium		7.21	70.95	No Detects	0
Cadmium		1.26	7.11	No Detects	
Total Phenolic Compounds		304.2		No Detects	
Chromium III		252	1,903	No Detects	
Chromium VI (b)		12.2	17.5	No Detects	
Chromium, Total (b)		17.36	24.30	No Detects	
Copper		5.5	24.0	No Detects	
Cyanide		8.0	201.5	No Detects	
Lead		13.32		No Detects	
Mercury		81.5	726.3	No Detects	
Nickel		5.5	61.1	No Detects	
Selenium		0.07	1.26	No Detects	
Silver		277.6	276.4	No Detects	
Zinc				No Detects	

What If Analysis

Parameter (all units = ug/L, except Mercury = ng/L)	Allowable Cw Considering %WC			Max Predicted Cw
	Fish Cons., HH	Chronic	Acute	
Arsenic	25.2	166.5	371.1	
Beryllium		7.21	70.95	

Parameter (all units = ug/L, except Mercury = ng/L)	Allowable Cw Considering %WC			Max Predicted Cw	Applicable Flow
	Fish Cons., HH	Chronic	Acute		
Arsenic	25.2	166.5	371.1	No Detects	Qavg/7Q10s/1Q10s
Beryllium		7.21	70.95	No Detects	7Q10s/1Q10s
Cadmium		1.37	8.28	No Detects	7Q10s/1Q10s
Total Phenolic Compounds		304.2		No Detects	30Q2
Chromium III		291	2,197	No Detects	7Q10s/1Q10s
Chromium VI (b)		12.2	17.5	No Detects	-
Chromium, Total (b)		20.19	28.66	5.96	7Q10s/1Q10s
Copper		5.5	24.0	No Detects	7Q10s/1Q10s
Cyanide		9.7	244.5	No Detects	7Q10s
Lead		13.32		1.65	7Q10s/1Q10s
Mercury		94.6	835.3	17.3	7Q10s/1Q10s
Nickel		5.5	61.1	No Detects	7Q10s/1Q10s
Selenium		0.07	1.73	No Detects	7Q10s/1Q10s
Silver		322.4	313.6	79.9	7Q10s/1Q10s
Zinc					

AVG
MAX
MIN
COUNT

Date	S-In
1/1/2018	
1/2/2018	
1/3/2018	
1/4/2018	
1/5/2018	
1/6/2018	
1/7/2018	
1/8/2018	
1/9/2018	
1/10/2018	
1/11/2018	
1/12/2018	
1/13/2018	
1/14/2018	
1/15/2018	

Data from 7/1/2022 to 7/31/2022
 Hardness 55 mg/L as CaCO3

Note: Analysis considers data from 7/1/2021 to 7/31/2022.
 (a) Reasonable potential to exceed water quality standard exists when the maximum predicted Cw exceeds any allowable Cw. If the maximum predicted Cw is greater than 50% of allowable Cw, monitoring requirements are likely during permit renewal.
 (b) For monitoring and compliance purposes if Total Chromium is less than the allowable Cw for Chromium VI, chronic, no limit or monitoring is required.

Approved 03/05/19
 OMB No. 2040-0004

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 OMB No. 2040-0004

or MDL (in units)	X	ML
mg/L	X	ML
00 ml	X	ML
		MDL

mg/L	1,281	SM2540D-11	2.5	mg/L	X	ML
						MDL

...according to sufficiently sensitive test procedures (i.e. methods) approved under 40 CFR 136 for the analysis of pollutants or pollutant parameters or required under 40 CFR chapter I, subchapter N or O. See instructions and 40 CFR 122.21(e)(3).

Biosolids Program

Report
Biosolids - Biosolids & Residuals Facts & Figures
Biosolids - Disposal Cost Summary
Biosolids - Disposal Summary
Biosolids - Production Summary
Biosolids - Tracking
Biosolids - VSR Summary

Biosolids Tracking **August 27, 2022** *Select last day of the month. L*

data to the database.

	Sludge to Dewatering		Dry Tons Produced		Wet Tons Produced		Monthly Avg VSR		Monthly Avg Cake %TS		Wet Tons Removed		Wet Tons to Landfill		Wet Tons to Land App	
McAlpine	<input type="text"/>	gal	<input type="text"/>	Dry Tons	<input type="text"/>	Wet Tons	<input type="text"/>	%	<input type="text"/>	%	<input type="text"/>	Wet Tons	<input type="text"/>	Wet Tons	<input type="text"/>	Wet Tons
Irwin	<input type="text"/>	gal	<input type="text"/>	Dry Tons	<input type="text"/>	Wet Tons	<input type="text"/>	%	<input type="text"/>	%	<input type="text"/>	Wet Tons	<input type="text"/>	Wet Tons	<input type="text"/>	Wet Tons
Mallard	<input type="text"/>	gal	<input type="text"/>	Dry Tons	<input type="text"/>	Wet Tons	<input type="text"/>	%	<input type="text"/>	%	<input type="text"/>	Wet Tons	<input type="text"/>	Wet Tons	<input type="text"/>	Wet Tons
McDowell	<input type="text"/>	gal	<input type="text"/>	Dry Tons	<input type="text"/>	Wet Tons	<input type="text"/>	%	<input type="text"/>	%	<input type="text"/>	Wet Tons	<input type="text"/>	Wet Tons	<input type="text"/>	Wet Tons
Franklin	<input type="text"/>	gal	<input type="text"/>	Dry Tons	<input type="text"/>	Wet Tons	<input type="text"/>	%	<input type="text"/>	%	<input type="text"/>	Wet Tons	<input type="text"/>	Wet Tons	<input type="text"/>	Wet Tons

Biosolids Disposal Cost Summary

	McAlpine			Irwin			Mallard			McDowell			Total		
	LandFill	Land App	Total	LandFill	Land App	Total	LandFill	Land App	Total	LandFill	Land App	Total	LandFill	Land App	Total
Month	Wet Tons	Wet Tons	Wet Tons	Wet Tons	Wet Tons	Wet Tons	Wet Tons	Wet Tons	Wet Tons	Wet Tons	Wet Tons	Wet Tons	Wet Tons	Wet Tons	Wet Tons
Jan 2023															
Feb 2023															
Mar 2023															
Apr 2023															

Quality Assurance and Process Validation



SQL Console

```
select varnum, name from vardesc
where name like '%Total Coliform-P/A,%'
and name not like '%Total Coliform-P/A, Colilert'
and name not like '%Total Coliform-P/A, Colisure'
```

Execute (F5) Timeout = 30 s View History Copy Results Print Results Run Script ...

Execution successful. Returned 2 rows. Took 0.062 s.

	varnum	name
1	20014	A03 Total Coliform-P/A, Coliler
2	339013	789 Total Coliform-P/A, Colisure

Variable Admin Tool

File Variable Location Interface

Variable: Delete Edit Copy Move Up Down Replace Inter Preview Export Wizard Unskip

Location: Copy Order Up Down Import Refresh Backup

Location Tree

- Sugar Creek WWTP
 - Administration
 - Operator
 - Process Control
 - Influent
 - Plant
 - Lab
 - Effluent
 - Plant
 - Lab

	Varnum	Name	Location	VarType	Units	Entry Min	Entry Max	StoreCode
1	1005	S-INF Alkalinity	Lab	Day Calculated	mg/L			IF(ISBLANK(S-INF
2	1006	S-INF Alkalinity, Lab	Lab	Day Parameter	mg/L			
3	1007	S-INF Alkalinity, Outside Lab	Lab	Day Parameter	mg/L			
4	1010	S-INF Ammonia	Lab	Day Calculated	mg/L			IF(ISBLANK(S-INF
5	1011	S-INF Ammonia, Lab	Lab	Day Parameter	mg/L			
6	1012	S-INF Ammonia, Outside Lab	Lab	Day Parameter	mg/L			
7	1015	S-INF Antimony	Lab	Day Calculated	µg/L			IF(NOT (ISBLANK(
8	1016	S-INF Antimony ICPMS, Lab	Lab	Day Parameter	µg/L			
9	1017	S-INF Antimony ICPOES, Lab	Lab	Day Parameter	µg/L			
10	1018	S-INF Antimony, Outside Lab	Lab	Day Parameter	µg/L			



CHARLOTTE WATER

Stowe Regional

Water Resource Recovery Facility

The Future Looks Bright!

- **Mobility**
- **SCADA**
- **Integrations with other applications**
- **Interactive Dashboards**



Questions?



Kristen Brown / *Business Systems Supervisor, Critical Systems*

CHARLOTTE WATER

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