





DRIVING EFFICIENCY & COMPLIANCE FOR MULTIPLE SITES

Brian Strickland

Engineer & Land Surveyor

Business Owner, Controller,
Human Resources Director,
Class A Wastewater Operator,
DSII Water Operator



Company Background

- Engineering & surveying company started by my father in 1979
- Started offering contract operations of small private wastewater systems that we had designed in 2006
- Today we have over 43 different permits that we operate and perform water quality testing, DNR compliance reporting, and operation/maintenance



Where were we before WIMS?

- Spreadsheets
- Operator notes
- Test results

Spreadsheets

WWTF Testing Requirements Summary

MONTHLY

Facility Name	MSOP	SE file	Frequency	BOD	TSS	pH	Ammonia Sum/W in	E Coli	Total Residual Chlorine	Temp	Oil & Grease	DO	Annual Status Report	WET Test Due	Permit Expiration
Oak Ridge	MO-0133086	08-083	Monthly	30	30	x	1.2/2.7	206	0.08		10	x		6/28/2017	12/31/2017
Willow Heights	MO-0131423	12-031	Monthly	10	15	x	1.1/2.2	126 Year Round	0.13	x		x			5/31/2022
Altenburg & Frohna	MO-0130010	17-067	Monthly	10	15	6.5/9.0	1.1/2.6	206	0.13		10 (Qtr)	x			12/21/2023
Savers Farm	MO-0137839	17-060	Monthly	10	10	x	1.4/2.9	206						12/28/2021	8/31/2022
Gordonville	MO-0135615	10-065	Monthly	30	30	x	7.7/8.6	206			10 (Qtr)				12/31/2022
RD Sewer	MO-0096881	20-135	Monthly	30	30	x	1.3/2.8	206		x	10	x			6/30/2024
Highlands Ranch	MO-0139220	20-073	Monthly	10	10	x	0.6/1.0	206		x		x			6/30/2023
Fruitland WWTF	MO-0138631	22-001	Monthly	10	10	6.5/9.0	0.6/2.1	126 Weekly		x	10	x		x	6/30/2023
Fruitland WWTF	MO-0138631		Quarterly	TOTAL PHOSPHORUS, TKN, NH3, NITRITE/NITRATE INFLUENT/EFFLUENT											

QUARTERLY

Facility Name	MSOP	SE file	Frequency	BOD	TSS	pH	Ammonia Sum/W in	E Coli	Total Residual Chlorine	Temp	Oil & Grease	DO	Annual Status Report	WET Test Due	Permit Expiration
Indian Springs	MO-0130958	06-126	Quarterly	30	30	6.5/9.0	1.3/2.9	206	0.13	x		x	August		7/31/2022
Clover Hill	MO-0128856	06-127	Quarterly	30	30	6.5/9.0	1.3/2.7	206	0.13	x		x			12/31/2022
Diana's Boarding House	MO-0129593	07-118	Quarterly	45	70	6.5/9.0	1.3/2.8	206		x			March		9/30/2022
Cape Rock Village	MO-0056332	15-080	Quarterly	45	80	6.5/9.0	1.4/2.9	206		x					9/30/2023
Hawks Landing	MO-0134431	09-017	Quarterly	30	30	x	1.2/2.5	206	0.13			x			12/31/2022
Kelly School	MO-0134678	09-051	Quarterly	30	30	6.5/9.0	3.9/2.2/1.4/3.4			x					3/31/2027
VIP Industries	MO-0103837	11-026	Quarterly	30	30	6.5/9.0	1.3/2.5	(1Q23)		x			October		12/31/2022
Westbridge Place	MO-0100277	13-068	Quarterly	45	70	6.5/9.0	x(1Q23)	206		x			February		6/30/2023
Spring Lake Estates	MO-0058459	13-069	Quarterly	30	30	6.5/9.0	x(1Q23)	206	0.13	x		x	February		12/31/2022
Arbor Trails	MO-0128279	13-070	Quarterly - Composite	30	30	6.5/9.0	1.2/2.5	206	0.13	x		x			12/31/2022
Forest Meadows	MO-0097225	14-013	Quarterly	45	80	x	x(2Q22)	x(2Q22)		x			May		6/30/2024
Pleasant Lake Estates	MO-0123056	14-055	Quarterly - Composite	30	30	6.5/9.0	1.1/2.9	(4Q22)		x			August		6/30/2024

Lab test results

Report of Analysis

Reference:

The analysis of wastewater is conducted in accordance US EPA approved methods listed in 40 CFR Part 136. All results expressed on an as received basis unless indicated by a footnote.

Log Number: 1615714 Sample Description: Arbor Trails Influent Sample Date: 12/17/2013 Sample Received Date: 12/17/2013

Demands

Test Description	Result	Units	Method	Comment Code	Analysis Date	Analyst
B.O.D. (5-day)	278	mg/L	SM-5210 B-01		12/18/13	147

Minerals

Test Description	Result	Units	Method	Comment Code	Analysis Date	Analyst
pH Measurement	7.77	S.U.	SM-4500-H B-00		12/17/13	133

Solids

Test Description	Result	Units	Method	Comment Code	Analysis Date	Analyst
Suspended Solids	232	mg/L	SM-2540 D-97		12/17/13	133

Log Number: 1615715 Sample Description: Arbor Trails Effluent Sample Date: 12/17/2013 Sample Received Date: 12/17/2013

Demands

Test Description	Result	Units	Method	Comment Code	Analysis Date	Analyst
B.O.D. (5-day)	8.50	mg/L	SM-5210 B-01	J	12/18/13	147

Minerals

Test Description	Result	Units	Method	Comment Code	Analysis Date	Analyst
pH Measurement	7.70	S.U.	SM-4500-H B-00		12/17/13	133

Nutrients

Test Description	Result	Units	Method	Comment Code	Analysis Date	Analyst
Ammonia as Nitrogen	< 0.050	mg/L	Lachat-10-107-06-1-K		12/23/13	102

NPDES Reporting

Report of Analysis

Reference: The analysis of wastewater is conducted in accordance US EPA approved methods listed in 40 CFR Part 136. All results expressed on an as received basis unless indicated by a footnote.

Log Number: **1615714** Sample Description: **Arbor Trails Influent** Sample Date: **12/17/2013** Sample Received Date: **12/17/2013**

Demands

Test Description	Result	Units	Method	Comment Code	Analysis Date	Analyst
B.O.D. (5-day)	278	mg/L	SM-5210 B-01		12/18/13	147

Minerals

Test Description	Result	Units	Method	Comment Code	Analysis Date	Analyst
pH Measurement	7.77	S.U.	SM-4500-H B-00		12/17/13	133

Solids

Test Description	Result	Units	Method	Comment Code	Analysis Date	Analyst
Suspended Solids	232	mg/L	SM-2540 D-97		12/17/13	133

Log Number: **1615715** Sample Description: **Arbor Trails Effluent** Sample Date: **12/17/2013** Sample Received Date: **12/17/2013**

Demands

Test Description	Result	Units	Method	Comment Code	Analysis Date	Analyst
B.O.D. (5-day)	8.50	mg/L	SM-5210 B-01	J	12/18/13	147

Minerals

Test Description	Result	Units	Method	Comment Code	Analysis Date	Analyst
pH Measurement	7.70	S.U.	SM-4500-H B-00		12/17/13	133

Nutrients

Test Description	Result	Units	Method	Comment Code	Analysis Date	Analyst
Ammonia as Nitrogen	< 0.050	mg/L	Lachat-10-107-06-1-K		12/23/13	102

MISSOURI DEPARTMENT OF NATURAL RESOURCES
NPDES MONITORING REPORT
Quarterly Sampling – Quarterly Reporting

Arbor Trails Subdivision WWTF MO-0128279 CAPE GIRARDEAU COUNTY	Owner Address: Cape Girardeau County Common Sewer District No. 1 113 W Main Street, Suite 6 Jackson, MO 63755	Address Change for Owner: <input type="checkbox"/> Billing <input type="checkbox"/>	Facility Address: 135 Arbor Place Jackson, MO 63755
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THIS REPORT COVERS THE PERIOD: Please place an "X" in the box beneath the appropriate quarter.

1st Quarter = January through March 2nd Quarter = April through June 3rd Quarter = July through September 4th Quarter = October through December

Due by April 28th, 2013
 Due by July 28th, 2013
 Due by October 28th, 2013
 Due by January 28th, 2014

NO DISCHARGE FOR QUARTER
 NO DISCHARGE FOR QUARTER
 NO DISCHARGE FOR QUARTER
 NO DISCHARGE FOR QUARTER

Samples Collected By: Strickland Engineering, 113 W Main St, Jackson, MO 63755	Phone: 573-243-4080	Analyses Performed by (LAB): EAS, 4000 E Jackson Blvd, Jackson MO 63755	Phone: 573-204-8817
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PARAMETER	UNITS	PERMITTED FINAL LIMITS			SAMPLE 1		SAMPLE 2		AVERAGE OF SAMPLES IF TAKEN IN SAME MONTH	SAMPLE TYPE	ANALYTICAL METHOD
		DAILY MAX	WEEKLY AVG	MONTHLY AVG	DATE	ANALYSIS DATE	DATE	ANALYSIS DATE			
					DATE						
					12/17/2013						
					TIME						
					1230						
Influent BOD	mg/L	*	*	*	278	12/18/13				grab	SM-5210 B-01
Influent TSS	mg/L	*	*	*	232	12/17/13				grab	SM-2540 D-97
Influent Temp	C	*		*	8	12/17/13					NA
Ammonia as N	mg/L	*	*	*	0.05	12/23/13				grab	Lachat-10-107-06-1-K
BOD5	mg/L		45	30	8.5	12/18/13				grab	SM-5210 B-01
Flow	MGD	*		*	0.012	12/17/13				estimate	NA
pH	SU	***		***	7.70	12/17/13				grab	SM-4500-H B-00
Sample Temp	°C	*		*	11	12/17/13					NA
TSS	mg/L		45	30	3	12/17/13				grab	SM-2540 D-97

SIGNATURE AND TITLE OF INDIVIDUAL PREPARING REPORT	DATE	PHONE NUMBER	EMAIL ADDRESS:
	01/24/14	573-243-4080	bstrick@stricklandengineering.com
SIGNATURE OF OWNER OR DESIGNEE APPROVING REPORT	DATE	PHONE NUMBER	EMAIL ADDRESS:



What was our biggest need?

GET CONTROL OF THE DATA

Transition to WIMS

- Introduced to WIMS by a utility client that was implementing it across all their facilities, one of which we operated
- Conferenced with the WIMS group to learn more about the platform, benefits, and implementation
- Developed an implementation plan
- Training on WIMS basics and sample facility set up

Key		
Need to Test	No Discharge	Not Required
Met Limit	Broke limit	Test

eDMR Copy/Paste (Monthly)

eDMR login URL

Maintenance Report

eDMR Copy/Paste (Quarterly)

MDNR Permits Website

EXCEEDANCES IDENTIFIED BY CONDITIONAL FORMATTING

Jump To				Facility Info				EFF	Influent			Effluent										Permit Info					
Entry	OMR	MMR/QMR	Permit	Facility Name	MSOP	Frequen cy	Progress Report?	Flow	BOD	TSS	BOD	pH	TSS	NH3	Chlorine	Sample Temp	E. coli	DO	Oil & Grease	BOD %R	TSS %R	Times Tested	1st Test By	1st test Date	Start Date	Expiration Date	Progress Report?
E	O	R	P	Altenburg & Frohna	MO-0130010	Monthly			83.70	126.00	2.37	6.94	2.00	2.27	7.50	55.01	2,420	4.01		97.17	98.41	1	Wayne	8/1/2022	4/1/2019	12/31/2023	
								0.0434	247.00	177.00							1		2			2		8/2/2022			
E	O	R	P									7.23				25.63		5.01							6/1/2018	12/31/2022	
E	O	R	P								4.39	7.33	2.00	0.76		26.03	1.00	3.13				1	Wayne	8/9/2022	7/1/2020	6/30/2023	
E	O	R	P	Oak Ridge	MO-0133086	Monthly			38.90	68.00	3.33	7.16	4.00	0.03	42.86										12/1/2014	12/31/2017	
E	O	R	P	Port Perry	MO-0116998	Monthly																		7/1/2021	12/31/2023		
E	O	R	P	RD Sewer	MO-0096881	Monthly		0.0158			4.95	7.24	5.00	0.00		2									9/1/2019	6/30/2024	
E	O	R	P	Savers Farm	MO-0137839	Monthly					6.40	7.02	2.00	4.04		2									9/1/2017	8/31/2022	
E	O?	R	P	Willow Heights	MO-0131423	Monthly		0.0120			2.81	7.60	7.00	0.03	0.00	2									6/1/2017	5/31/2022	

BUTTON OPENS ENTRY FORM

FACILITY WITH NO SAMPLE RESULTS FOR THE PERIOD EASILY IDENTIFIED

E			P	Bella Vista	MO-0094897	Quarterly																			6/1/2020	6/30/2024	
E	O		P	Bloomsdale Rest Area	MO-0090581	Quarterly					2.00	7.60	2.00	0.03		25.65		6.01				1	Wayne	8/11/2022	9/1/2017	12/31/2021	
E	O		P	Buzzi	MO-0000809	Quarterly					8.00	8.00	42.00	54.40		21.40	2,420					1	Mike	8/3/2022	10/1/2018	12/31/2022	
E	O		P	Cape Rock Village	MO-0056332	Quarterly	Q2																		1/1/2019	9/30/2023	Q2
E	O		P	Cedar Meadows	MO-0130729	Quarterly					6.02	7.44	2.00	0.45		26.84	15	4.41				1	Wayne	8/8/2022	9/1/2017	8/31/2022	
E			P	Clover Hill Estates	MO-0128856	Quarterly		0.0135			15.10	7.25	3.00	0.03	31.33	26.69	1	3.75				1	Wayne	8/2/2022	10/1/2018	12/31/2022	
E			P	Diana's Boarding Home	MO-0129593	Quarterly	Q1																		4/1/2019	9/30/2022	Q1
E			P	Enclave Lake Estates	MO-0135364	Quarterly		0.0029				7.10				27.35		2.75							4/1/2018	12/31/2022	

Benefits of WIMS & Collect

- Collect gave the operators a place to document the data they were obtaining in the field
- Lab data only entered once for compliance evaluation & reporting
- Exceedances quickly identified and flagged for resampling
- Reports generated automatically for client & DNR

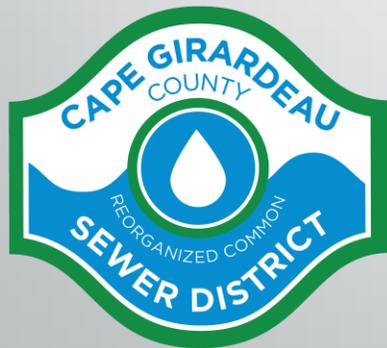
An opportunity to bring it all together...

- Sewer district had been acquiring small systems since 2008
- Acquired 20 permitted facilities
- Received \$32M Rural Development funding to construct a regional system
- Regional plant will combine 15 permits into 1

FRUITLAND REGIONAL WWTF

0.425 MGD
AQUA AEROBIC
SBR SYSTEM

COMBINES 15
EXISTING PERMITS
INTO 1 NEW PERMIT



What were we able to do different?

TSS, pH, and DO probes are all Hach MSM enabled sensors



Brian Strickland



Select an application to get started:



Drinking Water



Wastewater



Distribution

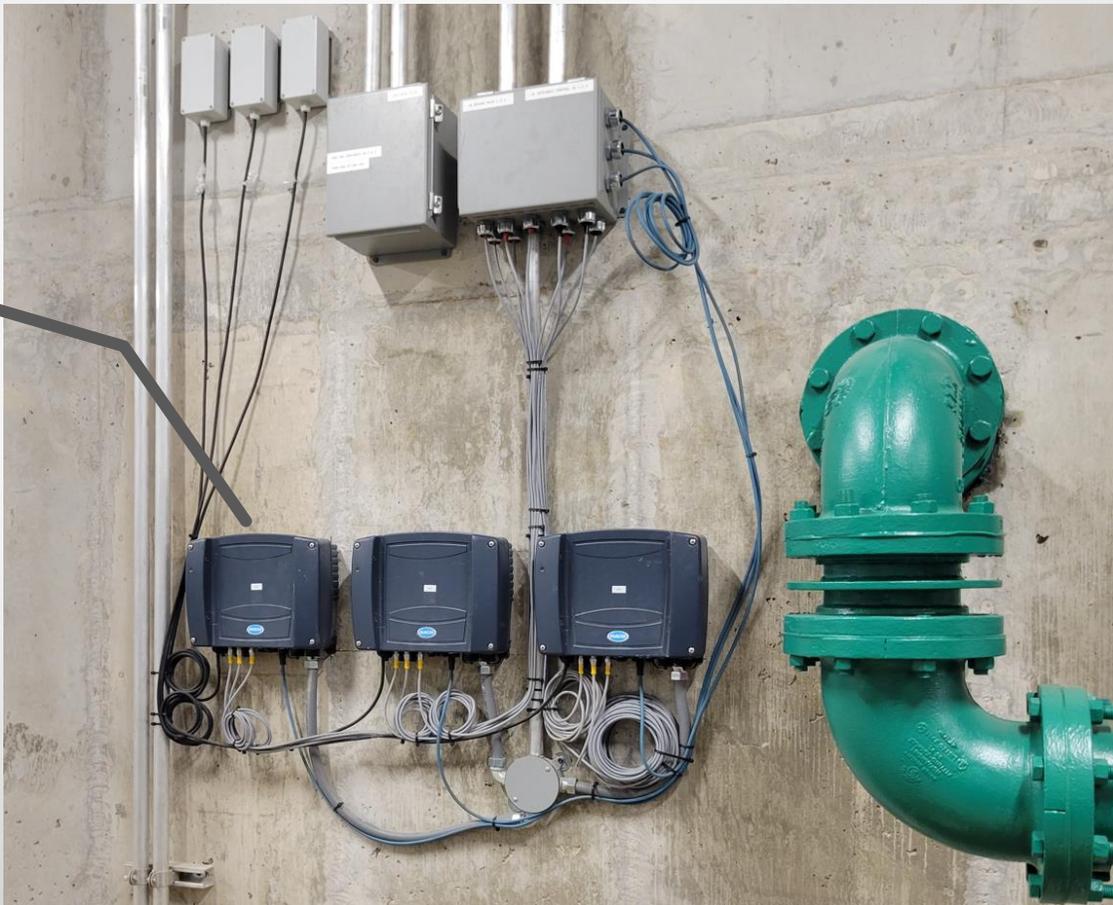


Collections



Mobile Sensor Management

SC1500 Controllers w/wi-fi
antennas



Devices

Limits

Data

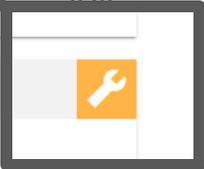
Manage

Dashboard

Notification History

Notifications for probe calibration or maintenance

SBR1 2065177 - SOLITAX sc		
	23:10 27 August 2022	27.4 °C
		9.27
		25.8 °C
		0.70
SBR1 2065177 - SOLITAX sc		
	23:09 27 August 2022	
	TSS mg/L	3.00
SBR1 260013759 - LDO sc		
	23:09 27 August 2022	26.1 °C
	DO ppm	0.28
SBR1 8492 - pH sc V2		
	23:09 27 August 2022	24.2 °C
	pH pH	6.87





SBR1 2065177 - SOLITAX sc

Cleaning 15 days overdue



On-line Total suspended solids TSS | mg/L

2.71



23:19
27 August 2022

Historical data



Device menu



Maintenance





Cleaning



Use these guided steps to clean the sensor. Estimated completion time: 5-10 minutes.

Review these settings:

Output
mA value and relay

Hold

Active

CANCEL

START



SBR1 8492 - pHD sc V2

Calibration is required. 14:07 | 14 May 2022



pH pH | pH

6.86



24.1 °C

23:23
27 August 2022

Historical data



Device menu



How do we get the sensor data to WIMS?

The screenshot shows the 'Select a Variable' dialog box in WIMS. The tree view on the left shows the following structure:

- Strickland Engineering
 - MBBR
 - Pea Gravel Template
 - Altenburg & Frohna
 - Fruitland WWTF
 - Influent
 - SBR Basins
 - SBR1**
 - SBR2
 - SBR3
 - Digester
 - Effluent
 - Gordonville
 - Highlands Ranch
 - Oak Ridge
 - Port Perry
 - RD Sewer
 - Savers Farm
 - Willow Heights
 - Archer Trails

The main table displays the following data:

VarNum	Type	Var Name	Heading	Location	Storet #
36957	Parameter	MLSS	MLSS	SBR1	
36959	Calculated	MLSS Lbs	MLSS Lbs	SBR1	
36961	Parameter	ML DO	ML DO	SBR1	
36962	Parameter	MLSS pH		SBR1	
36963	Parameter	ML Temp	ML Temp	SBR1	
36965	Parameter	ML SSV30	Settleability	SBR1	
36967	Calculated	ML SVI	ML SVI	SBR1	

At the bottom of the dialog, there is a status bar with the following information:

Multi Select: OFF 8/31/2022 8:07:22 PM 5/3/2022 6:16:41 AM 8/3/2022 10:39:14 AM 95.633 0

Edit/View Variables

VarNum

Location

Name **Units**

Track every **Type**
 Data Read-Only Definition Read-Only

OFF Interface To
 External Source

Data Approval Level To Write With

SCADA Tag

Statistic **Scale Factor**

Start Time (hh:mm) **Stop Time** (hh:mm)
 Same Day as Start Day After Start

Filter
 Low Range
 High Range
 Deadband

Filter Data (Only analyze data when:)
Filter Tag
Condition **Value**

BSTRICK (5/2/2022 2:35:24 PM) VARID : 2496

SCADA Tag List

Pick G2_Q14522_114_TAGS

OK Cancel Quick Filter

Tag	Units	Description	UD1	UD2
2acab1ec-14ec-497e-b052-859d65611cbb	mg/L	MSM\Devices\SBR1 2065177 - MSM_TSS	MSM	Devices
30619f2f-44ec-4705-87b6-4182d82989e2	°C	MSM\Devices\SBR3 8598 - MSM_TEMP	MSM	Devices
3606440c-72ca-4aca-820b-f491d8a75274	pH	MSM\Devices\SBR2 8597 - PH	MSM	Devices
39ced2af-55f3-45fb-a752-7cdcc6ad460a	°C	RD Sewer\WWTF\Aeration Basin - MSM_TEMP	RD Sewer	WWTF
42a8bd62-62a0-4291-a7cf-8859d015073d	mg/L	MSM\Devices\SBR3 2065912 - MSM_TSS	MSM	Devices
51cbb2ee-0288-4e19-92e1-6db740b8f86e	°C	MSM\Devices\SBR1 260013759 - MSM_TEMP	MSM	Devices
5b7f119f-de4c-4ae8-93b0-a254cb9adf40	mg/L	MSM\Devices\2100257 - MSM_TSS	MSM	Devices
5ba58cce-3d30-4c32-a329-88553eae98e8	°C	MSM\Devices\SBR2 8597 - MSM_TEMP	MSM	Devices
5e9a9ca7-663a-46fd-a74a-90d4642485a9	°C	MSM\Devices\SBR1 8492 - MSM_TEMP	MSM	Devices
64713086-fc0b-4360-a4bf-0a7ae4dc950e	ppm	MSM\Devices\SBR1 260013759 - MSM_DO	MSM	Devices
6e6f82cf-5f4b-4376-8bb3-a57460c9eca0	ppm	RD Sewer\WWTF\Aeration Basin - MSM_DO	RD Sewer	WWTF
84374111-596c-464a-b050-58f9fd5eb182	pH	MSM\Devices\SBR1 8492 - PH	MSM	Devices
89f14a91-5348-4424-9c13-387aab10abd5	ppm	MSM\Devices\SBR3 1942 - MSM_DO	MSM	Devices
9596a3ab-befa-4ba5-a3e7-182a53787deb	°C	MSM\Devices\SBR2 290011711 - MSM_TEMP	MSM	Devices
a0bbd456-b42d-413f-b5ac-f3f3e8c23630	°C	Cape Rock\Nitrox MBBR\Cape Rock Nitrox - MSM_TEMP	Cape Rock	Nitrox MBBR
a1d9199c-cd20-4d07-8f4f-e91b77cd4b91	ppm	MSM\Devices\SBR2 290011711 - MSM_DO	MSM	Devices
aff5fd3a-89f3-4bfd-9272-13aa7d679287	ppm	Cape Rock\Nitrox MBBR\Cape Rock Nitrox - MSM_DO	Cape Rock	Nitrox MBBR
ea8bf538-1272-4948-b225-2249ce0d3170	pH	MSM\Devices\SBR3 8598 - PH	MSM	Devices
fd36454a-afb4-4a4f-8695-f8b709fec645	°C	MSM\Devices\SBR3 1942 - MSM_TEMP	MSM	Devices



Plant setup

Your plant is the foundation of data storage in Claros. Add each process, location, and parameter that your plant needs to track. Have questions? We're here to help.

[Learn More](#)

MSM



Devices



2100257



SBR1 2065177



SBR1 260013759



SBR1 2065177 

[Relocate](#)

Parameters

 On-line Total suspended solids (mg/L)

Entry





Plant setup

Your plant is the foundation of data storage in Claros. Add each process, location, and parameter that your plant needs to track. Have questions? We're here to help.

[Learn More](#)

Cape Rock

+ Lagoons =

- Nitrox MBBR =

Cape Rock Nitrox =

MBBR Reactor 1 =

MBBR Reactor 2 =

Cape Rock Nitrox

[Relocate](#)

Parameters

= On-line Dissolved Oxygen (ppm) Entry 

= On-line Temperature (°C) Entry 

Edit/View Variables X

First Prev Next Last ... Browse New Del Ins Info Copy

VarNum

Location ...

Name ... **Units**

Track every **Type**
 Data Read-Only Definition Read-Only

Description Reg Limits QC Limits Entry Limits Equation **Interface** Options User Defined Symbols Text Options Additional Info Global IDs Samp Req

OFF Interface To

External Source

SCADA Tag ? **Statistic** **Scale Factor**

Start Time (hh:mm) **Stop Time** (hh:mm)

Same Day as Start Day After Start

Filter

Low Range	<input type="text" value="None"/>	<input type="button" value="X"/>
High Range	<input type="text" value="None"/>	<input type="button" value="X"/>
Deadband	<input type="text" value="None"/>	<input type="button" value="X"/>

Filter Data (Only analyze data when:)

Filter Tag	Condition	Value
<input type="text" value="64713086-fc0b-4360-a4bf-0a7ae4dc950e"/> ?	<input type="text" value=">"/>	<input type="text" value="0"/>

BSTRICK (5/2/2022 2:36:17 PM) VARID : 2498

Edit/View Variables

First Prev Next Last ... Browse New Del Ins Info Copy

VarNum Edit VarNum

Location

Name Units

Track every Type Data Read-Only Definition Read-Only

Description Reg Limits QC Limits Entry Limits Equation **Interface** Options User Defined Symbols Text Options Additional Info Global IDs Samp Req

OFF Interface To Data Approval Level To Write With

External Source

SCADA Tag ?

Statistic **Scale Factor**

Start Time (hh:mm) **Stop Time** (hh:mm)

Same Day as Start Day After Start

Filter

Low Range

High Range

Deadband

Filter Data (Only analyze data when:)

Filter Tag ?

Condition **Value**



MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER POLLUTION CONTROL PROGRAM

**OPERATIONAL MONITORING REPORT -
MECHANICAL / RECIRCULATING FILTER
MEDIA BED WASTEWATER FACILITY**

This report covers the period of:

Jul, 2022

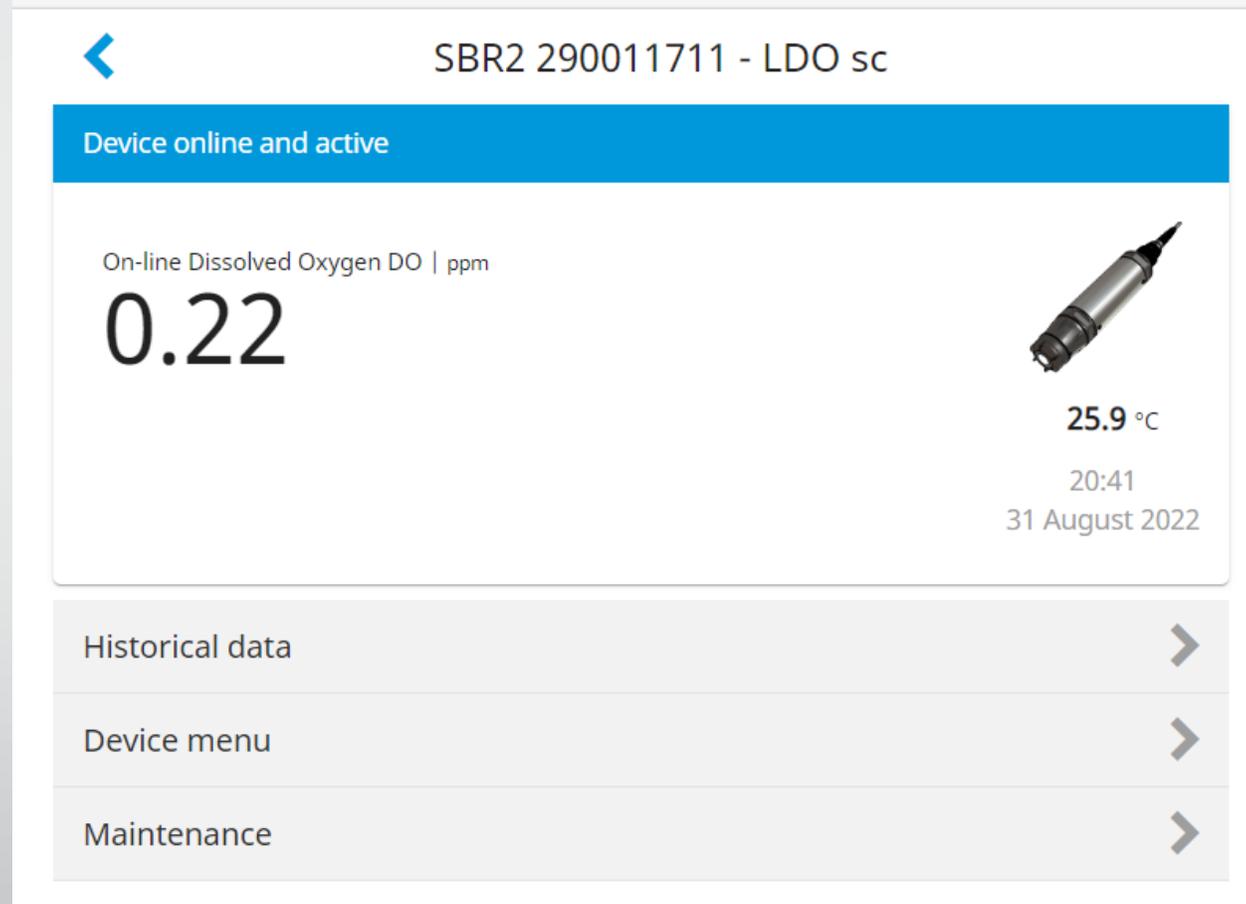
GENERAL INFORMATION

FACILITY NAME FRUITLAND WWTF	PERMIT NUMBER MO-016381
--	-----------------------------------

MECHANICAL FACILITY OPERATIONAL CONTROL PARAMETERS (continued)

DATE	SBR1					SBR2					SBR3				
	Dissolved Oxygen	TSS	Settleability	Temp	pH	Dissolved Oxygen	TSS	Settleability	Temp	pH	Dissolved Oxygen	TSS	Settleability	Temp	pH
	Mixed Liquor	Mixed Liquor	Mixed Liquor	Basin	Basin	Mixed Liquor	Mixed Liquor	Mixed Liquor	Basin	Basin	Mixed Liquor	Mixed Liquor	Mixed Liquor	Basin	Basin
	mg/L	mg/L	ml/L	°C	SU	mg/L	mg/L	ml/L	°C	SU	mg/L	mg/L	ml/L	°C	SU
Daily	Once/Week	Daily	Daily	Daily	Daily	Once/Week	Daily	Daily	Daily	Daily	Once/Week	Daily	Daily	Daily	
1	1.93	1,295		23.8	7.01	4.06	964				6.15	1,241		26.2	7.44
2	1.65	1,317		23.9	6.79	1.92	1,000				1.87	1,709		26.6	7.02
3	2.80	1,251		23.5	6.80	0.54	1,108				2.87	1,271		26.2	6.99
4	1.36	1,411		23.7	6.72	1.43	1,117				3.60	1,233		26.0	6.76
5	2.27	1,391	120	24.3	6.96	2.25	1,171	130			2.72	1,302	110	26.9	6.90
6	2.11	1,397	100	24.4	6.68	1.74	1,177	150			1.79	1,318	130	27.2	6.68
7	1.70	1,420		24.8	6.67	1.77	1,164	120			1.94	1,303	100	27.3	6.65
8	2.02	1,486	90	24.9	6.62	1.76	2,117	130			2.03	1,334	90	27.4	6.64
9	2.56	1,354		25.3	7.00	1.80	2,167				2.31	1,249		27.5	6.89
10	1.65	1,335		24.6	6.74	2.05	2,083				1.82	1,269		27.3	6.71
11	2.42	1,384		24.6	7.01	2.36	2,055	120			2.78	1,246	90	27.4	6.96
12	2.30	1,347	100	24.7	6.76	2.08	1,993	130			2.16	1,315	80	27.5	6.76
13	3.29	1,340	90	24.7	6.83	1.77	1,976	130			1.88	1,334	80	27.2	6.67
14	2.41	1,325	100	24.8	6.74	1.96	1,886	120			2.36	1,290	90	27.3	6.70

How does Operator see historical data?



The screenshot shows a mobile application interface for a dissolved oxygen sensor. At the top, there is a back arrow and the device identifier "SBR2 290011711 - LDO sc". Below this is a blue status bar that reads "Device online and active". The main display area shows the current reading "On-line Dissolved Oxygen DO | ppm" as "0.22". To the right of the reading is an icon of the sensor probe. Below the reading, the temperature is shown as "25.9 °C", the time as "20:41", and the date as "31 August 2022". At the bottom, there is a menu with three items: "Historical data", "Device menu", and "Maintenance", each with a right-pointing chevron icon.

< SBR2 290011711 - LDO sc

Device online and active

On-line Dissolved Oxygen DO | ppm

0.22



25.9 °C

20:41
31 August 2022

Historical data >

Device menu >

Maintenance >



Alerts

Map

RD Sewer

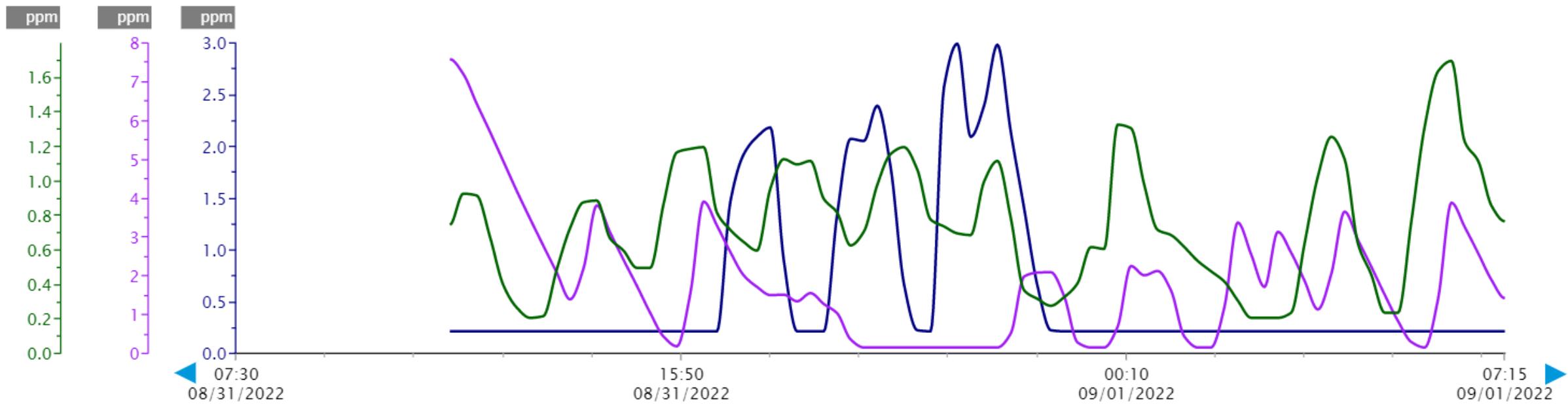
Fruitland WWTF



SBR Aeration

24 hours - 15 minutes (Average data) - 08/31/2022|07:30 - 09/01/2022|07:15

Current data



- LDO sc - SBR2 290011711 DO (ppm)
- LDO sc - SBR1 260013759 DO (ppm)

- LDO sc - SBR3 1942 DO (ppm)

Could it be better...



...by January 2023



Questions?