



Prepared for:

**MELA**

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# **HACH COMPANY**

## **Water Quality Group**

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# WIMS LAB CAL MODULE

## KEEPING LAB AND OPERATIONS CONNECTED

- What is Lab Cal
  - Part of the Hach Water Information Management Solution (WIMS)
  - Easy to use Sample Scheduling and Tracking

The screenshot displays the LabCal - OPSROCKY software interface. The main window shows a calendar view for the week of March 4-8, 2006. The calendar is organized by day, with columns for Saturday 3/4/2006, Sunday 3/5/2006, Monday 3/6/2006, Tuesday 3/7/2006, and Wednesday 3/8/2006. The rows represent sample numbers 1 through 16. Each cell in the calendar contains a sample ID and a description, such as '060303-0005 // Influent' or '060306-0005 // Effluent'. The cells are color-coded: red for 'Late > 1 Day', yellow for 'Late 1 Day', blue for 'Due', green for 'Skipped', pink for 'Received', and purple for 'Analyzed'.

Below the calendar, there is a 'Sample Detail - Analyzed' section. It includes fields for 'Sample #', 'Sample Name', 'Sampled By', and 'Sampled On'. The 'Sample #' field is populated with '060304-0006'. The 'Sample Name' field is populated with 'Influent'. The 'Sampled By' field is populated with 'Dr Bob'. The 'Sampled On' field is populated with '3/4/2006 12:00 AM'. There are also fields for 'Scheduled For Collection On' (3/4/2006 08:00 AM), 'Date Closed', 'Schedule Type' (Regular), and 'Sample Status' (analyzed).

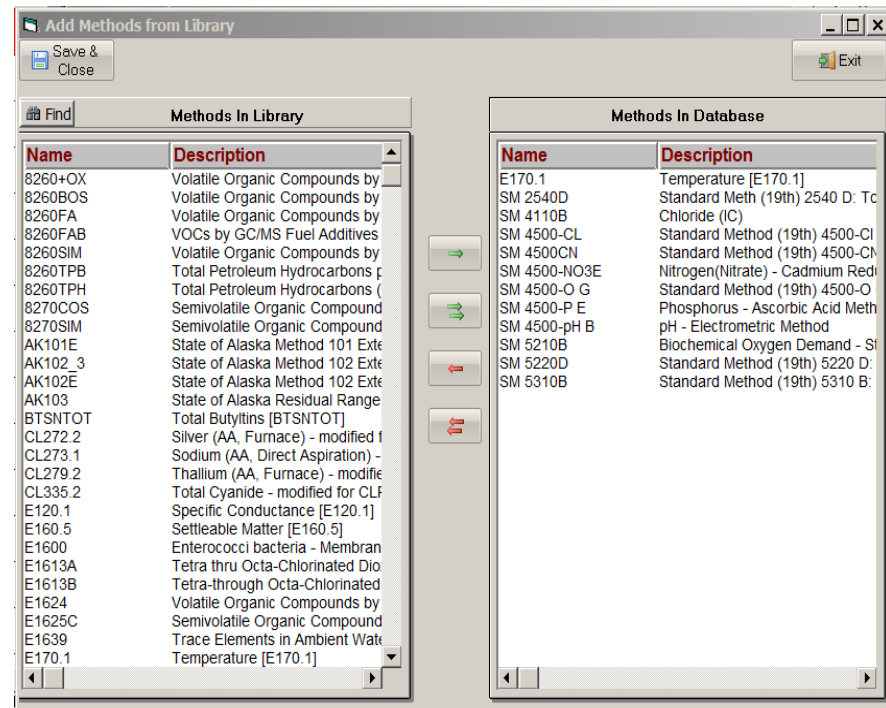
To the right of the sample details, there is a 'Tests' table with columns for 'Tests' and 'Result'. The table contains the following data:

Tests	Result
TSS	231
BOD	198
Oil & Grease - Total	1.70

Below the tests table, there is a 'Sample Type' dropdown menu set to 'Grab' and a 'Client' dropdown menu. The 'Sample Status' is 'Analyzed'.

The bottom right corner of the window shows the number '1747'.

- **Fast and Easy Set Up**
  - Choose Tests and Methods from modifiable Library.



# WIMS LAB CAL MODULE

## KEEPING LAB AND OPERATIONS CONNECTED

- Fast and Easy Set Up
  - Build Your Testing Schedule

Add Test(s) and Schedule(s) for Sample 'Effluent'

Tests

pH

Add Test(s)

Delete Test

☐ Auto Sense variables

Save & Close

Cancel

SCHEDULES (all schedules apply to all of the test(s) above)

Next Due Date  
Enter the date the first sample is due.

4 / 1 /2016

Save Schedule

Cancel Saving Schedule

Recurrence pattern

☒ Daily

☒ Every 1 day(s)

☐ Every weekday

☐ Weekly

Recur every 1 week(s) on: ☐ Sunday ☐ Monday ☐ Tuesday ☐ Wednesday ☐ Thursday ☐ Friday ☐ Saturday

☐ Monthly

☐ Day of every 1 month(s)

☐ The of every 1 month(s)

☐ Yearly

☐ Every of of

☐ The of of

☐ Custom

March 2016

April 2016

Sun Mon Tue Wed Thu Fri Sat

28 29 1 2 3 4 5

6 7 8 9 10 11 12

3 4 5 6 7 8 9

Dates

# WIMS LAB CAL MODULE

## KEEPING LAB AND OPERATIONS CONNECTED

- Print Sample Orders

LabCal (Hach WIMS v7.5.0) - SUPER @ "Wastewater Tutorial" on LOCALHOST\OPSQL.OPSWWTUTOR

Find Setup Utilities Help

Receive Close Skip Del

Create Sample Test Results Print Ca

1 140702-0001 // Effluent

2

3

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12

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14

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16

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Previous Next Print Page Print All Zoom In Zoom Out 75%

2

Wastewater Tutorial

SAMPLE ORDER

Sample Number: 140702-0001 Sample Type: Composite

Sample Name: Effluent Scheduled for collection on: 7/2/2014 8:00:00 AM

Location: Effluent Area: WWTP

Sample Date/Time: 7/2/2014 3:24:32 PM Sampled By: Scott Patrick Dorner

Notes:

Tests:

Variable	Units	Analysis Method	Result	Date Complete	Analyzed By
Effluent BOD	mg/L	SM 5210B	2	7/14/2014 2:42:00 PM	
Effluent TSS	mg/L	SM 2540D	6	7/14/2014 2:42:00 PM	
Effluent pH	SU	SM 4500-pH B	7.5	7/14/2014 2:42:00 PM	

Chain of Custody

Transfer Date	Relinquished By	Received By	Notes
7/3/2014 12:08:00 PM	Scott Patrick Dorner	Jim S Carroll	Sample properly preserved

3

Sheet: Sheet1 Export As

Page 1 Microsoft XPS Document Writer 2:56 PM

# WIMS LAB CAL MODULE

## KEEPING LAB AND OPERATIONS CONNECTED

- Use familiar bench sheets to capture data.

**TSS Benchsheet (Custom Data Entry Form)**

File Edit Format Help KeyPad

Start Date: 1 / 4 / 2016 Current Date: Comment

H26 Save Approve Calc Show Calcs

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2	<b>TSS Benchsheet - Method SM 2540D</b>															
3																
4	Analyst:					Oven Temperature In:										
5	Sample Date:		01/04/16 - Mon			Oven Temperature Out:										
6	Analysis Date/Time:															
7																
8																
9																
10																
11			<u>Inf TSS</u>			<u>PE TSS</u>			<u>RAS Conc</u>			<u>MLSS</u>			<u>Ef TSS</u>	
12	Sample & Tare				g			g			g			g		
13	Tare				g			g			g			g		
14	Solids				g			g			g			g		
15	Sample Volume				ml			ml			ml			ml		
16	Suspended Solids				245 mg/L			77 mg/L			10300 mg/L			3622 mg/L		
17																
18																
19																
20																
21																
22																

# WIMS LAB CAL MODULE

## KEEPING LAB AND OPERATIONS CONNECTED

- Enter results directly in the Lab Cal Screen


Tests	Chain Of Custody	Sample Notes	Sample Definition Notes	Test Notes	User Defined Fields	Associated Samples
Variable	Test	Method	Result	Units	Analysis Start Date	Ar T
4011 - Effluent BOD	BOD5	SM 5210B	<2	mg/L		
4041 - Effluent TSS	TSS	SM 2540D	6	mg/L		
4081 - Effluent pH	pH	SM 4500-pH B	7.5	SU		

Add Test

Delete Test

View Test History

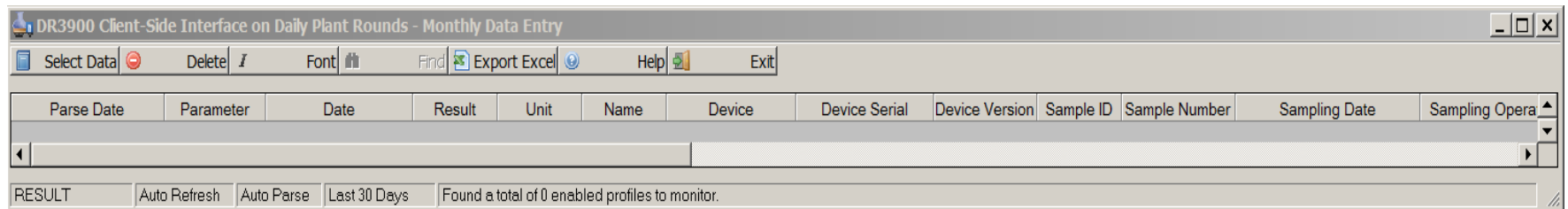
Approve ☒



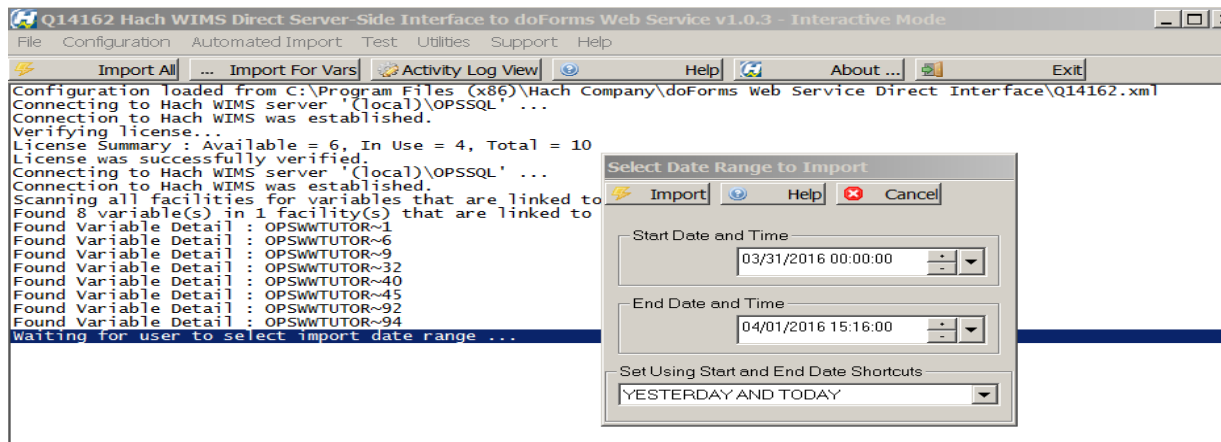
# WIMS LAB CAL MODULE

## KEEPING LAB AND OPERATIONS CONNECTED

- Or Interface to Lab Instruments



- And Commercial Labs

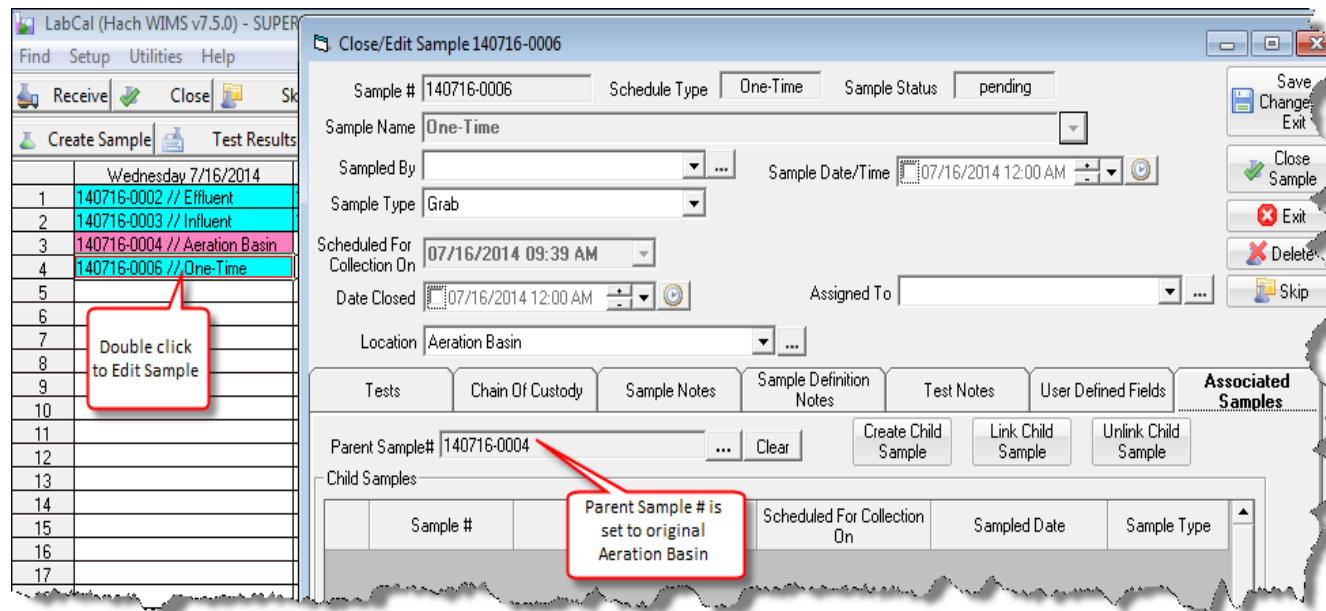




# WIMS LAB CAL MODULE

## KEEPING LAB AND OPERATIONS CONNECTED

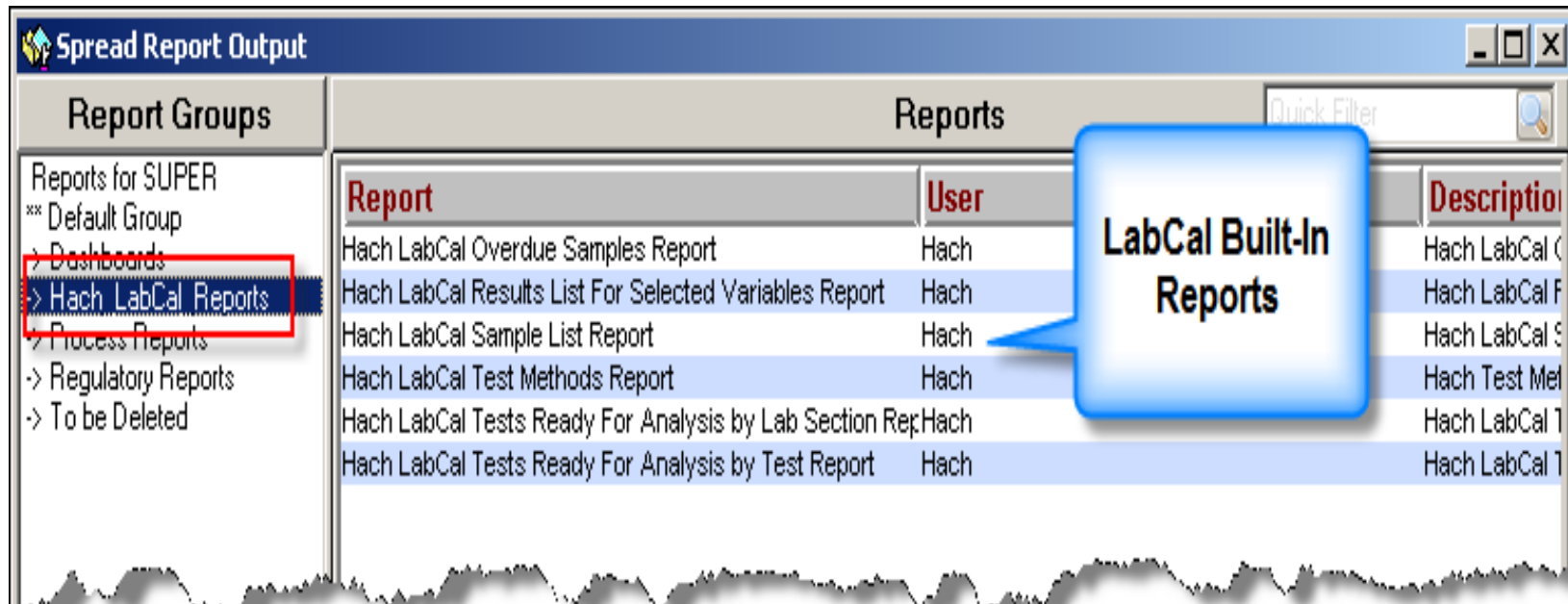
- And Manage the Process
  - Close Out Samples, Reschedule Samples, Skip Samples,
  - Build Associated Samples, One Time/Ad Hoc Samples



# WIMS LAB CAL MODULE

## KEEPING LAB AND OPERATIONS CONNECTED

- Manage the Process
  - Reporting



**Spread Report Output**

**Report Groups**

- Reports for SUPER
- \*\* Default Group
- > Dashboards
- > Hach LabCal Reports**
- > Process Reports
- > Regulatory Reports
- > To be Deleted

**Reports**

Report	User	Description
Hach LabCal Overdue Samples Report	Hach	Hach LabCal (
Hach LabCal Results List For Selected Variables Report	Hach	Hach LabCal F
Hach LabCal Sample List Report	Hach	Hach LabCal S
Hach LabCal Test Methods Report	Hach	Hach Test Mel
Hach LabCal Tests Ready For Analysis by Lab Section Rep	Hach	Hach LabCal T
Hach LabCal Tests Ready For Analysis by Test Report	Hach	Hach LabCal T

**LabCal Built-In Reports**

# WIMS LAB CAL MODULE

## KEEPING LAB AND OPERATIONS CONNECTED

- Manage the Process - Reporting

### EXAMPLES:

#### **Hach Lab Cal Overdue Samples Report**

Displays all the overdue samples:

Rocky Creek Waste Water TUTORIAL Overdue Samples Report				13-May-14 10:23
Samples due before: 13-May-14				
Sample Number	Description	Scheduled for Collection	Tests	
140512-0001	Effluent	12-May-14 08:00:00	BOD5, TSS	
140512-0002	Influent Test	12-May-14 08:00:00	BOD5	
140512-0003	Influent	12-May-14	TSS	
140509-0002	Influent Test	09-May-14 08:00:00	BOD5	
140509-0001	Effluent	09-May-14 08:00:00	BOD5, TSS	

#### **Hach Lab Cal Results List For Selected Variables Report**

Displays list of results for selected variables:

Rocky Creek Waste Water TUTORIAL Results for Variables					13-May-14 10:28
01-Jul-13 - 31-Jul-13					
Variable	Date	Result	Audit User	Audit Timestamp	
Influent BOD (mg/L)	01-Jul-13	220	BGIORD	07-Jul-13 10:22:15	
Influent Flow Hourly (MGD)	01-Jul-13	2.381	VIA_HISTORIAN	02-Jul-13 02:24:03	
Influent Flow Hourly (MGD)	01-Jul-13 01:00:00	2.562	VIA_HISTORIAN	02-Jul-13 02:24:03	
Influent Flow Hourly (MGD)	01-Jul-13 02:00:00	2.401	VIA_HISTORIAN	02-Jul-13 02:24:03	

# WIMS LAB CAL MODULE

## KEEPING LAB AND OPERATIONS CONNECTED

- Manage the Process Reporting

### Hach Lab Cal Sample List Report

Displays all the samples:

Rocky Creek Waste Water TUTORIAL Sample List Report				13-May-14 10:30
Sample Name	Location	Test	Schedule	
Effluent	Effluent	BOD5	vWeekly,Start-18-Dec-13,Every 1 week(s) on M,W,F	
		TSS	vWeekly,Start-18-Dec-13,Every 1 week(s) on M,W,F	
Influent	Influent	TSS	vWeekly,Start-06-Jan-14,Every 1 week(s) on M,W,F	
Influent Test		BOD5	vWeekly,Start-25-Jan-14,Every 1 week(s) on M,W,F	

### Hach Lab Cal Test Methods Report

Displays all the tests and associated methods:

Rocky Creek Waste Water TUTORIAL Test - Methods Report				13-May-14 10:35
Test	Description	Method	Max Hold Time (Hours)	
BOD5	BOD5 @ 20 Deg. C, Percent Removal	SM 5210B	24	
TSS	Total Suspended Solids (TSS)	SM 2540D	24	

### Hach Lab Cal Tests Ready For Analysis by Lab Section Report

Displays tests ready for analysis grouped by Lab Section entry

Rocky Creek Waste Water TUTORIAL Tests Ready for Analysis				13-May-14 10:56
By Lab Section				
LabSection	Test	Sample	DateCollected	
Contractor	TSS	140512-0001 Effluent	13-May-14 08:00:00	
	TSS	140512-0003 Influent	13-May-14	
Kitchen	BOD5	140512-0001 Effluent	13-May-14 08:00:00	

- Manage the Process Reporting

Displays tests ready for analysis grouped by Test entry

### Sample Login and Chain of Custody

[illegible]

# WIMS LAB CAL MODULE

## KEEPING LAB AND OPERATIONS CONNECTED

- QA/QC

The screenshot displays the 'QC Report' software interface. At the top, there is a menu bar with 'Preview', 'Graph', 'Histogram', 'Load', 'Save', and 'Exit' options. Below this is a tabbed interface with 'Report Settings', 'Options', and 'QC Limits' tabs. The 'Report Settings' tab is active and contains two main sections: 'Run Report for' and 'Analyze Variables'.

In the 'Run Report for' section, there are two radio buttons. The first, 'Date Range', is selected and includes 'Start Date' (3 / 1 /2016) and 'End Date' (3 /31/2016) fields, along with a monthly navigation button showing 'Mar 2016'. The second radio button, 'Number of Samples', is unselected and includes a 'Find last' field (20) and an 'ending on' field (4 / 1 /2016).

The 'Analyze Variables' section features three buttons: '... Add', 'Remove', and 'Remove All'. Below these is a table with the following data:

Var #	Var Name	Units	VarType
1021	MLSS	mg/L	P

Vertical scroll arrows are located to the right of the table.

# WIMS LAB CAL MODULE

## KEEPING LAB AND OPERATIONS CONNECTED

- QA/QC

The screenshot shows the 'QC Report' dialog box with the 'Options' tab selected. The 'Report/Graph Options' section has a text field for 'Report/Graph Heading' containing 'MLSS (mg/L) QC'. The 'Report Options' section contains four checked items: 'All points above or below Upper and Lower Control Limit', '2 Consecutive points are above or below the Warning Limits', '7 Consecutive points are on one side of the mean', and '5 Consecutive points are sloping in one direction'. The 'Outlier Detection' section has 'Off' selected. The 'Outlier Type' section has a dropdown menu set to 'High Outliers'.

**QC Report**

Preview Graph Histogram Load Save Exit

Report Settings **Options** QC Limits

**Report/Graph Options**

Report/Graph Heading  
MLSS (mg/L) QC

**Report Options**

☒ All points above or below Upper and Lower Control Limit

☒ 2 Consecutive points are above or below the Warning Limits

☒ 7 Consecutive points are on one side of the mean

☐ 5 Consecutive points are sloping in one direction

**Outlier Detection**

☒ Off

☐ T Test (Critical Value 5%)

☐ T Test (Critical Value 1%)

☐ Grubbs Test

☐ Manually mark the outliers

**Outlier Type**

For the Test Selected, Check For High Outliers

# WIMS LAB CAL MODULE

## KEEPING LAB AND OPERATIONS CONNECTED

- QA/QC

**QC Report**

Preview | Graph | Histogram | Load | Save | Exit

Report Settings | Options | **QC Limits**

**What QC Limits to use**

☒ **From Variable's QC Settings**

Choose Variable

**Variable** 1021 - MLSS ...

Start Date	UCL	UWL	QC Mean	LWL	LCL
1/1/2009	4000	3800	3500	3000	2800

☐ **User Defined**

User Defined Limits

Upper Control Limit	<input type="text"/>
Upper Warning Limit	<input type="text"/>
QC Mean	<input type="text"/>
Lower Warning Limit	<input type="text"/>
Lower Control Limit	<input type="text"/>



# WIMS LAB CAL MODULE

## KEEPING LAB AND OPERATIONS CONNECTED

- QA/QC

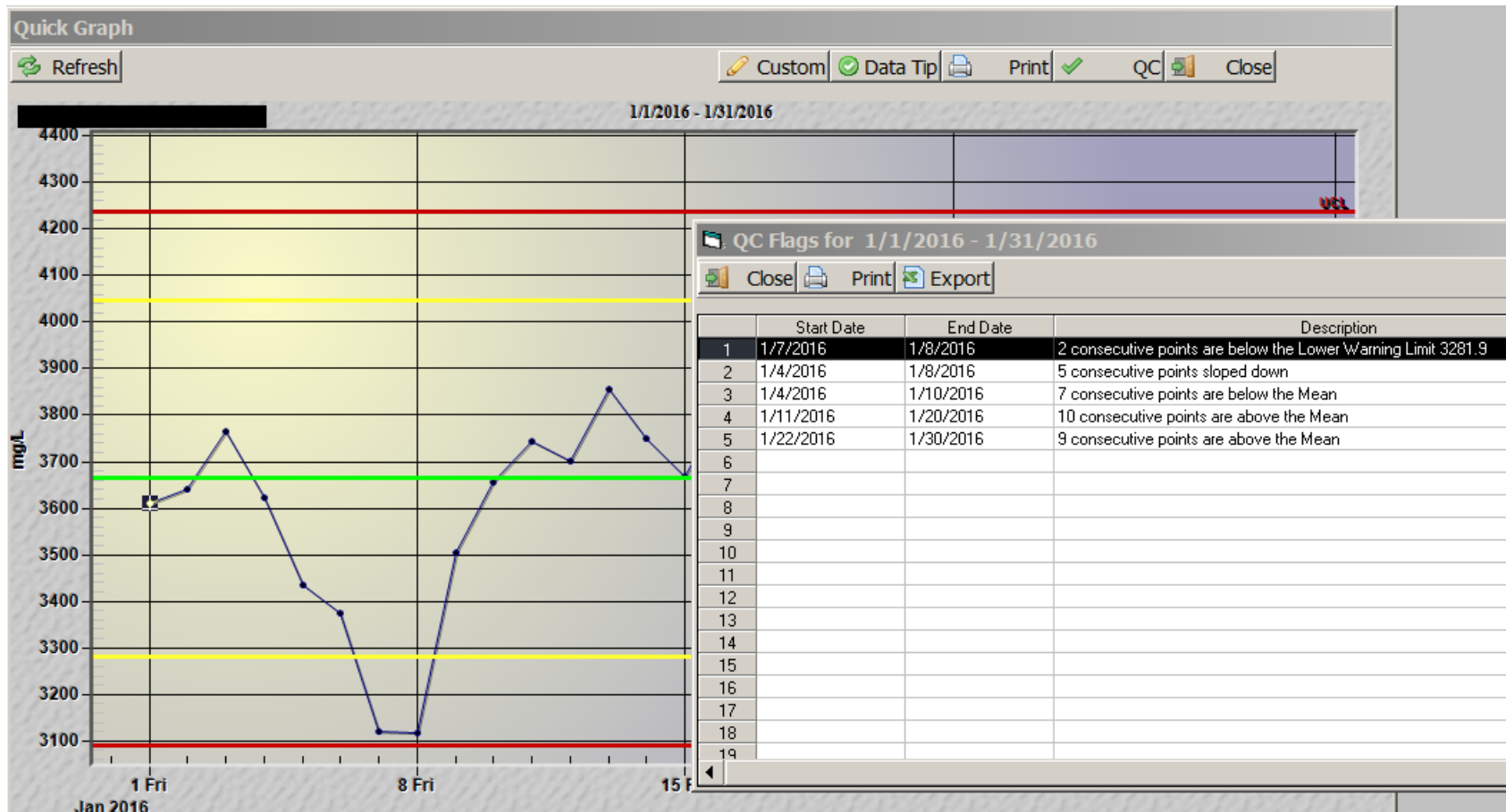
The screenshot displays the 'Variable Analysis' software window. The 'Variable to Analyze' field is set to '1021 - MLSS'. The 'Date Settings' section shows a 'Start Date' of 3 / 1 / 2016 and an 'End Date' of 3 / 31 / 2016, with a calendar icon for 'Mar 2016'. The 'Options' tab is active, showing 'Graphs to display' with four checked options: 'Show Trend Graph', 'Show Year Over Year Graph', 'Show Individuals-Moving Range Graph', and 'Show Histogram Graph'. The 'Show Compare to Graph' option is unchecked, with a 'Suggest' button and a dropdown menu. The 'QC Flag Detection Rules' section has four checked rules: 'All points above or below Upper and Lower Control Limit', '2 Consecutive points are above or below the Warning Limits', '7 Consecutive points are on one side of the mean', and '5 Consecutive points are sloping in one direction'. The 'Stats' tab is also visible, showing 'Control Limits' with three radio buttons: 'From Variable's QC Settings', 'User Defined', and 'Calculated' (which is selected). Below the 'Calculated' option is a table of 'Calculated Limits'.

Calculated Limits	
Upper Control Limit	4,409.4
Upper Warning Limit	4,119.1
QC Mean	3,538.6
Lower Warning Limit	2,958.0
Lower Control Limit	2,667.7

Below the table, the 'Calculated with outliers removed' radio button is also visible.

# WIMS LAB CAL MODULE

## KEEPING LAB AND OPERATIONS CONNECTED

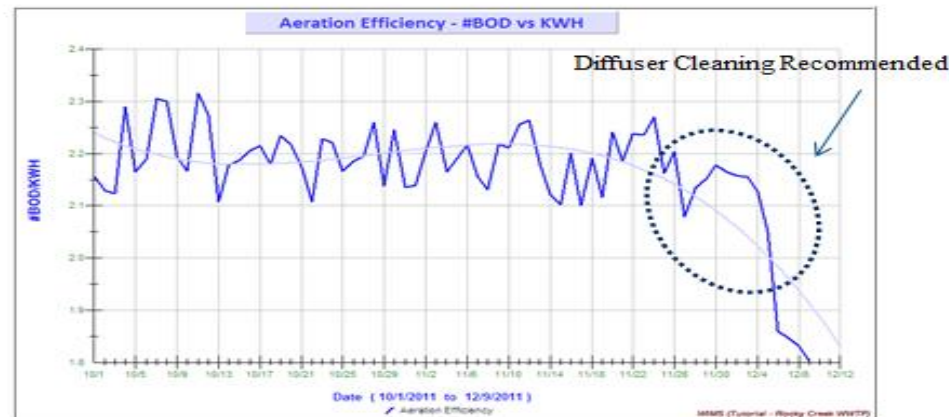


# WIMS LAB CAL MODULE

## KEEPING LAB AND OPERATIONS CONNECTED

### Do: Identify the Problem

WIMS™ shows the cleaning cycle by benchmarking pounds of BOD removed (lab data) per KW of electricity used (SCADA data). Benchmark shows that the diffuser should be cleaned at 2.0lb BOD/kwh



Be Right™

# WIMS LAB CAL MODULE

## KEEPING LAB AND OPERATIONS CONNECTED

Hach WIMS automates your CT calculations making them fast, accurate, and reliable.

For each disinfectant segment given a baffling factor, volume, etc... the CT Achieved is calculated. Flows, pH, temperatures, and Disinfectant Residuals can be hand entered or pulled from your SCADA system to calculate your CT Required.

Weekly CT Report			
	Clearwell CT Achieved	Clearwell 3 Log Giardi CT Required	Clearwell Giardi Log Inactivation
Date	mg/L-mins	mg/L-mins	
1/1/2009	42.7	79.3	1.6
1/2/2009	47.7	96.6	1.5
1/3/2009	41.9	92.1	1.4
1/4/2009	40.7	93.0	1.3
1/5/2009	29.8	96.6	0.9
1/6/2009	63.3	85.9	2.2
1/7/2009	50.9	98.9	1.5
Minimum	29.8	79.3	0.9
Maximum	63.3	98.9	2.2
Average	45.3	91.8	1.5

# WIMS LAB CAL MODULE

## KEEPING LAB AND OPERATIONS CONNECTED



# Hach WIMS

< *Input Data* >

MOR Entry Form

< *Graphs* >

Output Graphs

Raw VS Settled Turb

< *Reports* >

Output Reports

MOR Report

Variable Analysis

Design Reports

Help

Key Performance Indicators			
03/02/16 - 04/01/16	Min	Max	Avg
Water Production	41.89	45.62	44.15
Chlorine Residual	0.620	2.900	2.402
CCPP - Corrosion Potential	-2.090	-1.380	-1.659



# WIMS LAB CAL MODULE

## KEEPING LAB AND OPERATIONS CONNECTED

- Summary
  - Easy to Set-Up
  - Easy to Learn
  - Easy to Use
- Integrated Software for Decision Support
  - Combines Lab Data with Process and Field Data
  - Powerful Trending and Analysis for QA/QC and Optimization
- Take of Quick Look



