

# Quality Assurance Tools in DWR F.L.I.M.S. and WDL

(4/23/12)

# Definitions

- ▶ F.L.I.M.S. = Field and Laboratory Information Management System
- ▶ WDL = DWR's Water Data Library, an assortment of databases storing water-related data. F.L.I.M.S. directly feeds the **Water Quality** Portion of the WDL.

<http://www.water.ca.gov/waterdatalibrary/>

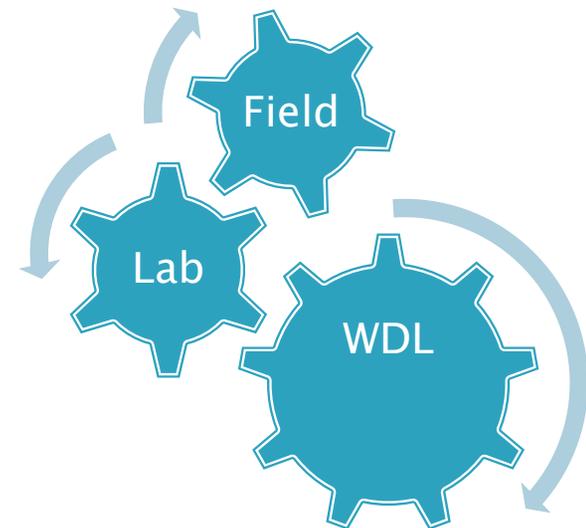
# Background

- ▶ F.L.I.M.S. was developed in the mid 1990's through the Municipal Water Quality Investigations Program, which oversaw the operation of DWR Bryte Lab at the time.
- ▶ F.L.I.M.S. went live in 1998, WDL WQ went live in 2002
- ▶ F.L.I.M.S. / WDL are collectively designed to capture and permanently store all DWR Grab Sample WQ data, plus QC data for programs throughout DWR
- ▶ DES, O&M including Field Divisions, Regional Offices, DOE, Flood, others



# F.L.I.M.S. and WDL/wQ

- ▶ Modern Relational Database Design
  - Oracle 11, SQL Server, MS Access
- ▶ Designed as an integrated data system serving three groups within DWR, plus the public:
  - Field Sample Collectors
  - DWR Bryte Lab (LIMS system)
  - End Users and Public (WDL)
- ▶ Utilize a common set of definitions for all groups



# Design

- ▶ Database and applications were designed to
  - Capture as much relevant information about the sampling event as possible
  - Identify field QC samples for later analysis
  - Reduce or eliminate systematic data entry errors by using a 'single' entry system and through extensive use of pre-defined templates
  - Capture all relevant lab QC
  - Meet the goals of DWR WREM 60
- ▶ Paperwork and container labels are generated by the software– reducing the effort required to prepare for runs



# F.L.I.M.S. Field QC

- ▶ F.L.I.M.S. field modules are designed to capture as much information as possible about the sample and the conditions under which it was collected.
  - Lab template definitions are utilized to help define user runs
  - Users can define new items, like stations. These definitions are used later by the lab and WDL
  - Samples are identified by their purpose, e.g.
    - ‘Normal’ samples, Blanks, Duplicates (Sample purpose is not shared with the lab so that they treat it in a normal manner)
  - Collection Staff are reminded about holding times and proper container handling in the run paperwork and container labels



# F.L.I.M.S. Field Module

FLIMS Field Module 97 - [Customer Definitions]

File Edit View Insert Format Records Tools Window Help

**Definitions** Close

Collector Activity Unit: 2220 - Oroville Field Division

**Templates and Lists** **User's Manual**

Runs	Cost Codes	Field Crew List
Laboratory Analyses	User Projects	Field Instruments
Field Measurements	Mail Contacts	Instrument Probes
Stations		Database Maintenance*

**Look Up**

Lab Request Group Details	Method Containers and Handling	Method, Analyte Lists
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\*Use Database Maintenance To Reset the Counter At the Beginning of a new year. This operation must be performed on every machine running the Field Module.

# F.L.I.M.S. Field Module

**FLIMS Field Module 97 - [Sample Description]**

File Edit View Insert Format Records Tools Window Help

Run Plan and Laboratory Submittal

1. Select Sample: (Double-Click to Update)

#	Sample Number	StationName	Purpose	Desc	Depth
1	CR0312B0444	VERNALIS	Experimental Samp	Pre-Maintenance G	1 Meters
2	CR0312B0445	VERNALIS	Normal Sample	River Grab	1 Meters
3	CR0312B0446	(None)	Experimental Samp	TOC river 5.0 ppm	1 Meters
4	CR0312B0447	VERNALIS	Experimental Samp	Post-Maintenance	1 Meters
5	CR0312B0448	(None)	Blank; Field	Filtered Blank	1 Meters

2. Select View

Sample Number: CR0312B0444

# 1 Pacific Standard Time

Collection Data + Time: 03/27/2012 0:00

Priority: 5 Cost Code: V10093000000

Sampling Device: Spigot / Tap

\* Station Number / Name: VERNALIS

\* Sample Description: Pre-Maintenance Grab; 2 min flush

\* Location

Sample Purpose: Experimental Sample

Project 1: REAL TIME TOC Project 2: Real Time IonChroma Q Project 3: MWQI

SampleMatrix: Water, Natural

Sampler(s): Bettencourt & New

WDL Fate: New Data Not Validated by Ownr

\* Depth: 1 Depth Units: Meters

Instructions to Lab: Pre-Maintenance Grab; 2 min flush

Instructions to Field Crew

Submittal Details

Run: Vernalis RTMQC

Default Priority: 5 Default Cost Code: V10093000000

Mail To: Steve San Julian New Mail To:

# F.L.I.M.S. Lab QC

**Batch QC Results**      QC Batch: 34732      Inorganic Anions 28d hold

1. Category      2. Item

1. Category	2. Item	QC Sample ID	QC Measure Name
Blanks		<New>	(Select to Add New)
<b>Spikes / Standards</b>			
Surrogate Recoveries		281861	Low Level Standard
Sample Matrix Spikes		<b>281862</b>	<b>Low Level Standard</b>
Batch Accuracy Statistics		281863	Check Standard
Sample Duplicate Stats		281864	Check Standard
		281865	Check Standard
		281866	Check Standard

Chemist's Batch Notes:

Pineda, Maritza

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**Standards**      QC Parameter: Low Level Standard

Spike Lot ID:       Standard:       Surrogate:

Nickname:

Spike Volume (ml):      

Sample Flags:

Final Volume (ml):      

Chemist's Notes:

Analyte	Result	Units	Reference Conc	RL (calc)	% Recovery	QC Warning Message
Chloride	.948	mg/L	1.	1	94.8%	
Bromide	.1039	mg/L	.1	0.01	103.9%	
Nitrate	.9935	mg/L	1.	0.1	99.4%	
Sulfate	.8696	mg/L	1.	1	87.0%	



# F.L.I.M.S. Lab QC Review

Management and Control Main

## Sample Management And Control

Exit

Samples Received in the Past Day

Chl/Pheo
DON
IC
ICP Metals + Cations (D)
NH3
NO3+NO2
O-P04
TKN
TPhos
TSS
VSS

Sample Status

Sample Status Summary

Unassigned Samples

Chemist and Lab Activities

Reassign Methods

Batch Review

Submittal Review

Final Reports

Retrieve Discontinued Spike Lots

Assign Analysis to Contract Lab

NOTES: New=Received in the past 4 Hrs  
Exp=Some Expedite Samples

Version: 3.044

# WDL Water Quality – Public Face

[Skip to: Content | Footer | Accessibility](#)

DWR

Home
Newsroom
Flood & Safety
Planning
State Water Project
Funding
Environment
Supply & Use
Data

[CDEC](#) | [CIMIS](#) | [WDL](#) | [IEP](#) | [MWRIS](#) | [All Data Topics...](#)

- [Water Data Library Home](#)
- [Groundwater Level Data](#)
- [Water Quality Data](#)
- [Continuous Data](#)
- [Historical Information](#)
- [Contact Information](#)

**DWR CLIENTS ONLY**

- [Admin Login](#)
- [Climate Data \(Beta 1.1\)](#)
- [Climate Data \(Access Prototype\)](#)

**DWR Documents**

- [Data Collection in DPLA](#)
- [Data Coordination Project Charter](#)
- [Groundwater Strategic Plan](#)
- [Surface Water Strategic Plan](#)
- [Water Quality User's Manual](#)
- [Well Data Strategic Plan](#)
- [WDL Strategic Plan](#)
- [Water PIE Strategic Plan](#)

**Hydra Documents**

- [Hydra Procedures](#)
- [Hydra Tracking Reports](#)
- [Hydra Use Summary Reports](#)

## Water Data Library

Use the map below to locate monitoring stations. You can find an area of interest if you zoom and pan the map. Quickly find an area searching for named features on a map such as the name of a city, park, landmark, lake, water feature, or zip code within California. Once at the area of interest, select the desired Site Type and click the "Refresh Map" button to show monitoring stations in the area. Additional searches by data type are possible by clicking the links on the left. For help on these and other ways to find your data [click here](#).

**WDL STATION MAP**

**Location Search**

To find monitoring stations for a specific area, enter the placename or zip code into the text box below then, click the "Search" button.

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**Site Type**

Select the desired site type using the checkboxes, then click the "Refresh" button.

Groundwater Level

Water Quality

Continuous Data

Multi-parameter site

Cluster, showing

Map Center: 38.550000, -121.750000	Mouse LatLon: 38.653701, -121.420441
Map SW: 37.679473, -123.403931	Mouse Px: 10664, 25127
Map NE: 39.406489, -120.097046	Mouse Tile: 41, 98
Map Zoom: 8	Mouse Click:



# WDL – Internal Face

The screenshot displays the WDL Internal Face web application. At the top, a navigation bar contains links for Home, Newsroom, Flood & Safety, Planning, State Water Project, Funding, and Environment. Below this is a secondary navigation bar with links for CDEC, CIMIS, WDL, IEP, IWRIS, and All Data Topics. The main content area is divided into a left sidebar and a right main panel. The sidebar contains sections for 'DWR CLIENTS ONLY' (Logout, WQ Admin, Climate Data), 'DWR Documents' (Data Collection in DPLA, Data Coordination Project Charter, Groundwater Strategic Plan, Surface Water Strategic Plan, Water Quality User's Manual, Well Data Strategic Plan, WDL Strategic Plan, Water PIE Strategic Plan), and 'Hydstra Documents' (Hydstra Procedures, Hydstra Tracking Reports, Hydstra Use Summary Reports). The main panel is titled 'WDL Water Quality Admin Functions' and shows the user's name as 'agee4804' and activity unit as '4804'. It lists several admin functions: 'Water Quality Users Manual' (1.82mb PDF), 'Internal Water Quality Reports' (Water Quality Report by Project, Run, Station, Station Group, Permanent Station Sample Statistics, User Defined Station Summary), 'Edit Sample Data' (Update Sample Information, Status, Field Data), 'Manage Station Groups' (Define a New Station Group, Rename/Delete Station Group, Revise Station Group List), 'Manage User Projects' (Define a New Project, Rename/Delete a Project, Assign/Remove Project Samples), and 'Manage Data Sharing' (Add a New Data Share, Update/Delete a Data Share).

Home Newsroom Flood & Safety Planning State Water Project Funding Environme

CDEC | CIMIS | WDL | IEP | IWRIS | All Data Topics...

→ Water Data Library Home  
→ Groundwater Level Data  
→ Water Quality Data  
→ Continuous Data  
→ Historical Information  
→ Contact Information

**DWR CLIENTS ONLY**

→ Logout  
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**DWR Documents**

→ Data Collection in DPLA  
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**Hydstra Documents**

→ Hydstra Procedures  
→ Hydstra Tracking Reports  
→ Hydstra Use Summary Reports

**WDL Water Quality Admin Functions**

**User Name:** agee4804 **Activity Unit:** 4804  
Select from one of the water quality admin functions:

[Water Quality Users Manual](#) (1.82mb PDF)

Internal Water Quality Reports

- [Water Quality Report by Project](#)
- [Water Quality Report by Run](#)
- [Water Quality Report by Station](#)
- [Water Quality Report by Station Group](#)
- [Permanent Station Sample Statistics](#)
- [\(User Defined\) Station Summary](#)

Edit Sample Data

- [Update Sample Information](#)
- [Update Sample Status](#)
- [Update Field Data](#)

Manage Station Groups

- [Define a New Station Group](#)
- [Rename/Delete Station Group](#)
- [Revise Station Group List](#)

Manage User Projects

- [Define a New Project](#)
- [Rename/Delete a Project](#)
- [Assign/Remove Project Samples](#)

Manage Data Sharing

- [Add a New Data Share](#)
- [Update/Delete a Data Share](#)

# What About Program QA?

- ▶ You've set up a Program Plan incl. data quality standards
- ▶ You're collecting control samples; blanks, duplicates and you've identified them in your field runs
- ▶ You have lab QC reports – but they're in .pdf format
- ▶ How do you get and analyze your QC samples and the lab info to demonstrate that your efforts meet the standards of data quality you've described in your plan?



# Quality Assurance

Former Method

- ▶ Lab QC Reports: .pdf summary available from the lab at the time of data release.

## Quality Control Reports

Inorganic Analyses

09-Jun-10

Submittal Name: SWCMP  
Submittal ID: NA0509B0015

### QC Batch List:

Method	QC Batch Number	Method	QC Batch Number	Method	QC Batch Number
EPA 100.2	20858	EPA 100.5	20858	EPA 100.1	20851
EPA 200.7 (G)	20859	EPA 200.7 (F)	20864	EPA 300.2 (601464)	20877
EPA 300.1	20878	EPA 300.1 (60081464)	20879	EPA 300.4	20881
EPA 300.6	20882	EPA 415.1 (G) Cobalt	20884	EPA 415.1 (G) Cobalt	20884
EPA 415.1 (G) Cobalt	20889	EPA 415.1 (F) Cobalt	20873	EPA 415.1 (F) Cobalt	20883
EPA 415.1 (F) Cobalt	20886	Std Method 250.9	20889	Std Method 250.9	20887
Std Method 2540.9 (M)	20893	Std Method 2510.8	20888	Std Method 2540.9	20871
Std Method 4520.9(C)	20890				

- ▶ Some info via WDL internal site – but you had to pull it out from everything else
- ▶ Overall summary: full info available through Bruce Agee
- ▶ Intent was always to make this more easily accessed by user



# WDL Study Summary

## (Beta, Limited Distribution)

- ▶ We've recently created an application that makes it possible to select a portion of your data from the WDL and
  - Produce summary descriptive statistics
  - Produce Program QC data – and results. (This is your QC, e.g. blanks, dups)
  - Produce a summary of holding time and handling alerts
  - Produce an electronic summary of all Lab QC



# Study Summary Main Form

WDL Study QC Summary : Form

## WDL Study Summaries

2. Select By: 1) User Activity Unit: 1860

Station List     Run     User Project

All Participants (Cooperative Studies)

Just give me all recent data    \*All

3. BeginDate: 8/8/2012    EndDate: 4/22/2012

Ready    **Load Project**

4.

Study	
Summary Parameters	
Description	QC
Runs	Blanks - QC
Sample List	Dups - QC
Station Uses	Additional QC*
QA Sample Distribution	Hold+Handling Flags
"Excluded" Samples?	Analysis Dilut+Notes
*Flags+Notes	*Field QC List

Data
<input checked="" type="checkbox"/> Include Hold/Temp Violations
Results
Field Results
Stations
* Method Comparability

Lab QC
QC Batch List
QC Batch Sample List
Batch QC (6)
*QC Flag Notes

\* When selecting by Station List or by Project, relevant Run QC samples will be added whether or not they have a project tag or are included in the Stations List. Selection by Run includes these samples by default.

# Study Summary: Descriptive Information

QCSummary\_01\_Runs : Select Query

RUN_CODE	RUN_USER_RU	RUN_NAME	RUN_SUBMITT	RUN_RECEIVE	RUN_LAB_INST	RUN_FIELD_OF	RUN_LAB_REC	RUN_REVIEW
CA0312B0153	CA0312B0153	Eastside Strea	Kenneth New	Carroll, Marilyn			12 12:45:00 PM	
CK0412B0168	CK0412B0168	Delta East_Mor	Mark Bettencou	Chan, Elaine			012 2:20:00 PM	
CK0412B0170	CK0412B0170							
CK0412B0172	CK0412B0172							
CK0412B0173	CK0412B0173							
CK0412B0174	CK0412B0174							
CK0412B0175	CK0412B0175							
CK0412B0176	CK0412B0176							
CR0312B0060	CR0312B0060							
CR0312B0061	CR0312B0061							
CR0312B0062	CR0312B0062							
CR0312B0063	CR0312B0063							
CR0312B0064	CR0312B0064							
CR0312B0065	CR0312B0065							
CR0312B0066	CR0312B0066							
CR0312B0070	CR0312B0070							
CR0312B0071	CR0312B0071							
CR0312B0072	CR0312B0072							
CR0312B0073	CR0312B0073							

QCSummary\_02 Samples : Crosstab Query

SAM_CODE	SAM_SAM_CO	SAM_ACT_CO	SAM_RUN_CO	SAM_ACT_CO	SAM_SCC_CO	Station Listing	SAM_USER_S	SAM_Stn_N
CA0312B0942	CA0312B0945	1860	CA0312B0153	1860	V20833701010	User Defined	B9D42136142	Little Sl.@Fr
CA0312B0943	0	1860	CA0312B0153	1860	V20833701010	Master List	B9S81841416	ShagSl@Lib
CA0312B0944	0	1860	CA0312B0153	1860	V20833701010	Master List	B9D81371295	NFMokelum
CA0312B0945	0	1860	CA0312B0153	1860	V20833701010	Master List	B9D75891188	Calaveras R
CA0312B0946	0	1860	CA0312B0153	1860	V20833701010	Master List	(NONE)	(None )
CA0312B0947	0	1860	CA0312B0153	1860	V20833701010	Master List	(NONE)	(None )
CK0412B1017	CK0412B1019	1860	CK0412B0168	1860	V20833701010	User Defined	B9D75732454	Johnson Sl. (
CK0412B1018	0	1860	CK0412B0168	1860	V20833701010	Master List	B9S81841416	ShagSl@Lib
CK0412B1019	0	1860	CK0412B0168	1860	V20833701010	Master List	B9D81371295	NFMokelum

QCSummary\_02b\_Stations : Crosstab Query

SAM_ACT_CO	Station Listing	SAM_USER_S	SAM_Stn_NAM	Sample Purpose	FirstOfSAM_DES	CountOfSAM_c	MinOfSA
1860	Master List	(NONE)	(None )	Blank; Equipment	Pyrethroids Blank	3	3/1
1860	Master List	(NONE)	(None )	Blank; Field	Filtered Nutrient B	17	012 9:35
1860	Master List	(NONE)	(None )	Experimental Samp	5.0 ppm house st	5	012 8:00
1860	Master List	B0702000	VERNALIS	Experimental Samp	Pre-Maintenance (	4	012 9:30
1860	Master List	B0702000	VERNALIS	Normal Sample	River Grab	5	012 9:42
	Master List	B0D74761180	KV Lft Sta	Normal Sample		4	012 9:07
	Master List	B0D74781185	M6 Lft Sta	Normal Sample		3	012 7:00
	Master List	B0D74821181	M5 Lft Sta	Normal Sample		4	012 8:55
	Master List	B0D74821187	M2 Lft Sta	Normal Sample		4	012 8:00
	Master List	B0D74831187	Riv Sta	Normal Sample		4	012 7:33
	Master List	B0D74881187	M1 Lft Sta	Normal Sample		4	012 5:05
	Master List	B0D75041170	Stn Brg Sta	Normal Sample		1	3/1

QCSummary\_07\_Study QA Samp Sta...

CountOfSAM_c	SPP_DESCRIPTION
36	Normal Sample
3	Blank; Equipment
17	Blank; Field
22	Experimental Sample
5	Replicate Sample

Record: 1 of 30

\*Field QC List

Stations List. Selection by Run includes these samples by default.

# Study Summary: Program QA

QCSummary\_04\_Blanks : Select Query

MTH_NAME	Analyte	UNS_NAME	RES_RESULT	RES_REPORTI	ALQ_NOTE	RES_NOTE	QC Note 1	QC Note 2
EPA 415.1 (D)	Dissolved Organic Carbon	mg/L as C	0	0.5			T1	
EPA 200.8 (D)	Dissolved Aluminum	mg/L	0	0.01				
EPA 200.8 (D)	Dissolved Antimony	mg/L	0	0.001				
EPA 200.8 (D)	Dissolved Arsenic	mg/L	0	0.001				
EPA 200.8 (D)	Dissolved Cadmium	mg/L	0	0.001				

QCSummary\_05\_Dups : Select Query

CollectionDate_	MTH_NAME	Analyte	Result1	Result2	CalcRPD(%)	ReptLimit_1	ReptLimit_2	Lab RPD Limit
12 10:35:00 AM	EPA 300.0 28d	Dissolved Nitrate mg/L	1.8	1.8	0.00	0.1	0.1	20.0
12 10:35:00 AM	EPA 180.1	Turbidity N.T.U.	9	9	0.00	1	1	15.0
12 10:35:00 AM	EPA 180.1	Turbidity N.T.U.	9	9	0.00	1	1	15.0
12 10:35:00 AM	Std Method 591	UV Absorbance @254nm absorbance/cm	0.101	0.101	0.00	0.001	0.001	10.0
12 10:35:00 AM	Std Method 591	UV Absorbance @254nm absorbance/cm	0.102	0.101	0.99	0.001	0.001	10.0
12 10:35:00 AM	Std Method 591	pH pH Units	7.8	7.8	0.00	0.1	0.1	10.0
12 10:35:00 AM	EPA 350.1	Dissolved Ammonia mg/L as N	0.06	0.04	40.00	0.01	0.01	20.0

QCSummary\_03\_Hold & Handling Flags : Crosstab Query

Analyte	RES_TEXT_RE	RES_RESULT	UNS_NAME	RES_REPORTI	Analyte Except	ALQ_NOTE	QC Note 1	QC Note 2	QC Note 3	H Flag Info: Colle
Dissolved Merc	< R.L.	0 mg/L		0.0002	All		T1			Actual 14d: Limit
Dissolved Merc	< R.L.	0 mg/L		0.0002	All		T1			Actual 14d: Limit
Dissolved Brom	< R.L.	0 mg/L		0.01	All		T1			Actual 14d: Limit

QCSummary\_08\_Analysis Dilutions+Notes : Select Query

Dilution Factor	MTH_NAME	MTH_TITLE	FRC_FRACTION	ANL_ANALYTE	RES_RESULT	RES_REPORTI	UNS_NAME	RES_NOTE	Result Che
1	EPA 415.1 (T)	Organic Carbon Total		Organic Carbon	2	0.5 mg/L as C	Dissolved>Tota		
1	EPA 415.1 (D)	Organic Carbon Dissolved		Organic Carbon	2.3	0.5 mg/L as C	Dissolved>Tota		
1	EPA 415.1 (T)	Organic Carbon Total		Organic Carbon	5.9	0.5 mg/L as C	Dissolved>Tota		
1	EPA 415.1 (D)	Organic Carbon Dissolved		Organic Carbon	6.1	0.5 mg/L as C	Dissolved>Tota		
1	EPA 415.1 (T)	Organic Carbon Total		Organic Carbon	7.1	0.5 mg/L as C	Dissolved>Tota		
1	EPA 415.1 (D)	Organic Carbon Dissolved		Organic Carbon	7.6	0.5 mg/L as C	Dissolved>Tota		
1	EPA 415.1 (T)	Organic Carbon Total		Organic Carbon	7.1	0.5 mg/L as C	Dissolved>Tota		
1	EPA 415.1 (D)	Organic Carbon Dissolved		Organic Carbon	7.8	0.5 mg/L as C	Dissolved>Tota		

QCSummary\_02 : Select Query

MTH_NAME	Analyte	UNS_NAME	RES_RESULT	RES_REPORTI	ALQ_NOTE	RES_NOTE	QC Note 1	QC Note 2	
12 10:35:00 AM	Std Method 234	Dissolved Hardness mg/L as CaCO3	75	78		3.92	1	1	20.0

# Study Summary: Data

QCSummary\_20 Lab Results : Select Query

MTH_NAME	MTH_TITLE	Analyte	RES_REPORT	RES_TEXT_RE	RES_RESULT	UNS_NAME	Note1	Note2	N
None	None	Chlorophyll a (1)	0.06 =		6.09 µg/L				
None	None	Conductance (EC) (1)	1 =		824 µS/cm				
None	None	Dissolved Ammonia (1)	0.01 =		0.06 mg/L as N				
None	None	Dissolved Boron (1)	0.1 =		0.6 mg/L				
None	None	Dissolved Bromide (1)	0.01 =		0.12 mg/L				
None	None	Dissolved Calcium (1)	1 =		35 mg/L				

QCSummary\_21 Field Results : Select Query

Phone	Sample Purpose	MTH_NAME	Analyte	Result	FDR_RESULT	FDR_TEXT_RE	FDR_DATE_RE	FDR_FOOTNO
(916) 371-3118	Replicate Sample	EPA 120.1 (Fiel	Conductance (EC), µS/cm (1)	195	195			
(916) 371-3118	Replicate Sample	EPA 150.1 (Fiel	pH, pH Units (1)	7.81	7.81			
(916) 371-3118	Replicate Sample	EPA 170.1 (Fiel	Water Temperature, °C (1)	12.1	12.1			
(916) 371-3118	Replicate Sample	EPA 180.1 (Fiel	Turbidity, N.T.U. (D-2)	9.35	9.35			
(916) 371-3118	Replicate Sample	EPA 360.1 (Fiel	Dissolved Oxygen, mg/L (1)	10.53	10.53			
(916) 371-3118	Replicate Sample	Notes (Field)	Field Notes, (1)	0.45um capsule				0.45um capsule
(916) 371-3118	Normal Sample	EPA 120.1 (Fiel	Conductance (EC), µS/cm (1)	818	818			
(916) 371-3118	Normal Sample	EPA 150.1 (Fiel	pH, pH Units (1)	7.75	7.75			
(916) 371-3118	Normal Sample	EPA 170.1 (Fiel	Water Temperature, °C (1)	11.99	11.99			

WLoc\_STN\_STATIONS : Table

Station Listing	SAM_USER_S	SAM_Stn_NAM	FULL_STATION	Station Type	ACT_CODE_OWNER	QST_ID	LatDD	LonDD	Link
(916) 371-3118	User Defined	B0D74781185	M6 Lft Sta	M6 Lift Station	Broad Water Bo	1860	37.796544	-121.308531	<a href="#">M6 Lft Sta</a>
(916) 371-3118	User Defined	B0D75041170	Stn Brg Sta	Stone Bridge St	Broad Water Bo	1860	37.840617	-121.283494	<a href="#">Stn Brg Sta</a>
(916) 371-3118	User Defined	B8R703101043	Gianelli	Gianelli Pumpin	Broad Water Bo	1860	37.066456	-121.072186	<a href="#">Gianelli</a>
(916) 371-3118	User Defined	B9D42136142	Little Sl.@Frenc						<a href="#">Little Sl.@French Cu</a>
(916) 371-3118	User Defined	B9D75732454	Johnson Sl.@R						<a href="#">Johnson Sl.@Robinson</a>
(916) 371-3118	User Defined	B9D81543434	South Sl nr.Han						<a href="#">South Sl nr.Hanrahan</a>
(916) 371-3118	Master List	(NONE)	( None )						<a href="#">( None )</a>
(916) 371-3118	Master List	B0702000	VERNALIS				37.676111	-121.264167	<a href="#">VERNALIS</a>
(916) 371-3118	Master List	B0D74761180	KV Lft Sta				37.793778	-121.300000	<a href="#">KV Lft Sta</a>
(916) 371-3118	Master List	B0D74781185	M6 Lft Sta				37.796544	-121.308531	<a href="#">M6 Lft Sta</a>
(916) 371-3118	Master List	B0D74821181	M5 Lft Sta				37.803436	-121.301694	<a href="#">M5 Lft Sta</a>
(916) 371-3118	Master List	B0D74821187	M2 Lft Sta				37.802742	-121.311486	<a href="#">M2 Lft Sta</a>
(916) 371-3118	Master List	B0D74831187	Riv Sta				37.804706	-121.312278	<a href="#">Riv Sta</a>
(916) 371-3118	Master List	B0D74881187	M1 Lft Sta				37.814094	-121.312319	<a href="#">M1 Lft Sta</a>
(916) 371-3118	Master List	B0D75041170	Stn Brg Sta				37.840617	-121.283494	<a href="#">Stn Brg Sta</a>
(916) 371-3118	Master List	B9C74701355	Headworks @ J				37.782811	-121.591200	<a href="#">Headworks @ Jones PF</a>
(916) 371-3118	Master List	B9C74781352	JonesPP @ WQ				37.797042	-121.586186	<a href="#">JonesPP @ WQ LockU</a>
(916) 371-3118	Master List	B9D74761184	SJR@Sadler O				37.7934	-121.306300	<a href="#">SJR@Sadler Oak Rd</a>

# Study Summary: Lab QC

QCSummary\_12a\_LAB\_QC\_Blanks Q : Select Query

QCB_CODE	QCB_DATE	MethodName	MethodTitle	Chemist	QCB_NOTE	QCS_CODE	QCMeasureName	Fraction	AnalyteName	QCR_RESULT	QCR
34564	012 1:53:06 PM	Std Method 232	Alkalinity	Chan, Elaine	All QC Passe	280510	Method Blank		pH	<	
34564	012 1:53:06 PM	Std Method 232	Alkalinity	Chan, Elaine	All QC Passe	280510	Method Blank		Alkalinity	<	

QCSummary\_12b\_LAB\_QC\_Std Q : Select Query

QCB_CODE	QCB_DATE	MethodName	MethodTitle	Chemist	QCB_NOTE	QCS_CODE	QCMeasureName	Fraction	AnalyteName	QCR_CONTR	QCR_RESULT
34564	012 1:53:06 PM	Std Method 232	Alkalinity	Chan, Elaine	All QC Passe	280512	Check Standard		Alkalinity	500.5	493.
34564	012 1:53:06 PM	Std Method 232	Alkalinity	Chan, Elaine	All QC Passe	280513	LCS - Recovery		Alkalinity	250.2	249.

QCSummary\_10\_LAB\_QCBATCH : Select Query

QCB_CODE	QCB_DATE	MTH_NAME	MTH_TITLE	QCMeasureName	Fraction	AnalyteName	QCR_CONTR	QCR_RESULT
34550	3/15/2012 4:17:15 PM	EPA 160.2	Total Suspended Solids	All QC Passed.				
34557	3/16/2012 3:10:59 PM	Std Method 254	Total Dissolved Solids	All QC Passed.				
34558	3/19/2012 7:55:15 AM	EPA 160.2	Total Suspended Solids	QC is in control			80.00%	

QCSummary\_12c\_LAB\_QC\_MtxSpk Q : Select Query

QCMeasureName	QCR_SAMPLE1	QCR_SAMPLE2	QCR_RESULT
Matrix Spike - Recovery	108		
Matrix Spike - Recovery	108		
Matrix Spike - Recovery	0.016		
Matrix Spike - Recovery	0.016		
Matrix Spike - Recovery	0.066		

QCSummary\_12d\_LAB\_QC\_Surrogates Q : Select Query

QCB_CODE	MethodName	MethodTitle	Chemist	QCB_NOTE	QCS_CODE	QCMeasureName	Fraction	AnalyteName	QCR_REPORT	Units
34568	EPA 608	Chlorinated Organics	Wong,...							
34568	EPA 608	Chlorinated Organics	Wong,...						0.3	µg/L
34568	EPA 608	Chlorinated Organics	Wong,...						0.3	µg/L

QCSummary\_12e\_LAB\_QC\_Std\_RPD Q : Select Query

QCB_CODE	QCB_DATE	MethodName	MethodTitle	Chemist	QCB_NOTE	QCS_CODE	QCMeasureName	RECOVERY1_QCS_CODE
34564	012 1:53:06 PM	Std Method 232	Alkalinity	Chan, Elaine	All QC Passe	280518	RPD - Check Standard	280512
34564	012 1:53:06 PM	Std Method 232	Alkalinity	Chan, Elaine	All QC Passe	280519	RPD - LCS Duplicate	280513
34564	012 1:53:06 PM	Std Method 232	Alkalinity	Chan, Elaine	All QC Passe	280520	RPD - Matrix Spike Duplicate	280516

QCSummary\_12f\_LAB\_QC\_Sample\_RPD Q : Select Query

RECOVERY1_ALQ_CODE	RECOVERY2_CODE	QCR_SAMPLE1_CONC	QCR_SAMPLE2_CONC	Fraction	AnalyteName	RPD	QCR_REPORT	QCR_UPPER_LIMIT	Units	QCR
BL12B620746	BL12B620832	190	191		Conductance (E	.525	1	15.00%		
BL12B620752	BL12B620833	68	68	Total	Alkalinity	<	1	15.00%		
BL12B620752	BL12B620833	7.9	7.9		pH	<	0.1			
BL12B620790	BL12B620834	21	22		Turbidity	4.651	1	15.00%		
BL12B620411	BL12B620853	20	21	Total Suspended Solids	Solids	4.878	1	25.00%		
BL12B620624	BL12B621008	22	24	Total Suspended Solids	Solids	8.696	1	25.00%		

# Where Is It / Contact

- ▶ General Questions about QA/QC: Murage Ngatia
- ▶ A copy of WDL Study Summary is on the MWQI guest computer. Log in using the DES plotter login (note on computer)
- ▶ Copy also at DWR Bryte Lab (Agee, Pepper)
- ▶ Contact for custom assistance  
Bruce Agee or Kelley Pepper  
DWR Bryte Lab  
1450 Riverbank Rd  
West Sac  
375-6008

