



# Electronic Data Validation Using the EIM System

Locus Technologies

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# Agenda



## Introduction

- ◆ Environmental Information Management System (EIM).
- ◆ Data validation module (DVM).

## DVM Setup

- ◆ Configure validation plan and settings.

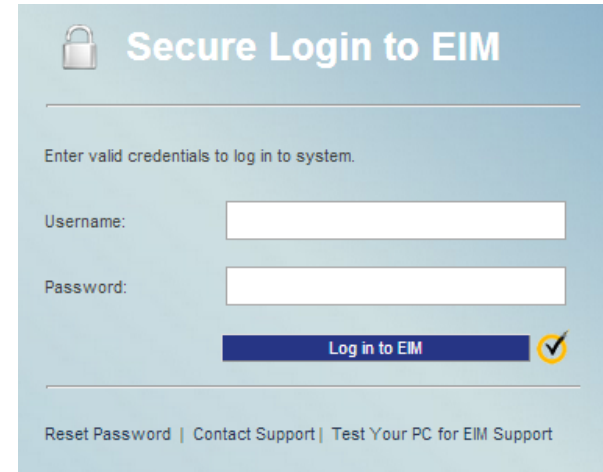
## Validation

- ◆ Perform automated validation.
- ◆ Review/update findings.
- ◆ Produce report outputs.

# What is EIM?



- ◆ Cloud based environmental data management software.
- ◆ Data uploaded by labs, consultants, and data owners.
- ◆ Login via web browser and run data tools.
- ◆ Features include validation, sample planning, regulatory exports (e.g. ERPIMS), and visualization tools.



Secure Login to EIM

Enter valid credentials to log in to system.

Username:

Password:

[Log in to EIM](#) ✓

[Reset Password](#) | [Contact Support](#) | [Test Your PC for EIM Support](#)



# EIM DVM



Configure  
Validation  
Upfront.

Automated  
Validation Run  
and Findings  
Applied.

Validator  
Reviews and  
Finalizes  
Dataset.

Reporting of  
Validation  
Findings.



# Automated DVM Checks



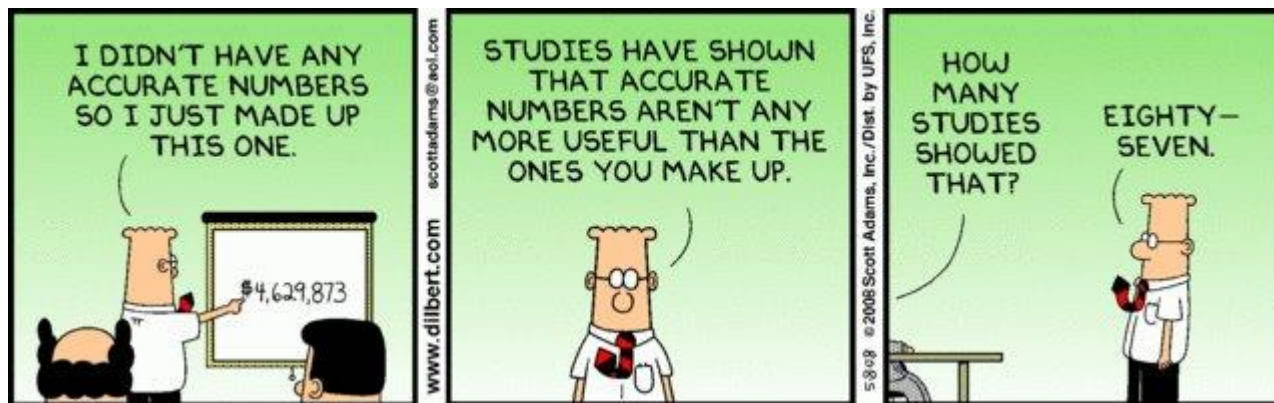
- ◆ Holding Times
- ◆ Blank Detects
- ◆ Spike Control Limits
- ◆ Duplicate RPDs
- ◆ Total vs Dissolved Metals RPDs
- ◆ Required QC Components
- ◆ Sensitivity of Reporting Limits
- ◆ Missing QC criteria
- ◆ Sample Condition

Typical Level II  
Components.

# Why Use Validation in EIM?



- ◆ Improve quality by standardizing validation approach.
- ◆ Reduce costs by automating time-intensive processes that are prone to error when performed manually.
- ◆ Focus skilled resources on critical data issues.
- ◆ Fast to generate initial validation findings.



# Configure Validation



## The Basics

- ◆ Locus works with chemist/validator on setup.
- ◆ Establish validation plan and set criteria to QAPP.
- ◆ Customize validation qualifiers/reason codes.
- ◆ Configure validation controls.



# Creating Validation Plan and Criteria



## Establish Validation Plan “Option Set”

**Enter/Edit Validation Options Set**

Options Set Name\*:

Description\*:

Default Status Code\*:

Make Validation Qualifiers Method Specific?

Make Validation Qualifiers Matrix Specific?

Make Miscellaneous Settings Method Specific?

Make Miscellaneous Settings Matrix Specific?

Make Validation Reason Codes Method Specific?

Is This A Default Set That Is To Be Used To Populate Other Validation Sets?

Is This Set To Be Shared With Other Sites?

Can Other Sites Edit This Set?

Apply Validation  
Criteria to Plan

Holding Times  
Blank Correction Factors  
Required QC Samples  
RPD Calculations  
QC Limits  
QC Limit Sources  
Uncertainty Limits (Radiological Only)  
MDCs (Radiological Only)  
Sample Condition Limits  
LCS Outlier Proportions  
Matrix Spike Ratio  
Total vs Dissolved Metals Analysis  
Miscellaneous  
Miscellaneous (Batch Mode)  
Validation Qualifiers  
Validation Qualifiers (Batch Mode)  
Copy Settings In Current Validation Options Set  
Copy Default Settings From Another Options Set

DVM settings are  
business rules based  
on the logic of the  
validation approach.

# Applying Validation Criteria



## Create Holding Times

### Analytical Method Holding Times

Method Synonym ▲	Parameter	Matrix Category	Preserved Flag	Extraction Hold Time (Max)	Extraction Hold Time (Reject)	Extraction Hold Time Units	Analysis Hold Time (Max)	Analysis Hold Time (Reject)	Analysis Hold Time Units
▼	▼		▼						
E300.0	Nitrate (as N)	Aqueous Sample	Y				2	4	Days
E300.0	Nitrite (as N)	Aqueous Sample	Y				2	4	Days
E300.0	Not Specified	Aqueous Sample	Y				28	56	Days

## Set Required QC Samples

### Required QC Samples

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of
1

Rows
4

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Method Synonym	Matrix Category	Parameter	QC Sample Type/ Analysis	Edit
NS	Aqueous Sample	Not Specified	LCS/BS	<a href="#">Edit</a>
NS	Aqueous Sample	Not Specified	METHOD BLANK	<a href="#">Edit</a>
SW8260B	Aqueous Sample	Not Specified	SURROGATE	<a href="#">Edit</a>
SW8260B	Aqueous Sample	Not Specified	TRIP BLANK	<a href="#">Edit</a>



# Build Qualifiers to Apply



EIM has reason codes for QC scenarios checked during validation.

EIM Validation Reason Code	EIM Validation Reason Desc
<input type="text"/>	<input type="text"/>
SC1	Analysis holding time exceeded.
SC2	Analysis holding time grossly exceeded.
SC3	Extraction holding time exceeded.
SC4	Extraction holding time grossly exceeded.
SC5	pH in sample too high.

Input validation qualifier (if any) DVM should apply for QC scenario.

**Specify Validation Qualifiers For QA/QC Problems: Pag**

Save Val	Matrix	Detect	
Edits Qual	Category	Status	Problem
<input checked="" type="checkbox"/>	J <input type="text"/>	A <input type="text"/>	Y <input type="text"/> Analysis holding time exceeded.
<input checked="" type="checkbox"/>	R <input type="text"/>	A <input type="text"/>	Y <input type="text"/> Analysis holding time grossly exceeded.
<input checked="" type="checkbox"/>	J <input type="text"/>	A <input type="text"/>	Y <input type="text"/> Extraction holding time exceeded.
<input checked="" type="checkbox"/>	R <input type="text"/>	A <input type="text"/>	Y <input type="text"/> Extraction holding time grossly exceeded.

# Custom Setup Options



Apply optional special handling of certain QC situations by DVM.

## Enter/Edit Miscellaneous Validation Options

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Matrix Category	Validation Option	Option Value
A	Blank Correction When Result Less Than Reporting Limit	Set result equal to detection limit when parameter found in any blank.
A	Diluted Surrogate Results	Do not flag any diluted surrogate analysis with a recovery of 0.

Use the fields below to enter new records or replace or delete existing ones.

Matrix Category\*:

Aqueous Sample

Select A Setting\*:

Blank Correction When Result Less Than Reporting Limit  
Diluted Matrix Spikes  
Diluted Surrogate Results  
Lab Duplicate Qualification Scope  
Matrix Spike Qualification Scope  
Processing Of Surrogate Exceedances  
Reporting Of Blank Spike Sample Results  
Reporting Of Laboratory Control Sample Results  
Results of Laboratory Control Samples and Duplicates Evaluated Together  
Results of Matrix and Analytical/Post-Digestion Spikes

Select A Value For This Setting

No Selection  
Results of Matrix Spike Used To Qualify All Samples In Batch  
Results of Matrix Spike Used To Qualify Spiked Sample Only

Save

Batch Delete Mode

Return



# Running Validation



- ◆ Run validation checks.
- ◆ Review data outliers.
- ◆ Review auto-applied validation findings.
- ◆ Add validation findings from offline (manual) components.
- ◆ Download data reports on findings/QC issues.

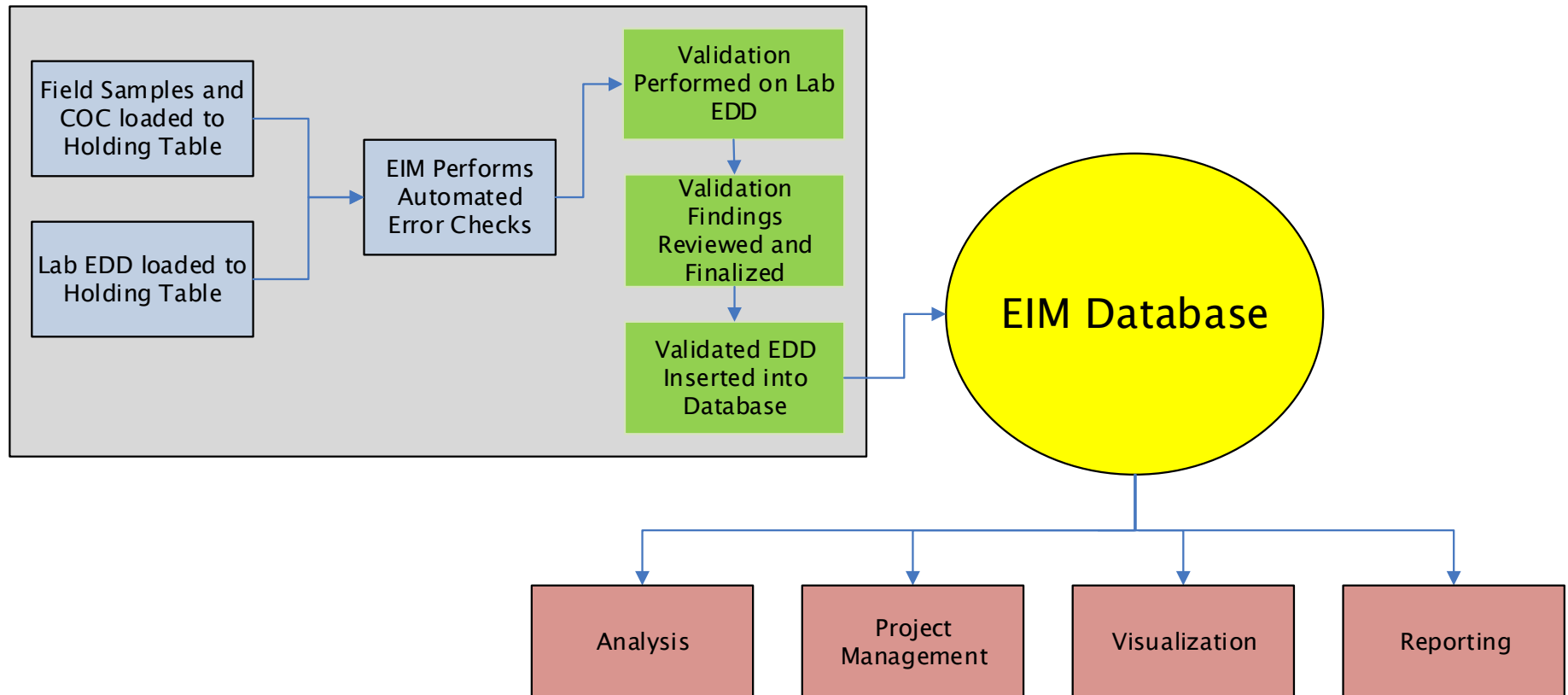
The DVM steps up to support the validation process...



# Where Does DVM Fit in EIM?



## EIM's Holding Table ("Quarantine Zone")



# Starting Validation



Support staff can prep EDD and start validation checks, then hand off to validator.

Edit/Review Dataset: 158951D.txt, ID=702

Process Delete Validate Views/Notifications

1. Summary Of Findings ([View](#))
2. Sample Counts ([Lab and Field Samples](#)) ([Field Samples Only](#))
3. Blank Contaminants ([Blanks Only](#)) or ([Potentially Affected Samples](#))
4. Holding Times ([View All](#)) or ([QC Problems Only](#))
5. Missing QC Samples ([View](#))
6. Matrix Spikes ([View All](#)) or ([QC Problems Only](#)) or ([Samples With Too High Initial Concentrations](#))
7. Lab Control Samples ([View All](#)) or ([QC Problems Only](#)) or ([Summary Counts](#))
8. Surrogates ([View All](#)) or ([QC Problems Only](#)) or ([Summary Counts](#))
9. Field Duplicates ([View All](#)) or ([QC Problems Only](#))
10. Lab Duplicates ([View All](#)) or ([QC Problems Only](#))
11. MDCs Not Met ([View All](#))
12. Uncertainty Limits Not Met ([View All](#))
13. Percent Solids ([View](#))
14. Sample Condition Upon Arrival At Lab ([View](#))
15. Lab Used Inappropriate Field Sample For QC Analyses ([View](#))
16. Individual Results With Links To Associated QC Problems ([View](#))
17. Assigned Validation Qualifiers And Reason Codes ([View/Edit](#))
18. Download Data For Offline Validation ([Download](#))
19. Upload Offline Validated Data ([Upload](#))
20. Best Result Findings ([Review/Edit](#))
21. Validation Comments ([Enter/Edit](#))
22. Validation Status Code ([Change](#))
23. File With Validation Information ([Download](#))
24. Miscellaneous Validation Reports ([Display Report Options](#))
25. **Run/Rerun Validation Checks**
26. Validation Settings ([Summary](#)) or ([Details](#))
27. Potential Inconsistencies Or Missing/Incomplete Data ([View](#))
28. Do Not Validate This Dataset
29. Manual Validation Of This Dataset Is Complete
30. Change Validation Options Set
31. Send Notification That Validation Is Complete
32. Move All Validated Data Into Destination Tables

Start the validation process.

#### Dataset Status:

Initial Records: 495  
Errors: 0  
Warnings: 0

#### Validation Status: ([Change](#))

Validation Options Set: *Boston Validation Settings*  
Awaiting Validation: **No**  
Awaiting Qualifiers: **No**  
Offline validation required: **No**

#### Manual Review Status: ([Reset](#))

Awaiting Review

Check here if review has been completed



**Rerun Database Checks**

**Select Another Dataset**

**Load Another File Of The Same Format**



# Snapshot of Validation Outcome



## Field Results With One Or More Reason Codes

### Field Results With One Or More Reason Codes

Blank Contaminants (Affected Samples)

Holding Times

Missing QC Samples

MS/MSD Recoveries

MS/MSD Samples With Too High Initial Concentrations

LCS/LCSD Recoveries

Surrogate Recoveries

Field Duplicates

Lab Duplicates

Fixed reports show different groupings of validation findings and QC outcomes.

Select A Category: Field Results With One Or More Reason Codes

Lab Sample ID	Field Sample ID	Analytical Method	Analy Type Code	Dil Factor	Parameter	Parameter Code	Lab Result	Lab Detection Limit	Units	Lab Qualifier	Val Qualifier	Val Reason Codes	Detect Flag	Use Flag
4272039	SJ-0018	SW-846 8260B	INIT	1	1,1,1-Trichloroethane	71-55-6	5	5	ug/l	U	UJ	MS1	N	Y
4272039	SJ-0018	SW-846 8260B	INIT	1	Trichloroethene	79-01-6	5	5	ug/l	U	UJ	MS1	N	Y
4272040	SJ-0019	CALUFT-DRO/SW-846 8015B mod.	INIT	100	TPH - DRO CA LUFT (Waters)	PHCD	66000	10000	ug/l			SU2	Y	Y
4272040	SJ-0019	SW-846 8260B	INIT	25	1,1,1-Trichloroethane	71-55-6	130	130	ug/l	U	UJ	MS1	N	Y
4272040	SJ-0019	SW-846 8260B	INIT	25	Trichloroethene	79-01-6	130	130	ug/l	U	UJ	MS1	N	Y
4272040	SJ-0019	SW-846 8270C	INIT	5	7,12-Dimethylbenz[a]anthracene	57-97-6	53	53	ug/l	U	U	LC2	N	Y
4272041	SJ-0019	SW-846 6010B	INIT	10	Zinc	7440-66-6	0.0642	0.2	mg/l	J	J	BL4	Y	Y
4272042	SJ-0020	CALUFT-DRO/SW-846 8015B mod.	INIT	10	TPH - DRO CA LUFT (Waters)	PHCD	6800	980	ug/l			SU2	Y	Y
4272042	SJ-0020	SW-846 8260B	INIT	1	1,1,1-Trichloroethane	71-55-6	5	5	ug/l	U	UJ	MS1	N	Y
4272042	SJ-0020	SW-846 8260B	INIT	1	Trichloroethene	79-01-6	5	5	ug/l	U	UJ	MS1	N	Y
4272042	SJ-0020	SW-846 8270C	INIT	1	1-Methylnaphthalene	90-12-0	11	11	ug/l	U	R	SC4	N	N
4272042	SJ-0020	SW-846 8270C	INIT	1	2,4-Dimethylphenol	105-67-9	11	11	ug/l	U	R	SC4	N	N
4272042	SJ-0020	SW-846 8270C	INIT	1	2-Methylnaphthalene	91-57-6	11	11	ug/l	U	R	SC4	N	N
4272042	SJ-0020	SW-846 8270C	INIT	1	2-Methylphenol	95-48-7	11	11	ug/l	U	R	SC4	N	N
4272042	SJ-0020	SW-846 8270C	INIT	1	4-Methylphenol	106-44-5	11	11	ug/l	U	R	SC4	N	N
4272042	SJ-0020	SW-846 8270C	INIT	1	7,12-Dimethylbenz[a]anthracene	57-97-6	11	11	ug/l	U	R	SC4	N	N
4272042	SJ-0020	SW-846 8270C	INIT	1	Acetophenone	98-96-2	11	11	ug/l	U	R	SC4	N	N
4272042	SJ-0020	SW-846 8270C	INIT	1	bis(2-Ethylhexyl)phthalate	117-81-7	11	11	ug/l	U	R	SC4	N	N
4272042	SJ-0020	SW-846 8270C	INIT	1	Butylbenzylphthalate	85-68-7	11	11	ug/l	U	R	SC4	N	N
4272042	SJ-0020	SW-846 8270C	INIT	1	Di-n-butylphthalate	84-74-2	11	11	ug/l	U	R	SC4	N	N

Reason Code	Description
BL4	Parameter in blank below CRQL.
LC2	LCS/LCSD recovery below lower acceptance limit.
MS1	MS/MSD recovery below lower limit.
SC4	Extraction holding time grossly exceeded.
SU2	Surrogate recovery below lower acceptance limit.

# Surrogate Recovery Reports



Select A Category: Surrogate Recoveries

Field Sample ID	Lab Sample ID	CALUFT-DRO/SW-846 8015B mod.	CALUFT/SW-846 8015B modified	SW-846 8260B	SW-846 8270C	SW-846 8310
	134WALCS				0/6	
	134WALCSD				0/6	
	134WCLCS					0/2
	134WCLCSD					0/2
	134WFLCS				0/6	
	134WFLCSD				0/6	
SJ-0015	4271232		0/1	0/4		
SJ-0016	4271233	0/2	0/1	0/4	0/12	0/2
SJ-0017	4271235	0/2	0/1	0/4	<a href="#">5/12</a>	0/2
	4271878			0/4		
	BLK5550B		0/1			
	LCDW11			0/4		

Quick overviews of surrogate counts and outliers with hyperlinks to outlier records.

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Field Sample ID	Lab Sample ID	Analytical Method	Parameter Name	Analysis Lot ID	Analysis Date	Dilution Factor	Spike Recovery	Upper QC Limit	Lower QC Limit	Recvry Rejection Limit	Surrogate Recvry Flag
SJ-0017	4271235	SW-846 8270C	2,4,6-Tribromophenol	04134WAF026	05-14-2004	1	6	142	45		OUT
SJ-0017	4271235	SW-846 8270C	2,4,6-Tribromophenol	04134WAA026	05-20-2004	1	6	142	45		OUT
SJ-0017	4271235	SW-846 8270C	2-Fluorophenol	04134WAF026	05-14-2004	1	3	94	23		OUT
SJ-0017	4271235	SW-846 8270C	2-Fluorophenol	04134WAA026	05-20-2004	1	2	94	23		OUT
SJ-0017	4271235	SW-846 8270C	Phenol-d6	04134WAA026	05-20-2004	1	2	80	10		OUT

# Field Duplicates and Required QC



## Field duplicate pair RPDs.

**Field Duplicates**

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Field Sample ID	Field DuplicateID	Analytical Method	Parameter Name	Sample Matrix	Lab Result	FD Result	Lab Detection Limit	FD Lab Detection Limit	Lab Units	Detect Flag	FD Detect Flag	RPD	RPD Limit	RPD Flag	Detection Limit Multiple	Alt. Control Limit
SJ-0006	SJ-0009	CALUFT-DRO/SW-846 8015B mod.	TPH - DRO CA LUFT (Waters)	WATER	51000	33	9300	94	ug/l	Y	Y	199.741			1	1
SJ-0006	SJ-0009	CALUFT-DRO/SW-846 8015B mod.	TPH-DRO CALUFT(Water) w/Si Gel	WATER	43000	94	9300	94	ug/l	Y	N	199.127			1	1
SJ-0006	SJ-0009	CALUFT/SW-846 8015B modified	TPH-GRO (CA LUFT)	WATER	2.6	0.05	0.05	0.05	mg/l	Y	N	192.453			1	1
SJ-0006	SJ-0009	EPA 376.2 modified	Sulfide	WATER	0.1	0.1	0.1	0.1	mg/l	N	N				1	1
SJ-0006	SJ-0009	SW-846 6010B	Arsenic	WATER	0.0201	0.0055	0.01	0.01	mg/l	Y	Y	114.062			1	1
SJ-0006	SJ-0009	SW-846 6010B	Barium	WATER	0.844	0.184	0.005	0.005	mg/l	Y	Y	128.405			1	1
SJ-0006	SJ-0009	SW-846 6010B	Cadmium	WATER	0.005	0.005	0.005	0.005	mg/l	N	N				1	1
SJ-0006	SJ-0009	SW-846 6010B	Chromium	WATER	0.009	0.005	0.005	0.005	mg/l	Y	N	57.1429			1	1
SJ-0006	SJ-0009	SW-846 6010B	Cobalt	WATER	0.0019	0.0213	0.005	0.005	mg/l	Y	Y	167.241			1	1
SJ-0006	SJ-0009	SW-846 6010B	Copper	WATER	0.01	0.01	0.01	0.01	mg/l	N	N				1	1
SJ-0006	SJ-0009	SW-846 6010B	Selenium	WATER	0.01	0.01	0.01	0.01	mg/l	N	N				1	1
SJ-0006	SJ-0009	SW-846 6010B	Silver	WATER	0.005	0.005	0.005	0.005	mg/l	N	N				1	1
SJ-0006	SJ-0009	SW-846 6010B	Vanadium	WATER	0.0362	0.005	0.005	0.005	mg/l	Y	N	151.456			1	1

## VOC results missing a trip blank sample.

### Data For Selected Option:

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Lab Sample ID	Field Sample ID	Missing QC Sample	Analytical Method	Parameter Name	Lab Result	Lab Qualifier	Units	Val Qlfr	Val Reason Codes
X96584	SJ-151	TRIP BLANK	SW-846 8260B	cis-1,2-dichloroethene	7.1		ug/l		MQ1
X96584	SJ-151	TRIP BLANK	SW-846 8260B	trichloroethene	29		ug/l		MQ1
X96585	SJ-152	TRIP BLANK	SW-846 8260B	trichloroethene	8.8		ug/l		MQ1
X96586	SJ-153	TRIP BLANK	SW-846 8260B	cis-1,2-dichloroethene	1.3		ug/l		MQ1
X96586	SJ-153	TRIP BLANK	SW-846 8260B	trichloroethene	1.6		ug/l		MQ1

# Review, Edit, or Add Findings



**View Validation Qualifiers And Reason Codes: Select Data Filters**

<b>Choose One Or More Field Sample IDs:</b> SJ-0021 SJ-0022 SJ-0024	<b>Choose One Or More Lab Sample IDs:</b> 4273681 4273682 4273683 4273686 4273687	<b>Choose An SDG:</b> SDG6	<b>Choose One Or More Analysis Types:</b> INIT
		<b>Choose An Analysis Lot:</b> NO SELECTION	
		<b>Choose A Prep Lot:</b> NO SELECTION	<b>Choose A Dilution Factor:</b> NO SELECTION
<b>Choose One Or More Analytical Methods:</b> CALUFT-DRO/SW-846 8015B mod. CALUFT/SW-846 8015B modified EPA 376.2 SW-846 6010B SW-846 7421 SW-846 7470A	<b>Choose One Or More Parameters:</b> 7,12-Dimethylbenz[a]anthracene Acenaphthene Acenaphthylene Acetophenone Anthracene Arsenic	<b>Choose One Or More Assigned Reason Code Combinations:</b> LC7 SU5	
<b>Choose One Or More Lab Qualifiers:</b> J NULL U	<b>Choose One Or More Validation Qualifiers:</b> J NULL U UJ	<b>Default Settings For Fixe</b> Save Box Checked: <input checked="" type="radio"/> Lab Result Not Editable: Show Lab Sample ID Only	

Review automated validation finding using filter criteria to narrow down dataset.

Change auto-applied findings or add in qualifiers from offline validation inputs like calibration or raw data review.

**Edit/View Validated Records**

Validation Qualifier: No Action  
Reason Code: No Action  
Use Flag: No Action

Replace/Append With:   
Replace/Append With:   
Caution: See Note At Bottom Before Using This Form

Save RecNo	Field Sample ID	Method	Parameter	Lab Result	Lab Qual	Detect Limit	Units	Val Qual	Val Status	Reason Codes	Detect Use	Factor	Analy Code	Type	Analysis Lot	Prep Lot
<input checked="" type="checkbox"/>	389077 SJ-0021	SW-846 8310	Acenaphthene	17	U	17	ug/l	UJ	LIII	CC1	N	Y	1	INIT	04138WAD026	04138WAD026
<input checked="" type="checkbox"/>	389113 SJ-0024	SW-846 8310	Acenaphthene	15	U	15	ug/l	U	LIII		N	Y	1	INIT	04138WAD026	04138WAD026

Save/Return To Select Data Filters    Save/Exit To Validate Tab

Return To Select Data Filters (No Save)    Exit To Validate Tab (No Save)

Save/Return Here    ?

# Document Entire Review Process



Handy to add supporting documentation, including verification (e.g., Form 1 review) and Level III/IV offline review or professional judgment applied to findings.

<b>Internal Standard Area/Retention Time Comments:</b>	
<b>Tuning/Mass Calibration Comments:</b>	BFB Tune check met frequency and mass abundance criteria for each 12 hour period of sample analysis.
<b>Initial Calibration Comments:</b>	ICAL review performed for GCMS1 (Run 80741 11/8/11 8:30), GCMS2 (Run 11894 11/7/11 17:14). RSD < 15% or linear calibration with r2 > 0.9990.
<b>Continuing Calibration Comments:</b>	GCMS2 11/8/11 CCV bromomethane 35% - J/UJ qualified associated bromomethane results. GCMS1 CCV met acceptance criteria.






# Data Quality Report Tables



Quickly produce downloadable tables to communicate/report validation outcome.

Selected	Description	Description
<input checked="" type="checkbox"/>	Holding Table Data Dump With Validation Fields	Print all fields in EDD plus the following: Use Flag, Validation Reason Codes, Validation Qualifier, Validated By, and Validated Date.
<input checked="" type="checkbox"/>	Print All Detects	Print data for detected analytes only.
<input checked="" type="checkbox"/>	Print All Detects and Nondetects With QC Issues	Print data for all detects and any analysis with a validation issue.
<input type="checkbox"/>	Print All Detects and Nondetects With QC Issues: Useable Results Only	Same as Print All Detects and Nondetects With QC Issues except limited to results with a Use Flag of Y.
<input checked="" type="checkbox"/>	Print All Flagged Results	Print data for any analysis with a validation issue.
<input checked="" type="checkbox"/>	Print All Rejected Results	Print data for all rejected analyses.
<input checked="" type="checkbox"/>	Print Analyses With Both Filtered and Unfiltered Results	Print data side-by-side for those analyses which have both a filtered and an unfiltered result.
<input checked="" type="checkbox"/>	Print Field Duplicate Results	Print data side-by-side for those analyses which have an analysis for both a regular and a field duplicate sample.
<input checked="" type="checkbox"/>	Print Field Samples, Methods, and Their Associated Field QC Samples	Show the Sample IDs of the Trip Blanks, Field Blanks, Equipment Blanks, and Field Duplicates associated with each regular sample. Include the SDG, analytical method, Location ID, and sample date in each record.

Example percent completeness report.

Selected Validation Report:   							
Lab Matrix	Parameter Class	Analytical Method	Leached Method	Total Unique Results	Fully Rejected Results	Difference	Percent Complete
WATER		CALUFT-DRO/SW-846 8015B mod.		24	0	24	100.00
WATER		CALUFT/SW-846 8015B modified		14	0	14	100.00
WATER		EPA 376.2		7	0	7	100.00
WATER		SW-846 6010B		70	0	70	100.00
WATER		SW-846 7421		7	0	7	100.00
WATER		SW-846 7470A		7	0	7	100.00
WATER		SW-846 7521		7	0	7	100.00
WATER		SW-846 8260B		91	0	91	100.00

# Takeaways....



- ◆ EIM automates what can be automated.
- ◆ Once configured, DVM is fast!
- ◆ Reduces costs of the overall process.
- ◆ Catch errors earlier in process before data are finalized.
- ◆ Validator focus on critical quality elements.

EIM customer  
estimated \$1.7  
million cost  
savings from EIM  
DVM: 3,948 EDDs  
from 2/1/2012 to  
01/01/2014.



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