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Computer Systems, Inc.

Data Management and Validation Workflow

2022 ASP Workshop

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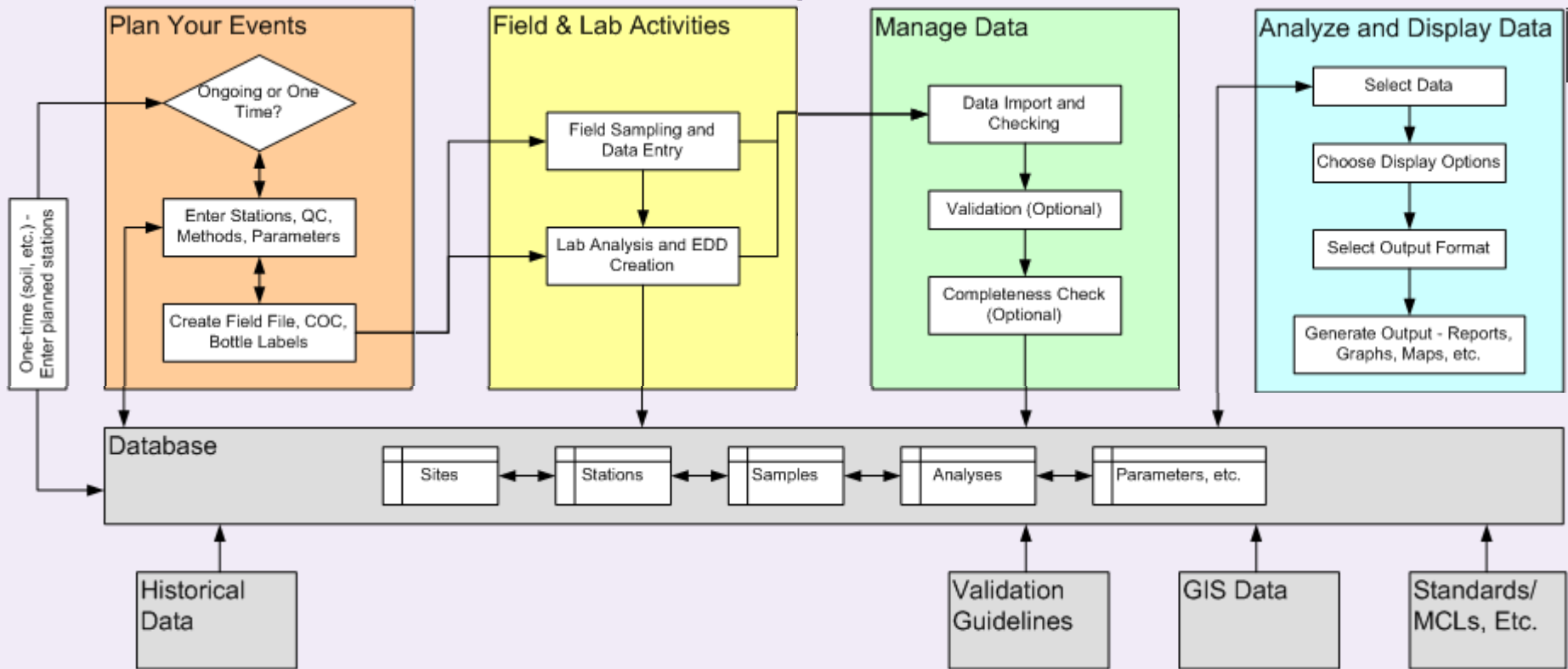
December 6 – 8, 2022



- ① High level view of the process
- ② Setting up the database
- ③ Managing field events
- ④ Importing lab and other data
- ⑤ Data review and validation
- ⑥ Data selection
- ⑦ Formatting
- ⑧ Displays
- ⑨ Mapping and GIS
- ⑩ Business justification



High level view of the process



Plan your sample events

Manage field and lab activities

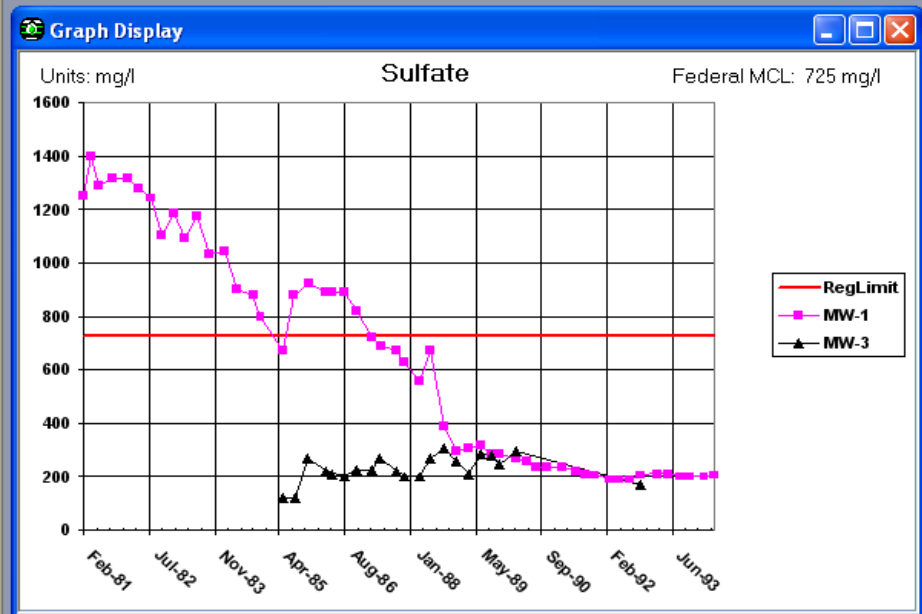
Manage data and quality

Store in a robust repository

Analyze and display data

It's all in one location





Map

Base Map: [CAD]C:\Enviro\data2008\RadInd.dwg
 Image: C:\Enviro\data2008\envdata.bmp
 Parameter: Ra-226 - soil (Max.)

Legend:
 ● 1
 ● 10
 ● 100
 ● 1000

Buttons: Clear, Refresh, Full Extent, Draw Stations, Draw Image

Show Sta. Name

Coordinates:
 Min X: -420, Max X: 4116
 Min Y: 278, Max Y: 2898

Export to Clipboard: BMP, EMF

- ### Tree View
- Rad Industries
 - ⊕ A2 - Soil boring
 - ⊕ AA1 - Soil boring
 - ⊕ AA2 - Soil boring
 - ⊕ AA3 - Soil boring
 - ⊖ Soil - Date: 9/1/1995 - Depth: 725.96:724.46
 - Ra-226 - soil: 2.3 pCi/g - Flag: v
 - Th-232 - soil: 1.4 pCi/g - Flag: v
 - Total Radium-soil: 3.7 pCi/g - Flag: v
 - U-238: 2 pCi/g - Flag: u
 - ⊕ Soil - Date: 9/1/1995 - Depth: 730.96:729.46
 - ⊕ Soil - Date: 9/1/1995 - Depth: 735.96:734.46
 - ⊕ Soil - Date: 9/1/1995 - Depth: 740.96:739.46
 - ⊕ B1 - Soil boring
 - ⊕ B2 - Soil boring
 - ⊕ B3 - Soil boring
 - ⊕ B4 - Soil boring
 - ⊕ B5 - Soil boring
 - ⊕ B6 - Soil boring
 - ⊕ BB1 - Soil boring
 - ⊕ BB2 - Soil boring
 - ⊕ BB3 - Soil boring
 - Blank - Unknown
 - ⊕ C2 - Soil boring
 - ⊕ D4 - Soil boring
 - ⊕ D4A - Soil boring

Site: Rad Industries

Analyte	Units	Federal MCL	Primary	Safe Drinking Water	State Drinking Water Levels	Deep	Deep	Deep
Metals								
Calcium	mg/l	NA	NA	NA	NA	150	170	180
Iron (Ferrous)	mg/l	NA	0.1	NA	NA	2.6	0.074	0.95
Potassium	mg/l	NA	NA	NA	NA	4.2	3.2	3.8
Sodium	mg/l	NA	NA	NA	NA	120	86	110
Inorganics								
Chloride	mg/l	NA	NA	NA	NA	230	190	200
Nitrate	mg/l	NA	2	NA	NA	1	<1	<1
Sulfate	mg/l	725	800	350	1000	370	280	350
Field Param								
Field pH	su.	NA	NA	NA	8.4	7.2	7	7.7
Other								
Total Dissolved Solids	mg/l	NA	NA	NA	NA	1120	1020	1060

Lookup tables

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Manage Lookups

Sites Site Owners Labs & Contr. Contact Names Site Users **Show Less**

Stations Current Status Station Alias Station Groups Station Types Aquifer ASTM Codes Basin
Elev.Coll.Method Enviro. Status Land Use Location Codes Offset Type Sample Freq. Station Alias Type Sub Basin
Water Use Well Type XY Offsets

Samples Sample Groups Sample Matrix Sample Method Sample Types Sample Purpose Sample Result
Sample Status Gender Life Stage Tissue Type Taxonomy

Analyses Analytic Flags Analytic Methods Analytic Probs Parameters Parm. Groups Sum. Categories Validation Flags
Analytic Location Batch Type Basis Data Rev.Stat. Leach Method Parm. Aliases Param. Type Prep Method
Preserve Method Run Code Statistical Types Value Code Value Type Reason Code Task Code Method Aliases

Reg Limits Reg. Limits Reg Limit Groups Reg Limit Types Permit Options

Bulk Data Instruments Survey

Multiple Tables Documents Filtered Geol. Units Lithology QC Codes Reporting Units Unit Conversion
Constant Type Container Type Content Filter Det. Limit Types Geol.Qualif.Codes Geol. Src. Codes Holding Times Hold Time Types
Import Defaults QC Scope Valid. Program Valid Detect.Limit Validation Tasks

Miscellaneous Cat. Result Types Event Status P.R.P. Interval Mtl Types Interval Types Multi. Obs. Ref. Prod. Rates
Cleanup Group

Close



Regulatory limits

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Edit Regulatory Limits

Filter Limits by... **Regulatory Limit Type:** **Actions:**

Regulatory Type Group: **Sample Matrix:**

All Sites Site-Specific

Parameter	Regulatory Limit Type	Matrix	Limit	FilterCode	Lower Lir	Unit
Arsenic (As)	Calculate Percentile	Water	25	z		ug.
Arsenic (As)	Federal MCL	Water	100	z		ug.
Arsenic (As)	Guidance	Water	2	z		ug.
Arsenic (As)	None	Water	30	z		ug.
Arsenic (As)	Permit	Water	0.5	z		ug.
Arsenic (As)	Primary	Water	10	z		ug.
Arsenic (As)	Safe Drinking Water Standards	Water	0.1	z		ug.
Arsenic (As)	Sec. High	Water	10	z		ug.
Arsenic (As)	Sec. Low	Water	10	z		ug.
Arsenic (As)	State Drinking Water Levels	Water	10	z		ug.
Arsenic (As)	Surface Water	Water	50	z		ug.
Benzene	TCLP	Water	0.1	z		mc
Benzene	Unknown	Soil	10	z		ug.
Benzo(a)pyrene	Primary	Water	50	z		ug.
Chromium	State Drinking Water Levels	Water	100	z		ug.
Chromium	State Drinking Water Levels	Water	1	z		pC
Copper	Primary	Water	1	z		ug.
Copper	Primary	Water	1	z		ug.
Fluoride	Guidance	Water	1	z		mc
Fluoride	Guidance	Water	1	z		mc
Gross Alpha	Federal MCL	Water	1	z		pC
Iron (Ferrous)	Primary	Water	100	z		ug.
Lead (Pb)	Federal MCL	Water	1	z		ug.
Lead (Pb)	Primary	Water	1	z		ug.

Record: Search

Import Regulatory Limit Records from Parameters: confirm each record?

Delete Regulatory Limit Records:

Record: 1 of 3 Search



Importing lab and other data

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Import Wizard - Select File and Format for Import

This wizard will guide you through selecting, checking, cleaning up, and importing a data file. It will help you document what you did, and allow you to roll back an import later if necessary. To begin, choose a file type and format below, then type in or select the file path and name.

File Type and Format: **DTS 2012 Excel**

File Path and Name:

- DTS 2012 Excel
- Enviro Data Crosstab
- EQUIS Excel Import
- EQUIS Text Import
- EQuiSR4
- ERPIMS Lab Data (Lab Submission File)
- ERPIMS Text Import
- Field File Excel
- Gas Data Excel
- Geoscience Excel Import
- Groundwater Data Import
- Historical Data Import
- IHS Oil Production Data Import
- IHS Oil Well Data Import
- Import By Field Sample ID
- Meteorological Data Import

Delivery Group Project:

Or Use one of these choices to edit the import table, resume the most recent import, or undo any previous one.



Quality control - consistency checking during import

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The screenshot displays three overlapping windows from the Geotech software interface:

- Import Wizard - Match Station Names:** This window is used for matching station names. It features a table with columns: 'Site in Import File', 'Station in Import File', and 'Change To'. The 'Site in Import File' is 'Refining Inc.' and the 'Station in Import File' is 'MW14'. The 'Change To' column contains a list of station names: CRK 15.0, EFK 6.3, EFK 13.8, EFK 18.2, EFK 23.4, EFK 24.2, K720SLOUGH, KAP 0.2, KBP 0.1, MIK 0.2, MW-14 (highlighted), MW-15, MW-16, PCK 1.6, WCK 2.3, and WCK 2.9. Buttons for 'Add Station', 'Add All Stations', and 'Add Alias' are visible. A status bar at the bottom shows 'Record: 1 of 1' and 'No Filter'.
- Import Results:** A dialog box reporting the success of the import. It states: 'All of your data was handled successfully.' The summary statistics are: 'ImportFile records: 18', 'Deleted records: 0', 'Imported records: 18', and 'Imported to Samples table only: 0'. It also notes 'Highest duplicate: 1' and 'Highest superseded: 3'. An 'OK' button is at the bottom.
- Activity Log:** A dialog box providing details of the import activity. It shows 'Name: drdave' and 'Activity Date: 5/31/2018'. The 'Site Modified' is 'Refining Inc.'. The log entry reads: 'Please Describe What You Did: Imported 18 out of 18 Water data Analyses records for sample dates 6/15/1999 to 6/16/1999 from file UnsuccessfulImport2012.xls. Imported by DRDAVEDESKTOP on 5/31/2018 8:37:59 PM'. A 'Done' button is at the bottom.



Validation Program

Validation program code:

Validation program:

Validation Program Tasks

Validation Task	ValidF	Display
Blank Contamination (Equipment Blanks - DOD 5x)	DOD	<input checked="" type="checkbox"/>
Blank Contamination (Field Blanks - DOD 5x)	DOD	<input checked="" type="checkbox"/>
Blank Contamination (Method Blanks - DOD 5x)	DOD	<input checked="" type="checkbox"/>
Blank Contamination (Rinse Blanks - DOD 5x)	DOD	<input checked="" type="checkbox"/>
Blank Contamination (Trip Blanks - DOD 5x)	DOD	<input checked="" type="checkbox"/>
Blank Contamination Updt Detected Result	DOD	<input checked="" type="checkbox"/>
Field Duplicate RPDs	DOD	<input checked="" type="checkbox"/>
Headspace not achieved	DOD	<input checked="" type="checkbox"/>
Holding Times (Extract to Analysis Date)	DOD	<input checked="" type="checkbox"/>
Holding Times (Sample to Analysis Date)	DOD	<input checked="" type="checkbox"/>
Holding Times (Sample to Extract Date)	DOD	<input checked="" type="checkbox"/>

Record: 1 of 21 | No Filter | Search

Datashheet | Close

Record: 1 of 1 | No Filter | Search

First set up your validation programs



Data review and validation

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Analytic Methods

Go to Method

Analytic Method

Description

Notes

Summary Category

Matrix Container Type

Prep Method Preserv Method

Material Required Units

Turn Around Time Time Type

Matrix	Holding Time	Time 1	Time 2	HT Units	Preservation
Water	7	Sample Date	Extraction Date	Days	
Water	40	Extraction Date	Analysis Date	Days	
*					Unknown

Record: 1 of 2 of 2 | No Filter | Search

Default Time 1

Default Time 2

Holding Time

Default HT Units

Record: 1 of 312 of 462 | No Filter | Search

Set up analytic methods and holding times



Import Wizard - Select File and Format for Import

This wizard will guide you through selecting, checking, cleaning up, and importing a data file. It will help you document what you did, and allow you to roll back an import later if necessary. To begin, choose a file type and format below, then type in or select the file path and name.

File Type and Format

File Path and Name

Delivery Group Project **Lab MSA Invoice Checking**

Or Use one of these choices to edit the import table, resume the most recent import, or undo any previous one.

Import delivery groups into a validation project



Val. Program	Sample Matrix	QC Type	An Method	Multiplier	Weighting Factor	RPD Limit	Units	Upp
DOD	Surface Water	FD	Method	5	3	30		
DOD	Water	FD	Method	5	3	30		
DOD	Water	MSD				20	Analysis Date	
DOD	Water	LCSD		5	1	35	Field Sample ID	
DOD	Groundwater	FD	Method	5	3	30		
DOD	Soil	LCSD		5	1	35	Field Sample ID	
DOD	Water	B		5			Sample Date	
DOD	Soil	MS					Analysis Date	
DOD	Soil	FB		5			Field Sample ID	
DOD	Soil	LCS					Analysis Date	
DOD	Soil	CCV					Lab Sample ID	
DOD	Soil	LD		5	2	35	Lab Sample ID	
*								

Set up validation criteria by QC Code for samples where the lab doesn't provide them



Data review and validation

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EditPrimarySamples

User's Instructions

Duplicate samples must be associated with primary samples in order to perform RPD calculations.

Use the Primary Sample dropdown to associate duplicate samples with their corresponding primary samples.

Note: Set Primary Sampl for field duplicates to the Field Sample ID of the primary sample.

All lab QC samples must use the lab sample ID of the parent sample as the primary sample.

Set Primary Sample Using:

Field Sample ID Lab Sample ID

cboPrimarySample	Field Sample ID	Lab Sample ID	QC Sample Code	AnalyticalBatch
BG-20-100722-GW	BG-20-100722-D	410-101181-5	FD	410-305280
BG-23R-042822-GW	BG-23R-042822-D	22204295010	FD	739789
BG-23R-100722-GW	BG-23R-100722-DUP	410-101181-2 DU	LD	410-307525
BG-23R-100722-GW	BG-23R-100722-MS	410-101181-2 MS	MS	410-305280
BG-23R-100722-GW	BG-23R-100722-MSD	410-101181-2 MSD	MSD	410-305280
22204295003	BG-25-042722-MS	22204295004	MS	739789
22204295003	BG-25-042722-MSD	22204295005	MSD	739789
CC-17-100622-GW	CC-17-100622-DU	410-100883-2 DU	LD	410-311409
	CC-17-100622-MS	410-100883-2 MS	MS	410-304715
CC-17-100622-MS	CC-17-100622-MSD	410-100883-2 MSD	MSD	410-304715
	CC-21-042122-D	22204231115	FD	739984
	CC-23-042022-D	22204231103	FD	739888
CC-23-100622-GW	CC-23-100622-D	410-100883-4	FD	410-304715
22204231109	CC-8-042122-MS	22204231110	MS	739984
22204231109	CC-8-042122-MSD	22204231111	MSD	739984

Record: 1 of 123 Unfiltered Search

Close

Set up primary samples such as for field dups after importing EDD



Data review and validation

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Validate Data

Program Code: DOD | Project: Automated data review | Delivery Grp: | Analytic Method: | Analytical Batch: | Station Group: | Date Range: |

Select Data | QC Tasks | Validated Analyses | Validation Checklist | Reports and Other Tasks

Load Data Append to existing data

Station Group	Delivery Group	Analytical Batch	Station Name	Primary Samp	Field Sample ID	QC Sample Code	Value	Samp. Date
Area A	222071306	745527	Area A QAQC		EB-071122	EB	0.08	7/11/2022 Ammonia
Area A	222071533	745527	Area A QAQC		EB-071322	EB	0.08	7/13/2022 Ammonia
Area A	222071533	745527	Area A QAQC		LCS for HBN 745527 [NTRO/818 LCS		99	7/16/2022 Ammonia
Area A	222071306	745527	Area A QAQC		LCS for HBN 745527 [NTRO/818 LCS		99	7/16/2022 Ammonia
Area A	222071533	745527	Area A QAQC		MB for HBN 745527 [NTRO/818 MB		0.08	7/16/2022 Ammonia
Area A	222071306	745527	Area A QAQC		MB for HBN 745527 [NTRO/818 MB		0.08	7/16/2022 Ammonia
Area A	222071306	745527	Area A QAQC	22207130601	MW-C-071122-MS	MS	105	7/11/2022 Ammonia
Area A	222071306	745527	Area A QAQC	22207130601	MW-C-071122-MSD	MSD	105	7/11/2022 Ammonia
Area A	222042321	739683	Area A QAQC		LCS for HBN 739683 [NTRO/813 LCS		100	4/28/2022 Ammonia
Area A	222042321	739683	Area A QAQC	2339506	LCSD for HBN 739683 [NTRO/813 LCSD		100	4/28/2022 Ammonia
Area A	222042321	739683	Area A QAQC		MB for HBN 739683 [NTRO/813 MB		0.08	4/28/2022 Ammonia
Area A	222042086	739387	Area A QAQC		EB-041922	EB	0.47	4/19/2022 Ammonia
Area A	222042086	739387	Area A QAQC		LCS for HBN 739387 [NTRO/813 LCS		98	4/26/2022 Ammonia
Area A	222042086	739387	Area A QAQC		MB for HBN 739387 [NTRO/813 MB		0.08	4/26/2022 Ammonia
Area A	222042086	739387	Area A QAQC	22204208604	MW-8-041922-MS	MS	100	4/19/2022 Ammonia
Area A	222042086	739387	Area A QAQC	22204208604	MW-8-041922-MSD	MSD	98	4/19/2022 Ammonia
Area A	222071533	746365	Area A QAQC		MB for HBN 746365 [SOLI/3710 MB		10	7/27/2022 Total Dissc
Area A	222071533	745678	Area A QAQC		EB-071322	EB	233	7/13/2022 Total Dissc
Area A	222071533	745678	Area A QAQC		MB for HBN 745678 [SOLI/3707 MB		10	7/19/2022 Total Dissc
Area A	222071306	745296	Area A QAQC		EB-071122	EB	249	7/11/2022 Total Dissc

Record: 1 of 7701 | No Filter | Search

Data has been loaded into validation



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Data review and validation

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Validate Data

Program Code: DOD | Project: Automated data review | Delivery Grp: | Analytic Method: | Analytical Batch: | Station Group: | Date Range: |

Select Data | QC Tasks | Validated Analyses | Validation Checklist | Reports and Other Tasks

QC Task	Order	Run	Completed	Detect Code	Non Detect Code	RejectionCoc	Reason	Additional Reason	Q
Blank Contamination Updt Detected Result	3	✓					FBK	BLOQ	Val_UFlagge
Preserve Lab J Flags	10	✓		J			BRL	BLOQ	Val_Lab J F
Blank Contamination (Method Blanks - DOD 5x)	0	✓		J+	U		MBK		Val_MB DO
Headspace not achieved	1	✓		J			OCH		Val_HeadSp
Holding Times (Extract to Analysis Date)	1	✓		J	UJ		HT		Val_HTEExtra
Holding Times (Sample to Analysis Date)	1	✓		J	UJ		HT		Val_HTSamp
Holding Times (Sample to Extract Date)	1	✓		J	UJ		HT		Val_HT_Sarr
Field Duplicate RPDs	3	✓					FDP		Val_FieldDu
LCS/LCSD RPDs	3	✓		J			LCS_RPD		Val_LCS_LCS
Surrogate Recovery < LCL	3	✓		J-	UJ	X	SURR_LCL		Val_SurrExc
Surrogate Recovery > UCL	3	✓		J+			SURR_UCL		Val_SurrExc
LCS / LCSD Recovery < LCL	4	✓		J-	UJ	X	LCS_LCL		Val_LCSExce
LCS / LCSD Recovery > UCL	4	✓		J+			LCS_UCL		Val_LCSExce
MS / MSD %Rec < LCL	8	✓		J-	UJ	X	MS_LCL		Val_MSExce
MS / MSD %Rec > UCL	8	✓		J+			MS_UCL		Val_MSExce
MS/MSD RPDs	9	✓		J			MS_RPD		Val_MS_MS
Preserve Lab U Flags	10	✓			U		PLU		Val_Lab U

Record: 1 of 21 | No Filter | Search

View Task Details | Acceptance Criteria: EDD Control Limits Table Strictest | Validation Notes | Select All | Un-Select All

Query Catalog | Flag Data | Edit Validation Criteria | Set Primary Samples | QC Detect. Limits

Detection Limit Exceeds the Regulatory Limit

Reg Limit Type: | View Reg Limits

Update Analyses Table | Clear Temp Validation Codes | Refresh Temp Valid. Codes | Update Null FlagCode with Validation Code

Replace Existing Validation Codes | Data Review Code: Stage 2A

Detection Limits: DL: Detect | LOD: Detect2 | LOQ: Detect3

Record: 1 of 1 | No Filter | Search

Set up codes, flagging, etc. and choose tests



Data review and validation

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Validate Data

Program Code: DOD | Project: Automated data review | Delivery Grp: | Analytic Method: | Analytical Batch: | Station Group: | Date Range: |

Select Data | QC Tasks | Validated Analyses | Validation Checklist | Reports and Other Tasks

FieldSampleID	Analytical Batch	LongName	QCSampleCode	Value	FlagCode	Temp Validation Code	Reason	RPD
G-3R-101222-D	410-310961	Zinc	FD	0.0052	J	J	BRL	
G-1R-101222-GW	410-310961	Zinc	O	0.0049	J	J	BRL	
G-2-101222-GW	410-310961	Zinc	O	0.011	J	J	BRL	
MW-8-071122-GW	745418	Zinc	NQ	19.2	J	J	BRL	
SW-18-DN-071222-SW	746065	Zinc	NQ	13.3	J	J	BRL	
MW-D-071122-GW	745418	Zinc	NQ	13.4	J	J	BRL	
CDG-11-042622-D	740421	Arsenic	FD	0.72	j	UJ	BLOQ,FBK	
CDG-11-042622-GW	740421	Arsenic	NQ	0.8	j	UJ	BLOQ,FBK	
CDG-15-042622-GW	740421	Chromium	NQ	0.66	j	UJ	BLOQ,FBK	
CDG-11-042622-D	740421	Chromium	FD	0.88	j	UJ	BLOQ,FBK	
CDG-14-042622-GW	740421	Chromium	NQ	0.82	j	UJ	BLOQ,FBK	
CDG-17-042622-GW	740421	Chromium	NQ	0.85	j	UJ	BLOQ,FBK	
CDG-11-042622-GW	740421	Chromium	NQ	0.78	j	UJ	BLOQ,FBK	
CDG-12-042622-GW	740421	Chromium	NQ	0.87	j	UJ	BLOQ,FBK	
CDG-15-042622-GW	740421	Copper	NQ	0.56	j	UJ	BLOQ,FBK	
CDG-11-042622-GW	740421	Copper	NQ	0.61	j	UJ	BLOQ,FBK	
CDG-11-042622-D	740421	Copper	FD	0.54	j	UJ	BLOQ,FBK	
CDG-12-042622-GW	740421	Lead	NQ	0.97	j	UJ	BLOQ,FBK	
CDG-14-042622-GW	740421	Lead	NQ	0.96	j	UJ	BLOQ,FBK	

Record: 1 of 7701 | No Filter | Search

Review after auto-flagging



Validate Data

Program Code: DOD | Project: Automated data review | Delivery Grp: | Analytic Method: | Analytical Batch: | Station Group: | Date Range: |

Select Data | QC Tasks | Validated Analyses | Validation Checklist | Reports and Other Tasks

Test Name	VBAFunction	Completed	Result
Were appropriate types of laboratory method blanks analyzed?	ValCheckMBExists	<input type="checkbox"/>	Yes
Was the method blank free of contamination (i.e., less than the MDL or RL)?	ValCheckMBContamination	<input type="checkbox"/>	No
Did the method blank contamination affect the final results? If so, note on page 2.	Val_CheckMBFlags	<input type="checkbox"/>	Yes
Was a trip blank required and submitted with the samples?	ValCheckTBExists	<input type="checkbox"/>	Yes
Was the trip blank free of contamination (i.e., less than the MDL or RL)?	ValCheckTBContamination	<input type="checkbox"/>	No
Did the trip blank contamination affect the final results? If so, note on page 2.	Val_CheckTBFlags	<input type="checkbox"/>	Yes
Was an equipment blank required and submitted with the samples?	ValCheckEBExists	<input type="checkbox"/>	N/A
Was the equipment blank free of contamination (i.e., less than the MDL or RL)?	ValCheckEBContamination	<input type="checkbox"/>	No
Did the equipment blank contamination affect the final results? If so, note on page 2.	Val_CheckEBFlags	<input type="checkbox"/>	N/A
Were surrogates added prior to extraction for all appropriate methods?	ValCheckSURRExists	<input type="checkbox"/>	Yes
Were surrogate percent recoveries within laboratory control limits?	ValCheckSurrogates	<input type="checkbox"/>	Yes
Did the surrogate percent recoveries affect the final results? If so, note on page 2.	Val_CheckSURRFlags	<input type="checkbox"/>	No
Were Laboratory Control Sample (LCS) analyzed at a frequency of one per batch?	ValCheckLCSEExists	<input type="checkbox"/>	Yes
Were LCSs spiked with appropriate list of target compounds?	ValCheckLCSTargets	<input type="checkbox"/>	N/A
Were LCS percent recoveries within laboratory control limits?	ValCheckLCSRecovery	<input type="checkbox"/>	No
Did the LCS percent recoveries affect the final results? If so, note on page 2.	ValCheckLCSRecFlags	<input type="checkbox"/>	No
Were duplicate LCSs analyzed for each method?	ValCheckLCSDFExists	<input type="checkbox"/>	Yes

Record: 14 of 26 of 30 | No Filter | Search

Run Checklist Tests | Print Checklist

Record: 1 of 1 | No Filter | Search

Set up your e-Checklist



Data review and validation

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A	B	C	D	E	F	G	H	I	J	
1	Laboratory Report Data Review e-Checklist									
2	Laboratory Report ID:									
3	Laboratory Name:	PACE				Report Package Date:				
4	Project Name:					Review Date:				
5	Project Number:	222042086, 222042311, 222042321, 222042362, 222042608, 222042609, 22								
6	Reviewer Name:					No. of Environ. Sples?				
7	Parameters:	Explosives, Inorganics, Metals, Other, Semi-VOAs, VOAs				No. of QC Sples?				
8	Method IDs:	2320B-2011, 2340B-2011, 2540C-2011, 353.2, 6020B, 7196A, 7470A,				Rejected Results?				
9	Matrix:									
10	*Attach copy of lab report showing sample IDs and corresponding lab IDs (Att 1)					Yes	No	N/A	Comment	
11										
31	Laboratory Method Blanks and Field Blanks									
32	1	Were appropriate types of laboratory method blanks analyzed?				X				
33	2	Were the laboratory method blanks analyzed at the appropriate frequency?								
34	3	Was the method blank free of contamination (i.e., less than the MDL or RL)?					X			
35	4	Did the method blank contamination affect the final results? If so, note on page 2.				X				
36	5	Was a trip blank required and submitted with the samples?				X				
37	6	Was the trip blank free of contamination (i.e., less than the MDL or RL)?					X			
38	7	Did the trip blank contamination affect the final results? If so, note on page 2.				X				
39	8	Was an equipment blank required and submitted with the samples?						X		
40	9	Was the equipment blank free of contamination (i.e., less than the MDL or RL)?					X			
41	10	Did the equipment blank contamination affect the final results? If so, note on page 2.						X		
42	11	Was a source water blank required and submitted with the samples?					X			
43	12	Was the source water blank free of contamination (i.e., less than the MDL or RL)?								
44	13	Did the source water blank contamination affect the final results? If so, note on page 2.								
45	Surrogates									
46	1	Were surrogates added prior to extraction for all appropriate methods?				X				
47	2	Were surrogate percent recoveries within laboratory control limits?				X				
48	3	Did the surrogate percent recoveries affect the final results? If so, note on page 2.					X			
49	Laboratory Control Samples									
50	1	Were Laboratory Control Sample (LCS) analyzed at a frequency of one per batch?				X				
51	2	Were LCSs spiked with appropriate list of target compounds?						X		
52	3	Were LCS percent recoveries within laboratory control limits?					X			
53	4	Did the LCS percent recoveries affect the final results? If so, note on page 2.					X			
54	5	If performed, was LCS Duplicate data provided?				X				
55	6	Were the LCS/LCSD RPD values within laboratory control limits?				X				
56	Matrix Spikes									
57	1	Were MS/MSDs analyzed at a frequency of one per batch?				X				
58	2	Sample used/methods: 0-101222-MSD, MW-2-100522-D MS, MW-2-100522-D MSD, MW-8-041922-MS, MW-4								
59	2	Were MS/MSDs performed on a project sample selected by the laboratory?				X				
60	3	Sample used/methods: MSD, CC-17-100622-MS, CC-17-100622-MSD, CC-8-042122-MS, CC-8-042122-								
61	3	Were MS/MSDs spiked with appropriate list of target compounds?						X		
62	4	Were MS/MSD percent recoveries within laboratory control limits?					X			
63	5	Did the MS/MSD percent recoveries affect the final results? If yes, narrate.					X			
64	6	Were the MS/MSD RPD values within laboratory control limits?					X			

Print your e-Checklist report



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The screenshot shows the 'Validate Data' application window. At the top, there are several dropdown menus for 'Program Code' (DOD), 'Project' (Automated data review), 'Delivery Grp', 'Analytic Method', and 'Analytical Batch'. Below these are 'Station Group' and 'Date Range' fields. A navigation bar includes 'Select Data', 'QC Tasks', 'Validated Analyses', 'Validation Checklist', and 'Reports and Other Tasks'. The 'Reports' section is active, displaying a list of report names on the left and a details panel on the right. The details panel shows 'Report Name: Field Duplicate Outliers', 'Description: Portrait report that displays field duplicate pairs with relative percent difference exceeding the control limit', and 'Access Name: Val_FDOutlierReport'. A 'Preview / Print' button is located to the right of the details panel. Below the reports section is a 'Custom Queries' table with one entry: 'Dsplays spike and RPD acceptance criteria' with 'QueryName: View Acceptance Criteria' and 'QuerySQL: SELECT Distinct ValidationImport.QCSar'. To the right of the table are 'Run Query' and 'Export Query' buttons. On the far right, an 'Excel Exports' panel contains buttons for 'Validation Summary', 'Flat File Tables', 'Sample Completeness', and 'Sample Quantities'. The bottom status bar shows 'Record: 1 of 1' and 'No Filter'.

Program Code: DOD | Project: Automated data review | Delivery Grp: | Analytic Method: | Analytical Batch: | Station Group: | Date Range: |

Select Data | QC Tasks | Validated Analyses | Validation Checklist | Reports and Other Tasks

Reports

Report Name

- Field Duplicate Outliers
- Lab Control Sample Outliers
- Matrix Spike Outliers
- Non-Detects above the Reporting Limit
- Reporting Limits Outliers
- Surrogate Outlier Statistics
- Surrogate Outliers
- Validation Summary
- Validation Summary (Flagged Results)

Details

Report Name: Field Duplicate Outliers

Description: Portrait report that displays field duplicate pairs with relative percent difference exceeding the control limit

Access Name: Val_FDOutlierReport

Preview / Print

Custom Queries

Selected	Description	QueryName	QuerySQL
<input checked="" type="checkbox"/>	Dsplays spike and RPD acceptance criteria	View Acceptance Criteria	SELECT Distinct ValidationImport.QCSar

Run Query | Export Query

Excel Exports

- Validation Summary
- Flat File Tables
- Sample Completeness
- Sample Quantities

Record: 1 of 1 | No Filter | Search

Select other reports



Data review and validation

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Station Group	Location	Sample Date	353_2	8260D	EPA 8260D DOD	Inorganics	Metals Dissolved	Metals Total	VOCs	Comment
Area A	EB-041922	4/19/2022	0	0	1	1	1	1	1	
Area A	EB-071122	7/11/2022	0	0	1	1	1	1	1	
Area A	EB-071322	7/13/2022	0	0	1	1	1	1	1	
Area A	EB-100422	10/4/2022	0	1	0	1	1	1	1	
Area A	EB-100522	10/5/2022	1	1	0	1	1	1	1	
Area A	MW-2	4/19/2022	0	0	1	1	1	1	1	
Area A	MW-2	7/13/2022	0	0	1	1	1	1	1	
Area A	MW-2	10/5/2022	2	2	0	2	2	2	2	
Area A	MW-8	4/19/2022	0	0	1	1	1	1	1	
Area A	MW-8	7/11/2022	0	0	2	2	2	2	2	
Area A	MW-8	10/5/2022	0	1	0	0	1	1	1	
Area A	MW-C	4/19/2022	0	0	2	2	2	2	2	
Area A	MW-C	7/11/2022	0	0	1	1	1	1	1	
Area A	MW-C	10/4/2022	0	1	0	1	1	1	1	
Area A	MW-D	4/19/2022	0	0	1	1	1	1	1	
Area A	MW-D	4/20/2022	0	0	0	1	0	0	0	
Area A	MW-D	7/11/2022	0	0	1	1	1	1	1	
Area A	MW-D	10/4/2022	0	1	0	1	1	1	1	
Area A	TB-041922	4/19/2022	0	0	1	0	0	0	1	
Area A	TB-042922	4/29/2022	0	0	1	0	0	0	1	
Area A	TB-071122	7/11/2022	0	0	1	0	0	0	1	
Area A	TB-071322	7/13/2022	0	0	1	0	0	0	1	
Area A	TB-100422	10/4/2022	0	1	0	0	0	0	1	
Area A	TB-100522	10/5/2022	0	1	0	0	0	0	1	
Total			3	9	17	20	20	20	26	

Sample completeness export



Data review and validation

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Lab SDGs							
2727, 222042839, 222042948, 222042950, 222042951, 222042952, 222050516, 222071306, 222071443, 222071533, 410-100484, 410-100648							
Validated Sample List							
Field ID	ate Collect	Lab ID	QC / Notes	Matrix	Analysis	ation S	
222042086							
EB-041922	4/19/2022	22204208609	Equipment Blank	Water	Inorganics	Stage 2A	
EB-041922	4/19/2022	22204208609	Equipment Blank	Water	Metals Dissolved	Stage 2A	
EB-041922	4/19/2022	22204208609	Equipment Blank	Water	Metals Total	Stage 2A	
EB-041922	4/19/2022	22204208609	Equipment Blank	Water	VOCs	Stage 2A	
MW-2-041922-GW	4/19/2022	22204208607	Investigative Sample	Groundwater	Inorganics	Stage 2A	
MW-2-041922-GW	4/19/2022	22204208607	Investigative Sample	Groundwater	Metals Dissolved	Stage 2A	
MW-2-041922-GW	4/19/2022	22204208607	Investigative Sample	Groundwater	Metals Total	Stage 2A	
MW-2-041922-GW	4/19/2022	22204208607	Investigative Sample	Groundwater	VOCs	Stage 2A	
MW-8-041922-GW	4/19/2022	22204208604	Investigative Sample	Groundwater	Inorganics	Stage 2A	
MW-8-041922-GW	4/19/2022	22204208604	Investigative Sample	Groundwater	Metals Dissolved	Stage 2A	
MW-8-041922-GW	4/19/2022	22204208604	Investigative Sample	Groundwater	Metals Total	Stage 2A	
MW-8-041922-GW	4/19/2022	22204208604	Investigative Sample	Groundwater	VOCs	Stage 2A	
MW-8-041922-MS	4/19/2022	22204208605	Matrix spike	Water	Inorganics	Stage 2A	
MW-8-041922-MS	4/19/2022	22204208605	Matrix spike	Water	Metals Dissolved	Stage 2A	
MW-8-041922-MS	4/19/2022	22204208605	Matrix spike	Water	Metals Total	Stage 2A	
MW-8-041922-MS	4/19/2022	22204208605	Matrix spike	Water	VOCs	Stage 2A	
MW-8-041922-MSD	4/19/2022	22204208606	Matrix spike duplicate	Water	Inorganics	Stage 2A	
MW-8-041922-MSD	4/19/2022	22204208606	Matrix spike duplicate	Water	Metals Dissolved	Stage 2A	
MW-8-041922-MSD	4/19/2022	22204208606	Matrix spike duplicate	Water	Metals Total	Stage 2A	
MW-8-041922-MSD	4/19/2022	22204208606	Matrix spike duplicate	Water	VOCs	Stage 2A	
MW-C-041922-D	4/19/2022	22204208602	Field Duplicate	Groundwater	Inorganics	Stage 2A	
MW-C-041922-D	4/19/2022	22204208602	Field Duplicate	Groundwater	Metals Dissolved	Stage 2A	
MW-C-041922-D	4/19/2022	22204208602	Field Duplicate	Groundwater	Metals Total	Stage 2A	
MW-C-041922-D	4/19/2022	22204208602	Field Duplicate	Groundwater	VOCs	Stage 2A	
MW-C-041922-GW	4/19/2022	22204208601	Investigative Sample	Groundwater	Inorganics	Stage 2A	
MW-C-041922-GW	4/19/2022	22204208601	Investigative Sample	Groundwater	Metals Dissolved	Stage 2A	

SampleSummary HTQ Lab Blanks LCS-LCSD MS-MSD Field Duplicates DataQualifiers Field Blanks Result ...

Accessibility: Investigate

Sample summary export



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Laboratory Blank Qualification

Lab Blank ID	Lab Blank Result Value	Date Collected	Lab SDG No.	Prep Batch	Analytic Method	Parameter Name	Sample ID	Result Value	Units	Lab Flag	DV Qualifier	DV Reason Code	DL
MB for HBN 739847	7.44	4/28/2022	222042948	739847	EPA 6020B Dissolved (DIS)	Zinc	SW-18-MID-042822-SW	10.00	ug/l	J	U	MBK,BRL	5
MB for HBN 739850	13.80	4/28/2022	222042950	739850	EPA 6020B (TOT)	Aluminum	EPS-2-042822-GW	13.10	ug/l	J	UJ	MBK,BLOQ	5
MB for HBN 739850	13.80	4/27/2022	222042950	739850	EPA 6020B (TOT)	Aluminum	BG-10-042722-GW	12.20	ug/l	J	UJ	MBK,BLOQ	5
MB for HBN 739850	13.80	4/27/2022	222042950	739850	EPA 6020B (TOT)	Aluminum	BG-22-042722-GW	100.00	ug/l	J	U	MBK,EBK,BRL	50
MB for HBN 739850	13.80	4/27/2022	222042950	739850	EPA 6020B (TOT)	Aluminum	BG-25-042722-GW	100.00	ug/l	J	U	MBK,EBK,BRL	50
MB for HBN 745459	1.10	7/11/2022	222071306	745459	EPA 8260D DOD	Methylene chloride	TB-071122	2.00	ug/l	J	U	MBK,EBK,BRL	1.07
MB for HBN 745365	6.44	7/12/2022	222071443	745365	EPA 6020B (TOT)	Zinc	SW-18-DN-071222-SW	17.20	ug/l	J	UJ	MBK,BRL	5
MB for HBN 745459	1.10	7/11/2022	222071533	745459	EPA 8260D DOD	Methylene chloride	TB-071122	2.00	ug/l	J	U	MBK,EBK,BRL	1.07

Blank qualification

	G	H	I	J	K	L	M	P	R	S	T	
1												
2												
3												
4	MATRIX SPIKE - MATRIX SPIKE DUPLICATE (MS/MSD) NON-COMPLIANCE											
5												
6	MS/MSD ID	MS Recovery (%)	MSD Recovery (%)	Spike Amount	MS/MSD Criteria	Precision outlier (RPD)	MS/MSD RPD Criteria	Result Value	Lab Flag	DV Qualifier	DV Reason Code	
7	CDG-12-042622-MS/CDG-12-042622-MSD	137	155	50	87 / 115	2	20	41.3		J+	MS_UCL	1.
8	CDG-12-042622-MS/CDG-12-042622-MSD	137	155	50	87 / 115	2	20	179		J+	MS_UCL	1.
9	CDG-12-042622-MS/CDG-12-042622-MSD	137	155	50	87 / 115	2	20	168		J+	MS_UCL	1.
10	CDG-12-042622-MS/CDG-12-042622-MSD	137	155	50	87 / 115	2	20	180		J+	MS_UCL	1.
11	CDG-12-042622-MS/CDG-12-042622-MSD	67	87	0.005	82 / 119	25	20	0.00012	J	J	MS_RPD,BRL	0.0
12	CDG-12-042622-MS/CDG-12-042622-MSD	67	87	0.005	82 / 119	25	20	0.00011	J	J	MS_RPD,BRL	0.0
13	CDG-12-042622-MS/CDG-12-042622-MSD	67	87	0.005	82 / 119	25	20	0.00011	J	J	MS_RPD,BRL	0.0
14	SW-16-UP-042722-MS/SW-16-UP-042722-MSD	268	237	1000	84 / 117	10	20	199		J+	MS_UCL	
15	SW-16-UP-042722-MS/SW-16-UP-042722-MSD	268	237	1000	84 / 117	10	20	566		J+	MS_UCL	
16	SW-16-UP-042722-MS/SW-16-UP-042722-MSD	268	237	1000	84 / 117	10	20	1210		J+	MS_UCL	
17	SW-16-UP-042722-MS/SW-16-UP-042722-MSD	268	237	1000	84 / 117	10	20	494		J+	MS_UCL	
18	BG-25-042722-MS/BG-25-042722-MSD	16	17	10	73 / 125	1	20	0.5	UJ	UJ	MS_LCL	0.
19	BG-25-042722-MS/BG-25-042722-MSD	18	17	10	65 / 134	8	20	0.5	UJ	UJ	MS_LCL	0.
20	SW-02-042822-MS/SW-02-042822-MSD	18	11	10	70 / 127	49	20	0.17	UJ	UJ	MS_LCL	0.
21	SW-02-042822-MS/SW-02-042822-MSD	12	9	10	73 / 125	23	20	0.33	X	X	MS_LCL	0.
22	SW-02-042822-MS/SW-02-042822-MSD	26	20	10	71 / 127	24	20	0.42	UJ	UJ	MS_LCL	0.
23	SW-02-042822-MS/SW-02-042822-MSD	13	8	10	65 / 134	44	20	0.23	X	X	MS_LCL	0.
24												
25												

MS/MSD summary export



Data review and validation

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FIELD DUPLICATE SUMMARY														
Date Sampled: 4/19/2022														
MW-C-041922-GW / MW-C-041922-D														
Analyte	SAMPLE				DUPLICATE			Precision			Difference	Lab Flag	DV Qualifier	DV Reason
	Result	Lab Flag	DV Qualifier	DV Reason	Result	Units	LOQ	RPD						
Acetone	4.5	J	J	BRL	4.74	ug/l	5	---	---	0.2399998	J	J	BRL	
Barium (TOT)	88.6		J+	EBK	9.35	ug/l	10	---	---	79.25	J	J	BLOQ	
Calcium (DIS)	532000				534000	ug/l	5000	0.38	---	---				
Calcium (TOT)	549000		J+	EBK	607000	ug/l	5000	10.03	---	---		J+	EBK	
Chloride	738000				732000	ug/l	100000	0.82	---	---				
Cobalt (TOT)	11.8				ND(5)	ug/l	10	---	---	*	U	U	PLU	
Copper (TOT)	8.12	J	J	BRL	ND(5)	ug/l	10	---	---	*	U	U	PLU	
Hardness	2990		J+	EBK	3230	mg/l	16.6	7.72	---	---		J+	EBK	
Magnesium (DIS)	366000				367000	ug/l	1000	0.27	---	---				
Magnesium (TOT)	394000		J+	EBK	416000	ug/l	1000	5.43	---	---		J+	EBK	
Nickel (TOT)	294				34.4	ug/l	20	---	---	259.6		J+	EBK	
Nitrate	14900				15100	ug/l	4000	---	---	200				
Sulfate	4190000				4130000	ug/l	100000	1.44	---	---				
Toluene	0.702	J	J	BRL	0.763	ug/l	1	---	---	6.10E-02	J	J	BRL	
Total Alkalinity	236		J+	EBK	244	mg/l	1	3.33	---	---		J+	EBK	
Total Dissolved Solids	6520				6770	mg/l	10	3.76	---	---				
Trichloroethene	0.458	J	J	BRL	0.358	ug/l	1	---	---	1.00E-01	J	J	BRL	
Vanadium (TOT)	6.78	J	J	BLOQ	ND(5)	ug/l	10	---	---	*	U	U	PLU	
Zinc (TOT)	258				ND(100)	ug/l	200	---	---	*	U	U	PLU	

Field dup summary export



Data review and validation

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SiteName					
042839, 222042948, 222042950, 222042951, 222042952, 222050516, 222071306, 222071443, 222071533, 410-100484, 4					
Data Qualifiers					
SampleID	Date Collected	Method	Analyte	Qualifier	Reason for Qualification
222042086					
EB-041922	4/19/2022	EPA 6020B (TOT)	Vanadium	J	EBK,BRL
	4/19/2022	EPA 8260D DOD	Methylene chloride	J	EBK,BRL
MW-2-041922-GW	4/19/2022	EPA 6020B (TOT)	Barium	J+	EBK
	4/19/2022		Vanadium	J	BLOQ
	4/19/2022	EPA 8260D DOD	Toluene	J	BRL
	4/19/2022		Trichloroethene	J	BRL
	4/19/2022	SM 2320 B-2011	Total Alkalinity	J+	EBK
	4/19/2022	SM 2340 B	Hardness	J+	EBK
	4/19/2022	SM 2340 B (TOT)	Calcium	J+	EBK
	4/19/2022		Magnesium	J+	EBK
	4/19/2022	SM 2540 C-2015	Total Dissolved Solids	J+	EBK
MW-8-041922-GW	4/19/2022	EPA 6020B (TOT)	Barium	J+	EBK
	4/19/2022		Nickel	J+	EBK
	4/19/2022		Vanadium	U	EBK,BRL
	4/19/2022	EPA 8260D DOD	Toluene	J	BRL
	4/19/2022		Trichloroethene	J	BRL
	4/19/2022	SM 2320 B-2011	Total Alkalinity	J+	EBK
	4/19/2022	SM 2340 B	Hardness	J+	EBK
	4/19/2022	SM 2340 B (TOT)	Calcium	J+	EBK
	4/19/2022		Magnesium	J+	EBK
	4/19/2022	EPA 6020B (TOT)	Barium	J	BLOQ
	4/19/2022		Nickel	J+	EBK
	4/19/2022		Acetone	J	BRL

Data qualifier summary export



Data review and validation

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Station Group	Station Name	Sample ID	Date Collected	Parameter Name	Units	Original Result Value	Lab Flag	Final Result Value	DV Qualifier	DV Reason Code	DL	LOD	LOQ
Area A	MW-2	MW-2-04192	4/19/2022	Barium (TOT)	ug/l	110		110	J+	EBK	2.5	5	10
Area A	MW-2	MW-2-04192	4/19/2022	Calcium (TOT)	ug/l	228000		228000	J+	EBK	1250	2500	5000
Area A	MW-2	MW-2-04192	4/19/2022	Hardness	mg/l	1120		1120	J+	EBK	4.2	8.3	16.6
Area A	MW-2	MW-2-04192	4/19/2022	Magnesium (TOT)	ug/l	133000		133000	J+	EBK	250	500	1000
Area A	MW-2	MW-2-04192	4/19/2022	Total Alkalinity	mg/l	91.4		91.4	J+	EBK	0.26	0.8	1
Area A	MW-2	MW-2-04192	4/19/2022	Total Dissolved Solids	mg/l	947		947	J+	EBK	10	10	10
Area A	MW-2	MW-2-07132	7/13/2022	Arsenic (TOT)	ug/l	0.33	J	0.5	U	EBK,BRL	0.25	0.5	1
Area A	MW-2	MW-2-07132	7/13/2022	Copper (TOT)	ug/l	0.41	J	0.5	U	EBK,BRL	0.25	0.5	1
Area A	MW-2	MW-2-07132	7/13/2022	Lead (TOT)	ug/l	0.34	J	0.5	U	EBK,BRL	0.25	0.5	1
Area A	MW-2	MW-2-07132	7/13/2022	Total Alkalinity	mg/l	171		171	J+	EBK	0.26	0.8	1
Area A	MW-2	MW-2-07132	7/13/2022	Vanadium (TOT)	ug/l	1.38		1.38	J+	EBK	0.25	0.5	1
Area A	MW-2	MW-2-10052	10/5/2022	Chromium (TRC)	ug/l	1.2	J J1	1.2	UJ	FBK,BLOQ	0.33	0.8	2
Area A	MW-2	MW-2-10052	10/5/2022	Cobalt (TRC)	ug/l	0.33	J J1	0.33	J	BRL	0.16	0.4	0.5
Area A	MW-2	MW-2-10052	10/5/2022	Copper (TRC)	ug/l	0.9	J J1	0.9	U	FBK,BRL	0.36	0.9	1
Area A	MW-2	MW-2-10052	10/5/2022	Lead (TRC)	ug/l	0.39	J J1	0.39	UJ	FBK,BLOQ	0.071	0.2	0.5
Area A	MW-2	MW-2-10052	10/5/2022	Thallium (TRC)	ug/l	0.24	J J1	0.3	U	FBK,BRL	0.13	0.3	0.5
Area A	MW-2	MW-2-10052	10/5/2022	Vanadium (TRC)	ug/l	2.4	J J1	2.4	UJ	FBK,BLOQ	0.79	2	4
Area A	MW-2	MW-2-10052	10/5/2022	Zinc (TRC)	ug/l	12	J J1	12	J	BRL	4	8	15
Area A	MW-2	MW-2-10052	10/5/2022	Acetone	ug/l	1.3	J Q CN	1.3	J	BRL	0.7	2	20
Area A	MW-2	MW-2-10052	10/5/2022	Chromium (TRC)	ug/l	0.75	J	0.8	U	FBK,BRL	0.33	0.8	2
Area A	MW-2	MW-2-10052	10/5/2022	Copper (TRC)	ug/l	0.82	J	0.9	U	FBK,BRL	0.36	0.9	1
Area A	MW-2	MW-2-10052	10/5/2022	Lead (TRC)	ug/l	0.39	J	0.39	UJ	FBK,BLOQ	0.071	0.2	0.5
Area A	MW-2	MW-2-10052	10/5/2022	Vanadium (TRC)	ug/l	2	J	2	U	FBK,BRL	0.79	2	4
Area A	MW-8	MW-8-04192	4/19/2022	Barium (TOT)	ug/l	26		26	J+	EBK	2.5	5	10
Area A	MW-8	MW-8-04192	4/19/2022	Calcium (TOT)	ug/l	552000		552000	J+	EBK	1250	2500	5000
Area A	MW-8	MW-8-04192	4/19/2022	Hardness	mg/l	2660		2660	J+	EBK	4.2	8.3	16.6
Area A	MW-8	MW-8-04192	4/19/2022	Magnesium (TOT)	ug/l	312000		312000	J+	EBK	250	500	1000
Area A	MW-8	MW-8-04192	4/19/2022	Nickel (TOT)	ug/l	29.5		29.5	J+	EBK	5	10	20
Area A	MW-8	MW-8-04192	4/19/2022	Total Alkalinity	mg/l	243		243	J+	EBK	0.26	0.8	1
Area A	MW-8	MW-8-04192	4/19/2022	Vanadium (TOT)	ug/l	3.31	J	5	U	EBK,BRL	2.5	5	10
Area A	MW-8	MW-8-07112	7/11/2022	Arsenic (TOT)	ug/l	0.39	J	0.5	U	EBK,BRL	0.25	0.5	1
Area A	MW-8	MW-8-07112	7/11/2022	Chromium (TOT)	ug/l	1.28		1.28	J+	EBK	0.25	0.5	1
Area A	MW-8	MW-8-07112	7/11/2022	Total Alkalinity	mg/l	234		234	J+	EBK	0.26	0.8	1

Result change summary export



Data review and validation

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Laboratory Report ID	Sample Date	Batch Group	Lab	Lab Sample ID	Sample ID	Media	Compound	QA/QC Description	Result Bias	Target Range
222042086	4/19/2022	739072	PACE	22204208609	EB-041922	Water	Magnesium	Lab / Method Blank Contamination	High	ND<25
222042086	4/19/2022	739345	PACE	22204208601, 22204208602, 22204208603, 22204208604, 22204208607	MW-2-041922-GW, MW-8-041922-GW, MW-C-041922-D, MW-C-041922-GW, MW-D-041922-GW	Water	Zinc	Lab / Method Blank Contamination	High	ND<5
222042086	4/19/2022	740016	PACE	22204208601, 22204208602, 22204208603, 22204208604, 22204208607, 22204208609	EB-041922, MW-2-041922-GW, MW-8-041922-GW, MW-C-041922-D, MW-C-041922-GW, MW-D-041922-GW	Water	Vinyl acetate	High LCS/LCSD Recovery	High	54-146
222042086	4/19/2022	740016	PACE	22204208601, 22204208602, 22204208603, 22204208604, 22204208607, 22204208609	EB-041922, MW-2-041922-GW, MW-8-041922-GW, MW-C-041922-D, MW-C-041922-GW, MW-D-041922-GW	Water	Vinyl acetate	High MSD Recovery	High	54-146
222042086	4/19/2022	740016	PACE	22204208601, 22204208602, 22204208603, 22204208604, 22204208607, 22204208609	EB-041922, MW-2-041922-GW, MW-8-041922-GW, MW-C-041922-D, MW-C-041922-GW, MW-D-041922-GW	Water	Methylene chloride	Lab / Method Blank Contamination	High	ND<0.2
222042086	4/19/2022	740039	PACE	22204208608	T8-041922	Water	Methylolide	Low LCS/LCSD Recovery	Low	69-131
222042086	4/19/2022	740039	PACE	22204208608	T8-041922	Water	Vinyl acetate	High LCS/LCSD Recovery	High	54-146
222042086	4/19/2022	740039	PACE	22204208608	T8-041922	Water	Methylene chloride	Lab / Method Blank Contamination	High	ND<0.2
222042086	4/19/2022	740264	PACE	22204208601, 22204208602, 22204208603, 22204208604, 22204208607, 22204208609	EB-041922, MW-2-041922-GW, MW-8-041922-GW, MW-C-041922-D, MW-C-041922-GW, MW-D-041922-GW	Water	Calcium; Hardness; Magnesium	Low MS/MSD Recovery	Low	80-120
222042086	4/19/2022	740264	PACE	22204208601, 22204208602, 22204208603, 22204208604, 22204208607, 22204208609	EB-041922, MW-2-041922-GW, MW-8-041922-GW, MW-C-041922-D, MW-C-041922-GW, MW-D-041922-GW	Water	Chromium	Lab / Method Blank Contamination	High	ND<0.25
222042086	4/19/2022	740264	PACE	22204208601, 22204208602, 22204208603, 22204208604, 22204208607, 22204208609	EB-041922, MW-2-041922-GW, MW-8-041922-GW, MW-C-041922-D, MW-C-041922-GW, MW-D-041922-GW	Water	Zinc	Lab / Method Blank Contamination	High	ND<5
222042086	4/19/2022	740264	PACE	22204208601, 22204208602, 22204208603, 22204208604, 22204208607, 22204208609	EB-041922, MW-2-041922-GW, MW-8-041922-GW, MW-C-041922-D, MW-C-041922-GW, MW-D-041922-GW	Water	Barium	Field Blank Contamination	High	ND<2.5
222042086	4/19/2022	740264	PACE	22204208601, 22204208602, 22204208603, 22204208604, 22204208607, 22204208609	EB-041922, MW-2-041922-GW, MW-8-041922-GW, MW-C-041922-D, MW-C-041922-GW, MW-D-041922-GW	Water	Calcium	Field Blank Contamination	High	ND<1250
222042086	4/19/2022	740264	PACE	22204208601, 22204208602, 22204208603, 22204208604, 22204208607, 22204208609	EB-041922, MW-2-041922-GW, MW-8-041922-GW, MW-C-041922-D, MW-C-041922-GW, MW-D-041922-GW	Water	Magnesium	Field Blank Contamination	High	ND<250
222042086	4/19/2022	740264	PACE	22204208601, 22204208602, 22204208603, 22204208604, 22204208607, 22204208609	EB-041922, MW-2-041922-GW, MW-8-041922-GW, MW-C-041922-D, MW-C-041922-GW, MW-D-041922-GW	Water	Nickel	Field Blank Contamination	High	ND<5
222042086	4/19/2022	740264	PACE	22204208601, 22204208602, 22204208603, 22204208604, 22204208607, 22204208609	EB-041922, MW-2-041922-GW, MW-8-041922-GW, MW-C-041922-D, MW-C-041922-GW, MW-D-041922-GW	Water	Vanadium	Field Blank Contamination	High	ND<2.5

Data usability summary export



Data review and validation

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Parameter Completeness

Validated Sample List

Sample ID	Date Collected	Notes	Parameters	# Parameters In Sample	Validation Level
EB-100422	10/4/2022	EB	8260D.Inorganics,Metals Dissolved,Metals Total,V	75	Stage 2A
MW-C-100422-GW	10/4/2022	O	8260D.Inorganics,Metals Dissolved,Metals Total,V	75	Stage 2A
MW-C-100422-MS	10/4/2022	MS	8260D.Inorganics,Metals Dissolved,Metals Total,V	73	Stage 2A
MW-C-100422-MSD	10/4/2022	MSD	8260D.Inorganics,Metals Dissolved,Metals Total,V	68	Stage 2A
MW-D-100422-GW	10/4/2022	O	8260D.Inorganics,Metals Dissolved,Metals Total,V	75	Stage 2A
TB-100422	10/4/2022	TB	8260D.VOCs	47	Stage 2A
EB-100522	10/5/2022	FB	353.2,8260D.Inorganics,Metals Dissolved,Metals T	76	Stage 2A
MW-2-100522-D	10/5/2022	FD	353.2,8260D.Inorganics,Metals Dissolved,Metals T	75	Stage 2A
MW-2-100522-D MS	10/5/2022	MS	Metals Dissolved,Metals Total	17	Stage 2A
MW-2-100522-D MSD	10/5/2022	MSD	Metals Dissolved,Metals Total	17	Stage 2A
MW-2-100522-GW	10/5/2022	O	353.2,8260D.Inorganics,Metals Dissolved,Metals T	76	Stage 2A
MW-8-100522-GW	10/5/2022	MS	353.2,8260D.Inorganics,Metals Dissolved,Metals T	2	Stage 2A
MW-8-100522-GW	10/5/2022	O	353.2,8260D.Inorganics,Metals Dissolved,Metals T	76	Stage 2A
TB-100522	10/5/2022	TB	8260D.VOCs	47	Stage 2A
EB-041922	4/19/2022	EB	EPA 8260D DOD.Inorganics,Metals Dissolved,Me	74	Stage 2A
MW-2-041922-GW	4/19/2022	NQ	EPA 8260D DOD.Inorganics,Metals Dissolved,Me	74	Stage 2A
MW-8-041922-GW	4/19/2022	NQ	EPA 8260D DOD.Inorganics,Metals Dissolved,Me	74	Stage 2A
MW-8-041922-MS	4/19/2022	MS	EPA 8260D DOD.Inorganics,Metals Dissolved,Me	72	Stage 2A
MW-8-041922-MSD	4/19/2022	MSD	EPA 8260D DOD.Inorganics,Metals Dissolved,Me	72	Stage 2A
MW-C-041922-D	4/19/2022	FD	EPA 8260D DOD.Inorganics,Metals Dissolved,Me	74	Stage 2A
MW-C-041922-GW	4/19/2022	NQ	EPA 8260D DOD.Inorganics,Metals Dissolved,Me	74	Stage 2A
MW-D-041922-GW	4/19/2022	NQ	EPA 8260D DOD.Inorganics,Metals Dissolved,Me	71	Stage 2A
TB-041922	4/19/2022	TB	EPA 8260D DOD.VOCs	47	Stage 2A
MW-D-042022-GW	4/20/2022	NQ	Inorganics	3	Stage 2A
TB-042922	4/29/2022	TB	EPA 8260D DOD.VOCs	47	Stage 2A
EB-071122	7/11/2022	FB	EPA 8260D DOD.Inorganics,Metals Dissolved,Me	74	Stage 2A
MW-8-071122-D	7/11/2022	FD	EPA 8260D DOD.Inorganics,Metals Dissolved,Me	74	Stage 2A
MW-8-071122-GW	7/11/2022	NQ	EPA 8260D DOD.Inorganics,Metals Dissolved,Me	74	Stage 2A
MW-C-071122-GW	7/11/2022	NQ	EPA 8260D DOD.Inorganics,Metals Dissolved,Me	74	Stage 2A
MW-C-071122-MS	7/11/2022	MS	EPA 8260D DOD.Inorganics,Metals Dissolved,Me	72	Stage 2A

DO NOT PRINT

2237 =Total parameters in event

36 =Total samples in event

Data Usability Calc

Total	2237
J(BRL)	54
# J/UJ	104 (DV -includes BRL)
# R'd	0
92.94% % Not qualified	
4.65% % Q'd J/UJ	
0.00% % Q'd R	
100.00% % Completeness	

Total Samples	5	Trip Blanks
	1	Field Blanks
	4	Equipment Blanks
	0	Rinse Blanks
	3	Field Duplicates
	9	Designated MS/MSDs
	14	Investigative Samples
	36	Total Samples

Sample and parameter counts plus statistics export



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Data selection

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Select Data

Analytic Flags Help Display Options Back Refresh Selected Data Reset Clear

Sites Samples Analyses

Name	Rad Industries	▼	▼	▼
State		▼	▼	▼
Type		▼	▼	▼
Owner		▼	▼	▼

Stations

General Location Info. Regulatory Info.

Station Group		▼	▼	▼
Name	MW-1; MW-3	▼	▼	▼
Type		▼	▼	▼
Type2		▼	▼	▼
Geologic Unit		▼	▼	▼
Station Status		▼	▼	▼
QC Type		▼	▼	▼
PRP		▼	▼	▼
Enviro. Status		▼	▼	▼
Land Use		▼	▼	▼
Water Use		▼	▼	▼

Sample Group		▼	▼	▼
Sample Event		▼	▼	▼
Date	01/01/1990 :12/31/1990	▼	▼	▼
Top Depth		▼	▼	▼
Base Depth		▼	▼	▼
Type		▼	▼	▼
Purpose		▼	▼	▼
Matrix		▼	▼	▼
Filtered		▼	▼	▼
Geologic Unit		▼	▼	▼
Lithology		▼	▼	▼
Duplicate	0	▼	▼	▼
Field ID		▼	▼	▼
QC		▼	▼	▼
Collect. Agency		▼	▼	▼
Task Number		▼	▼	▼
Taxonomy		▼	▼	▼
Gender		▼	▼	▼
Life Stage		▼	▼	▼
TissueType		▼	▼	▼
Weight Volume		▼	▼	▼

General Additional Data * Display All Results *

Parameter Group		▼	▼	▼
Parameter	Sulfate	▼	▼	▼
Alt Param ID		▼	▼	▼
Param Type		▼	▼	▼
Lab		▼	▼	▼
Value		▼	▼	▼
Flags		▼	▼	▼
Problems		▼	▼	▼
Superseded	0	▼	▼	▼
Value Code		▼	▼	▼
Filtered		▼	▼	▼
Method		▼	▼	▼
Detected?		▼	▼	▼
Reportable?		▼	▼	▼
Validation Cd		▼	▼	▼
QC		▼	▼	▼
Batch		▼	▼	▼
Sum Category		▼	▼	▼
Analysis Group		▼	▼	▼
Delivery Grp		▼	▼	▼
Extracted?		▼	▼	▼
Report. Agency		▼	▼	▼

Update Number of Analyses: 5 AutoUpdate Dynamic Filtering

Output Save/Load Modify Other Options

List Report Export Graph Map Enviro Space Close



Display options determine how your results are displayed

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Example options:

- Regulatory limits
- Values and flags
- Unit conversion
- Date display
- Calculated parameters
- Non-detects
- Significant figures
- Graph display options
- Custom queries

Display/Graphing Options

Display Options | Graphing Options | Report Graph Options | Custom Queries

Display Set: Standard

Detected Value Options: Value Only Use Analytic Flags Table Value and Validation Flag Use Validation Flags Table

Edit Analytic Flags Edit Validation Flags

Non-detect Options Use Analytic Flags Table Display Detection Limit Display ½ Detection Limit Display Value Display 0
 Value And Validation Flag Use Validation Flags Table Use Detect Type Detect

Display Options All Dilutions in Same Report Column Use Scientific Notation Values > 10 Language Format English
Values < 1

Add delimiters to large numbers Append Leach Method to Parameter Name
 Un-Alias Parameters Append Filtered Code to Parameter Name
 Un-Alias Stations Alias Type Append Dilution to Parameter Name Run Custom Queries

Number of Decimals Exact Value Auto
Unit Conversion Yes No Ask Max # Decimals Unit Conversion Date Options Date Date & Time

Regulatory Limits Display Limits? Yes No Ask Field Data Options Columns Rows
Selected Limit Standard Report Group Offset Type Callout1

Calculated Parameters Calculate Parameters

Record: 1 of 2 No Filter Search

<< Back Close



Report examples

The image displays a collection of 12 screenshots from various geotechnical engineering reports, arranged in a 3x4 grid. Each screenshot shows a different type of data visualization or table:

- Top Row:**
 - 1. A large data table with multiple columns and rows, likely representing test results or material properties.
 - 2. A table titled "Soil Parameters" with columns for parameter names and numerical values.
 - 3. A table titled "Geotechnical Report" with a list of data points and associated parameters.
 - 4. A grid of nine small line graphs, each showing a different data series over time or depth.
- Middle Row:**
 - 1. A large data table with multiple columns and rows, similar to the first screenshot.
 - 2. A line graph showing a data series with a peak, accompanied by a small table of data points.
 - 3. A table titled "Water Report (Ground Water Analysis)" with columns for various water quality parameters.
 - 4. A table with multiple columns and rows, possibly representing a summary of test results.
- Bottom Row:**
 - 1. A line graph showing a data series with a peak, accompanied by a small table of data points.
 - 2. A table titled "Soil Test Results" with columns for test names, values, and units.
 - 3. A table titled "Soil Test Results" with columns for test names, values, and units.
 - 4. A table titled "Soil Test Results" with columns for test names, values, and units.



Sites 1 # Samples 5
Stations 2 # Analyses 5

Go to a Crosstab Format

Crosstab format name Stations Across - Parameters Down

Crosstab Data Grouping / Formatting Instructions

Column Fields

Grid for Column Fields

Enviro Data Column	Display Column Name	Order
StationName	Station Name	1
SampleDate_D	Sample Date	2
*		0

Record: 1 of 2 No Filter Search

Value Fields

Enviro Data Column	Display Column Name	Order
ValueAndFlag	Result	0
*		0

Record: 1 of 1 No Filter Search

Row Fields

Enviro Data Column	Display Column Name	Order	Form
LongName	Parameter	1	
ReportingUnits	Units	2	
*		0	

Record: 1 of 2 No Filter Search

Worksheet Fields

Enable grouping data by worksheet

Enviro Data Column	Order
*	0

Record: 1 of 1 No Filter Search

Report Title Crosstab Report

Delete Edit Available Clone Refresh Selected Show SQL

Progress Start: End: Finish Exit

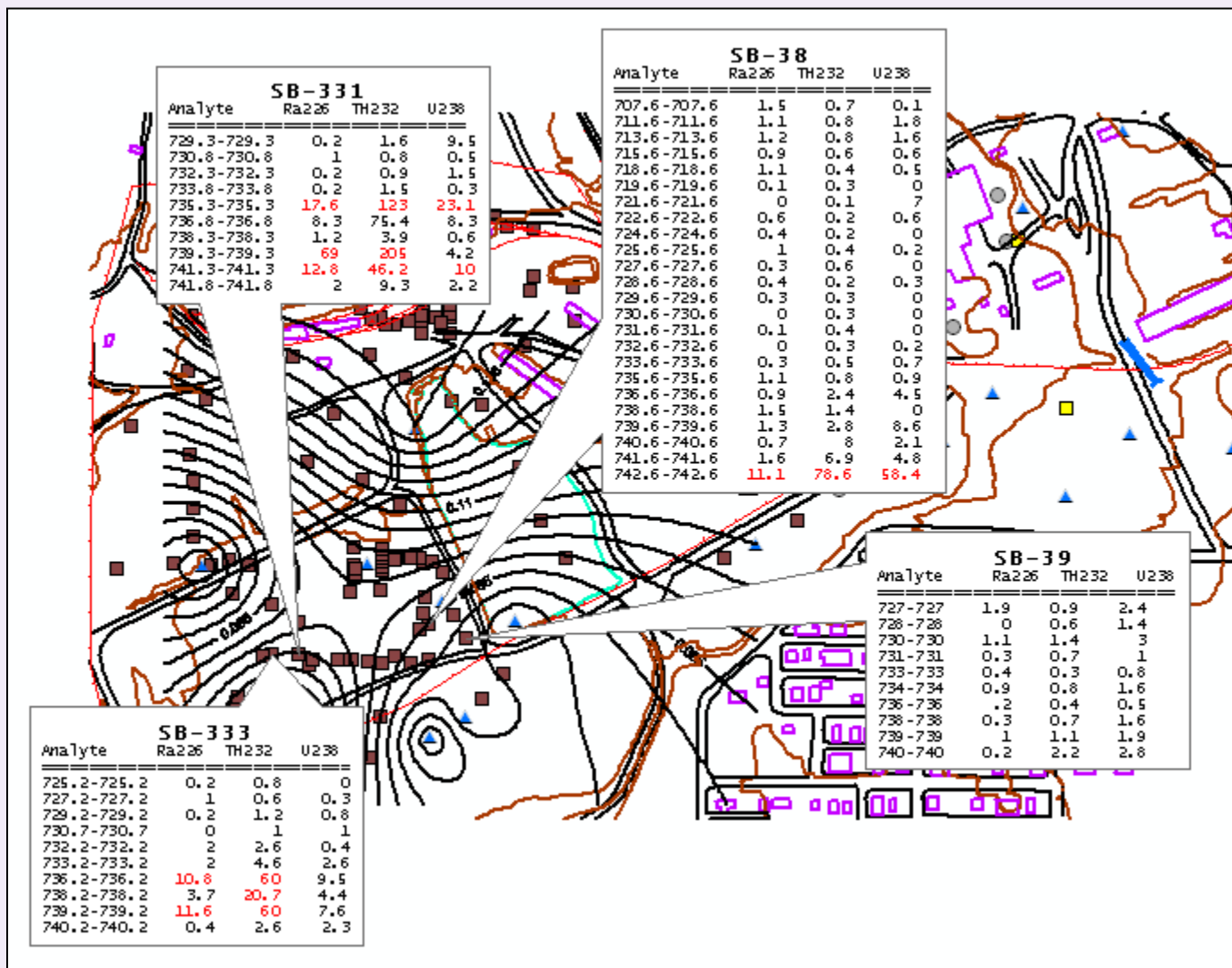
Record: 1 of 6 No Filter Search



1	Crosstab Report														
2	Station Name	Reporting Units	Federal MCL	Primary	Safe Drinking Water Standards	State Drinking Water Levels	MW-1	MW-1	MW-1	MW-1	Summary Statistics				
3	Sample Date						2/8/1984	5/10/1984	9/14/1984	11/13/1984	Results	Non-Detects	Minimum	Maximum	Mean**
4	QC Code						0	0	0	0					
5	Field Param														
6	Field pH	s.u.				7.1-8.4	7.70	7.10	7.10	7.20	4	0	7.1	7.7	7.2
7	Inorganics														
8	Bicarbonate	mg/l					520	550	470	560	4	0	470	560	525
9	Chloride	mg/l					250	260	230	190	4	0	190	260	232.5
10	Fluoride	mg/l					<1.00	<1.00	<1.00	<1.00	4	4	<1	<1	<1
11	Nitrate	mg/l		2			<1.00	2.00	2.00	<1.00	4	2	<1	2	1.2
12	Sulfate	mg/l	725	800	350	1000	1040	900	880	800	4	0	800	1040	905
13	Metals														
14	Arsenic (As)	mg/l	0.025	0.1	0.002	0.03	<0.11	<0.11	<0.11	<0.06	4	4	<0.06	<0.11	<0.11
15	Calcium	mg/l					180	170	203	180	4	0	170	203	183.2
16	Iron (Ferrous)	mg/l		0.1			0.2	3.2	3.7	4.8	4	0	0.2	4.8	2.9
17	Lead (Pb)	mg/l	0.001	0.004	0.005	0.0025	<0.068	<0.068	0.14	<0.08	4	3	<0.068	0.14	0.06
18	Magnesium	mg/l					94	100	107	100	4	0	94	107	100.2
19	Manganese	mg/l	0.0105	0.015	0.02	0.00225	0.077	0.066	0.076	0.086	4	0	0.066	0.086	0.07
20	Molybdenum	mg/l					0.02	<0.018	0.034	0.008	4	1	<0.018	0.034	0.01
21	Potassium	mg/l					5.20	6.20	5.61	20	4	0	5.2	20	9.2
22	Selenium	mg/l					<0.10	<0.10	<0.10	<0.08	4	4	<0.08	<0.1	<0.1
23	Sodium	mg/l					390	430	390	460	4	0	390	460	417.5
24	UTotal - sol	mg/l					0.003	0.01	0.003	0.003	4	0	0.003	0.01	0.004
25	Other														
26	Total Dissolved Solids	mg/l					2220	2230	2220	2200	4	0	2200	2230	2217.5
27	Radiologic														
28	Gross Alpha	pCi/l	1				<10.00	<10.00	<10.00	<10.00	4	4	<10	<10	<10
29	Ra-226 - soluble	mg/l			0.4375		0.32		0.035	0.0525	3	0	0.035	0.32375	0.1
30	Ra-228 - soluble	mg/l										0	0.27125	0.595	0.3
31	Th-230 - soluble	mg/l										0	0.025375	0.35175	0.1

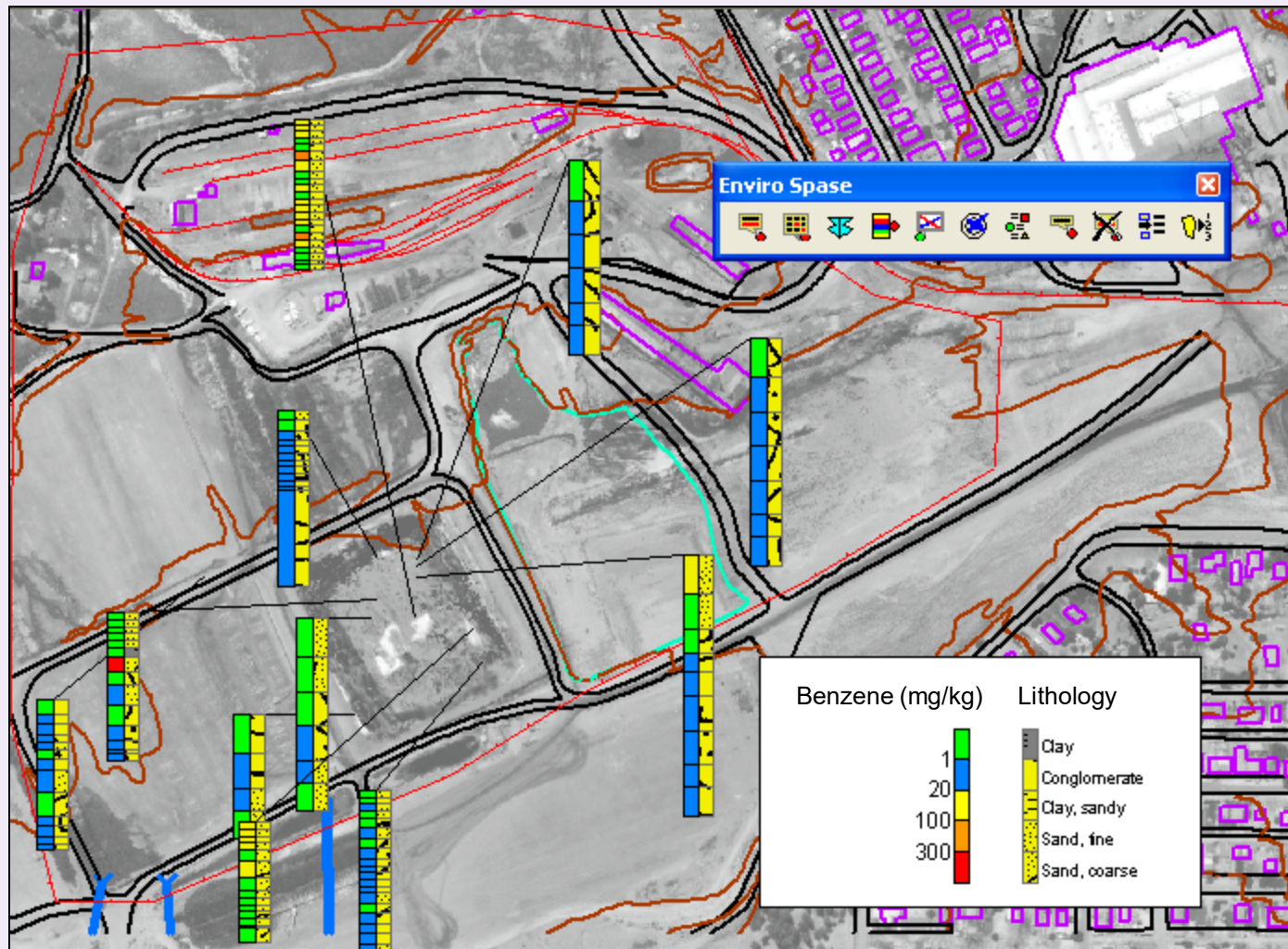
Crosstab Wizard output

** 1/2 RL used to calculate the mean wherer non-detect data occurred.



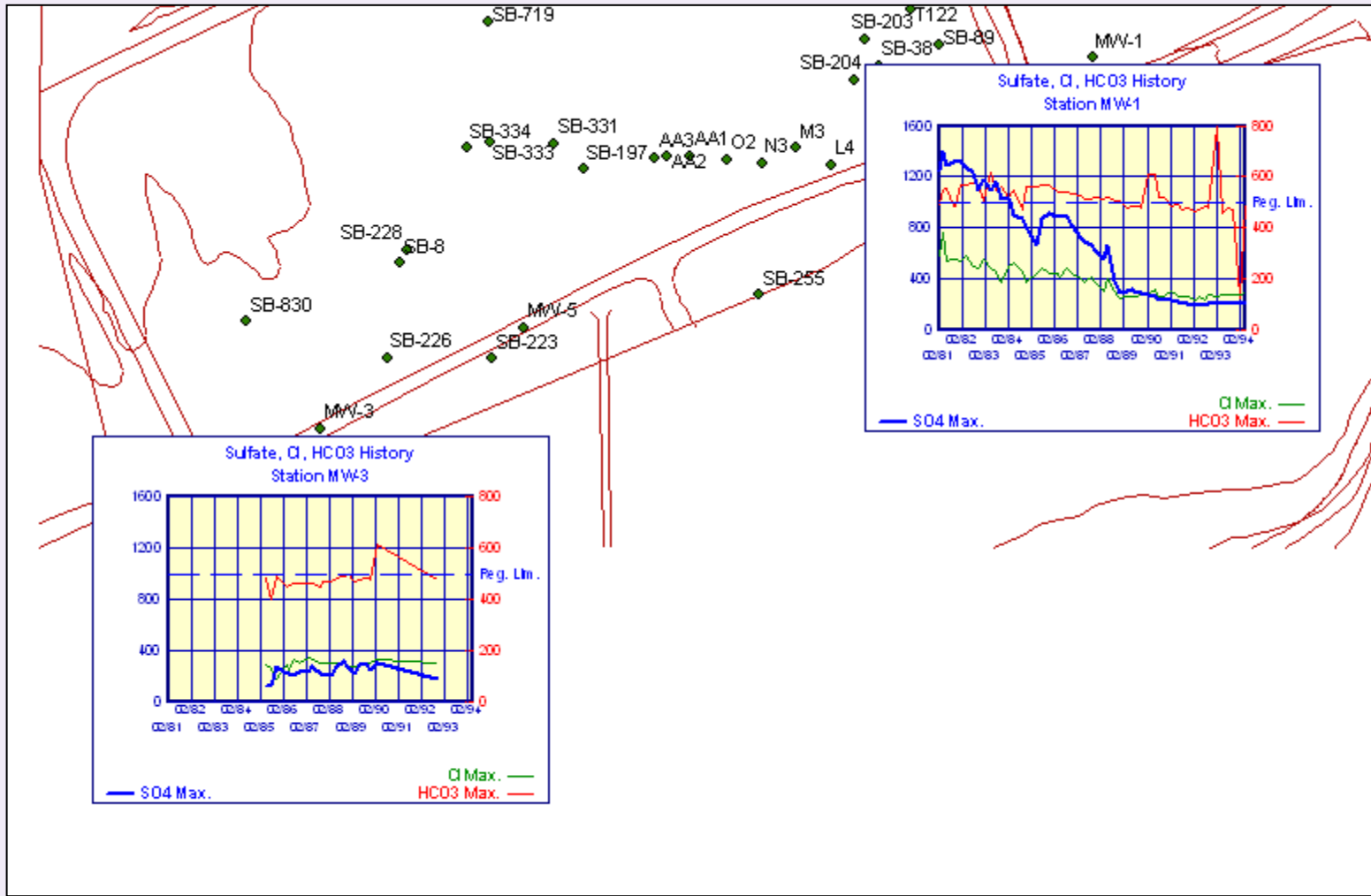
Soil borings with values from the database

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Time sequence graphs on the map

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Benefits of better data management

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Decrease overhead - One industrial company was able to save \$12,000 per year on just one project by moving the data management tasks to a much less expensive clerical person.

Lower operating cost - Another used data management to get their regulator to approve less-frequent sampling intervals for about two of their wells per year, resulting in a savings of \$9,000 each year, cumulative from year to year.

Increase efficiency – For one organization, the time to process an electronic deliverable decreased from an average of 30 minutes to 5 minutes, resulting in an annual savings of \$5,000 per year on each project.

An Indian tribe needed to make nine hundred graphs/year for their EPA PM. With Excel, it took 3 months. With a database with integrated graphing, it took 10 minutes.

Increase revenue - A consulting company client was able to use their Enviro Data software and expertise to land a \$300,000 data management task from one of their clients.

- **Environmental investigation and remediation projects at DOE facilities are inherently complex**
- **Implementing a centralized data management system makes sense for most environmental projects**
- **Integrating validation with data management can greatly reduce cost and improve quality**
- **Is it time to retire your spreadsheet?**





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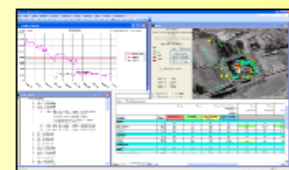
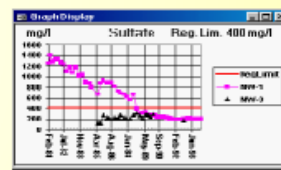
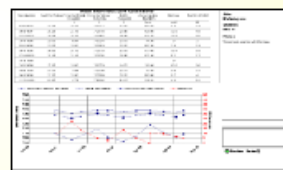
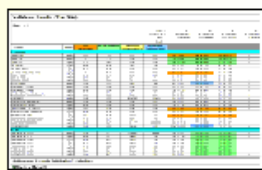
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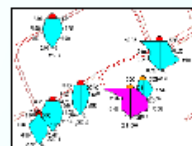
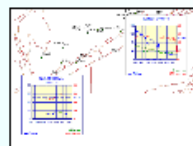
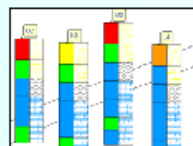
Enviro Data

Relational Management of
Site Environmental Data



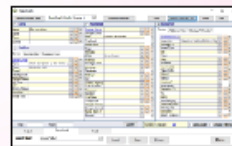
Enviro Spāse

Display and Analysis of
Site Environmental Data



Enviro Cloud

Enviro Software
As a Service



Enviro Portal

Show Your Data
in a Browser





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Data Management and Validation Workflow

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Las Vegas, NV

December 6 – 8, 2022

