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Data Management for the New and Expected Baseline Sampling Rules



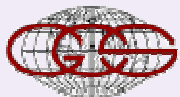
20th IPEC Conference

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San Antonio, TX
November 14, 2013

Introduction

- ❶ **Petroleum project challenges**
- ❷ **Petroleum data challenges**
- ❸ **Types of petroleum environmental data**
- ❹ **Baseline sampling**
- ❺ **Example state sampling rules**
- ❻ **Colorado Rules 609 and 318A**
- ❼ **Future direction and discussion**



Petroleum Project Challenges

Petroleum environmental projects from upstream to downstream have different needs:

- Baseline samples should be taken prior to and after drilling**
- Accidental spills during drilling may require sampling and analysis**
- Hydraulic fracturing is now under great scrutiny from a number of angles: water supply, fluid composition, and disposal or re-use of frac fluids**
- Unconventional resources such as coalbed and shale gases often involve the production of a large amount of water, which must be managed, and often discharge monitoring reports must be provided to regulators**
- Transportation activities, such as by pipeline and truck, can result in spills with environmental impact**
- Refining has its own set of environmental issues, such as monitoring of discharges and nearby groundwater and surface water**



Petroleum Data Challenges

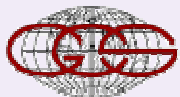
Petroleum environmental data provides special challenges:

- ① Handling on non-detected results
- ① Multiple dilutions to maintain a linear instrument response
- ① Comparison to multiple, and often complex, regulatory limits and target levels
- ① Special handling of non-aqueous phase liquid data
- ① Potentially large amounts of data
- ① Inconsistent reporting of hydrocarbon ranges
- ① Often complex site geology



Baseline Sampling

- Program requirement Types
 - Voluntary - Example: COGA
 - Mandatory - Examples: COGCC, Ohio
- Timing
 - Pre-drilling
 - Post-drilling
- Reporting requirements
 - Agency
 - Operator
 - Landowner



Example State Sampling Rules

State	Agency	Summary of Rules	Reference
Alabama	State Oil and Gas Board of Al	Sampling apparently not required ¹	gsa.state.al.us/documents/misc_ogb/goldbook.pdf
Alaska	Alaska Oil and Gas Conservation Commission	Sampling apparently not required	www.legis.state.ak.us/cgi-bin/folioisa.dll/stattx07/query=%5BJUMP:AS3105030%5D/doc/%7B@1%7D?firsthit
Arkansas	Arkansas Oil and Gas Comm.	Sampling apparently not required	aogc.state.ar.us/operator_requirements.htm
California	Division of Oil, Gas and Geothermal Resources	May be required by state supervisor	ftp://ftp.consrv.ca.gov/pub/oil/laws/PRC01.pdf
Colorado	Colorado Oil and Gas Conservation Commission	Baseline sampling before and after drilling ²	cogcc.state.co.us/RR_HF2012/Groundwater/FinalRules/FinalRule609-01092013.pdf
Kansas	Kansas Geological Survey	Baseline sampling voluntary	www.kcc.state.ks.us/conservation/kgs_baseline_groundwater_quality.pdf
Louisiana	Louisiana Dept. of Nat. Res.	Sampling apparently not required	dnr.louisiana.gov/assets/OC/43XIX_June2010.pdf
Ohio	Ohio Dept. of Natural Resources	Baseline sampling before drilling ²	oilandgas.ohiodnr.gov/laws-regulations/senate-bill-315
Oklahoma	Oklahoma Corp. Commission	Baseline sampling recommended	oklahomawatersurvey.org/?p=214
Pennsylvania	Pennsylvania Dept. of Environmental Protection	No sampling requirement, but operators presumed responsible for pollution	stateimpact.npr.org/pennsylvania/tag/impact-fee/
New Mexico	New Mexico Energy, Minerals and Natural Resources Dept.	Sampling apparently not required	www.emnrd.state.nm.us/OCD/documents/SearchablePDFofOCDDTitle19Chapter15created3-2-2012.pdf
New York	New York State Dept. of Environmental Conservation	Baseline sampling before drilling proposed, voluntary sampling in southern New York	www.dec.ny.gov/energy/47554.html
North Dakota	North Dakota Industrial Comm.	Sampling not required	www.dmr.nd.gov/oilgas/rules/rulebook.pdf
Texas	Railroad Commission of Texas	Sampling apparently not required, except City of Fort Worth	info.sos.state.tx.us/pls/pub/readtac\$ext.ViewTAC?tac_view=4&ti=16&pt=1&ch=3&rl=Y
Utah	UT Div. of Oil, Gas and Mining	Sampling apparently not required	www.rules.utah.gov/publicat/code/r649/r649-003.htm
West Virginia	West Virginia Department of Environmental Protection	No sampling requirement, but operators presumed responsible for pollution	www.legis.state.wv.us/WVcode/ChapterEntire.cfm?chap=22&art=6A&section=18
Wyoming	Wyoming Oil and Gas Conservation Commission	Pre-drilling sampling recommended ¹	wogcc.state.wy.us/

¹ Working with Ground Water Protection Council ² Worked with GWPC



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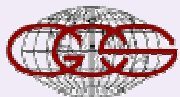
COGCC Rule 609

- ① Rule 609, and modifications to Rule 318A, were published by the Colorado Oil and Gas Conservation Commission (COGCC) in February, 2013, for permits issued after May 1, 2013
- ② These rules make Colorado the first state in the country to require pre- and post-drilling sampling of water sources near new oil and gas wells
- ③ Consultants, labs, and software vendors have cooperated with COGCC to update the transfer of data to COGCC's database using COGCC's new XML or an Excel format



Rule 609 Sample Requirements

- Sampling required for new oil and gas wells, multi-site wells, and dedicated injection wells
- Installing of monitoring wells is not required
- Samples must be collected from up to four water sources within a half mile of proposed well location
- One pre-drill sample required with 12 months prior to setting conductor pipe
- Two post-drill samples required, one 6-12 months and one 5-6 years after drilling
- Data must be made publicly available on the COGCC website
- Rule 318A (Wattenberg Area) has slightly different requirements (one sample per quarter, one post-drill)



Baseline Sampling and Reporting Steps

- ① Determine locations
- ② Obtain landowner permission
- ③ Take samples and field measurements
- ④ Enter locations in COGCC website
- ⑤ Obtain the Facility ID
- ⑥ Import field measurements
- ⑦ Obtain and import lab data
- ⑧ Review data
- ⑨ Export to COGCC format, with Facility ID
- ⑩ Upload to the COGCC website
- ⑪ Review submission online

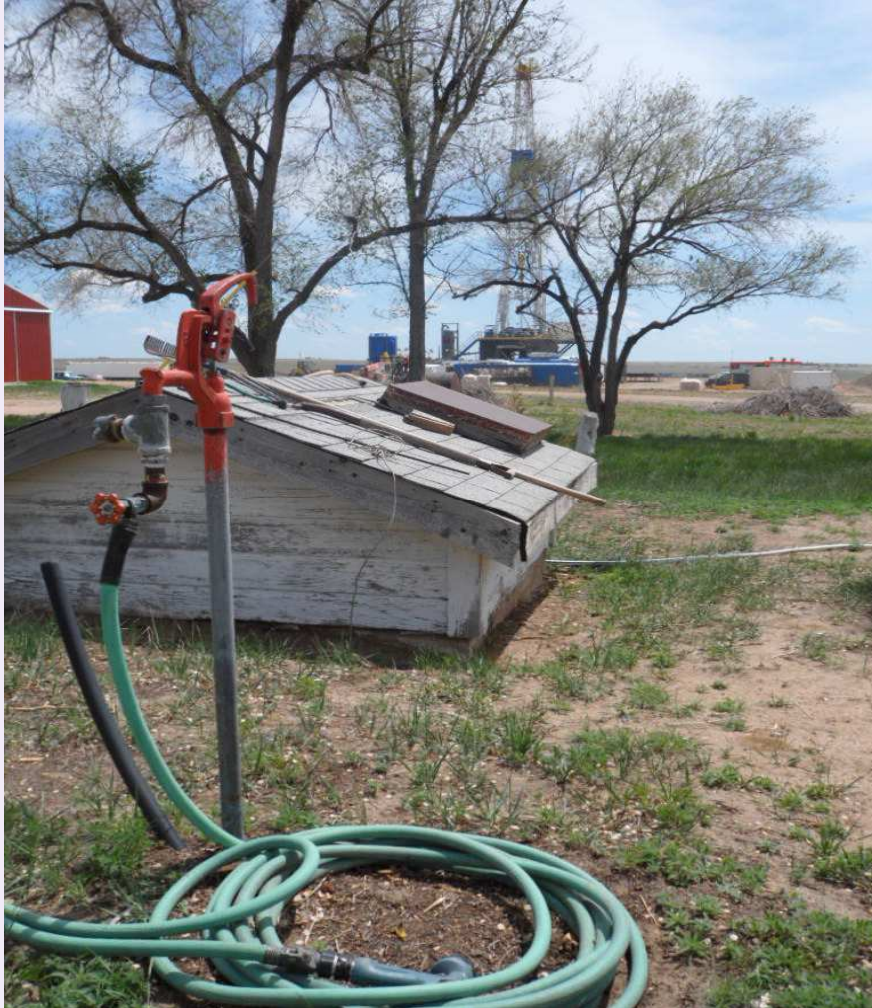


COGCC Facility Information

- ④ The first step on the state website is to upload the location
- ④ The location is then given a Facility ID
- ④ This should be recorded and added to the lab and field data before upload
- ④ This can also be used on the COGCC website to retrieve and view the data

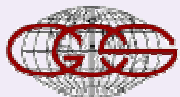


Typical Sample Location



- **Typical compliance costs:**
 - **Sampling: \$2,500**
 - **Lab analysis: \$500 - 600**
 - **Isotopic analysis, if needed: \$300 - 400 more**

Photo courtesy of
Ben Baugh
Olsson Associates



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Container Labels

Rad Industries	
Environmental Project Number	None
Sample No: MW-1_2009-08-01_0-0	
Lab: XYZ Labs	Location: MW-1
Sample Date: 08/01/2009	Time: 00:00
Analysis 8260A	
Preservation: Cool to 4°	
Cooler Temp 4	Filtered: Unknown
Sampler	Container 40 ml VOA Vials

Rad Industries	
Environmental Project Number	None
Sample No: MW-1_2009-08-01_0-0	
Lab: XYZ Labs	Location: MW-1
Sample Date: 08/01/2009	Time: 00:00
Analysis 8260A	
Preservation:	
Cooler Temp 4	Filtered: Unknown
Sampler	Container

Rad Industries	
Environmental Project Number	None
Sample No: MW-1_2009-08-01_0-0	
Lab: XYZ Labs	Location: MW-1
Sample Date: 08/01/2009	Time: 00:00
Analysis 8270	
Preservation: Cool to 4°	
Cooler Temp 4	Filtered: Unknown
Sampler	Container 40 ml VOA Vials

Rad Industries	
Environmental Project Number	None
Sample No: MW-1_2009-08-01_0-0	
Lab: XYZ Labs	Location: MW-1
Sample Date: 08/01/2009	Time: 00:00
Analysis Method:As	
Preservation: Cool to 4°	
Cooler Temp 4	Filtered: Unknown
Sampler	Container 1 Liter Clear Glass

Rad Industries	
Environmental Project Number	None
Sample No: MW-1_2009-08-01_0-0	
Lab: XYZ Labs	Location: MW-1
Sample Date: 08/01/2009	Time: 00:00
Analysis Method:Cd	
Preservation: Cool to 4°	
Cooler Temp 4	Filtered: Unknown
Sampler	Container 1 Liter Clear Glass

Rad Industries	
Environmental Project Number	None
Sample No: MW-1_2009-08-01_0-0	
Lab: XYZ Labs	Location: MW-1
Sample Date: 08/01/2009	Time: 00:00
Analysis TO-13	
Preservation: Cool to 4°	
Cooler Temp 4	Filtered: Unknown
Sampler	Container 1 Liter Amber Glass



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Gathering Field Data

Microsoft Excel - FieldFile.xls

File Edit View Insert Format Tools Data Window Help WebEx Adobe PDF Type a question for help

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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Field ID	Site	Station	Date	Top	Bottom	QC Type	Parameter	Value	Units	Super.	COC Num.	Sampler	Descrip.	Result
2	86Q1MW10	Refining Inc.	MW-1				Original	Field pH		s.u.	0	08-33507			
3	86Q1MW10	Refining Inc.	MW-1				Original	Field pH		s.u.	1	08-33507			
4	86Q1MW10	Refining Inc.	MW-1				Original	Field pH		s.u.	2	08-33507			
5	86Q1MW10	Refining Inc.	MW-1				Original	Field Cond.		umhos/cm	0	08-33507			



Station	Date	Top	Bottom	QC Type	Parameter	Value	Units	Super.	COC Num.	Sampler	Descrip.	Result
MW-1	4/22	-	-	Original	Field pH	8.1	s.u.	0	08-33507	DWR	CLEAR	
MW-1	4/22	-	-	Original	Field pH	7.9	s.u.	1	08-33507	DWR	CLEAR	
MW-1	4/22	-	-	Original	Field pH	7.9	s.u.	2	08-33507	DWR	CLEAR	
MW-1	4/22	-	-	Original	Field Cond.	43	umhos/cm	0	08-33507	DWR	CLEAR	
MW-1	4/22	-	-	Original	Temp.	17	Deg C	0	08-33507	DWR	CLEAR	
MW-1	4/22	-	-	Duplicate	Field pH	7.8	s.u.	0	08-33507	DWR	CLEAR	
MW-1	4/22	-	-	Duplicate	Field Cond.	44	umhos/cm	0	08-33507	DWR	CLEAR	
MW-1	4/22	-	-	Duplicate	Temp.	17	Deg C	0	08-33507	DWR	CLEAR	
MW-3	4/22	-	-	Original	Field pH		s.u.	0	08-33507	DWR		DRY
MW-3				Original	Field Cond.		umhos/cm	0	08-33507			
MW-3				Original	Temp.		Deg C	0	08-33507			



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Required Analyses

Required Analyses for Rules 318A and 609 pre-drilling samples
pH
Specific Conductance
Total Dissolved Solids*
Dissolved Gases (methane, ethane, propane)*
Total Alkalinity as CaCO ₃ *
Bicarbonate Alkalinity as CaCO ₃ *
Carbonate Alkalinity as CaCO ₃ *
Major Anions (bromide*, chloride*, fluoride*, sulfate*, nitrate, nitrite as N, phosphorus)
Major Cations (calcium*, iron, magnesium*, manganese, potassium*, sodium*)
Other Elements (barium, boron, selenium, strontium)
Bacteria (iron related, sulfate reducing, slime, coliform)
Total Petroleum Hydrocarbons*
BTEX (benzene, toluene, ethylbenzene, xylenes)*
Field Observations (odor, water color, sediment, bubbles, effervescence)
Gas Composition (if methane exceeds 1mg/L)
Stable Isotopes of methane and water (if methane exceeds 1 mg/L)
Notes:
1. All of the above analyses must be performed on pre-drilling samples. Analyses marked with an asterisk (*) are also required for post-drilling samples.
2. If free gas or a dissolved methane concentration greater than 1.0 milligram per liter (mg/l) is detected in a water sample, gas compositional analysis and stable isotope analysis of the methane (carbon and hydrogen – 12C, 13C, 1H and 2H) must also be performed to determine gas type.
3. Field observations such as odor, water color, sediment, bubbles, and effervescence must also be documented.



Example Laboratory Deliverable

D40014Edited.xls [Compatibility Mode] - Microsoft Excel

File Home Insert Page Layout Formulas Data Review View Developer Team

BR27

	A	B	C	E	J	L	M	Q	R	AM	AP	AQ
	Site Name	Station Name	Sample Date	Sample Matrix	Field SampleID	Cooler ID	Samp ler	COC Number	Delivery Group	Parameter Name	Value	ReportingU nits
1	Moffat	Smith 1	10/18/2012	Water	Smith1-10-12	C334	LH	Smith1-10-12-A	D40014	Sulfate	143	mg/l
2	Moffat	Smith 1	10/18/2012	Water	Smith1-10-13	C334	LH	Smith1-10-12-A	D40014	Alkalinity (as CaCO3)	387	mg/l
3	Moffat	Smith 1	10/18/2012	Water	Smith1-10-14	C334	LH	Smith1-10-12-A	D40014	Alkalinity, Carbonate	21.3	mg/l
4	Moffat	Smith 1	10/18/2012	Water	Smith1-10-15	C334	LH	Smith1-10-12-A	D40014	Phosphorus, Total	0.11	mg/l
5	Moffat	Smith 1	10/18/2012	Water	Smith1-10-16	C334	LH	Smith1-10-12-A	D40014	Alkalinity, Bicarbonate as CaCO3	366	mg/l
6	Moffat	Smith 1	10/18/2012	Water	Smith1-10-17	C334	LH	Smith1-10-12-A	D40014	Total dissolved solids	714	mg/l
7	Moffat	Smith 1	10/18/2012	Water	Smith1-10-18	C334	LH	Smith1-10-12-A	D40014	Laboratory conductivity	942	umhos/cm
8	Moffat	Smith 1	10/18/2012	Water	Smith1-10-19	C334	LH	Smith1-10-12-A	D40014	Nitrate	0.02	mg/l
9	Moffat	Smith 1	10/18/2012	Water	Smith1-10-20	C334	LH	Smith1-10-12-A	D40014	Nitrite	0.008	mg/l
10	Moffat	Smith 1	10/18/2012	Water	Smith1-10-21	C334	LH	Smith1-10-12-A	D40014	Chloride	42.3	mg/l
11	Moffat	Smith 1	10/18/2012	Water	Smith1-10-22	C334	LH	Smith1-10-12-A	D40014	Bromide	0.52	mg/l
12	Moffat	Smith 1	10/18/2012	Water	Smith1-10-23	C334	LH	Smith1-10-12-A	D40014	Ethyl benzene	2	ug/l
13	Moffat	Smith 1	10/18/2012	Water	Smith1-10-24	C334	LH	Smith1-10-12-A	D40014	Toluene	2	ug/l
14	Moffat	Smith 1	10/18/2012	Water	Smith1-10-25	C334	LH	Smith1-10-12-A	D40014	Xylenes (Total)	3	ug/l
15	Moffat	Smith 1	10/18/2012	Water	Smith1-10-26	C334	LH	Smith1-10-12-A	D40014	1,2-Dichloroethane-D4	101	%
16	Moffat	Smith 1	10/18/2012	Water	Smith1-10-27	C334	LH	Smith1-10-12-A	D40014	Toluene-D8	97	%
17	Moffat	Smith 1	10/18/2012	Water	Smith1-10-28	C334	LH	Smith1-10-12-A	D40014	Bromofluorobenzene	93	%
18	Moffat	Smith 1	10/18/2012	Water	Smith1-10-29	C334	LH	Smith1-10-12-A	D40014	Benzene	1	ug/l
19	Moffat	Smith 1	10/18/2012	Water	Smith1-10-30	C334	LH	Smith1-10-12-A	D40014	Laboratory pH	8.64	su
20	Moffat	Smith 1	10/18/2012	Water	Smith1-10-31	C334	LH	Smith1-10-12-A	D40014	Methane	0.0621	mg/l
21	Moffat	Smith 1	10/18/2012	Water	Smith1-10-32	C334	LH	Smith1-10-12-A	D40014	Ethane	0.0016	mg/l
22	Moffat	Smith 1	10/18/2012	Water	Smith1-10-33	C334	LH	Smith1-10-12-A	D40014	Propane	0.018	mg/l
23	Moffat	Smith 1	10/18/2012	Water	Smith1-10-34	C334	LH	Smith1-10-12-A	D40014	Selenium	0.8	ug/l
24	Moffat	Smith 1	10/18/2012	Water	Smith1-10-35	C334	LH	Smith1-10-12-A	D40014	Iron	10	ug/l
25	Moffat	Smith 1	10/18/2012	Water	Smith1-10-36	C334	LH	Smith1-10-12-A	D40014	Magnesium	927	ug/l
26	Moffat	Smith 1	10/18/2012	Water	Smith1-10-37	C334	LH	Smith1-10-12-A	D40014	Manganese	5.1	ug/l
27	Moffat	Smith 1	10/18/2012	Water	Smith1-10-38	C334	LH	Smith1-10-12-A	D40014	Potassium	1600	ug/l
28	Moffat	Smith 1	10/18/2012	Water	Smith1-10-39	C334	LH	Smith1-10-12-A	D40014	Sodium	260000	ua/l

envdata2010_export

Ready 100%



Importing Data

Import Wizard - Data Checking Options

Use this screen to tell Enviro Data how to help you check your data.

General	Use Advanced Data Checker <input type="checkbox"/>
	Default Values <input type="button" value="Set Defaults"/> Define values for required fields that are not populated in the DTS file.
	Duplicates & Superseded <input checked="" type="radio"/> Auto <input type="radio"/> Field ID <input type="radio"/> Alt ID <input type="radio"/> EDD <input type="radio"/> Lab ID
	Content Filtering <input type="checkbox"/> Filter Specific Data Content <input type="button" value="Configure"/> <input type="checkbox"/> Delete Manually
	Review File <input type="checkbox"/> Display Before Import
Stations	<input type="checkbox"/> Match Stations by Regulatory Number <input type="checkbox"/> Get Sample Event ID, Station and Sample Numbers from Field Sample ID
Samples	<input type="checkbox"/> Set All Depths to Zero <input checked="" type="checkbox"/> Allow Null Dates
Parameters	Parameter Aliases <input type="checkbox"/> Use Site-Specific Values <input checked="" type="checkbox"/> Use Global Values <input checked="" type="checkbox"/> Use CAS Numbers <input type="checkbox"/> Use Other Parameter ID
	Calculated Parameters <input type="checkbox"/> Calculate <i>Value Options:</i> <input checked="" type="radio"/> Supersede Original Value <input type="radio"/> Replace Original Value
Analyses	Analytic Methods <input type="checkbox"/> Verify Analytic Methods <input type="checkbox"/> Parameter Methods Help
	Reporting Units
	# of Decimals Values

Import Wizard - Match Station Names

This screen will help you match station names in the import file with those in the database.

Site in Import File	Station in Import File	Change To
Refining Inc.	MW14	MW-100
		BN04 Refining Inc.
		BO07 Refining Inc.
		BQ18 Refining Inc.
		CF03 Refining Inc.
		CG12 Refining Inc.
		CL02 Refining Inc.
		CM08 Refining Inc.
		CM09 Refining Inc.
		DL14 Refining Inc.
		LabQCStation Refining Inc.
		MW-100 Refining Inc.
		MW-101 Refining Inc.
		MW-102 Refining Inc.
		MW-14 Refining Inc.
		MW-15 Refining Inc.
		MW-16 Refining Inc.

Record: 14 | 1 of 1 | No Filter | Search



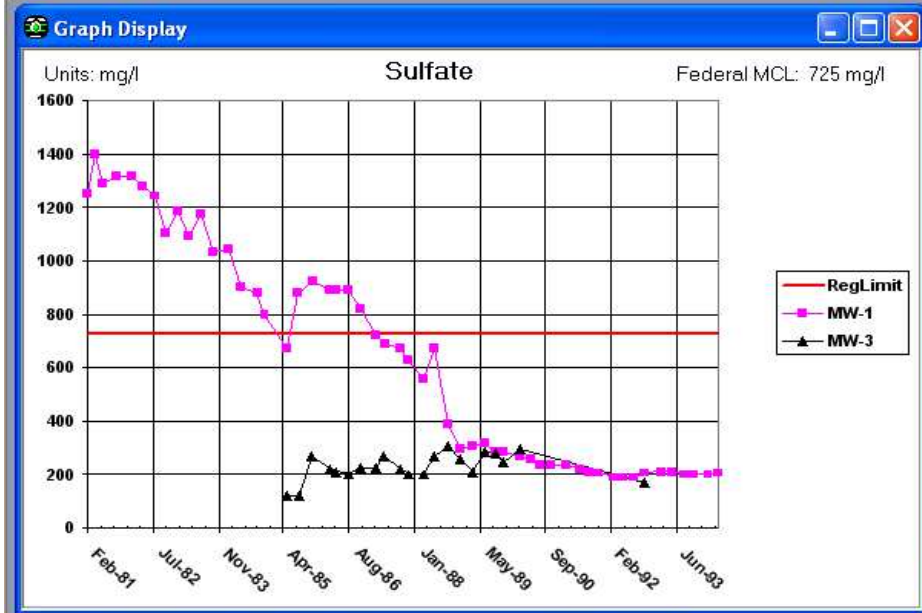
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Excel Table for Review

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					
4	QC Code						0	0	0	0	Results	Non-Detects	Minimum	Maximum	Mean**
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					0.59	0.36	0.33	0.27	4	0	0.27125	0.595	0.3
31	Th-230 - soluble	mg/l					0.025375	0.028875	0.041125	0.35	4	0	0.025375	0.35175	0.1
32															
33	** 1/2 RL used to calculate the mean wherer non-detect data occurred.														





- ### 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

Selection and Output

Select Data

Sites

Name		▼	▼	—
State		▼	▼	—
Type		▼	▼	—
Owner		▼	▼	—

Stations

General | Location Info. | Regulatory Info.

Station Group

Name	Smith 1	▼	▼	—
Type		▼	▼	—
Type2		▼	▼	—
Geologic Unit		▼	▼	—
Station Status		▼	▼	—
QC Type		▼	▼	—
PRP		▼	▼	—
Enviro. Status		▼	▼	—
Land Use		▼	▼	—
Water Use		▼	▼	—

Samples

<u>Sample Group</u>		▼	▼	—
Sample Event		▼	▼	—
Date	10/18/2012			—
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				—

Analyses

General | Additional Data | * Display All Results *

<u>Parameter Group</u>		▼	▼	—
Parameter		▼	▼	—
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	D40014			—
Extracted?		▼	▼	—
Report. Agency		▼	▼	—

Number of Analyses:

 AutoUpdate
 Dynamic Filtering

Output

Save/Load

Modify

Other Options



Exporting COGCC Format

The image displays two software windows side-by-side. The left window is Microsoft WordPad, showing an XML document with the following content:

```
<?xml version="1.0" encoding="utf-8"?>
<COEnvEDD xsi:schemaLocation="http://www.rbdmsonline.org/xml/COEnvEDD.xsd COEnvEDD.xsd"
xmlns="http://www.rbdmsonline.org/xml/COEnvEDD.xsd"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <Organization>
    <OrganizationDescription>
    <OrganizationIdentifier>0</OrganizationIdentifier>
    <OrganizationFormalName>ESC Lab Sciences</OrganizationFormalName>
  </Organization>
  <Project>
    <ProjectIdentifier />
    <ProjectName>L599220</ProjectName>
    <ProjectDescriptionText>Surface Water Samples</ProjectDescriptionText>
  </Project>
  <SamplingActivityDescription>
    <ActivityIdentifier>705381</ActivityIdentifier>
    <ActivityStartDate>2012-10-04T11:15:00</ActivityStartDate>
    <MonitoringLocationIdentifier>L599220-01</MonitoringLocationIdentifier>
    <ActivityTypeCode>MI</ActivityTypeCode>
    <ActivityMediaName>WATER</ActivityMediaName>
    <ProjectIdentifier>COILGASRCO-100312</ProjectIdentifier>
    <DateReceived>2012-10-05T09:00:00</DateReceived>
    <ResultBatchDescription>
    <ResultLabInformation>
      <LabBatchID>WG616544</LabBatchID>
      <AnalysisStartDate xsi:nil="false">2012-10-06T15:06:00</AnalysisStartDate>
    </ResultLabInformation>
    <MethodName>Method</MethodName>
    <PreparationStartDate>2012-10-06T15:06:00</PreparationStartDate>
    <StartDate xsi:nil="true" />
    <EndDate xsi:nil="true" />
    <InitVol>25</InitVol>
    <InitVolUnits>ml</InitVolUnits>
    <FinalVol>25</FinalVol>
    <FinalVolUnits>ml</FinalVolUnits>
    <ResultWeightBasisText>As Received</ResultWeightBasisText>
    <CommentText />
    <FileName />
    <ColumnNumber />
    <ResultDescription>
      <CharacteristicName>10-29-7</CharacteristicName>
      <ResultAnalyticalMethod>
      <MethodDescriptionText>pH</MethodDescriptionText>
    </ResultAnalyticalMethod>
  </SamplingActivityDescription>
```

The right window is Microsoft Excel, displaying a table of COGCC data. The table has the following structure:

Organizational Reporting	Reporting Organization Name	Order Number	Entity	Purpose	Project		
OrgKey	will be a lookup-formerly labeled N	OrderNumber	RequestKey	Purpose	ProjectID		
4491	TestAmerica Inc.	280-19973-1	4491		25087038		
Sample	COGCC Facility	Sample Date and Time	API #	Lab Sample ID	Sample Type	Matrix	Comment
FacilityID	SampleDate	Lookup for Facilit	LabSampleID	SampleType	Matrix	Comment	
708115	9/7/2011 11:13		280-19973-	GW			
Batch	Lab ID	Lab Batch Identifier	Leach Date	Date and Time	Extract Method	Start Date and Time	End Date
LabID	BatchID	LeachDate	ExtractDate	ExtractMeth	StartDate	EndDate	
126	280-86348	9/16/2011	9/16/2011		9/16/2011	9/16/2011	
Result	CAS Number	Analysis Name	Method	Analytical Method	Units	Result Value	Qualifier
				Modifier			
106-93-4	1,2-Dibromoethane	SW846 8260B		ug/L	1.0	<	
75-25-2	Bromoform	SW846 8260B		ug/L	1.0	<	
96-12-8	1,2-Dibromo-3-Chloropropane	SW846 8260B		ug/L	5.0	<	
75-69-4	Trichlorofluoromethane	SW846 8260B		ug/L	2.0	<	
79-01-6	Trichloroethene	SW846 8260B		ug/L	1.0	<	
108-86-1	Bromobenzene	SW846 8260B		ug/L	1.0	<	
78-93-3	2-Butanone (MEK)	SW846 8260B		ug/L	6.0	<	
78-87-5	1,2-Dichloropropane	SW846 8260B		ug/L	1.0	<	
1634-04-4	Methyl tert-butyl ether	SW846 8260B		ug/L	5.0	<	
106-46-7	1,4-Dichlorobenzene	SW846 8260B		ug/L	1.0	<	
630-20-6	1,1,1,2-Tetrachloroethane	SW846 8260B		ug/L	1.0	<	
100-41-4	Ethylbenzene	SW846 8260B		ug/L	1.0	<	
156-60-5	trans-1,2-Dichloroethene	SW846 8260B		ug/L	1.0	<	
87-68-3	Hexachlorobutadiene	SW846 8260B		ug/L	1.0	<	
75-34-3	1,1-Dichloroethane	SW846 8260B		ug/L	1.0	<	
74-83-9	Bromomethane	SW846 8260B		ug/L	2.0	<	
95-50-1	1,2-Dichlorobenzene	SW846 8260B		ug/L	1.0	<	
95-49-8	2-Chlorotoluene	SW846 8260B		ug/L	1.0	<	
96-18-4	1,2,3-Trichloropropane	SW846 8260B		ug/L	2.5	<	
56-23-5	Carbon tetrachloride	SW846 8260B		ug/L	1.0	<	
591-78-6	2-Hexanone	SW846 8260B		ug/L	5.0	<	
1330-20-7	Xylenes, Total	SW846 8260B		ug/L	2.0	<	
100-101-5	1,1,1,2-Tetrachloroethane	SW846 8260B		ug/L	1.0	<	

Data files courtesy of Arthur Koepsell, COGCC

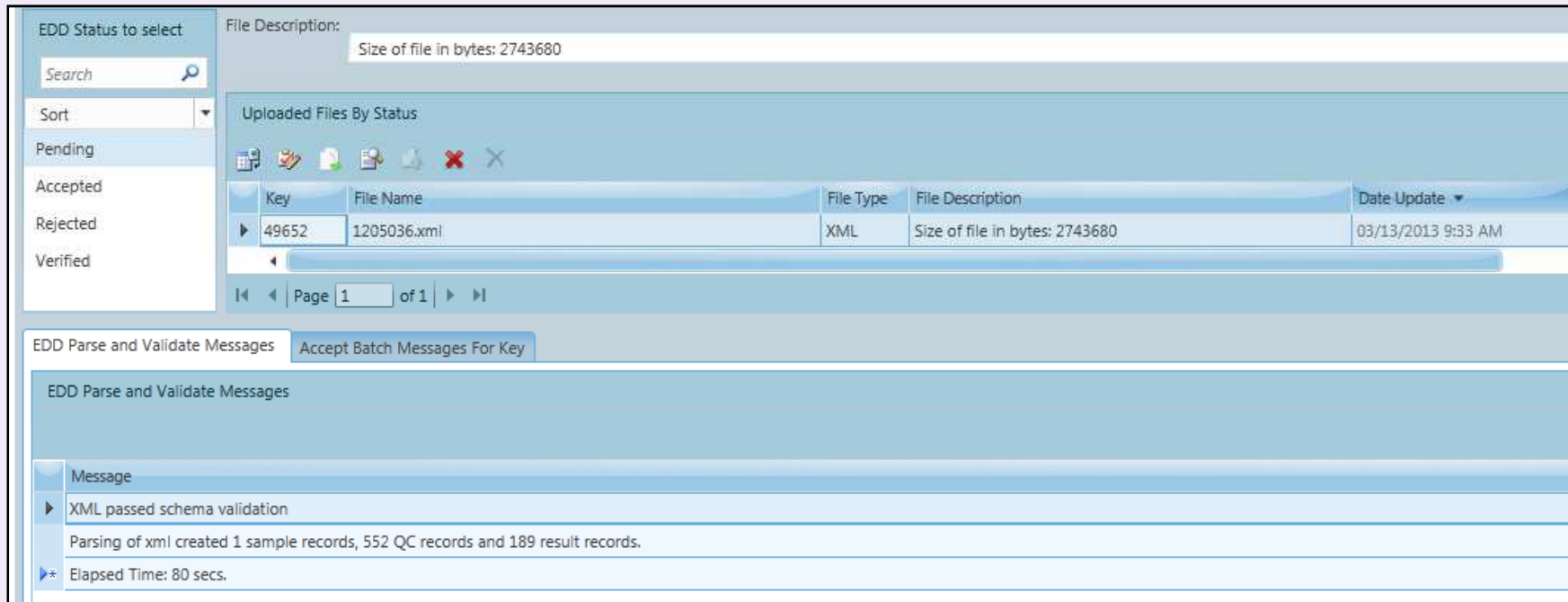


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Uploading to COGCC

 Data is uploaded using COGCC website



The screenshot displays the COGCC website interface. On the left, there is a sidebar with 'EDD Status to select' options: Pending, Accepted, Rejected, and Verified. The main area shows 'File Description: Size of file in bytes: 2743680'. Below this is a table titled 'Uploaded Files By Status' with columns: Key, File Name, File Type, File Description, and Date Update. A single row is visible with Key '49652', File Name '1205036.xml', File Type 'XML', File Description 'Size of file in bytes: 2743680', and Date Update '03/13/2013 9:33 AM'. Below the table is a section for 'EDD Parse and Validate Messages' with a button 'Accept Batch Messages For Key'. The messages list includes: 'XML passed schema validation', 'Parsing of xml created 1 sample records, 552 QC records and 189 result records.', and 'Elapsed Time: 80 secs.'

Image courtesy of Arthur Koepsell, COGCC



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Map from COGCC website

COGCC GISOnline Address Search Zoom Selection Results Intersect Add Point Redline Copy Lat/Long

Layers

- O&G Facilities
 - Wells
 - Pits
 - Active
 - Closed
 - Unknown
 - Permits
 - Pending
 - Pending 2As (Diamond)
 - Well Status
- COGCC Data
 - O&G Locations
 - Directionals
 - COGCC Rules
 - O&G Fields
 - SeismicPermits
- Water/Gas Sampling Data
 - Sites w/Lab Data
 - Sample Sites
- Roads & RRs
- Water Resources
- SecTwpRng
- Wildlife DOW
- State Lands

Select Within

Select areas on the image.

Restrict results to selected layers:

- TempPoints
- Wells
- Pits
- Permits
- Pending Permits
- Pending 2As (Diamond)
- 2A Locations
- Locations
- DIR_PENDING

Refresh

• If you continue to select areas on the image, click "Refresh" to update the layer list.
• To finish and select all features within the highlighted areas, click "Done".
• To start over, click "Clear".

Done Clear

X: 227288, Y: 4446880 (METER) 1 Sites w/Lab Data selected 1: 56871.87 6.03 x 4.34 (mi) Powered by Infrastructure Map Server

Sample site ID: 262331
Analytical data is available.
Double-click to open link
(<http://cogcc.state.co.us/COGIS/EnviroSample.asp?facid=262331>)

2N97W

Hwy 64



Data from COGCC website

Sample(s) All

Sample ID: **457572** Sample Date: **9/11/2003** Matrix: **WATER**

Sample Results for Sample # 457572 [- Minimize](#)

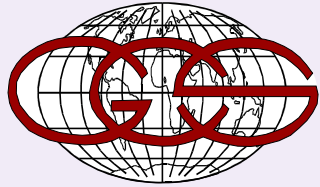
Methodcode	ParamDescription	ResultValue	Units	DetectionLimit	Qualifier
UnSpec	BICARBONATE ALKALINITY as CaCO3	22900	mg/L		
UnSpec	CALCIUM	32	mg/L		
UnSpec	CARBONATE ALKALINITY AS CaCO3	ND	mg/L		U
UnSpec	CHLORIDE	1700	mg/L		
UnSpec	IRON	2.1	mg/L		
UnSpec	MAGNESIUM	29	mg/L		
UnSpec	MANGANESE	ND	mg/L		U
UnSpec	pH	8	SU		
UnSpec	POTASSIUM	85	mg/L		
UnSpec	RESISTIVITY	0.43	ohm/M		
UnSpec	SODIUM	9943	mg/L		
UnSpec	SPECIFIC GRAVITY	1.024	Ratio		
UnSpec	SULFATE	800	mg/L		
UnSpec	TOTAL DISSOLVED SOLIDS	35406	mg/L		



Future Direction and Discussion

- ➊ For COGCC, perhaps a way to download the Facility IDs and Sample IDs
- ➋ More data retrieval options from website
- ➌ Expansion to other states
- ➍ Use by the public
- ➎ Use in litigation
- ➏ Other issues?





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Data Management for the New and Expected Baseline Sampling Rules



20th IPEC Conference

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San Antonio, TX
November 14, 2013