

**DPRA, Inc.**

Environmental Data Management



*Creative People. Smart Solutions.*

# Rocky Mountain Arsenal (RMA)

- Army WWII
  - Chemical weapons development
- Shell
  - Pesticides
- Superfund Site (1980s)
- Record of Decision (1990s)
- United States Fish & Wildlife Services
- Wildlife Refuge

# DPRAs Role

- Provided technical infrastructure and professional services
  - Army
  - Shell
  - Program Management Contractor (Tetra Tech)
  - Unites States Fish & Wildlife Service

# Environmental Data Management

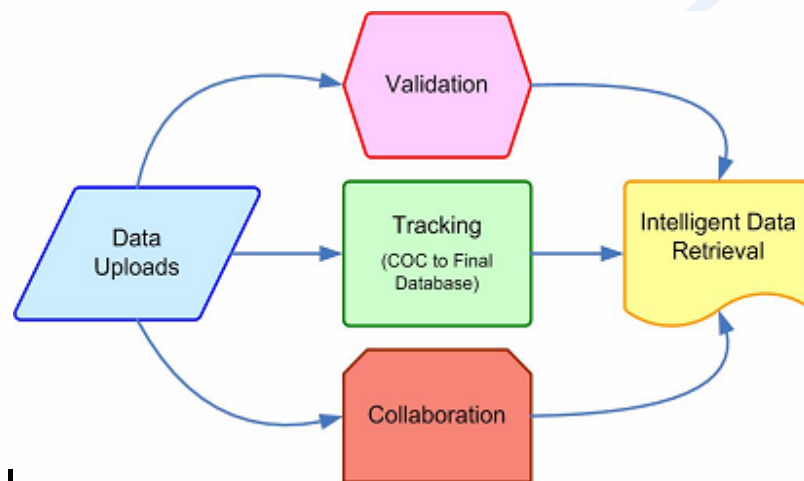
- Sampling & analysis
  - Soil
  - Air
  - Water
  - Biota (animal tissue)
- Information Management Systems
- Geospatial Information Systems

# Environmental Data Overview

- Integrated and seamless
- Secure web-based application
  - Centralized “portal”
  - Process consistency
- Powerful, flexible and customizable
  - Any environmental database schema
  - Information management system functionality
  - GIS functionality

# Components

- Data uploading via a centralized “portal”
  - Analytical data
  - Electronic documents
- Data tracking
- Collaboration
- Validation
- Retrieval
  - Powerful search functionality
  - GIS-based document retrieval
  - Graphical visualizations
  - Formatted reports & tabular output

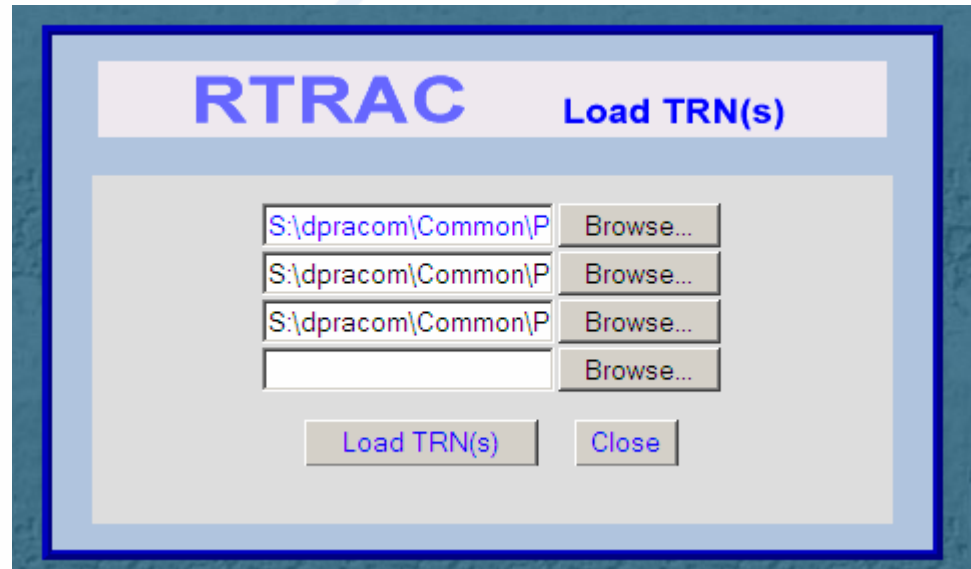


# Uploading Analytical Data

- Secure
- Web-based
- Central repository
- Numerous EDD formats
  - ERPIMS
  - IRDMIS
  - Custom formats

# Uploading Analytical Data

- Upload confirmation
- Email notifications



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
RK	CQC			RM	RM	ABJN	LM45	S	UGG	N	001						2042003	2052003	LCS-65	ALDRN	1B		4.13	1	4.13	1	1.01	1	0	0	S	5	1		N	W103	
RK	CQC			RM	RM	ABJN	LM45	S	UGG	N	001						2042003	2052003	LCS-65	ACLDAN	1B		4.18	1	4.18	1	1.01	1	0	0	S	5	1		N	W103	
RK	CQC			RM	RM	ABJN	LM45	S	UGG	N	002						2042003	2052003	LCS-65	PPDDE	1B		4.08	1	4.08	1	1.01	1	0	0	S	5	1		N	W103	
RK	CQC			RM	RM	ABJN	LM45	S	UGG	N	002						2042003	2052003	LCS-65	PPDDT	1B		4.06	1	4.06	1	1.01	1	0	0	S	5	1		N	W103	
RK	CQC			RM	RM	ABJN	LM45	S	UGG	N	003						2042003	2052003	LCS-65	DLDRN	1B		4.14	1	4.14	1	1.01	1	0	0	S	5	1		N	W103	
RK	CQC			RM	RM	ABJN	LM45	S	UGG	N	003						2042003	2052003	LCS-65	ENDRN	1B		4.3	1	4.3	1	1.01	1	0	0	S	5	1		N	W103	
RK	CSO	BORE	S36B0A-379	EB	RM	ABJN	LM45	S	UGG	N	004	S36-314	1312003	LEE	6	G	2042003	2052003	31B41A	ALDRN	1B	LT	2.5	0	2.5	0	1.01	1	0	6.2					N	W103	
RK	CSO	BORE	S36B0A-379	EB	RM	ABJN	LM45	S	UGG	N	004	S36-314	1312003	LEE	6	G	2042003	2052003	31B41A	ACLDAN	1B	LT	2.5	0	2.5	0	1.01	1	0	6.2					N	W103	
RK	CSO	BORE	S36B0A-379	EB	RM	ABJN	LM45	S	UGG	N	004	S36-314	1312003	LEE	6	G	2042003	2052003	31B41A	PPDDE	1B	LT	2.5	0	2.5	0	1.01	1	0	6.2					N	W103	
RK	CSO	BORE	S36B0A-379	EB	RM	ABJN	LM45	S	UGG	N	004	S36-314	1312003	LEE	6	G	2042003	2052003	31B41A	PPDDT	1B	LT	2.5	0	2.5	0	1.01	1	0	6.2					N	W103	
RK	CSO	BORE	S36B0A-379	EB	RM	ABJN	LM45	S	UGG	N	004	S36-314	1312003	LEE	6	G	2042003	2052003	31B41A	DLDRN	1B	LT	2.5	0	2.5	0	1.01	1	0	6.2					N	W103	
RK	CSO	BORE	S36B0A-379	EB	RM	ABJN	LM45	S	UGG	N	004	S36-314	1312003	LEE	6	G	2042003	2052003	31B41A	ENDRN	1B	LT	2.5	0	2.5	0	1.01	1	0	6.2					N	W103	
RK	CSO	BORE	S36B0A-379	EB	RM	ABJN	LM45	S	UGG	N	005	S36-314	1312003	LEE	6	G	2042003	2052003	31B41A	GCLDAN	1B	LT	2.5	0	2.5	0	1.01	1	0	6.2					N	W103	
RK	CSO	BORE	S36B0A-379	EB	RM	ABJN	LM45	S	UGG	N	005	S36-314	1312003	LEE	6	G	2042003	2052003	31B41A	HPCL	1B	LT	2.5	0	2.5	0	1.01	1	0	6.2					N	W103	
RK	CSO	BORE	S36B0A-379	EB	RM	ABJN	LM45	S	UGG	N	005	S36-314	1312003	LEE	6	G	2042003	2052003	31B41A	HPCL	1B	LT	2.5	0	2.5	0	1.01	1	0	6.2					N	W103	
RK	CSO	BORE	S36B0A-379	EB	RM	ABJN	LM45	S	UGG	N	005	S36-314	1312003	LEE	6	G	2042003	2052003	31B41A	CL6CP	1B	LT	3.51	0	3.51	0	1.01	1	0	6.2					N	W103	
RK	CSO	BORE	S36B0A-379	EB	RM	ABJN	LM45	S	UGG	N	005	S36-314	1312003	LEE	6	G	2042003	2052003	31B41A	ISODR	1B	LT	2.5	0	2.5	0	1.01	1	0	6.2					N	W103	
RK	CSO	BORE	S36B0A-379	EB	RM	ABJN	LM45	S	UGG	N	005	S36-314	1312003	LEE	6	G	2042003	2052003	31B41A	LIN	1B	LT	2.5	0	2.5	0	1.01	1	0	6.2					N	W103	
RK	CSO	BORE	S36B0A-379	EB	RM	ABJN	LM45	S	UGG	N	005	S36-314	1312003	LEE	6	G	2042003	2052003	31B41A	CL10BP	1B		3.23	1	3.23	1	1.01	1	0	6.2	N	5	1		N	W103	



# Uploading Electronic Documents

## Upload Documents

Project:

Report Type:

File1:	<input type="text" value="C:\NEB\FieldProj\Sec36_ESL-053.JPG"/>	<input type="button" value="Browse..."/>
File2:	<input type="text" value="C:\NEB\FieldProj\Map_107-0000-011-644_001_(A0V2I9).pdf"/>	<input type="button" value="Browse..."/>
File3:	<input type="text" value="C:\NEB\ApprovalCycle\Project_Permit_ApplicationTT.xls"/>	<input type="button" value="Browse..."/>
File4:	<input type="text"/>	<input type="button" value="Browse..."/>

[Attach More Files](#)

- Any document format (i.e., Excel, Word, jpg, etc.)
- PDF conversion
- Searchable

# Chain of Custody (COC)

- Initial field sampling information
- Laboratories upload COC data

**COCEntry**

File Edit Submit Options View Help

COC # SC\_02883 Exported

COR POC: Doug Stevenson Tele: 303 289-0518 Project Name: EANTS Semi-Annual Monitoring

LSS POC: Katherine Weinel Tele: 303 289-0890 Turn Around Time: 21 Day

Contractor POC: Wade Thornburg Tele: 303 853-3975 Contractor Name: Shell/Washington

Lab Code	File Type	Sampling Technique	Prime Contractor	Purchase Request #	No. of Containers	Meth No.	VOC	OCF	DHP	QC Code
AR_	CGW	B	SC_	1313						
Sampling Program	Matrix Code	Sampler's Initials	Sampler's Signature							
LWG	WA	WJO/JJD								
Field Sample ID (8)	Site ID (10)	Site Type	Sample Date	Sample Time	Top Depth	Bot Depth				
03150701	36563	WELL	20070315	0940	0.0	0.0	7			
03150702	36565	WELL	20070315	0945	0.0	0.0	3			
03150703	36565	TRIP	20070315	0945	0.0	0.0	2	T		

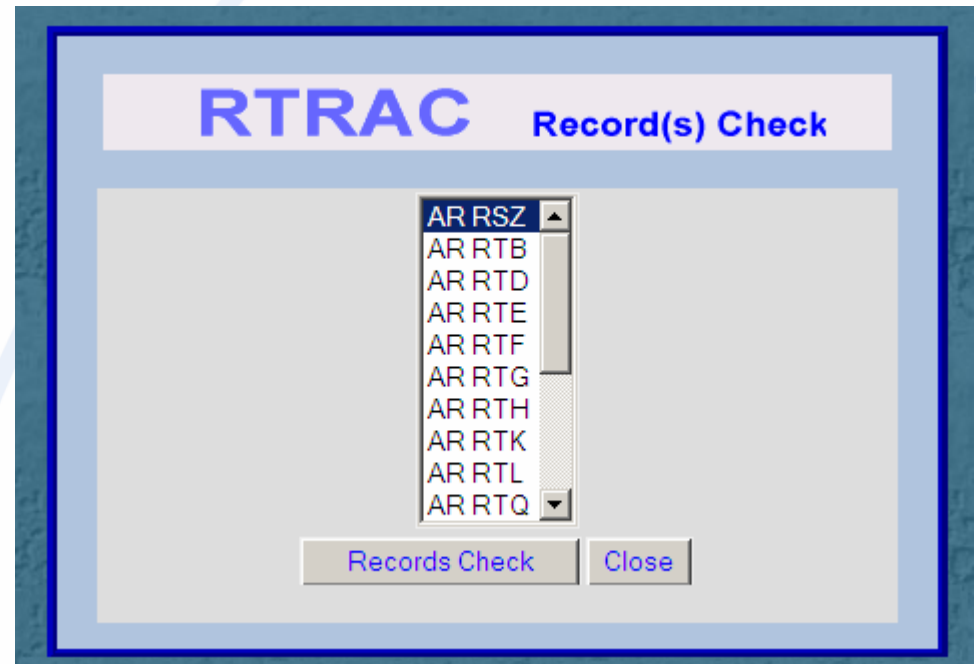
# Sample Tracking

- Dates
  - Preliminary data received
  - Electronic deliverable received
- Status

Query Results											
Query Sort Simple Sort Unhide Columns Show EDD Dates Export View Prelim Data Exit											
	COC Id	Lab Sample	Analysis	Analysis Meth	Lot Id	Sample Date	Received	Preliminary	EDD Received	EDD Released	RMAED Preliminary
▶	EB_07951	70208601	OCP	CH08	PASP	2/17/2007	2/20/2007	3/9/2007	3/9/2007 12:04	3/9/2007 12:03	3/9/2007 2:12:00 PM
	EB_07951	70208602	OCP	CH08	PASP	2/17/2007	2/20/2007	3/9/2007	3/9/2007 12:04	3/9/2007 12:03	3/9/2007 2:12:00 PM
	EB_07951	70208603	OCP	CH08	PASP	2/17/2007	2/20/2007	3/9/2007	3/9/2007 12:04	3/9/2007 12:03	3/9/2007 2:12:00 PM
	EB_07951	70208604	OCP	CH08	PASP	2/17/2007	2/20/2007	3/9/2007	3/9/2007 12:04	3/9/2007 12:03	3/9/2007 2:12:00 PM
	EB_07951	70208605	OCP	CH08	PASP	2/17/2007	2/20/2007	3/9/2007	3/9/2007 12:04	3/9/2007 12:03	3/9/2007 2:12:00 PM
	EB_07951	70208606	OCP	CH08	PASP	2/17/2007	2/20/2007	3/9/2007	3/9/2007 12:04	3/9/2007 12:03	3/9/2007 2:12:00 PM
	EB_07951	70208607	OCP	CH08	PASP	2/17/2007	2/20/2007	3/9/2007	3/9/2007 12:04	3/9/2007 12:03	3/9/2007 2:12:00 PM
	EB_07951	70208608	OCP	CH08	PASP	2/17/2007	2/20/2007	3/9/2007	3/9/2007 12:04	3/9/2007 12:03	3/9/2007 2:12:00 PM
	EB_07951	70208609	OCP	CH08	PASP	2/17/2007	2/20/2007	3/9/2007	3/9/2007 12:04	3/9/2007 12:03	3/9/2007 2:12:00 PM
	EB_07951	70208610	OCP	CH08	PASP	2/17/2007	2/20/2007	3/9/2007	3/9/2007 12:04	3/9/2007 12:03	3/9/2007 2:12:00 PM
	EB_07951	70208611	OCP	CH08	PASP	2/17/2007	2/20/2007	3/9/2007	3/9/2007 12:04	3/9/2007 12:03	3/9/2007 2:12:00 PM
	EB_07951	70208612	OCP	CH08	PASP	2/17/2007	2/20/2007	3/9/2007	3/9/2007 12:04	3/9/2007 12:03	3/9/2007 2:12:00 PM
	EB_07952	70208613	OCP	CH08	PASP	2/17/2007	2/20/2007	3/9/2007	3/9/2007 12:04	3/9/2007 12:03	3/9/2007 2:12:00 PM
	EB_07952	70208614	OCP	CH08	PASP	2/17/2007	2/20/2007	3/9/2007	3/9/2007 12:04	3/9/2007 12:03	3/9/2007 2:12:00 PM
	EB_07952	70208615	OCP	CH08	PASP	2/17/2007	2/20/2007	3/9/2007	3/9/2007 12:04	3/9/2007 12:03	3/9/2007 2:12:00 PM

# Data Validation

- 100s of quality checks
  - Integrity
  - Accuracy
  - Compliance
- Corrections
- Resubmission



The screenshot shows a table titled "Analysis Errors". Below the title is a note: "(Severe errors are identified by red, and regular errors are blue.)". The table has the following columns: Inst, Lab, Lot, Samp#, Method, Test Name, Bool, File Type, Uncorr, Dil, Moist, Flag Code, Data Qual, QC Flag, QC Spike, Sample Date, Prep Date, and Analysis Date. Below the table, there is a message: "----Record Check passed for Lot : [RWI], Lab : [AR]"

Inst	Lab	Lot	Samp#	Method	Test Name	Bool	File Type	Uncorr	Dil	Moist	Flag Code	Data Qual	QC Flag	QC Spike	Sample Date	Prep Date	Analysis Date
----Record Check passed for Lot : [RWI], Lab : [AR]																	

# Real-time Collaboration

Project: Pipeline Segment X

Report Type: [Empty Field]

---


**Documents**

Document	Project	Report Type	Upload Date	Amendments	Comments
<a href="#">Sec36_ESL-053</a>	Pipeline Segment X	Borrow Sites	2007-04-17	0	<a href="#">2</a>

**Comments For Parent Document : Sec36\_ESL-053**  
[Collaborate / Add Comment](#)

Created By	Created Date	Comment
nancy	2007-04-17	I agree it needs to be at least 6 inches wider.
mike	2007-04-17	I do not think the hole is wide enough.

Attachments



# Web-based Document Searching

**Please enter Search Criteria**

Permit:

Report Type:

PDF Key Word:

Limit No.Of Hits to:

Words around each Hit:

Fuzziness  Stemming  Synonyms  Phonics

Context Blocks:

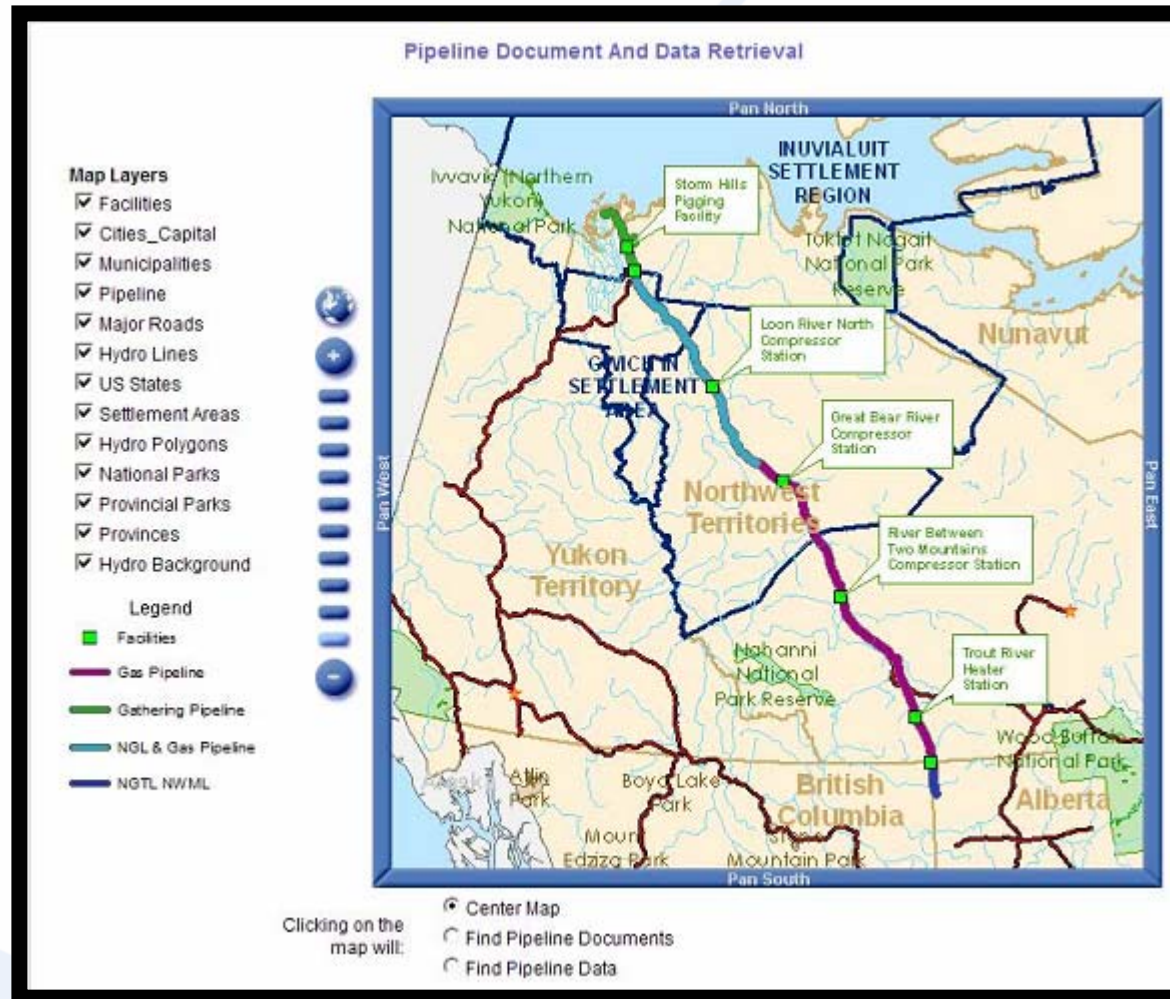
**Search Results**

Click on filename to View the file

Permit	ReportType	FileName	Synopsis	Action
IMS Water Related Reports	Horizontal Directional Drilling	<a href="#">IORVL-187B - Great Bear River HDD Report - A0X4S0.pdf</a>	<p>++ Feasibility Assessment for a Horizontal Directionally Drilled Crossing of the <b>Great Bear River</b> WP52D120-3-02-009 Work Package: WP52 Feasibility Assessment for HDD Crossing of <b>Great Bear River</b> December 2006 Mackenzie Gas Project Revision 0 99-C-3079 ++ plan to construct an NPS 30 gas pipeline across the <b>Great Bear River</b>. The crossing is located at kilometre post 536.3 of ++ gravel or fine-grained soil over unfrozen bedrock below the <b>Great Bear River</b>, and mainly frozen sand over frozen clay over frozen till</p> <p>++ River North compressor station, Loon River North compressor station to <b>Great Bear River</b> compressor station, and <b>Great Bear River</b> compressor station to Alberta. In general, the threshold angles were ++ River North Compressor Station Loon River North Compressor Station to <b>Great Bear River</b> Compressor Station <b>Great Bear River</b> Compressor Station to Alberta Ice-rich clay 7? 11? 8. ++ Pore Water Pressure Ratio, Loon River North Compressor Station to <b>Great Bear River</b> Compressor Station.....5-8 Figure 5-6 Excess Pore Water Pressure Ratio, <b>Great Bear River</b> Compressor Station to Alberta Boundary .....5-9 Figure 5-7</p>	
IMS Water Related Reports	Slopes	<a href="#">A0U0C5 - Other IORVL-118B.pdf</a>		

- Across document searching
- “google” like search results

# GIS Map



# Document Retrieval via Map

The screenshot shows a web application interface for document retrieval via map. The main component is a map of Western Canada, including Yukon Territory, Northwest Territories, British Columbia, and Alberta. The map displays various pipeline types and facilities. A legend on the left side of the map includes the following items:

- US States
- Settlement Areas
- Hydro Polygons
- National Parks
- Provincial Parks
- Provinces
- Hydro Background
- Legend
  - Facilities
  - Gas Pipeline
  - Gathering Pipeline
  - NGL & Gas Pipeline
  - NGTL HWML

Below the map, there are three radio button options for clicking on the map:

- Center Map
- Find Pipeline Documents
- Find Pipeline Data

At the bottom, there is a section titled "Pipeline Document Search" with a table of results:

Document
<a href="#">Map 2 of 7 - NGL Pipeline Index Map.pdf</a>
<a href="#">Map 1 of 2 - Mackenzie Gathering Pipelines Index Map.pdf</a>
<a href="#">Map 1 of 7 - NGL Pipeline Index Map.pdf</a>
<a href="#">Map 1 of 16 - Gas Pipeline Index Map.pdf</a>
<a href="#">Map 2 of 2 - Mackenzie Gathering Pipelines Index Map.pdf</a>



# Analytical Data Retrieval via Map

Clicking on the map will:

- Center Map
- Find Pipeline Documents
- Find Pipeline Data

Client Sample Id	Lab Sample Id	Sample Location	Matrix	Analyte	Boolean	Result
BC20050818-4	995271	N/A	WIPE	LEAD	LT	0.0
BC20050818-5	995272	N/A	WIPE	LEAD	LT	0.0
BC20050818-3	995270	N/A	WIPE	LEAD	LT	0.0
101805-06	58950	N/A	WIPE	LEAD	LT	0.0
101805-07	58951	N/A	WIPE	LEAD	LT	0.0
BC20050818-1	995268	N/A	WIPE	LEAD	LT	0.0
BC20050818-2	995269	N/A	WIPE	LEAD	NUL	39.0
BC20050818-6	995273	N/A	WIPE	LEAD	LT	0.0
BC20050818-7	995274	N/A	WIPE	LEAD	LT	0.0

# Customizable Web-based Analytical Data Retrieval

## SQL WEB

Username

Password

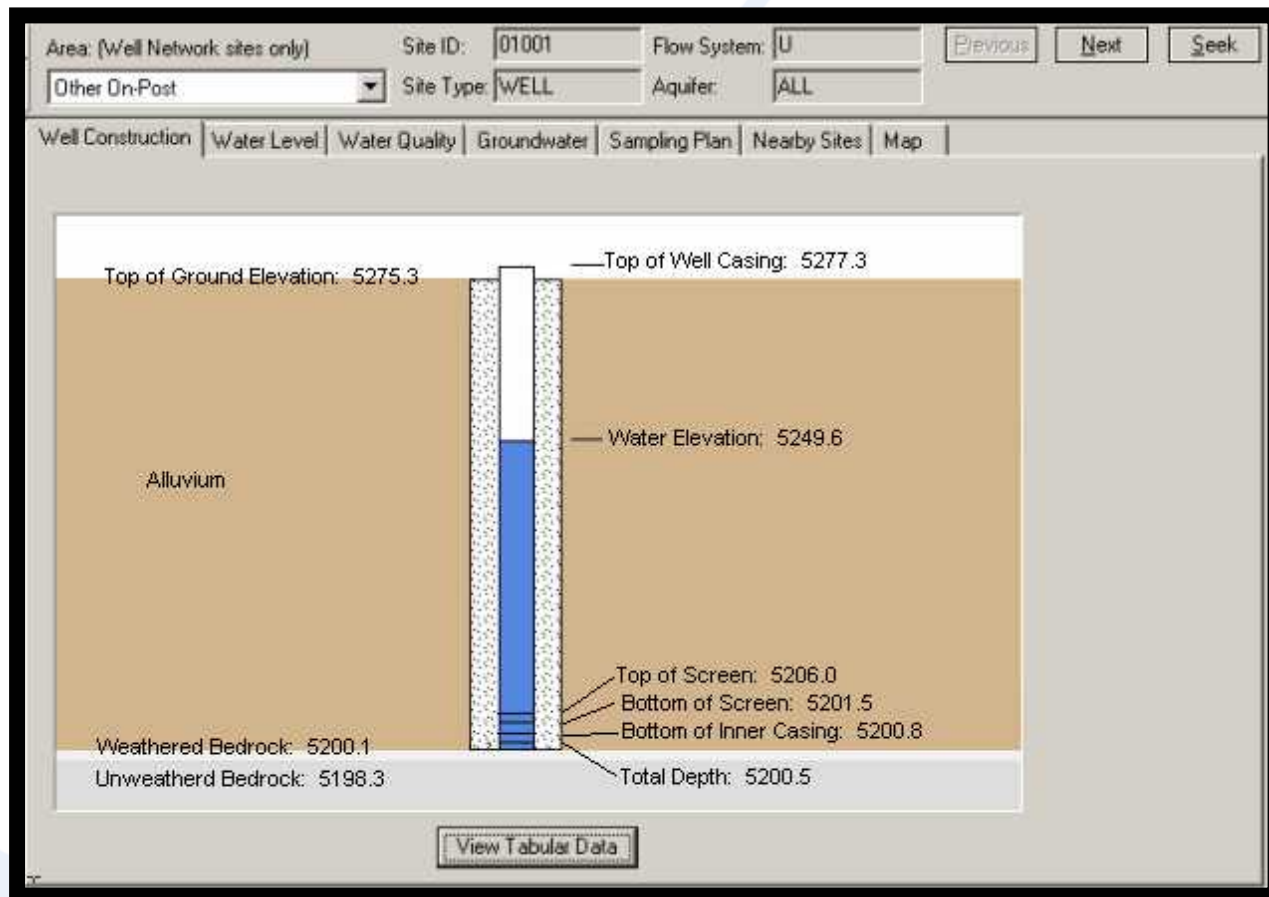
Query   Saved Searches   Grid Options   Set Max Rows   Log Out

Data Source:   
Samples   
Tests   
Results

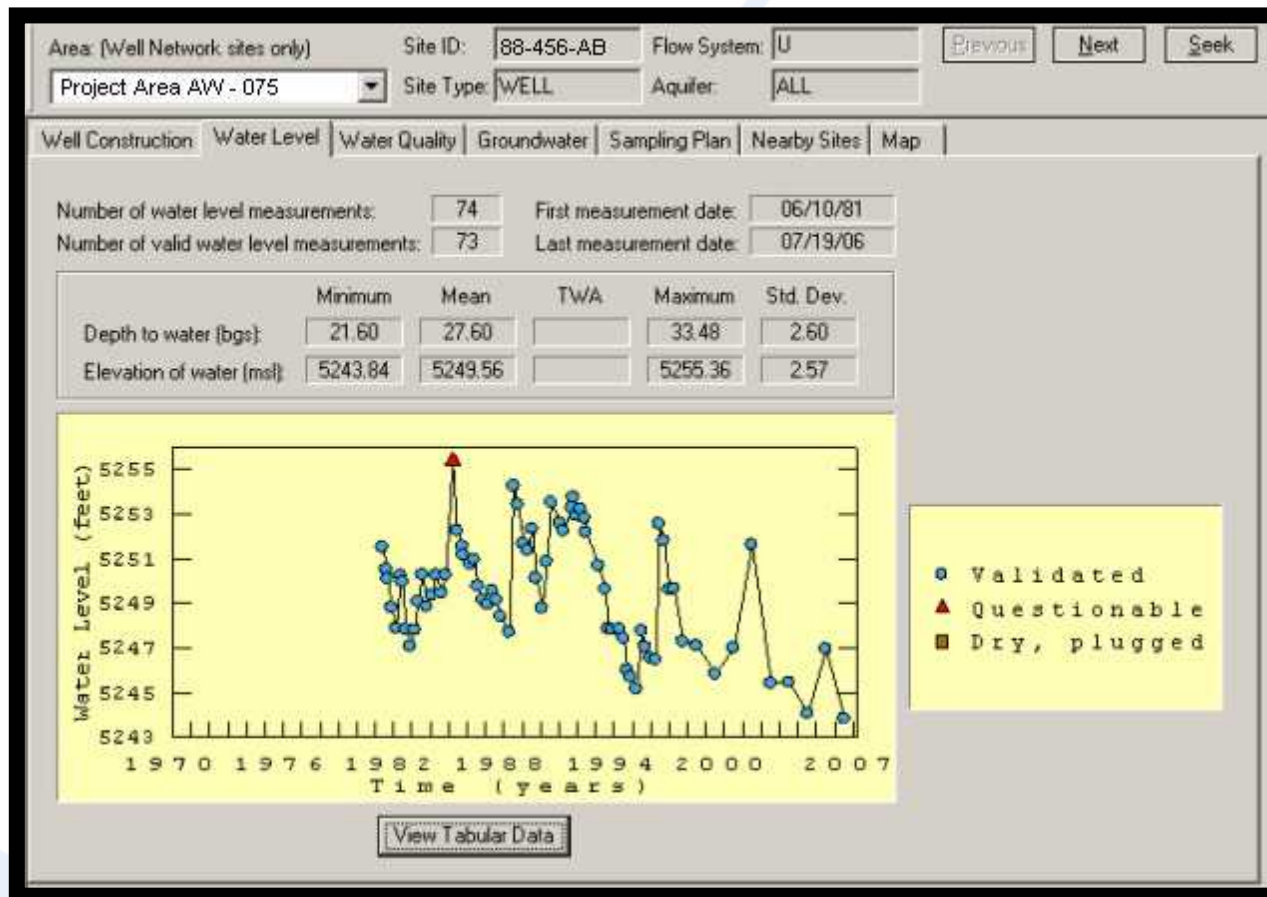
Viewing:   
- Max results returned is limited to : 100   
- Total records returned : 100

locid	logdate	logtime	matrix	topdepth	botdepth	sacode	sampno	logcode	smcode	fldsampid	cocid	cooler	al
00551828SD	1996-10-29	0000	ST	0.0	0.0	N	1	ETHE	G	00006066	null	02	nu
00552828LF	1996-10-29	0000	ST	0.0	0.0	N	1	ETHE	G	00006067	null	02	nu
00553828LF	1996-10-29	0000	ST	0.0	0.0	N	1	ETHE	G	00006068	null	02	nu
100CONC1	1998-11-11	1049	SC	0.0	0.0	N	1	ETHE	G	13381	null	null	nu
100CONC2	1998-11-11	1045	SC	0.0	0.0	N	1	ETHE	G	13382	null	null	nu
100PW1	1998-11-11	1110	WL	0.0	0.0	N	1	ETHE	G	13383	null	null	nu
100PW2	1998-11-11	1120	WL	0.0	0.0	N	1	ETHE	G	13384	null	null	nu
131AH01	1999-10-07	1100	SN	0.0	1.0	N	1	ETHE	G	14299	null	null	nu

# Graphical Representation



# Graphical Representation



# Conclusion

- Let DPRA meet all your Environmental Data Management needs today!

# For More Information...



**1600 Broadway, Suite 2400, Denver, Colorado**

Nancy Gonzales  
Senior Associate  
(303) 289-0393

nancy.gonzales@dpra.com

Steven Miller  
Senior Associate  
(303) 289-0368

steven.miller@dpra.com