

Integrated Cloud Based Environmental Data Management System

Penny Gomez (pgomez@lanl.gov)

Los Alamos National Laboratory
Data System Integration Project Leader

Karen Schultz Paige (ksp@lanl.gov)

Los Alamos National Laboratory
Intellus Project Leader

Chris EchoHawk (echohawk@lanl.gov)

Los Alamos National Laboratory
Environmental Data and Analysis Group Leader



UNCLASSIFIED

LA-UR-12-21030



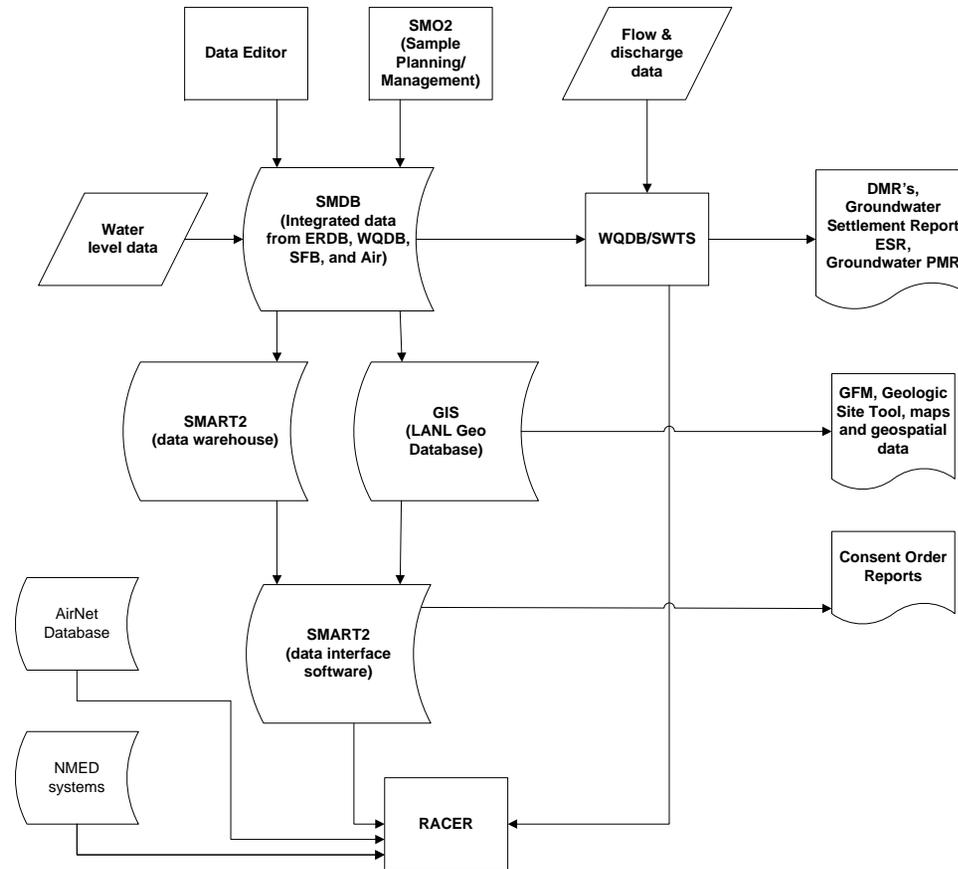
Cloud Based Data System

What is it?

Leveraging 3rd party computing capability over the network to **cut costs, increase scale, improve agility, and access best practices** through shared resources.



Integrated Data and Systems



Cost



- **Resource constraints and project requirements forced LANL to investigate new technology**
- **Shared resources with other customers including IT staff, software development, software maintenance, hardware, version updates, and licenses**
- **Fixed price competitively competed small business development contract**
- **Annual subscription based fee dependent on number of records**

Information at <http://www.locustec.com/eim.asp>

Public Interface (Intellus)

- Complete transparency
- Visibility into LANL data process
- No data feeds, transfers, data transformations
- Immediate availability of data
- Ability to accommodate new data providers
- Requirements from NMCF based on RACER improvements list
- Data available at www.intellusmdata.com
- New Mexico Community Foundation outreach at www.intellusnm.com



NMED-OB



- **Share system and tools**
- **Full control of their data**
- **Full administration of roles and privileges**

Third Party Data Providers

- **Environmental data from Northern New Mexico area**
- **Final data loaded into system by NMED-OB**
- **LANL and NMED-OB data available to public, 3rd party data available depending on data provider conditions for use**



Mapping and Graphing

- Interactive maps, boring logs, and well diagrams
- Integrated GIS
- Layers/backgrounds:
Google Terrain,
Google Map,
Google Satellite,
Google Hybrid,
USGS Topographic,
USGS Aerial,
LANL GIS
- Statistical tests



Reporting



- **On-line reports**
- **Reports can be run at any time with any set of data**
- **Data are current**
- **Possible transition from static hardcopy reports**

Reporting



Select Data Provider¹:

Los Alamos National Laboratory

NMED DOE Oversight Bureau

¹ As of Feb 1, 2012 the Los Alamos National Laboratory data source is the only active link. The NMED data source is still under construction and the link will be made active after data has been uploaded. Until then NMED data can be accessed via <http://tracerdta.com>

*Note: some queries will produce very large results sets that may not be able to be imported into some programs, such as some versions of Microsoft Excel. If you are unable to import query results in older versions of some programs, try to refine your query via filters such as fewer location groups, fewer parameter groups, or smaller date ranges.

Reports

Analytical Reporting

Query analytical (laboratory) data and download query results for field and laboratory samples for all available media. Queries are performed on validated data made available to this database. Multiple output formats are available. Users must specify filter criteria for each query and some query criteria are limited to improve performance. Query and filter selection is similar for all available options.

Non-Analytical Reporting

Query non-analytical data including locations, field measurements, field sample and Chain of Custody (COC) information. Multiple output formats are available. Users must specify filter criteria for each query and some query criteria are limited to improve performance. Query and filter selection is similar for all available options.

Pre-Designed Reports

Saved pre-designed reports created by Los Alamos National Labs and others. One click reports to provide quick access to common queries.

Sampling Calendar

Presents the planned samples for the data source – such as Los Alamos National Laboratory planned samples. Click on the date link and view information on planned samples and planned analyses. Note that dates indicate the projected date range for a given sampling campaign, not the exact date the sample will be collected. Data are presented in data grids for download in multiple formats.

Track Changes

List of changes made to data as a result of the data review process by data owners.

Reference Tables

List of database valid values, list of values, and look up tables. These items comprise the various acceptable values in the database and allow meaningful queries.

Public Data Files

To accommodate the over 70,000,000 groundwater level and flow data records, LANL has provided these data files as flat file downloads. Users can obtain current and historical data in selected categories by selecting the desired files and downloading the files to their computers. Files can then be imported into other programs for review and analysis.

Charts

Note: All charts are based on Flash and require an Adobe flash player. If you do not have any Adobe Flash Player you can [click here](#) to download.

Note: All maps open in a new window. Make sure any pop-up blockers are turned off.

Analytical Chemistry

Create a wide variety of customizable charts based on location and sample type. All charts are limited in the number of parameters or locations that can be charted. Once charted, the charts can be customized by clicking on the "Edit Chart" button below the chart. To save the chart, right click and select "save as image" and save the file. Once saved, the image file can be printed with standard software or viewed in any photo viewer.

Subsurface

The Subsurface option provides charts of groundwater level data. Please note that LANL may provide groundwater level data in large downloadable files and so this charting option may return only limited and the most recent data. Refer to Intellicus for more information on data options.

Note: you are able to download data associated with the Chart by clicking on "show data" and clicking on the small document icon above the data



Powered by Locus

Locus Technologies © 1997-2012 • Terms and Conditions



Reporting

View Field Sample Analytical Result Information: Select Data Filters And Output Options

Primary Filter	Parameter Filters	Data Fields/Output
Select Data Fields To Display:		
<div style="border: 1px solid gray; padding: 5px;"><ul style="list-style-type: none">Analysis DateAnalysis Deferred FlagAnalysis Lot IDAnalysis SubcontractedAnalysis Suite CodeAnalysis Type CodeAnalytical MethodApproved ByBackground Comparison Media CodeBasisBest Value FlagBest Value Status CodeCalibration Reference IDChain Of Custody No.CompositeComposite DescriptionComposite Field Sample IDComposite Type CodeConfidential Flag (Sample)Custom Result Field 1</div>	<p>< ></p>	<div style="border: 1px solid gray; padding: 5px;"><ul style="list-style-type: none">Field Sample IDLocation IDSample Date (Start)Parameter NameReport ResultReport UnitsLab QualifierDetect FlagSample MatrixSample PurposeSample Type</div>

¹Up to 10 items may be selected

[\[Help\]](#)

Note that all tabs must be selected and a selection made (unless the tab has pre-selected options). Failure to select an item on all tabs will cause the query to fail at the end and going backwards through a query deletes all entries.

Reporting

Selected Analytical Results:




 Page of


 Rows
 



There are additional columns that are not being displayed; use the 'Select Columns' button to show them.

Field Sample ID	Location ID	Sample Date (Start)	Parameter Name	Report Result	Report Units	Lab Qualifier	Detect Flag	Sample Matrix	Sample Purpose
CAMO-08-12720	CDBO-6	5/22/2008	Cobalt-60	-0.205	pCi/L	U	N	W	REG
CAMO-08-12721	CDBO-6	5/22/2008	Cobalt-60	2.71	pCi/L	U	N	W	REG
CAMO-08-12720	CDBO-6	5/22/2008	Plutonium-239/240	0.00202	pCi/L	U	N	W	REG
CAMO-08-12721	CDBO-6	5/22/2008	Plutonium-239/240	0	pCi/L	U	N	W	REG
CAMO-08-12721	CDBO-6	5/22/2008	Gross beta	8.95	pCi/L		Y	W	REG
CAMO-08-12720	CDBO-6	5/22/2008	Neptunium-237	3.01	pCi/L	U	N	W	REG
CAMO-08-12721	CDBO-6	5/22/2008	Neptunium-237	-11.8	pCi/L	U	N	W	REG
CAMO-08-12720	CDBO-6	5/22/2008	Uranium-234	0.00971	pCi/L	U	N	W	REG
CAMO-08-12721	CDBO-6	5/22/2008	Uranium-234	0.174	pCi/L		Y	W	REG
CAMO-08-12720	CDBO-6	5/22/2008	Uranium-235/236	0.006	pCi/L	U	N	W	REG

[Return](#)

Reporting

Legend

- Supply Well
- Spring
- Well Not Otherwise Class
- Monitoring Well
- LANL

Identify Results

Location ID: MCO-4 Location Type: MON Easting: 1631214.37 Northing: 1769787.87

Analytical Exceedances Groundwater Levels Field Measurements Charts

Excel 07 Spatial Filter: 1000 ft_US 1450 analytical results

Parameter	Result	Units	Lab Qual	Val Qual	Detect	Sample ...	Leached	Filtered	Purpose	Type	Depth
Acidity or Alkalinity of a soil	7.8	SU			Y	1994-06-23	N	N	REG	WG	
Acidity or Alkalinity of a soil	7.4	SU			Y	1993-07-19	N	N	REG	WG	
Acidity or Alkalinity of a soil	7.5	SU			Y	1992-11-06	N	Y	REG	WG	
Acidity or Alkalinity of a soil	7	SU			Y	1991-08-28	N	Y	REG	WG	
Acidity or Alkalinity of a soil	7.47	SU			Y	1990-09-13	N	Y	REG	WG	
Acidity or Alkalinity of a soil	7.8	SU			Y	1990-05-08	N	Y	REG	WG	
Acidity or Alkalinity of a soil	7.5	SU			Y	1989-04-26	N	Y	REG	WG	
Acidity or Alkalinity of a soil	7.9	SU			Y	1988-04-11	N	Y	REG	WG	
Acidity or Alkalinity of a soil	8.4	SU			Y	1987-03-23	N	Y	REG	WG	
Acidity or Alkalinity of a soil	9.9	SU			Y	1987-03-01	N	N	REG	WG	

POWERED BY Google

NATIONAL LABORATORY
EST. 1943

UNCLASSIFIED

Operated by Los Alamos National Security, LLC for the U.S. Department of Energy's NNSA



Reliability

- **Servers located in a Tier IV data center**
 - redundant power supplies
 - redundant data communication connections
 - environmental controls
 - security devices
- **Collocated facilities**
- **Offsite backups**



Accessibility



- **Web based**
- **No firewall, VPN, portal**
- **Platform independent**
 - internet browser
 - operating system