



OVERCOMING THE CHALLENGES OF DATA MIGRATION & MANAGEMENT, A 300-SITE CASE STUDY

Kyle Power, Environmental Chemist • August 18th, 2020 • 2:30PM





CONVERSATION AT A GLANCE

- The Data
- Migrating the Data
- Organizing/Accessing the Data
- Navigating/Understanding the Data
- Exporting/Reporting the Data
- Managing the Data



THE DATA

- Groundwater and leachate data from 300+ U.S. landfill sites, including analytical, fluid-level, and field parameter data for organic, inorganic, and general chemistry constituents
 - 31 million + data point as of today (spanning more than 30 years)



PREVIOUS DATABASE

- Previously stored in a one-person-managed database with no access for the client/consultants
 - All query outputs and inquiries had to be performed by the database manager
 - All data outputs were in a restricted format
 - Lack of precise, quality assurance and quality control checks



MIGRATING THE DATA

- New Location: Trihydro's in-house database called Project Direct
- Match up parameters from previous database to Project Direct
- Resolving duplicate data issues
- Work with client when data would not match valid values
 - Locations, analytes, site names, etc.
- Millions of data points migrated in Fall of 2017

ORGANIZING/ACCESSING THE DATA

- Each project site's data is stored in its own secure database
 - Give individual access to clients and consultants
 - Set up permissions to those individuals based on their position
 - Access specific data using unique modules
- Store inactive sites elsewhere, but still accessible if needed

The screenshot shows the Project DIRECT User Administration interface. The top navigation bar includes 'File', 'Edit', 'View', 'Favorites', 'Tools', and 'Help'. Below this is the 'Project DIRECT' logo and a search bar for 'Select Site'. The main content area is titled 'User Administration' and contains a blue information banner: 'You may view information about the users and which security groups they are a member of via this page. To cha...'. The interface is divided into three steps: Step 1 (radio buttons for 'Display a list of all users currently assigned to this site' and 'Display a list of all Project Direct users NOT currently assigned'), Step 2 (a dropdown menu for 'Select User' with 'Power, Kyle' selected and a 'Can't find the person you are looking for?' link), and Step 3 (two columns for group management: 'Group(s) the user is NOT in' and 'Group(s) the user IS in', with a double-headed arrow between them). A 'User's Menu' sidebar on the right lists various modules like 'Administrators', 'Analyte Groups', 'Site Properties', etc. A yellow warning icon at the bottom states: 'Do not remove yourself from the Site Administrators group. Your membership in the Site Administrators group allows you access to this set of Administrators tools. Anyone in the Site Administrators group should be someone whom you trust to manage users and groups in the best interest of your client.'

ORGANIZING THE FLOW OF DATA

File Edit View Favorites Tools Help

Project DIRECT






Select Site My Profile Requests Support Help PD Admin Logout Kyle


Demo Project Direct

» TRIHYDRO.COM  

- Administrator
- Analytical Reports
- Charting
- Data Analysis
- Data Qualification
- Data Query Tool
- Data Validation
- Document Sharing
- Stakeholder Documents
- Fluid Level Input
- Fluid Level Reports
- Lab Data Management
- Administration
- QC Assistant
- Sample Planning
- Tracker
- Well Management

Template: Current Filter Value: No filters currently set

 Add new Sample Delivery Group  Save Filters  Clear Filters  Clear Colors  Export to Excel

Update	View Comments	Project Event	Sample Event	SDG	Sample Date	DV Tier	Priority	EDD Received	EDD Uploaded	DV Final	DV Flags Posted	Tier I Report	DV Report	EDD	Standard Lab Report	Expanded Lab Report	Upload EDD to Database	Update	Pull	Delete
		Quarterly Monitoring	Q2	1005061	05/04/2009	2	Medium	08/26/2009	08/26/2009	04/10/2012							08/26/2009			
		Quarterly Monitoring	Q2	1005062	05/07/2009			08/26/2009	08/26/2009	12/23/2009							08/26/2009			
		Quarterly Monitoring	Q2	1005063	05/08/2009		Low	08/26/2009	01/31/2010	08/24/2010							01/31/2010			
		Quarterly Monitoring	Q2	1005064	05/09/2009	2		08/26/2009	12/16/2009	01/31/2010	01/31/2010						12/16/2009			
		Semiannual Monitoring	S2	1112222		2		07/16/2012		03/01/2010							EDD Uploader			
		Semiannual Monitoring	S1	13172881126		3	High			04/10/2012							EDD Uploader			
		Quarterly Monitoring	Q4	1354579	12/06/2012	2		01/23/2013	01/23/2013								01/23/2013			
		Quarterly Monitoring	Q1	234534													EDD Uploader			
		Quarterly Monitoring	Q3	A_12345	08/10/2019			08/29/2019	08/29/2019								08/29/2019			
		Quarterly Monitoring	Q3	A_123456				08/29/2019									EDD Uploader			
		Quarterly Monitoring	Q3	A_12349x	09/01/2019			09/12/2019	09/12/2019								09/12/2019			
		Quarterly Monitoring	Q3	A_flow	08/06/2019			08/29/2019	08/29/2019								08/29/2019			
		Quarterly Monitoring	Q3	August800	08/01/2019			08/16/2019	08/16/2019								08/16/2019			
		Quarterly Monitoring	Q3	August900	08/06/2019			08/27/2019	08/27/2019								08/27/2019			
		Semiannual Monitoring	S1	0M00002011			High			12/21/2011							EDD Uploader			
		Quarterly Monitoring	Q1	ExampleEDD	01/01/2010	3		01/06/2011	05/26/2011	04/10/2012	01/06/2011						05/26/2011			
		Quarterly Monitoring	Q1	JenBatch	03/20/2011			12/19/2011	12/19/2011								12/19/2011			
		Quarterly Monitoring	Q1	JenBatch2	04/20/2011	3		12/19/2011	12/19/2011	02/06/2013	02/06/2013						12/19/2011			
		Quarterly Monitoring	Q2	JenSoilPract2				12/29/2011									Field Sample ID			
		Quarterly Monitoring	Q3	JulySampling	07/01/2019			08/15/2019	08/15/2019								08/15/2019			
																	Field Sample			



UNDERSTANDING AND NAVIGATING THE DATA

- Training
 - Provide specific trainings for client managers and consultants on the different Project Direct modules and where to access these modules
 - Record these training sessions for future database users who need access
 - Provide contact information if/when database users need assistance
 - Provide refresher trainings for future years
- Make navigation through site modules easy to understand for users

EXPORTING/REPORTING THE DATA

- Client managers and consultants can access data using unique modules
 - Data Query Tool
 - Thousands of data points at a time
 - Custom export format
 - Analytical Reporting/Charting
 - Sample Planning
 - Create a plan now to compare that against incoming datasets later

The screenshot displays the Project DIRECT web application interface. The top navigation bar includes 'File', 'Edit', 'View', 'Favorites', 'Tools', and 'Help'. Below this is the 'Project DIRECT' logo and a search bar for 'Select Site' with a dropdown menu. The main navigation menu on the left lists various modules: Administrator, Analytical Reports, Charting, Data Analysis, Data Qualification, Data Query Tool (highlighted), Data Validation, Document Sharing, Stakeholder Documents, Fluid Level Input, Fluid Level Reports, Lab Data Management, and Well Management. The main content area is titled 'Demo Project Direct' and features a 'Save Query' button and a 'Return to Query Selection' button. Below these are input fields for 'Query Name' and 'Description'. The 'DATA FIELDS' section is expanded, showing a list of fields to be displayed in the results grid. A 'Check/Uncheck All' checkbox is present at the top of this section. The fields are organized into three columns:

Select the fields that you would like to see in the results grid.		
<input checked="" type="checkbox"/> Check/Uncheck All		
<input checked="" type="checkbox"/> Sample ID	<input checked="" type="checkbox"/> Lab Units	<input checked="" type="checkbox"/> X
<input checked="" type="checkbox"/> Location	<input checked="" type="checkbox"/> Value RL	<input checked="" type="checkbox"/> Y
<input checked="" type="checkbox"/> Date Sampled	<input checked="" type="checkbox"/> Value MDL	<input checked="" type="checkbox"/> Lab Batch Id
<input checked="" type="checkbox"/> Date Time Sampled	<input checked="" type="checkbox"/> Value Units	<input checked="" type="checkbox"/> Field Sample Id
<input checked="" type="checkbox"/> Sample Start Depth	<input checked="" type="checkbox"/> Lab Qualifier	<input checked="" type="checkbox"/> Lab Sample Id
<input checked="" type="checkbox"/> Sample End Depth	<input checked="" type="checkbox"/> Reviewer Qualifier	<input checked="" type="checkbox"/> DVcomplete
<input checked="" type="checkbox"/> Tri Cas	<input checked="" type="checkbox"/> Method	<input checked="" type="checkbox"/> Location Type
<input checked="" type="checkbox"/> Analyte	<input checked="" type="checkbox"/> Matrix	<input checked="" type="checkbox"/> Validation Reason Code
<input checked="" type="checkbox"/> Method Category	<input checked="" type="checkbox"/> Dilution Factor	<input checked="" type="checkbox"/> mg Result
<input checked="" type="checkbox"/> Lab Result	<input checked="" type="checkbox"/> Detect Flag	<input checked="" type="checkbox"/> mg Limit
<input checked="" type="checkbox"/> Lab Limit	<input checked="" type="checkbox"/> Sample Type Code	<input checked="" type="checkbox"/> Data File
<input checked="" type="checkbox"/> Lab MDL	<input checked="" type="checkbox"/> Qa Batch Id	<input checked="" type="checkbox"/> Is Significant

At the bottom of the configuration area, there are 'Previous' and 'Next' navigation buttons. The footer of the interface includes another 'Save Query' and 'Return to Query Selection' button.



MANAGING THE DATA

- Designated data manager with assistance upon absence
- Uploading for Past/Current/Future Data
- Revisions for Past Data
- Auditing
 - Valid values
 - User permissions
 - Tracking and statistics



CONCLUSIONS AND OTHER TIPS

- Management of 300+ sites is possible!
- Managing these sites for 2+ years and going strong
- Be thorough, but also quick to plan and act
 - Prepare migration/implementation/management well ahead of time
 - Don't be afraid to divert effort for a better solution
 - Don't procrastinate in training, responses, or management



CONCLUSIONS AND OTHER TIPS

- Be Vigilant
 - Pay attention to everyone involved in the system
 - Be more proactive than reactive
 - Ask users for advice or things they would like to see in the database
- Keep a well-oiled machine (database)
 - Keep up to date on new technologies/advancements
 - Consider client needs rather than your own



Code of the West

Trihydro adopted the “Code of the West” in 2005 as our corporate code of conduct, and we use it to guide our business each day.

1. Live Each Day With Courage
2. Take Pride in Your Work
3. Always Finish What You Start
4. Do What Has To Be Done
5. Be Tough, But Fair
6. When You Make A Promise, Keep It
7. Ride For The Brand
8. Talk Less And Say More
9. Remember That Some Things Aren't For Sale
10. Know Where To Draw The Line

*From “Cowboy Ethics”
by James P. Owen*