



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 search prompt 'Can't find the person you are looking for?'), and Step 3 (two columns for 'Group(s) the user is NOT in' and 'Group(s) the user IS in', with 'Administrators', 'Compliance demo', 'PD Demo', 'TAB Tool Admin', and 'Tab Tool User' listed in the first column and 'Data Validators' and 'Standard User' in the second). A 'User's Menu' sidebar on the right lists various modules like 'Analyte Groups', 'Site Properties', 'Standard/Objectives', 'User Groups', 'Users', 'Valid Values', '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', and 'Well Management'. A 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 | 13172898126 | | 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 'Save Query' and 'Return to Query Selection'. It features a 'Query Name' field and a 'Description' field. Below these is a section for 'DATA TYPE' and 'DATA FIELDS'. Under 'DATA FIELDS', there are 'FILTER OPTIONS' and 'DISPLAY OPTIONS'. The 'RESULTS' section contains a grid of checkboxes for various data fields, all of which are checked. The fields include: Sample ID, Location, Date Sampled, Date Time Sampled, Sample Start Depth, Sample End Depth, Tri Cas, Analyte, Method Category, Lab Result, Lab Limit, Lab MDL, Lab Units, Value RL, Value MDL, Value Units, Lab Qualifier, Reviewer Qualifier, Method, Matrix, Dilution Factor, Detect Flag, Sample Type Code, Qa Batch Id, X, Y, Lab Batch Id, Field Sample Id, Lab Sample Id, DVcomplete, Location Type, Validation Reason Code, mg Result, mg Limit, Data File, and Is Significant. At the bottom of the results grid are 'Previous' and 'Next' buttons. The footer of the interface also includes 'Save Query' and 'Return to Query Selection' buttons.



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*