HOW OPTAHUB HELPED EMS ENVIRONMENTAL REDUCE REPORTING TIME BY 85%

A CASE STUDY

Environmental remediation projects entail the collection, analysis, and presentation of large sets of analytical data. Implementation of a software automation solution has the potential to meet these needs. OptaHub recently released a cloud-based application designed to manage environmental data and create routine monitoring reports.
Management and analysis of data takes time and requires several different technical disciplines (data entry, database management, drafting, hydrogeological interpretation, etc.). Successful environmental firms have created procedures and systems to process this data in a manner that is cost competitive, error free, and profitable. However, as the environmental business has matured, the competitive environment has made it more difficult to meet client and regulatory objectives.

The purpose of this study was to compare OptaHub’s solution to standard data organization, analysis, and presentation methods in the industry.

**BACKGROUND**

Sites undergoing groundwater investigation and remediation have prescribed regulatory reporting requirements. Reporting requirements typically vary slightly between different state and/or federal environmental agencies, but all typically involve determining the type/amount of contaminants present, determining how far the contaminants have spread, and measuring the cleanup progress.

EMS Environmental, Inc. is a multiple disciplined firm founded in 1988 to provide environmental services to industrial, commercial, and municipal clients throughout the eastern U.S. They operate out of offices in New York, Pennsylvania, and North Carolina. EMS has an extensive track record for completing groundwater remediation projects of varying scales. Recently EMS launched a corporate initiative to utilize technology to improve results and conducted an evaluation of the OptaHub application in practice on active groundwater cleanup projects.

EMS selected six groundwater monitoring projects to test the software with multiple staff members ranging from technicians to project managers.
NEEDS AND EXPECTATIONS

- Eliminate time spent transcribing data
- Reduce the time spent on basic QC and concentrate on meeting cleanup objectives
- Maintain regulatory requirements for report objectives and deliverables
- Provide Project Managers with important real time updates
- Provide real time updates to client when unexpected results are received
- Improve profitability

PROJECT SPECIFICS

- Six gas station properties with groundwater contamination
- Seven - 19 monitoring wells per site
- Quarterly groundwater gauging and sampling requirements for each project
- Each site has historical gauging and sampling data for 3 – 15 years
- Three sites with groundwater treatment/SVE systems
- Team of four experienced professionals

PROBLEM STATEMENT

THREE POTENTIAL SOLUTIONS

1. Data transcribed by hand to go through all analysis, presentation and reporting processes
2. Data managed with a database program such as EQuIS along with a mapping program such as ArcGIS
3. Hybrid solutions such as spreadsheets/databases and third party contouring programs

ISSUES OR PROBLEMS

- Potential transcription or data entry errors and time to complete the reports
- Cost, lack of a report generation feature
- Level of training and expertise required to use software

SOLUTION

Smaller groundwater remediation projects do not have the budget to cover the cost of expensive database and mapping software solutions. For this study, the comparison will be made with Option 1 as OptaHub offers a solution with no upfront software licensing or maintenance costs.
STANDARD WORKFLOW

The groundwater monitoring and reporting process starts with a technician who travels to the site to collect gauging data (depth to water, liquid petroleum thickness (LPH), and groundwater quality parameters) from each monitoring well and groundwater samples from each well that does not contain LPH. The gauging data and sample times are manually recorded. The groundwater samples are shipped to a laboratory for chemical analysis. When the laboratory results are received, the following process is followed:

- Transcribe gauging data onto master data summary excel spreadsheet
- Transcribe laboratory data onto master data summary excel spreadsheet
- Spreadsheet set up with formulas to calculate groundwater elevation
  - review step for identification of transcription and typographical errors
- Plot groundwater elevation data and laboratory data onto site plan
- Construct hydraulic gradient map, from the elevation data, to show groundwater flow direction
- Construct contaminant plume or box maps to show the extent of contamination for various chemicals
  - Review step to ensure the correct data is plotted at the correct location
- Enter laboratory data into statistical spreadsheet template to generate trend analysis charts
- Cut and paste report data into report template
  - Final QC check by project manager (common to find parts of previous reports incompletely erased from the template)
  - Final QC check by senior management
  - Data must be backed up
STANDARD WORKFLOW

Well Gauging
Well Sampling

Enter gauging data into field book

Send samples to lab

Sample results received

Transcribe lab and gauging data into master Excel spreadsheet

QC check data entries

Plot lab and gauging data on site plan, draw contours drawn spreadsheet

QC check for correct plotting locations and correct contour locations

Enter lab data into excel statistics spreadsheet

QC check data entries

Assemble report text, summary data table, maps and statistics charts into final report

Cut and paste data into previous report template spreadsheet

Quarterly Report Submittal to Client

QC check by PM

QC check by Senior PM
OPTAHUB WORKFLOW

With the OptaHub workflow, the groundwater monitoring and reporting process starts the same as the standard workflow: a technician travels to the site to collect gauging data (depth to water, LPH, and groundwater quality parameters) from each monitoring well and groundwater samples from each well that does not contain LPH. The gauging data and sample times are manually recorded. The groundwater samples are shipped to a laboratory for chemical analysis. From this point, the process differs:

- Gauging data is entered into the cloud via the OptaHub user interface
- Laboratory data is electronically uploaded directly into the OptaHub cloud
- OptaHub automatically plots groundwater elevation data onto any site plan to create a hydraulic gradient map
- OptaHub automatically plots chemical data onto any site plan to create contaminant concentration maps
- OptaHub automatically conducts a statistical analysis and produces trend analysis charts for any user-identified chemical
- OptaHub automatically generates a fully editable summary report with user interface to add additional information

INITIAL PROJECT SETUP IN OPTAHUB

- Train users, intuitive - about 30 minutes
- Enter site-specific MCLs - 3 minutes
- Upload site plan - 3 minutes
- Upload historical data - 5 minutes
- ID well locations - 10 minutes
OPTAHUB WORKFLOW

**Well Gauging**
- Enter gauging data into field book
- Send samples to lab
- Sample results received
- QC check for correct plotting locations and correct contour locations
- Cut and paste data into previous report template spreadsheet
- Select automated report contents: summary data table, maps and statistics charts into final report
- QC check by PM
- QC check by Senior PM
- Quarterly Report Submittal to Client
- EDD Sample results received and automatically uploaded into OptaHub
- Enter gauging data into OptaHub interface
- Plot lab and gauging data on site plan, draw contours, draw spreadsheet
- Transcribe lab and gauging data into master excel spreadsheet
- Enter lab data into excel statistics spreadsheet
- QC check data entries

**Well Sampling**
- Send samples to lab
- Sample results received
- QC check data entries
- Transcribe lab and gauging data into master excel spreadsheet
- Enter lab data into excel statistics spreadsheet
- QC check data entries
- Cut and paste data into previous report template spreadsheet
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RESULTS

The primary result showed that OptaHub generated reports 85% faster than the standard workflow. The savings for the quarterly sampling and reporting event for these six projects was 32 hours or approximately $2,240. The yearly savings projected over four quarters is 127 hours or $8,960.

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ADDITIONAL RESULTS

- The reports were officially accepted by regulators in NY, PA, MD and DE
- Improved quality and efficiency
- Uniformity in reporting
- Better maps

BETTER MAPS EXPLAINED

Many consultants construct a Box Map to present analytical data. A Box Map contains all of the data jumbled onto one drawing. The Box Map evolved in order to reduce the amount of time spent drafting separate maps for each chemical compound. Boxes of data are placed in open spaces around a map and lines or pointers are used to specify the wells that belong to each data set. The problem is that hazardous material spills usually are comprised of a number of different contaminants all with their own unique properties which cause them to migrate at different rates. Sites with multiple spills may be even more complicated. Presenting contaminant plume data with Box Maps is often problematic and difficult to visualize. The figures below were created as part of this study.

The Box Map took 140 minutes to complete while the groundwater flow and four individual chemical compound maps were generated by OptaHub in ten minutes. It is clear from the individual constituent maps that there are separate contaminant plumes. Contaminant concentrations are not obvious when looking at the Box Map, even though it is much larger in size.
VS.
USER FEEDBACK

NOTHING FELL THROUGH THE CRACKS

The software accurately uploaded the lab data into the database and there were no data gaps. It was easy to meet reporting deadlines since there was no wait for various professionals to complete separate phases of the reports.

REGULATORY APPROVAL

The regulators were particularly impressed with the automated statistical trend analysis. In fact, they decided not to request an additional offsite well at a project where the down-gradient well exhibited a decreasing trend.

NO ERRORS

Errors keep environmental consultants up at night. Repeat business is the key to survival and you are only as good as your last report. At best, simple mistakes erode the trust of clients and regulators. The worst mistakes, such as identifying contamination where it does not exist or vice versa, could end up causing litigation issues that far exceed the value of a consultant having to re-do the work. OptaHub eliminates the opportunity for many of the simple data transcription errors.

COLLABORATION

The cloud-based software platform allowed multiple team members operating from remote locations to securely access project data and review and edit reports.

DATA BACKUP

Most companies have backup procedures for PCs and servers. Sometimes backup procedures are followed and tested and sometimes they are not. OptaHub’s cloud-based software platform is backed up in the cloud and leverages modern data storage practices to ensure 99% uptime and full redundancy. This type of security and reliability is hard to match.

LACK OF CUSTOMIZATION

The software did not meet every data processing requirement. For example, sites with a remediation system had product recovery data, water treatment system data, and air quality data. This information did have to be tabulated separately and appended to the software generated reports. Of course this data was also manually added to the standard workflow.
CONSIDERATIONS

Changing habits can be difficult. Some of the professionals came up with lots of reasons to keep doing it the same old way: lack of customization, I like to use “professional judgment” when drawing contours, etc.

However, in order to maintain competitiveness, we have to question the belief that things should be done a certain way because “this is the way we have always done it.” Operational and investment decisions have to be made based upon scientific, accounting, and strategic planning objectives.

The value that OptaHub brought to the problem solving and decision making of the individuals on the team and to the financial performance of the team far outweighed the stress of change.

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