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AGRC/DOGM- Database Project

1 message

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Hi Matt,

Per our meeting, I've attached a short description of the Division's water quality collection/review process. Towards the bottom, you'll find a "wish list" that I hope is adequate enough for you to begin discussions with your folks in developing a scope of work.

If you have any questions, or need further clarification, please don't hesitate to contact me.

Thanks for your time.

Steve

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Utah Division of Oil, Gas and Mining (DOGGM)- Coal Program Water Quality Database- Wish list/Needs

1. Coal Program water quality data overview
 - a. Regulatory requirements
 - i. Per the hydrology regulations within the Surface Mining Control and Reclamation Act (SMCRA), permitted coal operators are required to conduct water monitoring (quality/quantity). The monitoring is conducted pre-, during and post- active coal mining operations.
 - ii. The data is typically submitted on a quarterly basis.
 - iii. The water monitoring requirements can vary somewhat relative to the amount of data required. However; SMCRA does identify the minimum requirements for both ground and surface water.
 1. Ground water- total dissolved solids or specific conductance, pH, total iron and total manganese, rates of discharge or usage and depth to water.
 2. Surface water- total suspended solids, total dissolved solids or specific conductance, pH, total iron and total manganese and flow rates.
 3. The Coal Program has developed a technical directive (Tech-004) that provides recommendations for additional water quality parameters. The majority of coal operators follow these recommendations.
2. Current Water Quality Database/Operation
 - a. Currently an APPX database is utilized by the coal program. It has been in operation since the 1990's.
 - b. The water quality and quantity data is uploaded into the APPX database remotely by the coal operators. Typically, the laboratory that performs the water quality analysis provides the coal operators a .csv file of the analytical results which can then be uploaded to the APPX database. In addition to the suite of water quality parameter concentrations generated from the lab, the coal operators also manually enter field data (e.g. pH, conductivity, temperature, dissolved oxygen).
 - c. Once the data is uploaded, the Coal Operators indicate the individual samples are "o.k." for uploading by Division hydrologists (i.e. a box is checked in the database to indicate the samples are good to go).
 - d. The Coal Program hydrologists then go through the water quality samples, check the "o.k." box for download and then update the database to bring the samples in. The data is then transferred to Microsoft SQL servers for use with any Microsoft Office product.

- e. The water quality data can then be brought into an Excel spreadsheet for analysis.
 - f. By in large, the APPX database has served the Coal Program and the coal operators well through the years. However; over time (and more frequently in recent years) the APPX database has become somewhat problematic from an operational/trouble-shooting stand point.
 - g. The Coal Program is very excited at the prospect of a new application/database that incorporates interactive, internet based GIS technology.
3. Potential Water Quality Database Wish list/Needs
- a. Coal Program's water quality database would require the following:
 - i. Allow for remote uploading of data by the coal operators and/or laboratory.
 - ii. Allow for operators to manually submit field data (e.g. pH, DO, Temp etc.)
 - iii. Allow for Coal Program hydrologists to edit/delete the data as needed. It's common for various water quality data to be submitted in error (e.g. transposition errors, data inadvertently submitted for the wrong monitoring site etc.). The ability to revise and/or delete a reported concentration or value for a given water monitoring site would be necessary.
 - iv. Once the data is approved the operators must not be able to change the data.
 - v. Allow for Coal Program hydrologists to establish and/or delete water monitoring sites as needed. Additionally, the ability to revise the required parameters on a site by site basis would be required. Water monitoring requirements are not static given the type of the resource being monitored relative to the timing of mining and/or associated activity that is subject to change over the course of time.
 - vi. Provide a simple standard deviation calculation to identify potential outliers relative to the historical data set. The APPX database will flag a value/concentration that is outside of 2 standard deviations from the mean.
 - vii. Programming in PHP or some other language that the Division of Oil, Gas and Mining would aid in maintaining and revising the database into the future.
 - b. Improved functionality/features of a new water quality database:
 - i. Additional quality assurance/quality control functions. Basic water chemistry QA/QC functions would be a great improvement (e.g. cation/anion balance). It would be advantageous if these QA/QC functions could be examined by staff hydrologists prior to bringing the data set in.
 - ii. The format should be such to allow for easy export to a GIS system.
 - iii. The format should be such to allow for easy backups of the database.
 - iv. The data is available through simple queries online.
 - 1. Ability to locate/analyze specific parameters and download data.