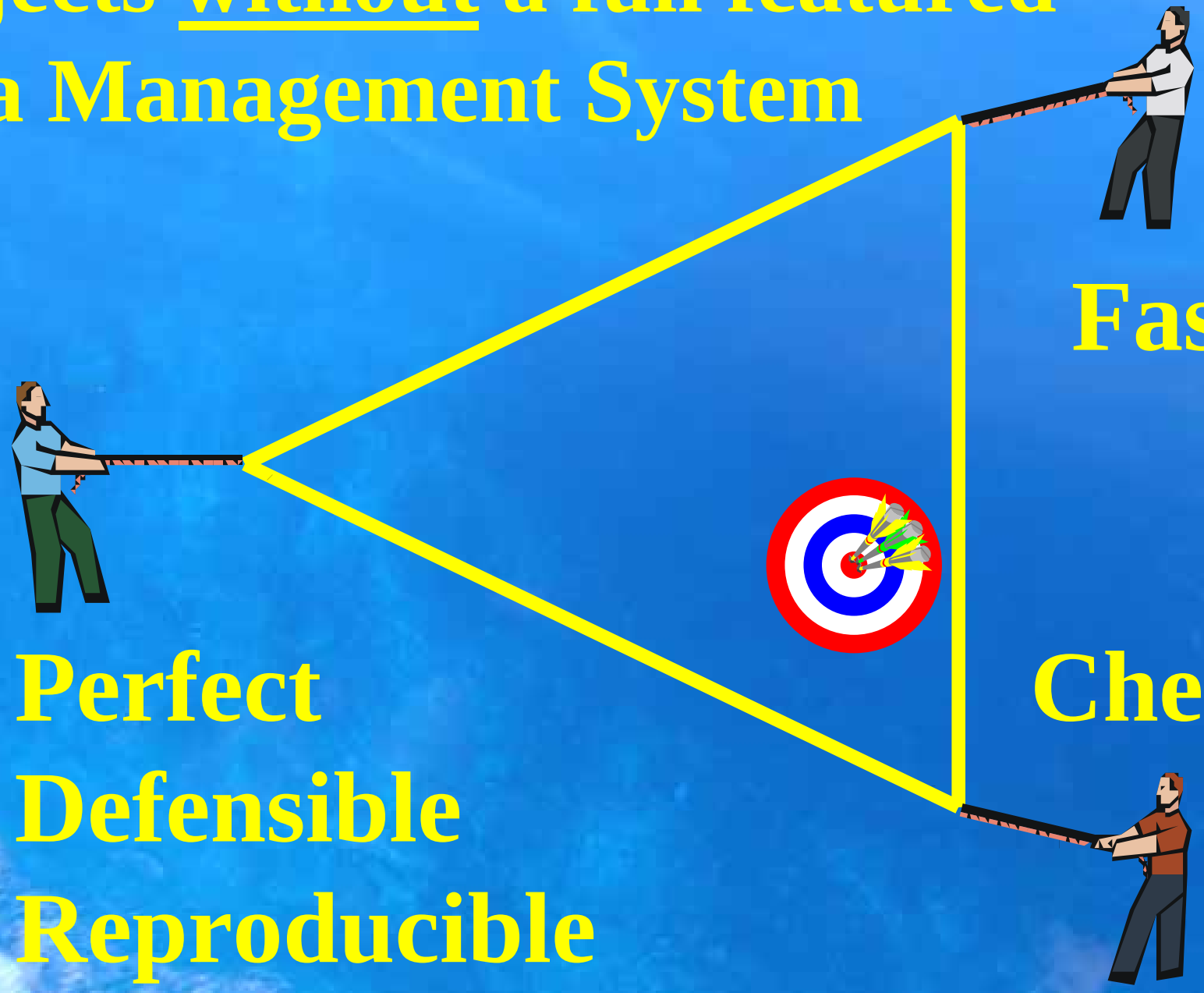
Flexible Cradle to Grave Data Management Tools for Complex Tasks Including Data Visualization, Data Evaluation, Optimization, and Site Closeout

David Greenberg
Jacobs Engineering
(865) 220-4828
David.Greenberg@jacobs.com
http://otisview.jacobs.com/database.htm

Conference on Accelerating Site Closeout, Improving Performance, and Reducing Costs Through Optimization

June 17 2004

Projects without a full featured Data Management System

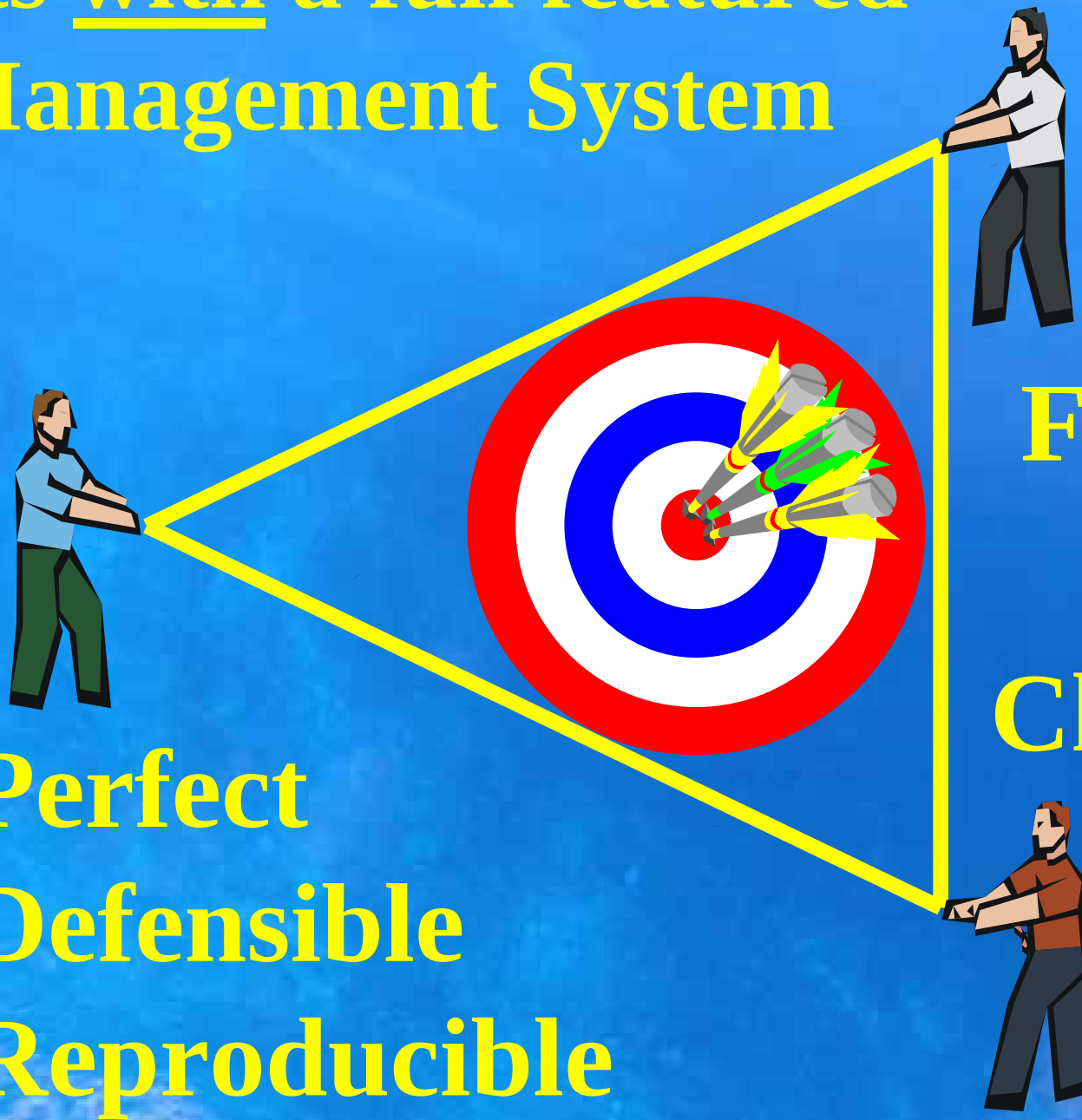


Fast

Perfect
Defensible
Reproducible

Cheap

Projects with a full featured Data Management System



Fast

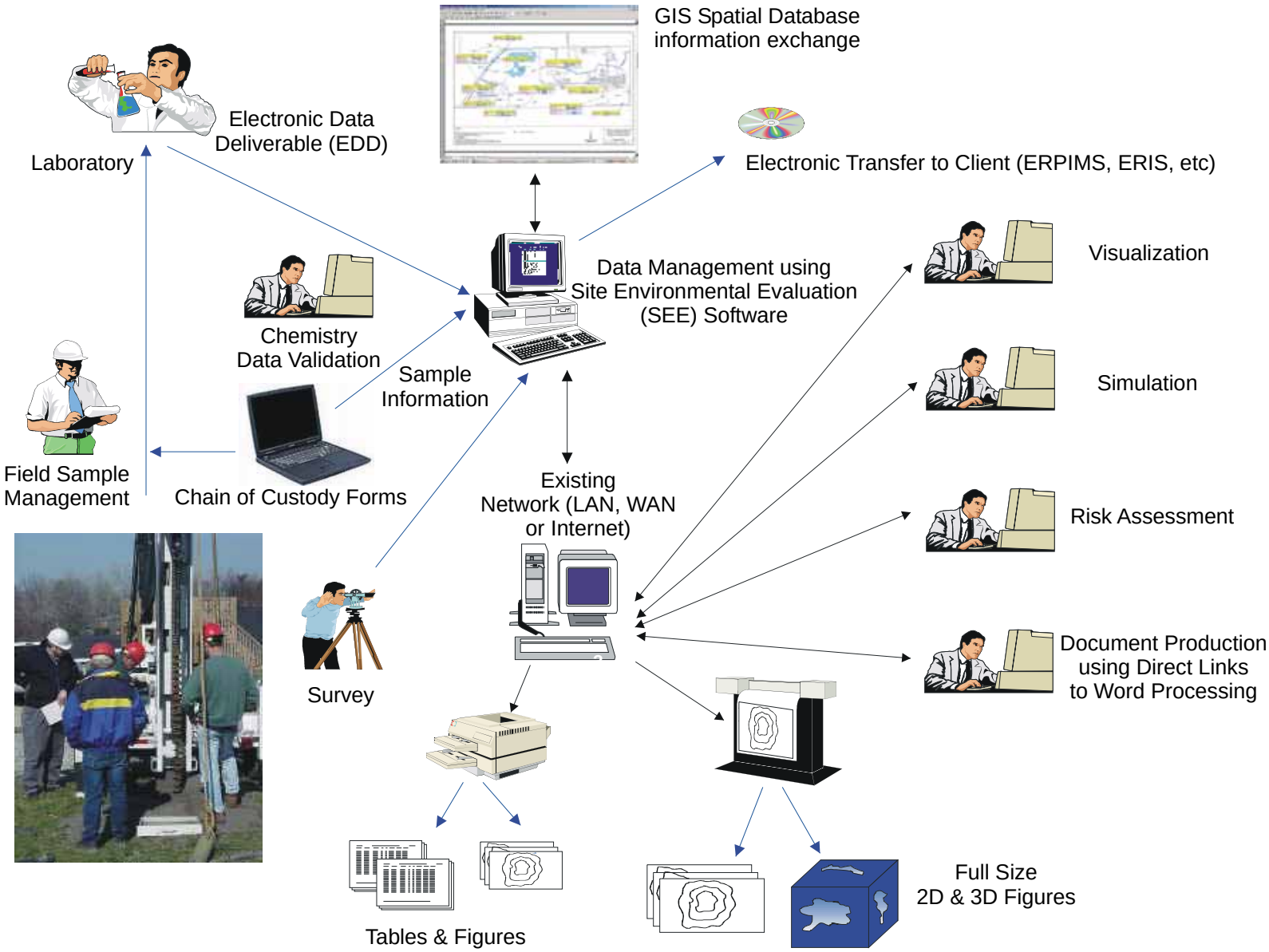
Cheap

Perfect

Defensible

Reproducible

Typical Data Flow

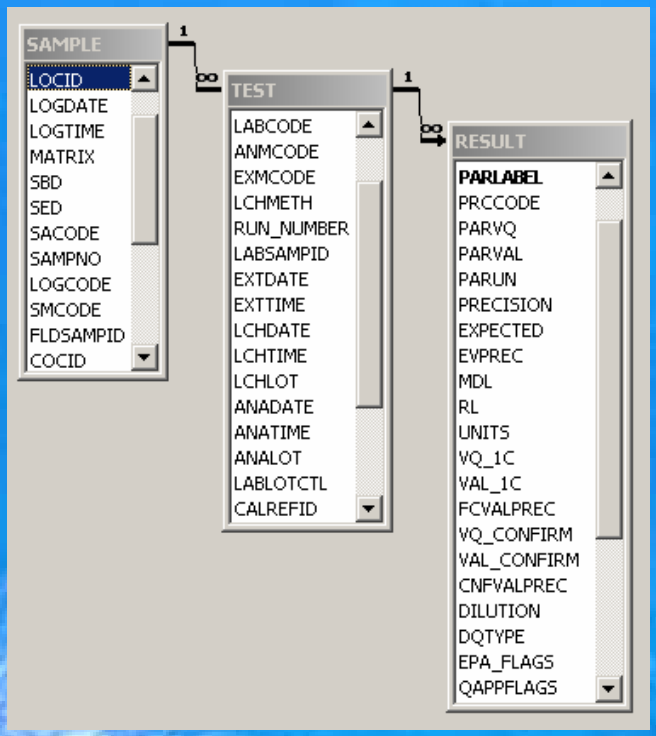


All Data should originate from a single source

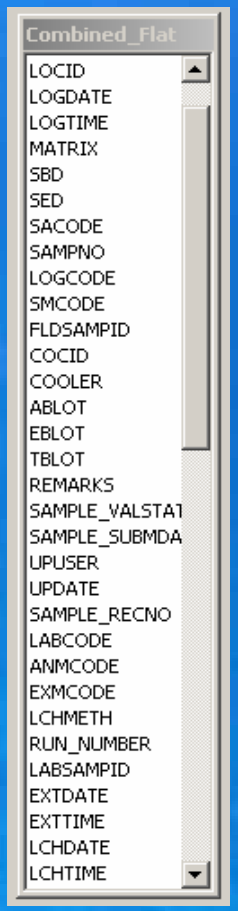
- Avoid duplicate data entry/corrections
- Identify Owner/Administrator and be realistic
- If master version of data is another database, then update information frequently

Database information exchange approach

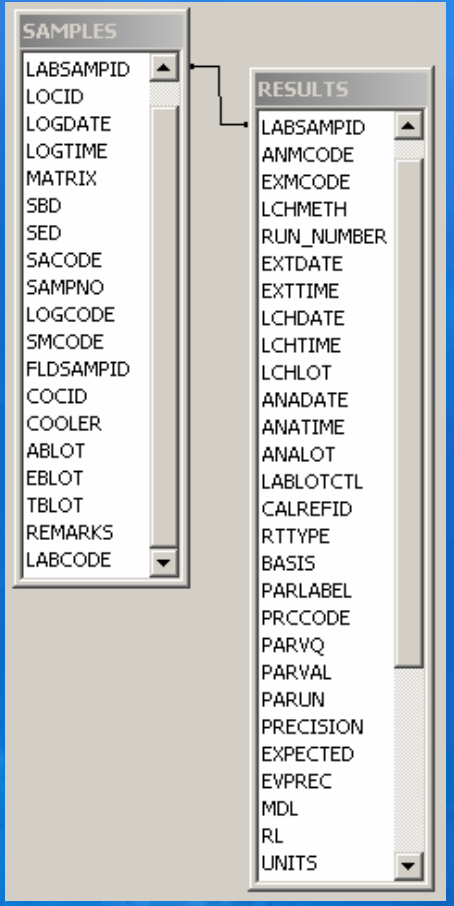
Source Database



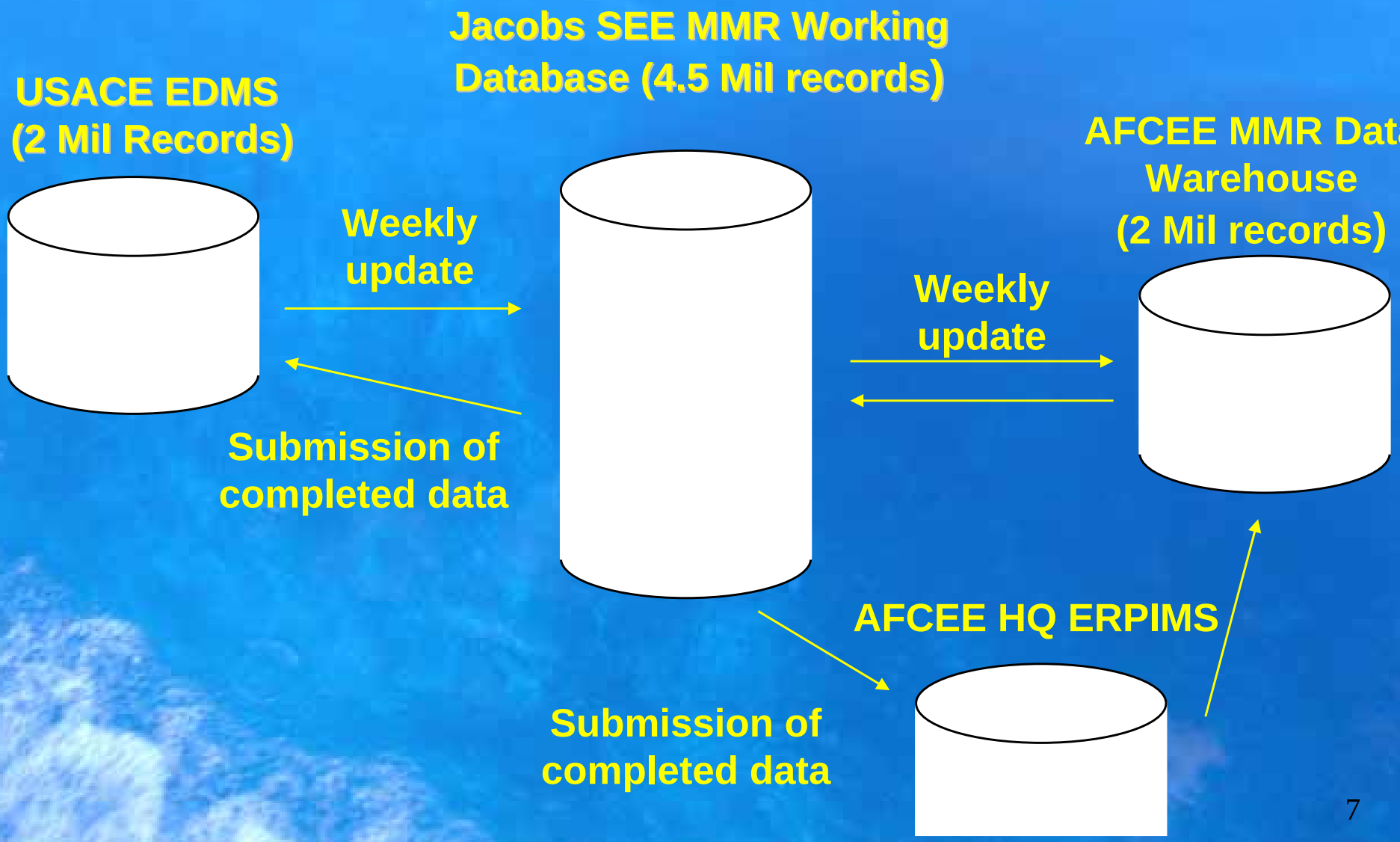
Temp Table



Destination Database



Case Study: Database Information Exchange at MMR



Populate as much data as possible

- The sum of the QA/QC benefit is greater then the sum of the effort
- The QA/QC benefit is especially good for dates, depths, and measurements that have relationships
- Possibly required for project closeout exports to ERPIMS, ERIS etc

Data Defensibility

- Automated QA/QC at each step
- Automated log of edit history
- Restricted Edit Privileges
- Processed on a Proven System

Automated QA/QC is essential on large projects

Example:

At MMR, the working database Site Environmental Evaluation (SEE) that Jacobs uses contains over 300 million data values. This would take someone 417 years of work to make even a single pass through the database to manually check the values if they check one value every 10 seconds.

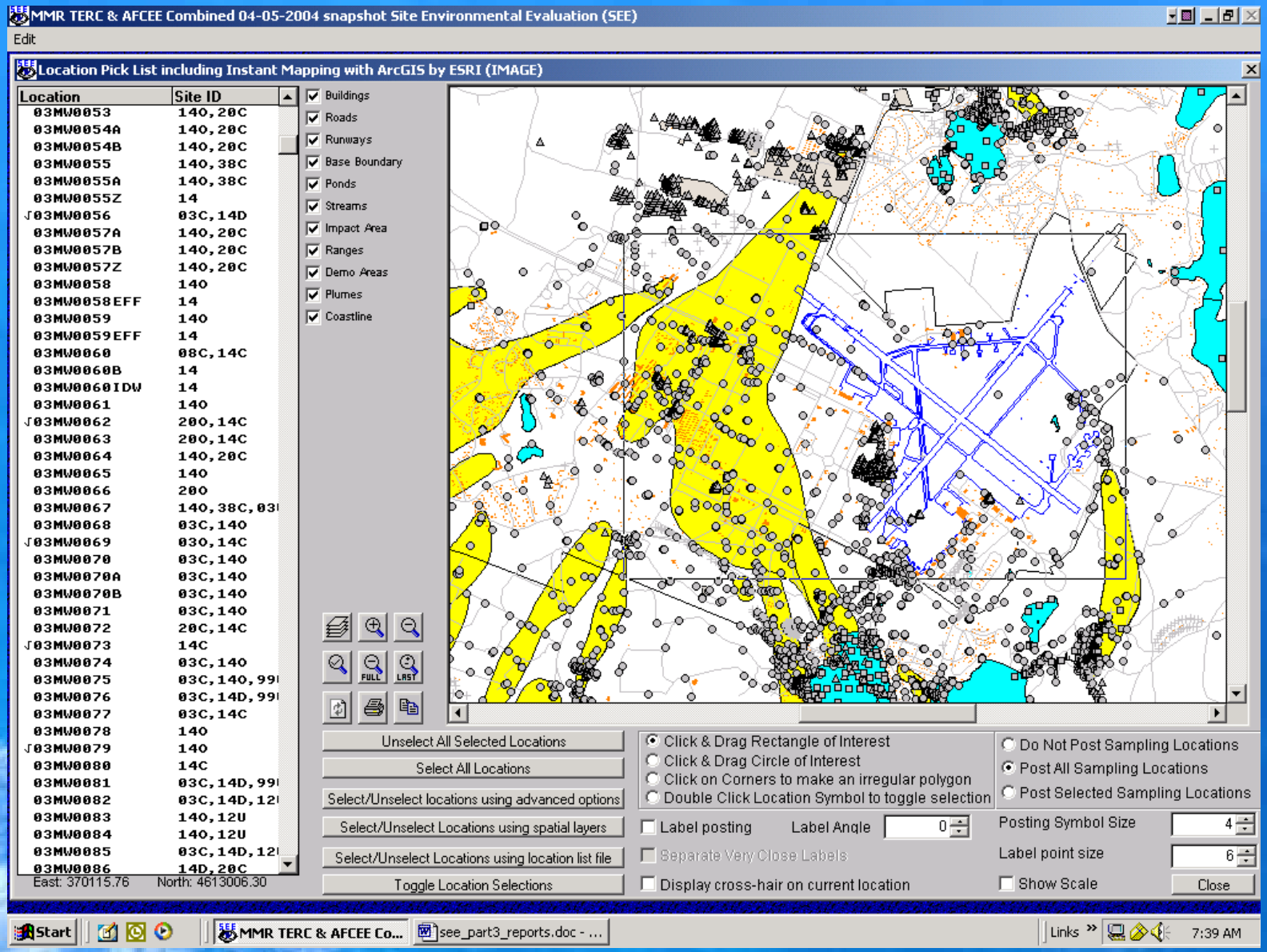
Project Configurable System Flexibility

- Needs to be compatible with USACE, AFCEE, EPA, DOE, Navy using look up lists and configuration files
- Data driven edit screens and report modules allowing new fields to all tables
- User configurable reports
- User configurable browse/edit screens
- Data review and auto-flagging tools based on project validation criteria

Capacity Issues

- More than just the back end database
- Interface limits (i.e. lists of 32K+ locations, 128K+ samples, auto spanning of Excel sheets, etc.)
- 2 GB output limit on Windows PCs
- Transfer speed over the web for large queries

Users should be able to choose locations out of thousands using a variety of methods



“On the fly” Compression Performance Gains

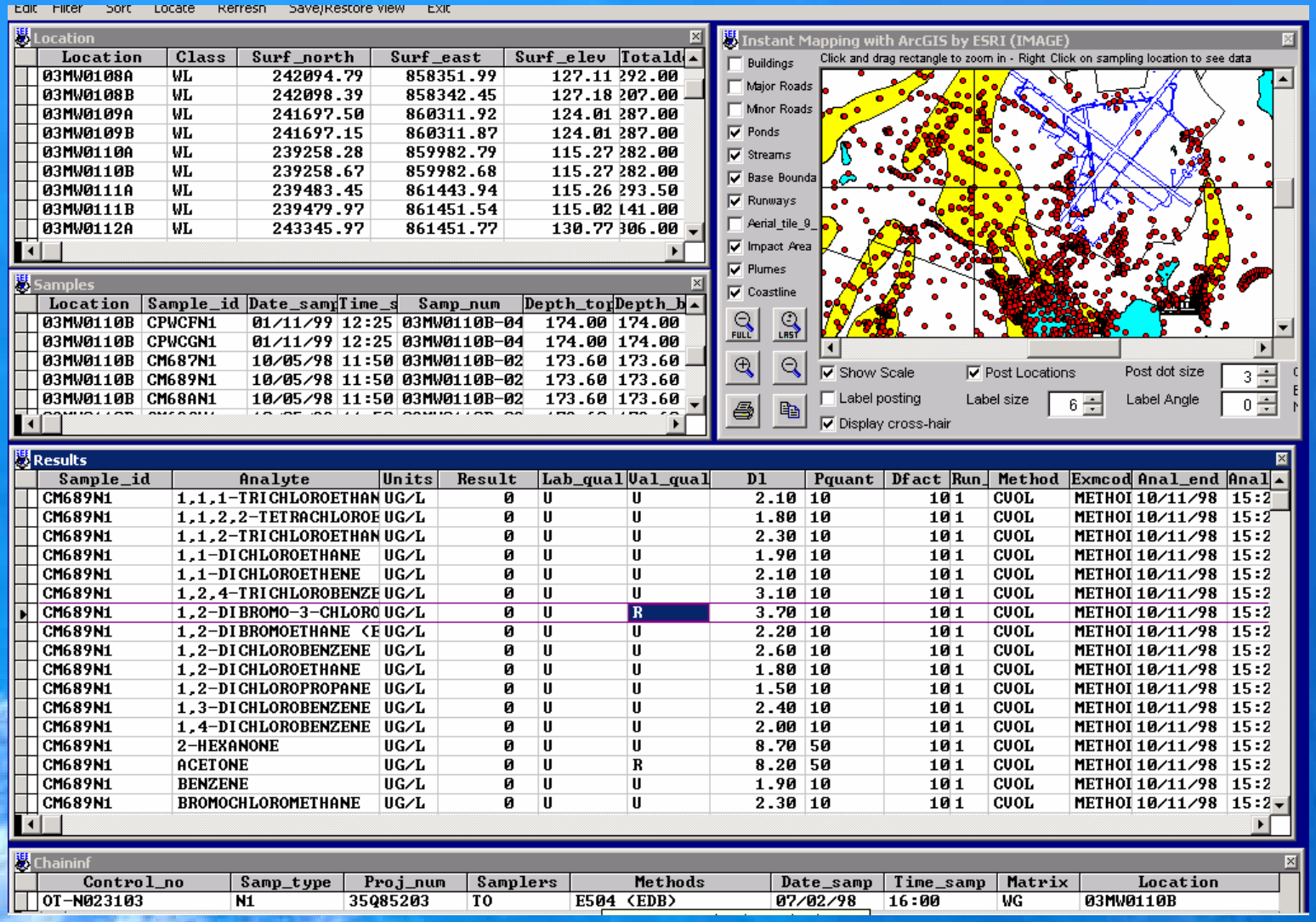
Example:
Approximate time to query 1 million records over the Internet with a 512KB connection

File Type	Uncompressed transfer time	Compressed Transfer Time
.CSV	40 Min	3 Min
XML	3 Hrs	12 Minutes

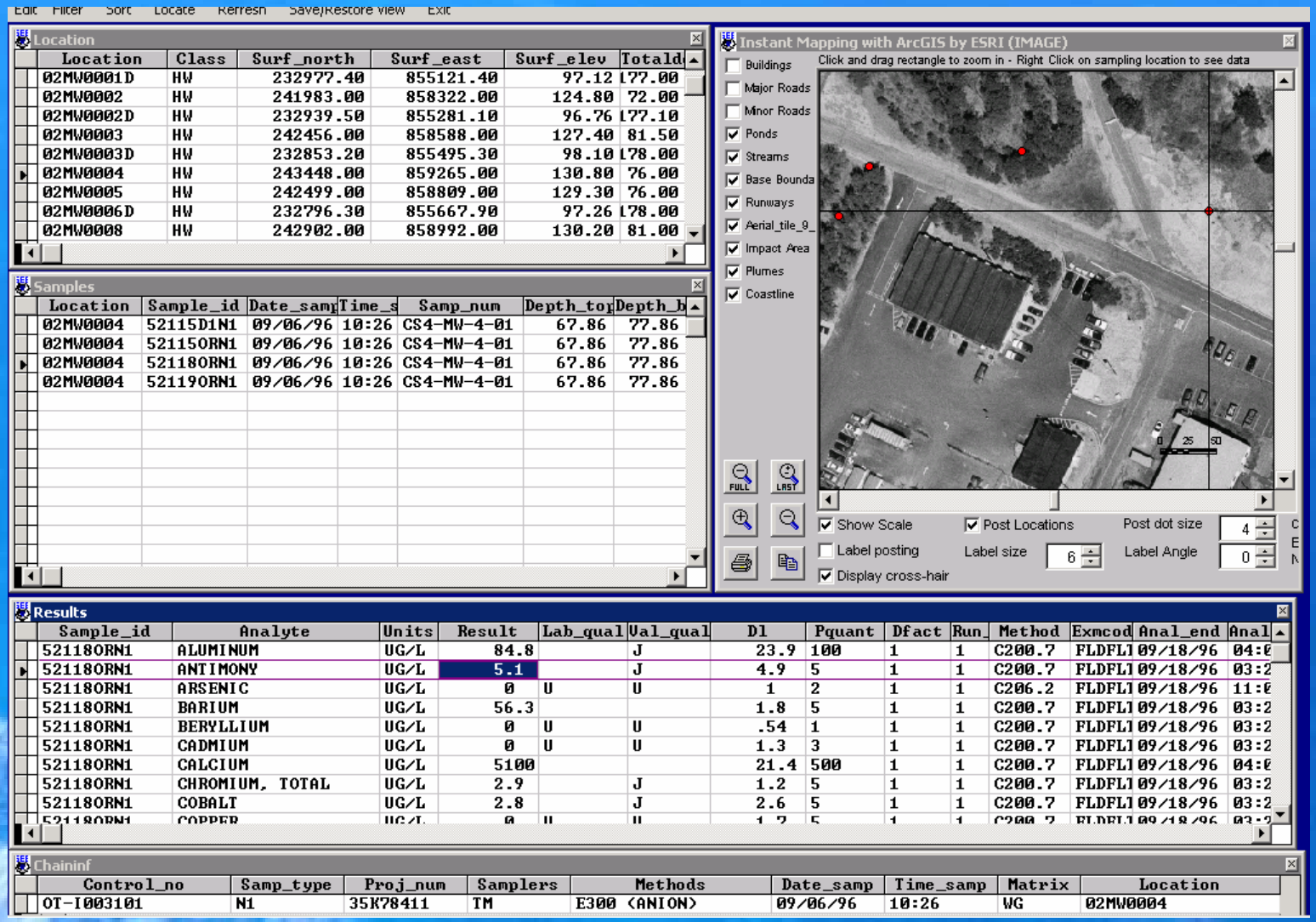
Innovative Technologies developed by Jacobs Engineering

- Relational Browse/Edit data windows joined directly to instant map windows
- Remote Internet users have the same features as local users and “On the fly compression” for fast performance
- Data Review and Flagging Tools (DRAFT)
- Automatic links with other software to create maps and figures

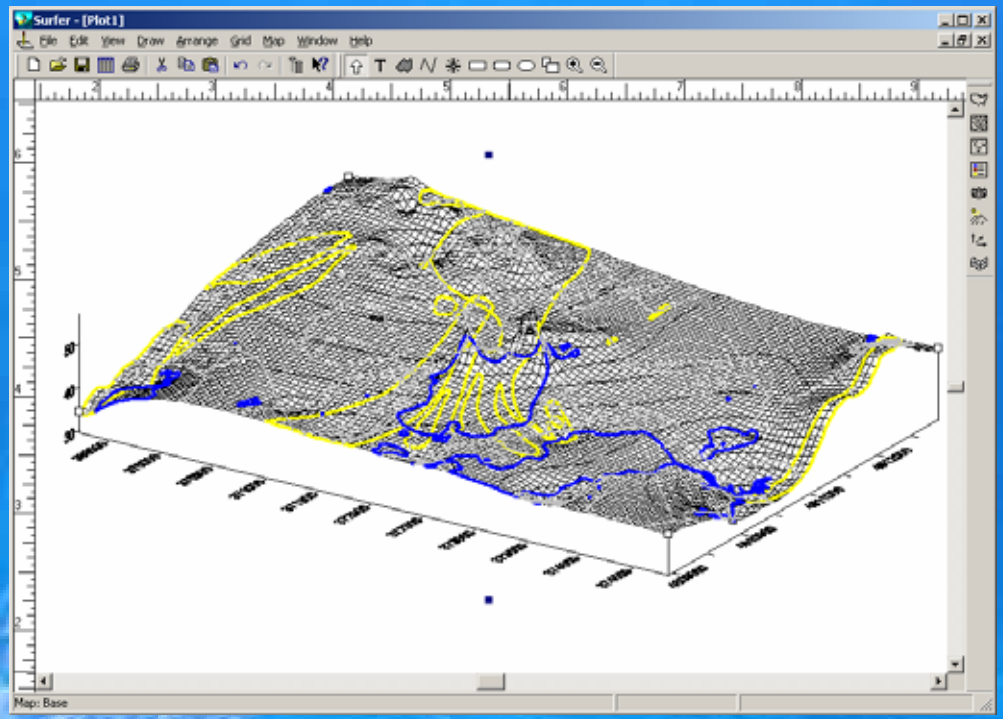
Browse/Edit data windows are linked directly to instant map windows

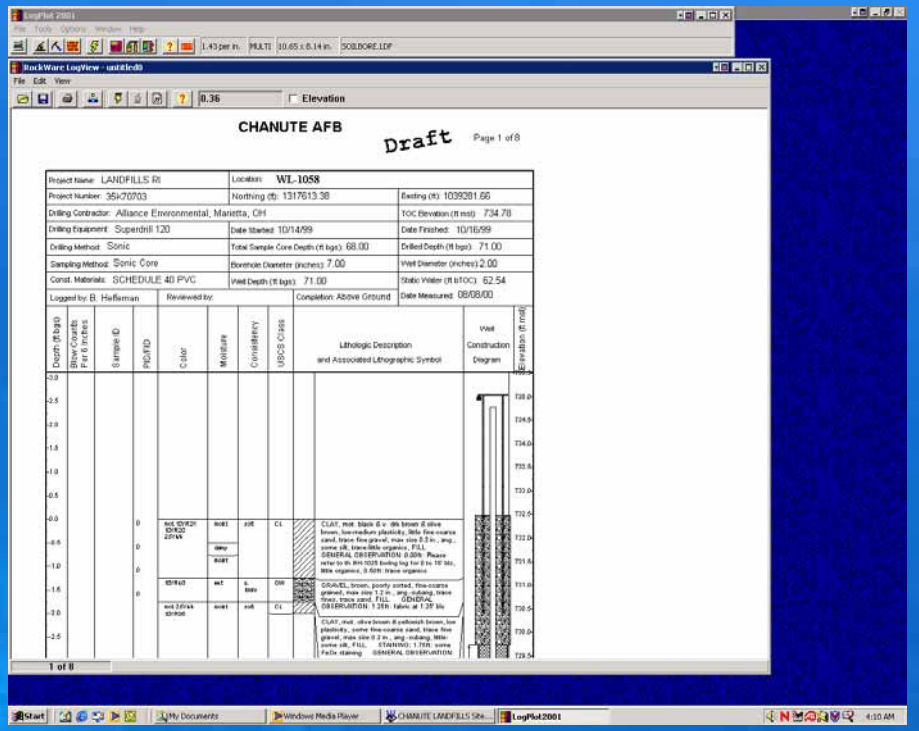


Maps can include both Vector and Raster spatial layers such as Aerial Photos

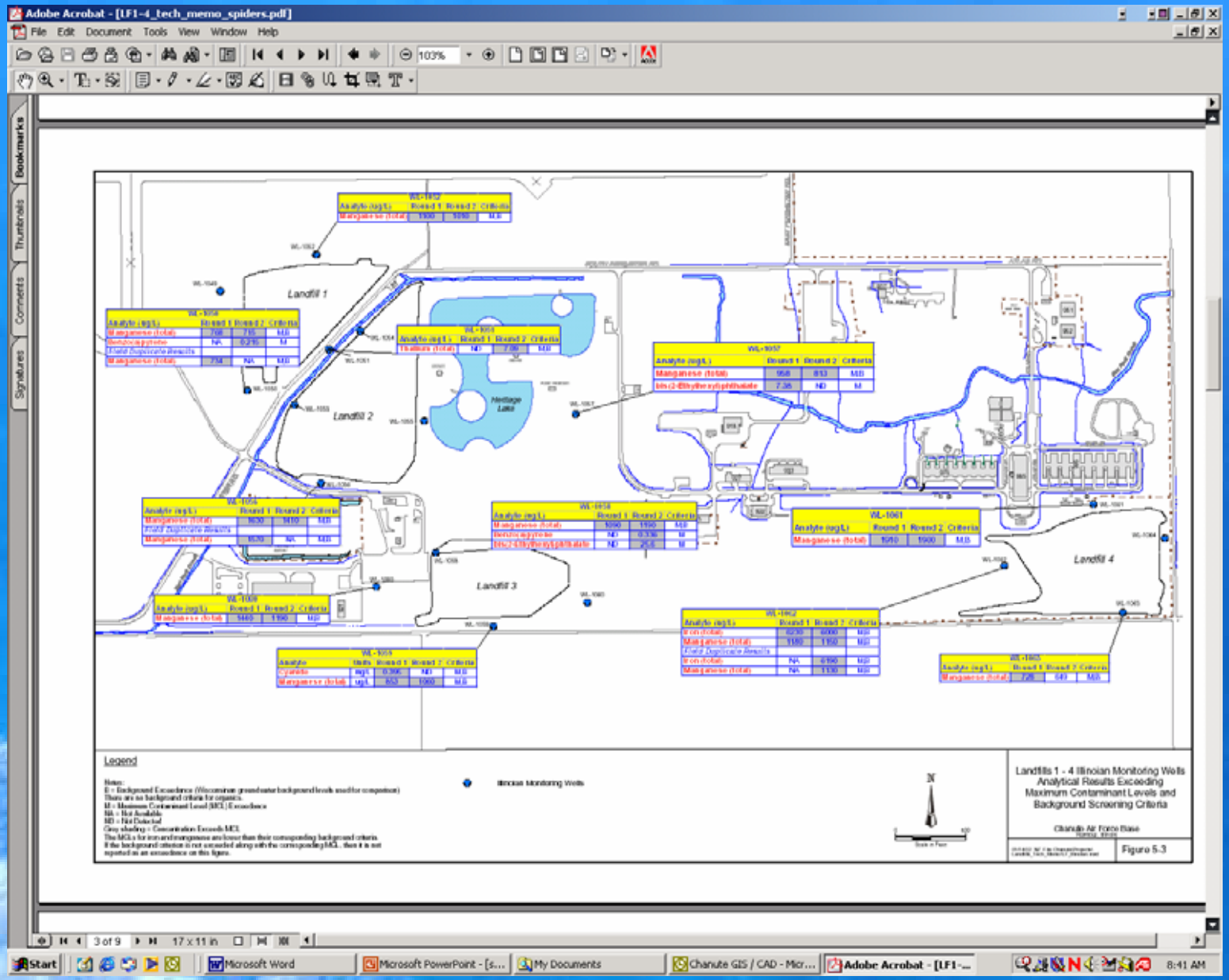


Here are examples of direct links to contouring and boring log software

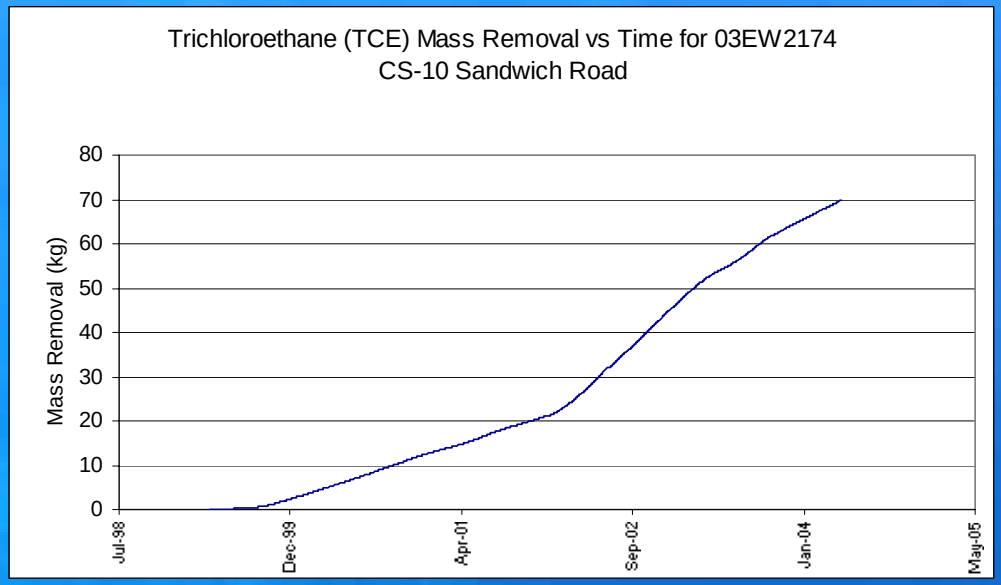


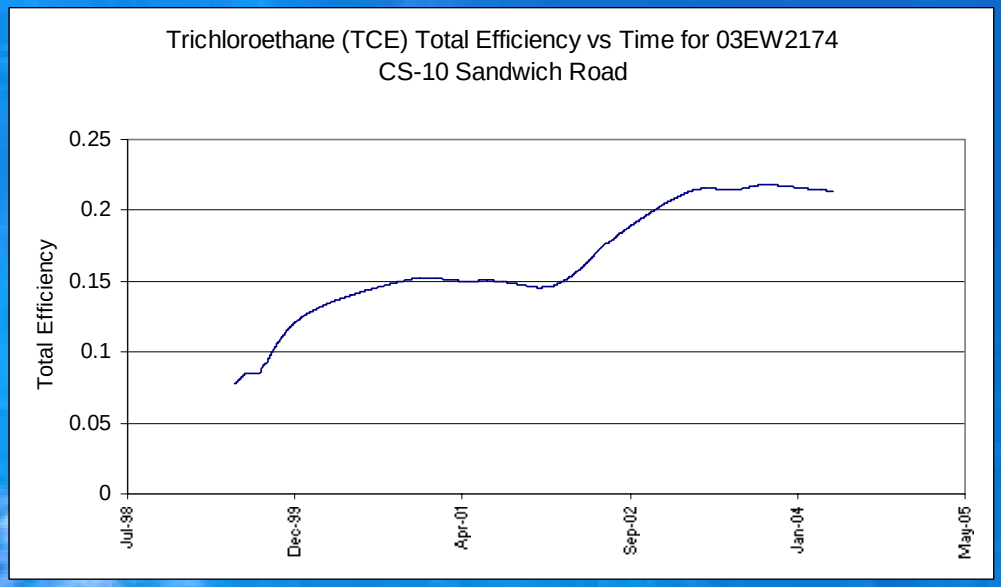


Automating Spider diagrams to query database results and compare to risk criteria



History of Operations & Modeling Evaluations (HOME)





David Greenberg
Jacobs Engineering

(865) 220-4828
David.Greenberg@jacobs.com
http://otisview.jacobs.com/database.htm