Data Management Within the Legacy Landfill Branch of the DTSC

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What We're Going To Talk About

- History of Stringfellow Database
- Present Status of Database/What We Can Do With It
- Lessons Learned

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Data Management Prior To Database

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Decision to Create a Database-1998

- Large Amount of Data, Only Going to Get Larger Over Time

- Can Not Efficiently Operate/Monitor/Investigate Stringfellow Site Without a Database

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Tetra Tech Delivers EMAGIS Database - March,1999

- Converted Truckloads of Paper Data to Digital
- Designed Database Structure
- Microsoft Access Based
- Competent Access Users Can Retrieve Data
- Desktop Data Storage

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A Giant Leap For Data Management at Stringfellow

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Management Makes a Good Decision

- All Data In One Container (database)
- Everyone Has The Container (Microsoft Access)
- Permitted Access Users to Retrieve Geology, Chemistry, Water Level, and Flow Data
- Staff Could Use Data to More Efficiently Operate/Monitor/Investigate Stringfellow Site

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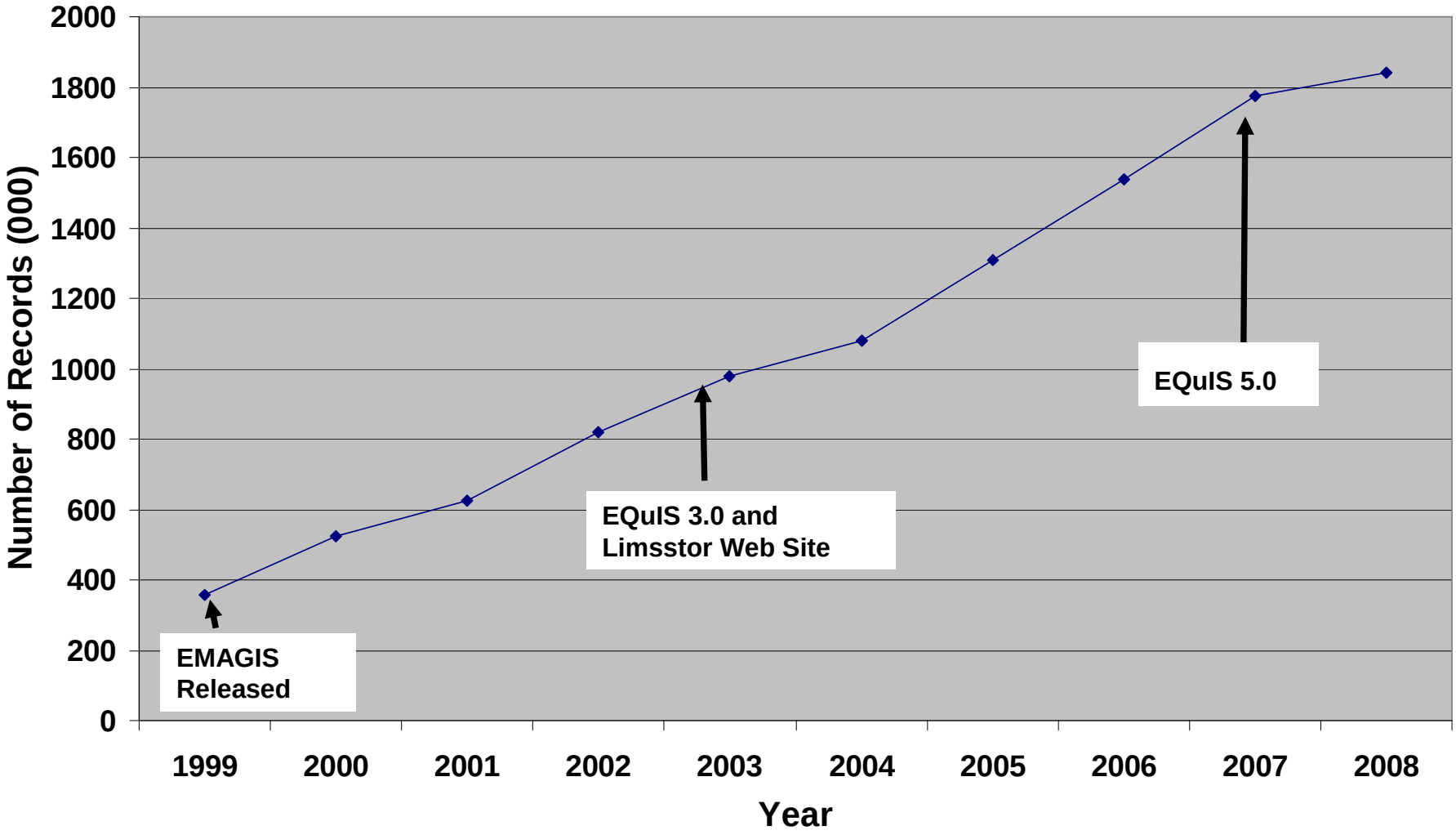
Records in Legacy Landfill Database (Stringfellow Only)



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DATA IN

EMAGIS Access Database

DATA OUT

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Moving Past EMAGIS

- Electronic Data Deliverables
- Greater Reporting and Data Extraction Capabilities
- Better User Interface
- Interfaces to Other Software Applications
- Greater Storage Capabilities
- Broader User Base
- Enterprise Capabilities
- Chemistry Data Validation (EPA Level II)

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EarthSoft EQuIS 3.0 - December, 2002

- COTS (Commercial Off The Shelf)
- Established Company
- Fixed Yearly Cost
- A More Robust Database system
- Handles Electronic Data Deliverables
- Interface to Other Applications (ArcGIS, Rockworks, gINT, GMS, EVS, LogPlot, Surfer, LogPlot, Environmental Insite, …)
- Large User Base
  - Over 2,900 systems sold world-wide
  - 450 member User Group

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A Website is Born LIMSstor – December, 2002

- http://www,Limsstor.com (Laboratory Information Management System Storage)
- Processed EDDs From Chemistry Validator (LDC)
- Started With a Single FTP Site
- Data Upload and Approval
- Enabled Web Based Reporting
- Software Distribution

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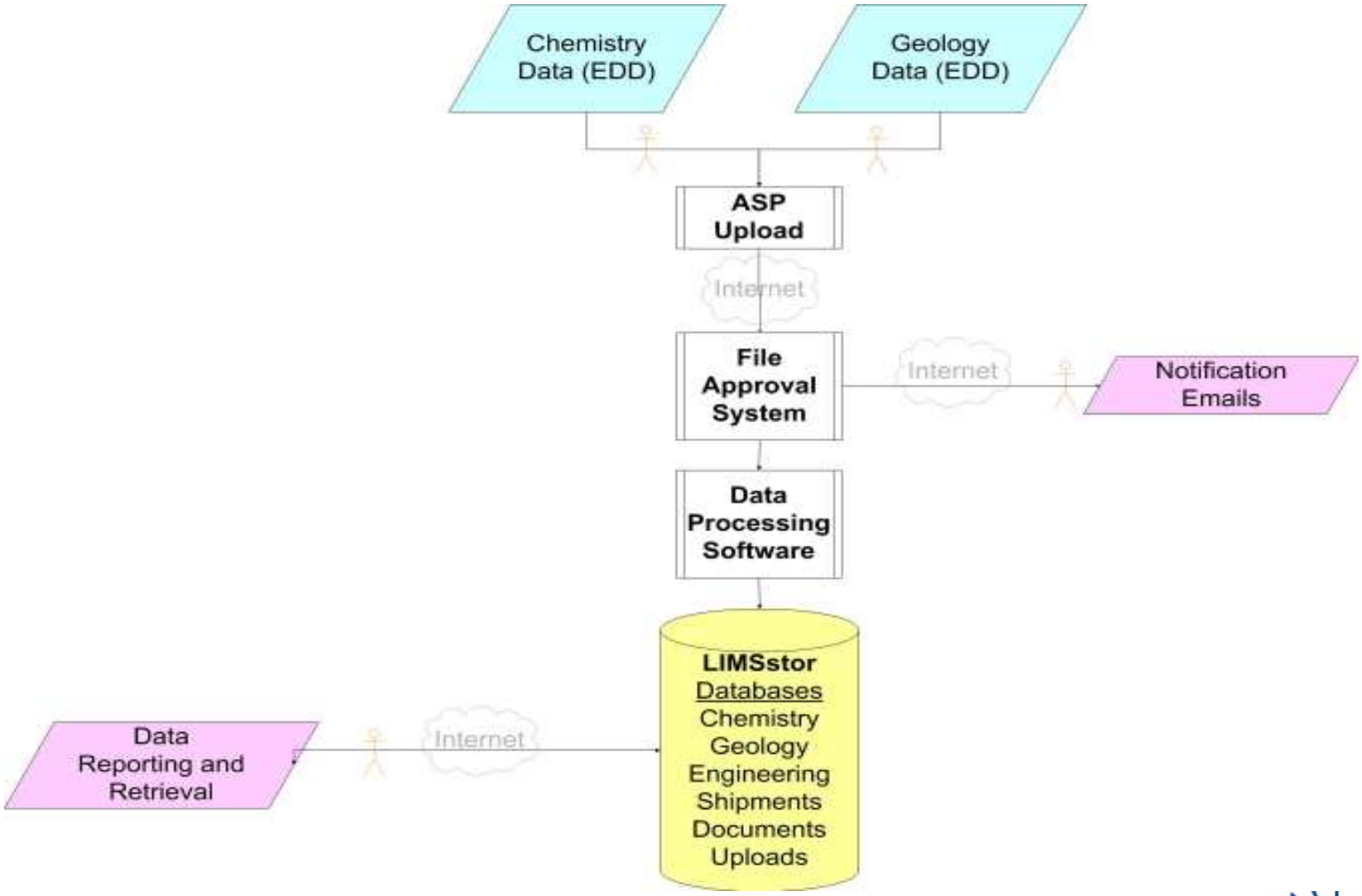
EQuIS 3.0 and LIMSstor



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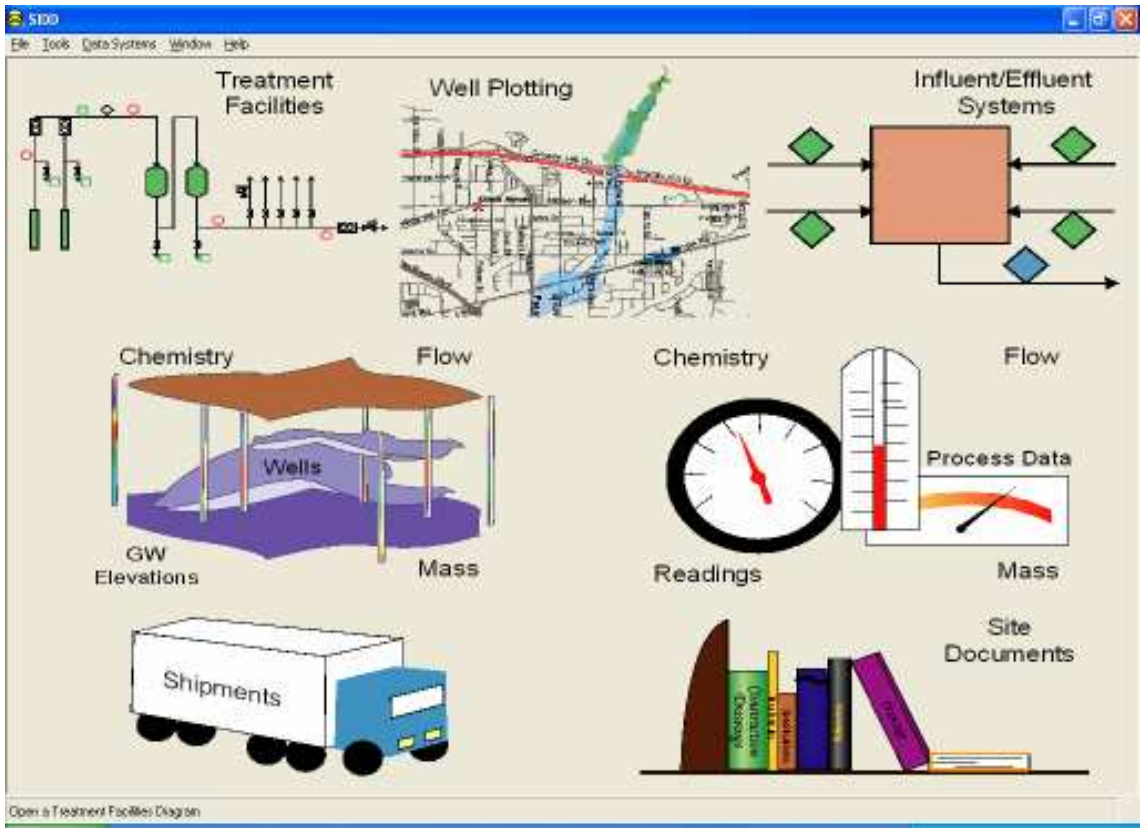
Moving Past EQuIS 3.0

- Desktop Based, Custom, Database Front-end
- Access Database Structure
- Limited Storage Capability
- Move from Desktop to Enterprise Database System
- More Diverse Tool Set
- Latest Product
- Decrease Cost of Maintaining Custom Code

Stringfellow Interface for Data and Documents (SIDD)

- Wizard Based
- Calculates Flow
- Calculates Mass
- Time-Series Graphs
- Exports to Excel
- Plotting (via Visio)



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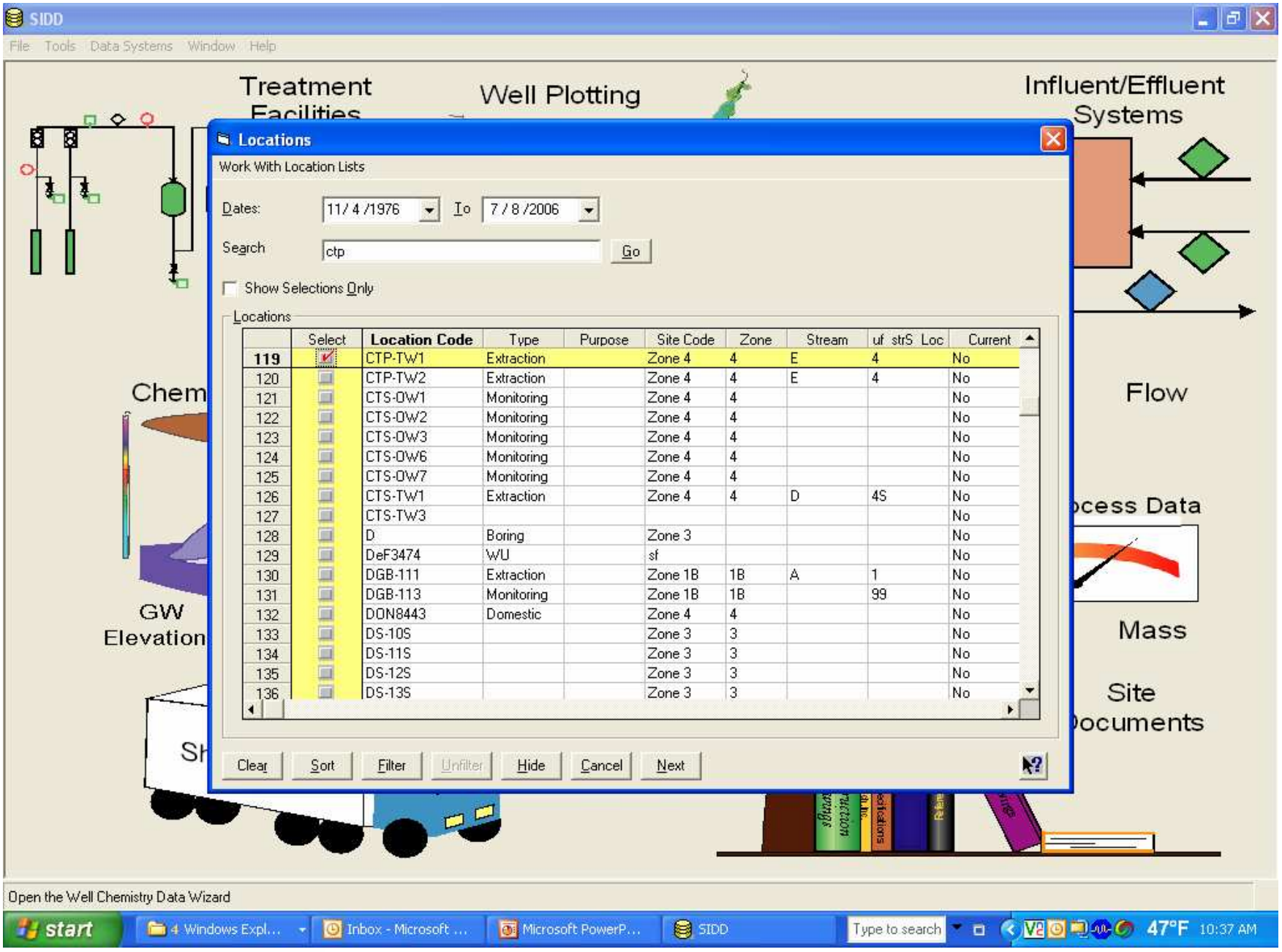
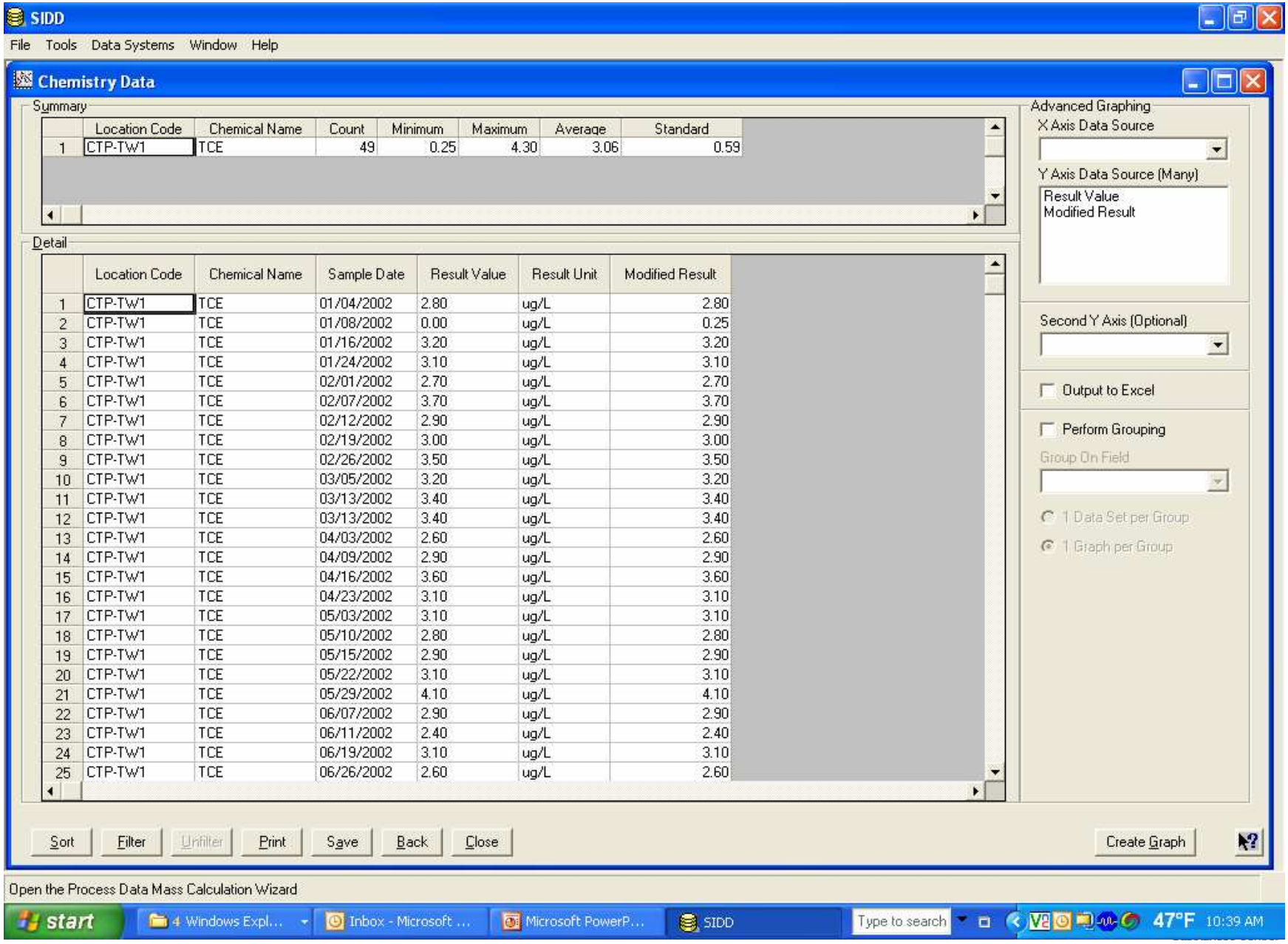
SIDD-Wizards



SIDD-Wizards



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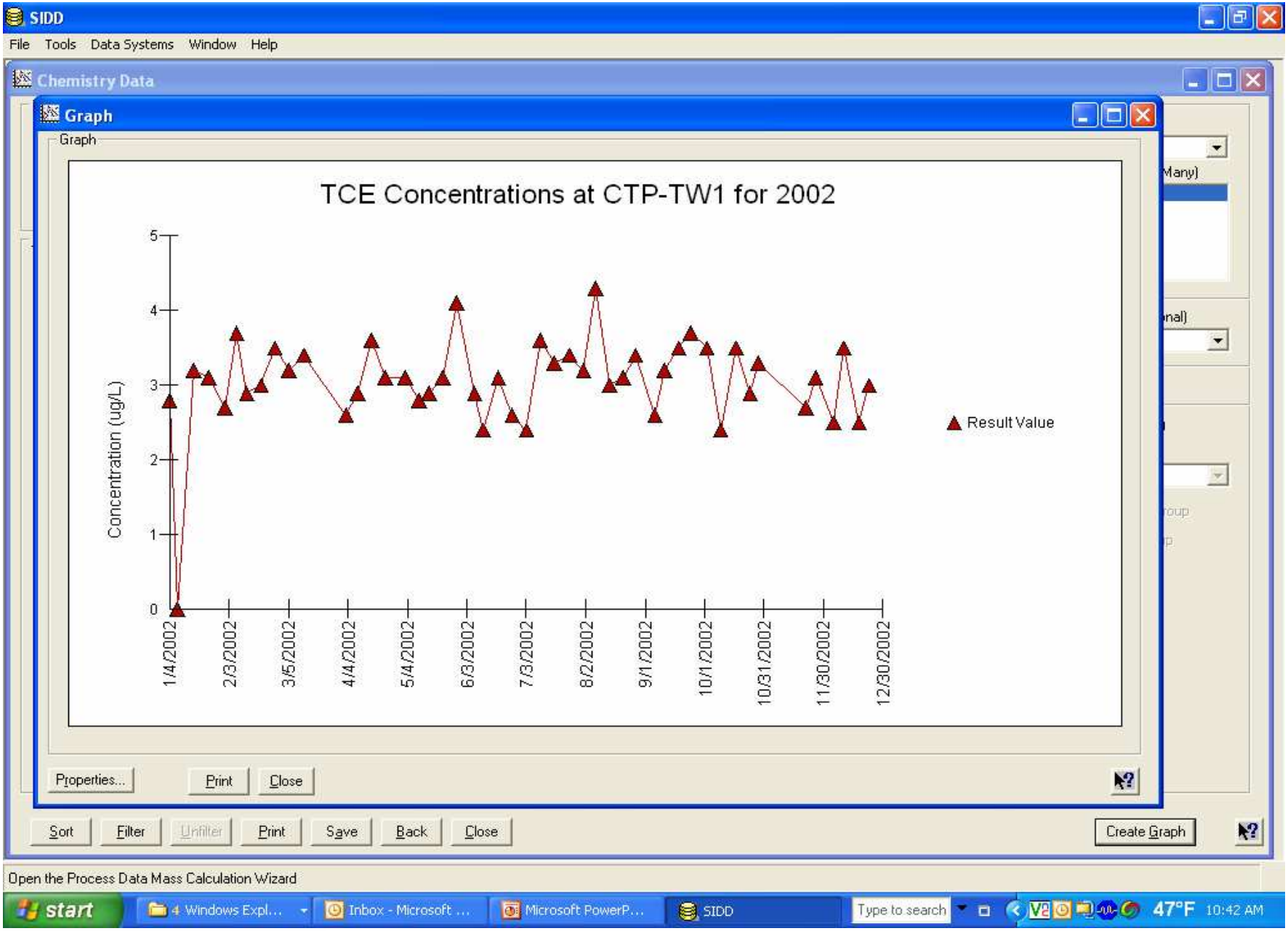

EQuIS 5.0-December 2006

- Web Based Data Tracking and Approval
- Broad Range of Canned EDDs
- Custom Reports
- Latest Product
- SQL Server Database
- Unlimited Storage
- Existing Cost Structure
- Latest Hardware

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DTSC - Site Map - Microsoft Internet Explorer
File Edit View Favorites Tools Help
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Stringfellow LIMSstor Website
About Us
Site Map
Field Measurements
Field Inspection Data
Document File Uploads
Shipment Data
Site/Facility Locations and Equipment
Software
Upload Management
Data Checker
Help
Share Points
EQuIS Enterprise
SQL Report Manager
About Us > Site Map
Field Measurements
• Add a New Instrument Reading
• Edit an Existing Instrument Reading
• View/Extract Data
Field Inspection Data (Site Events)
• Add a New Site Event
• Edit an Existing Site Event
• View/Extract Data
Document/EDD File Uploads
• EDD File Upload
• COC File Upload
• Haz Waste Manifest File Upload
• Weigh Master Cert File Upload
• Permit File Upload
Shipment Data
• Add a New Shipment Record
• Edit a Shipment Record
• View/Extract Data
Site/Facility Locations and Equipment
• Field Measurement Locations
• Equipment Characteristics
• Chem/Geo Locations
Software
• STDET for the Barcode Reader
• SIDD
• Zone Finder
• Alias Generator
• COC v2.0 Installer
Upload Management
• Approve Data Uploads
• View Uploads History
• Manage Pre-Approval Rights
• Manage Approval Notification
• Manage Completion Notification
• Manage Who Can Approve Edd Uploads
Data Checker
• QA/QC Data Checker
Document/EDD File Downloads
• Process Database Template
• EQuIS EDD Template
Analytical Chemistry Data
• EQuIS Enterprise
Internet

Data Approval and Notification System

- System Uses Combination of EQuIS Enterprise 5.0 and Custom Processor
- Authentication
- Authorization
- Notifications
  - Approval needed
  - Processing complete
  - Error reporting

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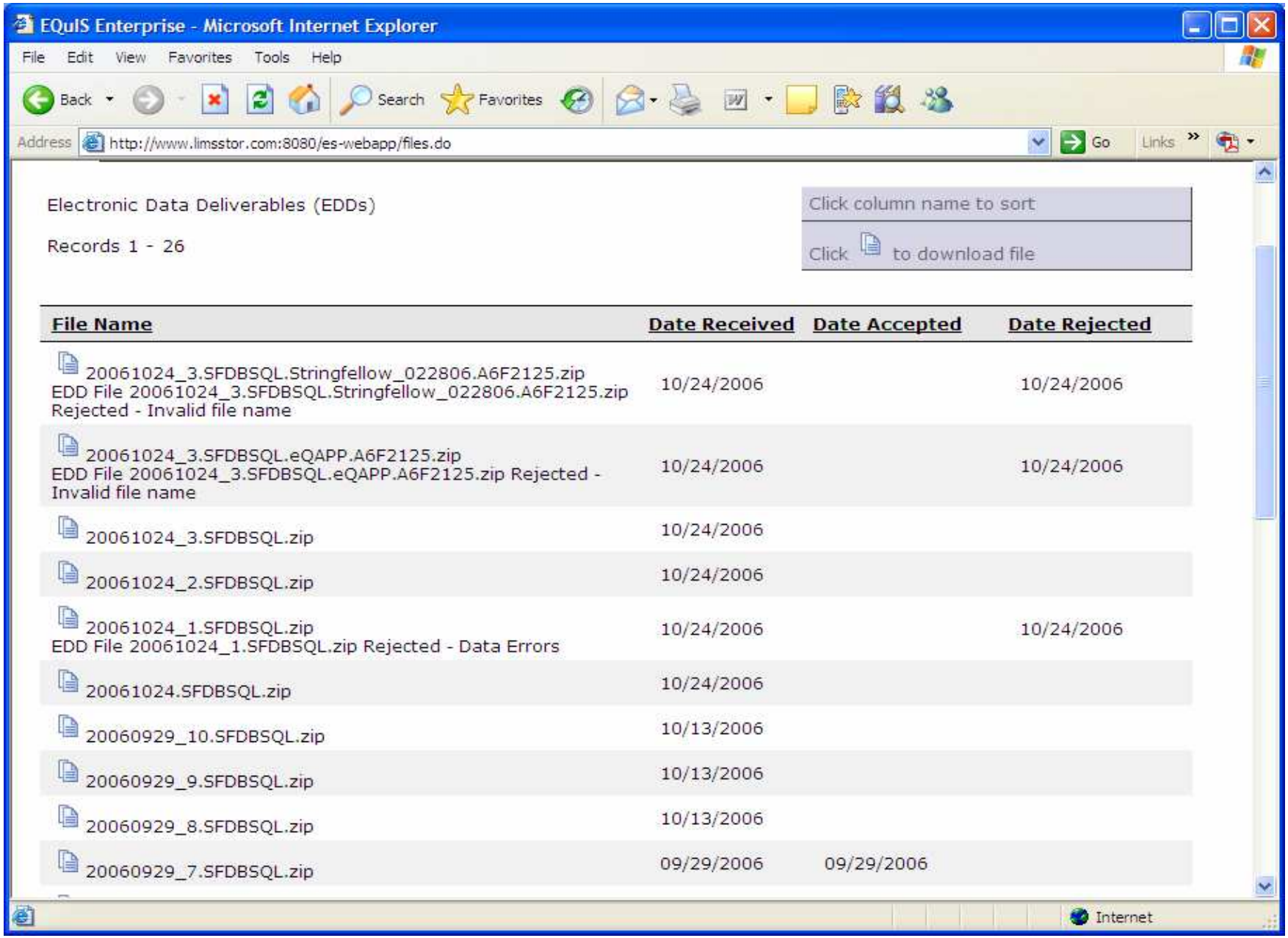
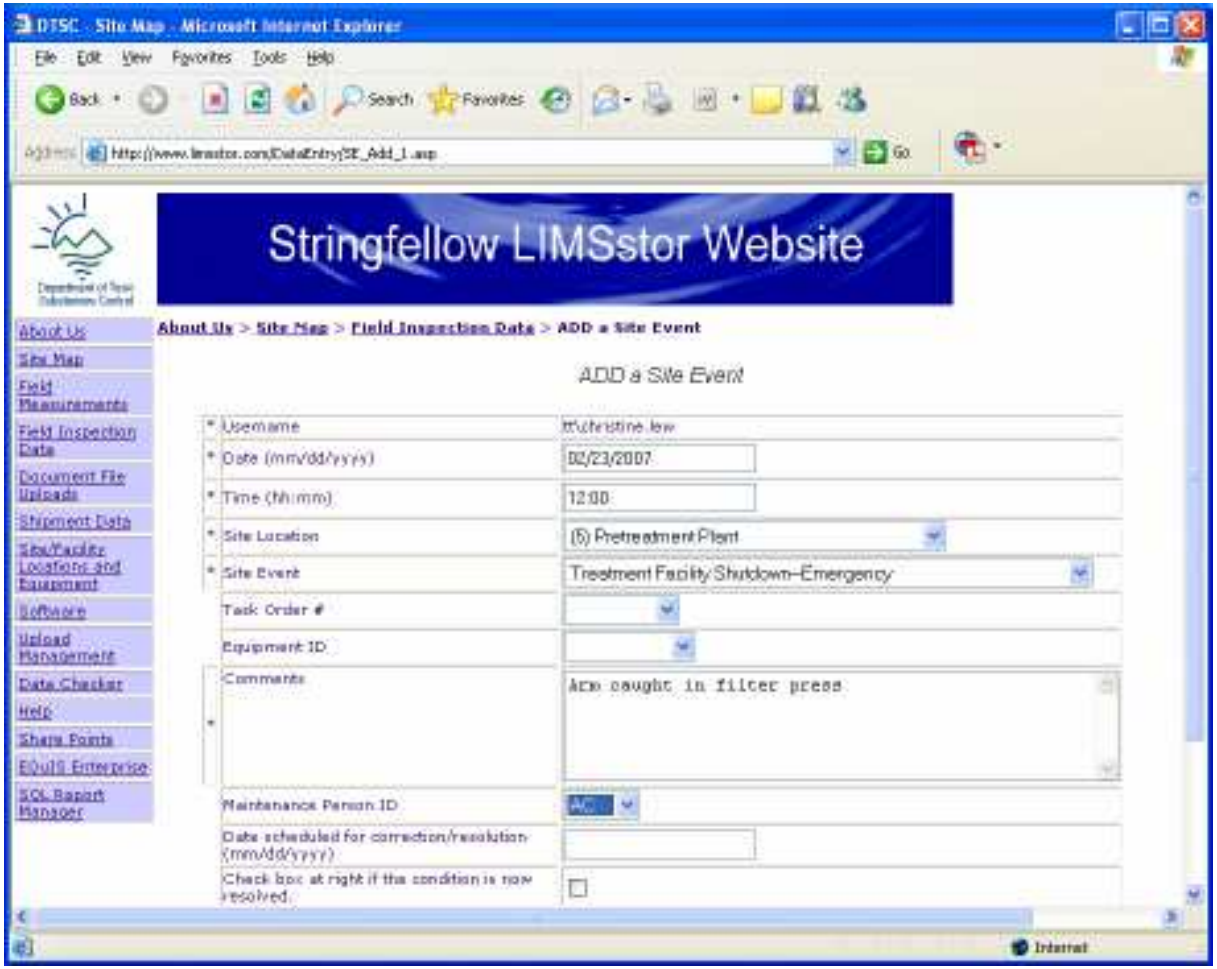
EQuIS Enterprise



Web Site Data Entry

- Available For All Types of Data
- Secure Access
- Selection Lists
- Verification on Save



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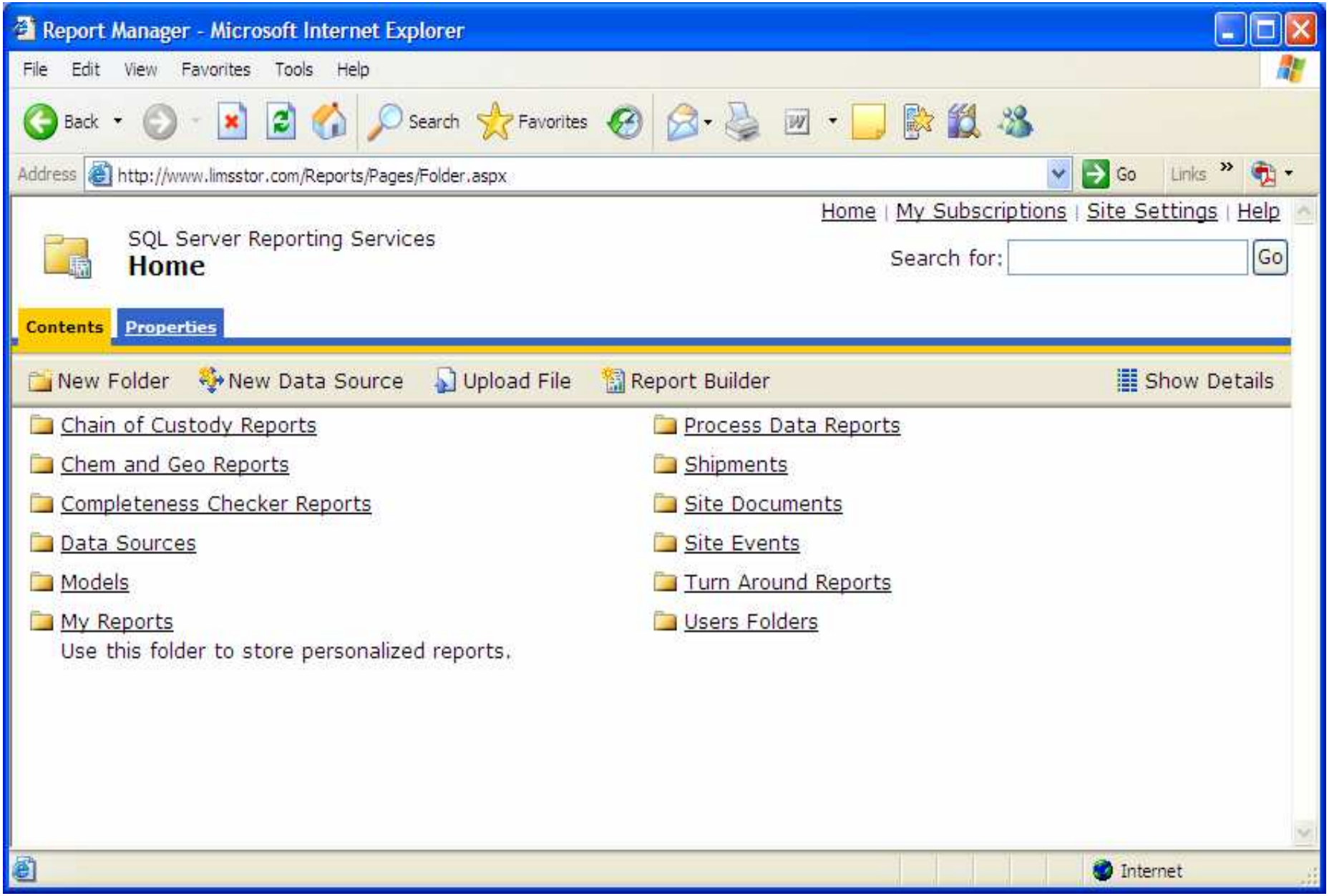
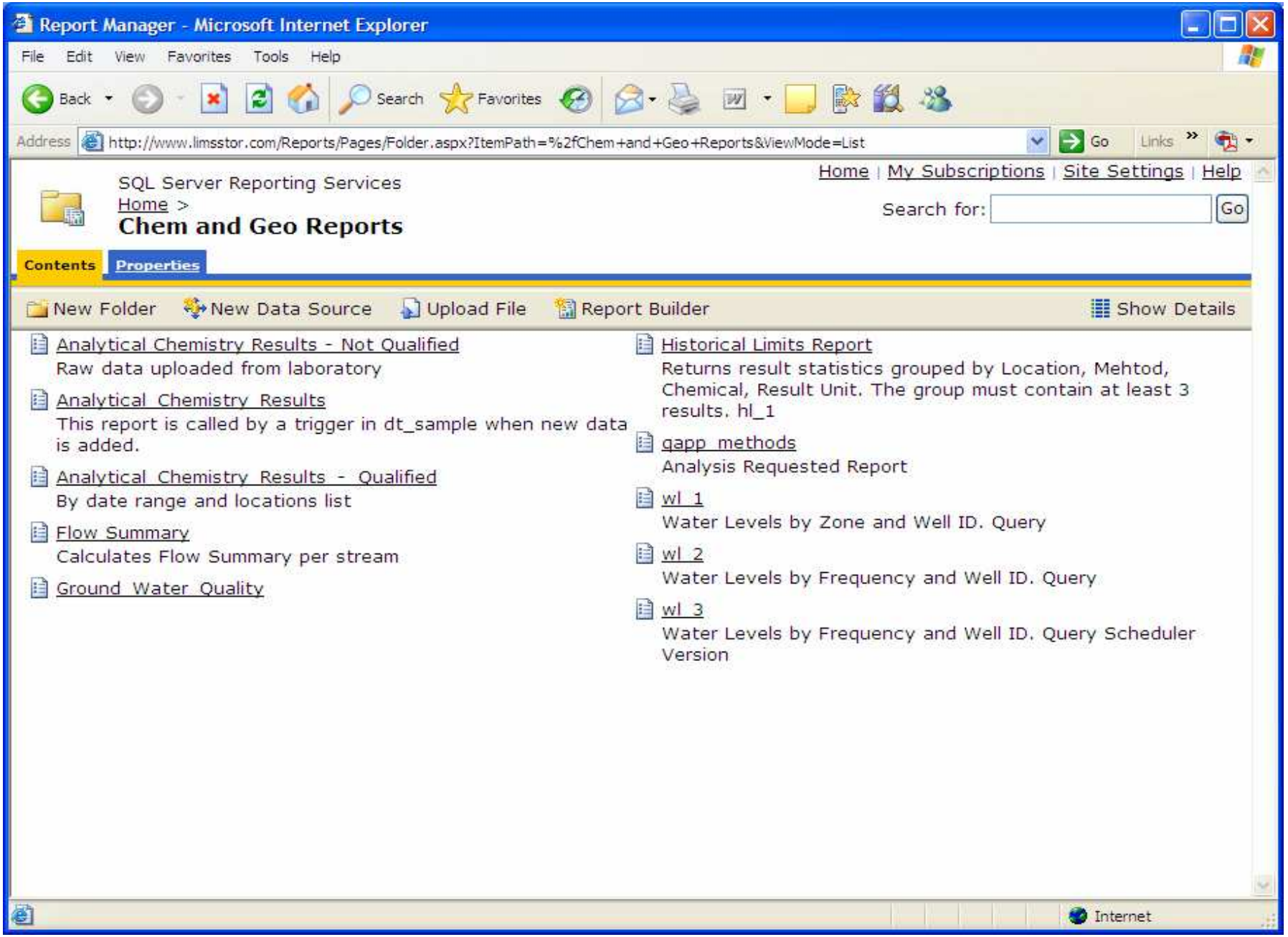
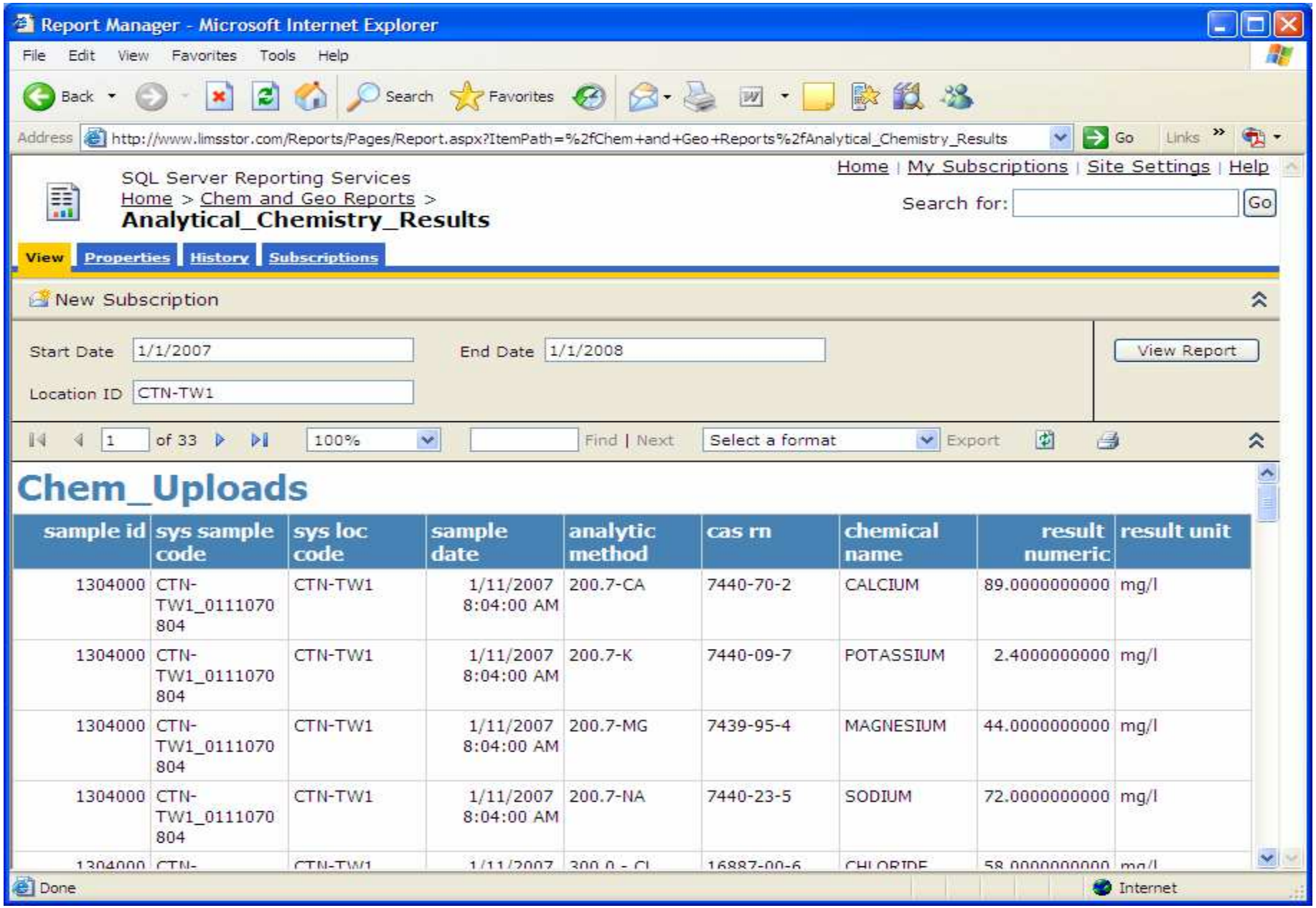
SQL Server Reporting Services



SQL Server Reporting Services



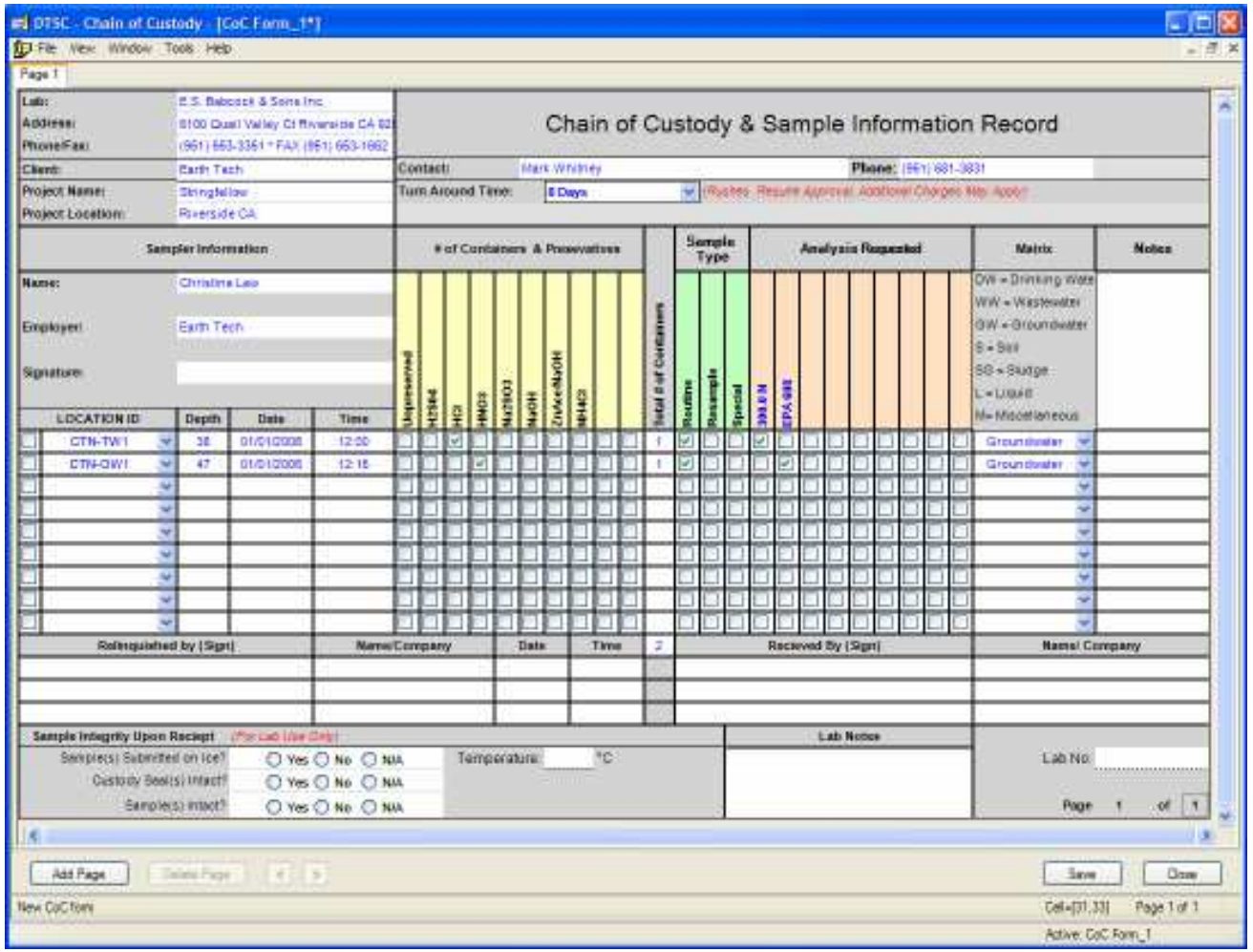
SQL Server Reporting Services



sample id	sys sample code	sys loc code	sample date	analytic method	cas rn	chemical name	result numeric	result unit
1304000	CTN-TW1_011107080 4	CTN-TW1	1/11/2007 8:04:00 AM	200.7-CA	7440-70-2	CALCIUM	89.0000000000	mg/l
1304000	CTN-TW1_011107080 4	CTN-TW1	1/11/2007 8:04:00 AM	200.7-K	7440-09-7	POTASSIUM	2.4000000000	mg/l
1304000	CTN-TW1_011107080 4	CTN-TW1	1/11/2007 8:04:00 AM	200.7-MG	7439-95-4	MAGNESIUM	44.0000000000	mg/l
1304000	CTN-TW1_011107080 4	CTN-TW1	1/11/2007 8:04:00 AM	200.7-NA	7440-23-5	SODIUM	72.0000000000	mg/l
1304000	CTN-	CTN-TW1	1/11/2007	300.0 - CL	16887-00-6	CHLORIDE	58.0000000000	mg/l

Electronic Chain of Custody

- COC Data Directly From Field to Database
- Eliminates Sample Point Naming Errors
- Allows Analytical Completeness Checking and Lab TAT Reports



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Summary of Legacy Landfill Data Management System

- Easy-To-Use Desktop Based, Database Front-end
- Customized Reporting Capabilities From Web Site
- Unlimited Storage
- Unlimited Number of Sites
- Handle a Variety of Data
- Chemistry, Geology, Well Construction, Well Production, Treatment Plant, Documents, COCs
- Automated Data Review and Contract Compliance Screening
- Easy Access by All Participating Parties
- Fully Customizable

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Annual Database Costs

- Day to day maintenance = 1.5 hours X 5 days per week X 52 weeks X $100 per hour - $39,000
- 100% EPA Level II Chemistry Validation - $180,000
- Software Licensing - $15,000
- Hardware - $10,000 (replaced every 3 years)
- Data Completeness Checking - $12,000
- Custom Programs for Data Reporting - $5,000 to $30,000/each
- Total Cost – Less than 2% of the Stringfellow and BKK Annual Budgets

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Lessons Learned

- Don’t Re-Invent the Wheel (Unless you have no other choice, don’t start from scratch. Use an existing database system with a proven track record).
- QA All Data
- Involve Users In Needs Analysis
- ***BUT Don’t Over Design !***
- A Simple Process in Action is Worth 10 Processes on the Drawing Board
- You Can Not have Too Many Methods for Users to Access Their Data

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