EQuIS
Air Quality Data Management
Integrated Field Logbooks

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EarthSoft, Inc.
Who are we?

- EarthSoft is our company, EQuIS is our product
- Worldwide leader in environmental data management systems
- Over 100 staff with large Help Desk and Development team
- EQuIS is all we do – continuous development since 1994
What is EQuIS?

EQuIS™
An advanced environmental data management and decision support system

- Manage large amounts of air quality data and associated monitoring data
- Modular and scalable system capable meeting the needs of a multi-site portfolio
- Meets requirements of power users, casual users, and management
- Designed for workflow automation and quality control of the entire data management cycle
Data Management Workflow

- Field Planning
- Field Data Collection
- Sensor/Logger Integration
- LIMS Integration
- Data Verification & Validation
- Reporting (AQS)
- Visualization
Field Logbooks

Goal: Integrate data collection with your data management workflow

Collect field data – samples, measurements, or inspections

Enter data into phones, tablets or laptops

Submit data to laboratories and the database
Data Management Workflow
EQuIS Collect & EDGE

Task planning/tracking
Discrete samples (eCOC)
Continuous monitoring
Sensor/logger datafile download
Instrument Calibration/Maintenance
Field Notes
<table>
<thead>
<tr>
<th>CURRENT STATE</th>
<th>DESIRED STATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Redundant and manual systems</td>
<td>Single centralized system</td>
</tr>
<tr>
<td>Limited or varied data quality control (QC) procedures</td>
<td>High quality, consistent data</td>
</tr>
<tr>
<td>Limited data ownership</td>
<td>Established data QC standards</td>
</tr>
<tr>
<td>Limited accessibility</td>
<td>Full client ownership</td>
</tr>
<tr>
<td>Limited process automation</td>
<td>Unlimited web accessibility</td>
</tr>
<tr>
<td>No external collaboration ability</td>
<td>Cost savings via automation</td>
</tr>
<tr>
<td>Limited project management tools</td>
<td>Easy collaboration outside your internal network</td>
</tr>
<tr>
<td></td>
<td>Efficient tools to help manage projects</td>
</tr>
</tbody>
</table>
- Hosting & Security: Software-as-a-Service vs. On-premise
- Hardware & Browsers
- Flexibility, Supportability, & Integration
- Implementation: Timeline, Budget, Requirements, UAT, Go-Live
- Technical: Validation, LIMS Integration, Instrument QC, AQS Deliverables, CARB Deliverables
Where to host your data?

Cloud vs. On-Prem

EarthSoft supports both models for a diverse client base

Considerations: Maintenance, security, upgrades, backups, etc.
Cloud Hosting: Microsoft Azure

Why Azure?
FedRAMP Compliant
Security, Accessibility, Reliability
Manage Permissions

Create data management plan and workflow documentation

Define/assign roles: field, lab, data manager, validator, end user, etc.

Manage User: Multi-factor authentication, Windows authentication, password manager

AUDIT, AUDIT, AUDIT

One Database — Different User Interfaces

End Users

Web

Power Users

Desksops
Laptops
Mobile Devices
CONSIDERATIONS

✓ Hosting & Security: Software-as-a-Service vs. On-premise
✓ Hardware & Browsers
✓ Flexibility, Supportability, & Integration
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Hardware & Browsers

EQuIS Professional: Laptop + Windows 10

EQuIS Enterprise: Browser

EQuIS Collect: Mobile
Hosting & Security: Software-as-a-Service vs. On-premise

Hardware & Browsers

Flexibility, Supportability, & Integration

Implementation: Timeline, Budget, Requirements, UAT, Go-Live

Technical: Validation, LIMS Integration, Instrument QC, AQS Deliverables, CARB Deliverables
• Data management workflows have similar objectives but are different in the way tasks are assigned and completed

• System should accommodate these differences while maintaining a sharp focus on quality management and automation

• COTS vs. Custom: EarthSoft supports clients in 52 countries with a team of over 100 people

• Quarterly releases include new tools, bug fixes, patches, and tailored development

• What other systems need to integrate with your database? Field instruments? GIS? Air dispersion models? Statistical software? Public data portals?

• EarthSoft’s** Open System Business Model** attracts 3rd party developers to build on top of EQuIS
HOSTING & SECURITY: SOFTWARE-AS-A-SERVICE VS. ON-PREMISE

HARDWARE & BROWSERS

FLEXIBILITY, SUPPORTABILITY, & INTEGRATION

IMPLEMENTATION: TIMELINE, BUDGET, REQUIREMENTS, UAT, GO-LIVE

TECHNICAL: VALIDATION, LIMS INTEGRATION, INSTRUMENT QC, AQS DELIVERABLES, CARB DELIVERABLES
Implementation

Timeline
Budget
Scope
UAT
Go-Live

Waterfall: Business value realized only at the end of the project.

Agile: Business value delivered in increments, benefits realized sooner.
✓ Hosting & Security: Software-as-a-Service vs. On-premise
✓ Hardware & Browsers
✓ Flexibility, Supportability, & Integration
✓ Implementation: Timeline, Budget, Requirements, UAT, Go-Live
✓ Technical: Validation, LIMS Integration, Instrument QC, AQS Deliverables, CARB Deliverables
Technical Functional Requirements

• Data Quality Objectives (Automated Validation)
• LIMS Integration (Onsite vs. 3rd Party Lab)
• Instrument QC: Make sure your database is configured as a vibrant tool in the workflow, not just a black box repository
• AQS Deliverables
• CARB Deliverables
• Internal Reporting
• Public Data Display

Transaction types available for submission:

<table>
<thead>
<tr>
<th>Transaction Type</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>AA - Site Basic</td>
<td></td>
</tr>
<tr>
<td>AR - Site Street</td>
<td></td>
</tr>
<tr>
<td>AC - Site Origin</td>
<td></td>
</tr>
<tr>
<td>AS - Site Sampler</td>
<td></td>
</tr>
<tr>
<td>AE - Site Sampler Channel</td>
<td></td>
</tr>
<tr>
<td>MA - Monitor Basic</td>
<td></td>
</tr>
<tr>
<td>MB - Monitor Sampling Period</td>
<td></td>
</tr>
<tr>
<td>MC - Monitor Type</td>
<td></td>
</tr>
<tr>
<td>MD - Monitor Agency Role</td>
<td></td>
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<tr>
<td>ME - Monitor Objective</td>
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<tr>
<td>MP - Monitor Sampling Schedule</td>
<td></td>
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<tr>
<td>MJ - Monitor Target Road</td>
<td></td>
</tr>
<tr>
<td>ML - Monitor Observation</td>
<td></td>
</tr>
<tr>
<td>MI - Monitor Regulatory Compliance</td>
<td></td>
</tr>
<tr>
<td>MJ - Monitor Collection Period</td>
<td></td>
</tr>
<tr>
<td>MN - Monitor Method</td>
<td></td>
</tr>
<tr>
<td>MN - Monitor Network Affiliation</td>
<td></td>
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<tr>
<td>MO - Monitor Primary Period</td>
<td></td>
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<tr>
<td>MF - Monitor Channel</td>
<td></td>
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<tr>
<td>MX - Monitor NOx Source</td>
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</tbody>
</table>

| 1C - Raw Composite | 1D - Raw Data |
| 1B - Raw Blank | 1A - 3-Point QC |
| 1B - Annual PE | 1A - Flow Rate Verification |
| 1C - Semi Annual Flow Rate Audit | 1A - Flow Rate Verification for PM2.5 |
| 1C - Semi Annual Flow Rate Audit for PM10 | 1A - Performance Evaluation Program |
| 1A - National Performance Audit Program | 1A - Field Proficiency Test |
| 1A - Duplicate | 1A - Report |
| 1A - PM Analysis Audit | 1A - Lab Proficiency Test |
| 1C - Archived Air Pollution Gas Verification Program | 1A - Ozone SIP and Ozone Transfer Standard Verification |
| 1A - Ozone Flow Rate Verification | 1A - Speciation Semi-Annual Flow Rate Audit |
Thank you! Questions?