AQS Basics
Loading data

Help
Getting Your Data In: Online Updates
Create a Site and Monitor, Define an Exceptional Event
Data Formats
Getting Your Data In: Batch Overview
Getting Your Data In: When All Goes Well
Getting Your Data In: How to Correct What Went Wrong
Help
Helpdesk User Support

EPA Helpdesk
- 866-411-4372 or epacallcenter@epa.gov
- Levels of support
  - Level 1: password resets for AQSProd; opens a problem ticket
  - Level 2: AQS-specific issues → Pamela and Donnie
  - Level 3: server issues → NCC
  - Level 4: software and data issues → AQS Team

• Exchange Network (EN) Helpdesk
  - 888-890-1995 or nodehelpdesk@epa.cdx.net
  - Supports:
    - Node (production) password resets / general Node support

When in doubt, call the EPA Helpdesk
AQS Team

AQSTeam@epa.gov

- Robert Coats, team lead
- Bill Frietsche (QA & audits)
- Way Poteat
- Chris Chapman
- Nick Mangus (Data Mart)
- Michael Hamlin (user registration)
- Angie Shatas
AQS Regional Contacts

1: Wendy McDougall  
   (617) 918-8323

2: Henry Feingersh  
   (212) 637-3382

3: Pauline DeVose  
   (215) 814-2186

4: Darren Palmer  
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5: Jesse McGrath  
   (312) 886-1532

6: Trisha Curran  
   (214) 665-8345

7: James Regehr  
   (913) 551-5063

8: Joe Delwiche  
   (303) 312-6448

9: Fletcher Clover  
   (415) 972-3991

10: Jan Noel  
    (206) 553-1691
AQS Documentation

- Manuals and Guides
  - Design Value Report (SO₂) *
  - Submit Automation User Guide *
  - Data Dictionary *
  - Data Coding Manual
  - AQS Input Transaction Formats***
  - Exceptional Event Tutorial
  - Fundamentals & User Guide **
  - Data Retrieval Manual **

- Codes and Descriptions *
  - Memos and Software Release Notes *

* New/updated  ** Near term updates/overhaul  *** Longer term overhaul
From the Application

- “Help” From the Menu
  - Topics
  - Short-Cut Keys
  - Display Error
- Field-Level Help
Getting Your Data In:
Online Updates
What *can* you update online?

What *should* you?

- Data owned by your Screening Group
- Site/Monitor metadata
  - Monitor Begin and End dates
- Exceptional Event definitions
- Exceptional Event & other concurrences (RO only)
- Data — update online if you can narrow it down
  - Raw Measurements/Precision & Accuracy Data
  - Comments
Where Do I Start?

**Session access**
You can only see data from monitors **YOU OWN**
You can change any data that **YOU OWN**
How to update data online?

- You are in your Screening Group
- Go to Maintenance tab
- Select the type of data you want
  - Site OR Monitor OR Event OR Sample Values
- Build the query
  - specify “filters” (just like in Browse) to get only the records you want
- Execute the Query
- Scroll through the records and modify as needed
  - For Site, Monitor, Event or P&A data, can modify directly
  - For Raw Data, must “insert” a new record with a “U” (then go through Stat/CR process)
- Save (Look for confirmation message)
Form Navigation

- Previous Block
- First Record
- Previous Record
- Next Record
- Next Block
- Last Record
- Insert Record
- Delete Record
- Duplicate Record
- Clear (Erase) Record
- Rollback Changes
- Save Changes

Online Updates
Save & Rollback

• Rollback
  o Throws away all changes back to the last time you Saved.
  o Cannot “undo” a Rollback

• Save
  o Your changes do not take effect until you save
  o Look for the confirmation message at bottom left
Online Maintenance:
Create a Site and Monitor; Define an Exceptional Event;
Get Set up for Data
Where Do I Start?

Login

Screening Group Access
If you are adding information to AQS, you must be in a Screening Group.
Maintain Site → Create a new site online
Maintain Monitor → Create new monitor(s) online
Maintain Event → Define exceptional event(s) & Associate Raw Data with an event

AQS Maintain Form hints:
When you enter a form in Maintain with the intent to create a new record, remember to “Cancel Query” before entering any data. Check Completeness” will let you know if any required information is missing.
You must add a monitor when adding a new site. Use “Create Monitor.”
To add multiple new monitors, use the “Duplicate Monitor” button.
“Save” before leaving the form. Look for a confirmation message at the bottom left of screen.
Monitoring data to AQS – What is required to set-up a Site?

- **Unique Site ID**
- **Metadata needed:**
  - Latitude and longitude (in decimal degrees)
  - Horizontal datum (what datum was used for lat/lon?)
  - Horizontal method (how was lat/lon measured?)
  - Horizontal accuracy (accuracy of lat/lon, in meters)
  - Vertical measure (elevation, in meters)
  - Vertical accuracy (accuracy of elevation, in meters)
  - Vertical method (how elevation measured?)
  - Street address, land use type and location setting
  - Agency Role (agency that is supporting this site)
  - Primary Monitor Period (for PM$_{2.5}$, lead. SO$_2$, NO$_2$)
Maintain Site: how to add a site

- You must create a site in AQS before you can submit raw data
- Identified by
  - State Code-County Code-Site (06-073-5501) OR TT-Tribal Code-Site (TT-587-5501)
- Physical location
  - Latitude and longitude?
  - Street address?
  - Local site name?
- Characteristics of the site
  - Nearby Streets?
  - Open Path Set Up?
  - Need a Primary monitor? (PM$_{2.5}$, lead, SO$_2$ or NO$_2$)
- Agency Roles
  - Supporting Agency?
- Use the Tabs on the Form:
  - Basic
  - Additional Site Data
  - Agency Roles
  - Tangent Roads
  - Open Paths
  - Comments
  - Primary Monitor Periods

AQS Form hints:
“Check Completeness” will let you know if any required information is missing.
You must add a monitor when adding a new site. Use “Create Monitor.”
Monitoring data to AQS – What is required to set-up a Monitor?

- An established Site + Parameter code + POC
- Basic Monitor (Instrument) information (optional)
  - Probe location
  - Probe height (height of probe from ground)
  - Probe horizontal distance (distance from probe to support)
  - Probe vertical distance (vert. distance from probe to support)
- Sample period begin date
- Monitor type (SLAMS, Tribal, NCORE, IMPROVE... ) and begin date
- Agency roles and begin date
  - Collecting Agency (who maintains the instrument in the field?)
  - Analyzing Agency (Who (which lab) analyzes the filters?)
  - PQAO (Primary Quality Assurance Organization) Agency (Who is responsible for QA, audits, etc?)
    - Required for all pollutants; make start date no earlier than 1/1/2007
  - Reporting Agency (who reports the data to AQS?)
    - Required for all pollutants
- Monitoring objective and applicable geographical area
- Required collection frequency and begin date
- Tangent Road
- Collocation information
Maintain Monitor: how to add a monitor

- You must create a monitor for each parameter that will supply raw data
- Identified by
  - State Code-County Code-Site-Parameter-Parameter Occurrence Code (06-073-5501-42153-1) OR
  - TT-Tribal Code-Site-Parameter-POC (TT-587-5501-42153-1)
  (Think of the POC as a sequence number)

- About the Measurements for that Parameter/Pollutant
  - When did Sampling Begin?
  - Which Network(s) is this monitor in? (Monitor Type)
  - Which Agencies run the Monitor?
  - What are the Monitoring Objectives?
  - Nearby Obstructions?
  - Nearby Roads?
  - If Collocated, which is the Primary?
  - Frequency of Sampling?
- Use the Tabs on the Form:
  - Monitor Basic
  - Sample Periods
  - Monitor Type Assignments
  - Agency Roles
  - Objectives
  - Collocation

AQS Form hints:
To add multiple new monitors, use the “Duplicate Monitor” button.
Reference Data

- AQS uses codes
- Codes give Information about the Data in AQS
  - “AQS Codes and Descriptions” on AQS website
  - Standard Codes Used where Available
- Codes are Used to Identify
  - States, Counties, Tribal Lands,
  - Pollutants,
  - Frequency of collection for a sample
  - Length of time a sample represents
  - Sample data (qualify the data or explain a null value)
  - etc...

Parameter Codes
- $O_3 = 44201$
- NO$_2 = 42602$
- SO$_2$ hourly = 42401
- CO = 42101
- PM$_{2.5} = 88101$
- PM$_{10}$ STP = 81102
- Lead (TSP) at LC FRM/FEM = 14129
- Lead (PM$_{10}$) at LC FRM/FEM = 85129

Units of Measure
- 001 = $\mu g/m^3$
- 007 = ppm (parts per million)
- 008 = ppb (parts per billion)

Collection Frequency Codes
- 1 = Every Day
- 3 = Every 3$^{rd}$ Day
- 6 = Every 6$^{th}$ Day

Duration Codes
- 7 = 24 Hours
- 1 = 1 Hour
- W = 8-Hour Running Avg.*
- X = 24-Hour Block Avg.*
- Y = 3-Hour Block Avg.*
Exceptional Events

- What is an exceptional event?
  The Federal Regulations (40 CFR Part 50.14) allow Ambient Air Quality Measurements that are Exceedances or Violations of the National Ambient Air Quality Standards (NAAQS) that are *caused* by an “Exceptional Event” to be excluded from Attainment demonstrations.

- What is the process in AQS?
  - Reporting Agency “flags” data with exceptional Event Flag, and submits justification to EPA → you put a “request exclusion” qualifier on your reported Raw Data
  - Reporting Agency defines the Exceptional Event → you define an Event in AQS (online only)
  - Reporting Agency ties the flagged data to the defined Event → you associate these in AQS (online only)
  - Regional office either concurs with exclusion or “non-concurs”

- The result?
  - AQS computes different summaries (daily, quarterly, and annual)
  - Summaries either include or exclude the flagged data
  - Summaries have a unique “Exceptional Data Type ID”

- This affects what shows on reports!
  - AQS Reports will show either summary data marked with
    - EDT ID 0
      - 0 = No data has been flagged OR
    - EDT IDs 1, 2, and 5
      - 1 = The summary excludes all flagged data
      - 2 = The summary does not exclude any data
      - 5 = The summary excludes regionally concurred flagged data

= You have until July 1st of the year following the event to do these steps
Maintain Event: how to add an event

- Event Identified by
  - Screening Group + Qualifier Code
  - Event Begin and End Dates
  - Event Description

- Define Event
  - What “request exclusion” qualifier?
  - Begin and end dates? (req’d)
  - Description? (req’d)
  - Comment (optional)

AQS Form hints:
Use the dropdowns to help populate the data fields.
“Save” before leaving the form.
Maintain Event: how to add an event

- Event Identified by
  - Screening Group + Qualifier Code
  - Event Begin and End Dates
  - Event Description

- Define Event
  - What “request exclusion” qualifier?
  - Begin and end dates? (req’d)
  - Description? (req’d)
  - Comment (optional)
Put it into practice – Exercise 2.1
Data Formats
Data Formats Overview

- 2 types supported
  - “Pipe-delimited” format
    - “|”
    - 19 different formats; one for each type of data supported through the system
    - “Data Input Formats for the Re-engineered AQS”
    - http://www.epa.gov/ttn/airs/airsaqs/manuals/
  - XML
    - AQS XML Schema definition can be found at http://www.exchangenetwork.net/exchanges/air/aqs.htm
Map AQS Transaction Types to AQS screens

Site Information
- AA: Basic Site Information
- AB: Site Street Information
- AC: Site Open Path Information

Monitor Information
- MA: Basic Monitor Information
- MB: Monitor Sampling Periods
- MC: Monitor Type Information
- MD: Monitor Agency Role
- ME: Monitoring Objective Information
- MF: Monitor Sampling Schedule
- MG: Monitor Tangent Roads
- MH: Monitor Obstruction Information
- MI: Monitor Regulatory Compliance
- MJ: Monitor Collocation Period
- MK: Monitor Protocol

Reported Data Values
- RC: Composite Raw Data
- RD: Hourly, Daily, and Sub Hourly Raw Data
- RA: Accuracy Data
- RP: Precision Data
- RS: Annual Summary Data
- RB: Blanks Data
Transaction Types (Site)

Site Information.................................
AA  Basic Site Information ........
AB  Site Street Information ........
AC  Site Open Path Information
Transaction Types (Monitor)

Data Formats
- Virtually all RD is submitted via batch
- Add qualifiers to explain data
- Comments are not supported on RD transaction
- Only way to enter a comment is online
Delimited Transaction Common Fields

- Transaction Type – always the 1\textsuperscript{st} column
- Action Indicator – always the 2\textsuperscript{nd} column
  - I = INSERT
  - U = UPDATE
  - D = DELETE
- State Code – always the 3\textsuperscript{rd} column
- County Code – always the 4\textsuperscript{th} column
- Site ID – always the 5\textsuperscript{th} column
Pipe-Delimited vs XML Example

- AQS Site ID: 01-001-9999
- Pollutant Measured: Ozone
- POC (assigned as part of the monitor ID): 1
- Does this value already exist in the system? No
- What time period does this sample represent (the duration)? hour
- What kind of instrument was used? Dasibi 1008-AH
- When was the sample collected? June 10, 2006
- What time did sample begin (local standard time): 1:00 PM
- Sample Concentration: 0.050 parts per million
- Other qualifiers that you want to apply to data? No
- Would you like to specify an alternate Minimum Detection Limit for this sample? No
- Would you like to specify an uncertainty value with this sample? No
RD|I|01|001|9999|44201|1|1|007|056|20060610|13:00|0.050

Pipe-Delimited Format

XML Format

```xml
<SiteIdentifierDetails>
  <StateCode>01</StateCode>
  <CountyCode>001</CountyCode>
  <SiteIdentifier>9999</SiteIdentifier>
</SiteIdentifierDetails>

<MonitorIdentifierDetails>
  <ParameterCode>44201</ParameterCode>
  <ParameterOccurrenceCode>1</ParameterOccurrenceCode>
</MonitorIdentifierDetails>

<TransactionProtocolDetails>
  <DurationCode>1</DurationCode>
  <MethodCode>056</MethodCode>
  <UnitCode>007</UnitCode>
</TransactionProtocolDetails>

<TransactionRDInsertDetails>
  <ObservationDate>20060610</ObservationDate>
  <ObservationStartTime>13:00</ObservationStartTime>
  <RawValueInsertDetails>
    <SampleValue>0.050</SampleValue>
  </RawValueInsertDetails>
</TransactionRDInsertDetails>
</ActionRawDataInsert>
```
XML Format

- As you can see, XML looks like HTML, but with some changes:
  - The HTML standard defines a fixed set of “tags” that define the data content and formatting.
  - XML allows you to create your own tags, with the meanings that you define.

- XML Tradeoffs:
  - XML files are “self describing”
  - XML files are bigger (100 X bigger, but compressible.)

- ENSC will “wrap” your flat (text) file with an XML header
Getting Your Data In: Batch Overview
What Do You Mean By Batch Updates?

- Mass entry of data, so faster
- Data in AQS format (from datalogger, Agency system, other)
- Send the file to AQS
- Processing of the data happens without your interaction
- AQS notifies you via email on job completions
- AQS provides reports at the end of each process
Overall Process/Big Picture

- Collect Samples
- Validate the Data
- Format the Data
- Send data file to AQS Using the Exchange Network (ENSC)
- Load the data to AQS (includes error checking)
- Correct any errors & reprocess
- Metadata & non-raw data process is finished
- Raw data (sample measurements) are posted
- Data is then available to the public
What Can Be Input by Batch?

**Can batch load:**
- Site information (all)
- Monitor information (all)
- Raw data
- Audit (precision & bias) data
- Blanks and composite data

**Cannot batch load:**
- Comments (add’l info on sites, monitors, audits, raw data values)
- Exceptional event definitions
- EPA concurrences (Regional user only)
- Primary monitor period designations (PM2.5)
1. Create file of ambient air data.
2. Transfer the file using the ENSC (Stage)
3. Automatically or manually process the file.
4. Either way, same processing steps in AQS.
   - Raw Data (Load, Post)
   - Non-raw Data (Load)
Where Do I Start?

Register for the 2012 AQS Conference! Visit the AQS web page at www.epa.gov/ttn/airs/airsraqs/

You have accessed AQSPROD. Raw data for 1957 to present is now available for access. Raw data is available for update for 2007 to present.

IF YOU NEED ASSISTANCE, PLEASE CALL THE EPA CALL CENTER AT 1-866-411-4EPA (1-866-411-4372) Hours: 6:00am- 6:30pm Eastern.
**Where To Go Next?**

**Batch Processes**

**Next step is to transfer your file**
ENSC

https://enservices.epa.gov/login.aspx

Step 1: login

You can go directly here and bypass AQS

EN user ID is not your AQS ID; it is the email address on your AQS Security Profile (you supplied it when you got your AQS account)

Change in Email address? Call the EN Helpdesk.

Not your AQS pw (unless you manually synced them)

Need a pw reset? Call the EN Helpdesk.
ENSC (One time setup)

Step 2:
On your first login:

Step 3:
From the Express Register box, type in AQS and click on the Search button.
ENSC (One time setup)

Step 4: Choose “Send Info” to establish AQS as the service that will receive the files.

Step 5: Suggest (optional but recommended) that you go to the “My Services Tab” and check “Make this my Start page.” This will then be your starting point each time.
Each time you submit a file, you will fill out an “Express Request: AQS Submit”

- **File to be submitted** – must be zipped
- Supply if you want email notifications separately from ENSC * or if you want emails sent to a 3rd party; emails automatically go to the address in your AQS profile

- **AQS ID**

- **Screening group** (“owner” of data”)

- **Final Processing Step** - Automate the process by choosing the last step you want done - Default is “Post”
  Can choose Post for both non-Raw and Raw Data. If you do not have any errors during the AQS processing, you are DONE.

- **Stop on Error** – Applies to Post. If an error is encountered, AQS stops processing the file. If you aren’t taking Raw Data through POST then this setting is ignored.

- **Send Data** – the last step

* This is the only way to messages related to ENSC problems (Node is down, XML validation failure) in cases when the file doesn’t make it to AQS.
“Automatic” file processing:

- Minimizes time needed to handle a file; “Submit Automation” project; don’t even have to log in to AQS
- Final Processing Step = Post (ENSC default) supports automatic file handling
- Stop on Error = Yes (ENSC default) is user preference

“Manual” file processing

- You must change the defaults on ENSC form
  - Final Processing Step = Stage or Load
  - Then kickoff each subsequent process (Load and/or Post) in AQS
Getting your Data In:
File processing when all goes well
non Raw data
File Processing of non-Raw Data

At ENSC, you specify “Final Processing Step” of

<table>
<thead>
<tr>
<th>At ENSC, you specify “Stop on Error” of</th>
<th>Did your file have Errors?¹</th>
<th>You will see this “Process Status” on the AQS Batch Form</th>
<th>What does it mean?</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAGE</td>
<td>No/Yes²</td>
<td>STAGE-COMPLETED</td>
<td>File is ready for LOAD.</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>STAGE-ERROR</td>
<td>File had errors in transfer. Fix errors in file on your end and resubmit.</td>
</tr>
<tr>
<td>LOAD</td>
<td>No/Yes²</td>
<td>LOAD-COMPLETED</td>
<td>Done.</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>LOAD-ERROR</td>
<td>Records w/errors in Correct (review reports to see reason). Other records are done.</td>
</tr>
<tr>
<td>POST²</td>
<td>No/Yes</td>
<td>POST process only runs against Reported Data.</td>
<td></td>
</tr>
</tbody>
</table>

¹ This “Stop on Error” is done at ENSC on a QMRA between M* and A* transactions but not RD
² If No, go to next step. If Yes, go to next step and resubmit
Batch form - Process by File

**PROCESS CONTROL**

<table>
<thead>
<tr>
<th>Process selected file through:</th>
<th>Load</th>
<th>Post</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Load File</td>
<td>Post File</td>
<td>Show User Log</td>
</tr>
<tr>
<td>Results and Reports:</td>
<td>Load Summary and Errors</td>
<td>Stat CR Report</td>
<td>Goto ENSC</td>
</tr>
<tr>
<td></td>
<td>Raw Data Inventory</td>
<td>Refresh Sessions</td>
<td></td>
</tr>
</tbody>
</table>

**HISTORY AND STATUS**

<table>
<thead>
<tr>
<th>Submission Date</th>
<th>File Name</th>
<th>User Name</th>
<th>Records In File</th>
<th>Date (Last)</th>
<th>Process Status</th>
<th>Load</th>
<th>Recs Loaded</th>
<th>Recs Falling to Load</th>
<th>Recs to Post</th>
<th>Records Posted</th>
</tr>
</thead>
<tbody>
<tr>
<td>20120725 09:15</td>
<td>RIIR TSAT RD DATA.zip</td>
<td>JAIME HAUSER</td>
<td>142</td>
<td>20120725 09:15</td>
<td>CRST-COMPLETED</td>
<td>142</td>
<td>0</td>
<td>13</td>
<td>142</td>
<td>0</td>
</tr>
<tr>
<td>20120725 09:12</td>
<td>POMN TSAT RD DATA.zip</td>
<td>JAIME HAUSER</td>
<td>55</td>
<td>20120725 09:12</td>
<td>CRST-COMPLETED</td>
<td>55</td>
<td>0</td>
<td>4</td>
<td>55</td>
<td>0</td>
</tr>
<tr>
<td>20120720 11:48</td>
<td>RIIR TSAT RD DATA.zip</td>
<td>JAIME HAUSER</td>
<td>387</td>
<td>20120720 11:50</td>
<td>CRST-COMPLETED</td>
<td>387</td>
<td>0</td>
<td>1</td>
<td>387</td>
<td>0</td>
</tr>
<tr>
<td>20120720 10:14</td>
<td>RIIR TO-16 monitor transaction</td>
<td>JAIME HAUSER</td>
<td>520</td>
<td>20120720 10:19</td>
<td>LOAD-COMPLETED</td>
<td>513</td>
<td>0</td>
<td>0</td>
<td>513</td>
<td>0</td>
</tr>
<tr>
<td>20120720 10:10</td>
<td>RIIR TO-11 monitor transaction</td>
<td>JAIME HAUSER</td>
<td>117</td>
<td>20120720 10:10</td>
<td>LOAD-COMPLETED</td>
<td>117</td>
<td>0</td>
<td>0</td>
<td>117</td>
<td>0</td>
</tr>
<tr>
<td>20120625 09:08</td>
<td>TSAT RD DATA_20120625.zip</td>
<td>JAIME HAUSER</td>
<td>11</td>
<td>20120625 10:27</td>
<td>POST-COMPLETED</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td>11</td>
<td>0</td>
</tr>
</tbody>
</table>
Batch Processes

Batch form - History

History tab: Shows all processes performed on a file
Put it into Practice: Exercise 2.2

- You will submit a file containing non-raw data
  - You will use the “Automatic” process
  - Final processing step = “Post”
- Review the File Processing
Getting Your Data In:
File Processing when all goes well
Raw data
File Processing of Raw Data

At ENSC, you specify “Final Processing Step” of
At ENSC, you specify “Stop on Error” of
Did your file have Errors?¹
You will see this “Process Status” on the AQS Batch form
What does it mean?

<table>
<thead>
<tr>
<th>Step</th>
<th>No/Yes²</th>
<th>Result</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAGE</td>
<td>No/Yes²</td>
<td>No</td>
<td>STAGE-COMPLETED</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>STAGE-ERROR</td>
</tr>
<tr>
<td>LOAD</td>
<td>No/Yes²</td>
<td>No</td>
<td>CRST-COMPLETED</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>CRST-COMPLETED</td>
</tr>
<tr>
<td>POST</td>
<td>No</td>
<td>No</td>
<td>POST-COMPLETED</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>POST-COMPLETED</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>POST-COMPLETED</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>RAW CRST-COMPLETED</td>
</tr>
</tbody>
</table>
Batch: Load step for Raw Data includes Stat CR

- Raw data goes through Statistical Evaluation & Critical Review
- Evaluates data and flags anomalies.
  - anomalies are not necessarily errors
  - real errors that fit the rest of the data are not necessarily captured
- You are notified of the results of these through
  - Stat CR Report
    - Compares pre-production data to existing production data*
    - Statistical findings
    - Critical Review findings
    - Link to report is emailed to you
    - Also available via Process by File or History tabs
  - Scan Report
    - Information on maximum values and validity flags for raw data
    - Link to report is emailed to you
    - Available via History tab

*using Shewhart test, Patterns test, and Gap test;
see http://www.epa.gov/ttn/airs/aqs/softw/AQSUserGuide.pdf
Batch: Post step for Raw Data

- Raw data must go through Post step
- Makes data “production status” and publicly available
- Required when Raw Data is added or changed
  - Online → “Save” → AQS will generate a file that you must process using the Batch form
  - Batch → Raw data requires the Post step
- You are notified of what was posted through
  - Raw Data Inventory Report
    - Information on data fields that were updated
    - Reviewed by many submitters; some save each report
    - Link to report is emailed to you
    - Also available via History tab
Tracking a file: Process by File vs. History

**Process by file tab:** shows the **last** process performed on a file

- **List of files**
- **User who ran the last job**
- **Date and time of last process**
- **Last process & status**

**Record counts for LOAD**

**Record counts for POST**

**History tab:** Shows all processes performed on a file

- **Date and time of process**
- **Process run**
- **File name**
- **Successes**
- **Failures**

Total record counts for all jobs performed on this file, not just the last job.
### History

**History tab:** Shows all processes performed on a file

<table>
<thead>
<tr>
<th>Session Date</th>
<th>Job Type</th>
<th>User Name</th>
<th>File Name</th>
<th>File Status</th>
<th>Successful Transactions</th>
<th>Failed Transactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>20120725 08:07:22</td>
<td>POST</td>
<td>Jane Doe</td>
<td>LYNNOzoneJune2012.zip</td>
<td>COMPLETED</td>
<td>744</td>
<td>0</td>
</tr>
<tr>
<td>20120725 08:07:08</td>
<td>CRST</td>
<td>Jane Doe</td>
<td>LYNNOzoneJune2012.zip</td>
<td>COMPLETED</td>
<td>744</td>
<td>0</td>
</tr>
<tr>
<td>20120725 08:06:12</td>
<td>LOAD</td>
<td>Jane Doe</td>
<td>LYNNOzoneJune2012.zip</td>
<td>COMPLETED</td>
<td>744</td>
<td>0</td>
</tr>
<tr>
<td>20120725 08:06:07</td>
<td>STAGE</td>
<td>Jane Doe</td>
<td>LYNNOzoneJune2012.zip</td>
<td>COMPLETED</td>
<td>744</td>
<td>0</td>
</tr>
</tbody>
</table>

**Historical reports:**
- Load Summary and Errors
- Stat CR Report
- Raw Data Inventory

**Re Run Reports:**
- Rerun Load Summary and Errors
- Rerun Stat CR Report
- Rerun Raw Data Inventory
- Rerun Scan Report
- Refresh History

---

**Batch Processes**

1. **File**
2. **ENSC**
3. **STAGE**
4. Transfer Error?
5. **LOAD**
6. Errors?
7. **POST**
8. **DONE**
9. Load Summary and Errors
10. Statistical and Critical Review (Stat CR)
11. Raw Data Inventory

- **Correct**
- **Diagnose and fix problem**
- **STOP**
Stat CR Report

- Stat CR is automatically run after Load for Raw Data submissions
- If Job Type is “CRST” → Stat CR Report is available

Only records that fail a test are reported

Report is stored for 15 days

After 15 days, must rerun
Scan Report

- Stat CR is automatically run after Load for Raw Data submissions
- If Job Type is “CRST” → Scan Report is available
Raw Data Inventory Report

- Job Type is “POST” → Raw Data Inventory Report is available

Report is stored for 15 days

After 15 days, must rerun
Put it into Practice: Exercise 2.3

- You will submit a mixed file with non-Raw data and Raw data
  - You will use the “Automatic” process
  - Final processing step = “Post”
  - Go into AQS and look at the Batch form
    - ✔️ Process by File
    - ✔️ History
Getting Your Data In:
How to Correct What Went Wrong
Batch load: When your file has errors

- AQS checks all incoming data
- Load process looks for relational and formatting anomalies
- Any data with errors goes to the “Staging Tables”
- Data with errors are prevented from getting all the way through to the “Production Tables”
### Final Processing Step = “Post”

**File had errors:**

- **Stop on Error = “Yes”** → all processing stops;
- **Stop on Error = “No”** → “good” data posts; “bad” data in Correct
Caveats:

- A batch load job can end with a status of “WARNING” or “ERROR”
- “WARNING” does **not** prevent data from going into AQS
  - *E.g.* “Urbanized Area Code replaced by Geospatial Lookup”
- “ERROR” **does** prevent data from going into AQS
  - *E.g.*, “Invalid Protocol”
  - *You must fix the data before it will go in.*
- Some errors are typos/missing metadata
- Some errors require additional knowledge
  - *E.g.*, certain parameters (PM$_{2.5}$, lead, SO$_2$, NO$_2$) require a primary monitor designation on the Maintain Site form because their data is combinable by site
Recap

Steps:
- If There is No Raw Data and No Errors
  - ENSC → Load
- If There is No Raw Data and Errors
  - Load → Load → Correct → Load
- If There is Raw Data and No Errors
  - ENSC → Load (includes Stat/CR) → Post
- If There is Raw Data and Errors
  - ENSC → Load (includes Stat/CR) → Correct → Load → Post

Status of records will change with the steps run:
- Status = R
- Status = S
- Status = P
Batch load: When your file has errors

- How to fix the data?
  Option 1: Use Correct (online editor that works against Staging)
  Option 2: Use Preproduction Report to get data back out in the delimited transaction format; delete Preproduction data; fix the transactions outside of AQS and resubmit
Batch load: Using Correct to fix Data

- Form available to correct every type of data input record
- Reports available

[Diagram showing the process of data correction with a flowchart and a table]

**Air Quality Subsystem Edit/Load Summary Report**

<table>
<thead>
<tr>
<th>Screening Group Name: INSTRUCTOR1</th>
<th>Jun. 5, 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Transaction Type</strong></td>
<td><strong>Transaction Description</strong></td>
</tr>
<tr>
<td>AA</td>
<td>SITE BASIC</td>
</tr>
<tr>
<td>MA</td>
<td>MONITOR BASIC</td>
</tr>
<tr>
<td>MB</td>
<td>MONITOR SAMPLING</td>
</tr>
<tr>
<td>MM</td>
<td>PERIODS</td>
</tr>
<tr>
<td>MC</td>
<td>MONITOR TYPE</td>
</tr>
<tr>
<td>MD</td>
<td>MONITOR AGENCY ROLE</td>
</tr>
<tr>
<td>ME</td>
<td>MONITORING OBJECTIVE INFORMATION</td>
</tr>
<tr>
<td>RD</td>
<td>RAW DATA</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Batch Processes**
Batch load: Using Correct Forms

1. **Execute Query**
   - This will load all of this type of data in the Staging tables for your Screening Group.
   - If you want to limit selection, you must put in selection values **before** the execute query.

2. **Read the error message(s)**
   - Error messages are the same as in the error details report.
   - Many chose to go straight to the Correct screens rather than run a report.
   - The column name is sometimes informative.

3. **Find, Analyze and fix the data**
   - Fixing the data often requires knowledge of the nature of the data and may require going back to data sources.

4. **Save**
   - Exclude unfixed data
   - Excluding unfixed data will keep it from raising error flags during load.
Correct Features

- New transactions may be entered using Correct forms
- After making changes/additions on Correct screen, **SAVE** changes
- “Delete All Selected” button will delete according to “Execute Query” selection criteria for the form; it will ignore subsequent changes.
- If you are a Screening Group Administrator, can use “Delete by screening group” to completely eliminate all records in staging tables for your screening group

Be sure this is what you want to do. It works quickly and it deletes **EVERYTHING** for the screening group, including data entered by other users in your screening group.
The highlighted record can be deleted from the form.

The record will be deleted from the Staging Table database only after a SAVE.

All selected records will be deleted.

The records will be deleted from the Staging Table database when the button is clicked.
Delete by Screening Group will completely clear ALL records owned by the Screening Group in the Staging Tables.
Search & Replace

- Not “Search & Replace” as you may know it!
- Replaces ALL Queried Values in a given column Regardless of the “Current Value”
Once data is corrected
- Load the file again
- Recheck for errors ("Recs Failing to Load" column)
- Identify errors using Load Summary and Error report
- Correct residual errors (Correct)
- Repeat until no errors occur
Exceptional Events

• What is an exceptional event?

  The Federal Regulations (40 CFR Part 50.14) allow Ambient Air Quality Measurements that are Exceedances or Violations of the National Ambient Air Quality Standards (NAAQS) that are caused by an “Exceptional Event” to be excluded from Attainment demonstrations.

• These steps are now done:

  o Reporting Agency “flags” data with exceptional Event Flag, and submits justification to EPA → you put a special qualifier on your Raw Data value

  o Reporting Agency defines the Exceptional Event → you defined an Event in AQS using Maintain Event

• Time to do the last necessary step for the Reporting Agency

  o Reporting Agency ties the flagged data to the defined Event → you associate these in AQS using Maintain Event (online)

• When this step is complete, then the EPA Regional Office can take AQS action.

  o Regional office either concurs with exclusion or “non-concurs”

= You have until July 1st of the year following the event to do these steps
Maintain Event: how associate data

- Query in the Event
  - Screening Group + Qualifier Code
  - Event Begin and End Dates

- Go to “Associate Raw Data with Event” tab
  - Query Affected Monitors

- Associate Raw Data
  - Use Associate All button or
  - Do individually using “Action” dropdown
Put it into Practice: Exercise 2.4

- You will submit a file with Raw data
  - You will use the “Automatic” process
  - Final processing step = “Post”
  - Go into AQS and look at the Batch form
    - Process by File
    - History

- Use the report and Correct to analyze and fix the errors
  - Site/monitor does not exist
  - Overlapping sample data
  - Inactive monitor on date of entry
  - Invalid Protocol

- Associate Raw data with an Event