♻EPA Implementation Guidelines for SDWARS/UCMR

Volume V: Flat File Format

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Introduction

This document describes the specifications for submitting data for the Unregulated Contaminant Monitoring Rule (UCMR) program to the U.S. Environmental Protection Agency (EPA) in a flat file format. Only laboratories that are registered with EPA's Central Data Exchange (CDX) can submit data to the Safe Drinking Water Accession and Review System (SDWARS). SDWARS is the information system that supports the collection of data for the UCMR. Preliminary analytical data are entered by laboratories on behalf of the Public Water Systems (PWSs) participating under the rule. The PWS can then review their data online. Data approved by the PWS are then available for state and EPA review before being transmitted to the National Contaminant Occurrence Database (NCOD). To learn more about CDX and how to register, see Volume I of these implementation guidelines, or contact the CDX Technical Support by phone (1-888-890-1995) or e-mail at <EPACDX@lmi.org>, with "UCMR" in the subject line.

INTENDED USERS OF GUIDE

This implementation guide (IG) describes the requirements and procedures necessary for UCMR participants to transmit flat files through the EPA's CDX to the SDWARS. The scope of this IG is solely to transmit monitoring data from laboratories for public water systems (PWSs) to EPA's SDWARS through the CDX.

ORGANIZATION OF GUIDE

This IG is the fifth volume of a five-volume set. It describes the requirements and procedures for submitting flat files. The other volumes are listed below:

◆ *IG Volume I*—introduces the CDX and electronic reporting.

◆ *IG Volume II*—describes completing and submitting Web forms in detail.

◆ *IG Volume III*—contains details about Electronic Data Interchange (EDI) in case EPA decides to exchange monitoring data using EDI (not applicable to UCMR).

◆ *IG Volume IV*—documents in detail the formatting requirements for Extensible Markup Language (XML) to be used with the EPA-provided

document type definition (DTD) to create a well-formed, valid XML document.

RESPONSIBLE ENTITY

These guidelines are published under the authority of

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The Office of Environmental Information (OEI) helps ensure that EPA collects high-quality environmental information and makes it available to the American public. OEI provides guidance to assist the agency about the way EPA collects, manages, analyzes,, and provides/allows access to environmental information.

Within OEI is the Office of Information Collection (OIC). OIC is the agency lead for information collection programs, including how EPA obtains and manages information. OIC works closely with many partners, stakeholders, facilities, other federal agencies, and states. Within OIC, the Central Data Exchange is the EPA's new infrastructure for supporting the exchange of environmental data between EPA and its external partners. Over the next several years CDX will expand to become the point of entry for nearly all environmental data submissions to the agency. It will also improve collection, management and sharing of environmental information among states, tribes, and EPA so that they can achieve their respective and shared environmental goals.

The CDX Technical Support Center will answer questions about the web form for data monitoring or compliance reporting. The Center logs each call to ensure customer support is completed. Several options are available for receiving customer support for electronic reporting:

◆ *By telephone.* Person-to-person telephone support is available between 8:00 a.m. and 6:00 p.m. (EST/EDT) from our toll-free line at 1-888-890-1995.

◆ *By fax.* You may request assistance 24 hours a day; support personnel will return calls between 8:00 a.m. and 6:00 p.m. (EST/EDT). Our fax number is 703-917-7105.

◆ *By e-mail.* Send e-mail to <EPACDX@lmi.org> with "UCMR" in the subject line. Responses will be sent between 8:00 a.m. and 6:00 p.m. (EST/EDT).

HOW TO USE THIS VOLUME

You can find general information about the CDX and electronic reporting in Volume I. The remainder of this volume is structured as follows:

◆ *Chapter 2—Business Issues*. This chapter discusses format rules and maintenance.

◆ *Chapter 3—Legal and Security Considerations*. This chapter contains legal and security considerations.

◆ *Chapter 4—Environments*. This chapter explains the communications and software requirements for submitting data to CDX.

◆ *Chapter 5—Error Corrections and Resubmissions*. This chapter explains correcting errors and resubmitting data.

◆ *Appendix A—Flat File Format, UCMR Reporting*. This appendix is the UCMR flat file format.

◆ *Appendix B—Analyte Code List*. This appendix is a list of analyte codes.

◆ *Appendix C—Analytical Method Code*. This appendix is a list of analytical method codes.

◆ *Appendix D—Flat File Examples*. This appendix shows examples of flat files.

◆ *Appendix E—*Abbreviations.

HOW TO GET MORE INFORMATION

EPA has websites that you may find useful in submitting a UCMR electronically:

◆ The CDX website is at <http://EPACDX.lmi.org>; only registered users can access this site. (To gain access, register by using the process described in Volume I.)

◆ General public information about the EPA CDX is at <http://www.epa.gov/cdx>.

◆ The Office of Ground Water and Drinking Water (OGWDW) maintains a Web page about UCMR at <http://www.epa.gov/safewater/ucmr.html>.

Chapter 2
Business Issues

This section describes when data may be submitted and introduces the UCMR flat file structure, which specifies the record layout and the data elements required for submitting data to SDWARS. The flat file structure is defined in Appendix A.

FLAT FILE SUBMISSIONS

Only laboratories may submit electronic files to the SDWARS database. These files contain data about batches (analytical or extraction) and sample results. After you, as representative of the lab, submit a file, the CDX will return a message to your "MyCDX" inbox that the file has been successfully processed, or that errors have been detected and the file has been rejected. You should correct rejected files and resubmit (Chapter 5 discusses error correction and resubmissions). Depending on specific codes placed in the file and the results of SDWARS range check validations (see Chapter 5 for details of range checks), you may need to log into the SDWARS database and further process the data through web forms (see Volume II for more on web form processing).

THE FLAT FILE FORMAT RULES

The following format rules apply to generating a proper UCMR flat file, as shown in Appendix A.

Each file submission may contain three types of records:

- ◆ Header record

- ◆ Batch record(s)

- ◆ Sample record(s)

The content and format of each record type is described in Appendix A. The following sections describe some general rules.

File Naming Convention

The file name must be unique from all other files submitted to SDWARS. The file name must follow the format: "UCM + (Laboratory ID) + (unique alphanumeric identifier assigned by the laboratory).txt" (e.g., The unique alphanumeric identifier may be an incremental counter, such as "UCMIL00028001.txt."). The

length must not exceed 40 characters and may include an underscore "_", but not spaces or symbols (e.g., $, @, &, %).

Your laboratory ID begins with the two letter postal code for your state followed by a five-digit numeric code assigned by the US EPA during a past performance evaluation (PE) study (e.g., FL12345). If you do not know your lab ID, please contact the Safe Drinking Water Hotline (see Chapter 1).

Header Records

The header record identifies the report type and purpose, the submitting laboratory and other file data. **There must be exactly one header record and it must be the first record in the file**. The following describes the fields for the header record:

◆ *Start tag field* identifies the record type as a header record (only "HDR" is accepted).

◆ *Report type field* identifies the incoming data for a specific program.

◆ *Version field* identifies the standard the data are formatted to.

◆ *Transaction purpose field* identifies data as original or replacement—a code "o" or "r". If they are original, at least one subsequent batch or sample record must be new. A replacement contains replacement data, but may also contain original data. If the transaction purpose is replacement then the record from the file will overwrite any existing data. If the record does not exist, SDWARS inserts the data into the database.

◆ *Sender ID field* identifies the laboratory submitting the data.

◆ *CDX identification field* identifies the user to be contacted for processing issues.

◆ *Transaction date field* provides the date of the transaction.

◆ *Transaction time field* provides the time of the transaction.

◆ *Environment field* identifies the data as test or production. If they are test, the file will be checked as if it were going to be loaded into the database. CDX will provide the laboratory with a message noting that the file would successfully process into the database or a reject message listing up to 50 errors. **Data submitted as test *will not* upload into SDWARS.** Production indicates the system will process the data into SDWARS, unless the data have errors. CDX will provide a message to the laboratory indicating a successful upload or a message with the errors. If the file contains errors, the whole file is rejected.

Following the header record is the batch data, which may be any number of batch records. The batch record is optional if there is not any original batch data. Following the batch data are the sample/results records. There must be at least one batch or sample record within the file.

Batch Records

Batch quality control records contain a unique batch ID, extraction or analysis date, analytical method code and other information related to the collection. A file may contain zero, one, or many batch quality control (QC) records. However, all batch records must be grouped together immediately following the header record and preceding any sample records.

If the Transaction Purpose code in the header record indicates a replacement file, then at least one of the batch IDs must match one already in SDWARS. The data in this record will replace the previous data. If SDWARS cannot find a matching ID, it will reject the record.

If the Transaction Purpose code in the header record indicates an original file, then all batch IDs must be new. If SDWARS finds a matching ID already present, it will reject the record as a duplicate and reject the entire file.

Sample Records

A sample record identifies the PWS, facility, and sample point of the analyzed data. It also contains an associated batch ID, and other results data. A file may contain zero, one, or many sample records. However, all sample records must be grouped together following all the batch QC records (if any).

A sample record must be associated to a unique batch ID. That batch ID will typically be in the preceding batch records, however it could have been previously loaded in SDWARS through another file.

If the Transaction Purpose code in the header record indicates replacement, then at least one of the sample IDs should match one already in SDWARS. The data in this record will replace the previous data. If SDWARS cannot find a matching ID, it will reject the data.

If the Transaction Purpose code in the header record indicates original, then all sample IDs must be new. If SDWARS finds a matching ID already present, it will reject the record as a duplicate and reject the entire file.

Sample IDs must be linked to a valid PWS, facility, sampling point, and batch. If any of these are not present in SDWARS, the record will be rejected, which will result in the entire file being rejected.

Each sample record must reference a batch record that is either one of the preceding batch records in the transaction or already exists in SDWARS from a previous transaction or online data entry. (Note: batch data and associated sample records do not have to be part of the same transaction as long as the batch data are processed into SDWARS before the sample results are submitted. Mixing new batch records is permitted in the same transaction as sample records that are associated with existing SDWARS batch records.)

General Format Rules

◆ Each record begins with a 3-character "start_tag" that identifies the type of record to be processed.

◆ Each record is processed field by field according to the order in which they are defined. The field/element delimiter indicates the end of one field/element and the start of the next field/element in the definition.

◆ All record elements are pipe '|' delimited with a record-terminator tilde "~".

◆ A 'new-line' character (i.e., a carriage return) is permitted only after a record terminator (i.e., "~").

◆ The first character of an element must be either alphabetic or numeric, *not* a space or special character.

◆ Record elements that may be null should apply the text value of 'null' if the value of the element is null. Restrictions on element type and size are ignored for 'null' values.

TIMING OF TRANSACTIONS

The CDX system operates 24 hours a day, 365 days a year. See the CDX website for any specific changes in operating hours. CDX places a receipt acknowledgment message in the users CDX inbox for each file submitted. Users are encouraged to check their box on a regular basis as well as to follow the detailed instructions for verifying submissions in Volume II. Submissions typically will be uploaded to SDWARS within 30 minutes after they are received, but may take as long as an hour.

MAINTENANCE

Maintaining This Implementation Guideline

EPA will be responsible for maintaining, updating, and distributing the IG as needed. Submitters will be responsible for ensuring their process remains consistent with this guide. If a system is modernized, it must retain data formats and processes consistent with what is defined in this IG and the UCMR program. EPA will notify all laboratories registered as file submitters when revising this IG and its content.

Maintaining the Flat File Format Version or Release

The flat file rules in this chapter and the structure in Appendix A represent the current flat file format. If business requirements dictate revising this guide, EPA will coordinate the changes and transition with CDX registrants.

Chapter 3
Legal and Security Considerations

Electronic reporting of UCMR data reduces the burden of reporting, collecting data, and record keeping for both reporting facilities and responsible environmental agencies by eliminating the labor, time, and other costs of submitting paper reports. Electronic reporting does not lessen or alter any of the submitter's responsibilities or liabilities under good business practices.

AUTHENTIC SUBMISSIONS

Drinking water regulations do not require laboratories to electronically sign data submitted to SDWARS. However, submitting laboratories should consider their submissions as their official copy of record.

UCMR business rules require laboratories to mark each sample "approved" before the responsible PWS can review it. In turn, each PWS must mark a sample "approved" before a state or EPA entity can review it or before it can be moved on to EPA data systems.

Laboratories can mark uploaded files as "approved." If successfully uploaded, these files will move directly to the PWS review process. If rejected, the laboratory must correct and resubmit them. However, there are also certain data range checks which the system will review. If data fall outside of the range limits, SDWARS will alter the status from "lab approved" to "lab hold." For such records, the laboratory must use the web form to manually approve the records.

ELECTRONIC REPORTING

CDX Registration

All laboratories reporting UCMR data must be registered with CDX before submitting flat files. Refer to IG Volume I for information about registration.

Flat File Submission

The flat file submission itself does not require authentication. However, the submitting organization must maintain proper safeguards and security over the computer systems that will generate the flat file. At a minimum, an authorized official must use a secure means to release the UCMR data. The security can include using password- or token-based entry into the system to release the completed monitoring data so the flat file can be generated.

Approving Submissions

Once the CDX receives the data, the system will display the data on its website within an hour, unless the data were marked "approved" in the flat file—then it will go directly to the PWS. The facility may access the website and approve the data. The official who approves the data must have previously registered with EPA. After the data are approved, they are considered the official data for SDWARS. See Volume I of this IG for more information about registering.

ELECTRONIC RECORD KEEPING

Regardless of how a facility keeps the records, the facility's systems for monitoring applications and generating flat files should adhere to procedures described below.

Backup and Recovery Procedures

The systems should back up all data and programs daily. Backup media should be stored off site. Users should maintain archives of all transmissions sent and received, which should be readily accessible for at least 30 days to ensure that the user can retransmit the data if EPA or another regulatory agency requests them. The facility should maintain logs of all transmitted UCMR flat files and verify that EPA received them.

Alternative plans should be developed to accommodate unforeseen problems, such as loss of a data center or local phone system, or a catastrophic act of nature that prevents transmitting data for an extended period. Alternatives may include temporarily using remote backup systems or different third-party service providers.

Audit Considerations

Submitters should maintain an adequate audit trail to ensure that they can substantiate, when needed, information exchanged electronically. In an information systems environment, an audit trail typically focuses on the transactions in the system—the data processed, input or output devices accessed, and the date and time that activities occurred. Documents in paper form usually are available to validate information input or output from information systems. However, in an electronic reporting environment, paper versions of data do not exist. Therefore, an audit mechanism for the electronic environment should be more comprehensive to substantiate the information transmitted and received electronically. A submission audit trail is a full set of records (maintained in either electronic or paper format) documenting the data received, sent, retained, and stored. This set of records should accurately reflect data or date the events as they occurred.

Procedure Documentation

The submitter should maintain current and detailed documentation of its backup and disaster-and-recovery procedures. In addition, the facility should document its record-keeping procedures (either paper or electronic).

Chapter 4
Environments

This chapter summarizes the flow of flat file data between the submitting organization and the CDX. The chapter begins with a discussion of the communications path between the user and CDX.

COMMUNICATIONS

Once a file is generated, it can be uploaded through the CDX website. Once the user has established an account with CDX and the user's sponsor letter is processed at CDX, the user will have access to the UCMR:File Upload link in the "Available Account Profiles" at the bottom of the "MyCDX" account web page (Figure 4-1).

Figure 4-1. CDX Account Web Page

The link will take the user to the UCMR file upload web page (Figure 4-2). On the UCMR File Upload screen the user will enter the directory location of the flat file or click on the Browse button to locate the file. When file has been located, the user may click on the Send File button.

Figure 4-2. File Upload
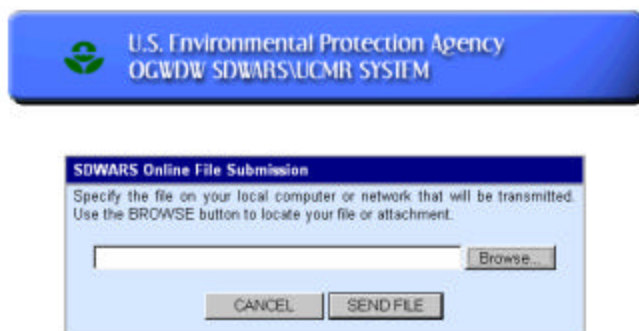
The user will receive an acknowledgement on the screen and in the user's CDX inbox that SDWARS received the user's file (Figure 4-3). If the user encounters problems with uploading the file, contact the CDX Technical Support.

Figure 4-3. File Submission Confirmation
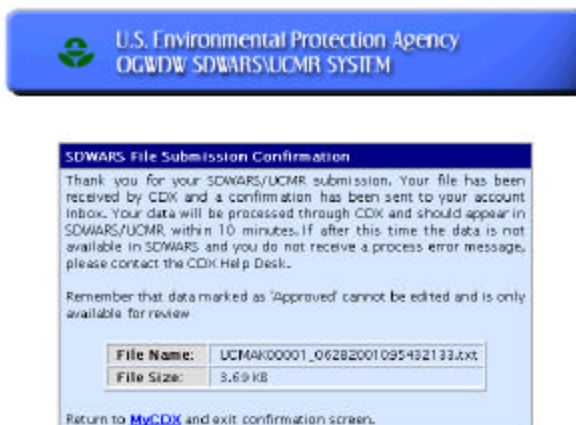
CDX may take several minutes to process the user's file into SDWARS. When the file has been processed, CDX will send the user an upload confirmation message or an error message to the user's CDX inbox (Figure 4-4). If the user receives an error message, refer to Chapter 5. If the user receives a successful upload confirmation message (Figure 4-4), the user's data have been loaded and, depending on the laboratory status, the user should be able to view the data in SDWARS. The laboratory can edit data with a laboratory status of "lab hold," but approved data can only be viewed through the search function of SDWARS. See the Volume II, for a more complete discussion about the SDWARS web interface.

Figure 4-4. CDX Inbox with Successful Upload Message
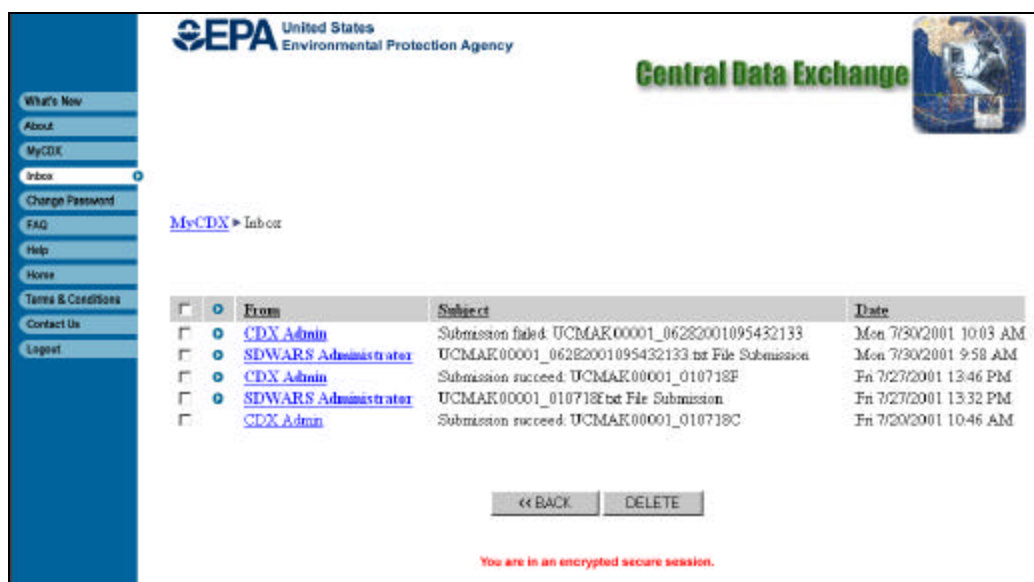
SOFTWARE REQUIREMENTS

Users must develop a parser to parse (map) the data into the flat file format according to their Laboratory Information Management System (LIMS) or other information system architecture. For the first submission, each laboratory should use the test environment. The laboratory may also coordinate with the CDX Technical Support to test a transaction to ensure their files will be properly processed when received.

UCMR DATA FLOW

The first step to creating a flat file is to prepare the extraction of the data from the LIMS. The various LIMSs available may be programmed to extract and parse the flat file elements or use some data transformation software to parse the data once extracted. The user's LIMS provider should be consulted about the capabilities of the user's software.

When the user has determined a process for extracting the data, the user must parse the data into a flat file format. The flat file format is in Appendix A. EPA will maintain the most recent UCMR flat file format on the CDX website. The lab should validate the resultant flat file to ensure that it complies with the structure of the format.

The user then can communicate the validated flat file format to CDX as described above. CDX will poll the laboratory mailboxes on the CDX server and convert the flat files to the UCMR XML DTD (see IG Volume IV for a description of XML).

The XML document is sent to the CDX parser for validating and uploading into SDWARS. Figure 4-5 represents the processing of a UCMR flat file submission.

Figure 4-5. UCMR Flat File Process
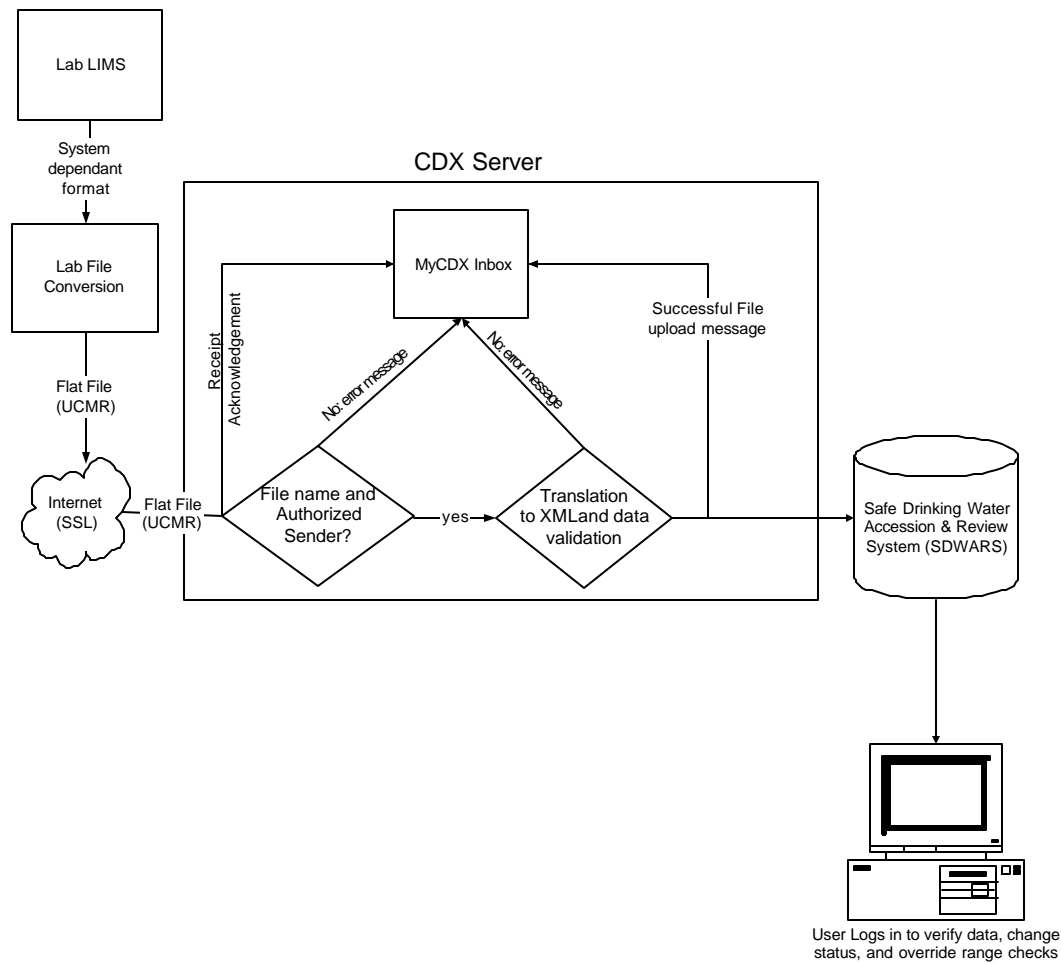
If errors prevent processing the submission, CDX will send an error message to the submitter's CDX inbox (Figure 4-4).

After making the corrections, the data can be resubmitted (refer to Chapter 5). The submitter can call the CDX Technical Support for additional assistance.

Once the data are loaded into SDWARS, the laboratory will be able to enter CDX via their web account to view the data (see IG Volume II for a discussion of web access). If the laboratory has an "approval" status in the Reviewer_Status element, the laboratory will only be able to view the data online. If the laboratory has a "hold" in the Reviewer_Status element or does not provide a status, the laboratory will be able to view and make edits. The PWS cannot review data until the laboratory has approved the submitted data.

Chapter 5
Error Corrections and Resubmissions

CORRECTING ERRORS

If a submission contains errors that prevent it from being parsed into SDWARS, CDX will notify the submitter of the error by sending a notification to the "MyCDX" inbox (Figure 5-1).

Figure 5-1. MyCDX Inbox with Error Notification

Data checks are done at two stages during the file upload process—authentication and data validation. Authentication occurs as soon as CDX receives the file. CDX authenticates the sender and the file name. These messages are displayed in the user's inbox. Table 5-1 shows the error messages a user might receive.

Table 5-1. Authentication Error Messages

Error message	Administrator note
Archive1 fail. File name larger than 75 characters. File: gggggggggggggggg was not accepted. The user ID yyyyyyy is not authorized to submit for lab ID: xxxxxxxxxxxxxx. For questions, contact CDX Technical Support at 1-888-890-1995. The file submitted for UCMR Lab ID xxxxxxxxxxxxxxxxxxx has some problems. Please access your CDX Inbox for further information. Thank you for your cooperation.	

The data validation function performs checks in two parts—format and UCMR validations. SDWARS will conduct data validation and verifications according to UCMR. If the file does not pass the checks, SDWARS will provide an error message in the user's "MyCDX" inbox. A copy of the error notification is sent to the CDX Technical Support, in case the submitter has questions about the error report.

The message (see Figure 5-2) is numbered and provides an explanation, the extract of the record that contains the error, and an optional administrator message. The administrator message is included to provide the technical support staff additional information, should the user need assistance. The text file lists up to the first 50 errors in the submitted file. The first message in Figure 5-2 does not include an administrator message, while the second message does.

SDWARS verifies the data by first checking general format and verifying IDs (i.e., correct format for date, batch ID, valid PWS ID, valid method, valid sampling point ID). Table 5-2 lists common error messages for data formatting and general validations. These messages identify the probable cause for the error and recommended corrective actions.

Figure 5-2. Text File with Details of Errors

An error occured while processing a file submission to UCMR.

Submission information:
File name: UCMAK00001_06292001113952750-JKELLOG1.txt
Error date: Jun 29, 2001
Error time: 11:52:6 AM

For further assistance, please contact the CDX Technical Support staff at 1 888 890-1995.

1. ERROR MESSAGE EXPLANATION:
 SPK_CONCENTRATION must equal N/A or be greater than 0. For further assistance,
 please contact the CDX Technical Support staff at 1 888 890-1995.

LAB_IDENT_CD: AK00001
BATCH_IDENT_CD: AST2251887
METHOD_CD: ASTM D5790
ANALYTE_CD: 2254
SPK_CONCENTRATION: 0
RESULT_PRECISION: 71
ACCURACY: 19
EXTRACTION_ANALYSIS_DATE: 24-Jan-01
USER_LOGIN_ID:
LAST_CHANGE:

2. ERROR MESSAGE EXPLANATION:
The Batch associated with this Sample does not exist. Please add the Batch data or change
 the Batch ID and resubmit your data. See BATCH_ID below. For further assistance,
 please contact the CDX Technical Support staff at 1 888 890-1995.

LAB_IDENT_CD: AK00001
BATCH_IDENT_CD: ASTOUNDING
METHOD_CD: ASTM D5475
SAMPLE_IDENT_CD: AST2052644164
ANALYTE_CD: 2272
ANAL_RESULT_VALUE: 6
ERROR_EXIST:
LAB_REVIEW:
LAB_REVIEW_DATE:
PWS_REVIEW:
PWS_REVIEW_DATE:
STATE_REVIEW:
STATE_REVIEW_DATE:
EPA_REVIEW:
EPA_REVIEW_DATE:
SENT_TO_EPA_DATE:
PRESENCE_ABSENCE:
LESS_THAN_MRL: 0
STATE_REGION_ID: 99
PWS_ID: 990000001
FACILITY_ID: 00002
SAMPLING_POINT_ID: 4354
STATUS_CD: 10
USER_LOGIN_ID:
LAST_CHANGE:

Administrator Message:
ORA-02291: integrity constraint (UCMR.FK_FIELD_ANALYTES_BATCH_QC) violated - parent key not found

Table 5-2. Common Formatting Data/Verification Error Messages

Error message	Administrator message
The Batch ID and Method combination already exist in SDWARS. Please change the Batch ID or Method and resubmit your data. See BATCH_IDENT_CD and METHOD_CD: below. For further assistance, please contact the CDX Technical Support staff at 1-888-890-1995.	ORA-0001 unique constraint (UCMR.PK_TableName) violated.
Your Lab ID is not known. Verify your Lab ID is correct and resubmit. See LAB_IDENT_CD below. For further assistance, please contact the CDX Technical Support staff at 1-888-890-1995.	ORA-02291 integrity constraint (UCMR.FK_TableName_TableName) violated– parent key not found.
This Method is unknown to SDWARS. See METHOD_CD below. Verify the method and resubmit your data. For further assistance, please contact the CDX Technical Support staff at 1-888-890-1995.	UCMR.FK_BATCH_QC_METH0D_ANALYTE_IDS
The analyte and method combination is unknown to SDWARS. See ANALYTE_CD and METHOD_CD below. Verify the analyte and method, then resubmit your data. For further assistance, please contact the CDX Technical Support staff at 1-888-890-1995.	UCMR.FK_BATCH_QC_METH0D_ANALYTE_IDS
The record below shows that this Method is not associated with this Analyte in SDWARS. Please verify the METHOD_CD and ANALYTE_CD are correctly associated. For further assistance, please contact the CDX Technical Support staff at 1-888-890-1995.	UCMR.FK_BATCH_QC_METH0D_ANALYTE_IDS
The Sample ID and PWS ID combination already exists. Please change the Sample ID and resubmit your data. See SAMPLE_IDENT_CD below. For further assistance, please contact the CDX Technical Support staff at 1-888-890-1995.	ORA-00001 unique constraint (UCMR.PK_TableName) violated.
Your Lab ID could not be found in SDWARS. Please verify your Lab ID and resubmit your data. See LAB_IDENT_CD below. For further assistance, please contact the CDX Technical Support staff at 1-888-890-1995.	ORA-02291 integrity constraint (UCMR.FK_TableName_TableName) violated— parent key not found.
The following PWS ID could not be found in SDWARS. Please verify the PWS ID and resubmit your data. See PWS_ID below. For further assistance, please contact the CDX Technical Support staff at 1-888-890-1995.	ORA-02291 integrity constraint (UCMR.FK_TableName_TableName) violated— parent key not found. FK Violation (UCMR.FK.BATCH_QC_METHOD_ANALYTE_IDS)
The following PWS ID and Facility ID combination could not be found in SDWARS. Please verify the Facility ID belongs to this PWS and resubmit your data. See FACILTY_ID and PWS_ID below. If the Facility is correct, please contact the PWS and have them update their inventory in SDWARS. For further assistance, please contact the CDX Technical Support staff at 1-888-890-1995.	ORA-02291 integrity constraint (UCMR.FK_TableName_TableName) violated— parent key not found. K Violation (UCMR.FK.SAMPLES_PWS_FACILITY)

Table 5-2. Common Formatting Data/Verification Error Messages (Continued)

Error message	Administrator message
The PWS ID, Facility ID, and Sampling Point ID combination could not be found in SDWARS. Please validate the Sampling Point ID belongs to this Facility and PWS, then resubmit your data. See FACILTY_ID, PWS_ID, and SAMPLING_POINT_ID below. If the PWS is registered on your client list and the Sampling Point is correct, contact the PWS and have them update their inventory in SDWARS. For further assistance, please contact the CDX Technical Support staff at 1-888-890-1995.	ORA-02291 integrity constraint (UCMR.FK_TableName_TableName) violated— parent key not found. FK Violation (UCMR.FK.SAMPLES_PWS_ FAC_SAMPLING_POINT)
The Sample Type is invalid. Please change the Sample Type and resubmit your data. See SAMPLE_TYPE below. For further assistance, please contact the CDX Technical Support staff at 1-888-890-1995.	SAMPLES FK Violation (UCMR.FK.SAMPLES_VALID_SAMPLE_TYPE)
The PWS ID, Sample ID, Batch ID, Method ID combination already exists for your Lab. Please validate these data or change the file to a "Replacement" and resubmit your data. See PWS_ID, SAMPLE_ID, BATCH_ID, and METHOD_ID below. For further assistance, please contact the CDX Technical Support staff at 1-888-890-1995.	FIELD ANALYTES PK Violation
The Batch associated with this Sample does not exist. Please add the Batch data or change the Batch ID and resubmit your data. See BATCH_ID below. For further assistance, please contact the CDX Technical Support staff at 1-888-890-1995.	FIELD ANALYTES FK Violation (UCMR.FK.FIELD_ANALYTES_BATCH_QC)
Your Lab ID could not be found in SDWARS. Please verify your Lab ID and resubmit your data. See LAB_ID below. For further assistance, please contact the CDX Technical Support staff at 1-888-890-1995.	FIELD ANALYTES FK Violation (UCMR.FK. FIELD_ANALYTES _LABS)
The PWS ID could not be found in SDWARS. Please validate the PWS ID and resubmit your data. See PWS_ID below. For further assistance, please contact the CDX Technical Support staff at 1-888-890-1995.	FIELD ANALYTES FK Violation (UCMR.FK. FIELD_ANALYTES _PWS)
The PWS ID and Facility ID combination could not be found in SDWARS. Please verify the Facility belongs to this PWS and resubmit your data and that the PWS is registered on your client list. See PWS_ID and FACILTIY_ID below. If the Facility is correct, please contact the PWS and have them update their inventory in SDWARS. For further assistance, please contact the CDX Technical Support staff at 1-888-890-1995.	FIELD ANALYTES FK Violation (UCMR.FK. FIELD_ANALYTES _PWS_FACILITY)
The following PWS ID, Facility ID, and Sampling Point ID combination could not be found in SDWARS. Please verify the Sampling Point belongs to this Facility in the PWS and resubmit your data. See PWS_ID, FACILTY_ID, and SAMPLING_POINT_ID below. If the PWS is registered on your client list and the Sampling Point is correct, please contact the PWS and have them update their inventory in SDWARS. For further assistance, please contact the CDX Technical Support staff at 1-888-890-1995.	FIELD ANALYTES FK Violation (UCMR.FK. FIELD_ANALYTES _PWS_ FAC_SAMPLING_POINT)
Application terminated. No data were processed. Document must contain an Environment field and field value must be T or P. For further assistance, please contact the CDX Technical Support staff at 1-888-890-1995.	

Error message	Administrator message
Application terminated. No data were processed. Document must contain Header data and Batch QC or Sample & Result data.	
Application terminated. No data were processed. Document must contain a Report Type field and field value must be UCMR to identify transaction as a UCMR report.	
Application terminated. No data were processed. Document must contain a Transaction Purpose field and field value must be o or r.	

The final validations that SDWARS conducts are UCMR data validations. Table 5-3 lists common error messages for UCMR data validations

Table 5-3. UCMR Validation Errors

Error message	Administrator message
RESULT_PRECISION,ACCURACY,SPK_CONCENTRATION must equal N/A	ORA-20100
RESULT_PRECISION must equal N/A or be greater than or equal to 0	ORA-20101
ACCURACY must equal N/A or be greater than or equal to 0	ORA-20102
SPK_CONCENTRATION must equal N/A or be greater than 0	ORA-20103
EXTRACTION_ANALYSIS_DATE must be between January 1, 1985 and sysdate	ORA-20104
SPIKE CONCENTRATION may not equal MISSING	ORA-20105
ACCURACY may not equal MISSING	ORA-20106
RESULT_PRECISION must be a number or N/A or missing	ORA-20107
ACCURACY must be a number or N/A	ORA-20108
SPK_CONCENTRATION must be a number or N/A	ORA-20109
The Collection Date DD-MON-YYYY must be on or before the Extraction Analysis Date DD-MON-YYYY	ORA-20200
For Method, the analytical result value must be less than MRL	ORA-20201
ANAL_RESULT_VALUE is not null, so LESS_THAN_MRL must be null	ORA-20202
ANAL_RESULT_VALUE must equal to N/A or be greater than or equal to the MRL	ORA-20203
LESS_THAN_MRL is LT, so ANAL_RESULT_VALUES must be null	ORA-20204
Either LESS_THAN_MRL or ANAL_RESULT_VALUES must be not null in order to be approved	ORA-20205
Your STATUS CODE is status_cd and STATUS CODE must be 10 or 50 in order to change the ANAL_RESULT_VALUE	ORA-20206
Your STATUS CODE is status_cd and STATUS CODE must be 10 or 50 in order to change the LESS_THAN_MRL	ORA-20207
ANAL RESULT VALUES must be a number or N/A	ORA-20208

RESUBMITTING DATA

The laboratory can submit a flat file as an original transaction or a resubmission. The type of submission is indicated in the transaction_purpose element. The laboratory may resubmit results for a sample if the result has not yet been approved. When resubmitting data, the laboratory *must* use the code "r" that indicates the transaction contains records that will replace existing records. **The laboratory cannot resubmit a flat file that has the same name as a previous submission.** *The laboratory must rename the file before resubmitting it.* The resubmission will overwrite the existing data in the CDX database. The laboratory may confirm that the data were overwritten by viewing the records in the SDWARS application.

The laboratory is the only entity that may edit sampling and analytical data. The laboratory can only edit data that are in "lab hold" status in the SDWARS database. If the laboratory needs to edit data that has already been approved by the PWS, then the PWS or the laboratory must request that the SDWARS database administrator return editing rights to the laboratory. The SDWARS database administrator can be contacted through CDX Technical Support.

CHECKING THE RANGE OF DATA VALUES

In addition to the edit validations described in the preceding sections SDWARS reviews several fields for specific values or ranges. In some cases it may entirely reject the record for failing the range check while in others it may create a warning that requires the laboratory to manually review and either approve or modify the results. This section describes these fields.

UCMR Data Range Checks

The UCMR has specific ranges of values for different analytes and methods. Information about MRL values is in the following regulations:

- ◆ 40 CFR, parts 9, 141 and 142, "Revisions to the Unregulated Contaminant Monitoring Regulation for Public Water Systems;" final rule, September 17, 1999.

- ◆ 40 CFR, part 141, "Unregulated Contaminant Monitoring Regulation for Public Water Systems: Analytical Methods for Perchlorate and Acetochlor;" "Announcement of Laboratory Approval and Performance Testing (PT) Program for the Analysis of Perchlorate;" final rule and proposed rule, March 2, 2000.

- ◆ 40 CFR, part 141, "Unregulated Contaminant Monitoring Regulation for Public Water Systems;" "Analytical Methods for List 2 Contaminants and Clarifications;" final rule, January 11, 2001.

SDWARS Data Range Checks

SDWARS will check the range of some data values. Table 5-4 shows the list of elements that SDWARS checks. SDWARS assigns a range or value that the element must satisfy, and the range or value it should satisfy. The "must" checks will prevent the data from loading, although the "should" checks will not. However, the "should" checks will flag results as having potential errors for the laboratory to confirm. **If data are submitted that violate the "should" criteria, then the status of those records will be "hold" and the laboratory must use the web forms to override the range check.** Laboratories cannot approve data that have range check notifications without choosing the override option. Thus, the data cannot be sent to the PWS to approve and will remain in the laboratory's "hold" samples.

To edit a range check, the reporting laboratory has two options. In order to override the warning message and approve the data, the laboratory must use the web forms. If in reviewing the data the lab believes the data should be corrected, it may do so either by using the web form or by correcting the data in their system and issuing a replacement transaction.

Table 5-4. Range Checks Performed by SDWARS

Element	Criteria	
	Must be	Should be
Accuracy	$\geq$ 0 or N/A < 32000	$\leq$ 200% $\geq$ 10%
Collection date	Not later than the current date Not earlier than 1/1/85	
Extraction/analysis date	Not later than the current date Not earlier than the collection date Not earlier than 1/1/85	$\leq$ 60 days from collection date
Precision	$\geq$ 0, "MISSING,"[a] or N/A < 32000	$\leq$ 99%
Result (value)[b]	$\geq$ MRL or N/A < 32000	> 10 x MRL
Spiking concentration	> 0 or N/A < 32000	$\leq$ 200

[a] "MISSING" is allowed when a duplicate result was not available.

[b] If the result_sign is "eq," then the result value field must be numeric and comply with the above criteria. Otherwise, the result sign is "lt" and the result value is "null." Method EPA 515.3 will not have a result value, it must always be reported as less than MRL.

Note: N/A indicates "not analyzed." If an analyte is not analyzed for a batch, then precision, accuracy and spiking concentration must be N/A. If an analyte is not analyzed for the sample then the result value is N/A.

Appendix A
Flat File Format, UCMR Reporting

How to Read the Record Definitions

Table A-1. Explanation of the Layout for Record Definitions

Column	Purpose
Element*	Provides the name for the element.
	(Record elements that define a unique record in SDWARS are identified with an asterisk ("*") after the element name.)
Type and size	Specifies the allowable character types and the number of characters.
	(Types [AN = alphanumeric and special characters, N = numeric characters with optional decimal "."]; Sizes [absolute (e.g., "9"), range (e.g., "1…15")])
UCMR element number	Cross-references the flat file element to the UCMR element defined in "Table 1 Unregulated Contaminant Monitoring Rule Requirements."[a]
Must not be null	Indicates if the element is prohibited from being valued as null.
Codes	Specifies acceptable code values for coded elements.
Notes	Provides additional information about element definitions, their purposes, or values.

[a] *Federal Register*, Vol. 66, No. 8, Thursday, January 11, 2001, Final Rule, pages 2300–2302.

Header Record Definitions

Occurs once at the beginning of a transaction file to provide transaction processing information.

Table A-2. Header Record Definitions

Element	Type and size	UCMR element number	Must not be null	Code	Notes
start_tag	AN 3	–	Yes	HDR	Identifies the record type as a header record. Used by CDX to determine processing functions.
report_type	AN 4	–	Yes	UCMR	Identifies this transaction as a UCMR report. Used by CDX to determine processing functions.
version	AN 1.4	–	Yes		Identifies the version (currently 2.1) of the report format. Used by CDX to determine processing functions.

Element	Type and size	UCMR element number	Must not be null	Code	Notes
transaction_ purpose	AN 1	–	Yes	o, r	An "o" identifies whether the transaction contains only new data (originals only). An "r" identifies the record as containing replacement data and may also contain some original data. The replacement submission identifies if the record already exists. If it does, it will overwrite those existing records in SDWARS (replacements permitted). Once a transaction is defined with the purpose of either "o" or "r," then all records in that transaction will be processed under the rules of the selected purpose code. If "o," then all duplicate transaction records in SDWARS are rejected. SDWARS will reject the entire file if any error is found. Used by CDX to determine processing functions. o: Originals r: Replacements permitted
sender_ID*	AN 1.15	11.a	Yes		Identifies the laboratory submitting the data. Your laboratory ID begins with the two letter postal code for your state followed by a five-digit numeric code assigned by the U.S. EPA during a past PE study (e.g., FL12345). If you do not know your lab ID, please contact the Safe Drinking Water Hotline (see Chapter 1, *How to Get More Information*).
CDX_ identification	AN 8.30	–	Yes		Identifies the CDX user to be contacted for processing issues. Should be your user ID to log in to CDX.
transaction_ date	N 8	–	Yes		Identifies the date the transaction was created. Date format is "YYYYMMDD."
transaction_ time	N 6	–	Yes		Identifies the time the transaction was created. Time format is "HHMMSS."
environment	AN 1	–	No	t, p	Instructs the translator to process the file as test or production data. The use of "T" will give messages, as if it were loading the data, but will not load the data into the database. T: Test P: Production

BATCH QUALITY CONTROL DATA

The quality control (QC) data show spiking concentration, analytical precision, and accuracy for each analyte of a reported batch. A separate record instance is required for each combination of batch_ID, extraction_analysis_date, and analyte_code (e.g., Two analytes that are measured from the same batch must have two batch QC data records to provide QC data for each.).

Table A-3. Batch QC Record Definitions

Element	Type and size	UCMR element number	Must not be null	Code	Notes
start_tag	AN 3	–	Yes	BCH	Identifies the record type as a batch data record. Used by CDX to determine processing functions.
batch_ID*	AN 1.15	11.b	Yes		Identifies the laboratory-assigned batch number for an extraction batch. If no extraction was part of the method, use the analysis batch identification. Batch identifications may contain alphanumeric characters as well as #, &, ( ), -.
extraction_ analysis_date	N 8	11.c	Yes		Identifies the date the batch was extracted. If the method used is not an extraction process, use the analysis start date. Date format is "YYYYMMDD."
analytical_ method	AN 6.15	9	Yes	(See Appendix C)	Identifies the method for analysis.
analyte_code*	N 4	5	Yes	(See Appendix B)	Identifies an analyte analyzed as part of the batch by the analytical method. Analytes are identified by their SDWIS code value.
spiking_ concentration	N 1.5	16	Yes		Identifies the spiking concentration of the analyte for the batch. Value is assumed to be in accordance with the unit of measure for the analyte. The decimal point is *not* included in the element size limit.
analytical_ precision	N 1.5	14	Yes		Identifies the analytical precision for measuring the analyte for the batch according to the observed variability of results for duplicate spiked samples. Values are percentages (e.g., 5.5) or "missing" if not measured. The use of a decimal point is *not* included in the element size limit.
analytical_ accuracy	N 1.5	15	Yes		Identifies the analytical accuracy for measuring the analyte for the batch according to the percent recovered from spiked samples. Values are percentages (e.g., 95.5). The use of a decimal point is *not* included in the element size limit.

SAMPLE AND RESULT

The sample and result provides a single analytical result for a sample. A separate record instance is required for each analyte analyzed from a sample.

Table A-4. Sample-and-Result Record Definitions

Element	Type and size	UCMR element number	Must not be null	Code	Notes
start_tag	AN 3	–	Yes	RES	Identifies the record type as a sample-and-result data record. Used by CDX to determine processing functions.
pws_ID*	AN 9	1	Yes		Identifies the PWS from which the sample was taken. Use state code and state-assigned ID (i.e., 2-character state code + 7-character state-assigned ID; e.g., "CA1234567").
facility_ID*	AN 1.6	2.a	Yes		Identifies the facility at the PWS from which the sample was taken. Use state-assigned ID, if available. If no state ID exists for the facility, the PWS must register the facility with SDWARS. ID of each facility in the PWS must be unique.
sample_point_ID*	AN 1.20	2.b	Yes		Identifies the point from which the sample was taken. Use state-assigned ID, if available. If no state-provided ID exists for the sampling point, the PWS must register the sampling point with SDWARS. ID of each sampling point for the facility in the PWS must be unique.
sample_ID*	AN 1.15	4	Yes		Uniquely identifies the sample in the laboratory. Assigned by laboratory.
sample_ collection_date	N 8	3	Yes		Identifies the date the sample was collected. Date format is "YYYYMMDD."
analysis_type	AN 3	10	Yes	rfs, rds, tfs, tds	Identifies the sample's analysis type. Duplicate field samples will only be reported for small PWS participants. rfs: Raw field sample rds: Raw duplicate field sample tfs: Treated field sample tds: Treated duplicate field sample
analyte_code*	N 4	5	Yes	See Appen-dix B	Identifies the applicable analyte for the result. Analytes are identified by their SDWIS code value. This element also links results to QC data along with batch_ID and analytical_method.

Table A-4. Sample-and-Result Record Definitions (Continued)

Element	Type and size	UCMR element number	Must not be null	Code	Notes
batch_ID*	AN 1.15	11.b	Yes		Provides a foreign key to link results to QC data along with analyte_code and analytical_method. Must equal a batch_ID in a preceding batch QC data record or existing in SDWARS.
analytical_ method*	AN 6.15	9	Yes	(See Appen- dix C)	Provides a foreign key to link results to QC data along with analyte_code and batch_ID.
value	N 1.15	7	No		Identifies the result value for measurable analysis. Must be valued if result_sign is "eq." If result_sign is "lt," this field must be "NULL.
result_sign	AN 2	6	Yes	lt, eq	Identifies if the result is less than the statutory MRL. lt: Less than MRL eq: Equals (a value = or > MRL)
presence	AN 1	17	No	p, a	Reserved for future use. Must be "NULL." p: Present a: Absent
reviewer_status	AN 1	–	No	h, a	Identifies the laboratory's status for an analytical result. If not valued, SDWARS will default to hold status. h: Hold result record a: Approve result
lab_result_ comment	AN 1.250	–	No		Optional laboratory comments about the sample result (e.g., slightly lower internal standard).
lab_sample_ comment	AN 1.250	–	No		Optional laboratory comments about the sample (e.g., condition upon receipt).

Appendix B
Analyte Code List

Table B-1. Assessment Monitoring Analytes

SDWIS code	UCMR analyte name
2009	4,4'-DDE
1039	Perchlorate
2108	DCPA mono/di-acid degradates[a]
2027	Acetochlor
2052	EPTC
2251	MTBE
2254	Nitrobenzene
2266	2,6-dinitrotoluene
2270	2,4-dinitrotoluene
2272	Terbacil
2626	Molinate

[a] DCPA mono-acid degradate and di-acid degradate are not reported to SDWARS individually.

Table B-2. Screening Survey Analytes

SDWIS code	UCMR analyte name
3201	Aeromonas
2029	Prometon
2056	Diazinon
2102	Disulfoton
2103	Diuron
2104	Fonofos
2233	2-methyl-phenol
2254	Low-level nitrobenzene
2268	1,2-diphenylhydrazine
2283	Linuron
2328	2,4-dinitrophenol
2332	2,4,6-trichlorophenol
2334	2,4-dichlorophenol
2545	Terbufos

Appendix C
Analytical Method Code

Table C-1. Analyte Method Codes

Analytical method	Abbreviated method name (40 characters maximum)
AOAC 990.06	Organochlorine pesticides in water
AOAC 991.07	Nitrogen/phosphorus pesticides
AOAC 992.32	Chlorinated acid pesticides
ASTM D5317	Chlorinated organic acids, GC/ECD
ASTM D5475	Pesticides, nitrogen/phosphorous, LLE, GC, NPD
ASTM D5790	VOC, GC/MS, P&T, capcolumn
ASTM D5812	Pesticides, chlorinated, GC
EPA 1605	Membrane filter, aeromonas
EPA 314.0	Perchlorate, ion chromatography
EPA 502.2	VOC, GC, PID/ECD, P&T
EPA 507	Pesticides, nitrogen/phosphorous, LLE, GC, NPD
EPA 508	Pesticides, chlorinated, LLE, GC/ECD
EPA 508.1	Pesticides, chlorinated, SPE, GC/ECD
EPA 515.1	Herbicides, acids, LLE, GC/ECD
EPA 515.2	Herbicides, acids, SPE, GC/ECD
EPA 515.3	Herbicides, acids, LLE, GC/ECD
EPA 515.4	Herbicides, acids, micro LLE, GC/ECD
EPA 524.2	VOC, GC/MS, P&T, capcolumn
EPA 525.2	Organics, SPE, GC/MS
EPA 526	Organics, SPE, GC/MS
EPA 528	Phenols, SPE, GC/MS
EPA 532	Phenylurea, SPE, HPLC/UV
SM 6200 B	VOC, GC/MS, P&T, capcolumn
SM 6200 C	VOC, GC/MS, P&T, capcolumn
SM 6210 D	VOC, GC/MS, P&T, capcolumn

Appendix D
Flat File Examples

EXAMPLE 1

Example 1 is of two batch QC records and the compatible sample result in the same transaction.

HDR|UCMR|2.1|O|EP00001|LABTEST1|20010718|1700|P~

BCH|101NMO507|20010705|EPA 507|2052|10|11.10|92.60~

BCH|101NMO507|20010705|EPA 507|2272|10|21.40|77.40~

RES|AK9000073|00065|00488|20010727F|20010701|TFS|2052|101NMO507|EPA 507|NULL|LT|NULL|A|NULL|NULL~

RES|AK9000073|00065|00488|20010727F|20010701|TFS|2272|101NMO507|EPA 507|2.6|EQ|NULL|H|NULL|NULL~

EXAMPLE 2

Example 2 is of two batch QC records for the same analyte, each referenced by sample results in a later transaction.

Transaction 1:

HDR|UCMR|2.1|R|EP00001|LABTEST1|20010719|1708|P~

BCH|B071801A|20010718|EPA 507|2272|10|15.3|84.00~

BCH|B071801B|20010718|EPA 525.2|2027|10|9|98~

Transaction 2:

HDR|UCMR|2.1|R|EP00001|LABTEST1|20010725|1725|P~

RES|AK9090074|00107|00107E|CD33480|20010708|TFS|2272|B071801A|EPA 507|NULL|LT|NULL|A|NULL|THE BOTTLES WERE NOT SECURELY PACKED, BUT SEAL INTEGRITY WAS MAINTAINED.~

RES|AK9090074|00107|00107E|CD33480|20010708|TFS|2027|B071801B|EPA 525.2|NULL|LT|NULL|A|NULL|THE BOTTLES WERE NOT SECURELY PACKED, BUT SEAL INTEGRITY WAS MAINTAINED.~

EXAMPLE 3

Example 3 is of two batches and related sample results for each. This lab decided not to re-analyze analytes in the batch run under method EP525.2 that were already part of the other batch run under method EP507. This lab decided to explicitly denote the analytes not analyzed by using "N/A" in the batch's precision, accuracy, spiking concentration, and the sample result's value fields. They could have instead left those records out of the transaction.

HDR|UCMR|2.1|O|EP00001|JKELLOG1|20010718|1700|P~

BCH|103NMO507|20010705|EPA 507|2052|10|11.1|92.6~

BCH|103NMO507|20010705|EPA 507|2272|10|17|85.3~

BCH|103NMO507|20010705|EPA 507|2626|10|12.8|87.1~

BCH|104NMO525|20010705|EPA 525.2|2009|20|8|93.7~

BCH|104NMO525|20010705|EPA 525.2|2027|20|15.5|87.4~

BCH|104NMO525|20010705|EPA 525.2|2052|N/A|N/A|N/A~

BCH|104NMO525|20010705|EPA 525.2|2266|20|MISSING|100.6~

BCH|104NMO525|20010705|EPA 525.2|2270|20|9.4|94.9~

BCH|104NMO525|20010705|EPA 525.2|2272|N/A|N/A|N/A~

BCH|104NMO525|20010705|EPA 525.2|2626|N/A|N/A|N/A~

RES|TN0000073|00065|00488|20010727F|20010701|TFS|2052|103NMO507|EPA 507|NULL|LT|NULL|A|NULL|NULL~

RES|TN0000073|00065|00488|20010727F|20010701|TFS|2272|103NMO507|EPA 507|3|EQ|NULL|H|NULL|NULL~

RES|TN0000073|00065|00488|20010727F|20010701|TFS|2626|103NMO507|EPA 507|NULL|LT|NULL|A|NULL|NULL~

RES|TN0000073|00065|00488|20010727F|20010701|TFS|2009|104NMO525|EPA 525.2|NULL|LT|NULL|A|NULL|NULL~

RES|TN0000073|00065|00488|20010727F|20010701|TFS|2027|104NMO525|EPA 525.2|NULL|LT|NULL|A|NULL|NULL~

RES|TN0000073|00065|00488|20010727F|20010701|TFS|2052|104NMO525|EPA 525.2|N/A|EQ|NULL|A|NULL|NULL~

RES|TN0000073|00065|00488|20010727F|20010701|TFS|2266|104NMO525|EPA 525.2|NULL|LT|NULL|A|NULL|NULL~

RES|TN0000073|00065|00488|20010727F|20010701|TFS|2270|104NMO525|EPA 525.2|NULL|LT|NULL|A|NULL|NULL~

RES|TN0000073|00065|00488|20010727F|20010701|TFS|2272|104NMO525|EPA 525.2|N/A|EQ|NULL|A|NULL|NULL~

RES|TN0000073|00065|00488|20010727F|20010701|TFS|2626|104NMO525|EPA 525.2|N/A|EQ|NULL|A|NULL|NULL~

Appendix E
Abbreviations

ACES	Access Certificates for Electronic Services
B2B	business-to-business
CA	certifying agent
CDX	Central Data Exchange
CRK	customer retrieval key
CSI	Common Sense Initiative
DTD	document-type definition
EC	electronic commerce
EDI	Electronic Data Exchange
EPA	U.S. Environmental Protection Agency
FCC	Federal Communications Commission
GPEA	Government Paperwork Elimination Act
GPRA	Government Performance and Results Act
GSA	General Services Administration
I-3	Information Integration Initiative
ID	identification
IG	implementation guide
IT	information technology
LIMS	Laboratory Information Management Guide
NCOD	National Contaminant Occurance Database
OEI	Office of Environmental Information
OGWDW	Office of Ground Water and Drinking Water
OIC	Office of Information Collection
OLAP	online analytical processing
PE	performance evaluation
PIN	personal identification number
PC	personal computer
PWS	public water systems

REI	Reinventing Environmental Information
SDWARS	Safe Drinking Water Accession and Review System
SSL	secure socket layer
UCMR	Unregulated Contaminant Monitoring Rule
URL	uniform resource locator
XML	Extensible Markup Language
Y2K	Year 2000