BC Environmental Monitoring System

(EMS)

Electronic Data Transfer

Guidelines and Responsibilities

About This Document

This document is intended to provide private laboratories with guidelines and information on how to access and use the EMS Electronic Data Transfer (EDT).

The document has been organized to allow for distribution of the document as a whole or, to enable efficient extraction of pertinent portions of the document for distribution to a specific target audience.

Users should be aware that the contents of this document will evolve over time. An up-to-date copy will be maintained on our website

https://www2.gov.bc.ca/gov/content/environment/research-monitoring-reporting/monitoring/environmental-monitoring-system

User feedback on improvements to the document will be greatly appreciated. Comments and suggestions should be forwarded to the EMS Helpdesk at:

emshelp@gov.bc.ca

1.0 Introduction

The Environmental Monitoring System (EMS) is the Ministry of Environment's monitoring database. EMS assists Ministry staff and external stakeholders in the capture, storage, retrieval, administration, compilation and analysis of environmental monitoring data. Field samples are collected by Ministry staff as well as waste permit holders and analysed by private laboratories. Electronic Data Transfer (EDT) is intended to provide laboratories with a means to transfer analytical data electronically to the EMS system.

2.0 Getting Started

2.1 Who to Contact

The first line of contact for all data is the Ministry Contact. Ministry personnel will be in the best position to provide immediate assistance and/or escalate issues/problems to the appropriate channels to obtain resolution in a timely manner.

Private Laboratories providing analytical services for permittees should contact the Ministry through:

Sergei Verenitch
Senior Provincial Laboratory Specialist

Telephone: **(236) 478-3284**
Fax: **(250) 356-7197**
e-mail: **Sergei.Verenitch@gov.bc.ca**

2.2 Roles and Responsibilities

1. Electronic Data Provider (EDP) Responsibilities

- have a computer with modem or direct Internet access
- use a current web-browser
- obtain access to an e-mail account (i.e. through a commercial Internet Service Provider)
- assess which EDT option best suits your data transfer needs (Internet Upload or File Transfer Protocol (FTP) for bulk upload)
- produce a file using supported file format options:
    1. EMS format (see *Appendix B.1* for technical specifications)
       - Must be used by all new data providers
    2. Federal Provincial Pulp and Paper (FPP) format (see *Appendix B.2* for technical specifications)
       - Must only be used by permittees who report data electronically under the Federal/ Provincial Pulp and Paper Agreement.

2. Ministry Regional Staff Responsibilities

- provide all current and potential data providers with the EMS electronic data transfer instruction documents

- provide all data providers with supported Electronic File Transfer options
- provide all data providers with the appropriate supported Electronic Data Transfer formats (*Appendix B*)
- determine which electronic data transfer option will be used by the data provider and request the appropriate userid and password from the EMS Helpdesk
- supply all data providers with required codes for coded fields
- ensure all codes used by data providers are valid EMS codes
- if new codes (i.e. parameter or method codes) are required, request new codes from the EMS Helpdesk. Requests for new parameter codes must include a detailed description of analytical method and minimum detection limit (MDL) obtained from lab performing analysis on behalf of the permittee
- advise all EDPs that initial data transfers must be uploaded for QA first
- review initial file transfers for file compatibility and advise the data provider of any problems
- after the EDP has successfully completed a data transfer in train mode, advise the user how they may transfer data into EMS production (all files transferred to the train environment must be re-submitted to the EMS production version)

3. EMS Helpdesk Responsibilities

- assign and maintain userids and passwords for data providers
- establish new system support codes as required
- maintain EMS Electronic Data Transfer Guidelines and Responsibilities document
- post EMS EDT guidelines document on the Ministry website

https://www2.gov.bc.ca/gov/content/environment/research-monitoring-reporting/monitoring/environmental-monitoring-system

- provide help and assistance to the Ministry regional contact as required

3.0 Electronic Data Transfer Details

3.1 General Overview

Electronic Data Transfer (EDT) has been developed to provide a utility to capture monitoring data collected by the Ministry and/or permit holders for assessing environmental impacts and meeting permit reporting requirements. In addition, EDT provides value-added functionality by generating immediate data transfer confirmation messages, a data error report, and by providing a 'QA index only' option to enable data providers to assess the QA index before submitting the final dataset to the Ministry.

3.2 Data Transfer Acknowledgement Messages

An automatic message acknowledging receipt of the data transfer file will be sent to data providers transmitting data to EMS electronically. These messages will be transmitted to the EPD as soon as EMS successfully receives the files. Generally, EDPs using the Web page data transfer method will receive a message immediately, those using the e-mail data transfer option will receive a confirmation message by return e-mail, and EDPs using File Transfer Protocol will receive an immediate on-line successful file transfer message.

3.3 Upload Data QA (Quality Assurance) Index Only

The EMS QA indexer is based on an algorithm developed to indicate a basic level of scientific confidence associated with a particular dataset. The QA indexer is not intended to indicate 'good' or 'bad' data or whether the permit related data is in compliance. The current version of EMS will indicate just two QA values, 'C' or 'F'.

- **QA index of 'C'** indicates the data passed EMS calculation and validation checks.
- **QA index of 'F'** indicates the data failed one or more of EMS calculation or validation checks. An error report will be generated for all data with a QA index of 'F' indicating why the data was assigned an index of 'F'.

EMS allows the user to submit the data for QA (Quality Assurance) index calculation only. This allows users to review any possible errors in the dataset, before formally submitting the data to EMS. If the QA index option is selected, the user is informed via e-mail of the QA index value and any errors associated with the data. The user may then correct this data and the file resubmitted for official entry into EMS. Once formally entered into EMS, the data provider can no longer modify the data. Access to this data for corrective action is restricted to the Ministry contact.

NOTE: files submitted to EMS with a QA Index Only option are not actually loaded into EMS. Such files need to be subsequently re-sent for transfer to EMS.

3.4 QA Index/Error Reports

EMS will generate Quality Assurance (QA) index and error reports after EMS has processed the data. Examples of QA index/error reports are included in *Appendix B*.

The QA Index/Error Report may contain the following messages:

- **ERRORS**: If major errors are found in the dataset (i.e. mandatory fields left blank or incorrectly coded), EMS will prefix the record with an ERROR and the file will be rejected by EMS. The data must be corrected at the source and the **entire file** resubmitted to EMS.

- **WARNINGS:** If warnings are found in the dataset (i.e. invalid Ministry contact), EMS will prefix the record with a WARNING but EMS will not reject the file. If the file contains **both** WARNINGS and ERRORS, the errors must be corrected and the **entire file** resubmitted to EMS.

- **DATA SUCCESSFULLY TRANSFERRED:** A message confirming all data files were successfully transferred to EMS and a copy of the QA Index/Error Reports will be sent to the Ministry Regional contact. EMS will retain an archive log of all acknowledgement messages (including a date stamp) and any error reports.

3.5 Security and Confidentiality

Data providers using the Internet based Web upload or FTP will require an account to access EDT. Contact your regional Ministry contact to inquire about access. The regional contact will make the arrangements through the EMS Helpdesk.

It is the EDP's responsibility to monitor their file transfers and notify the regional Ministry contact immediately if they receive any unexpected data transfer messages. Receipt of such messages could indicate a possible security breach.

3.6 System Failure

EMS resides on a stable and reliable platform. However we may, on occasion, encounter system failures due to e-mail, communication or hardware/software problems beyond our control. EDPs should notify the Ministry regional contact if they do not receive e-mail confirmation within 2-3 days of transferring files to EMS. The Ministry contact will be able to escalate the problem to the appropriate resource for resolution.

4.0 How to become an Electronic Data Provider

EMS supports three data transfer options: (see *Appendix A* for details)

- **Internet based Web page:** includes a file transfer and interactive data entry option
- **File Transfer Protocol (FTP)**

General Information for all EDT Users:

Determine the best method to transfer data to EMS electronically.

4.1 Userid and Passwords

- **Internet based Web page and FTP users:**
  - Both options require an EDT account set up and a valid Business BCeID.
  - Request through your regional Ministry contact

4.2 File formats

- **EMS File Formats:** create an ASCII data file in one of the supported ASCII file formats (see *Appendix B.1* for technical specifications)
- **Federal/Provincial Pulp and Paper Format (FPP):** fixed file format (see *Appendix B.2* for technical specifications)

4.3 Data Transfer for QA

All users **MUST** transfer files to EMS for QA before uploading. This will ensure file format compatibility and an opportunity to fix all errors or warnings. Once the file passes all QA you may upload your file for final submission.

NOTE: Files transferred to the EMS for QA environment will not be retained by EMS and must be re-submitted to the EMS production environment.

4.4 File transfer acknowledgements

- **WEB page data transfer method:** will receive an email within an hour. Typically it takes less than 3 minutes.
- **FTP method**: will receive an email within an hour.

4.5 QA Index/Error Reports

EMS will generate QA Index/Error Reports after the data has been processed by the system.

- **Web Page data transfer options:**
  All data submitted using one of these options will be processed immediately and an e-mail containing the QA Index/Error report will be sent to the submitter and the regional Ministry contact by return mail.

- **FTP option:**
  Data files submitted using the FTP option will be processed within the hour. An e-mail indicating the QA Index/Error report will be sent to the EDP and the Ministry contact by e-mail the following day.

4.6 QA Index Only Option

EMS provides EDPs with the option to process the data for grading purposes only and provides the submitter with the appropriate QA index (see *Section 3.4* for an explanation of the QA index). This option is not available in the revised FPP file formats when using the FTP or e-mail data transfer options.

NOTE: the file is NOT actually loaded into EMS under the QA Index Only option.

4.7 File Upload Option

The File Upload option transfers the data file into EMS. Once formally entered into EMS, the data provider can no longer modify the data. Access to this data for corrective action is restricted to the Ministry contact.

Appendix A - Uploading

Appendix A.1 How to transfer files using Web Submission

General

Data transferred to EMS using this option will be entered into the system immediately. An e-mail message reporting the results of the submission will be sent to the data provider's e-mail address that was specified within the upload file and regional Ministry contact as soon as EMS has completed processing the file.

- This option is recommended for use by Electronic Data Providers (EDPs) submitting small to medium sized datasets. The recommended file size when using this option is 150K or less.

  IMPORTANT: As a security precaution, there will be an automatic time out after 1 hour of inactivity on the EMS Web page. Users will be automatically logged out if there has not been a data submission to EMS during the previous hour.

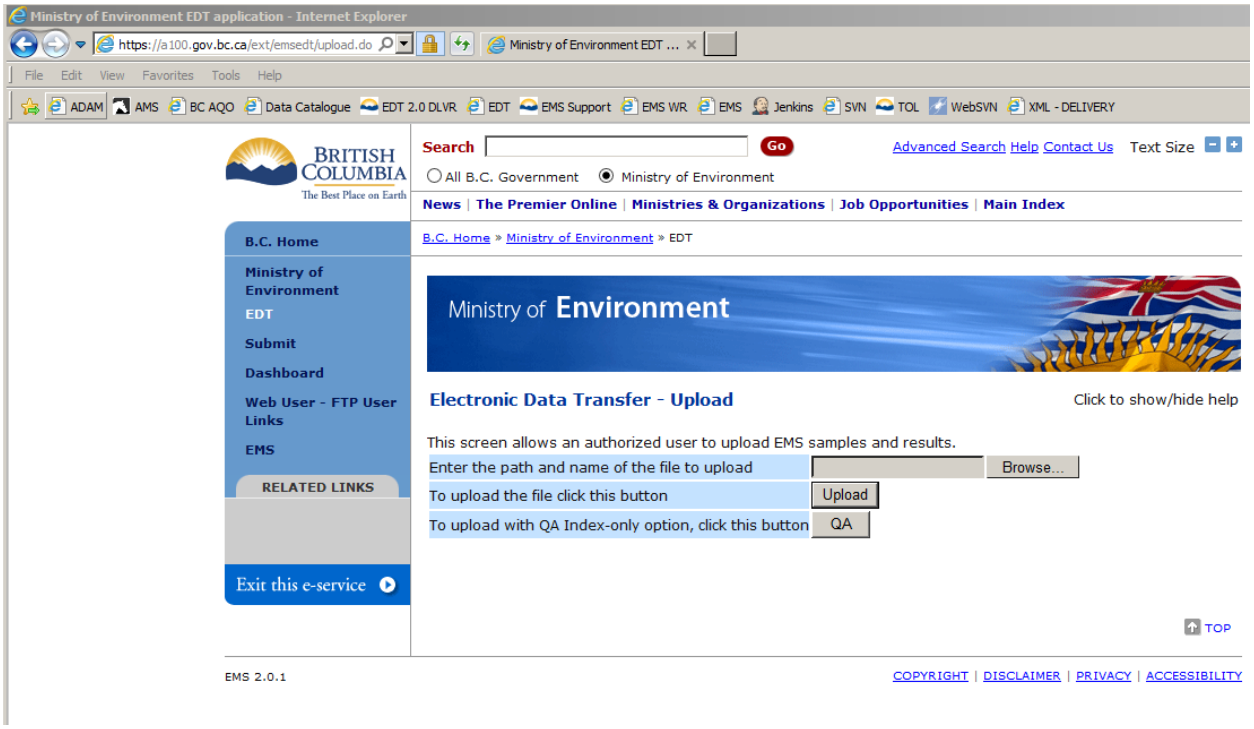
To access the Internet

- Use a current browser and type in the following address:

  https://a100.gov.bc.ca/ext/emsedt/upload.do

- You will be prompted to login using your Business BCeID
- The EMS Electronic Data Transfer Screen will be displayed (*Figure 1*)

Figure 1



- The user may now choose one of the following options:

  - Upload a file.
  - QA a file.
  - View the Dashboard. (Left side menu.)

File Upload

This function allows the user to send an ASCII file in the supported EMS formats directly to EMS.

- Use the **Browse** key to select a file from your local drive.
- Always start by **Upload for QA Index only** to view the QA index only. EMS will process the data for QA Index and/or any errors associated with the file. The file will not be loaded into EMS.
- Once any corrections (if necessary) have been made, the data provider must re-transfer the entire file by selecting the **Upload** button.

Appendix A.2 How to Transfer Data using File Transfer Protocol (FTP)

General

Data transferred to EMS using this option will be entered into the system and processed within the hour. An e-mail message reporting the results of the submission will be sent to the data provider and the Ministry contact the following day. The FTP option supports EMS, FPP file formats but does not support a '**QA Index Only**' function if the files submitted are in FPP formats.

- More likely to be used by EDPs transmitting larger datasets on a regular basis.
- Files are transmitted directly to an EMS directory using FTP (File Transfer Protocol).
- Can be programmed by EDPs to automate data transfer on a regular basis.

To transfer a file to EMS

1. Open your FTP software:
    - Enter '**FTP://epdftp.env.gov.bc.ca**' in the host name or IP address field
    - Enter in provided username and password.
    - Navigate to: ftp://epdftp.env.gov.bc.ca/apps/ems/prod/
2. Enter your user directory.
3. EMS will process the file within the hour, and notify you and the ministry contact by email.

Appendix B

Appendix B.1 EMS File Format for Regular Samples

1.0 EMS File Format for Regular Samples

This document describes the content and format for files electronically transferred to EMS by a lab. The record types that may be submitted are:

- Header Record (must be included)
- Regular Sample (must be included)
- Result (must be included)
- QA/QC Sample (optional, include only if the file contains QA/QC Samples)
- QA/QC Results (optional but must be included if the file contains QA/QC sample information)
- Expected Results (optional)
- Trailer Record (must be included)

Not all record types have to be included in a file but some dependencies exist. Sample and Result records are logically linked. Therefore, the Result Record(s) associated with that sample must follow the Regular Sample Record. The same rule applies to QA/QC Sample and QA/QC Result records. Expected Result records are optional and must be linked to QA/QC Sample record or a Regular Sample record. The Expected Result information must be entered immediately following the associated QA/QC or Regular sample result. In addition, a Header and Trailer record are added for validation. **They must always be present.** The columns for each type are defined below.

The file must be comma delimited ASCII. Text values (i.e. comment fields) should be enclosed with double-quotes and should not include commas. The record length will be variable with data fields in the order described below for each record type.

Note: Mandatory columns are underlined and bold.

Note: Fields are not case sensitive.

All Date/Time fields use the format YYYYMMDDHHMM (year, month, day, hour, minutes) where the time component is in 24 hour format (0000-2359). If the time component is not required, then default to zeroes.

HR - Header Record

- The header record in the file identifies the source. It identifies the e-mail address of the person who sent the file.
- There is only one header record in the file and it must be present. It must be the first physical record in the file.

Type	Field	Content
char (2)	**Record Type**	HR
char (40)	**E-mail Address**	E-mail address of user who sent the file
date (12)	**Date Prepared**	Date the file was prepared (e.g. 19980927).
char (1)	**QA index Only Indicator**	Y - if the data file should be validated for errors N - if the data file should be loaded into EMS if no errors are found
char (19)	File Name	Optional user-defined file name. This information will be included in the QA Index/ Error Report.
char (80)	Comment	Optional comment about the file content. This information will not be stored in EMS but may be used in correspondence about the data.

RS - Regular Sample Record

- The Regular Sample record identifies sample information that is common to the Result records that follow.
- The following fields are found in the 'RS' record:

Type	Field	Content
char (2)	**Record Type**	RS
char (7)	Monitoring Location ID	Present if collected at an EMS Monitoring Location.
char (10)	Requisition Id	Present if sample is part of an EMS Requisition.
date (12)	**Collection Start Date/Time**	Date and time when the sample collection was started (e.g. 199809270000).
date (12)	Collection End Date/Time	Date and time when the sample collection was ended (e.g. 199809270000).
char (3)	**Sample State**	Code indicating the type of sample (e.g. FW for Fresh Water). Validated against EMS Sample State table.
char (3)	**Sample Descriptor**	Code further describing the type of sample (e.g. GE for General). Validated against EMS Sample Descriptor table.
char (6)	**Sample Class**	Code indicating the general class of the sample (e.g. REG for Regular). Validated against EMS Sample Class table.
char (6)	**Collection Method**	Code indicating the method used to collect the sample (e.g. GRB for Grab). Validated against EMS Collection Method table.
char (6)	Disinfectant Type	Code to indicate whether the sample is from a disinfected source (e.g. Chlorinated). Validated against EMS Disinfectant Type table.
number (6)	Composite Number of Items	The number of items that make up the sample if it is considered a composite.
char (3)	**Sampling Agency**	Code indicating the agency which collected the sample. Validated against EMS Client Location table's Short Name.
char (3)	**Analyzing Agency**	Code indicating the agency which performed the analysis. Validated against EMS Client Location table's Short Name.

char (10)	**Ministry Contact**	Ministry staff responsible for the sample. Validated against Staffs' table UserID. Permit holders may enter the permit number to indicate the Ministry contact. If permit number is used, it must be in the format AAnnnnn (File Type, Waste Type plus 5 digit numeric, e.g. PR99999).
char (60)	Sampler	The person who collected the sample.
date (12)	Lab Arrival Date	The date that the sample arrived at a Laboratory.
number (3)	Lab Arrival Temperature	The temperature of the sample at the time of arrival to the Lab in degrees Celsius (°C).
char (20)	Group Id	Identifier that is used to associate samples within the data file. All samples within the file having the same group ID will be associated to each other, e.g. a lab sample may be contracted out to more than one analyzing agency becoming multiple EMS samples that should be associated using the lab sample ID as the group ID.
number (6,2)	Depth Upper	Upper (shallower) depth at which the sample was taken. If it is a single depth enter the same value in the Depth Lower. This is required information. Expressed in meters(m) in the format 9,999.99
number (6,2)	Depth Lower	Lower (deeper) depth at which the sample was taken. If it is a single depth enter the same value in the Depth Upper. This is required information. Expressed in meters (m) in the format 9,999.99
char (6)	Tide Code	Code to indicate the state of the tide for marine or estuarine samples. Validated against EMS Tide tables.
number (6,2)	Height Upper	Upper height at which the sample was taken. Expressed in meters (m) in the format 9,999.99
number (6,2)	Height Lower	Lower Height at which the sample was taken. Expressed in meters (m) in the format 9,999.99
char (6)	Direction Code	Validated against EMS Direction table.
number (4,1)	Filter Size	The size of a filter used in collecting a sample. Expressed in µm in the format of 999.9
number (4,2)	Air Flow	Rate of air flow. Expressed in m3 in the format of 99.99
char (6)	Air Flow Unit	Measurement unit code for air flow, i.e. code 220 for m3

char (1000)	Sample Comment	Text up to 1000 characters.
char (1000)	Field Comment	Text up to 1000 characters.

RR - Result Record

- The Result record identifies the information specific to a Regular Sample record if the result type is not a continuous summary. Many result records may be present for one sample record.
- The following fields are found in the RR record:

Type	Field	Content
char (2)	**Record Type**	RR
date (12)	Analytical Date/Time	The date the result was determined (e.g. 199809270000).
char (6)	**Parameter**	Code indicating the test for which the result is reported. Validated with EMS Parameter table.
char (6)	**Analytical Method**	Code indicating the analytical method used to determine the result. Validated with EMS Analytical Method table.
char (1)	Result Letter	A letter or symbol to describe the result. Valid values are <, >, M: indicating over-range, less than detection limit or mean, respectively.
char (60)	**Result**	Must convert to numeric result. An entry of 'C' will be accepted to record analytical results which cannot be converted to numeric results (e.g. qualitative results). Results with entries = 'C' in the result field, must include result details in the comment field.
char (60)	Confidence Interval	Confidence interval for a Parameter/Analytical Method for the Laboratory that determined the result.
char (6)	**Measurement Unit**	Code indicating the units of the result reported. Validated with EMS Measurement Unit table.
char (60)	Method Detection Limit	A value to indicate the minimum detectable limit for a parameter/analytical method as specified by a Lab.
char (10)	Laboratory Batch Id	An internal Laboratory identifier used to logically group a series of samples for the purpose of performing the same analytical methodology.
char (10)	Laboratory Sample Id	An internal identifier that a Laboratory assigns to a sample.
char (6)	Preservation Code	Method used to preserve the sample (e.g. Unfilt. HN03). Validated against EMS Preservation table.
char (6)	Media Code	Media used to collect the sample (e.g. Polybottle 4L). Validated against EMS Media table.

char (1000)	Result Comment	Text up to 1000 characters.

QS - Quality Assurance Sample Record

- The Quality Assurance Sample record identifies QA/QC sample information that is common to the result records that follow. The regular sample record contains more fields and is described in another record type.
- The following fields are found in the QS record:

Type	Field	Content
char (2)	**Record Type**	QS
date (12)	**Start Date/Time**	Date and time when the sample was started.
char (12)	**End Date/Time**	Date and time when the sample was ended.
char (6)	**Sample State**	Code indicating the type of the sample (e.g. FW for Fresh Water). Validated against EMS Sample State table.
char (6)	**Sample Descriptor**	Code further describing the type of sample (e.g. GE for General). Validated against EMS Sample Descriptor table.
char (6)	**Sample Class**	Code indicating the general class of the sample (e.g. REG for Regular). Validated against EMS Sample Class table.
char (3)	**Analyzing Agency**	Code indicating the agency which performed the analysis. Validated against EMS Client Location table's Short Name.
char (20)	Group ID	Identifier that is used to associate samples within the data file. All samples within the file having the same group ID will be associated to each other, e.g. a lab sample may be contracted out to more than one analyzing agency becoming multiple EMS samples that should be associated using the lab sample ID as the group ID.
number(4,1)	Filter Size	The size of a filter used in collecting a sample. Expressed in µm in the format of 999.9
number(4,2)	Air Flow	Rate of air flow. Expressed in m3 in the format of 99.99
char (6)	Air Flow Unit	Measurement unit code for air flow, i.e. code 220 for m3
char (1000)	Sample Comment	Text up to 1000 characters.

QR - Quality Assurance Result Record

- The Quality Assurance Result record identifies the information specific to the Quality Assurance Sample record. Many result records may be present for one sample record.
- The following fields are found in the QR record:

Type	Field	Content
char (2)	**Record Type**	QR
date (12)	**Analytical Date/Time**	The date the result was determined.
char (10)	**Laboratory Batch Id**	An internal Laboratory identifier used to logically group a series of samples for the purpose of performing the same analytical methodology.
char (10)	Laboratory Sample Id	An internal identifier that a laboratory assigns to a sample.
char (6)	**Parameter**	Code indicating the test for which the result is reported. Validated with EMS Parameters table.
char (6)	**Analytical Method**	Code indicating the analytical method used to determine the result. Validated with EMS Analytical Method table.
char (1)	Result Letter	A letter or symbol to describe the result. Valid values are <, >, M.
char (60)	**Result**	Must convert to numeric result. An entry of 'C' will be accepted to record analytical results which cannot be converted to numeric results (e.g. qualitative results). Results with entries='C' in the result field, must include result details in the comment field.
char(60)	**Confidence Interval**	Confidence interval for a Parameter/Analytical Method for the Laboratory that determined the result.
char (6)	**Measurement Unit**	Code indicating the units of the result reported. Validated with EMS Measurement Unit table.
char (60)	Method Detection Limit	A value to indicate the minimum detectable limit for a parameter/analytical method as specified by a Lab.
char (1000)	Result Comment	Text up to 1000 characters.

ER - Expected Result Record

- The Expected Result record identifies the information specific to a Quality Assurance Sample or Regular Sample record. Many Expected Result records may be present for one sample record.
- The following field are found in the ER record:

Type	Field	Content
char (2)	**Record Type**	ER
date (6)	**Parameter**	Code indicating the test for which the result is reported. Validated with EMS Parameters table.
char (60)	**Result**	Must convert to numeric result.
char (60)	**Confidence Interval**	Confidence interval for a Parameter/Analytical Method for the Laboratory that determined the result.
char (6)	**Measurement Unit**	Code indicating the units of the result reported. Validated with EMS Measurement Unit table.

TR - Trailer Record

- The trailer record will be used to validate that the transmission of the file has been successful by identifying that the last record has been received.

Type	Field	Content
char (2)	**Record Type**	TR

2.0 EMS File Format for Continuous Samples

This document describes the content and format for files electronically transferred to EMS for continuous samples. The record types that are submitted for continuous samples are:

- Header Record
- Continuous Summary Sample
- Continuous Summary Result
- Trailer Record

Sample and Result records are logically linked. Therefore, the Continuous Result Record(s) associated with that sample must follow the Continuous Summary Record. In addition, a Header and Trailer record are added for validation. **They must always be present**. The columns for each type are defined below.

The file must be comma delimited ASCII with text values enclosed with double-quotes. The record length will be variable with data fields in the order described below for each record type.

Note: Mandatory columns are underlined and bold.

Note: Fields are not case sensitive.

All Date/Time fields use the format YYYYMMDDHHMM (year, month, day, hour, minutes) where the time component is in 24 hour format (0000-2359). If the time component is not required, then default to zeroes.

HR - Header Record

- The header record in the file identifies the source. It identifies the e-mail address of the person who sent the file.
- There is only one header record in the file and it must be present. It must be the first physical record in the file.

Type	Field	Content
char (2)	**Record Type**	HR
char (40)	**E-mail Address**	E-mail address of user who sent the file
date (12)	**Date Prepared**	Date the file was prepared (e.g. 19980927).
char (1)	**QA index Only Indicator**	Y - if the data file should be validated for errors N - if the data file should be loaded into EMS if no errors are found
char (19)	File Name	Optional user-defined file name. This information will be included in the QA Index/Error Report.
char (80)	Comment	Optional comment about the file content. This information will not be stored in EMS but may be used in correspondence about the data.

CS - Continuous Summary Sample Record

- The Continuous Summary Sample Record identifies sample information that is common to the Result records that follow.
- The following fields are found in the 'CS' record:

Type	Field	Content
char (2)	**Record Type**	CS
char (7)	Monitoring Location ID	Present if collected at an EMS Monitoring Location.
date (12)	**Collection Start Date/Time**	Date and time when the sample collection was started (e.g. 199809270000).
date (12)	Collection End Date/Time	Date and time when the sample collection was ended (e.g. 199809270000).
char (3)	**Sample State**	Code indicating the type of sample (e.g. FW for Fresh Water). Validated against EMS Sample State table.
char (3)	**Sample Descriptor**	Code further describing the type of sample (e.g. GE for General). Validated against EMS Sample Descriptor table.
char (6)	**Sample Class**	Code indicating the general class of the sample (e.g. REG for Regular). Validated against EMS Sample Class table.
char (6)	**Collection Method**	Code indicating the method used to collect the sample (e.g. GRB for Grab). Validated against EMS Collection Method table.
char (3)	**Sampling Agency**	Code indicating the agency which collected the sample. Validated against EMS Client Location table's Short Name.
char (3)	**Analyzing Agency**	Code indicating the agency which performed the analysis. Validated against EMS Client Location table's Short Name.
char (10)	**Ministry Contact**	Ministry staff responsible for the sample. Validated against Staffs' table UserID. Permit holders may enter the permit number to indicate the Ministry contact. If permit number is used, it must be in the format AAnnnnn (File Type, Waste Type plus 5 digit numeric e.g. PE99999).
char (60)	Sampler	The person who collected the sample.

number (6,2)	Depth Upper	Upper (shallower) depth at which the sample was taken. Expressed in meters (m) in the format 9,999.99
number (6,2)	Depth Lower	Lower (deeper) depth at which the sample was taken. Expressed in meters (m) in the format 9,999.99
char (6)	Tide Code	Code to indicate the state of the tide for marine or estuarine samples. Validated against EMS Tide tables.
number (6,2)	Height Upper	Upper height at which the sample was taken. Expressed in meters (m) in the format 9,999.99
number (6,2)	Height Lower	Lower height at which the sample was taken. Expressed in meters (m) in the format 9,999.99
char (6)	Direction Code	Validated against EMS Direction table.
number (4,1)	Filter Size	The size of a filter used in collecting a sample. Expressed in µm in the format of 999.9
number (4,2)	Air Flow	Rate of air flow. Expressed in m3 in the format of 99.99
char (6)	Air Unit	Measurement unit code for air flow, i.e. code 220 for m3
char (1000)	Sample Comment	Text up to 1000 characters.
char (1000)	Field Comment	Text up to 1000 characters.

CR - Continuous Summary Result Record

- The Continuous Result record identifies the information specific to a Regular Sample record where the result type is continuous. Many result records may be present for one sample record.
- The following fields are found in the CR record:

Type	Field	Content
char (2)	**Record Type**	CR
char (6)	**Parameter**	Code indicating the test for which the result is reported. Validated with EMS Parameter table.
char (6)	**Analytical Method**	Code indicating the analytical method used to determine the result. Validated with EMS Analytical Method table.
char (60)	**Average Result**	The average numeric result value determined.
char (60)	Minimum Result	The minimum numeric result value determined.
char (60)	Maximum Result	The maximum numeric result value determined.
char (6)	**Measurement Unit**	Code indicating the units of the result reported. Validated with EMS Measurement Unit table.
char (60)	Duration	The duration of the result.
char (10)	Duration Units	Code indicating the units of the duration reported. Validated with EMS Measurement Unit table.
char (10)	Number of Data Points	The number of data points that were used to derive the result.
char (6)	Method Detection Limit	A value to indicate the minimum detectable limit for a parameter /analytical method as specified by a Lab.
char (1000)	Result Comment	Text up to 1000 characters.

TR - Trailer Record

- The trailer record will be used to validate that the transmission of the file has been successful by identifying that the last record has been received.

Type	Field	Content
char (20)	**Record Type**	TR

3.0 Example of an EMS File Format for Regular Samples

HR,NELLIE.PEPPIN@GEMS7.GOV.BC.CA,19981012,N,Testfile,"Sent by web.”
RS,E223619,,199808010000, ,WW,FR,REG,GRB,,,PE,PE,NPEPPIN,JOE BLOW
RR,,0004,XM15,,7.5,,005
RR,,0008,X049,,69,,001
RR,,0115,X013,,78,,001
RR,,P--T,X247,,23,,002
RR,,0018,XM10,,4567,,035
RS,E223619,,199809010000, ,WW,FR,REG,GRB,,,PE,PE,NPEPPIN,JOE BLOW
RR,,0004,XM15,,6.8,,005
RR,,0008,X049,,70,,001
RR,,0115,X013,,76,,001
RR,,P--T,X247,,20,,002
RR,,0018,XM10,,1234,,035
TR

4.0 Examples of EMS QA Index/Error Reports

1. Example message received from EMS indicating all data has been processed and successfully submitted to EMS.

   From: EMS (ems@envux1.env.gov.bc.ca)
   To: Nellie.Peppin@gems7.gov.bc.ca
   Subject: EDT: Train Load Results: Testfile
   Date: Thursday, October 15, 1998 1:25PM

   QA Index Only: FALSE
   Users Original File: Testfile

   1998-10-15 13:25

   PL/SQL procedure successfully completed.

   #OK#nellie.peppin@gems7.gov.bc.ca
   Users Original Filename: Testfile
   #STOP#
   No errors were found during indexing of data to EMS
   ==========

   PL/SQL procedure successfully completed.

   1998-10-15 13:25

2. Example message received from EMS indicating all data has been processed and the file failed EMS validation checks. The file was rejected and the errors in this file have to be corrected by the data provider and resubmitted to EMS. Keyfields identifying the errors are bolded for this example.

   From: EMS (ems@envux1.env.gov.bc.ca)
   To: Nellie.Peppin@gems7.gov.bc.ca
   Subject: EDT: Train Load Results: Testfile
   Date: Thursday, October 15, 1998 1:25PM

   QA Index Only: FALSE
   Users Original File: Testfile

   1998-10-15 13:25

PL/SQL procedure successfully completed.

#START#nellie.peppin@gems7.gov.bc.ca
Users Original Filename: Testfile
The following warnings/errors were found during the import of data to EMS
Data will have to be corrected if Errors were found and resubmitted to EMS
If you have any questions please contact the ministry contact listed below
==========
Except for any records identified below, all data included in this file
have been assigned a QA index of C. The QA index assigned to this data
may be modified by EMS if/when additional QA information is
included/received by the system.

Ministry Contact: Nellie Peppin E-Mail Address: Nellie.Peppin@gems7.gov.bc.ca
---
*ERROR : Duplicate Result found for EMS ID: **E223619** Sample Date: **01-AUG-98** Parm*
*Code: **0008** Analytical Method: **X049** Analytical Date:*
*ERROR : Invalid Measurement Unit Code Found : **100** for EMS ID : **E223619** Sample*
*Date : **199808010000** Parm Code : **0115** Analytical Method: **X013***
*ERROR : Invalid Parameter Code Found : **0444** for EMS ID : **E223619** Sample Date :*
199808010000** Analytical Method: **XM15
ERROR : Parameter and Analytical Method not found in dictionary: for EMS ID :
***E223619** Sample Date : **199808010000** Parm Code : **0444** Analytical Method:*
XM15
#STOP#

PL/SQL procedure successfully completed.

1998-10-15 13:44

Appendix B.2 Federal/Provincial Pulp and Paper Format (FPP File Format)

1.0 Federal/Provincial Pulp and Paper Format (FPP File Format)

This file format should be used only by data providers who report data electronically under the Federal/Provincial Pulp and Paper Agreement.

Note: Mandatory columns are underlined and bold.

1. DLM--Delimiter record

Delimiter records are usually used to separate data for sites, however they may be used to group the data for other reasons. Note that "NTE" records must be preceded by a "DLM" record.

Field	Position	Length	Contents
1	1-3	3	**DLM**
2	4-9	6	**ENVIRODAT** project number
3	10-29	20	**File Name**: Optional user-defined file name
4	30-83	52	**Filler**: Any information is ignored

2. NTE--Notes record

As many note records as required may be included. Any information entered here is not entered into EMS. Note that "NTE" records must be preceded by a "DLM" record.

Field	Position	Length	Contents
1	1-3	3	**NTE**
2	4-80	77	**Comments or notes** which the data provider may wish to pass on to the technician.

3. CIN--Common information record

The "CIN" record indicates the start of a new sample. It must always be present.

Field	Position	Length	Contents
1	1-3	3	**CIN**
2	4-23	20	**Ministry Contact**: Ministry staff responsible for the sample. Validated against Staffs' table UserID. Data providers may enter the permit number to indicate the Ministry contact. If permit number is used, it must be in the format AAnnnnn (File Type, Waste Type plus 5 digit numeric e.g. PE99999).
3	24-25	2	**Sampling agency**: Code for the agency which collected the sample.
4	26-27	2	**Sample state**: Type of sample (e.g. FW for Fresh Water).
5	28-29	2	**Sample state descriptor**: Further note on sample state (e.g. GE for General).
6	30-36	7	**Site number**: Code for the site at which sampling was done.
7	37-40	4	**Lower depth**: The lower (deeper) depth at which sampling was done (in meters, including a decimal point if needed).
8	41-44	4	**Upper depth**: The upper (shallower) depth at which sampling was done (in meters, including a decimal point if needed). Should be equal to lower depth if sampling was performed at only one depth.
9	45-50	6	**Sample Class**: Code indicating the general class of the sample (e.g. REG for Regular).
10	51-90	40	**E-mail address:** of user who sent the file.

4. SCM--EMS sample comment record

As many records as required may be generated. EMS will only store the first 255 characters.

Field	Position	Length	Contents
1	1-3	3	**SCM**
2	4-255	251	**Sample comment**: Notes pertaining to the sample.

5. CIE--ENVIRODAT common information

This record must be present.

Field	Position	Length	Contents
1	1-3	3	**CIE**
2	4-6	3	**Code:** indicating the method used to collect the sample.
3	7-16	10	**ENVIRODAT sample number.**
4	17-26	10	**ENVIRODAT group sample number.**
5	27-46	20	**Optional cross reference sample number**: Permittee's or laboratory sample number.
6	47-80	33	**Filler**: Any information is ignored.

6. SCE--ENVIRODAT sample comment record

As many records as required may be generated. ENVIRODAT will only store the first 242 characters.

Field	Position	Length	Contents
1	1-3	3	**SCE**
2	4-80	77	**Sample comment**: Notes pertaining to the sample.

7. RIN--Result information record

The Result information record must always be present.

Field	Position	Length	Contents
1	1-3	3	**RIN**
2	4-13	10	**Sampling start date**: The date and time at which the sample was collected. Format is YYMMDDHHMM (year, month, day, hour, minutes) where the time is in 24 hour format (0000-2359).
3	14-23	10	**Sampling end date**: Only included if the sample is a composite, for example if the sample was collected over a period to time. Format as for sampling start date. Must be later or equal to the sampling start date.
4	24	1	**Tide code**: Code to indicate the state of the tide for marine or estuarine sites which were not sampled over an extended period of time.
5	25-32	8	**EMS sparcode**: Code of the test for which the result is being reported.
6	33-35	3	**Unit code**: Unit of the result being reported.
7	36-37	2	**Analyzing agency**: Code for the agency which performed the analysis.
8	38-43	6	**Result**: The analytic result which is being reported. Includes a sign and decimal point if required.
9	44	1	**Exponent sign**: The sign of the exponent if the result is reported in scientific notation.
10	45	1	**Exponent value**: The value of the exponent if the result is reported in scientific notation (blank defaults to zero).
11	46	1	**Result letter**: The letter associated with the reported result. Valid values are >, <, M, and blank.
12	47	1	**Result flag**: Code used to flag the result if it is in some way unusual. Valid values are I, B, P and blank. This field may be left blank.
13	48-50	3	**Replicate**: ENVIRODAT replicate number.
14	51-56	6	**Detection Limit**: The minimum detection limit for the analysis method.

Field	Position	Length	Contents
15	57	1	**Exponent sign**: The sign of the exponent if the detection limit is reported in scientific notation.
16	58	1	**Exponent value**: The value of the exponent if the detection limit is reported in scientific notation (blank defaults to zero).
17	59-68	10	**Measurement start time**: The date and time at which the analysis was started. Format is YYMMDDHHMM (year, month, day, hour, minutes) where the time is in 24 hour format (0000-2359). Date must be entered though time is optional.
18	69-78	10	**Measurement end time**: The date and time at which the analysis was completed. Format is YYMMDDHHMM (year, month, day, hour, minutes) where the time is in 24 hour format (0000-2359). Date must be entered though time is optional. If start and end are the same, leave end time blank.
19	79	1	**Pre-Treatment code**.
20	80	1	Questionable results and maximum (X) and minimum (I) **result flags**. Valid flags are T,E,Q (federal only), I and X.
21	81-90	10	**Filler**: Any information is ignored.
22	91-96	6	**Confidence Interval**: Includes a sign and decimal point if required.
23	97	1	**Exponent sign**: The sign of the exponent if the Confidence Interval is reported in scientific notation.
24	98	1	**Exponent value**: The value of the exponent if the Confidence Interval is reported in scientific notation (blank defaults to zero).

NOTE: The TR record is only necessary when sending the file by FTP!

Field	Position	Length	Contents
1	1-2	2	**TR**: The trailer record is used to validate that the transmission of the file has been successful by identifying that the last record has been received. When submitting Dioxin/Furan data records, the trailer record must be moved to the end of the file.

8. DXF--Dioxin/Furan

When submitting Dioxin/Furan data records for ENVIRODAT, the data must be submitted as answers to Dioxin/Furan questions in the following format:

Field	Position	Length	Contents
1	1-3	3	**DXF**
2	4	1	**Q**
3	5-6	2	**Question number** "01","02" ..."10"
4	7	1	**"."** (period)
5	8	1	**part of question** "A","B" or "C"
6	9	1	**answer (Y/N) for ALL**
7	10	1	**answer (Y/N) for TCDD**
8	11	1	**answer (Y/N) for TCDF**
9	12-80	69	**Filler**: Information is ignored.

Questions are as follows:

Questions	ALL	TCDD	TCDF
1. Have all required data forms been submitted? (Figure 8, Parts I & II, 9, 10, 11, 12, 13 of the Reference Method)	Y/N	Y/N	Y/N
2. Figure 8, Part I a) Are all surrogate recoveries within specified limits? (See section 8(c) of the Reference Method) b) Are all reported detection limits at or below maximum target values? (See Table 5 of the Reference Method)	Y/N Y/N	Y/N Y/N	Y/N Y/N
3. Figure 8, Part II Are ion abundance ratios within acceptable limits for 2,3,7,8-TCDD and 2,3,7,8-TCDF? (See subsection 6.5 and 6.7 or the Reference Method)	Y/N	Y/N	Y/N
4. Figure 10 a) Are all surrogate recoveries within range of 40 to 120% for each of the three tests? (See subsection 5.2 of the Reference Method) b) Are all native congener recoveries within 20% of the spiked amount for each of the three tests?	Y/N Y/N	Y/N Y/N	Y/N Y/N
5. Figure 11 Are %RSD values within specification for all native congeners? (See subsection 6.6 of the Reference Method)	Y/N	Y/N	Y/N
6. Figure 12 a) Was calibration verified within 12 hours from analysis for each reported compliance sample? (See section 8(j) of the Reference Method) b) Are [calculated/actual] concentration ratios for all native congeners within the specified limits? (See section 8(j) of the Reference Method) c) Are all surrogate recoveries within the range of 75 to 125%?	Y/N Y/N Y/N	Y/N Y/N Y/N	Y/N Y/N Y/N
7. Figure 13 Were analytical identification criteria satisfied for 2,3,7,8-TCDD and 2,3,7,8-TCDF in CS1 for each date on which compliance sample analyses were performed? (See section 6.5 and section 8(k) of the Reference Method)	Y/N	Y/N	Y/N

8. Were windows verified and was acceptable chromatographic performance confirmed for each date on which compliance sample analyses were performed? (See section 6.2 and 6.3 of the Reference Method)	Y/N	Y/N	Y/N
9. Were all compliance sample analyzed at MS resolution of 10,000 or better? (See section 6.2 and 6.3 of the Reference Method)	Y/N	Y/N	Y/N
10. Was PCDD/PCDF contamination non-detectable or below maximum allowance levels in all blank samples?	Y/N	Y/N	Y/N

2.0 Example of the FPP File Format

```
DLMPY1116
NTETest Data Submission
CINNPEPPIN          PEWWFRE212008          nellie.peppin@gems7.gov.bc.ca
SCMThis is an example of the FPP format acceptable to EMS
CIEGRBPY990001
SCEComments in this field will be captured by ENVIRODAT only
RIN0112010500011201050 0470X037369PE123     I      0112010500
RIN0112010500011201050 0018XG01035PE6789    I      0112010500
RIN0112020500011202050 0470X037369PE123     I      0112020500
RIN0112020500011202050 0018XG01035PE5678    I      0112020500
RIN0112030500011203050 0470X037369PE451     I      0112030500
RIN0112030500011203050 0018XG01035PE6789    I      0112030500
RIN0112040500011204050 0470X037369PE123     I      0112040500
RIN0112040500011205050 0018XG01035PE2345    I      0112040500
RIN0112050500011205050 0470X037369PE345     I      0112050500
RIN0112050500011206050 0018XG01035PE6789    I      0112050500
RIN0112060500011207050 0470X037369PE234     I      0112060500
RIN0112060500011207050 0018XG01035PE1234    I      0112060500
DLMPY1116
CINNPEPPIN          PEWWFRE212008          nellie.peppin@gems7.gov.bc.ca
SCMThis is an additonal comment
CIE014PY990001
SCEComments in this field will be captured by ENVIRODAT only
RIN0112110500011211050 0115X013001PE10      I      0112110500
RIN0112130500011213050 0115X013001PE9       I      0112130500
RIN0112150500011215050 0115X013001PE8       I      0112150500
RIN0112170500011217050 0115X013001PE7       I      0112170500
RIN0112190500011219050 0115X013001PE5       I      0112190500
RIN0112210500011221050 0115X013001PE5       I      0112210500
DXFQ01. YYY
DXFQ02.AYYY
DXFQ03.BYYY
DXFQ04. YYY
DXFQ05. YYY
DXFQ06. YYY
DXFQ07. YYY
DXFQ08. YYY
DXFQ09. YYY
DXFQ10. YYY
```

3.0 Examples of EMS QA Index/Error Reports

1. Example message received from EMS indicating all data has been processed and successfully submitted to EMS.

From: EMS (ems@envux1.env.gov.bc.ca)
To: Nellie.Peppin@gems7.gov.bc.ca
Subject: EDT: Train Load Results: PY1116
Date: Wednesday, February, 2002 2:00PM

QA Index Only: FALSE
Userfile: PY1116

2002-02-06 14:00

PL/SQL procedure successfully completed.

#OK#nellie.peppin@gems7.gov.bc.ca
Users Original Filename: PY1116
#STOP#
No errors were found during the import of data to EMS
==========
PL/SQL procedure successfully completed.

2002-02-06 14:00

2. Example message received from EMS indicating all data has been processed and the file failed EMS validation checks. The file was rejected and the errors in this file have to be corrected by the data provider and resubmitted to EMS. Keyfields identifying the errors are bolded for this example.

From: EMS (ems@envux1.env.gov.bc.ca)
To: Nellie.Peppin@gems7.gov.bc.ca
Subject: EDT: Train Load Results: PY1116
Date: Wednesday, February, 2002 2:00PM

QA Index Only: FALSE
Userfile: PY1116

2002-02-06 14:00

PL/SQL procedure successfully completed.

#START#nellie.peppin@gems7.gov.bc.ca
The following warnings/errors were found during the import of data to EMS
Data will have to be corrected if Errors were found and resubmitted to EMS
If you have any questions please contact the ministry contact listed below
==========
Except for any records identified below, all data included in this file
have been assigned a QA index of C. The QA index assigned to this data
may be modified by EMS if/when additional QA information is
included/received by the system.

Ministry Contact: Nellie Peppin E-Mail Address: nellie.peppin@gems7.gov.bc.ca
---
*ERROR : Invalid Parameter Code Found : **4470** for EMS ID : **E212008** Sample Date : **0112020500** Analytical Method: **X037***
*ERROR : Parameter and Analytical Method not found in dictionary: for EMS ID : E223619 Sample Date : **0112010500** Parm Code : **4470** Analytical Method: **X037***
*ERROR : Duplicate Result found for EMS ID: **E212008** Sample Date: **5-DEC-01** Parm Code: **0018** Analytical Method: **XG01** Analytical Date:*
#STOP#

PL/SQL procedure successfully completed.

2002-02-06 14:00