



Ministry of  
Environment and  
Climate Change Strategy

# **BC Environmental Monitoring System (EMS)**

**Electronic Data Transfer  
using the Internet based Web Page**

**EMS File Format**

**USER OVERVIEW**

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## INSTRUCTION SUMMARY

|                          |                                                                                                                                                                                                                                                                                          |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| What is EMS?             | <ul style="list-style-type: none"> <li>The Environmental Monitoring System (EMS) is the Ministry of Environment's monitoring database.</li> </ul>                                                                                                                                        |
| What is EDT?             | <ul style="list-style-type: none"> <li>Electronic Data Transfer (EDT) provides analytical laboratories and permit holders with a simple means to transfer analytical data electronically to the EMS system.</li> </ul>                                                                   |
| System Requirements      | <ul style="list-style-type: none"> <li>a computer with internet access</li> <li>an up-to-date web browser</li> <li>access to an e-mail account (i.e. through a commercial Internet Service Provider)</li> </ul>                                                                          |
| EDT Account Access       | <ul style="list-style-type: none"> <li>Request through your regional Ministry Contact</li> <li>A <a href="#">Business BCeID</a> is required</li> </ul>                                                                                                                                   |
| File Format              | <ul style="list-style-type: none"> <li>A comma delimited ASCII data file in the required file format (see Appendix for technical specifications)</li> </ul>                                                                                                                              |
| Internet URL             | <a href="https://a100.gov.bc.ca/ext/emsedt/upload.do">https://a100.gov.bc.ca/ext/emsedt/upload.do</a>                                                                                                                                                                                    |
| File Transfer Procedures | <ul style="list-style-type: none"> <li>Click on the appropriate function, QA, Upload or Dashboard</li> <li>perform the desired actions in the subsequent screens</li> </ul>                                                                                                              |
| QA Index Only Option     | <ul style="list-style-type: none"> <li>Users are expected to QA their file before uploading</li> <li>any necessary corrections to the data can be made before submitting the data to EMS</li> <li><b>NOTE:</b> The file is NOT loaded into EMS under the QA Index Only option</li> </ul> |

# Appendix A

## 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 identified below are mandatory and must be submitted.

- Header Record
- Regular Sample
- Result
- Trailer Record

Sample and Result records are logically linked. Therefore, the Regular Sample Record must be followed by the Result Record(s) associated with that sample. 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. 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.**

## 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)  | <b><u>Record Type</u></b>             | HR                                                                                                                                     |
| char (40) | <b><u>E-mail Address</u></b>          | E-mail address of user who sent the file                                                                                               |
| date (12) | <b><u>Date Prepared</u></b>           | Date the file was prepared (e.g. 19980927).                                                                                            |
| char (1)  | <b><u>QA index Only Indicator</u></b> | Y - if the data file should be validated for errors<br>N - if the data file should be loaded into EMS if no errors are found           |
| char (20) | File Name                             | Optional user-defined file name. This information will be included in the e-mail return message.                                       |
| char (80) | Comment                               | Optional comment about the file contents. 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)   | <b><u>Record Type</u></b>                | 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)  | <b><u>Collection Start Date/Time</u></b> | 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)   | <b><u>Sample State</u></b>               | Code indicating the type of sample (e.g. FW for Fresh Water). Validated against EMS Sample State table.                             |
| char (3)   | <b><u>Sample Descriptor</u></b>          | Code further describing the type of sample (e.g. GE for General). Validated against EMS Sample Descriptor table.                    |
| char (6)   | <b><u>Sample Class</u></b>               | Code indicating the general class of the sample (e.g. REG for Regular). Validated against EMS Sample Class table.                   |
| char (6)   | <b><u>Collection Method</u></b>          | 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)   | <b><u>Sampling Agency</u></b>            | Code indicating the agency which collected the sample. Validated against EMS Client Location table's Short Name.                    |
| char (3)   | <b><u>Analyzing Agency</u></b>           | Code indicating the agency which performed the analysis. Validated against EMS Client Location table's Short Name.                  |

|              |                                |                                                                                                                                                                                                                                                                                                                                      |
|--------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| char (10)    | <b><u>Ministry Contact</u></b> | 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. This is required information for samples taken at depth. If it is a single depth discrete sample, enter the same value in Depth Lower.<br>Expressed in meters(m) in the format 9,999.99                                                                                       |
| number (6,2) | Depth Lower                    | Lower (deeper) depth at which the sample was taken. This is required information for samples taken at depth. If it is a single depth discrete sample, enter the same value in Depth Upper.<br>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.<br>Expressed in meters (m) in the format 9,999.99                                                                                                                                                                                                                                        |
| number (6,2) | Height Lower                   | Lower Height at which the sample was taken.<br>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.<br>Expressed in µm in the format of 999.9                                                                                                                                                                                                                                          |
| number (4,2) | Air Flow                       | Rate of air flow.<br>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)  | <b><u>Record Type</u></b>       | RR                                                                                                                                                                                                                                                                       |
| date (12) | Analytical Date/Time            | The date the result was determined (e.g. 199809270000).                                                                                                                                                                                                                  |
| char (6)  | <b><u>Parameter</u></b>         | Code indicating the test for which the result is reported. Validated with EMS Parameter table.                                                                                                                                                                           |
| char (6)  | <b><u>Analytical Method</u></b> | 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, below detection limit and mean, respectively.                                                                                                                                |
| char (60) | <b><u>Result</u></b>            | 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)  | <b><u>Measurement Unit</u></b>  | 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.                                                                       |

## 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) | <u>Record Type</u> | 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 Summary Record must be followed by the Continuous Result Record(s) associated with that sample. 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.**

## 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)  | <b><u>Record Type</u></b>             | HR                                                                                                                                     |
| char (40) | <b><u>E-mail Address</u></b>          | E-mail address of user who sent the file                                                                                               |
| date (12) | <b><u>Date Prepared</u></b>           | Date the file was prepared (e.g. 19980927).                                                                                            |
| char (1)  | <b><u>QA index Only Indicator</u></b> | Y - if the data file should be validated for errors<br>N - if the data file should be loaded into EMS if no errors are found           |
| char (20) | File Name                             | Optional user-defined file name. This information will be included in the e-mail return message.                                       |
| char (80) | Comment                               | Optional comment about the file contents. 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)  | <b><u>Record Type</u></b>                | CS                                                                                                                                                                                                                                                                                    |
| char (7)  | Monitoring Location ID                   | Present if collected at an EMS Monitoring Location                                                                                                                                                                                                                                    |
| date (12) | <b><u>Collection Start Date/Time</u></b> | 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)  | <b><u>Sample State</u></b>               | Code indicating the type of sample (e.g. FW for Fresh Water). Validated against EMS Sample State table.                                                                                                                                                                               |
| char (3)  | <b><u>Sample Descriptor</u></b>          | Code further describing the type of sample (e.g. GE for General). Validated against EMS Sample Descriptor table.                                                                                                                                                                      |
| char (6)  | <b><u>Sample Class</u></b>               | Code indicating the general class of the sample (e.g. REG for Regular). Validated against EMS Sample Class table.                                                                                                                                                                     |
| char (6)  | <b><u>Collection Method</u></b>          | Code indicating the method used to collect the sample (e.g. GRB for Grab). Validated against EMS Collection Method table.                                                                                                                                                             |
| char (3)  | <b><u>Sampling Agency</u></b>            | Code indicating the agency which collected the sample. Validated against EMS Client Location table's Short Name.                                                                                                                                                                      |
| char (3)  | <b><u>Analyzing Agency</u></b>           | Code indicating the agency which performed the analysis. Validated against EMS Client Location table's Short Name.                                                                                                                                                                    |
| char (10) | <b><u>Ministry Contact</u></b>           | 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<br>(6,2) | Depth Upper    | Upper (shallower) depth at which the sample was taken.<br>Expressed in meters (m) in the format 9,999.99   |
| number<br>(6,2) | Depth Lower    | Lower (deeper) depth at which the sample was taken.<br>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<br>(6,2) | Height Upper   | Upper height at which the sample was taken.<br>Expressed in meters (m) in the format 9,999.99              |
| number<br>(6,2) | Height Lower   | Lower height at which the sample was taken.<br>Expressed in meters (m) in the format 9,999.99              |
| char (6)        | Direction Code | Validated against EMS Direction table.                                                                     |
| number<br>(4,1) | Filter Size    | The size of a filter used in collecting a sample.<br>Expressed in $\mu\text{m}$ in the format of 999.9     |
| number<br>(4,2) | Air Flow       | Rate of air flow.<br>Expressed in m <sup>3</sup> in the format of 99.99                                    |
| char (6)        | Air Unit       | Measurement unit code for air flow, i.e. code 220 for m <sup>3</sup>                                       |
| 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)    | <b><u>Record Type</u></b>       | CR                                                                                                              |
| char (6)    | <b><u>Parameter</u></b>         | Code indicating the test for which the result is reported. Validated with EMS Parameter table.                  |
| char (6)    | <b><u>Analytical Method</u></b> | Code indicating the analytical method used to determine the result. Validated with EMS Analytical Method table. |
| char (60)   | <b><u>Average Result</u></b>    | 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)    | <b><u>Measurement Unit</u></b>  | 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) | <b><u>Record Type</u></b> | TR      |

## Appendix B

### 1.0 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

## 2.0 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*