ELECTRONIC DATA DELIVERABLE (EDD) SPECIFICATION GUIDANCE DOCUMENT

VERSION 1.6

Prepared By:

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1.0 OVERVIEW

Civil & Environmental Consultants, Inc. (CEC) has adopted a company-wide standard for electronic data delivery (EDD) of analytical results. All analytical laboratories contracted with CEC are required to provide their data in this format, in addition to the hard copy or printable electronic format (PDF) provided otherwise. The prescribed EDD format supports the use of the Data Management and Analysis Systems for Lake, Estuaries, and Rivers (DASLER) application and other tools utilized by CEC to process, manage, and analyze testing results.

2.0 DESCRIPTION OF THE EDD SPECIFICATION

The detailed EDD specification is included in the Appendix to this booklet. Files are to be prepared as tab-delimited ASCII (flat) files. Comma-delimited (CSV) and Excel formats are not acceptable. Quotation marks should NOT be used to delineate text fields.

CEC's specification relies on information and methods used in the Electronic Data Deliverable format developed by Region V of the USEPA, although our specific format is not identical to the EPA format. The EPA EDD website can be found at https://www.epa.gov/superfund/region-5-superfund-electronic-data-submission-documents.

Our specification calls upon the Valid Values document associated with EPA's EDD. This document is available at https://www.epa.gov/sites/default/files/2020-10/documents/r5validvaluesreferencemanual_oct2020.pdf.

The first line of the EDD must be the title line, reproduced exactly as shown in the specification. For convenience, a setup file containing this line can be downloaded from our website, at https://apps.cecinc.com/edd/blankfile.txt.

Some guidance on specific items of the specification is presented below.

- Note that SampleID listed on the Chain of Custody and the laboratory-specified LabID must be unique for each sample included in a data file. This requirement likewise applies to laboratory QA samples (matrix spikes, duplicates, method blanks). The LabID refers to the sample number assigned by the laboratory, not the identifier for the laboratory itself.
- CEC's system uses CAS Numbers (EPA Table A-15) as the primary identifiers for chemical identity. This allows different chemical synonyms for chemicals to be applied to different projects, based on regulatory language, client preference, permit content, etc. In cases where no CAS Number applies to an analysis (such as indicators or combined parameters), a code from the EPA's Valid Values Table A-15 should be used, if available. If no Valid Value exists, reference Attachment 1. If the Non-CAS Parameter is not listed

in Attachment 1, contact CEC. In the absence of guidance in both of these documents, apply a unique code of up to 15 characters.

- The hyphens must be included in the CAS numbers; for example: 124-48-1 is right; 124481 is not.
- The parameter name is included for reference only, but may NOT be omitted. CEC uses this text to build a database of parameter synonyms.
- Data qualifiers are to follow the EPA Valid Values Table A-10.
- Units should be consistent with EPA Valid Values Table A-18. Attachment 2 provides unit units that are not included in this list.
- Basis is included to distinguish whether solids analysis is reported on a dry-weight or as-received basis. Since this column cannot be blank, include "N" for liquid samples.
- Total_or_dissolved is included to designate whether water samples were field-filtered (for "dissolved" analyses) or not (for "total" analyses). Like Basis, this field cannot be blank, so include "N" for solid samples or samples where such handling is otherwise not applicable (EPA Valid Values Table A-23).
- pMethod includes the standard preparation method. Where possible, this should use the designation provided in the Valid Values document (Table A-14). Consistency in presentation is important in this field so that the software can automatically identify whether the samples were prepared correctly before analysis.
- aMethod includes the analytical method. Where possible, this should use the designation provided in the Valid Values document (Table A-16). Consistency in presentation is important in this field so that the software can automatically identify whether analyses on a group of samples were performed in the same manner or not.
- Special is used to designate "special" or unusual handling of analyses. It is most commonly used to identify leach analyses of soils. Conventional totals analysis of solids or liquids should be designated by a blank in this column. Like aMethod, consistency in presentation in this column is very important. Insertion of non-critical information will result in difficulty in automatic tabulation and analysis of the data.

The most common errors that we have seen in preparation of the EDDs include:

1. *Improper modifiers attached to chemical names*: Water samples will often be reported with the field filtration indicated in the chemical name ("Calcium, total" and "Calcium, dissolved"). The parameter name should include ONLY the actual chemical name, and the total_or_dissolved field should be used to indicated filtration status.
2. *Improper file formats*: Note that Excel files are not acceptable. Also, only CEC's EDD format can be used. Do not make any modifications to CEC's format.
3. *Non-unique sample IDs*: If one data set includes several analyses from a single location, a distinct sampleID must be used for each individual sample. One way of accomplishing this is by appending a date or sequential identifier to the sample location. The unique sampleID is separate from the laboratory's internal sample identification number.
4. *Excessive "assistance" from Excel*: If using Excel to clean up the data before exported to a flat file, be aware that it tends to try to convert CAS Numbers to dates and makes other attempts to convert text into numbers. It may also add blank lines to the end of the data file.
5. *Overuse of comments*: The "comments" field should be used only for information that is specifically of interest to a specific analytical result. These should not be comments related to the sample as a whole, and the same comment should not be repeated for every analysis unless there is a specific issue. The comments should not repeat information indicated elsewhere in the EDD, such as analytical method, laboratory, sample description, etc.
6. *Improper QA qualifiers*: The list of qualifiers must conform to EPA's qualifier list. Alternative values are not permitted.

3.0 CONTACT INFORMATION

If you need additional assistance in preparing the CEC EDD format, contact CEC's Electronic Data Management Team by email at EDM_Team@cecinc.com.

APPENDIX A

EDD SPECIFICATION DETAIL

ELECTRONIC FILE SPECIFICATION
CEC Site Data Management System

File type: Tab-delimited text file, ASCII format

File Format:
Line 1: Header Row, tab delimited, as follows:
SampleID SampleDate SampleTime SampleType CASnumber ParamName Result Qualifier Units Basis total_or_dissolved Comments Laboratory pMethod aMethod

Remaining Lines: One line per analytical result, format as follows

Content	Type	Maximum Length	Accepts Nulls	Explanation
SampleID	text	30	No	Client-assigned sample number
SampleDate	mm/dd/yyyy	n/a	No	Date of sample collection
SampleTime	hh:mm	n/a	Yes	Time of sample collection, in military time
SampleType	text	3	Yes	Standard sample type codes from Table A-12 of USEPA Region V EDD Valid Values. Normal environmental samples should be submitted with code "N" or left as blank.
CASNumber	text	15	No	CAS number for the analyte. If no CAS number exists, assign a unique code, using the conventions in Table A-15 of USEPA Region V EDD Valid Values*.
ParamName	text	150	No	Name of the analytical parameter.
Result	numeric	n/a	No	Numeric result of the analysis. If the compound was not detected, insert the Practical Quantitation Limit (PQL).
Qualifier	text	6	Yes	Standard qualifier codes (from Table A-10 of USEPA Region V EDD Valid Values*). May use "=" for an unqualified result above detection limit.
Units	text	10	No	Standard units abbreviation. See Valid Values Table A-18 or Attachment 2 of this document.
Basis	text	1	No	Basis of analysis. Use: D for dry weight W for as-received N for not applicable (such as water samples).
t_or_d (Total_or_dissolved)	text	1	No	Whether the analysis represents a dissolved (field filtered) or total constituent analysis (Valid Values Table A-23). Use: T for total D for dissolved N for not applicable (solid samples, etc.)
Comments	text	240	Yes	Brief information necessary for understanding this specific analysis. Do not duplicate information provided elsewhere in the file. Do not include laboratory identification.
Laboratory	text	50	No	Name of the laboratory performing the analysis (Examples in Valid Values Table A-17)
pMethod	text	25	Yes	Standard Preparation method. Please use full citation, based on the Prep_Method name in Table A-14 of the USEPA EDD Valid Values*. Consistency in format is important.
aMethod	text	25	Yes	Analytical method. Please use full citation, based on the Lab_Anl_Method_Name in Table A-16 of the USEPA EDD Valid Values*. Consistency in format is important.
Special	text	25	Yes	Special handling or preparation method. Common values include TCLP, SPLP, EP-Tox. **Left blank for conventional analyses.**
MDL	numeric	n/a	Yes	Minimum detection limit for analysis. Required only for radiological parameters.
error	numeric	n/a	Yes	Error value for the analysis. Required only for radiological parameters.
RL	numeric	n/a	Yes	Reporting limit – normally the PQL
LabID	Text	30	No	Laboratory sample identification number
LabAnalysisDate	mm/dd/yyyy	n/a	No	Date of sample analysis

ELECTRONIC FILE SPECIFICATION
CEC Site Data Management System

Example Data:

SampleID	SampleDate	SampleTime	SampleType	CASNumber	ParamName	Result	Qualifier	Units	Basis	t_or_d	Comments	Laboratory	pMethod	aMethod	Special	MDL	error	RL	LabID	LabAnalysisDate
S-1	6/5/2020	8:20	N	7439-97-6	Mercury	0.0024		mg/L	N	U		Ace Labs	E245.2	SW846	TCLP	0.00003		0.00002	234X23	6/19/2020
S-1	6/5/2020	8:20	N	7439-97-6	Mercury	0.67		mg/kg	N	U		Ace Labs	E245.2	SW846		0.0042		0.001	234X23	6/19/2020
S-1	6/5/2020	8:20	N	297-97-2	Thionazin	33	U	ug/kg	N	U		Ace Labs	SW3540C	SW846		5.6		0.01	234X23	6/19/2020
S-1	6/5/2020	8:20	N	298-04-4	Disulfoton	33	U	ug/kg	N	U		Ace Labs	SW3540C	SW846		6.6		0.01	234X23	6/19/2020
S-1	6/5/2020	8:20	N	52-85-7	Famphur	33	U	ug/kg	N	U		Ace Labs	SW3540C	SW846		6.3		0.01	234X23	6/19/2020
S-1	6/5/2020	8:20	N	56-38-2	Parathion	33	U	ug/kg	N	U		Ace Labs	SW3540C	SW846		7.2		0.01	234X23	6/19/2020

Notes:

1. Provide information in title case, not all caps.
2. The chemical name should include the proper name of the chemical only. Do not include a chemical synonym as parenthetical information.

* Information on the USEPA Region V Electronic Data Deliverable is available on the Internet at https://www.epa.gov/superfund/region-5-superfund-electronic-data-submission-documents. The Valid Values document can be downloaded from https://www.epa.gov/sites/default/files/2020-10/documents/r5validvaluesreferencemanual_oct2020.pdf.

ATTACHMENT 1

CAS EQUIVALENTS FOR NON-CAS PARAMETERS

Attachment 1
Select CAS Equivalents for Non-CAS Parameters

Parameter	Abbreviation
Acidity, Total	ACID
Total Alkalinity	ALK
Bicarbonate Alkalinity	ALKB
Carbonate Alkalinity	ALKC
Hydroxide Alkalinity	ALKH
Phenolphthalein Alkalinity	ALKP
Biochemical Oxygen Demand	BOD
Biochemical Oxygen Demand, 20 Day	BOD20
Biologic Oxygen Demand, Five Day	BOD5
Neutralization potential as CaCO3 equivalenc	CCE
Chemical Oxygen Demand	COD
Coliform	COLIF
Color	COLOR
Corrosivity	CORROS
Cresol (Total)	Cresol-T
Free Cyanide	FREE CN
p-Cymene	CYMP
Diesel Components	DIESELCOMP
Fecal Coliform	FECCOLIFOR
Ferric Iron	FE-FC
Ferrous Iron	FE-FS
Field pH	FieldpH
Flashpoint	FLASHPT
Gasoline-Range Organics	GASCOMP
Hardness	HARD
Ignitability	IGNITB
Lipids	LIPIDS
Percent Lipids	LIPIDS
Total Volatile Solids(TVS)	LOI
Total Nitrate+Nitrite	NO3NO2N
Total Kjeldahl Nitrogen	KN

Parameter	Abbreviation
Moisture Content	MOIST
Motor Oils	MOIL
m,p-Cresol	MPCRESOL
m/p-Xylene	MPXYLENE
Other Hydrocarbons	NA
Net Acidity	NetAcidity
Oil & Grease	OILGREASE
PCB Total-TCL	PCB
% Organic Matter	Pct Org Mat
pH	pH
Phenolics	Phenolics
Reactivity	REACTIVITY
Residue, Total	RESTOT
Reactivity - Cyanide	RX-Cyn
Reactivity - Sulfide	RX-Sulf
Specific Conductance	SC
Surfactants	SURFACT
Total Bacteria	TB
Total Dissolved Solids	TDS
Temperature	TEMP
Tetrachlorobenzenes	TETRAXBENZENE
Total Trihalomethanes	THM
Total Inorganic Carbon	TIC
Total Organic Carbon	TOC
Total Organic Halides	TOX
Total Organic Halides - Brominated	TOX_BR
Total Organic Halides - Chlorinated	TOX_CL
Total Organic Halides - Iodinated	TOX_I
Solids	TS
Total Suspended Solids	TSS
Turbidity	TURB

* A full list of CAS numbers can be found in Table A- 15 of the USEPA Region V Valid Values document, https://www.epa.gov/sites/default/files/2020-10/documents/r5validvaluesreferencemanual_oct2020.pdf.

ATTACHMENT 2

UNIQUE UNITS ABBREVIATIONS

Attachment 2
Unique Unit Abbreviation

Unit	Description
°C	degrees Celcius
°F	degrees Farenheit
fibers/g	Fibers per Gram
fibers/kg	Fibers per Kilogram
g/m3	Gram per Cubic Meter
gpm	Gallons per Minute

Unit	Description
mg/L as CaCO3	Alkalinity Units in milligrams per liters as Calcium Carbonate
nm	nanometers
pCi/kg	Picocuries per Kilogram
pCi/m3	Picocuries per Cubic Meter
pH	pH Units

* Additional unit abbreviations can be found in Table 18 of the USEPA Region V Valid Values document, https://www.epa.gov/sites/default/files/2020-10/documents/r5validvaluesreferencemanual_oct2020.pdf.