

CEDEN

California Environmental Data Exchange Network



Toxicity Data Submission Guidance Document

Updated August 23rd, 2013

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List of Acronyms

CEDEN	California Environmental Data Exchange Network
CNEG	Laboratory Toxicity Negative Control Sample
LABQA	Laboratory Quality Assurance or Laboratory Generated Quality Assurance Samples
RDC	Regional Data Center
QA	Quality Assurance
SWAMP	Surface Water Ambient Monitoring Program
QAO	Quality Assurance Officer

List of Terms

Controlled Vocabulary	Controlled vocabulary refers to codes and associated definitions maintained within CEDEN to ensure comparability between and among data sets. Current controlled vocabulary can be found at: http://www.ceden.us/Metadata/ControlledVocab.php
Data Checker	Web-based automated tool that assists data submitters in examining their data sets against the required LookUp lists, formats and business rules. Each RDC maintains its own data checker.
LookUp Lists	Controlled vocabularies are maintained within the CEDEN database as 'LookUp Lists' and are managed through individual RDCs to maintain comparability between RDCs and throughout data sets available through CEDEN. Contact your Regional Data Center to add new codes to LookUp lists.
Primary Key	Uniquely identifies each row in a table and is comprised of a set of columns. No two distinct rows in a table can have the same combination of column values. Required for record uniqueness.
Data Type	Refers to the type of format required for a specific column heading in CEDEN templates. Data type examples include: integer (whole numbers), text, date and time, and decimal.

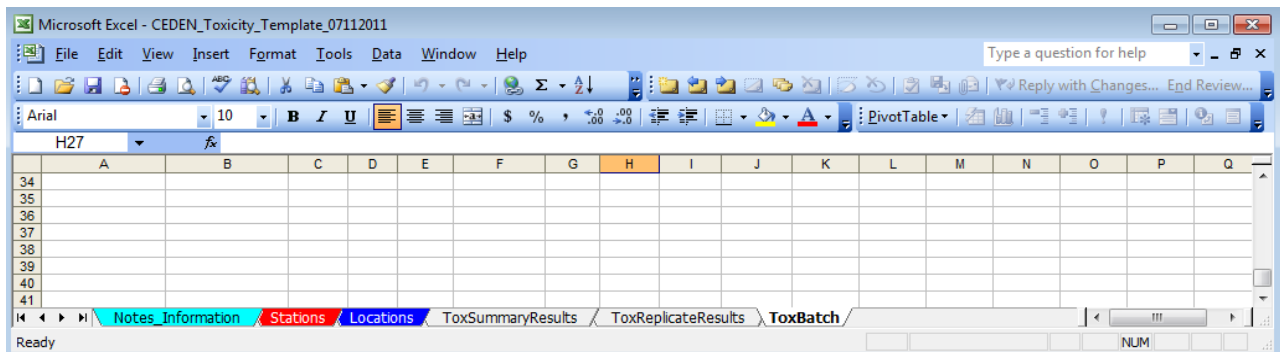
Introduction

This document is designed to provide guidance on reporting requirements for electronic data to be entered in the California Environmental Data Exchange Network (CEDEN) templates. Detailed below are definitions of data elements and rules for formatting toxicity data within the CEDEN toxicity template. For information on entering laboratory QA samples, i.e. negative control samples, see Appendix A. Please review the entire Toxicity Data Submission Guidance Document prior to filling out or submitting the CEDEN Toxicity Template. If you have any questions regarding these guidelines, contact your [Regional Data Center](#) for help.

Regional Data Center (RDC)	Contact	Phone Number	Email
Central Coast RDC	Mark Pranger	831/241-8178	pranger@mlml.calstate.edu
Central Valley RDC	Melissa Turner	530/756-5200	mturner@mlj-llc.com
San Francisco RDC	Cristina Grosso	510/746-7371	cristina@sfei.org
Southern California RDC	Shelly Moore	714/755-3207	shellym@sccwrp.org

Toxicity Data Submission Steps

To submit water quality toxicity data to CEDEN, start with the CEDEN_Toxicity_Template excel file you received from your Regional Data Center (RDC). In this template you will find the five data tables (each in a separate worksheet) required for submitting toxicity data. This file can be named at the discretion of the user; however, the Excel sheet tabs **MUST** be named **Stations**, **Locations**, **ToxSummaryResults**, **ToxReplicateResults** and **ToxBatch** respectively.



CEDEN Toxicity Template Tables

Below describes what is included and submission requirements for each of the 5 tables in the CEDEN Toxicity Template:

1. Stations
 - a. Holds information about sample site and GIS information
 - b. Submit new stations prior to or concurrently with submitting toxicity data
 - c. Required only for new stations that are not currently in the database.
2. Locations

- a. Holds information about location sampled
 - b. Required only if actual unique latitudes and longitudes were recorded for each sampling event.
3. ToxSummaryResults
 - a. Used to record toxicity summary results
 - b. Required to be submitted with the ToxBatch table. It is desired to include both the ToxSummaryResults and ToxReplicateResults tab but it is not required.
4. ToxReplicateResults
 - a. Used to record toxicity replicate results
 - b. Used to record toxicity in-test water quality measurements as well.
 - c. Required to be submitted with the ToxBatch table. It is desired to include both the ToxSummaryResults and ToxReplicateResults tables but it is not required.
5. ToxBatch
 - a. Used to record toxicity batch information necessary for analyzing the data
 - b. Required and must be submitted with the ToxSummaryResults and/or ToxReplicateResults table.

The guidelines in the following sections will assist you in getting your data into the CEDEN Toxicity Template tables. However, if at any time you have questions more specific to your data, (e.g. adding new codes to LookUp lists) contact your local Regional Data Center.

Once you have placed your data into the CEDEN Toxicity Template tables, visit your Regional Data Center's website to check and submit your data. Regional Data Center information can be found at: http://www.ceden.org/data_centers.shtml. The online data submission process includes specific checks on your data to ensure both data integrity and comparability with other data sets. Once your data has passed all of the checks it will be uploaded into the centralized CEDEN database and become available through the CEDEN website (www.ceden.org).

Toxicity Template Data Tables

Stations Table

PURPOSE:

The stations table contains information about the station/sample site and GIS information. It is important to fill out as much information as possible. This table is only required for new stations not within the database and can be submitted prior to or consecutively with any field data. Utilize the Station LookUp list within CEDEN's Controlled Vocabulary to view all current stations within CEDEN. Please see the above section for data submission steps.

COLUMN REQUIREMENTS:

Columns within the CEDEN Chemistry Template tables are either considered 1) required, 2) desired or 3) not required. Required columns must be filled out in order for data to be accepted by CEDEN. Desired columns are strongly encouraged and should be filled in whenever possible. Not required columns include additional information that aid in data usability. Individual column requirements are listed below:

Required Columns:

StationSource
StationCode
StationName
StationAgency
CoordinateNumber
TargetLatitude
TargetLongitude
SWRCBWatTypeCode

Desired Columns:

Datum
CoordinateSource
LocalWaterbody
State

Not Required Columns:

StationDescr	GageStationID
StationComments	UpstreamArea
EventType1	HBASA2_1995_NHCODE
EventType2	NHD_24k_v2_GNIS_Name
EventType3	NHD_24k_v2_ReachCode
GeometryShape	NHD_24k_v2_HUC_12
DirectionsToStation	NHD_24k_v2_Hu_12_Name
AddDate	NHD_100k_GNIS_Name
Elevation	NHD_100k_ReachCode
UnitElevation	NHD_Plus_CatchmentComID
StationDetailVerBy	IBI_NorthCoast_2005_WithinPolygon*
StationDetailVerDate	IBI_SoCal_2005_WithinPolygon*
StationDetailComments	Ecoregion_1987_Level3*
LocalWaterShed	StationGISVerBy
Counties_2004_COUNTY	StationGISVerDate
CalWater_2004_RB	StationGISVerComments
CalWater_2004_CALWNUM	
CalWater_2004_HUNAME	

* Not required unless station has accompanying bioassessment data.

ADDITIONAL RESOURCES:

When populating the stations table one can utilize additional resources provided by the Surface Water Ambient Monitoring Program (SWAMP) . SWAMP has compiled and summarized many fields that are desired to fully describe the location of your station on the following website: <http://swamp.mpsl.mlml.calstate.edu/resources-and-downloads/database-management-systems/swamp-25-database/templates-25/gis-shapefile-layers> . The SWAMP website has compiled GIS layers for CalWater, Counties, Ecoregion, IBI, HBASA and NHD. If one does not have access to GIS mapping software SWAMP has provided maps for data providers to visually map their stations for the IBI and Ecoregion layers. Contact your Regional Data Center if you have any questions regarding information found on this website.

STATIONS TABLE STRUCTURE:

* Primary Key, required for record uniqueness.

^ Not required unless station has accompanying bioassessment data.

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
StationSource*	Text	Yes	50	Agency LookUp or Project LookUp	Agency or project that submitted the station to CEDEN.
StationCode*	Text	Yes	25	Station LookUp	A code representing the StationName and site and should be unique within a study design.
StationName*	Text	Yes	100	Station LookUp	Represents a unique sampling site in a sampling design. A single waterbody may have multiple stations. Station name must be unique for all stations.
StationDescr	Text	No	255		Description of the StationCode.
StationAgency	Text	Yes	20	AgencyCode LookUp	Represents the agency that created the station and is responsible for any updates or modifications to the station. Only the agency listed here can modify the information for this station. Default value equals Not Recorded if unknown.
StationComments	Text	No	255		Any pertinent comments regarding the station and/or station area.
EventType1	Text	No	20	Event LookUp	Represents what type of sampling events will or have occurred at a station, i.e. water quality, tissue or bioassessment sampling.
EventType2	Text	No	20	Event LookUp	Represents what type of sampling events will or have occurred at a station, i.e. water quality, tissue or bioassessment sampling.
EventType3	Text	No	20	Event LookUp	Represents what type of sampling events will or have occurred at a station, i.e. water quality, tissue or bioassessment sampling.
GeometryShape	Text	No	50	Variable Code LookUp	Physical shape of the Station. Example values are Line, Point, or Polygon.
DirectionsToStation	Text	No	255		A general description of how to get to the station using streets, landmarks, etc.

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
AddDate	Date/ Time	No			Date the StationCode was added. Format as dd/mmm/yyyy
CoordinateNumber	Integer	Yes			Number of the coordinate recorded at a Station; e.g. 1 for Points (target and actual coordinates), 1 and 2 for Lines. Default value equals 1 if unknown.
TargetLatitude	Decimal	Yes			Represents the targeted latitude for the sample site in decimal degrees with 5 decimal places.
TargetLongitude	Decimal	Yes			Represents the targeted longitude for the sample site in decimal degrees with 5 decimal places (must be negative).
Datum	Text	Desired	10	Variable Code LookUp	Represents the associated model of the Earth from which reference points are used to calculate position measurements. GPS Devices commonly use Datums such as NAD83 and WGS84. Default value equals "NR" if unknown
CoordinateSource	Text	Desired	50	Variable Code LookUp	Describes how the coordinate was measured. For example, if measurement was taken from a map or GPS. Default value equals NR if unknown
Elevation	Decimal	No			Elevation at which the sample was taken.
UnitElevation	Text	No	2	Variable Codes LookUp	Unit of the Elevation measurement.
StationDetailVerBy	Text	No	100		Agency or person who performed the verification of the station detail information.
StationDetailVerDate	Date/ Time	No			Date the station detail information was verified.
StationDetailComments	Text	No	255		Comments related to the station detail information.
LocalWatershed	Text	No	50		Local watershed of the station as supplied by data user.
LocalWaterbody	Text	Desired	50		Local waterbody of the station as supplied by data user.

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
State	Text	Desired	2	Variable Codes LookUp	State in which the station was surveyed. Default = CA
Counties_2004_County	Text	No	50		County in which the station was surveyed.
SWRCBWatTypeCode	Text	Yes	10	WBType LookUp	Unique code assigned by the state for the appropriate waterbody type. Default value equals "NR" if unknown
CalWater_2004_RB	Integer	No	1		Regional Board ID Number from the CalWater 2.2.1 2004 GIS layer. This layer can be retrieved from: https://projects.atlas.ca.gov/frs/download.php/676/calw221_e00.zip
CalWater_2004_CALWNUM	Text	No	12		Watershed ID Number from the CalWater 2.2.1 2004 GIS layer.
CalWater_2004_HUNAME	Text	No	35		Hydrologic Unit Name from the CalWater 2.2.1 2004 GIS layer.
GageStationID	Text	No	50		Identifier for USGS Gage station located at the Station location.
UpstreamArea	Decimal	No			Area (measured in km2) upstream that drains to the sampling point.
HBASA2_1995_NHCODE	Text	No	6		NHDCODE from Teale HBASA watershed GIS layer. This layer can be retrieved from: https://projects.atlas.ca.gov/frs/download.php/389/hbasa2-1997_shp.zip
NHD_24k_v2_GNIS_Name	Text	No	65		Official federal Geographic Names Information System (GNIS) name of stream from the NHD high-resolution GIS layer. This layer can be retrieved from: http://nhd.usgs.gov/data.html
NHD_24k_v2_ReachCode	Text	No	14		14-digit ReachCode ID Number for streams from NHD high-resolution GIS layer.
NHD_24k_v2_HUC_12	Text	No	12		12-digit Hydrologic Unit ID for NHD watershed polygon (WBD) from NHD high-resolution GIS layer.
NHD_24k_v2_Hu_12_Name	Text	No	120		Name of 12-digit Hydrologic Unit for NHD watershed polygon (WBD) from NHD high-resolution GIS layer.

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
NHD_100k_GNIS_Name	Text	No	120		Official federal Geographic Names Information System (GNIS) name of stream from the NHD medium-resolution GIS layer. This layer can be retrieved from: http://nhd.usgs.gov/data.html
NHD_100k_ReachCode	Text	No	14		14-digit ReachCode ID Number for streams from NHD medium-resolution GIS layer.
NHD_Plus_CatchmentComID	Text	No	50		Represents the common identifier of an NHD Flowline for the catchment polygon.
Ecoregion_1987_Level3	Text	No^	5		EPA Ecoregion Level III name (US_L3NAME). This layer can be retrieved from: ftp://ftp.epa.gov/wed/ecoregions/ca/
IBI_NorthCoast_2005_WithinPolygon	TRUE/ FALSE	No^			True if the Station is located within the IBI North Coast 2005 polygon. False if otherwise.
IBI_SoCal_2005_WithinPolygon	TRUE/ FALSE	No^			True if the Station is located within the IBI Southern California 2005 polygon. False if otherwise.
StationGISVerBy	Text	No	100		Agency or person who performed the verification of the GIS station information.
StationGISVerDate	Date/ Time	No			Date the GIS station information was verified.
StationGISVerComments	Text	No	255		Comments related to the GIS station information verification.

Locations Table

PURPOSE:

The locations table contains specific information about the locations sampled. Actual latitudes and longitudes are recorded here for each sampling event. In the event that only target latitudes and longitudes were recorded, it is sufficient to fill out the Stations table only.

COLUMN REQUIREMENTS:

Columns within the CEDEN Chemistry Template tables are either considered 1) required, 2) desired or 3) not required. Required columns must be filled out in order for data to be accepted by CEDEN. Desired columns are strongly encouraged and should be filled in whenever possible. Not required columns include additional information that aid in data usability. Individual column requirements are listed below:

Required Columns:

StationCode
SampleDate
ProjectCode
CoordinateNumber
ActualLatitude
ActualLongitude
Datum

Desired Columns:

EventCode
ProtocolCode
AgencyCode
LocationCode
CoordinateSource

Not Required Columns:

SampleComments
GeometryShape
Elevation
UnitElevation
StationDetailVerBy
StationDetailVerDate
StationDetailComments

LOCATIONS TABLE STRUCTURE:

* Primary Key, required for record uniqueness.

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
StationCode*	Text	Yes	25	Station LookUp	Represents a unique sampling site in a sampling design. A single waterbody may have multiple stations. StationCodes and station information must be submitted to the CEDEN system via the Stations table before lab data can be submitted.
SampleDate*	Date/ Time	Yes	20		Refers to the date the sample was collected in the field. Formatted as dd/mm/yyyy.
ProjectCode*	Text	Yes	25	Project LookUp	References the project that is associated with the sample.
EventCode	Text	Desired	20	Event LookUp	Represents the primary reason, i.e. water quality, tissue or bioassessment sampling, of the sampling event at a particular station and date.
ProtocolCode	Text	Desired	50	Protocol LookUp	Represents the sampling protocol used, which includes the set of methods, methodology and/or specifications, such as MPSL-DFG_Field_v1.0. Established protocols may be used or Regions may document their own sampling protocols. Default value equals Not Recorded if unknown
AgencyCode	Text	Desired	20	Agency LookUp	Refers to the organization or agency that collected the sample. Default value equals Not Recorded if unknown
SampleComments	Text	No	255		Comments related to the GIS station information verification.
LocationCode	Text	Desired	50	Location LookUp	Describes the physical location in the waterbody where the sample was collected. One sampling event may have a single or multiple locations. Default value equals Not Recorded if unknown
GeometryShape	Text	No	50	Variable Codes LookUp	Physical shape of the location. Example values are Line, Point, or Polygon.

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
CoordinateNumber	Integer	Yes			Number of the coordinate recorded at a Location; e.g. 1 for Points (target and actual coordinates), 1 and 2 for Lines. Default value equals 1 if unknown.
ActualLatitude	Decimal	Yes			Represents the actual latitude for the sample site in decimal degrees with 5 decimal places.
ActualLongitude	Decimal	Yes			Represents the actual longitude for the sample site in decimal degrees with 5 decimal places (must be negative).
Datum	Text	Yes	10	Variable Codes LookUp	The Datum field records the datum that was used on the GPS Device to record the GPS measurements. Example = NAD83. Default value equals NR if unknown.
CoordinateSource	Text	Desired	50	Variable Codes LookUp	Describes how the coordinate was measured. For example, if measurement was taken from a map or GPS. Default value equals NR if unknown.
Elevation	Decimal	No			Elevation at which the sample was taken. Example = 1.
UnitElevation	Text	No	2	Variable Codes LookUp	Unit of the Elevation measurement. Example = m
StationDetailVerBy	Text	No	100		Agency or person who performed the verification of the station detail information.
StationDetailVerDate	Date/ Time	No			Date the station detail information was verified.
StationDetailComments	Text	No	255		Comments related to the station detail information.

ToxBatch Table

PURPOSE:

The ToxBatch table contains information about toxicity batches. A batch groups all environmental samples and supporting QA samples within a unique analysis batch. Batches should only include one species and should not combine test types, i.e. reference toxicants and sample results should not be in the same batch.

COLUMN REQUIREMENTS:

Columns within the CEDEN Toxicity Template tables are either considered 1) required, 2) desired or 3) not required. Required columns must be filled out in order for data to be accepted by CEDEN. Desired columns are strongly encouraged and should be filled in whenever possible. Not required columns include additional information that aid in data usability. Individual column requirements are listed below:

Required Columns:

ToxBatch
StartDate
LabAgencyCode

Desired Columns:

LabSubmissionCode
BatchVerificationCode
RefToxBatch

Not Required Columns:

OrganismAgeAtTestStart
SubmittingAgencyCode
OrganismSupplier
ToxBatchComments

TOXBATCH TABLE STRUCTURE:

* Primary Key, required for record uniqueness.

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
ToxBatch*	Text	Yes	50		The ToxBatch is a unique code, provided by the laboratory, which represents a group of samples processed together. It groups all environmental samples with their supporting QC samples and will be used to verify completeness. Batches should only include one species and should not combine test types, i.e. reference toxicants and sample results should not be in the same batch. It is recommended that the species code be included in the ToxBatch. To ensure uniqueness in the CEDEN system, the LabAgencyCode may be appended to this value when loaded to CEDEN. Please use a standard format to construct a composite ToxBatch. Format as ToxBatch a dash – and the AgencyCode. Example: Batch1-SCCWRP.
StartDate	Date/ Time	Yes			StartDate refers to the date the toxicity test began. Default value equals 01/Jan/1950 00:00 if unknown.
LabAgencyCode*	Text	Yes	20	Agency LookUp	LabAgencyCode refers to the organization, agency or laboratory that performed the analysis on the sample. Default value equals Not Recorded.
LabSubmissionCode	Text	Desired	10	Lab Submission Lookup	The LabSubmissionCode is a unique batch qualifier code assigned to the ToxBatch as a whole by the analyzing laboratory which references the quality of the data in the ToxBatch. The LabSubmissionCode should be reviewed by the Project Manager or other appropriate person to ensure that the code has been applied based on project specific data quality objectives and criteria. Default value equals NR if unknown.

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
BatchVerificationCode	Text	Desired	10	Batch Verification Lookup	Unique code referencing the Verification of a Batch. If the Batch Verification used is not found in the lookup list please contact your Regional Data Center for assistance. Default value equals NR if unknown.
RefToxBatch	Text	Desired	25		RefToxBatch lists the Reference Tox Batch ID run with this batch of samples. Default value equals Not Recorded if unknown.
OrganismAgeAtTestStart	Text	No	10		OrganismAgeAtTestStart indicates the age or age range (e.g. 7 days or 7-10 days) of the test organisms at the beginning of the test. The age or range is usually recommended by the method.
SubmittingAgencyCode	Text	No	20	Agency LookUp	Organization or agency that is responsible for submission of the data to the database. This agency may be different from LabAgencyCode if the toxicity tests were subcontracted to another agency.
OrganismSupplier	Text	No	75		OrganismSupplier refers to the agency that supplied the test organisms.
ToxBatchComments	Text	No	255		ToxBatchComments records any comments relating to the ToxBatch as a whole. Comments should explain any irregularities in sample processing and/or execution of the testing procedures.

ToxSummaryResults Table

PURPOSE:

The purpose of the toxicity summary table is to hold the core toxicity summary data including the mean, toxicity significance, and percent of control. Each record represents the mean of a particular organism analyzed by a particular method at a specific station. Both the environmental sample and negative control should be included in this table.

COLUMN REQUIREMENTS:

Columns within the CEDEN Toxicity Template tables are either considered 1) required, 2) desired or 3) not required. Required columns must be filled out in order for data to be accepted by CEDEN. Desired columns are strongly encouraged and should be filled in whenever possible. Not required columns include additional information that aid in data usability. Individual column requirements are listed below:

Required Columns:

StationCode	TestDuration	RepCount
SampleDate	OrganismName	Mean
ProjectCode	Treatment	StdDev
CollectionTime	Concentration	StatisticalMethod
CollectionMethodCode	UnitTreatment	AlphaValue
SampleTypeCode	Dilution	CalcValueType
Replicate	WQSource	CalculatedValue
CollectionDepth	ToxPointMethod	CriticalValue
UnitCollectionDepth	AnalyteName	PercentEffect
ToxBatch	FractionName	SigEffect
MatrixName	UnitAnalyte	TestQACode
MethodName	TimePoint	

Desired Columns:

EventCode	PositionWaterColumn
ProtocolCode	TestExposureType
AgencyCode	bValue
LocationCode	ComplianceCode
CollectionDeviceName	

Not Required Columns:

SampleComments	ToxTestComments
GeometryShape	MSD
LabCollectionComments	EvalThreshold
QAControlID	TIENarrative
SampleID	ToxPointSummaryComments
LabSampleID	

TOX SUMMARY RESULTS TABLE STRUCTURE:

* Primary Key, required for record uniqueness.

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
StationCode*	Text	Yes	25	Station LookUp	A code representing the StationName and site and should be unique within a study design.
SampleDate*	Date/ Time	Yes			Refers to the date the sample was collected in the field. Formatted as dd/mm/yyyy. Default value equals 01/Jan/1950 if unknown.
ProjectCode	Text	Yes	25	Project LookUp	References the project that is associated with the sample.
EventCode	Text	Desired	20	Event LookUp	Represents the primary reason, i.e. water quality, tissue or bioassessment sampling, of the sampling event at a particular station and date.
ProtocolCode	Text	Desired	50	Protocol LookUp	Represents the sampling protocol used, which includes the set of methods, methodology and/or specifications, such as MPSL-DFG_Field_v1.0. Established protocols may be used or Regions may document their own sampling protocols. The default value of Not Recorded is utilized for environmental samples if unknown. For LabQA samples utilize Not Applicable.
AgencyCode	Text	Desired	20	Agency LookUp	Refers to the organization or agency that collected the sample. This should be listed on the Chain of Custody (COC) document that accompanies the samples from the field. Default value equals Not Recorded if unknown.
SampleComments	Text	No	255		The comments field should be used for any notes or comments specifically related to the sample collection.
LocationCode	Text	Desired	50	Location LookUp	Describes the physical location in the waterbody where the sample was collected. One sampling event may have a single or multiple locations. The default value of Not Recorded is utilized for environmental samples if unknown. For LabQA samples utilize Not Applicable.

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
GeometryShape	Text	No	50	Variable Codes LookUp	Physical shape of the location. Example values are Line, Point, or Polygon.
CollectionTime*	Date/ Time	Yes	20		Refers to the time when the first sample of a sampling event at a specific station was collected in the field. Format equals hh:mm. Default value equals 00:00 if unknown.
CollectionMethodCode	Text	Yes	50	Collection Method LookUp	Refers to the general method of collection such as Sed_Grab, Sed_Core, Water_Grab, Autosampler24h, Autosampler7d. The default value of Not Recorded is utilized for environmental samples if unknown. For LabQA samples utilize Not Applicable.
SampleTypeCode*	Text	Yes	20	Sample Type LookUp	Refers to the type of sample collected or analyzed. Default value equals Not Recorded if unknown.
Replicate*	Integer	Yes			Used to distinguish between replicates created at a single collection in the field. Default value is 1. Replicate samples are collected at the same station and date. Therefore, samples collected on different dates from the same station should both have a value of 1 for FieldReplicate.
CollectionDeviceName	Text	Desired	50	Collection Device Lookup	Name of the CollectionDevice. Default value equals Not Recorded if unknown.
CollectionDepth	Decimal	Yes			Records the depth or penetration, from the surface in the water or sediment column, at which the sample was collected.
UnitCollectionDepth	Text	Yes	50	Variable Codes LookUp	Refers to the units used in the CollectionDepth including cm (centimeters) and m (meters).
PositionWaterColumn	Text	Desired	20	Variable Codes LookUp	Position in water column where sample was taken. Default value equals Not Applicable if unknown.
LabCollectionComments	Text	No	255		Comments related to the LabCollection

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
ToxBatch*	Text	Yes	35		The ToxBatch is a unique code, provided by the laboratory, which represents a group of samples processed together. It groups all environmental samples with their supporting QC samples and will be used to verify completeness. Batches should only include one species and should not combine test types, i.e. reference toxicants and sample results should not be in the same batch. It is recommended that the species code be included in the ToxBatch. To ensure uniqueness in the CEDEN system, the LabAgencyCode may be appended to this value when loaded to CEDEN. Please use a standard format to construct a composite ToxBatch. Format as ToxBatch a dash – and the AgencyCode. Example: Batch1-SCCWRP
MatrixName*	Text	Yes	50	Matrix LookUp	Refers to the sample matrix, e.g. samplewater. Default value equals Not Recorded if unknown.
MethodName*	Text	Yes	50	Method LookUp	Refers to the analysis method used by the laboratory to analyze the sample. Default value equals Not Recorded if unknown.
TestDuration	Text	Yes	10	ToxTestDur LookUp	ToxTestDurCode indicates the duration of the toxicity test as a number and includes the associated units.
OrganismName	Text	Yes	100	Organism LookUp	OrganismName (FinalID) refers to the scientific name of the species used in the toxicity test.
TestExposureType	Text	Desired		Variable Codes LookUp	Describes the type of exposure. Toxicity test exposure type based on the test method. Populate field with Acute or Chronic values. Default value equals Not Recorded if unknown.
QAControlID	Text	No			LabSampleID of the control sample used for statistical comparisons
SampleID	Text	No	35		Unique identifier supplied by the organization directing the sampling or sampling agency and is used to track the sample throughout the sampling and analysis processes. This field can be used to tie a result to the sample.

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
LabSampleID	Text	No	35		Recommended field intended to provide lab specific identification for an analyzed sample.
ToxTestComments	Text	No	255		Holds any comments related to the toxicity test results. Usually provided by the laboratories or QA personnel. Examples include: comments about sample test anomalies, temperature changes, high DO values that may affect all other results, etc.
Treatment	Text	Yes	255	Analyte Lookup	Treatment refers to any treatment performed on the sample, such as a pH adjustment. Default value is 'None'.
Concentration	Integer	Yes			Concentration refers to the adjusted final concentration or value of the analyte applied to the toxicity sample, expressed as a number. Default value is '0'.
UnitTreatment	Text	Yes	50	Unit Lookup	UnitTreatment refers to the units used in the treatment. When the treatment is none, the default for unit is 'None'.
Dilution	Integer	Yes			Dilution is recorded as a proportion of the original sample. If no dilution is performed, the default value of '100' is used. A sample with 80% sample and 20% blank water has a dilution value of '80'.
WQSource	Text	Yes	50	Matrix Lookup	WQSource differentiates between water quality measurements taken in the overlying water or interstitialwater (pore water). Default value equals Not Applicable for toxicity endpoints.
ToxPointMethod	Text	Yes		Method Lookup	ToxPointMethod refers to the general method used in obtaining or calculating the result. Toxicity replicate and summary data have a default value of 'None' unless a method other than the test MethodName is used for the calculations.
AnalyteName*	Text	Yes	100	Analyte Lookup	Name of the analyte or parameter for which the analysis is conducted and result is reported. The LookUp list includes the acceptable abbreviation or name of the variable used by the database, enabling consistency across reporting.

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
FractionName*	Text	Yes	50	Fraction LookUp	Specific descriptor of the Analyte. For example, Ammonia as NH3 are often expressed as total or unionized and therefore this description should be used within the fraction field.
UnitAnalyte*	Text	Yes	50	Unit LookUp	UnitAnalyte indicates the units used in the measurement of the AnalyteName.
TimePoint*	Text	Yes	10	Time Point LookUp	TimePoint refers to the point in time during the test at which the measurement was recorded for water quality measurements or the day on which the end points were taken. Example if a test was originally going to last 7 days but the endpoints were taken on the 6th day then the TimePoint would indicate "Day 6".
RepCount	Integer	Yes			RepCount is the total number of sample replicates analyzed for the associated toxpoint in the toxicity test i.e. RepCount equals the number of lab replicates used to calculate the mean result.
Mean	Decimal	Yes			Mean is the average result calculated from all replicates of a single sample.
StdDev	Decimal	Yes			StdDev or standard deviation is a statistic that indicates how tightly all the replicates are clustered around the mean in a set of data. This calculation includes all the applicable replicates from a single sample.
StatisticalMethod	Text	Yes		Variable Codes LookUp	StatisticalMethod is the statistical test or method used to calculate the probability of whether a test is significant or not. Used to determine whether the sample replicates are significantly different from the control. Default value equals NR when unknown.
AlphaValue	Decimal	Yes			AlphaValue is the predetermined statistical acceptance level that is not calculated, but is chosen by the laboratory when running the statistical method.
bValue	Decimal	Desired			bValue represents the threshold for unacceptable toxicity or the Regulatory Management Decision (RMD) associated with hypothesis testing between the control and sample

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
CalcValueType	Text	Yes		Variable Codes LookUp	Calculated statistical type. For example Probability or T value.
CalculatedValue	Decimal	Yes			Calculated statistic from associated statistical method. Note when utilizing a CalcValueType of Probability ,negative control samples (CNEG) are '0.5'.
CriticalValue	Decimal	Yes			The derived critical value based on sample size and alpha value of the statistical test. The CriticalValue is compared to the calculated value in the associated statistical test.
PercentEffect	Decimal	Yes			Percent difference between the mean of the endpoint and the mean of the control's associated endpoint; ((Mean Control Response – Mean Sample Response) / Mean Control Response) * 100.
MSD	Decimal	No			<p>The minimum significant difference (MSD) is a measurement that can be produced for each statistical comparison performed between sample and control, or among multiple concentrations of a sample and control. It represents the smallest significant difference from the control and is unique for each statistical comparison. This number should be reported as a percentage, e.g., '20' = 20%.</p> <p>For the EPA TST method there is no MSD value therefore the MSD field should be left blank.</p>

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
EvalThreshold	Decimal	No			<p>The evaluation threshold or EvalThreshold is the programmatic level that is used to identify that an environmental sample is biologically significantly different from its associated control sample and is recorded as a percentage. EvalThreshold is compared to the PercentEffect field.</p> <p>In cases where programs use program specific MSDs the EvalThreshold will equal the MSD and will be compared to the PercentEffect.</p> <p>If you are utilizing the TST method this field corresponds to the critical difference in the EPA TST methods.</p>
SigEffect	Text	Yes	10	SigEffect Lookup	The toxicity significant effect code or SigEffect indicates whether the sample result is significantly different from the control and can include whether or not it is greater or less than the evaluation threshold. Default value equals NR for environmental samples. Default value equals NA for LABQA with a CriticalValueType of Probability.
TestQACode	Text	Yes	30	QA LookUp	Applied to the result to describe any special conditions, situations or outliers that occurred during or prior to the analysis to achieve the result. The default code, indicating no special conditions, is 'None'. If more than one code needs to be applied to a record, the convention is to list them in alphabetical order separated by commas and no spaces. Default value equals NR if unknown.
ComplianceCode	Text	Desired	25	Data Compliance LookUp	Unique code referencing the Compliance with the associated QAPP. Default value equals NR if unknown..
ToxPointSummary Comments	Text	No	130		The SummaryComments field includes any comments necessary to describe special circumstances for the toxicity summary data for the specific record.
TIENarrative	Text	No	64000		Short narrative on the results of the toxicity identification evaluation (TIE).

ToxReplicateResults Table

PURPOSE:

The purpose of the toxicity replicate results table is to hold toxicity replicate data including in-test water quality measurements. This table should complement the toxicity summary results and provide the data that was used to calculate the summary results. This data will allow for external statistical analysis of the toxicity test replicates as well as provide environmental conditions of the samples to account for variability of the results and quality control review. Each record represents a replicate result of a particular organism analyzed by a particular method at a specific station or a particular water quality measurement at a specific point in time. Both the environmental and negative control samples should be included in this table.

COLUMN REQUIREMENTS:

Columns within the CEDEN Toxicity Template tables are either considered 1) required, 2) desired or 3) not required. Required columns must be filled out in order for data to be accepted by CEDEN. Desired columns are strongly encouraged and should be filled in whenever possible. Not required columns include additional information that aid in data usability. Individual column requirements are listed below:

Required Columns:

StationCode	ToxBatch	WQSource
SampleDate	MatrixName	ToxPointMethod
ProjectCode	MethodName	AnalyteName
CollectionTime	TestDuration	FractionName
CollectionMethodCode	OrganismName	UnitAnalyte
SampleTypeCode	Treatment	TimePoint
Replicate	Concentration	LabReplicate
CollectionDepth	UnitTreatment	Result
UnitCollectionDepth	Dilution	ResQualCode

Desired Columns:

EventCode	PositionWaterColumn
ProtocolCode	TestExposureType
AgencyCode	OrganismPerRep
LocationCode	ToxResultQACode
CollectionDeviceName	ComplianceCode

Not Required Columns:

SampleComments	QAControlID	ToxTestComments
GeometryShape	SampleID	ToxResultComments
LabCollectionComments	LabSampleID	

TOX REPLICATE RESULTS TABLE STRUCTURE:

* Primary Key, required for record uniqueness.

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
StationCode*	Text	Yes	25	Station LookUp	A code representing the StationName and site and should be unique within a study design.
SampleDate*	Date/ Time	Yes			Refers to the date the sample was collected in the field. Formatted as dd/mmm/yyyy. Default value equals 01/Jan/1950 if unknown.
ProjectCode	Text	Yes	25	Project LookUp	References the project that is associated with the sample.
EventCode	Text	No	20	Event LookUp	Represents the primary reason, i.e. water quality, tissue or bioassessment sampling, of the sampling event at a particular station and date.
ProtocolCode	Text	Desired	50	Protocol LookUp	Represents the sampling protocol used, which includes the set of methods, methodology and/or specifications, such as MPSL-DFG_Field_v1.0. Established protocols may be used or Regions may document their own sampling protocols. The default value of Not Recorded is utilized for environmental samples if unknown. For LabQA samples utilize Not Applicable.
AgencyCode	Text	Desired	20	Agency LookUp	Refers to the organization or agency that collected the sample. This should be listed on the Chain of Custody (COC) document that accompanies the samples from the field. Default value equals Not Recorded if unknown.
SampleComments	Text	No	255		The comments field should be used for any notes or comments specifically related to the sample collection.

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
LocationCode	Text	Desired	50	Location LookUp	Describes the physical location in the waterbody where the sample was collected. One sampling event may have a single or multiple locations. The default value of Not Recorded is utilized for environmental samples if unknown. For LabQA samples utilize Not Applicable.
GeometryShape	Text	No	50	Variable Codes LookUp	Physical shape of the location. Example values are Line, Point, or Polygon.
CollectionTime*	Date/ Time	Yes	20		Refers to the time when the first sample of a sampling event at a specific station was collected in the field. Format equals hh:mm. Default value equals 00:00 if unknown.
CollectionMethodCode	Text	Yes	50	Collection Method LookUp	Refers to the general method of collection such as Sed_Grab, Sed_Core, Water_Grab, Autosampler24h, Autosampler7d. The default value of Not Recorded is utilized for environmental samples if unknown. For LabQA samples utilize Not Applicable.
SampleTypeCode*	Text	Yes	20	Sample Type LookUp	Refers to the type of sample collected or analyzed. Default value equals Not Recorded if unknown.
Replicate*	Integer	Yes			Used to distinguish between replicates created at a single collection in the field. Default value is 1. Replicate samples are collected at the same station and date. Therefore, samples collected on different dates from the same station should both have a value of 1 for FieldReplicate.
CollectionDeviceName	Text	Desired	50	Collection Device LookUp	Name of the CollectionDevice. Default value equals Not Recorded if unknown.
CollectionDepth	Decimal	Yes			Records the depth and penetration, from the surface in the water or sediment column, at which the sample was collected.
UnitCollectionDepth	Text	Yes	50	Variable Codes LookUp	Refers to the units used in the CollectionDepth including cm (centimeters) and m (meters).

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
PositionWaterColumn	Text	No	20	Variable Codes LookUp	Position in water column where sample was taken. Default value equals Not Applicable if unknown.
LabCollection Comments	Text	No	255		Comments related to the LabCollection
ToxBatch*	Text	Yes	50		The ToxBatch is a unique code, provided by the laboratory, which represents a group of samples processed together. It groups all environmental samples with their supporting QC samples and will be used to verify completeness. Batches should only include one species and should not combine test types, i.e. reference toxicants and sample results should not be in the same batch. It is recommended that the species code be included in the ToxBatch. To ensure uniqueness in the CEDEN system, the LabAgencyCode may be appended to this value when loaded to CEDEN. Please use a standard format to construct a composite ToxBatch. Format as ToxBatch a dash – and the AgencyCode. Example: Batch1-SCCWRP
MatrixName*	Text	Yes	50	Matrix LookUp	Refers to the sample matrix, e.g. samplewater. Default value equals Not Recorded if unknown.
MethodName*	Text	Yes	50	Method LookUp	Refers to the analysis method used by the laboratory to analyze the sample. Default value equals Not Recorded if unknown.
TestDuration*	Text	Yes	10	ToxTestDur LookUp	ToxTestDurCode indicates the duration of the toxicity test as a number and includes the associated units.
OrganismName*	Text	Yes	100	Organism LookUp	OrganismName refers to the scientific name of the species used in the toxicity test.
TestExposureType	Text	Desired		Variable Codes LookUp	Describes the type of exposure. Toxicity test exposure type based on the test method. Populate field with Acute or Chronic values. Default value equals Not Recorded if unknown.

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
QAControlID	Text	No			LabSampleID of the control sample used for statistical comparisons
SampleID	Text	No	35		Unique identifier supplied by the organization directing the sampling or sampling agency and is used to track the sample throughout the sampling and analysis processes. This field can be used to tie a result to the sample.
LabSampleID	Text	No	35		Recommended field intended to provide lab specific identification for an analyzed sample.
ToxTestComments	Text	No	255		Holds any comments related to the toxicity test results. Usually provided by the laboratories or QA personnel. Examples include: comments about sample test anomalies, temperature changes, high DO values that may affect all other results, etc.
Treatment	Text	Yes	255	Analyte Lookup	Treatment refers to any treatment performed on the sample, such as a pH adjustment. Default value is 'None'.
Concentration	Integer	Yes			Concentration refers to the adjusted final concentration or value of the analyte applied to the toxicity sample, expressed as a number. Default value is '0'.
UnitTreatment	Text	Yes	50	Unit LookUp	UnitTreatment refers to the units used in the treatment. When the treatment is none, the default for unit is 'None'.
Dilution	Integer	Yes			Dilution is recorded as a proportion of the original sample. If no dilution is performed, the default value of '100' is used. A sample with 80% sample and 20% blankwater has a dilution value of '80'.
WQSource	Text	Yes	50	Matrix LookUp	WQSource differentiates between water quality measurements taken in the overlying water as well as in the sediment or interstitial water. Default value equals Not Applicable for toxicity endpoints. Default value equals Not recorded for water quality measurements if unknown.

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
ToxPointMethod	Text	Yes	50	Method LookUp	ToxPointMethod refers to the general method used in obtaining or calculating the result. Toxicity replicate and summary data have a default value of 'None unless a method other than the test MethodName is used for the calculations.'. Water quality measurement results have a default value of 'ToxWQMeasurement'.
AnalyteName*	Text	Yes	100	Analyte LookUp	Name of the analyte or parameter for which the analysis is conducted and result is reported. The LookUp list includes the acceptable abbreviation or name of the variable used by the database, enabling consistency across reporting.
FractionName*	Text	Yes	50	Fraction LookUp	Specific descriptor of the Analyte. For example, metals are often expressed as total or dissolved and therefore this description should be used within the fraction field.
UnitAnalyte*	Text	Yes	50	Unit LookUp	UnitAnalyte indicates the units used in the measurement of the AnalyteName.
TimePoint*	Text	Yes	10	TimePoint LookUp	TimePoint refers to the point in time during the test at which the measurement was recorded for water quality measurements or the day on which the end points were taken. Example if a test was originally going to last 7 days but the endpoints were taken on the 6th day then the TimePoint would indicate "Day 6".
LabReplicate*	Integer	Yes			The LabReplicate identifies the individual splits of the toxicity sample and is used to identify from which replicate a result originated.
OrganismPerRep	Integer	Desired			Number of organisms in each replicate. Default value equals "-88" when unknown. Default value for ToxWQMeasurements equals "0".
Result	Text	Yes	10		Numeric result of test, stored as text to retain trailing zeros. Result may be left blank as long as an appropriate ResQualCode is provided.

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
ResQualCode	Text	Yes	10	ResQual LookUp	The Result Qualifier Code or ResultQualCode qualifies the analytical result of the sample. Default value equals “=”.
ToxResultQACode	Text	Desired	30	ToxResultQA LookUp	A ToxResultQACode is used to further qualify the analytical result of the sample. Default value equals None.
ComplianceCode	Text	Desired	25	Data Compliance LookUp	Unique code referencing the compliance with the associated QAPP. Default value equals NR if unknown.
ToxResultComments	Text	No	255		In the ToxResultsComments field note any comments necessary to describe special circumstances for the toxicity results data for the specific record. These could be comments needed to clarify any portion of the analysis which is not described in any other field. Examples include: survival may be low due to lost individuals, questionable hardness due to probe variances, etc.

Appendix A: Specific Entry for Laboratory Generated QA Samples

INTRODUCTION

Appendix A has been created to give additional guidance regarding business rules and formatting of quality assurance data generated in the laboratory. The following sections on Laboratory Quality Assurance (QA) Samples list example values that can be used to ensure comparability with other QA samples generated with different projects. The example values are listed for a subset of the Toxicity Template columns and are associated with descriptions and business rules to further guide the data generator in how to format quality assurance data. Because the examples below only reference a subset of the columns in the Toxicity Template, the Toxicity Data Submission Guidance Document main body should be used as a reference for definitions and associated LookUp lists for how to populate the additional columns not addressed in the examples.

1. LABORATORY QA SAMPLES

The section below provides examples for entering negative controls, i.e. laboratory control samples.

1.1 LABORATORY GENERATED QA SAMPLES (LABQA)

All samples generated from within the laboratory, such as CNEG, should be entered into the Toxicity Template according to specific business rules. Below is an example of the data that should be entered for laboratory-generated QA samples for the specific Toxicity Template columns.

Table 1. Example values to be used for laboratory generated QA samples (LABQA) for a subset of toxicity template columns.

Toxicity Template Column Header	Value	Description & Business Rules
<i>StationCode</i>	LABQA	LABQA is used as the station code for any sample generated in the laboratory including LabBlank, LCS and CRMs.
<i>SampleDate</i>		SampleDate of LABQA reflects the date that the sample was created within the laboratory. SampleDate must be equal to or before AnalysisDate and expressed as dd/mm/yyyy.
<i>ProjectCode</i>		Populate with applicable project code within Project LookUp or use default value of 'Not Applicable'
<i>EventCode</i>	WQ	For water and sediment toxicity use 'WQ'. See the EventCode LookUp list for additional EventCodes and associated definitions. The EventCode should be consistent with the environmental samples in the same batch.
<i>ProtocolCode</i>		Populate with applicable ProtocolCode within Protocol LookUp or use default value of 'Not Applicable'
<i>AgencyCode</i>		Organization or agency that analyzed the sample. Select from Agency LookUp list. Or utilize null value of 'Not Recorded'.
<i>LocationCode</i>	Not Applicable	LABQA samples are generated in the laboratory and therefore are associated with a LocationCode of 'Not Applicable'.
<i>GeometryShape</i>		Leave blank

Toxicity Template Column Header	Value	Description & Business Rules
<i>CollectionTime</i>	00:00	LABQA are associated with 00:00 time for collection since they are generated in the laboratory. BR: There are situations within a batch when two identical sample types are used for QA reasons and the only way to differentiate between them is to give them each a different CollectionTime. For example, when more than one CNEG is analyzed in the same but are not replicates of each other, one CollectionTime should be 0:00 and the other 0:15, increasing the time by 15 minutes for each additional sample. Adjusting the Replicate to differentiate between samples is also acceptable.
<i>CollectionMethodCode</i>	Not Applicable	LABQA samples are generated in the laboratory and therefore are not associated with a sample LocationCode.
<i>SampleTypeCode</i>	CNEG	Select from SampleTypeLookUp List. CNEG is listed as the most common LABQA sample type code for toxicity data.
<i>Replicate</i>	1	BR: There are situations within a batch when two identical sample types are used for QA reasons and the only way to differentiate between them is to give them each a different CollectionTime (See collection time for details) or Replicate.
<i>CollectionDeviceName</i>		Leave blank; there is no CollectionDeviceName associated with LABQA and this field does not need to be populated.
<i>CollectionDepth</i>	-88	'-88' is used as a null value for LABQA samples. This field must be populated with a number and cannot be left blank.
<i>UnitCollectionDepth</i>	m	For water use 'm' for meter.
	cm	For sediment use 'cm' for centimeter.
<i>PositionWaterColumn</i>	Not Applicable	LABQA samples are generated in the laboratory and therefore are associated with the PositionWaterColumn value of 'Not Applicable'.
<i>Matrix</i>	labwater	Labwater is used for LABQA samples created with laboratory tap water.
	blankwater	Blankwater is used for LABQA samples created with laboratory Type II water.
	blankmatrix	Blankmatrix is used for LABQA sediment samples created with a commercially generated product.
	sediment	Sediment is used for LABQA sediment samples created with naturally occurring sediment from a known 'clean' source.
<i>LabReplicate</i>	1	LabReplicate '1' is associated with the original LABQA sample.
	2	LabReplicate '2' is associated with a duplicate LABQA sample.

BR: Business Rule