Central Valley
REGIONAL DATA CENTER

Central Valley Regional Data Center

Toxicity Template Entry Manual

March 8, 2013

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LIST OF ACRONYMS

BR	Business Rule
BR(CV RDC)	Business Rule: Central Valley Regional Data Center (specific to CV RDC and differs from the SWAMP Business Rule)
CEDEN	California Environmental Data Exchange Network
CNEG	Laboratory Toxicity Negative Control Sample
CV RDC	Central Valley Regional Data Center
ILRP	Irrigated Lands Regulatory Program
LABQA	Laboratory Quality Assurance
MLML RDC	Moss Landing Marine Laboratory Regional Data Center
MPSL	Marine Pollution Studies Laboratory
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
SOPs	Standard Operating Procedures
SWAMP	Surface Water Ambient Monitoring Program
TIE	Toxicity Identification Evaluation

LIST OF TERMS

Data Checker	A web-based automated tool provided to assist data submitters in examining their data sets against the required LookUp lists, formats and business rules of the CV RDC.
LookUp lists	Tables that contain specific CV RDC codes that can be housed in the CV RDC database. Current LookUp lists can be found at: http://ftp.mpsl.mlml.calstate.edu/CVRDC_LookUpLists.php
Negative Control	A sample expected to produce no change from the normal state. The purpose of the negative control is to ensure that an unknown variable is not adversely affecting the organism in the experiment, which might result in a false-positive conclusion.

AMMENDMENTS

Date of Amendment	Document Section	Page Number	Amendment to CV RDC Toxicity Documentation
April 30, 2012	**Section 1**	3-7	Replaced whole section with new CEDEN tables from new CEDEN documentation. Reorganized table to fit CV RDC template format.
April 30, 2012	**Appedix A: Table 1.2, Template Column Header = EvalThreshold**	56	Original Wording: **Evaluation threshold or EvalThreshold is the associated level that is used to identify that an environmental sample is significantly different from its associated control sample and is recorded as a percentage, e.g. 80%. EvalThreshold = Control % - MSD %** Amended To: **The evaluation threshold or EvalThreshold is the associated level that is used to identify that an environmental sample is biologically significantly different from its associated control sample and is recorded in the same unit as the mean; e.g. 80 or in percent when evaluating against the percent control.** •In cases where programs use the MSD to evaluate the evaluation threshold, for percentage endpoints (e.g. survival, etc.) EvalThreshold = Mean of Control - MSD and is compared to the Mean of the sample. To calculate the EvalThreshold for non-percentage endpoints (e.g. growth, cell counts, etc.) EvalThreshold = Mean of Control*(100-MSD)/100 and is compared to the Mean of the sample. •In cases where programs use the percent control to evaluate the evaluation threshold, EvalThreshold = Control % - MSD% and is compared to the percent control of the sample.
April 27, 2012	**Appendix A: Table 1.1 Template Column Header**		Original wording: • This field may be left blank for results that are considered detected. The database will be populated with an equal sign, "=", when the data are loaded. When a result is Not Detected a ResultQualCode of "ND" is required.

Date of Amendment	Document Section	Page Number	Amendment to CV RDC Toxicity Documentation
	= ResultQualCode		Amended To: • This field may be left blank for results that are considered detected. The database will be populated with an equal sign, "=", when the data are loaded. • *When the result is Not Detected a ResultQualCode of = is utilized with a result of 0.*
March 8, 2013	**Section 3**	7	Updated Data Checker link.

INTRODUCTION

This document is designed to provide guidance on the necessary data reporting requirements for electronic data to be submitted to the Central Valley Regional Data Center (CV RDC). For information about the CV RDC see online at http://mlj-llc.com/cv_rdc.html. This document details the content, required format and current business rules specifically for toxicity data.

Three templates are currently available for use to submit data to the CV RDC:

CV RDC toxicity data template (use if submitting data to ILRP)
California Environmental Data Exchange Network (CEDEN)

The following documentation is applicable for the CV RDC data template but business rules and definitions can be used across all templates.

This document has been divided into five subsections. A brief description of each is provided below:

Section 1: Water Quality Toxicity Data Template
Section 2: Laboratory QA Entry
Section 3: Data Checker
Section 4: Batch Verification Codes and Compliance Codes

Section 1, Water Quality Toxicity Data Template, defines the data elements needed for data entry into the CV RDC toxicity template. This section is designed to provide users with an idea of what type of data are needed for entry into the CV RDC toxicity templates. Minimum data requirements for California Environmental Data Exchange Network (CEDEN) are noted. Appendix A contains more detailed definitions of the data elements and describes the business rules for each column header within the toxicity template. The tables in Appendix A have been adapted from the Surface Water Ambient Monitoring Program (SWAMP) Moss Landing Marine Laboratory Regional Data Center (MLML RDC) with CV RDC specific business rules added.

Section 2, Laboratory QA Entry, describes the business rules for entering laboratory QA, such as laboratory control samples into the toxicity template. Business rules are indicated by "BR". If the business rule is specific to the CV RDC and differs from the SWAMP MLML RDC business rule then this is indicated by "BR(CV RDC)".

Section 3, Data Checker, details a web-based automated tool provided to assist data submitters in examining their data sets against the required LookUp lists, formats and business rules of the CV RDC. The data checker also serves as a point for projects to submit data directly to the CV RDC once the toxicity template has been verified and all errors have been addressed.

Section 4, Batch Verification Codes and Compliance Codes, describes the batch verification and compliance codes that the CV RDC applies to a program's submitted data. This process is completed by the CV RDC while transferring a program's submitted data to the CV RDC database.

1. WATER QUALITY TOXICITY DATA TEMPLATE

There are three Excel worksheets that must be completed for the toxicity data package to be considered complete by the CV RDC: “Summary”, and “Results”, and “ToxBatch”.

The **Summary** worksheet holds toxicity core summary data including the mean, toxicity significant, and percent of control. Both the environmental sample and negative control should be included in this worksheet. TIEs and reference toxicant tests are not required to be recorded and submitted electronically.

The **Results** worksheet holds toxicity replicate data including in-test water quality measurements. This worksheet should complement the Tox Summary and provide the data that was used to calculate the results found in the summary. Providing 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.

The **ToxBatch** worksheet holds summary and validation information of the laboratory batches recorded within the results worksheet.

The below sections briefly describe each of the column headers in the Summary, Results and Toxbatch worksheet. These tables include information about the data type, minimum data requirements for the California Environmental Data Exchange Network (CEDEN), size, and provides the appropriate CV RDC LookUp list if applicable for each column. This section is designed to provide users with an idea of what types of data are needed for entry into the CV RDC toxicity template. Table 1, 2 and 3 within Appendix A provide more detailed descriptions and business rules for each column in the template. Valid LookUp lists can be found online at the CV RDC data checker webpage (http://ftp.mpsl.mlml.calstate.edu/CVRDC_LookUpLists.php). For information on how to add new LookUp list values please visit http://mlj-llc.com/cvrdc_step2.html .

1.1. Toxicity Summary Worksheet

The following data elements populate the Summary worksheet of the toxicity data package.

TOX SUMMARY RESULTS TABLE STRUCTURE:

Table 1: Toxicity Summary template header definitions, cell requirements and LookUp list availability.

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.
StationCode*	Text	**Yes**	25	Station LookUp	A code representing the StationName and site and should be unique within a study design.
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.
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.
SampleDate*	Date/ Time	**Yes**			Refers to the date the sample was collected in the field. Formatted as dd/mmm/yyyy.
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.

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
CollectionMethod Code	Text	**Yes**	50	CollectionMethod LookUp	Refers to the general method of collection such as Sed_Grab, Sed_Core, Water_Grab, Autosampler24h, Autosampler7d.
SampleTypeCode*	Text	**Yes**	20	Sample Type LookUp	Refers to the type of sample collected or analyzed.
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.
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		Refers to the units used in the CollectionDepth including cm (centimeters) and m (meters).
ProjectCode	Text	**Yes**	25	Project LookUp	References the project that is associated with the sample.
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.
Collection Comments	Text	No	255		Comments related to the Collection
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
MatrixName*	Text	Yes	50	Matrix LookUp	Refers to the sample matrix, e.g. samplewater.
MethodName*	Text	Yes	50	Method LookUp	Refers to the analysis method used by the laboratory to analyze the sample.
TestDuration	Text	Yes	10	ToxTestDurLookUp	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.
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. This field is the primary key to ensure record uniqueness. 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 Tox Batch. See the CV RDC File and Batch Naming Convention for guidelines on assigning laboratory batch codes
ToxTestComments	Text	No	255		Holds any comments related to the toxicity test results.
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".

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
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”.
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".
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, Ammonia as NH3 are often expressed as total or unionized and therefore this description should be used within the fraction field.
WQSource	Text	Yes	50	Matrix LookUp	WQSource differentiates between water quality measurements taken in the overlying water or interstitialwater (pore water).
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.
UnitAnalyte*	Text	Yes	50	Unit LookUp	UnitAnalyte indicates the units used in the measurement of the AnalyteName.

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
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**			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.
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.
Probability	Decimal	**Yes**			Probability is the calculated probability using a standard statistical analysis between the replicates of the field samples and the control or reference sample within a ToxBatch. For negative control samples (CNEG) the probability is "0.5".
PercentControl	Decimal	**Yes**			Percent Control is the result of dividing the mean of the environmental sample by the mean of the control for the ToxBatch and multiplying by 100.
MSD	Integer	**Desired**			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%.

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
EvalThreshold	Decimal	**Desired**			The evaluation threshold or EvalThreshold is the associated level that is used to identify that an environmental sample is biologically significantly different from its associated control sample and is recorded in the same unit as the mean; e.g. 80 or in percent when evaluating against the percent control. In cases where programs use the MSD to evaluate the evaluation threshold, for percentage endpoints (e.g. survival, etc.) EvalThreshold = Mean of Control - MSD and is compared to the Mean of the sample. To calculate the EvalThreshold for non-percentage endpoints (e.g. growth, cell counts, etc.) EvalThreshold = Mean of Control*(100-MSD)/100 and is compared to the Mean of the sample. In cases where programs use the percent control to evaluate the evaluation threshold, EvalThreshold = Control % - MSD% and is compared to the percent control of the sample.
SigEffect	Text	**Yes**	10		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.
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.
SummaryComments	Text	**Desired**	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).

* Primary Key, required for record uniqueness.

1.2. Toxicity Results Worksheet

The following data elements populate the **Results** worksheet of the toxicity data package.

TOX RESULTS TABLE STRUCTURE:

Table 2: Toxicity Results template header definitions, cell requirements and LookUp list availability.

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.
StationCode*	Text	**Yes**	25	Station LookUp	A code representing the StationName and site and should be unique within a study design.
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.
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.
SampleDate*	Date/ Time	**Yes**			Refers to the date the sample was collected in the field. Formatted as dd/mmm/yyyy.
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.

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
CollectionMethod Code	Text	**Yes**	50	Collection Method LookUp	Refers to the general method of collection such as Sed_Grab, Sed_Core, Water_Grab, Autosampler24h, Autosampler7d.
SampleTypeCode*	Text	**Yes**	20	Sample Type LookUp	Refers to the type of sample collected or analyzed.
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.
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		Refers to the units used in the CollectionDepth including cm (centimeters) and m (meters).
ProjectCode	Text	**Yes**	25	Project LookUp	References the project that is associated with the sample.
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.
Collection Comments	Text	No	255		Comments related to the Collection
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
MatrixName*	Text	Yes	50	Matrix LookUp	Refers to the sample matrix, e.g. samplewater.
MethodName*	Text	Yes	50	Method LookUp	Refers to the analysis method used by the laboratory to analyze the sample.
TestDuration	Text	Yes	10	ToxTestDurLookUp	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.
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. This field is the primary key to ensure record uniqueness. 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 Tox Batch. See the CV RDC File and Batch Naming Convention for guidelines on assigning laboratory batch codes
ToxTestComments	Text	No	255		Holds any comments related to the toxicity test results.
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".

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
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”.
LabReplicate*	Integer	Yes			The LabReplicate identifies the individual splits of the toxicity sample and is used to identify from which replicate a result originated.
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".
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.
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.
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.
UnitAnalyte*	Text	Yes	50	Unit LookUp	UnitAnalyte indicates the units used in the measurement of the AnalyteName.

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
Result	Text	**Yes**	10		Numeric result of test, stored as text to retain trailing zeros.
ResultQualCode	Text	**Desired**	10	ResQual LookUp	The Result Qualifier Code or ResultQualCode qualifies the analytical result of the sample.
ToxResultQACode	Text	**Desired**	30	ToxResultQALookUp	A ToxResultQACode is used to further qualify the analytical result of the sample.
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.

* Primary Key, required for record uniqueness.

1.3. TOXBATCH WORKSHEET

The following data elements populate the ToxBatch worksheet of the toxicity data package.

TOXBATCH TABLE STRUCTURE:

Table 3: Toxicity ToxBatch template header definitions, cell requirements and LookUp list availability.

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. This field is the primary key to ensure record uniqueness. 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. See the CV RDC File and Batch Naming Convention for guidelines on assigning laboratory batch codes

TOXICITY TEMPLATE HEADER	DATA TYPE	REQUIRED	SIZE	LOOKUP LIST	DEFINITION
LabAgencyCode*	Text	**Desired**	20	Agency LookUp	LabAgencyCode refers to the organization, agency or laboratory that performed the analysis on the sample.
StartDate	Date/Time	**Yes**			StartDate refers to the date the toxicity test began.
RefToxBatch	Text	**Desired**	25		RefToxBatch lists the Reference Tox Batch ID run with this batch of samples.
OrganismSupplier	Text	No	75		OrganismSupplier refers to the agency that supplied the test organisms.
OrganismAgeAtTestSta	Text	**Desired**	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.
LabSubmissionCode	Text	**Desired**	10	Lab Submission Lookup	The LabSubmissionCode is a unique batch qualifier code assigned to the LabBatch as a whole by the analyzing laboratory which references the quality of the data in the LabBatch. 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.
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.
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.

* Primary Key, required for record uniqueness.

2. LABORATORY QA ENTRY

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

2.1. 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. Business rules are indicated by a "BR".

Table 4: Example Laboratory-Generated QA Sample (LABQA)

Toxicity Template Column Names	Value	Description & Business Rules
LabSampleID:		Recommended - provide lab specific identification for an analyzed sample
StationCode:	**LABQA**	
EventCode:	**WQ**	"WQ" for water and sediment chemistry and toxicity results
ProtocolCode:	**Not Applicable**	
LocationCode:	**Not Applicable**	
SampleDate:		Date test started, expressed as dd/mmm/yyyy
CollectionTime:	**0:00**	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 LabBlank is analyzed in the same batch on the same day 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.
CollectionMethodCode:	**Not Applicable**	
SampleTypeCode:		Select from SampleTypeLookUp List
Replicate:	**1**	

Toxicity Template Column Names	Value	Description & Business Rules
CollectionDepth:	**-88**	
UnitCollectionDepth:		"m" for water, "cm" for sediment
ProjectCode:	**Not Applicable**	
AgencyCode:		Organization or agency that analyzed the sample
LabReplicate	**1**	2 for laboratory duplicates
Matrix:		Water samples – "labwater" (laboratory tap water) or "blankwater" (laboratory Type II water) Sediment samples – "blankmatrix" (commercially generated product) or "sediment" (if laboratory is using solvent, water or nothing)

3. DATA CHECKER

When the toxicity data template is complete, please utilize the online data checker to verify entry against current CV RDC LookUp lists, business rules and formatting. The data checker can be found at: http://checker.cv.mpsl.mlml.calstate.edu/CVRDC/CVRDCUpload.php. Directions on how to use this tool are described below in five easy steps:

1. Choose “toxicity” for the data category.
2. Enter your Name, Email Address and select your Agency.
3. Browse for your file.
4. Uncheck "Check for existing samples" if your programs field measurement data is not already within the CV RDC database.
5. Click "Check Excel File".

Please be patient while the Data Checker processes your data. The Data Checker will then provide a report through the website and to the given email address with the errors found within the data template. Files may be checked more than once to ensure errors have been corrected successfully.

Once the toxicity template has been verified through the data checker and all applicable errors have been addressed projects can submit their data to the CV RDC. (Please note that the data checker is used as a tool to help catch errors and some errors might not be applicable to your program/project. If this happens please note that you can still submit your data to the CV RCD and the errors can be addressed if needed.)

For more information on the data checker and submitting data to the CV RDC see online at http://mlj-llc.com/cv_rdc.html.

4. Batch Verification Codes and Compliance Codes

The following codes are applied by the CV RDC while transferring the programs submitted data into the CV RDC database.

4.1. Batch Verification Codes

The BatchVerificationCode indicates the level of verification/validation performed on the data within the batch. This code should be consistent within a project. Before transferring a project's data, the CV RDC will verify which batch verification code the program wants to apply. See current CV RDC LookUp lists for current batch verification codes.

4.2. Compliance Codes

The CV RDC will use "Not Recorded" for all laboratory results compliance codes. Habitat and field results will have a compliance code of "Not Applicable".

5. REFERENCES

Surface Water Ambient Monitoring Program, 2009. SWAMP Data Management Plan: Toxicity Template. April 15, 2009 < http://swamp.mpsl.mlml.calstate.edu/wp-content/uploads/2009/04/swamp_data_management-plan_toxicity_template_041509.pdf >

APPENDIX A: WATER QUALITY TOXICITY DATA DESCRIPTIONS & BUSINESS RULES

APPENDIX A TABLES

1.1. TOX RESULTS WORKSHEET

Valid LookUp lists can be found online at the CV RDC data checker webpage (http://ftp.mpsl.mlml.calstate.edu/CVRDC_LookUpLists.php).

Business rules are indicated by a bullet point **(•)**; if the business rule is specific to the CV RDC and differs from the MLML SWAMP business rule then this is indicated by "BR(CV RDC)".

(*Note that the fields through Dilution are identical to those in the summary worksheet*)

Table 1. Toxicity Results Worksheet

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
LabSampleID		**The LabSampleID is a recommended field intended to provide lab specific identification for an analyzed sample.** • The format and content is determined by the lab. It is preferable to add -Dup, -MS, -MSD to the end of the ID to help confirm the SampleType and the LabSampleID of the native sample.
StationCode	StationLookUp	**StationCode represents a unique sampling site in a sampling design. A single waterbody may have multiple stations.** • The format for the unique alphanumeric description of the station is ###ABC123, where ### is the Hydrologic Unit number and ABC123 is an alphanumeric description of the Station. An example is 111EELBRN which is Hydrologic Unit 111 and an abbreviated code to indicate "Eel River - South Fork near Branscomb". • Use "LABQA" for samples created in

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		the lab for QA/QC (e.g., LC, CRM, LabBlank). See Laboratory QA section for details. • Use "FIELDQA" for non-station specific field generated QA such as travel blanks. See Field Generated QA samples section.
EventCode	EventLookUp	**EventCode represents the initial intent of the sampling event at a particular station.** • The EventCode will be in a hierarchical order as follows: "BA" – If the initial intent of sampling is for Bioassessment (Tissue and/or WaterQuality samples may or may not also be collected) "TI" – If the initial intent of sampling is for Tissue (WaterQuality samples may or may not also be collected; no associated Bioassessment samples collected) "WQ" – If the initial intent of sampling is for WaterQuality (no associated Bioassessment or Tissue samples collected)

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		*For example, if the initial intent of sampling on Day 1 was for Tissue and WaterQuality, the EventCode would be TI. If for some reason the WaterQuality had to be re-sampled the next day, on Day 2, the event for the re-sampling would still be TI because Tissue was the initial intent of sampling on Day 1 even though the WaterQuality was sampled on Day 2.
ProtocolCode	ProtocolLookUp	**ProtocolCode 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.** • It is preferable to combine protocols per StationCode and date so that all WaterQuality, Bioassessment and Tissue data are combined under the same EventCode. For example, if Tissue and WaterQuality are sampled at a station, the EventCode would be "TI". If the protocols are different for Tissue and WaterQuality, the Tissue protocol would be used and the WaterQuality protocol would be listed in the SampleComments. If that is not preferable, separate EventCodes may be used with each individual protocol. • Use "Not Recorded" for samples with unknown sampling protocols.
LocationCode	LocationLookUp	**LocationCode describes the physical location in the waterbody where the sample was collected. One sampling**

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		event may have a single or multiple locations. • For a single point of sampling, the physical location in the waterbody can be used such as, “Bank”, “Thalweg”, “Midchannel”, “OpenWater” , etc. • The LocationCode for field results should be the same as the location for the WaterQuality collection method. • For TI EventType sampling, the physical location plus the CollectionMethod is used such as, “BankNet1”, “BankShock1”, “OpenWaterTrawl1”, “OpenWaterNet1”, etc. For resident mussel or clam collections, the LocationCode would be the physical location in the water body plus the generic CollectionMethod, e.g., “BankTissue_Grab”. • OpenWater sampling with multiple sub-locations within a single water body or station could have locations of “OpenWaterTrawl1”, “OpenWaterTrawl2” describing one large location with two smaller areas of sampling within the OpenWater Location. • Multiple physical locations within a single station could consist of a LocationCode such as “BankShock1”, “BankNet1”, “OpenWaterHook1”, etc.

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		• If recording specific locations within a station is necessary for the project, a LocationCode such as "Location1Net1", "Location1Net2", or "Location2Shock1" may be used.
SampleDate		**SampleDate refers to the date the sample was collected in the field.** • The format for date in the templates is dd/mmm/yyyy, such as 10/Nov/2007. For samples with collection times that last longer than one day (for instance, when using an autosampler), the sample date is the date the last sample was collected. • When entering data using the forms (instead of the template), the format is mm/dd/yy. • For transplanted bivalves, the SampleDate is the date when the bivalves were deployed in the field.
CollectionTime		**CollectionTime refers to the time when the first sample of a sampling event at a specific station was collected in the field.** • If the sampling crew collects 18 bottles at a single station, the CollectionTime for each would be the time of the first bottle collected. By doing so, the samples can easily be linked and any holding time issues will be consistent, and conservative, for the laboratory work.

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		• The CollectionTime format should be expressed as hh:mm in 24 hour time, such as “13:30” for 1:30 pm.
CollectionMethodCode	CollectionMethodLookUp	**CollectionMethodCode refers to the general method of collection such as “Sed_Grab”, “Sed_Core”, “Water_Grab”, “Autosampler24h”, “Autosampler7d”, etc.** • The CV RDC water default is “Water_Grab” and the sediment default is “Sed_Grab”.
SampleTypeCode	SampleTypeLookUp	**SampleTypeCode refers to the type of sample collected or analyzed.** * Some commonly used SampleTypeCode choices include “Grab”, “Integrated”, “CRM”, “LabBlank”, and “CNEG”.
Replicate		**The Replicate number is used to distinguish between replicates created at a single collection in the field.** • The default is “1”. Field Duplicates will be identified by a Replicate of “2”. Field Blind Duplicates will be identified with a different SampleTypeCode of FieldBLDup, not a collection Replicate, because they are collected blind. Laboratory replicates will be identified by a replicate of “2” in the LabReplicate field, not a collection Replicate.
CollectionDepth		**CollectionDepth records the level, from the surface in the water or sediment column, at which the**

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		sample was collected. • CollectionDepth for water samples would be measured from the water surface and recorded in meters, "m", while depth collected for sediment would be measured from the sediment surface and recorded in centimeters, "cm". • Since depths for ambient monitoring Grab samples are generally "subsurface", defaults have been established to indicate this. For water samples the default value is 0.1 m and for sediment samples the default value is 2 cm. • For Integrated samples collected from the same depth at different points across a waterbody or for samples collected at multiple times, i.e. an autosampler, the actual sample depth should be recorded. This applies to both water and sediment samples. Integrated samples collected at multiple depths, i.e. samples integrated from the water column or sediment cores, should receive a depth of "-88" and the actual depths of collection should be recorded in the CollectionComments field.
UnitCollectionDepth	VariableCodesLookUp	**UnitCollectionDepth refers to the**

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		units used in the CollectionDepth including cm (centimeters) and m (meters).
ProjectCode	ProjectLookUp	**ProjectCode references the project that is associated with the sample.**
AgencyCode	AgencyLookUp	**AgencyCode refers to the organization or agency that collected the sample.**
CollectionComments (Not Required)		**CollectionComments records any comments relating to the collection of the field sample for laboratory analysis.**
SampleID (Not Required)		**SampleID is a 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.** • This ID, which is different from the StationCode, will likely be on the sample container the laboratory receives from the field crew or on the Chain-of-Custody. If there is no number, leave this field blank.
MatrixName	MatrixLookUp	**MatrixName refers to the sample matrix.**

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		• Water - For field-generated water samples, the MatrixName is samplewater. For lab-generated QC samples, the matrix should be the type of water that was used for the analysis of the sample, either labwater or blankwater. Labwater is water coming either directly from the tap in the laboratory or purchased spring water. • Sediment - For field-generated sediment samples, the MatrixName is sediment. For lab-generated QC samples, blankmatrix could be used as the MatrixName which is a matrix used to identify a commercial- or lab-produced medium in tissue or sediment QC samples. If this is not the case then the MatrixName for lab-generated QC samples would be sediment which would include samples where water, solvent or nothing was used as a matrix.
MethodName	MethodLookUp	**MethodName refers to the analysis method used by the laboratory to analyze the sample.**

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		• Methods are expressed with a MethodName such as EPA 600/R-99-064 and must be fully described in the Method Lookup list and in the laboratory records. If a laboratory has modified an EPA or Standard Method, the laboratory agency needs to add "M" to end of the MethodName. In such situations, the modification should be documented and communicated to the CV RDC for notation in the database. For instance, a lab would report a modified EPA 600/R-99-064 as EPA 600/R-99-064M accompanied by a description of the modification made. • Any method not in the current CV RDC database lookup list must be approved by the CV RDC prior to being added to the database.
TestDuration	ToxTestDurLookUp	**ToxTestDurCode indicates the duration of the toxicity test as a number and includes the associated units.** • Some methods allow for a test to be completed early if all the necessary data has been obtained. If this is the case, the ToxTestDurCode is recorded as the duration of the test initially indicated by the method. For example, a method indicates a 7 day test is to be performed but the laboratory ends the test one day early. The ToxTestDurCode would be "7 days", not 6 days.
OrganismName	OrganismLookup	**OrganismName refers to the scientific name of the species used in**

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		the toxicity test.
ToxBatch		**The ToxBatch is assigned by the laboratory and groups all environmental samples and supporting QA samples within a unique analysis batch. It is used to compare field samples with their associated NegativeControls for statistical analysis and will be used to verify completeness based on the projects QAPP.** • The ToxBatch should be listed only one time in the ToxBatch worksheet for each unique ToxBatch found in the Results and Summary worksheets. Follow the File and Batch Name Convention to correctly identify the batch. It is recommended to include the start date and an abbreviation of the OrganismName in the lab-specific portion of the ToxBatch.
ToxTestComments **(Not Required)**		**Use the ToxTestComments field to note any comments necessary to describe special circumstances for the toxicity test for the specific record.**
Treatment	AnalyteLookUp	**Treatment refers to any treatment performed on the sample, such as a pH adjustment.** • The default value is "None".
Concentration		**Concentration refers to the adjusted final concentration or value of the analyte applied to the toxicity sample, expressed as a number.**

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		• The default value is "0". Or the adjusted concentration level of the analyte e.g., pH or temp adjustment to 7 or 15 degrees
UnitTreatment	UnitLookUp	**UnitTreatment refers to the units used in the treatment.** • If a Treatment did not occur, the default value is "none".
Dilution		**Dilution is recorded as a proportion of the original sample.** * A sample with 80% sample and 20% blankwater has a Dilution Value of "80". • If no dilution is performed, the default value of "100" is used.
LabReplicate		**The LabReplicate identifies the individual splits of the toxicity sample and is used to identify from which replicate a result originated.** • For toxicity replicates, the default is "1" and increases by one for each successive replicate. • If a water quality measurement record is associated with a single replicate, it should have the same value as the replicate it measures. • If the water quality measurements are taken at the sample level, the LabReplicate should be recorded as replicate "0".
ToxPointMethod	MethodLookUp	**ToxPointMethod refers to the general method used in obtaining or**

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		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	AnalyteLookUp	**AnalyteName refers to the parameter being measured.** * Toxicity examples include "Survival", "Young/female", "Biomass" (weight/orig indiv). Water quality measurement examples include "pH", "Ammonia as NH3", "Salinity". • The recommendation is "Biomass" be calculated for all fish species (total weight of surviving individuals divided by the original number of organisms at the start of the test) and "Growth" be calculated for *Hyalella* growth weight (total weight of surviving individuals divided by the number of survivors at the end of the test). Toxicity endpoints in the database will change to represent this correction; the endpoints for all fish species will be expressed as biomass instead of growth weight.

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		• It is the recommendation of the panel that we do not go back and recalculate results in the database where growth was calculated instead of biomass. All previous measurements would be listed as growth or biomass according to analysis performed by the analyzing laboratory.
FractionName	FractionLookUp	**FractionName is a specific descriptor of the Analyte.** • Ammonia as NH3 is expressed as "Total" or "Unionized", each of which would be expressed as the Fraction, distinguishing the appropriate Analyte.
WQSource	MatrixLookUp	**WQSource differentiates between water quality measurements taken in the overlying water as well as in the sediment or interstitialwater.** • "Overlyingwater" is used for the overlying water measurement which is the default for all water quality measurements.
TimePoint	TimePointLookUp	**TimePoint refers to the point in time during the test at which the measurement was recorded for water quality measurements.** • If complete mortality occurs, causing the test to end earlier than the TestDuration, record the TimePoint as the same length as the TestDuration and include a ToxResultsComment.

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		* If complete mortality occurs on day 2 of a 4 day TestDuration, then record the TimePoint as “Day 4” and add ToxResultsComment of, “Complete mortality occurred on day 2.”
UnitAnalyte	UnitLookUp	**UnitAnalyte indicates the units used in the measurement of the AnalyteName.**
Result		**Numeric result of test, stored as text to retain trailing zeros.** • The toxicity Result is expressed as a real number rather than a calculation. The result should be reported with the appropriate number of significant figures. * A result of 3.7266945 with 3 significant figures should be reported as “3.73”. * A result of 1.350 with 4 significant figures must display “1.350” in the Excel file. If you only see 1.35, that is the result that will be loaded to the database and the 4th significant figure will be dropped.
ResultQualCode (Not Required)	ResQualLookUp	**The Result Qualifier Code or ResultQualCode qualifies the analytical result of the sample.**

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		• This field may be left blank for results that are considered detected. The database will be populated with an equal sign, "=", when the data are loaded. • *When the result is Not Detected a ResultQualCode of = is utilized with a result of 0.* • When the result is "-88" (null value), a ResultQualCode is required. If the ResultQualCode value is "NR" for Not Recorded or "NS" for No Survival, then a reason for this code must be written into the ToxResultComments field.
ToxResultQACode (Not Required)	ToxResultQALookUp	**A ToxResultQACode is used to further qualify the analytical result of the sample.** • When a test has a secondary toxpoint where young are measured and the first toxpoint is a Male instead of a female, the ToxResultQACode for the second toxpoint is "MAL" for male.
ToxResultComments (Not Required)		**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.** • When the ResultQualCode value is "NR" for Not Recorded or "NS" for No Survival, then a reason for this code must be written into the ToxResultsComments field.

1.2. TOXICITY SUMMARY WORKSHEET

The second worksheet to travel with the data holds information specific to toxicity summary data. This worksheet should be named **Summary** in its worksheet tab. The fields in this sheet should be completed as follows. Examples of special types of samples are listed in the Special Circumstances section.

(*Note that the fields through Dilution are identical to those in the Results Worksheet*)

Table 2. Toxicity Summary Worksheet

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
LabSampleID		**The LabSampleID is a recommended field intended to provide lab specific identification for an analyzed sample.** • The format and content is determined by the lab. It is preferable to add -Dup, -MS, -MSD to the end of the ID to help confirm the SampleType and the LabSampleID of the native sample.
StationCode	StationLookUp	**StationCode represents a unique sampling site in a sampling design. A single waterbody may have multiple stations.** • The format for the unique alphanumeric description of the station is ###ABC123, where ### is the Hydrologic Unit number and ABC123 is an alphanumeric description of the Station. An example is 111EELBRN which is Hydrologic Unit 111 and an abbreviated code to indicate “Eel River - South Fork near Branscomb”. • Use “LABQA” for samples created in the lab for QA/QC (e.g., LC, CRM, LabBlank). See Laboratory QA section for details.

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		• Use "FIELDQA" for non-station specific field generated QA such as travel blanks. See Field Generated QA samples section.
EventCode	EventLookUp	**EventCode represents the initial intent of the sampling event at a particular station.** • The EventCode will be in a hierarchical order as follows: "BA" – If the initial intent of sampling is for Bioassessment (Tissue and/or WaterQuality samples may or may not also be collected) "TI" – If the initial intent of sampling is for Tissue (WaterQuality samples may or may not also be collected; no associated Bioassessment samples collected) "WQ" – If the initial intent of sampling is for WaterQuality (no associated Bioassessment or Tissue samples collected) *For example, if the initial intent of sampling on Day 1 was for Tissue and WaterQuality, the EventCode would be "TI". If for some reason the WaterQuality had to be re-sampled the next day, on Day 2, the event for the re-sampling would still be "TI" because Tissue was the initial intent of sampling on Day 1 even though the WaterQuality

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		was sampled on Day 2.
ProtocolCode	ProtocolLookUp	**ProtocolCode 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.** • It is preferable to combine protocols per StationCode and date so that all WaterQuality, Bioassessment and Tissue data are combined under the same EventCode. For example, if Tissue and WaterQuality are sampled at a station, the EventCode would be "TI". If the protocols are different for Tissue and WaterQuality, the Tissue protocol would be used and the WaterQuality protocol would be listed in the SampleComments. If that is not preferable, separate EventCodes may be used with each individual protocol. • Use "Not Recorded" for samples with unknown sampling protocols.
LocationCode	LocationLookUp	**LocationCode describes the physical location in the waterbody where the sample was collected. One sampling event may have a single or multiple locations.**

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		• For a single point of sampling, the physical location in the waterbody can be used such as, “Bank”, “Thalweg”, “Midchannel”, “OpenWater” , etc. • The LocationCode for field results should be the same as the location for the WaterQuality collection method. • For TI EventType sampling, the physical location plus the CollectionMethod is used such as, “BankNet1”, “BankShock1”, “OpenWaterTrawl1”, “OpenWaterNet1”, etc. For resident mussel or clam collections, the LocationCode would be the physical location in the water body plus the generic CollectionMethod, e.g., “BankTissue_Grab”. • OpenWater sampling with multiple sub-locations within a single water body or station could have locations of “OpenWaterTrawl1”, “OpenWaterTrawl2” describing one large location with two smaller areas of sampling within the OpenWater Location. • Multiple physical locations within a single station could consist of a LocationCode such as “BankShock1”, “BankNet1”, “OpenWaterHook1”, etc.

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		• If recording specific locations within a station is necessary for the project, a LocationCode such as "Location1Net1", "Location1Net2", or "Location2Shock1" may be used.
SampleDate		**SampleDate refers to the date the sample was collected in the field.** • The format for date in the templates is dd/mmm/yyyy, such as 10/Nov/2007. For samples with collection times that last longer than one day, (for instance, when using an autosampler), the sample date is the date the last sample was collected. • When entering data using the forms, the format is mm/dd/yy. • For transplanted bivalves, the SampleDate is the date when the bivalves were deployed in the field.
CollectionTime		**CollectionTime refers to the time when the first sample of a sampling event at a specific station was collected in the field.** • If the sampling crew collects 18 bottles at a single station, the CollectionTime for each would be the time of the first bottle collected. By doing so, the samples can easily be linked and any holding time issues will be consistent, and conservative, for the laboratory work.

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		• The CollectionTime format should be expressed as hh:mm in 24 hour time, such as “13:30” for 1:30 pm.
CollectionMethodCode	CollectionMethodLookUp	**CollectionMethodCode refers to the general method of collection such as “Sed_Grab”, “Sed_Core”, “Water_Grab”, “Autosampler24h”, “Autosampler7d”, etc.** • The CV RDC water default is “Water_Grab” and the sediment default is “Sed_Grab”.
SampleTypeCode	SampleTypeLookUp	**SampleTypeCode refers to the type of sample collected or analyzed.** * Some commonly used SampleTypeCode choices include “Grab”, “Integrated”, “CRM”, “LabBlank”, or “CNEG”.
Replicate		**The Replicate number is used to distinguish between replicates created at a single collection in the field** • The default is “1”. Field Duplicates will be identified by a Replicate of “2”. Field Blind Duplicates will be identified with a different SampleTypeCode of FieldBLDup, not a collection Replicate, because they are collected blind. Laboratory replicates will be identified by a replicate of “2” in the LabReplicate field, not a collection Replicate.
CollectionDepth		**CollectionDepth records the level, from the surface in the water or sediment column, at which the sample was collected.**

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		• CollectionDepth for water samples would be measured from the water surface and recorded in meters, "m", while depth collected for sediment would be measured from the sediment surface and recorded in centimeters, "cm". • Since depths for ambient monitoring Grab samples are generally "subsurface", defaults have been established to indicate this. For water samples the default value is 0.1 m and for sediment samples the default value is 2 cm. • For Integrated samples collected from the same depth at different points across a waterbody or for samples collected at multiple times, i.e. an autosampler, the actual sample depth should be recorded. This applies to both water and sediment samples. Integrated samples collected at multiple depths, i.e. samples integrated from the water column or sediment cores, should receive a depth of "-88" and the actual depths of collection should be recorded in the CollectionComments field.
UnitCollectionDepth	VariableCodesLookUp	**UnitCollectionDepth refers to the units used in the CollectionDepth including cm (centimeters) and m (meters).**
ProjectCode	ProjectLookUp	**ProjectCode references the project that is associated with the sample.**

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
AgencyCode	AgencyLookUp	**AgencyCode refers to the organization or agency that collected the sample.**
CollectionComments (Not Required)		**CollectionComments records any comments relating to the collection of the field sample for laboratory analysis.**
SampleID (Not Required)		**SampleID is a 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.** • This ID, which is different from the StationCode, will likely be on the sample container the laboratory receives from the field crew or on the Chain-of-Custody. If there is no number, leave this field blank.
MatrixName	MatrixLookUp	**MatrixName refers to the sample matrix.** • Water - For field-generated water samples, the MatrixName is "samplewater". For lab-generated QC samples, the matrix should be the type of water that was used for the analysis of the sample, either "labwater" or "blankwater". Labwater is water coming either directly from the tap in the laboratory or purchased spring water.

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		• Sediment - For field-generated sediment samples, the MatrixName is "sediment". For lab-generated QC samples, "blankmatrix" could be used as the MatrixName which is a matrix used to identify a commercial- or lab-produced medium in tissue or sediment QC samples. If this is not the case then the MatrixName for lab-generated QC samples would be sediment which would include samples where water, solvent or nothing was used as a matrix.
MethodName	MethodLookUp	**MethodName refers to the analysis method used by the laboratory to analyze the sample.** • Methods are expressed with a MethodName such as "EPA 600/R-99-064" and must be fully described in the Method Lookup list and in the laboratory records. If a laboratory has modified an EPA or Standard Method, the laboratory agency needs to add "M" to end of the MethodName. In such situations, the modification should be documented and communicated to the CV RDC for notation in the database. * For instance, a lab would report a modified EPA 600/R-99-064 as EPA 600/R-99-064M accompanied by a description of the modification made. • Any method not in the current CV RDC database lookup list must be approved by the CV RDC prior to being added to the database.
TestDuration	ToxTestDurLookUp	**ToxTestDurCode indicates the duration of the toxicity test as a number and**

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		includes the associated units. • Some methods allow for a test to be completed early if all the necessary data has been obtained. If this is the case, the ToxTestDurCode is recorded as the duration of the test initially indicated by the method. For example, a method indicates a 7 day test is to be performed but the laboratory ends the test one day early. The ToxTestDurCode would be "7 days", not 6 days.
OrganismName	OrganismLookup	**OrganismName refers to the scientific name of the species used in the toxicity test.**
ToxBatch		**The ToxBatch is assigned by the laboratory and groups all environmental samples and supporting QA samples within a unique analysis batch. It is used to compare field samples with their associated NegativeControls for statistical analysis and will be used to verify completeness based on the projects QAPP.** • The ToxBatch should be listed only one time in the ToxBatch worksheet for each unique ToxBatch found in the Results and Summary worksheets. • Follow the File and Batch Name Convention to correctly identify the batch. It is recommended to include the start date and an abbreviation of the OrganismName in the lab-specific portion of the ToxBatch.

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
ToxTestComments (Not Required)		**Use the ToxTestComments field to note any comments necessary to describe special circumstances for the toxicity test for the specific record.**
Treatment	AnalyteLookUp	**Treatment refers to any treatment performed on the sample, such as a pH adjustment.** • The default value is "None".
Concentration		**Concentration refers to the adjusted final concentration or value of the analyte applied to the toxicity sample, expressed as a number.** • The default value is "0". Or the adjusted concentration level of the analyte e.g., pH or temp adjustment to 7 or 15 degrees
UnitTreatment	UnitLookUp	**UnitTreatment refers to the units used in the treatment.** • If a Treatment did not occur, the default value is "none".
Dilution		**Dilution is recorded as a proportion of the original sample.** * A sample with 80% sample and 20% blankwater has a Dilution Value of "80". • If no dilution is performed, the default value of "100" is used.
ToxPointMethod	MethodLookUp	**ToxPointMethod refers to the general method used in obtaining or calculating the result.**

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		• 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	AnalyteLookUp	**AnalyteName refers to the parameter being measured.** • The recommendation is "Biomass" be calculated for all fish species (total weight of surviving individuals divided by the original number of organisms at the start of the test) and "Growth" be calculated for *Hyalella* growth weight (total weight of surviving individuals divided by the number of survivors at the end of the test). Toxicity endpoints in the database will change to represent this correction; the endpoints for all fish species will be expressed as biomass instead of growth weight. • It is the recommendation of the panel that we do not go back and recalculate results in the database where growth was calculated instead of biomass. All previous measurements would be listed as growth or biomass according to analysis performed by the analyzing laboratory.

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		* Toxicity examples include “Survival”, “Young/female”, “Biomass” (weight/orig indiv). Water quality measurement examples include “pH”, “Ammonia as NH3”, “Salinity”.
FractionName	FractionLookUp	**FractionName is a specific descriptor of the Analyte.** • Ammonia as NH3 is expressed as “Total” or “Unionized”, each of which would be expressed as the Fraction, distinguishing the appropriate Analyte.
WQSource	MatrixLookUp	**WQSource differentiates between water quality measurements taken in the overlying water as well as in the sediment or interstitialwater.** • “Overlyingwater” is used for the overlying water measurement which is the default for all water quality measurements.
TimePoint	TimePointLookUp	**TimePoint refers to the point in time during the test at which the measurement was recorded for water quality measurements.** • If complete mortality occurs, causing the test to end earlier than the TestDuration, record the TimePoint as the same length as the TestDuration and include a ToxResultsComment. * If complete mortality occurs on day 2 of a 4 day TestDuration, then record the

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		TimePoint as “Day 4” and add ToxResultsComment of, “Complete mortality in less than 2 days.”
UnitAnalyte	UnitLookUp	**UnitAnalyte indicates the units used in the measurement of the AnalyteName.**
RepCount		**RepCount is the total number of sample replicates analyzed for the associated toxpoint in the toxicity test.** • There are a few circumstances where a replicate should not be counted or used in the calculations. For all tests, if a replicate was spilled before a result could be recorded, then the RepCount would decrease by one replicate. For all tests, but primarily *Ceriodaphnia dubia*, if the first toxpoint had a single individual and it was a male, the second toxpoint of Young/female would not be possible so the RepCount for the second toxpoint would decrease by one. For *Hyalella* only, if the first toxpoint had a Survival of 0, the second toxpoint of Growth (weight/surv indiv) would not be included in the calculations so the RepCount would decrease by one replicate.
Mean		**Mean is the average result calculated from all replicates of a single sample.**
StdDev		**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.**

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
StatisticalMethod	VariableCodesLookUp	**StatisticalMethod is the statistical test or method used to calculate the probability of whether a test is significant or not. Essentially, whether the sample replicates are significantly different from the control.**
AlphaValue		**AlphaValue is the predetermined statistical acceptance level that is not calculated, but is chosen by the laboratory.** • The default value for CV RDC is "0.05".
Probability		**Probability is the calculated probability using a standard statistical analysis between the replicates of the field samples and the control or reference sample within a ToxBatch.** • For negative control samples (CNEG) the probability is "0.5".
MSD		**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%.** • A threshold is generated for each batch of samples associated with a single control. The sample response will be evaluated by a statistical comparison to the control response, and then comparing it to the generated threshold. This provides a two-tier

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		system for designating a sample as toxic.
PercentControl		**Percent Control is the result of dividing the mean of the environmental sample by the mean of the control for the *ToxBatch* and multiplying by 100.** • Control samples should be reported as "100" for the corresponding endpoint.
EvalThreshold		**The evaluation threshold or EvalThreshold is the associated level that is used to identify that an environmental sample is biologically significantly different from its associated control sample and is recorded in the same unit as the mean; e.g. 80 or in percent when evaluating against the percent control.** •In cases where programs use the MSD to evaluate the evaluation threshold, for percentage endpoints (e.g. survival, etc.) EvalThreshold = Mean of Control - MSD and is compared to the Mean of the sample. To calculate the EvalThreshold for non-percentage endpoints (e.g. growth, cell counts, etc.) EvalThreshold = Mean of Control*(100-MSD)/100 and is compared to the Mean of the sample. •In cases where programs use the percent control to evaluate the evaluation threshold, EvalThreshold = Control % - MSD% and is compared to the percent control of the sample.

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		• Control sample should be reported as "80" for the corresponding endpoint. Unless supplied, the default EvalThreshold will be "80".
SigEffect	SigEffectLookUp	**The toxicity significant effect code or SigEffect indicates whether the sample result is significantly different from the control.** • The code is based on two criteria used to determine significance. The first or first two letters of the code refers to the significance compared to the negative control, which is determined whether it is above or below the alpha value of 0.05. The last letter of the code refers to the whether the %control is above or below the evaluation threshold. * For example, "NSG", is not significant compared to negative control based on statistical test, it was below the alpha of 5%, and above the evaluation threshold. • For labs submitting only one criterion to determine significance, the CV RDC will apply the last letter of the code based on an EvalThreshold of 80 unless the lab provides an alternate EvalThreshold value. The SigEffectCode will receive an "NA" code in this instance. • Sediment and water samples must be compared to the negative control sample. Reference sediment or salinity controls may be reported in the database for informational purposes.

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
		• While the ToxSigEffectCode will always reflect a combination of the probability and evaluation threshold, best professional judgment of the lab can be reflected in the sample comment.
TestQACode	QALookUp	**TestQACode is applied to each sample's toxpoint and water quality measurements 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 should be applied to a record, then the convention is to list them in alphabetical order separated by commas and no spaces; e.g., "BY,TW".
SummaryComments (Not Required)		**In the SummaryComments field note any comments necessary to describe special circumstances for the toxicity summary data for the specific record.**

1.3. TOXBATCH WORKSHEET

The third worksheet to travel with the data holds information specific to the laboratory batch in which data is analyzed. This worksheet tab should be named **ToxBatch** (with no spaces). The fields in this sheet should be completed as follows:

Table 3. ToxBatch Worksheet

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
ToxBatch		**The ToxBatch is assigned by the laboratory and groups all environmental samples and supporting QA samples within a unique analysis batch. It is used to compare field samples with their associated NegativeControls for statistical analysis and will be used to verify completeness based on the projects QAPP.** • The ToxBatch should be listed only one time in the ToxBatch worksheet for each unique ToxBatch found in the Results and Summary worksheets. • Follow the File and Batch Name Convention to correctly identify the batch. It is recommended to include the start date and an abbreviation of the OrganismName in the lab-specific portion of the ToxBatch.
LabAgencyCode	AgencyLookUp	**AgencyCode refers to the organization, agency or laboratory that performed the analysis of the sample.**
StartDate		**StartDate refers to the date the test began.**
RefToxBatch		**RefToxBatch lists the Reference Tox Batch ID run with this batch of samples.**
OrganismSupplier (Not Required)		**OrganismSupplier refers to the agency that supplied the test organisms.**

Template Field Name	LookUp List	Description & Business Rules Description in bold, business rules are noted with (•), and examples are noted with (*), CV RDC specific business rules are italicized
OrganismAgeAtTestStart (Not Required)		**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.**
LabSubmissionCode	LabSubmissionLookUp	**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.** • If the LabSubmissionCode of "A" is used, meaning Acceptable,then the laboratory is ensuring that all protocols were met for the toxicity batch. If anything other than A is used, then a ToxBatchComment is required.
SubmittingAgencyCode	AgencyLookUp	**SubmittingAgencyCode is the organization or agency that is responsible for submission of the data to the database. This agency may be different from LabAgencyCode if the analytical data were subcontracted to another agency.**
ToxBatchComments (Not Required)		**The ToxBatchComments field is intended to record any comments relating to the ToxBatch as a whole.** • If the LabSubmissionCode is anything other than A, then a ToxBatchComment is required