Tissue Template Guide

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Introduction

This manual provides an overview of the Microsoft Excel-based data templates used to record tissue composite data and analytical results for the Surface Water Ambient Monitoring Program (SWAMP) at the State Water Resources Control Board (State Water Board). This and other SWAMP data templates can be downloaded from the [SWAMP Wiki](#).

This manual briefly explains the data gathering process, the various fields to be filled out in the template, an overview of the data submittal process, and contact information.

Chain of Custody Form

The [Chain of Custody (COC) form](#) travels with the samples from the field to the lab. In addition to confirming laboratory receipt, COC forms are utilized by contract management staff to assist with budget tracking and invoice approvals. COC forms contain laboratory and project staff contact information, as well as sample information, and an Analysis Authorization (AA) form. An AA form is an optional tab structured similarly to that of [SWAMP's Chemistry Results Template](#) that offers laboratories the option of providing additional details about the analytical methods to be used for a given project.

Quality Assurance

The information in this guide should be used in conjunction with the [SWAMP Quality Assurance Program Plan](#) for complete compliance with the SWAMP program, including [Measurement Quality Objectives (MQO)](#) and required Quality Control (QC) samples.

Look-up Values

Select fields in SWAMP data templates require the use of specific words or phrases known as "Look-up Values." The appropriate Look-up list for each of these fields is identified and hyperlinked in the following tables. The complete list of Look-up Values can be found on the [SWAMP Data Checker website](#), which is discussed on page 33.

Please contact SWAMP IQ, via the [Office of Information Management and Analysis (OIMA) Helpdesk](#), if new Look-up Values need to be created for a project.

Tissue Templates

Tissue data must be submitted to SWAMP IQ in two separate spreadsheets: the "Composite" template and the "Results" template.

The Tissue Composite Template is used to record data pertaining to sample collection, organism size, and tissue composites. There is an additional tab for larger "super composites" as well.

The Tissue Results Template is used to record the results of the laboratory analyses conducted on the composites.

The Tissue Bycatch & End Time template is optional and used for recording the non-targeted species caught during sampling and the time when collection efforts end.

The following tables provide business rules and suggestions for completing these three templates. The complete data submittal process is explained on page 33.

Tissue Composite Template

The fields in Tissue Composite Template should be completed as follows:

Template Field Name	Responsibility	Look-up List	Description	Business Rules
EventCode	Field Crew	Event LookUp	"EventCode" represents the primary focus of the sampling event at a particular station. For example, a tissue study that incorporates supplemental water chemistry measurements would receive an Event Code of "TI."	BA – If the primary focus of sampling is for a bioassessment project (e.g. benthic macro invertebrates, algae) TI – If the primary focus of sampling is for a tissue project (e.g. fish, bivalves) WQ – If the primary focus of sampling is for a water quality project (e.g. chemistry, toxicity)
ProtocolCode	Field Crew	Protocol LookUp	"ProtocolCode" represents the sampling protocol used, which includes the set of methods, methodology, and/or specifications.	Separate EventCodes may be used with each individual protocol. "Not Recorded" is only permissible for historic data; all non-historic SWAMP projects require a true protocol reference. "Not Applicable" is only used for LABQA and "000NONPJ" (i.e. non-project data) samples only.
StationCode	Field Crew	Station LookUp	A "StationCode" represents a unique sampling site in a water body.	The format for this code is: The first 3 digits preceding the decimal in the Calwater Watershed ID Number from the CALWater221 data layer, followed by a minimum of 3/maximum of 6 letters and numbers identifying the station. If the station is outside of California, the first 3 digits are to be entered as "000." Example: Smith River above South Fork = 304SOK.
SampleDate	Field Crew	N/A	"SampleDate" refers to the date the sample was collected.	Dates must be entered into the database as: DD/MMM/YYYY (e.g. 15/Dec/2015). For samples with collection times that last longer than one day, (e.g. autosamplers, SPATT bags), the SampleDate is the date the sample was retrieved.

Template Field Name	Responsibility	Look-up List	Description	Business Rules
AgencyCode	Field Crew	Agency LookUp	"AgencyCode" refers to the organization or agency that collected the sample.	The AgencyCode always refers to the agency that collected the native sample, not the agency that created the QC sample.
ProjectCode	Field Crew; Laboratory Staff	Project LookUp	A "ProjectCode" is a unique code identifying a SWAMP project.	ProjectCodes with "FY" in the name indicate samples were collected in a fiscal year calendar cycle (e.g. "FY0708" indicates fiscal year 2007-2008). ProjectCodes without FY indicate samples were collected in a calendar year (e.g. "2003" indicates calendar year 2003). Each Project must have an associated QAPrP or Project QAPP listed.
SampleComments	Field Crew	N/A	"Sample Comments" records any comments related to the sampling event at a particular station.	When a PurposeFailureCode of "Other" is used, a SampleComment is required. This field is limited to 255 characters.
LocationCode	Field Crew	Location LookUp	"LocationCode" describes the physical location in the waterbody where the sample was collected. One sampling event may have a single location or multiple locations.	For a single point of sampling, the physical location in the waterbody can be used, such as "Bank," "Thalweg," or "Transect1." For field results, the LocationCode should be the same as the location for the WQ EventCode. Open water sampling with multiple sub-locations in a single water body or station may have numbered locations (e.g. "OpenWaterTrawl1," "OpenWaterTrawl2"). Multiple physical locations within a single station may consist of a similar numbering scheme (e.g. "BankShock1," "OpenWaterHook1"). For BA EventCode sampling, a location code of "X" is used to associate the water quality, field measure, and taxonomy data to one bioassessment sample.

Template Field Name	Responsibility	Look-up List	Description	Business Rules
GeometryShape	Field Crew	Variable CodesLook Up	"GeometryShape" is the physical shape of the location (e.g. Line, Point, Line Centroid, Polygon, Polygon Centroid).	A Variable Code Look-up Value must be used for the GeometryShape.
Collection MethodCode	Field Crew	Collection Method LookUp	"CollectionMethod Code" refers to the general method of sample collection.	The default for tissue is "Tissue_Grab."
CollectionDevice Name	Field Crew	Collection Device LookUp	"CollectionDevice Name" refers to the specific device used in the collection of the sample such as MPSL-Eboat_(BigE), WPCL-DFG Gill Net 1(50m,1.5").	A Collection Device Look-up Value must be used for CollectionDeviceName.
CollectionTime	Field Crew	N/A	"CollectionTime" refers to the time when the first sample was collected from a station.	If multiple samples are collected at a single station, the CollectionTime for the first sample taken is applied to every subsequent sample. In so doing, the samples can easily be linked, and any holding time issues will be consistent for laboratory work. CollectionTime must be expressed as "hh:mm" in 24-hour time (i.e. 13:30 for 1:30 pm).
TisSource	Field Crew	Variable CodesLook Up	"TisSource" or "Tissue Source" references the original source of the collected organism (e.g. resident, transplant).	Bivalves could be "Res" (Resident) or "Trans" ("Transplant") while fish are "NA" ("Not Applicable").
Replicate	Field Crew	N/A	The "Replicate" number is used to distinguish between replicates created at a single collection in the field.	The default value is "1," with additional replicates added sequentially.

Template Field Name	Responsibility	Look-up List	Description	Business Rules
TissueCollection Comments (Not Required)	Field Crew	N/A	"TissueCollection Comments" is intended to record any comments relating to the collection of the tissue sample for laboratory analysis.	Unique scenarios and abnormalities should be recorded here. This field is limited to 255 characters.
OrganismID	Field Crew; Laboratory Staff	N/A	"OrganismID" is a unique identifier assigned to the organism by the field crew or laboratory staff.	The OrganismID convention is: "StationCode, project abbreviation, project year, organism abbreviation, bag number, -, fish number." For example, in OrganismID "901SJATC5SW01RES02-6," "901SJATC5" is the StationCode, "SW" is the project abbreviation for "SWAMP," "01" is the project year, "RES" is the organism abbreviation for "Redear Sunfish," "02" is the bag number (meaning it's the second bag of Redear Sunfish at this station), and "6" is the fish number (meaning it is the 6th fish in the second bag). It is preferable to add "-Dup" to the end of the ID to help confirm that the collection is a Field Duplicate of the original sample.
TagNumber (Not Required)	Field Crew	N/A	"TotalCount" is the total count of alive organisms in the tissue sample associated with the same OrganismID.	This field is limited to 50 characters.
OrganismName	Field Crew; Laboratory Staff	Organism LookUp	"OrganismName" refers to the common name of the organism collected.	The OrganismName must match the appropriate organism in the Look-up Value table.
LifeStageCode	Field Crew; Laboratory Staff	LifeStage LookUp	"LifeStageCode" references the organism's life stage (e.g. adult, juvenile).	The LifeStageCode must utilize a Life Stage Look-up Value.

Template Field Name	Responsibility	Look-up List	Description	Business Rules
TotalCount (Not Required)	Field Crew	N/A	"TotalCount" is the total count of living organisms in the tissue sample associated with the same OrganismID	Organisms determined to be dead upon collection are not recorded in TotalCount. Rather, the total number of dead fish should be recorded in the "ProcessedOrganismsExpanded FishComments" field, and the total number of dead bivalves should be recorded in "ProcessedOrganismsExpanded BivalvesComments" field.
PartCreated (Not Required)	Laboratory Staff	N/A	N/A	"PartCreated" references whether a portion of the processed organism (i.e. OrganismID) was taken for analysis. This field should be completed with either a "yes" or a "no."
ForkLength (Not Required)	Field Crew; Laboratory Staff	N/A	"ForkLength" is the measured length of the organism from the most forward point, with mouth closed, to the center of the fork in the tail.	If the organism's ForkLength is not recorded, a null value of "-88" should be entered.
TotalLength (Not Required)	Field Crew; Laboratory Staff	N/A	"TotalLength" is the measured length of the organism from the most forward point of the head, with mouth closed, to the farthest tip of the tail.	If the organism's TotalLength is not recorded, a null value of "-88" should be entered.
UnitLengthFish (Not Required)	Field Crew; Laboratory Staff	[Variable CodesLook Up](#)	"UnitLengthFish" refers to the units used in measuring the length of the fish.	Length measurements should be recorded in millimeters ("mm").
LengthSource (Not Required)	Field Crew; Laboratory Staff	[Variable CodesLook Up](#)	"LengthSource" is the physical location where the length measurements were recorded.	This field should be completed with either "Lab" or "Field."
Weight (Not Required)	Field Crew; Laboratory Staff	N/A	"Weight" refers to the entire weight of the fish.	If the organism's Weight is not recorded, a null value of "-88" should be entered.

Template Field Name	Responsibility	Look-up List	Description	Business Rules
UnitWeightFish (Not Required)	Field Crew; Laboratory Staff	Variable CodesLook Up	"UnitWeightFish" refers to the units used in measuring the weight of the fish.	Weight measurements should be recorded in grams ("g").
WeightSource (Not Required)	Field Crew; Laboratory Staff	Variable CodesLook Up	"WeightSource" is the physical location where the weight measurements were recorded.	This field should be completed with either "Lab" or "Field."
SizeDescr (Not Required)	Field Crew; Laboratory Staff	N/A	"SizeDescr" (i.e. Size Description) is a description of organism groupings by size.	This field is to be used only when organism sizes are estimated, rather than measured.
Age (Not Required)	Field Crew; Laboratory Staff	N/A	"Age" describes the age of the organism.	This field is optional. However, if age is required for a project, yet not recorded, then a null value of "-88" should be entered.
Sex (Not Required)	Field Crew; Laboratory Staff	Variable CodesLook Up	"Sex" refers to the sex of the organism.	This field should be completed with "M," "F," or "Unk."
Anomaly (Not Required)	Field Crew; Laboratory Staff	Variable CodesLook Up	"Anomaly" describes any anomalies that may be on or in the organism (e.g. scars, tumors, parasites, etc.)	A Variable Code Look-up Value must be used for Anomaly.
Processed Organisms ExpandedFish Comments (Not Required)	Field Crew; Laboratory Staff	N/A	"Processed Organisms ExpandedFish Comments" field is used to record any comments relating to the processed organisms (e.g. location of an Anomaly).	This field is limited to 255 characters.
BivalveID	Field Crew; Laboratory Staff	N/A	"BivalveID" is an identifier assigned to the organism by the field crew or laboratory staff.	If a unique ID is not assigned, than a default value of "1" is used.
Count (Not Required)	Field Crew; Laboratory Staff	N/A	"Count" is the actual number of organisms represented by the BivalveID.	The default value is "1."

Template Field Name	Responsibility	Look-up List	Description	Business Rules
ShellLength (Not Required)	Field Crew; Laboratory Staff	N/A	"ShellWidth" is the actual measured width of the shell of the individual organism.	When a group of organisms are measured and averaged, enter the average width of the shell. If the ShellLength is not recorded, a null value of "-88" should be entered.
ShellWidth (Not Required)	Field Crew; Laboratory Staff	N/A	"ShellWidth" is the actual measured width of the shell of the individual organism.	When a group of bivalves are measured and averaged, enter the average width of the shell. If the ShellWidth is not recorded, a null value of "-88" should be entered.
UnitShellLength Width (Not Required)	Field Crew; Laboratory Staff	N/A	"UnitShellLength Width" refers to the units used in measuring the length and width of the organism.	When a group of bivalves are measured and averaged, enter the unit as "avg xx" where "xx" refers to the unit. If the UnitShellLengthWidth is not recorded, a null value of "-88" should be entered.
LengthWidthType (Not Required)	Field Crew; Laboratory Staff	Variable CodesLook Up	"LengthWidth Type" describes the type of length or width measurement recorded (e.g. "Ca" for Carapace, Ab for "Abdomen", or "TL" for Total Length)	If two different types of measurements were recorded, enter the primary type here and the secondary type in the "ProcessedOrganismsExpanded BivalvesComments" field.
BeginWeight (Not Required)	Field Crew; Laboratory Staff	N/A	"BeginWeight" is the weight of the bivalve organism at the start date.	If the bivalve's BeginWeight is not recorded, a null value of "-88" should be entered.
EndWeight (Not Required)	Field Crew; Laboratory Staff	N/A	"EndWeight" is the weight of the bivalve organism at the end date.	If the bivalve's EndWeight is not recorded, a null value of "-88" should be entered.
UnitWeightBivalve (Not Required)	Field Crew; Laboratory Staff	Variable CodesLook Up	"UnitWeight Bivalve" refers to the units used in measuring the weight of the bivalve.	Weight measurements should be recorded in grams ("g").
BivalveSex (Not Required)	Field Crew; Laboratory Staff	Variable CodesLook Up	"Sex" refers to the sex of the organism (e.g. "M," "F," "Unk")	If the bivalve's Sex is not recorded, a null value of "-88" should be entered.

Template Field Name	Responsibility	Look-up List	Description	Business Rules
SizeDescrBivalve (Not Required)	Field Crew; Laboratory Staff	N/A	"SizeDescrBivalve" or "Size Description Bivalve" is a description of the grouping of organisms by size (e.g. small, large, 100-150cm)	This field can only be used only when sizes are estimated and should not be populated if individual shell measurements are recorded.
Processed Organisms Expanded Bivalves Comments (Not Required)	Field Crew; Laboratory Staff	N/A	"Processed Organisms ExpandedBivalves Comments" records any comments relating to the "Processed Organisms Expanded Bivalves."	Include the number of animals involved in the weight and length measurements if it is different from the count number. This field is limited to 255 characters.
TissueID	Laboratory Staff	N/A	"TissueID" is a unique identifier that is assigned to each tissue part and is used to differentiate between the different parts of the same fish.	For fish, a suggested format is "funding code_tag number_part initial ("I" for "indivdual," "O" for "otolith," "C" for "composite," etc.) Example: "SW01_2435_I." For bivalves, a suggested format is "OrganismID_part initial" Example: "901SJATC5SW01RCM01_C"
TissueName	Laboratory Staff	TissueLookup	"TissueName" is the name of the tissue part used in the composite and analysis.	A value from the Tissue Look-up table must be used.
Preparation Preservation	Laboratory Staff	Prep Preservation LookUp	"Preparation Preservation" references the preparation or preservation method performed on the tissue part in order to create the composite.	If no preparation or preservation method was performed, the default value is "None."
EntryDateTime (Not Required)	Laboratory Staff	N/A	"EntryDateTime" reflects the date and time when the template is filled out and can be used as a way to group data entry.	N/A

Template Field Name	Responsibility	Look-up List	Description	Business Rules
TissueWeight	Laboratory Staff	N/A	"TissueWeight" is the measured weight of the tissue part included in the composite.	If the TissueWeight is not recorded, a null value of "-88" should be entered.
UnitTissueWeight	Laboratory Staff	Variable CodesLook Up	"UnitTissue Weight" refers to the units used in measuring the weight of the tissue part.	A value from the Variable Codes Look Up table must be used.
PartsComments (Not Required)	Laboratory Staff	N/A	"PartsComments" records any comments relating to the tissue parts.	This field is limited to 255 characters.
CompositeID	Laboratory Staff	N/A	"CompositeID" is a unique identifier supplied by the compositing agency to identify the composited tissue parts. It can refer to either the original composite or the super composite, where multiple composites are combined.	For an individual fish, a suggested format is "I_OrganismID," where "I" references an individual fish (e.g. "I_901SJATC5SW01RES02-6"). A composite of different fish from one or more bags would be formatted as "C1_OrganismID" (e.g. "C1_901SJATC5SW01RES"). If there is a second fish composite from one or more bags, the CompositeID would be "C2_OrganismID" (e.g. "C2_901SJATC5SW01RES"). For bivalves, a suggested format is "C1_OrganismID_analysis acronym" (e.g. "C_901SJATC5SW01RCM_TM" where "TM" references trace metals). For a non-muscle part of a fish, such as the liver, otolith, scale, gonads, etc., a suggested format is "Part Initial (from TissueID)_OrganismID" (e.g. "L_901SJATC5SW01RES") for a liver composite. For SuperComposites, a suggested format is "SC_OrganismID," where "SC" means SuperComposite.

Template Field Name	Responsibility	Look-up List	Description	Business Rules
CompositeType	Laboratory Staff	Variable CodesLook Up	"CompositeType" indicates the type of composite.	On the Composite tab, only "Normal" will be recorded. On the SuperComposite tab, only "SuperComposite" will be recorded. In the Results template, Normal and SuperComposite is recorded for samples, while "LABQA" is recorded for laboratory quality assurance/control.
Composite Replicate	Laboratory Staff	N/A	"Composite Replicate" is the number used to distinguish between replicate composites.	The default value is "1."
CompositeWeight	Laboratory Staff	N/A	"Composite Weight" is the weight of the total Composite or SuperComposite used in the analysis.	The default value is "-88" (null)
UnitComposite Weight	Laboratory Staff	Variable CodesLook Up	"UnitComposite Weight" refers to the units used in measuring the weight of the Composite or SuperComposite.	N/A
HomogDate	Laboratory Staff	N/A	"HomogDate" is the date the Composite or SuperComposite was homogenized.	HomogDates must be entered into the database as: DD/MMM/YYYY (e.g. 15/Dec/2015).
OrganismGroup	Field Crew; Laboratory Staff	Variable CodesLook Up	"OrganismGroup" refers to the grouping that the collected organisms belong to (e.g. "Fish," "Bivalves," "Crustacean," "Mammal," "Bird" or "Amphibian").	The default for LABQA is "Not Applicable." CRMs, however, should reflect the correct OrganismGroup.
CompAgency Code	Laboratory Staff	Agency LookUp	"CompAgency Code" is the agency that physically created the Composite or Super Composite.	A value from the Agency Look Up table must be used.

Template Field Name	Responsibility	Look-up List	Description	Business Rules
Composite Comments (Not Required)	Laboratory Staff	N/A	"Composite Comments" are any comments related to the Composite or Super Composite.	This field is limited to 255 characters.

Tissue SuperComposite Template

The fields in Tissue SuperComposite Template should be completed as follows:

Template Field Name	Responsibility	Look-up List	Description	Business Rules
SuperComposite ID	Laboratory Staff	N/A	"Super CompositeID" is a unique identifier supplied by the compositing agency to identify the composited tissue parts. It can refer to either the original composite or the super composite, where multiple composites are combined.	For an individual fish, a suggested format is "I_OrganismID," where "I" references an individual fish (e.g. "I_901SJATC5SW01RES02-6"). A composite of different fish from one or more bags would be formatted as "C1_OrganismID" (e.g. "C1_901SJATC5SW01RES"). If there is a second fish composite from one or more bags, the CompositeID would be "C2_OrganismID" (e.g. "C2_901SJATC5SW01RES"). For bivalves, a suggested format is "C1_OrganismID_analysis acronym" (e.g. "C_901SJATC5SW01RCM_TM" where "TM" references trace metals). For a non-muscle part of a fish, such as the liver, otolith, scale, gonads, etc., a suggested format is "Part Initial (from TissueID)_OrganismID" (e.g. "L_901SJATC5SW01RES") for a liver composite. For SuperComposites, a suggested format is "SC_OrganismID," where "SC" means SuperComposite.
CompositeType	Laboratory Staff	Variable CodesLook Up	"Composite Type" indicates the type of composite.	On the Composite tab, only "Normal" will be recorded. On the SuperComposite tab, only "SuperComposite" will be recorded. In the Results template, Normal and SuperComposite is recorded for samples, while "LABQA" is recorded for laboratory quality assurance/control.

Template Field Name	Responsibility	Look-up List	Description	Business Rules
Composite Replicate	Laboratory Staff	N/A	"Composite Replicate" is used to distinguish between replicate composites.	The default value is "1."
CompositeWeight	Laboratory Staff	N/A	"Composite Weight" is the weight of the total Composite or Super Composite used in the analysis.	The default value is "-88" (null).
UnitComposite Weight	Laboratory Staff	Variable CodesLook Up	"UnitComposite Weight" refers to the units used in measuring the weight of the Composite or Super Composite.	N/A
HomogDate	Laboratory Staff	N/A	"HomogDate" is the date the Composite or SuperComposite was homogenized.	HomogDates must be entered into the database as: DD/MMM/YYYY (e.g. 15/Dec/2015).
OrganismGroup	Field Crew; Laboratory Staff	Variable CodesLook Up	"OrganismGroup" refers to the grouping that the collected organisms belong to (e.g. "Fish," "Bivalves," "Crustacean," "Mammal," "Bird" or "Amphibian").	The default for LABQA is "Not Applicable." CRMs, however, should reflect the correct OrganismGroup.
CompAgency Code	Laboratory Staff	Agency LookUp	"CompAgency Code" is the agency that physically created the Composite or SuperComposite.	An AgencyCode Look-up Value must be used for the CompAgencyCode.
Composite Comments (Not Required)	Laboratory Staff	N/A	Composite Comments are any comments related to the Composite or SuperComposite.	This field is limited to 255 characters.

Template Field Name	Responsibility	Look-up List	Description	Business Rules
Composite SourceID	Laboratory Staff	N/A	"Composite SourceID" is a unique identifier supplied by the Compositing Agency to identify the composited tissue parts in the SuperComposite.	This CompositeID must match the original CompositeID used in the SuperComposite.
CompositeSource Weight	Laboratory Staff	N/A	"CompositeSource Weight" is the weight of the portion of the original Composite used to create the SuperComposite.	N/A
UnitComposite SourceWeight	Laboratory Staff	Variable CodesLook Up	"UnitComposite SourceWeight" refers to the units used in measuring the weight of the SuperComposite.	N/A

Tissue Results Template

The fields in Tissue Results Template should be completed as follows:

Template Field Name	Responsibility	Look-up List	Description	Business Rules
LabSampleID	Laboratory Staff	N/A	"LabSampleID" is used to provide lab-specific identification for an analyzed sample.	The format and content are 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.
CompositeID	Laboratory Staff	N/A	"CompositeID" is a unique identifier supplied by the compositing agency to identify the composited tissue parts. It can refer to either the original composite or the super composite, where multiple composites are combined.	For an individual fish, a suggested format is "I_OrganismID," where "I" references an individual fish (e.g. "I_901SJATC5SW01RES02-6"). A composite of different fish from one or more bags would be formatted as "C1_OrganismID" (e.g. "C1_901SJATC5SW01RES"). If there is a second fish composite from one or more bags, the CompositeID would be "C2_OrganismID" (e.g. "C2_901SJATC5SW01RES"). For bivalves, a suggested format is "C1_OrganismID_analysis acronym" (e.g. "C_901SJATC5SW01RCM_TM" where "TM" references trace metals). For a non-muscle part of a fish, such as the liver, otolith, scale, gonads, etc., a suggested format is "Part Initial (from TissueID)_OrganismID" (e.g. "L_901SJATC5SW01RES") for a liver composite. For SuperComposites, a suggested format is "SC_OrganismID," where "SC" means SuperComposite.
Composite Replicate	Laboratory Staff	N/A	The "Composite Replicate" is a field used to record the composite replicate number.	The default value is "1."

Template Field Name	Responsibility	Look-up List	Description	Business Rules
OrganismGroup	Field Crew; Laboratory Staff	Variable CodesLook Up	"OrganismGroup" refers to the grouping that the collected organisms belong to (e.g. "Fish," "Bivalves," "Crustacean," "Mammal," "Bird" or "Amphibian").	The default for LABQA is "Not Applicable." CRMs, however, should reflect the correct OrganismGroup.
CompositeType	Laboratory Staff	Variable CodesLook Up	"CompositeType" indicates the type of composite.	On the Composite tab, only "Normal" will be recorded. On the SuperComposite tab, only "SuperComposite" will be recorded. In the Results template, Normal and SuperComposite is recorded for samples, while "LABQA" is recorded for laboratory quality assurance/control.
Composite Comments (Not Required)	Laboratory Staff	N/A	"Composite Comments" are any comments related to the Composite or SuperComposite.	This field is limited to 255 characters.
SampleTypeCode	Field Crew; Laboratory Staff	Sample Type Lookup	"SampleTypeCode" refers to the type of sample collected or analyzed.	A SampleType Look-up Value must be used for the SampleTypeCode.
Preparation Preservation	Field Crew; Laboratory Staff	Prep Preservation LookUp	"PreparationPreser vation" references the preparation or preservation method performed on the organism prior to processing.	This field should be filled in with an appropriate Look-up Value (e.g. "fieldfrozen" or "labfrozen"). If no preparation or preservation method was performed, the default value is "None."
Preparation PreservationDate	Field Crew; Laboratory Staff	N/A	"Preparation PreservationDate" is the date and time the preparation or preservation was started.	The PreparationPreservationDate must be entered into the database as "DD/MMM/YYYY HH:MM." If there is no preparation or preservation method performed (None), then the PreparationPreservationDate should be listed as "01/Jan/1950 00:00" (the null date/time values). If a composite has multiple preparation or preservation dates, the earliest date should be entered.

Template Field Name	Responsibility	Look-up List	Description	Business Rules
DigestExtract Method	Laboratory Staff	Digest Extract LookUp	"DigestExtract Method" references the digestion or extraction method performed on the sample prior to analysis.	A DigestExtract Look-up Value must be used for this field. If no digestion or extraction method was performed, the default value is None.
DigestExtractDate	Laboratory Staff	N/A	"DigestExtractDate" is the date and time the digestion or extraction was started.	The DigestExtractDate must be entered into the database as "DD/MMM/YYYY HH:MM." If there is no digestion or extraction performed on the sample (None), then the DigestExtractDate should be listed as "01/Jan/1950 00:00" (the null date/time values).
LabBatch	Laboratory Staff	N/A	The "LabBatch" is a unique code, provided by the laboratory, that represents a group of samples processed together.	When a digestion or extraction is not performed as part of the method, the LabBatch represents all samples within a unique analysis.
AnalysisDate	Laboratory Staff	N/A	"AnalysisDate" is the date and time the sample was analyzed.	This date and time must be expressed as "DD/MMM/YYYY HH:MM."
LabReplicate	Laboratory Staff	N/A	The "LabReplicate" number is used to distinguish between replicates created in the laboratory.	The default is "1" for the first sample and increases by one for each successive replicate analyzed in the laboratory.

Template Field Name	Responsibility	Look-up List	Description	Business Rules
MatrixName	Laboratory Staff	[Matrix LookUp](#)	"MatrixName" refers to the sample matrix.	For field-generated water samples, the MatrixName is "samplewater." For lab-generated QC samples, the matrix should be either "labwater" or "blankwater." Labwater is water coming either directly from the tap in the laboratory or purchased spring water. Blankwater is laboratory Type I or Type II water, purchased reagent water, or water that is run through a filtration process in a laboratory, such as Deionized (DI) or Milli-Q (MQ) water. For field-generated sediment samples, the MatrixName is "sediment." For lab-generated QC samples, "blankmatrix" should be used to identify a medium produced commercially or in the lab. The MatrixName for lab-generated QC samples where water, solvent, or nothing at all was used as a matrix should be recorded as "sediment." For field-generated tissue samples, the MatrixName is "tissue." For lab-generated QC samples, blankmatrix should be used to identify a medium produced commercially or in the lab. The MatrixName for lab-generated QC samples where water, solvent, or nothing at all was used as a matrix should be recorded as "tissue."
MethodName	Laboratory Staff	[Method LookUp](#)	"MethodName" refers to the method used by the lab to analyze the sample.	Methods are expressed with a MethodName, such as "SM 4500-NH3 C." If a laboratory has modified an EPA or Standard Method, then an "M" must be added to the end of the MethodName. In such situations, the modification should be documented and communicated to SWAMP IQ staff for notation in the database. For instance, a lab would report a modified version of "EPA 600/R-99-064" as "EPA 600/R-99-064M," accompanied by a description of the modification made.

Template Field Name	Responsibility	Look-up List	Description	Business Rules
AnalyteName	Laboratory Staff	Analyte LookUp	The "AnalyteName" is the name of the analyte or parameter for which the analysis is conducted.	An Analyte Look-up Value must be used for the AnalyteName.
FractionName	Laboratory Staff	Fraction LookUp	"FractionName" refers to a descriptor of the analyte (e.g. "total" or "dissolved" metals).	If a Fraction Look-up Value is not needed, then "None" should be entered into this field.
Unit	Laboratory Staff	UnitLookUp	"Unit" refers to how the chemistry result is measured or expressed.	Each combination of Analyte and Matrix requires a specific Unit Loo-up Value to be used. Water units are indicated by weight/volume (e.g. "ng/L"). Sediment and tissue units are indicated by moisture content/weight (e.g. "ww" for "wet weight" and "dw" for "dry weight"), and surrogate recovery results are recorded as a percentage.
DilutionFactor	Laboratory Staff	N/A	"DilutionFactor" is the factor by which a sample was diluted.	The default value is "1." A whole number other than 1 is recorded when a sample requires an additional dilution to fit into the standard curve of the instrument. It does not apply to dilutions that are standard in the method being used for analysis. Final reported results, along with the Method Detection Limit and Reporting Limit, must be corrected for the dilution that was carried out during the process of analysis. For example, 1 part sample plus 9 parts blank is a DilutionFactor of 10. A 50% dilution is equivalent to a DilutionFactor of 2. A QACode of "D" is required when a dilution is performed on a sample.

Template Field Name	Responsibility	Look-up List	Description	Business Rules
Result	Laboratory Staff	N/A	The "Result" is the final numeric result of a given analysis.	The chemistry Result is expressed as a real number and stored as text. The result should be reported with an 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 should be reported as "1.350."
ResultQualCode (Not Required)	Laboratory Staff	ResQual LookUp	The Result Qualifier Code or "ResultQualCode" qualifies the analytical result of the sample.	The SWAMP Database will be populated with an equal sign when the data are loaded. When a result is not detected or detected but not quantified, a ResultQualCode of "ND" or "DNQ" is applied, respectively. When the result is a null value (i.e. "-88"), a ResultQualCode is required. If the ResultQualCode value is "NR" for "not recorded," then a reason for this code must be included in the "TissueResultComments" field, and an appropriate QACode will need to be applied.
MDL	Laboratory Staff	N/A	Method Detection Limit or "MDL" is the minimum concentration of an analyte that undergoes the entire measurement process and can be reported with a stated level of confidence that the analyte concentration is greater than zero. It is the detection limit associated with the method used to analyze the analyte or parameter in the sample.	The applicable MDL should be entered into this field for each analyte. If there is no MDL for a given analyte, a "-88" must be entered.

Template Field Name	Responsibility	Look-up List	Description	Business Rules
RL	Laboratory Staff	N/A	Reporting Limit or "RL" is the minimum value below which data are documented as nonquantifiable. It is the reporting limit for the sample analyzed, as determined by the laboratory.	The applicable RL should be entered into this field for each analyte. If there is no RL for a given analyte, a "-88" must be entered.
QACode	Laboratory Staff	QALookUp	A "QACode" is applied to a result to describe any special conditions or problems that occurred during, or prior to the analysis.	The default QACode, 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 (e.g. "GB,SC").
ExpectedValue (Not Required)	Laboratory Staff	N/A	The "ExpectedValue" is the expected concentration of the analyte in a reference standard, laboratory control sample, or matrix spike sample.	For spikes, the value consists of the native sample concentration plus the quantity of analyte in the spike. For surrogate samples, the ExpectedValue should be "100," representing 100%. This field is required for the SampleTypeCodes of "MS1," "MS2," "CRM," and "LCS."
TissueResult Comments (Not Required)	Laboratory Staff	N/A	The "TissueResult Comments" field records any comments regarding the analysis or results.	This field is limited to 255 characters.
LabBatch	Laboratory Staff	N/A	The "LabBatch" is a unique code, provided by the laboratory, that represents a group of samples processed together.	When a digestion or extraction is not performed as part of the method, the LabBatch represents all samples within a unique analysis.
LabAgencyCode	Laboratory Staff	Agency LookUp	"LabAgencyCode" refers to the organization, agency, or laboratory that performed the analysis on the sample.	A Lab Agency Look-up Value must be used for the LabAgencyCode.

Template Field Name	Responsibility	Look-up List	Description	Business Rules
LabSubmission Code	Laboratory Staff	[Lab Submission LookUp](#)	The "LabSubmission Code" is a unique code assigned to the LabBatch by the analyzing laboratory that references the quality of the data in the LabBatch.	If the LabSubmissionCode of "A" is used, meaning Acceptable, the laboratory is ensuring that all SWAMP QAQC protocols were met for the lab batch. If any other code is used, a short explanation in the LabBatchComment field is required.
Submitting AgencyCode	Laboratory Staff	[Agency LookUp](#)	"SubmittingAgency Code" refers to the organization or agency that is responsible for the submission of the data.	The submitting agency may be different from that listed in the LabAgencyCode field if the analytical data were subcontracted to another agency.
LabBatchComm (Not Required)	Laboratory Staff	N/A	"LabBatch Comments" records any comments relating to the LabBatch as a whole.	This field is limited to 255 characters.

Tissue Bycatch Template

Any bycatch, that is organisms that are not included in a tissue count or composite, can be recorded on the optional Tissue ByCatch template.

Template Field Name	Responsibility	Look-up List	Description	Business Rules
SampleDate	Field Crew	N/A	"SampleDate" refers to the date the sample was collected.	Dates must be entered into the database as: DD/MMM/YYYY (e.g. 15/Dec/2015). For samples with collection times that last longer than one day, (e.g. autosamplers, SPATT bags), the SampleDate is the date the sample was retrieved.
StationCode	Field Crew	Station LookUp	A "StationCode" represents a unique sampling site in a water body.	The format for this code is: The first 3 digits preceding the decimal in the Calwater Watershed ID Number from the CALWater221 data layer, followed by a minimum of 3/maximum of 6 letters and numbers identifying the station. If the station is outside of California, the first 3 digits are to be entered as "000." Example: Smith River above South Fork = 304SOK.
LocationCode	Field Crew	Location LookUp	"LocationCode" describes the physical location in the waterbody where the sample was collected. One sampling event may have a single location or multiple locations.	For a single point of sampling, the physical location in the waterbody can be used, such as "Bank," "Thalweg," or "Transect1." For field results, the LocationCode should be the same as the location for the WQ EventCode. Open water sampling with multiple sub-locations in a single water body or station may have numbered locations (e.g. "OpenWaterTrawl1," "OpenWaterTrawl2"). Multiple physical locations within a single station may consist of a similar numbering scheme (e.g. "BankShock1," "OpenWaterHook1"). For BA EventCode sampling, a location code of "X" is used to associate the water quality, field measure, and taxonomy data to one bioassessment sample.

Template Field Name	Responsibility	Look-up List	Description	Business Rules
ProjectCode	Field Crew	Project LookUp	A "ProjectCode" is a unique code identifying a SWAMP project.	ProjectCodes with "FY" in the name indicate samples were collected in a fiscal year calendar cycle (e.g. "FY0708" indicates fiscal year 2007-2008). ProjectCodes without FY indicate samples were collected in a calendar year (e.g. "2003" indicates calendar year 2003). Each Project must have an associated QAPrP or Project QAPP listed.
ProtocolCode	Field Crew	Protocol LookUp	"ProtocolCode" represents the sampling protocol used, which includes the set of methods, methodology, and/or specifications.	Separate EventCodes may be used with each individual protocol. "Not Recorded" is only permissible for historic data; all non-historic SWAMP projects require a true protocol reference. "Not Applicable" is only used for LABQA and "000NONPJ" (i.e. non-project data) samples only.
CollectionTime	Field Crew	N/A	"CollectionTime" refers to the time when the first sample was collected from a station.	If multiple samples are collected at a single station, the CollectionTime for the first sample taken is applied to every subsequent sample. In so doing, the samples can easily be linked, and any holding time issues will be consistent for laboratory work. CollectionTime must be expressed as "hh:mm" in 24-hour time (i.e. 13:30 for 1:30 pm).
Collection MethodCode	Field Crew	Collection Method LookUp	"CollectionMethod Code" refers to the general method of sample collection.	The default for tissue is "Tissue_Grab."
CollectionDevice Name	Field Crew	Collection Device LookUp	"CollectionDevice Name" refers to the specific device used in the collection of the sample such as MPSL-Eboat_(BigE), WPCL-DFG Gill Net 1(50m,1.5").	A Collection Device Look-up Value must be used for CollectionDeviceName.
OrganismName	Field Crew	Organism LookUp	"OrganismName" refers to the common name of the organism collected.	The OrganismName must match the appropriate organism in the Look-up Value table.

Template Field Name	Responsibility	Look-up List	Description	Business Rules
LifeStageCode	Field Crew	LifeStage LookUp	"LifeStageCode" references the organism's life stage (e.g. adult, juvenile).	The LifeStageCode must utilize a Life Stage Look-up Value.
TotalLength (Not Required)	Field Crew	N/A	"TotalLength" is the measured length of the organism from the most forward point of the head, with mouth closed, to the farthest tip of the tail.	If the organism's length is not recorded, a null value (i.e. "-88") should be entered.
LengthWidthType (Not Required)	Field Crew	Variable CodesLook Up	"LengthWidth Type" describes the type of length or width measurement recorded (e.g. "Ca" for Carapace, Ab for "Abdomen", or "TL" for Total Length)	If two different types of measurements were recorded, enter the primary type here and the secondary type in the "ProcessedOrganismsExpanded BivalvesComments" field.
UnitLength (Not Required)	Field Crew	Variable CodesLook Up	"UnitLength" refers to the units used in measuring the length of the organism.	Length measurements should be recorded in millimeters ("mm").
SizeRange (Not Required)	Field Crew	N/A	"SizeRange" is a rough estimate of the organism's length.	The range should be reported as two whole numbers, separated by a hyphen (e.g. "30-70"). This field should be left blank if the TotalLength was recorded.
Sex (Not Required)	Field Crew	Variable CodesLook Up	"Sex" refers to the sex of the organism.	This field should be completed with "M," "F," or "Unk."
Condition	Field Crew	N/A	"Condition" refers to whether or not the organism was alive at the time of the catch.	This field should be completed with either "Live" or "Dead." If the Condition of the organism was not recorded at the time of the catch, this field should be completed with "NR."
Anomaly (Not Required)	Field Crew	Variable CodesLook Up	"Anomaly" describes any anomalies that may be on or in the organism (e.g. scars, tumors, parasites, etc.)	A Variable Code Look-up Value must be used for Anomaly.

Template Field Name	Responsibility	Look-up List	Description	Business Rules
Count (Not Required)	Field Crew	N/A	"Count" is the actual number of organisms represented by the BivalveID.	The default value is "1."
ResQualCode	Field Crew	ResQual LookUp	"ResQualCode" ("Result Qualifier Code") is used to describe an aspect of the bycatch.	The default ResQualCode is an equal sign ("=").
QACode	Field Crew	QALookUp	A "QACode" is used to describe any special conditions or problems that occurred during, or prior to the catch.	The default QACode, 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 (e.g. "GB,SC").

Tissue End Time Template

The time that a tissue collection effort ends can be recorded on this optional template.

Template Field Name	Responsibility	Look-up List	Description	Business Rules
SampleDate	Field Crew	N/A	"SampleDate" refers to the date the sample was collected.	Dates must be entered into the database as: DD/MMM/YYYY (e.g. 15/Dec/2015). For samples with collection times that last longer than one day, (e.g. autosamplers, SPATT bags), the SampleDate is the date the sample was retrieved.
StationCode	Field Crew	Station LookUp	A "StationCode" represents a unique sampling site in a water body.	The format for this code is: The first 3 digits preceding the decimal in the Calwater Watershed ID Number from the CALWater221 data layer, followed by a minimum of 3/maximum of 6 letters and numbers identifying the station. If the station is outside of California, the first 3 digits are to be entered as "000."

Example: Smith River above South Fork = 304SOK. |
| **LocationCode** | Field Crew | Location LookUp | "LocationCode" describes the physical location in the waterbody where the sample was collected. One sampling event may have a single location or multiple locations. | For a single point of sampling, the physical location in the waterbody can be used, such as "Bank," "Thalweg," or "Transect1."

For field results, the LocationCode should be the same as the location for the WQ EventCode.

Open water sampling with multiple sub-locations in a single water body or station may have numbered locations (e.g. "OpenWaterTrawl1," "OpenWaterTrawl2"). Multiple physical locations within a single station may consist of a similar numbering scheme (e.g. "BankShock1," "OpenWaterHook1").

For BA EventCode sampling, a location code of "X" is used to associate the water quality, field measure, and taxonomy data to one bioassessment sample. |

Template Field Name	Responsibility	Look-up List	Description	Business Rules
CollectionTime	Field Crew	N/A	"CollectionTime" refers to the time when the first sample was collected from a station.	If multiple samples are collected at a single station, the CollectionTime for the first sample taken is applied to every subsequent sample. In so doing, the samples can easily be linked, and any holding time issues will be consistent for laboratory work. CollectionTime must be expressed as "hh:mm" in 24-hour time (i.e. 13:30 for 1:30 pm).
Collection EndTime	Field Crew	N/A	"CollectionEnd Time" refers to the time when a collection effort at a sampling station ended.	CollectionEndTime must be expressed as "hh:mm" in 24-hour time (i.e. 13:30 for 1:30 pm).
ProjectCode	Field Crew	[Project LookUp](#)	A "ProjectCode" is a unique code identifying a SWAMP project.	ProjectCodes with "FY" in the name indicate samples were collected in a fiscal year calendar cycle (e.g. "FY0708" indicates fiscal year 2007-2008). ProjectCodes without FY indicate samples were collected in a calendar year (e.g. "2003" indicates calendar year 2003). Each Project must have an associated QAPrP or Project QAPP listed.
ProtocolCode	Field Crew	[Protocol LookUp](#)	"ProtocolCode" represents the sampling protocol used, which includes the set of methods, methodology, and/or specifications.	Separate EventCodes may be used with each individual protocol. "Not Recorded" is only permissible for historic data; all non-historic SWAMP projects require a true protocol reference. "Not Applicable" is only used for LABQA and "000NONPJ" (i.e. non-project data) samples only.
Collection MethodCode	Field Crew	[Collection Method LookUp](#)	"CollectionMethod Code" refers to the general method of sample collection.	The default for tissue is "Tissue_Grab."
CollectionDevice Name	Field Crew	[Collection Device LookUp](#)	"CollectionDevice Name" refers to the specific device used in the collection of the sample such as MPSL-Eboat_(BigE), WPCL-DFG Gill Net 1(50m,1.5").	A Collection Device Look-up Value must be used for CollectionDeviceName.

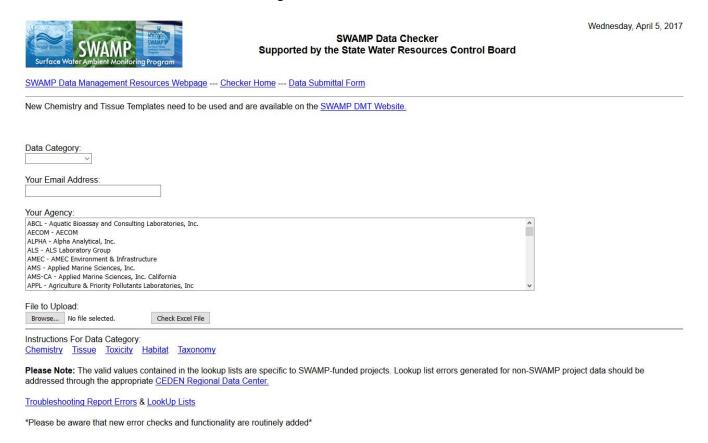| Template Field Name	Responsibility	Look-up List	Description	Business Rules
TissueEffort Comments	Field Crew	N/A	The "TissueEffort Comments" field is intended to record any comments relating to the collection of the tissue sample for laboratory analysis.	Unique scenarios and abnormalities should be recorded here. This field is limited to 255 characters.

Test Control Business Rules

All test controls must be documented in the SWAMP Tissue Results template. The valid values and business rules for samples generated or created by the laboratory (LABQA) are provided in the table below.

Template Field Name	Valid Values/Business Rules
LabSampleID	Lab-specific identification recommended
CompositeID	LabBlank "UniqueLabBatchIdentifier_Method Blank#" Only include # of blank if there is more than one blank analyzed (e.g. "L-487-07_BS494_Method Blank or 2006HgDig07_Blank3")
	LCS "UniqueLabBatchIdentifier_LCS#" Only include # of blank if there is more than one LCS analyzed (e.g. "L-487-07_BS494_LCS or 2006HgDig07_LCS2")
	CRM "UniqueLabBatchIdentifier_CRM Name" (e.g. "L-487-07_BD 494_SRM1588b or 2006HgDig07_Dorm-2")
CompositeReplicate	"1," "2," etc.
OrganismGroup	LabBlank "Not Applicable"
	LCS "Not Applicable"
	CRM Organism group of the CRM (e.g. "Fish," "Bivalves," "Crustacean," etc.)
CompositeType	"LABQA"
SampleTypeCode	Select from SampleTypeLookUp list
MatrixName	"Tissue" (when using solvent, water, or nothing)
	"Blankmatrix" (when using commercially-generated products)

Submitting Data for SWAMP Projects

Once the results have been calculated, the toxicity template should be submitted to the SWAMP Data Checker.

Figure 1. SWAMP Data Checker

This online program scans SWAMP data for business rule violations and produces a report of those that it finds, which is also sent to the address entered into the Checker. The report lists each error, the Excel rows and columns affected, the value in question, the severity of the error (e.g. "Critical," "Error," or "Warning"), a filter value to assist the user, and a link to the error description. A troubleshooting guide and list of error message descriptions is also available for reference.

After the user corrects the errors and resubmits the file to the SWAMP Data Checker for verification, the template should then be submitted to the Office of Information Management and Analysis (OIMA) Help Desk inbox. Questions about data templates, business rules, or data template errors should be sent to the OIMA Help Desk as well.