Quality Systems Assessment for Citizen Monitors Conducting Water Quality Monitoring Field Activities

Appendix A- Data Form

LEAD ASSESSOR: _____

FIELD TEAM: _____

FIELD LOCATION: _____

DATE OF ASSESSMENT: _____

BACKGROUND: _____

1. Pre-Field Monitoring Documentation

Item	Y	N	N/A	Comments and Suggested Corrective Actions
Programmatic Materials				
Sampling Team Briefing/Kickoff meeting- Did the field crew meet to discuss the project objectives, field conditions, safety procedures and any special situation(s) associated with the site?				
Does the staff have access to and an understanding of *Quality Assurance Project Plan* (QAPP)?				
Does staff have the proper collection permits?				
Does staff have permission to access the site?				
Is non-SWAMP staff aware of the SWAMP Help Desk?				
Is the staff aware of the SWAMP website?				
Quality Assurance Project Plan(s)				
Does the staff have access to and an understanding of the monitoring plan(s) and quality assurance project plan(s) (QAPP(s))?				
Is staff involved in project-planning processes?				
Standard Operating Procedure(s)				
Does the staff have with them the appropriate SOP for their field activities?				
Does the staff have a system for adding, updating, and retiring SOPs, as necessary?				
Are field staff trained and familiar with relevant laboratory SOPs?				
Is the involved lab staff trained and familiar with relevant field SOPs?				
Field Data Sheets				
Are field data sheets being used the most currently available from SWAMP?				
Are field data sheets specific to data type (e.g., ambient, toxicity, bioassessment) being collected as per the SOP being used?				
Do field data sheets include name, date, time, location, equipment ID and sample ID?				
Is there a space on the field data sheet for the results of all field measurements?				
Is there a space on the field data sheet for water and weather conditions?				
Is there a comment section on the field data sheet?				
Is *verbal* confirmation used between sampler and note-taker (field person filling out the field data sheet)?				

Item	Y	N	N/A	Comments and Suggested Corrective Actions
Are all field data sheets complete and all spaces filled (e.g., “0” or n/a)?				
Was all paperwork (field data sheets, chain of custody…) accounted for and inspected for completion?				

Notes:

2. Instrument(s) and Test Kit(s) Preparation

Item	Y	N	N/A	Comments and Suggested Corrective Actions
Are all instruments properly calibrated according to SOPs and/or manufacturer instructions as per QAPP(s)?				
Are equipment blanks run when new equipment is used or equipment has just been cleaned?				
Are the reagents and standards being used before their expiration date?				
Have reagents been tested?				
Are all meters and thermometers used properly conditioned and calibrated before they are used?				
Are all calibrations documented?				
Are all equipment maintenance actions documented?				
Are there back-up parts for instruments?				
Have spare batteries been packed?				

Notes:

3. Field Equipment Preparation

Item	Y	N	N/A	Comments and Suggested Corrective Actions
Are containers and chests used to hold gear clean?				
Are containers and chests used to hold gear properly labeled?				
Is all equipment clean and functional?				
Has all field equipment, including boots and waders, been decontaminated for Aquatic Invasive Species (AIS) since the last site visit?				
Is sampling gear set up in the field in a manner to prevent contamination?				
Has spare equipment and gear been packed?				
Have additional chemical reagents been packed?				
Are containers used to hold or store sample material clean and uncontaminated?				
Are appropriate containers used for each sample type?				
Are containers of the correct size used?				
Are a sufficient number of sample containers available in the field?				
Are containers rinsed (if required) and filled to the appropriate level?				
Does staff have a field first aid kit and access to material safety data sheets (MSDS) while in the field?				

Notes:

4. Reconnaissance and Logistics

Item	Y	N	N/A	Comments and Suggested Corrective Actions
Access				
Does staff have permission to access sites?				
Does staff have access to locked gates and other closed entries?				
Were creeks assessed for presence/absence of water and/or flow ahead of time?				
Was the site surveyed for access, hazards and special concerns?				
Safety				
Has staff reviewed the field safety plan?				
Did staff take safety precautions while sampling?				
Did staff have a safety plan for accidents in the field?				
Were potential high flow conditions taken into consideration before going into the field?				
Training				
Has all field staff been trained for the activities that they are to perform? Inspect training records.				
Are all field personnel aware of SOP(s), method, and site requirements?				
Assemble Equipment				
Has all equipment identified in the SOPs and QAPP been assembled before leaving to a field site?				

Notes:

5. QA/QC Actions for Water Samples

Item	Y	N	N/A	Comments and Suggested Corrective Actions
Decontamination				
Are appropriate gloves being worn?				
Is cross-contamination between sites avoided?				
Are clean work surfaces used in the field?				
Are intermediate sampling devices cleaned between sampling sites?				
Procedures				
Are samples collected in an appropriate location of stream for the project's objective(s)?				
Are samples properly preserved?				
Are samplers aware of holding times?				
Is sampling depth, flow, and velocity taken into account?				
Are water samples collected prior to sediment and or benthic biological sample collection?				
Was each sample labeled with "sample ID, date, location, and time"?				
Is data flagged (on the field data sheets) when instruments give measurements that are out of range?				
Quality Control Samples				
Are travel blanks included with samples?				
Are appropriate water sources used for the blanks of each analyte?				
Are field blanks collected at a rate of 5% for the length of the project for trace-metals, Hg, aqueous VOA, sediment VOA, aqueous DOC and bacteria?				
Are field blanks for all remaining analytes collected at the beginning of the sample period?				
Are field duplicates collected for at a rate of 5% for the length of the project or once per field event?				
Are copies of QC sample results available?				
If QC samples identify a problem, are corrective actions taken prior to future sampling events?				

Notes:

6a. Water Quality Measurements and Sampling Procedures

Item	Y	N	N/A	Comments and Suggested Corrective Actions
Sampling				
Are sampling containers appropriately rinsed three times with site water prior to filling (excluding pathogen and preserved samples)?				
Are water samples taken prior to other sample types, or up stream from other monitoring activities/disturbances?				
Is care taken not to disturb bottom sediments during sample collection?				
Are clean hands procedures used for trace metal and Hg sample collections?				
Are trace metal samples collected when turbidity is low?				
Do field analyses reflect the measurement quality objectives (MQOs) specified in Appendix A of the QAPrP?				
Do sample holding times reflect those specified in Appendix B of the QAPrP?				
Is staff properly locating the sampling point and then assessing and measuring things in accordance with the SOP?				
Measurements				
Are all meters being cleaned/rinsed before and after obtaining measurements?				
Are all meters used properly as per manufactures directions and SWAMP SOPs?				
Is care taken not to disturb bottom sediments while obtaining measurements?				
Is care taken not to disturb upstream waters from where measurements are being obtained?				
Is field staff communicating constantly during the monitoring and field data sheet recording process?				

Notes:

6b. Biological Sampling Procedures

Item	Y	N	N/A	Comments and Suggested Corrective Actions
Benthic Macro Invertebrate Collection				
Determine Collection Locations – Were collection locations determined according to high or low gradient procedures?				
Transect Layout – Were transect locations correctly identified and adequately marked?				
Net Placement – Is the sampling net correctly placed in the substrate and perpendicular to flow?				
Substrate Excavation Adequacy – Is the substrate adequately scrubbed of all BMIs?				
Substrate Excavation Duration – Is the substrate scrubbed for a consistent duration (1-3 minutes) and in accordance with the type of substrate?				
Substrate Excavation Depth – Is the substrate excavated to a depth (4-6 inches) adequate to collect all BMIs?				
Excavated Material Cleaning – Is staff taking precautions that no BMIs are lost when large material is cleaned from the net?				
Handling of Excavated Material – Is staff taking precautions that no BMIs are lost when transporting the net between collection locations?				
Compositing of Excavated Material – Is staff taking precautions that no excavated material is lost when compositing and placing material in jars?				
Labeling of Samples – Are all jars labeled according to the SOP?				
Collection of Duplicates – Are all procedures required for collecting duplicate samples followed according to SOP?				
Sampling Spot – Is the substrate to be sampled at each point correctly identified (and has not been recently disturbed by bug sampling or otherwise)?				
Sampling Area – Is staff sampling just the area specified as per the SOP?				
Protection of Sample Integrity – Is staff making sure that specimens are kept out of direct sunlight, away from heat, and protected from desiccation during sampling and sample processing?				

Item	Y	N	N/A	Comments and Suggested Corrective Actions
Algae Collection				
Determine Collection Locations – Were collection locations determined according to high or low gradient procedures?				
Transect Layout – Were transect locations correctly identified and adequately marked?				
Sampling Spot – Is the substrate to be sampled at each point correctly identified (and has not been recently disturbed by bug sampling or otherwise)?				
Sampling Area – Is staff sampling just the area specified as per the SOP?				
Labeling of Samples – Are all jars labeled according to the SOP?				
Collection of Duplicates – Are all procedures required for collecting duplicate samples followed according to SOP?				
Cobble/Wood/Macrophyte Substrates – Is staff making sure that substrate is placed in a tub such that the sampling spot (upper surface) of the substrate is kept track of; non-target material cannot slough off substrate into tub; target material is not lost from the substrate/sample?				
Silt/Sand/Fine Gravel Substrates – Is the PVC delimiter's edge "sharp" and clearly marked with a 1cm depth indicator?				
Silt/Sand/Fine Gravel Substrates –Is the delimiter inserted into substrate to a depth of 1 cm.?				
Silt/Sand/Fine Gravel Substrates –Was target material lost during the collection process?				
Silt/Sand/Fine Gravel Substrates –Was excess material cleared off spatula prior to adding material to tub?				
Macroalgal Substrates – Was a PVC delimiter used and was the entire thickness of the algal clump collected within the delimiter.				
Macroalgal Substrates – Was the macroalgal mat unnaturally stretched or bunched up prior to isolating the area to be sampled?				
Macroalgal Substrates – Was the excess material (algae outside of the PVC delimiter) cleanly cut away (not pulled) prior to adding the specimen to the tub?				
Macroalgal Substrates – Was any target material lost in the process of collecting the sample?				
Isolation of Specimen from Substrates: Cobble/Wood/Macrophyte – Was a rubber delimiter used on the appropriate spot on the substrate?				

Item	Y	N	N/A	Comments and Suggested Corrective Actions
Isolation of Specimen from Substrates: Cobble/Wood/Macrophyte –Did specimen collection (i.e., scrubbing, rinsing) occur only on the area within the delimiter?				
Isolation of Specimen from Substrates: Cobble/Wood/Macrophyte –Did the sampler check to make sure area sampled is rough, possibly different color, and free of algae after sampling?				
Isolation of Specimen from Substrates: Silt/Sand/Fine Gravel – Was the substrate thoroughly massaged and rinsed well (to the color of very weak tea or clearer) before separating the cleaned substrate from liquid and dumping substrate				
Isolation of Specimen from Substrates: Silt/Sand/Fine Gravel – Was the microalgal suspension (including any rinse water used) well agitated and transferred to a clean graduated cylinder in a manner that excludes most silt, etc.?				
Isolation of Specimen from Substrates: Bedrock/Boulders/Concrete – Is staff using a properly constructed syringe scrubber?				
Isolation of Specimen from Substrates: Bedrock/Boulders/Concrete – Was a new scrubber pad used for each sampling (or at least between sites)?				
Isolation of Specimen from Substrates: Bedrock/Boulders/Concrete – Was the scrubber rotated at least 3x flush against the substrate while maintaining a good seal with the barrel, and carefully removed from the stream to minimize potential for loss of material?				
Isolation of Specimen from Substrates: Bedrock/Boulders/Concrete – Was the scrubbed spot on the substrate checked to ensure sample material was adequately removed?				
Composite Sample Preparation –Was the total volume of composite liquid measured, including rinse water, and recorded on data sheets, sample labels and the Chain of Custody (CoC)?				
Aliquotting Samples – Was the sample adequately agitated immediately before ear pouring?				
Macroalgal clump processing: soft-bodied sample – Watch to see if all of the potentially different types of macro algae are evenly layered atop one another in equal lengths and rolled into a cylinder?				

Item	Y	N	N/A	Comments and Suggested Corrective Actions
Macroalgal clump processing: soft-bodied sample – Watch to see if ¼ of the rolled cylinder is measured and isolated and placed in soft-bodied sample tube.				
Macroalgal clump processing: soft-bodied sample – Was the remainder properly stored in cooler on wet ice?				
Taxonomic ID sample fixing and storage – Watch to see if the diatom sample is fixed immediately with formalin for final concentration of 2%; soft-bodied sample, if unfixed, is stored immediately on wet ice and in the dark; all sample tubes properly labeled and taped; proper safety precautions are taken when handling fixative (i.e., done only in well ventilated area; goggles and gloves are worn; fixative is stored in an appropriate container; tubes are kept on a centrifuge rack to free up hands).				
Taxonomic ID sample fixing and storage – Watch to see if the diatom sample is fixed immediately with formalin for final concentration of 2%; soft-bodied sample; or if unfixed, is stored immediately on wet ice and in the dark.				
Taxonomic ID sample fixing and storage – Were all sample tubes properly labeled and taped?				
Taxonomic ID sample fixing and storage – Were proper safety precautions taken when staff was handling the fixative (i.e., done only in well ventilated area; goggles and gloves are worn; fixative is stored in an appropriate container?				
Taxonomic ID sample fixing and storage – Were sample tubes kept in a rack to free up hands and keep the sample from spilling?				
Biomass Samples, General – Watch to see if the filter tower apparatus is always cleaned before use and between uses, and rubber o-rings are confirmed to be in place.				
Biomass Samples, General – Watch to see if 25mL is measured in a small grad. cylinder (or a smaller volume is used, only if necessary).				
Biomass Samples, General – Watch to see if proper pressure/vacuum is being applied and that the maximum allowable psi is not exceeded during filtering.				
Biomass Samples, General – Watch to see that the proper pore size, glass-fiber filters are used.				

Item	Y	N	N/A	Comments and Suggested Corrective Actions
Biomass Samples, General – Were the filters folded with sides containing material folded inward and wrapped carefully in a labeled Whirlpak, and shoved into wet ice?				
Biomass Samples, General – Were the final volumes that were filtered recorded, for each filter, on the data sheet and sample labels?				
Chlorophyll a – Watch to see if non-algal leaves are removed from the filter; filter is placed in Petri dish and wrapped in foil.				
AFDM – Watch to see if a precombusted filter is used; non-algal organic material (e.g., leaves, twigs, bugs) is removed from filter.				
Algal PHab – Watch to see if proper procedures are followed for determining micro- and macro-algal cover during the pebble count (correct assessment of point-interception of attached and unattached macroalgae; correct assignment of thickness and distinguishing from silt slime; always assesses microalgal cover on the substrate that is highest up in the water column… i.e., exposed to the sun; correct recording of dry sampling points vs. moist points with zero surface water depth as per SOP).				
Collection of Qualitative Soft-Bodied Algae Sample – Watch to see if the qualitative algal sample was collected and properly labeled and kept in the dark on wet ice; stream was examined with sufficient rigor to collect a reasonably exhaustive sample.				
Avoidance of Cross-Contamination – Has staff scrubbed and rinsed all equipment that touches algae since leaving the previous site and before leaving to the next site?				

Notes:

6c. Physical Habitat Analysis

Item	Y	N	N/A	Comments and Suggested Corrective Actions
Field Data Sheets– Have all field data sheets been filled out completely and correctly?				
Field Personnel Communication– Is field staff communicating constantly during the rating procedures?				
Field Personnel Verification and Agreement – Are all personnel in agreement on the rating procedure and verify what is recorded on the field data sheets?				
Reach Length- Is staff correctly determining the reach length as per the SOP?				
Notable Field Conditions- Is staff assessing these questions properly?				
Flow Habitat Delineation – Is staff assessing the correct area and assessing the existing flow-habitats in accordance with the SOP?				
Depth and Pebble Count + CPOM– Is staff properly locating the sampling point and then assessing and measuring things in accordance with the SOP?				
Macroalgal Cover- Is staff properly locating the sampling points and correctly determining the presence/absence of macroalgae and type (attached vs. unattached) in accordance with the SOP?				
Microalgal Presence and Thickness- Does staff assess microalgal (biofilm) presence, and measure thickness, correctly per the SOP? Does staff understand when it is appropriate to utilize "UD" for sampling points when is it not possible to determine whether or not microalgae is present?				
Macrophyte Cover- Is staff correctly identifying what constitutes a macrophyte and determining the presence/absence in accordance with the SOP?				
Cobble Count- Is staff recording cobble encountered while conducting pebble counts and/or finding "random cobble" as per SOP?				
Cobble Measurements- Is staff measuring cobble encountered while conducting pebble counts and measuring "random cobble" as per SOP?				
Item	**Y**	**N**	**N/A**	**Comments and Suggested**

				Corrective Actions
Channel Sinuosity – Is staff implementing this component of the procedure according to procedures described in the SOP for the gradient of the reach being monitored (slope and length)?				
Stream Gradient– Is staff measuring the percent slope and sinuosity of the stream reach measured according to procedures described in the SOP (bearings taken in coordination with sinuosity and length)?				
Canopy Cover– Is staff using a properly modified densiometer and obtaining measurements correctly in accordance to the SOP?				
Riparian Vegetation- Is staff assessing the correct area and elevation zones and properly estimating percent areal cover?				
Instream Habitat Complexity- Is staff assessing the correct area and estimating the percentage of the nine different in channel habitats being addressed?				
Human Influence- Is staff assessing the correct area and rating conditions properly in accordance with the SOP?				
Bank Stability – Is staff ensuring that this component of the procedure is rated according to procedures described in SOP				
Wetted Width- Is staff correctly identifying the wetted edge and measuring the wetted width?				
Bankfull Dimensions- Measuring bankfull dimensions are difficult. Is staff discussing this measurement and going about things in a manner as addressed within the SOP and its reference documents for these measurements?				
Channel Alteration Visual– Is staff following the procedure and using the rating criteria according to procedures described in the SOP?				
Sediment Deposition Visual– Is staff following the procedure and using the rating criteria according to procedures described in the SOP?				
Epifaunal Substrate/ Available Cover Visual– Is staff following the procedure and using the rating criteria according to procedures described in the SOP?				
Stream Flow Determination – Is staff measuring stream flow in accordance with the SOPs for the method used?				
Sampling Reach Photo-documentation – Is staff taking digital photos at transects specified and in the direction as described in the SOP?				
Item	**Y**	**N**	**N/A**	**Comments and Suggested**

				Corrective Actions
Visual Physical Habitat Assessment				
The Visual Physical Habitat Assessment was a part of the California Stream Bioassessment Procedure (CSBP) and a part of the Basic Bioassessment SOP (SWAMP 2007) and not the full Bioassessment SOP SWAMP 2007). <Refer to the CSBP SOP or EPA's Visual Habitat Assessment SOP.>				
Field Data Sheets– Have all field data sheets been filled out completely and correctly?				
Field Personnel Communication– Is field staff communicating constantly during the rating procedures?				
Field Personnel Verification and Agreement – Are all personnel in agreement on the rating procedure and also verifying what is recorded on the field data sheets?				
Reach Length- Did staff correctly determine the reach length as per the SOP?				
Sediment Deposition Visual – ensure that this component of the procedure is rated according to procedures described in SOP				
Epifaunal Substrate/ Available Cover Visual– Ensure that this component of the procedure is rated according to procedures described in the SOP.				
Visual Riparian Estimates – Does staff ensure that all components are properly rated in accordance with the SOP?				
Embeddedness – Does staff ensure that this component of the procedure is rated according to procedures described in the SOP for *high gradient reaches*?				
Pool Substrate Characterization – Does staff ensure that this component of the procedure is rated according to procedures described in the SOP for *low gradient reaches*?				
Velocity/ Depth Regimes – Does staff ensure that this component of the procedure is rated according to procedures described in the SOP for the appropriate *gradient (high, low)*?				
Pool Variability – Does staff ensure that this component of the procedure is rated according to procedures described in the SOP for *low gradient reaches*?				
Channel Flow Status – Does staff ensure that this component of the procedure is rated according to procedures described in SOP?				
Item	**Y**	**N**	**N/A**	**Comments and Suggested**

				Corrective Actions
Frequency of Riffles (or bends) – Does staff ensure that this component of the procedure is rated according to procedures described in the SOP for *high gradient reaches*?				
Vegetative Protection – Does staff ensure that this component of the procedure is rated according to procedures described in the SOP?				
Riparian Vegetative Zone Width – Does staff ensure that this component of the procedure is rated according to procedures described in the SOP?				
EPA Visual Physical Habitat Assessment/ California Rapid Bioassessment Visual Habitat Assessment Methods – Were field crews assessed independently within the same reach?				
EPA Visual Physical Habitat Assessment/ California Rapid Bioassessment Visual Habitat Assessment Methods – Was the field crew assessed against the Lead assessors' VPHA scores?				
California Rapid Assessment Method (CRAM) – Does staff ensure that this component of the procedure is conducted according to procedures described in the CRAM SOPs and CRAM QA recommendations?				

Notes:

6d. Describe Field Team Coordination

Provide: Number of field personnel. How data was recorded? How the data collection activities were divided amongst the field crew personnel? How disputes or uncertainties in data collection were dealt with? …

7. Post Field Activities

Item	Y	N	N/A	Comments and Suggested Corrective Actions
Biological Sample COC – Inspect to see that all information was provided on the Chain-of-Custody form.				
Water Chemistry Measures – Inspect field data sheets to see if all parameters of water chemistry were measured in accordance to procedures described in the SOP.				
GPS Coordinates – Inspect field data sheets to ensure that the latitude and longitude of the sampling location is measured as described in the SOP.				
Sampling Event Comments – See if staff ensures that at the end of the sampling events, comments specific to the event are recorded on the field form.				
Equipment Count- Is all equipment accounted for (before and after field activities)?				
Aquatic Invasive Species Decontamination- Is equipment, including boots and waders, decontaminated as per methods contained in the SWAMP AIS Website?				
Post Event Calibration Check- Were meters, probes and or test kits checked against traceable and certified standards/buffers.				

Notes:

8. Shipping

Item	Y	N	N/A	Comments and Suggested Corrective Actions
Is there a chain of custody (COC)?				
Verify holding time compliance.				
Verify sample is preserved as per SOP(s) and QAPP.				
Are sample containers sealed with tape?				
Are glass bottles cushioned to prevent breakage?				
Are ice chests sealed before shipping?				
Is a COC enclosed in each shipment and container (ice chest, box)?				
Are courier services able to deliver samples to the lab on time (refer to holding times in the QAPP)?				
Have there been problems with the receiving lab receiving samples with inappropriate temperatures or sample preservation from this program/staff previously?				

Notes:

9. Data Management

Item	Y	N	N/A	Comments and Suggested Corrective Actions
Oversight				
Is there a QA officer?				
How are anomalies handled (e.g., out of range samples, non-detects, matrix spikes, replicates, outliers)?				
Field Data Sheet Review				
Are field forms complete?				
Are field forms legible?				
Are numbers written to include all significant figures?				
Do data sheets have a proper storage location?				
Is there proper use of vocabulary (no abbreviations)?				
Is data checked for transcription errors?				
Is a percentage of data hand-checked (for data entry)?				
Verification				
Is the field data verified (e.g., units, conversions, quality control) against the actual field data sheets (or the electronic equivalent)?				
Were holding times met?				

Notes: