

Clean Rivers Program Audit Checklist

Directions for use: This checklist can be used to conduct Clean Rivers Program on-site project oversight/assessment activities. It is designed to evaluate the entire data collection process through final reporting of results. The checklist is provided in sections and should be modified to fit the scope of either a readiness review or a monitoring systems audit. Sections can be used by themselves to do an audit targeted towards a very specific function. Following the assessment, the completed checklist should be used to generate a report.

Operation	Yes	No	Comments
Section 1 - Documents (This section requires the examination of completed records. The auditor should record documented evidence in the comment section)			
Is there documentation of QAPP distribution as required by the basin-wide QAPP and also amendments and appendices, if applicable?			
Are there copies of QAPP adherence letter to the basin-wide QAPP on record for all sub-tier participants?			
Does the Quality Assurance Officer keep a non-conformance record and implement the corrective action procedure as described in the QAPP?			
Have any corrective action reports been generated associated with the current QAPP?			
Has the Quality Assurance Officer implemented the field training documentation requirement as described in the QAPP?			

Operation	Yes	No	Comments
Section 2 - Facility and Equipment (This section requires the examination of completed records. The auditor should record documented evidence in the comment section)			
Does the facility have adequate storage for field sampling equipment?			
What field equipment is available? (specify)			
Are multi-probe instruments stored in a temperature controlled environment?			
Are probes and field equipment stored dry with connectors separated and open to the air?			
Are multi-probe sensors rinsed upon return from the field and kept moist during storage?			
Are there thermometers in ovens, incubators, & refrigerators?			
Are thermometer temperatures checked and documented daily (or as required) and units adjusted?			
Are thermometers calibrated annually?			
Is deionized or other laboratory pure water available? (describe)			
Is DI water conductivity checked and documented daily?			
Are balances and weights calibrated annually?			

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Section 3 - Calibration and Maintenance of Field Instruments (This section requires the examination of completed records. The auditor should record documented evidence in the comment section)			
Are calibrations documented in log books or on field data sheets?			
Is calibration performed in a temperature controlled environment?			
Are calibration standards stored in a temperature controlled environment?			
Are commercial or prepared standards used for conductivity calibration?			
Are commercial or prepared standards used for pH calibration?			
Are calibration standards used within their expiration date?			
Are buffers and standards dated upon receipt and when opened?			
What calibration sequence is followed? (Answer - specific conductance, pH, DO)			
Is each sensor allowed to equilibrate for 2 minutes (or until stable) before calibrating?			
Is the multi-probe instrument calibrated with a standard with about the specific conductance of the water to be sampled?			

Are pH buffers of 4.0 and 7.0 used to calibrate when measuring pH in naturally acidic water?			
Are pH buffers of 7 and 10 used to calibrate when measuring pH in naturally basic waters?			
Is DO calibration performed by % saturation or mg/L? (specify)			
How is the local barometric pressure determined? (specify)			
Except for coastal areas, how is the local area altitude obtained so that barometric pressure may be decorrected? (specify)			
During DO sensor calibration, is the water level just below the O-ring?			
During DO sensor calibration, are water droplets on the membrane removed with a tissue?			
During DO sensor calibration, is a lid or cap placed over the calibration cup to limit breezes?			
Are post-calibrations performed during every sampling run?			
Are post-calibration limits adhered to?			
Based on the examination of calibration log books, are post-calibrations acceptable?			
Are records of maintenance documented in equipment log books?			

Explain the routine maintenance conducted on field equipment. (What, when, how, etc.)			
Are spare parts and/or backup equipment maintained?			

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Section 4 - Documentation (This section requires the examination of completed records. The auditor should provide documented evidence in the comment section)			
Are project staff those documented in the QAPP?			
Is the TCEQ SWQM procedures manual and QAPP available to staff?			
Is the monitoring plan in the QAPP followed?			
Are field forms filled out with indelible ink with errors corrected using a single line with an initial and date?			
Is the field data sheet or field log used the one specified in the QAPP?			
Are the following sample collection activities documented on data sheets or in field logs?			
a. Station ID?			
b. Location?			
c. Date & time & depth?			
d. Sample collector's name/signature?			
e. Values for all measured field parameters?			
f. Detailed observational data (e.g., water appearance, weather)?			
g. Other observational data (as applicable) (e.g., biological activity, stream uses, unusual odors, missing parameters)?			
Is the COC form used consistent with the form in the QAPP?			
Is the following information documented on the COC form?			
a. Date and time of collection			

b. Site identification			
c. Sample matrix			
d. Number of containers			
e. Preservative used			
f. Analyses required			
g. Name of collector			
h. Custody transfer signatures			
Are labels affixed to containers, or are the bottles written on with indelible ink?			
Is the following information labeled on the sample?			
a. Site identification			
b. Date and time of sampling			
c. Preservative			
d. Designation of field-filtered			
e. Sample type (e.g. conventional, dissolved metals, organics, etc.)			
Are field notebook or log entries made in permanent ink?			
Are field notebook or log errors crossed out with a single line, dated, and initialed?			
Are documents retained and handled in accordance with the current QAPP?			
Is documentation citing sub-participant commitment to the QAPP maintained?			
Is field training documented?			
Is a QAPP distribution list maintained?			
Is each sample transfer documented with a signature on the COC form?			
Is there a Nonconformance Report to log deficiencies?			
Are corrective action reports prepared to address nonconformances?			

Does the QAO have records of field staff training?			
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Section 5 - Field Analysis			
Is the TCEQ Surface Water Quality Procedures Manual followed?			
Are in situ or bucket measurements performed on DO, temperature, pH, and conductivity? In situ measurements should be taken when possible. The auditee should explain why bucket samples are taken.)			
If buckets are used for field measurements, is the bucket shaded from sunlight and temperature recorded immediately after collection before the sample begins to warm?			
When measuring conductivity, is the probe placed carefully in the water to avoid the entrapment of air?			
Is salinity reported in cases of estuarine or marine water bodies?			
When measuring field parameters, are the sensors allowed to equilibrate for at least 2 minutes before taking the readings?			
What depth are field measurements taken in water bodies less than 1.5 feet? (Answer - 1/3 the water depth measured from the surface)			
What depth are field measurements taken in water bodies between 1.5 ft and 5 ft in depth? (Answer - 1 ft below the surface)			
Are vertical profiles taken in water bodies >5 ft?			

Is DO, temperature, pH, and salinity reported to the nearest tenth place?			
Is conductivity reported to 3 significant figures?			
When measuring secchi disk transparency, is the mathematical average computed from the depth at which the disk disappeared and the depth to which it reappeared?			
In cases of shallow, clear water bodies, is the secchi disk transparency reported as > the depth of the water body?			
Is secchi disk transparency reported to 2 significant numbers?			
Is flow severity reported correctly? (Answer - 1=no flow, 2=low flow, 3=normal flow, 4=flood, 5=high flow, 6=dry)			
When a flow severity of 1 is reported, is the instantaneous measurement of flow reported as "0.0" cfs?			
If the stream bed holds no water and the flow severity reported as 6 (meaning dry) is any value reported for flow? (Answer-no)			
Are days since last significant precipitation recorded?			
If it raining when samples are collected, what is reported for days since last significant precipitation? (Answer - <1day)			

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Section 6 - Flow Monitoring			
Are flow measurements performed?			
Is a visual flow estimate made prior to performing the flow measurement?			
What type of flow meter is used?			
Discuss selection of flow measurement sites (laminar flow?)			
If an ideal site is not available, is the cross section modified to provide acceptable conditions?			
How is stream width measured?			
If the stream is <10ft wide, how many cross sections are required?(10)			
If the stream >10 ft wide, how many cross sections are required? (20)			
Are velocity measurements made at the mid-point of each cross section?			
Is depth of each cross section determined with a wading rod?			
Where in the cross section is velocity determined?			
How much time is allotted for each velocity determination?			
Are flow calculations correct? (Review computations)			

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Section 7 - Field Bacteriological Analysis			
Are bacteriological samples collected? E. coli, fecal coliform, or enterococcus?			
Are bacteriological samples placed on ice immediately upon collection?			
Are they collected at a depth of 1 foot in a direction away from the sampler?			
What containers are used for bacteriological sample collection?			
Are sample bags for bacteriological analyses not pre-rinsed?			
Is an air space in the sample container so that samples may be shaken prior to analysis?			
How and when is sodium thiosulfate added to fecal coliform containers?			
Are sample analyzed within the 6 + 2 hr hold time?			
For bacteriological analysis performed in the field, are dilutions performed to bracket the concentration?			
For bacteriological analysis performed in the field, is a complete log kept with sample location, dilution, counts, analyst, etc.			
For bacteriological analysis performed in the field, is the initial and final incubator temperature checked and recorded?			

Are incubators maintained at 35+/- .5 for Colilert analysis?			
For bacteriological analysis performed in the field, is time in and time out of the incubator checked and recorded?			

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Section 8 - Sample Collection			
Describe types of samples collected (i.e., analyses to be performed)			
Are water samples for parameter collected consistently with the parameters specified in the QAPP, Table A7? (Auditee should itemize samples collected)			
Are samples collected directly from the centroid of flow whenever possible or is sampling equipment used? (describe)			
Is the sample bucket (if applicable) rinsed 3 times between sites?			
Are sampling containers used as specified in the QAPP? (describe) Are chlorophyll samples collected in amber bottles?			
Is sample preservation, including icing, performed in the field immediately upon collection?			
Are field splits collected for all samples on a 10% basis at a frequency of no less than once per week?			
Are field equipment blanks collected for metals in water samples once per day or on a 10% basis if > 10 sample are collected in one week?			
Is quality-assured sample equipment being used for metals-in-water samples?			
Are pre-cleaned, certified containers used for metals-in-water samples?			

Is a clean hand/dirty hand approach used for dissolved metals-in-water sample collection and filtration?			
Are dissolved metals-in-water samples filtered in the field in a clean room (e.g. box) atmosphere?			
Are dissolved metals-in-water samples preserved in the field? What amount of acid?			
What type of equipment is used for sediment analysis?			
In cases where wading is possible, is the dredge mounted on a pole rather than on a rope?			
After the dredge has accepted the sediment sample, is the dredge gently tipped to one side and the overlying water decanted?			
Is the sediment sample deposited in a clean plastic pan for inspection prior to be put in a container?			
Is only the top aerobic layer or two subsampled and put into the sample container?			

Operation	Yes	No	Comments
Section 8 - Biological Sampling			
Describe the type of biological monitoring performed.			
Describe training of biological monitors.			
Are appropriate staff included on a current TPWD scientific collection permit?			
Is the field staff in possession of the current permit?			
Are electric shocking and seining employed during all fish surveys?			
Is electroshocking performed for a minimum 15 minutes?			
Are a minimum of 6 seine hauls performed?			
Describe level of taxonomic ID for fish?			
Describe how voucher specimens are maintained and questionable specimens are verified?			
Are 100 organism subsamples routinely counted for benthic data if kicknets are used to collect?			
Describe level of taxonomic identification for benthic data.			
Are habitat surveys conducted during each biological event?			
Is instantaneous flow measured and recorded for each biological event?			

Operation	Yes	No	Comments
Section 9 - Sample Receipt/Sample Control			
Is the chain -of- custody record checked to be sure it matches sample labels?			
Does a system exist for logging in samples and assigning sample ID numbers?			
Are sample containers checked to be sure they are intact?			
Are specified holding times adhered to?			
How are samples stored?			
Is access to samples controlled?			
Are samples and standards stored separately?			
Are samples returned to storage at the end of the day?			
Is the temperature monitored in the storage units (4 +/-2 C)?			

Operation	Yes	No	Comments
Section 10 - Data Management, verification, and validation			
Who is the Data Manager? What is this person's role in respect to data management?			
Who is the QAO? What is this person's role in respect to data management?			
Does the data manager keep a log of database activities, either electronically or hardcopy?			
How are field data entered into the planning agency database?			
Who reviews field data for conformance with TCEQ SWQM Procedures and QC requirements and how is this review documented?			
Who performs a review of precalibration records and post calibration error checks to ensure they comply with error limits and how is this review documented?			
Who checks field data calculations, reductions, and transcriptions and how is this check documented?			
How are lab data entered into the planning agency database?			

Who reviews laboratory data for conformance with QAPP requirements including sample handling and chain of custody, analytical and QC requirements to include documentation, holding times, sample receipt, sample preparation, sample analysis, project and program QC results, and reporting ? How is this review documented?			
Who checks lab data calculations, reductions, and transcriptions and how is this check documented?			
Who checks to be sure reporting limits are consistent with CRP requirements and how is this documented?			
Who evaluates analytical QC information to determine its impact on individual analyses and how is this documented?			
Who checks to be sure all laboratory samples analyzed for all parameters and how is this documented?			
Who evaluates data sets(to include field and laboratory data) for reasonableness and if corollary data agree and how is this documented?			
Who confirms outliers, how is this done, and how is this documented?			
Who checks field QC sample results to see they were analyzed and the results are acceptable? How is this review documented?			
Sampling and analytical data gaps checked to ensure data are from sites on the coordinated monitoring schedule?			

What role does the project manager play in confirming the reportability of data to the TCEQ?			
What are the verification/validation procedures for entering data from a cooperating partner?			
How are field data entered into the database?			
How are lab data entered into the database?			
Does the data manager have review protocols that check for the following? (Explain)			
a. data formatting errors			
b. record inconsistencies			
c. parameter code violations (i.e., not listed in the QAPP)			
d. spelling errors			
e. duplicate records			
f. key fields that do not contain information			
g. missing values			
h. outliers			
i. orphans			
j. reporting limits not in QAPP			
k. Stations not in the QAPP			
l. parameter codes not in the QAPP			
What is the process for submitting SLOC forms to the TCEQ?			
Does the laboratory report contain the elements described in the QAPP?			
Are quality-assured data maintained on planning agency internet site?			
Describe the data correction process?			