APPENDIX C: WATER QUALITY DATA ELEMENTS FOR POPULATION AND COMMUNITY LEVEL ANALYTES

Water Quality Data Elements for Reporting Results of Population/Community Biological Assessments
May 2005

Data Elements	Definition
1.0 Contact Information Module	See Chemical/Microbiology Data Elements
2.0 Results Module	
2.1 Result/Endpoint Value	Reportable numerical measure of the result for the biological organism, or other characteristic, being analyzed.: index score, metric value, density, biomass, etc.
2.1.1 Measure Name**	(Alternate Names: Parameter, Taxon, Metric, Index) Metric = measure of biological attribute (e.g. EPT, % lithophils, % Sensitive Diatoms) index = aggregated number used to judge condition (e.g. IBI, RBP, RIVPACS)
2.1.2 Unit of Measure	The name of the determinate quantity for a standard of measurement used for measuring dimension, capacity, or amount of something. e.g. count, mg
2.1.3 Confidence Intervals**	The values representing the lowest and highest confidence level
2.1.4 Confidence Level**	The percent confidence associated with the confidence levels; i.e., 95%, 99%
2.1.5 Method of Comparison**	The basis for comparison that yielded the sample result or endpoint. For example, compared to reference condition, upstream sample.
2.1.6 Statistical Methods Used**	Statistical test(s) used to obtain result or endpoint value (e.g., t-test, ANOVA, ordination or other multivariate method)
2.1.7 Modifications to method if any**	Text describing alterations to published methods; metric substitution, etc.
2.1.8 Method citation**	Reference citation (preferably published) for assessment method or metric calculation (including formula) used
3.0 Reasons for Sampling Module	
3.1 Reason for Sample Collection	A text field to include such reasons as: (a) Reconnaissance/Occurrence Survey (b) Trend analysis (c) Permit Compliance (d) Pollution Event (e) Storm Event (f) Research (g) Regulatory benchmark (h) Bioaccumulation (i) Deposition (j) Other entries as applicable
3.2 Sampling Design Used	Type of sampling design used to identify sampling sites: probabilistic, stratified-random, targeted, systematic
3.3 Data and/or Measurement Quality	Brief summary of MQOs in relation to biological

Objectives**	analysis; for example, sample precision, RSD ≤ 20%.
4.0 Date/Time Module	
4.1 Sample Collection Start Date	See Chemical/Microbiology Data Elements
4.2 Sample Collection Start Time	See Chemical/Microbiology Data Elements
4.3 Sample Collection End Date	See Chemical/Microbiology Data Elements
4.4 Sample Collection End Time Measure	See Chemical/Microbiology Data Elements
5.0 Sample Location Module	
5.1 Water Body/Aquifer Name	See Chemical/Microbiology Data Elements
5.1.1 Water Body Use Classification	Designated use classification of the water body sampled, if applicable
5.2 Sample Station Identifier	See Chemical/Microbiology Data Elements
5.2.2 River Mile*	River mile where the station is located, if applicable.
5.2.3 Reach*	EPA Reach code for where the station is located, if applicable
5.3 Sampling Station Type Name	See Chemical/Microbiology Data Elements
5.4 Latitude Measure	See Chemical/Microbiology Data Elements
5.5 Longitude Measure	See Chemical/Microbiology Data Elements
5.6 Horizontal Reference Datum	See Chemical/Microbiology Data Elements
6.0 Sample Collection Module	
6.1 Sample Type	See Chemical/Microbiology Data Elements
6.1.1 Assemblage Sampled*	The type of biological assemblage sampled (e.g., fish, periphyton, macroinvertebrates, etc.)
6.2 Media Sampled	See Chemical/Microbiology Data Elements
6.3 Sample Ambient Condition(s)*	For physical and/or water quality characteristics measured *in situ* at the time of the survey, refer to the following elements in the Chem/Micro data Elements list: 2.1 Parameter Value 2.1.1 Unit of measure 2.2.2 Parameter name 3.0 Reason for sampling 6.0 sample type 6.2 Media sampled 6.5.2 Instrument used For samples collected for detailed chemical analysis, refer to the Chem/Micro Data Elements modules 6.0 and 7.0
6.4 Sample Identification	See Chemical/Microbiology Data Elements
6.5 Sample Collection Method	
6.5.1 Sample Collection Device*	Name of the field gear used for sampling e.g. D-frame net, artificial substrate, seine, electroshocker
6.5.2 Area or Volume Sampled**	Area of media sampled; e.g. 1 m^2 of stream bottom
6.5.3 Written Sampling Method Citation**	Reference citation (preferably published) for

	sampling method used.
6.5.4 Certification/Training Status Of Sampler Personnel**	Text providing any certification or experience level of personnel sampling: e.g. agency-trained/certified personnel.
6.5.5 Sample Composite Method**	Text indicating the way in which samples were composited in the field prior to processing, if any: e.g. Depth-integrated composite, time-integrated composite, area-integrated, habitat-integrated, none.
6.6 Sample Processing	
6.6.1 Field Or Lab Processing**	Indicate whether samples were processed in the field or lab. For samples preserved for transport to lab, begin at 6.6.2. For samples processed in situ, go to 6.6.9.
6.6.2 Container type	For microbiological/plankton/algal samples; See Chemical/Microbiology Data Elements
6.6.3 Container color	For microbiological/phytoplankton/algal samples; See Chem/Micro Data Elements
6.6.4 Container size	For microbiological/plankton/algal samples; See Chemical/Microbiology Data Elements
6.6.5 Sample collection filtering code	For microbiological /plankton/algal samples; See Chemical/Microbiology Data Elements
6.6.6 Sample collection filtering comment text	For microbiological /plankton/algal samples; See Chemical/Microbiology Data Elements
6.6.7 Sample Volume	For microbiological /plankton/algal samples; See Chemical/Microbiology Data Elements
6.6.8 Sample Weight Collected	For microbiological /plankton/algal samples; See Chemical/Microbiology Data Elements
6.6.9 Preservation method	See Chemical/Microbiology Data Elements
6.6.10 Initial Device Used**	Indicate equipment used for initial processing such as screens, sieves, splitters.
6.6.11 Subsampling Method**	Text indicating method used to obtain subsamples for testing, if any: random aliquot
6.6.12 Homogenization Method**	Text indicating how sample was mixed prior to processing, if any: shaker, manual stirring?
6.6.13 Compositing Method**	Text indicating the way in which samples were composited during processing, if any.
6.6.14 Written Protocol Citation**	Citation for method used in sample processing.
6.6.15 Sample Storage Time**	Time, in days, over which sample was stored prior to processing.
6.6.16 Organism sorting efficiency	Measure of number of organisms isolated for taxonomic identification and enumeration versus organisms remaining in the sorted or picked sample

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7.0 Sample Analysis and QC Module

Note: Data elements 7.1 – 7.16 of the Chemical/Microbiological list may not be generally applicable to population – community data and are omitted here. Organizations should consult those elements to decide whether some are applicable to their program or study. Data element numbers in this module, therefore, do not correspond to element numbers in lists for other chemical/microbiological or toxicological data.

7.1 Organism Identification*	
7.1.1 Field or lab identification*	Indicate whether organisms were taxonomically identified in the field or lab
7.1.2 Device used*	Indicate equipment used for identification such as hand lens, dissecting scope
7.1.3 Organism Preparation*	Indicate how organisms were prepared prior to identification: dissection, slide-mounting, rose bengal staining, etc.
7.1.4 Organism Classification*	
7.1.4.1 Taxonomic resolution*	Indicate taxonomic level to which organisms are identified
7.1.4.2 Taxonomic Citations*	Taxonomic keys (preferably published) used as references in the identification process
7.1.4.3 Taxonomic Identifier	See Chemical/Microbiology Data Elements at 2.2
7.1.4.4 Taxonomic name	See Chemical/Microbiology Data Elements
7.1.4.5 Taxonomic verification procedures*	Text describing how taxonomic identifications are confirmed and cross-checked
7.1.4.6 Taxonomic precision*	e.g., % taxonomic agreement in QC samples; percent difference in enumeration in QC samples
7.1.4.7 Taxonomic accuracy*	e.g., use of reference or voucher specimens; qualitative evaluation of specimen condition (e.g., slide mounts) for identification
7.2 QA/QC Exception Flags (Test Acceptability Criteria Met?)	Flags should allow for (e.g.): Precision of field sampling method not met; high sorting or subsampling bias; reduced sorting efficiency; control limit for taxonomic identification exceeded; other deviations from established MQOs/DQOs.
7.3 QA/QC Exception Comment (Test Acceptability Notes)	Text indicating any comments or clarifications concerning how the data met or didn't meet certain acceptability criteria (e.g. inclement weather or dangerous conditions, sparseness of samples due to impairment, loss or damage of organisms, or samplers)

Elements marked with * denote ones that are unique to population-community data.
Elements marked with ** denote ones that are shared between toxicological and population-community data