



State of West Virginia
 Department of Administration
 Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

Request for Quotation

RFQ NUMBER
DEP15456

PAGE
1

ADDRESS CORRESPONDENCE TO ATTENTION OF
CHUCK BOWMAN 304-558-2157

VENDOR

RFQ COPY
 TYPE NAME/ADDRESS HERE

SHIP TO

ENVIRONMENTAL PROTECTION,
 DEPARTMENT OF
 DIV OF WATER AND WASTE MGT
 601 57TH STREET SE
 CHARLESTON, WV
 25304 304-926-0499

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
05/26/2011				

BID OPENING DATE: **06/23/2011** BID OPENING TIME **01:30PM**

LINE	QUANTITY	UOP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT
0001	1	LS		961-48		
FIELD TESTING SERVICES THE WEST VIRGINIA PURCHASING DIVISION, FOR THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, IS SOLICITING BIDS FROM QUALIFIED VENDORS FOR A CONTRACT TO PROVIDE PROCESSING AND IDENTIFICATION OF BENTHIC MACROINVERTEBRATE SAMPLES COLLECTED FROM WEST VIRGINIA WATERS, PER THE FOLLOWING SPECIFICATIONS, BID REQUIREMENTS, TERMS & CONDITIONS, AND THE ATTACHED BID SCHEDULE. EXHIBIT 3 LIFE OF CONTRACT: THIS CONTRACT BECOMES EFFECTIVE UPON AWARD AND EXTENDS FOR A PERIOD OF ONE (1) YEAR OR UNTIL SUCH "REASONABLE TIME" THEREAFTER AS IS NECESSARY TO OBTAIN A NEW CONTRACT OR RENEW THE ORIGINAL CONTRACT. THE "REASONABLE TIME" PERIOD SHALL NOT EXCEED TWELVE (12) MONTHS. DURING THIS "REASONABLE TIME" THE VENDOR MAY TERMINATE THIS CONTRACT FOR ANY REASON UPON GIVING THE DIRECTOR OF PURCHASING 30 DAYS WRITTEN NOTICE. UNLESS SPECIFIC PROVISIONS ARE STIPULATED ELSEWHERE IN THIS CONTRACT DOCUMENT, THE TERMS, CONDITIONS AND PRICING SET HEREIN ARE FIRM FOR THE LIFE OF THE CONTRACT. RENEWAL: THIS CONTRACT MAY BE RENEWED UPON THE MUTUAL WRITTEN CONSENT OF THE SPENDING UNIT AND VENDOR, SUBMITTED TO THE DIRECTOR OF PURCHASING THIRTY (30)						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE	TELEPHONE	DATE
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TITLE	FEIN	ADDRESS CHANGES TO BE NOTED ABOVE
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WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

GENERAL TERMS & CONDITIONS
REQUEST FOR QUOTATION (RFQ) AND REQUEST FOR PROPOSAL (RFP)

1. Awards will be made in the best interest of the State of West Virginia.
2. The State may accept or reject in part, or in whole, any bid.
3. Prior to any award, the apparent successful vendor must be properly registered with the Purchasing Division and have paid the required \$125 fee.
4. All services performed or goods delivered under State Purchase Order/Contracts are to be continued for the term of the Purchase Order/Contracts, contingent upon funds being appropriated by the Legislature or otherwise being made available. In the event funds are not appropriated or otherwise available for these services or goods this Purchase Order/Contract becomes void and of no effect after June 30.
5. Payment may only be made after the delivery and acceptance of goods or services.
6. Interest may be paid for late payment in accordance with the *West Virginia Code*.
7. Vendor preference will be granted upon written request in accordance with the *West Virginia Code*.
8. The State of West Virginia is exempt from federal and state taxes and will not pay or reimburse such taxes.
9. The Director of Purchasing may cancel any Purchase Order/Contract upon 30 days written notice to the seller.
10. The laws of the State of West Virginia and the *Legislative Rules* of the Purchasing Division shall govern the purchasing process.
11. Any reference to automatic renewal is hereby deleted. The Contract may be renewed only upon mutual written agreement of the parties.
12. **BANKRUPTCY:** In the event the vendor/contractor files for bankruptcy protection, the State may deem this contract null and void, and terminate such contract without further order.
13. **HIPAA BUSINESS ASSOCIATE ADDENDUM:** The West Virginia State Government HIPAA Business Associate Addendum (BAA), approved by the Attorney General, is available online at www.state.wv.us/admin/purchase/vrc/hipaa.htm and is hereby made part of the agreement. Provided that the Agency meets the definition of a Cover Entity (45 CFR §160.103) and will be disclosing Protected Health Information (45 CFR §160.103) to the vendor.
14. **CONFIDENTIALITY:** The vendor agrees that he or she will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the agency's policies, procedures, and rules. Vendor further agrees to comply with the Confidentiality Policies and Information Security Accountability Requirements, set forth in <http://www.state.wv.us/admin/purchase/privacy/noticeConfidentiality.pdf>.
15. **LICENSING:** Vendors must be licensed and in good standing in accordance with any and all state and local laws and requirements by any state or local agency of West Virginia, including, but not limited to, the West Virginia Secretary of State's Office, the West Virginia Tax Department, and the West Virginia Insurance Commission. The vendor must provide all necessary releases to obtain information to enable the director or spending unit to verify that the vendor is licensed and in good standing with the above entities.
16. **ANTITRUST:** In submitting a bid to any agency for the State of West Virginia, the bidder offers and agrees that if the bid is accepted the bidder will convey, sell, assign or transfer to the State of West Virginia all rights, title and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the State of West Virginia for price fixing and/or unreasonable restraints of trade relating to the particular commodities or services purchased or acquired by the State of West Virginia. Such assignment shall be made and become effective at the time the purchasing agency tenders the initial payment to the bidder.

I certify that this bid is made without prior understanding, agreement, or connection with any corporation, firm, limited liability company, partnership, or person or entity submitting a bid for the same material, supplies, equipment or services and is in all respects fair and without collusion or Fraud. I further certify that I am authorized to sign the certification on behalf of the bidder or this bid.

INSTRUCTIONS TO BIDDERS

1. Use the quotation forms provided by the Purchasing Division. Complete all sections of the quotation form.
2. Items offered must be in compliance with the specifications. Any deviation from the specifications must be clearly indicated by the bidder. Alternates offered by the bidder as **EQUAL** to the specifications must be clearly defined. A bidder offering an alternate should attach complete specifications and literature to the bid. The Purchasing Division may waive minor deviations to specifications.
3. Unit prices shall prevail in case of discrepancy. All quotations are considered F.O.B. destination unless alternate shipping terms are clearly identified in the quotation.
4. All quotations must be delivered by the bidder to the office listed below prior to the date and time of the bid opening. Failure of the bidder to deliver the quotations on time will result in bid disqualifications: Department of Administration, Purchasing Division, 2019 Washington Street East, P.O. Box 50130, Charleston, WV 25305-0130
5. Communication during the solicitation, bid, evaluation or award periods, except through the Purchasing Division, is strictly prohibited (W.Va. C.S.R. §148-1-6.6).



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	<p>DAYS PRIOR TO THE EXPIRATION DATE. SUCH RENEWAL SHALL BE IN ACCORDANCE WITH THE TERMS AND CONDITIONS OF THE ORIGINAL CONTRACT AND SHALL BE LIMITED TO TWO (2) ONE (1) YEAR PERIODS.</p> <p>CANCELLATION: THE DIRECTOR OF PURCHASING RESERVES THE RIGHT TO CANCEL THIS CONTRACT IMMEDIATELY UPON WRITTEN NOTICE TO THE VENDOR IF THE COMMODITIES AND/OR SERVICES SUPPLIED ARE OF AN INFERIOR QUALITY OR DO NOT CONFORM TO THE SPECIFICATIONS OF THE BID AND CONTRACT HEREIN.</p> <p>OPEN MARKET CLAUSE: THE DIRECTOR OF PURCHASING MAY AUTHORIZE A SPENDING UNIT TO PURCHASE ON THE OPEN MARKET, WITHOUT THE FILING OF A REQUISITION OR COST ESTIMATE, ITEMS SPECIFIED ON THIS CONTRACT FOR IMMEDIATE DELIVERY IN EMERGENCIES DUE TO UNFORESEEN CAUSES (INCLUDING BUT NOT LIMITED TO DELAYS IN TRANSPORTATION OR AN UNANTICIPATED INCREASE IN THE VOLUME OF WORK.)</p> <p>QUANTITIES: QUANTITIES LISTED IN THE REQUISITION ARE APPROXIMATIONS ONLY, BASED ON ESTIMATES SUPPLIED BY THE STATE SPENDING UNIT. IT IS UNDERSTOOD AND AGREED THAT THE CONTRACT SHALL COVER THE QUANTITIES ACTUALLY ORDERED FOR DELIVERY DURING THE TERM OF THE CONTRACT, WHETHER MORE OR LESS THAN THE QUANTITIES SHOWN.</p> <p>BANKRUPTCY: IN THE EVENT THE VENDOR/CONTRACTOR FILES FOR BANKRUPTCY PROTECTION, THE STATE MAY DEEM THE CONTRACT NULL AND VOID, AND TERMINATE SUCH CONTRACT WITHOUT FURTHER ORDER.</p> <p>THE TERMS AND CONDITIONS CONTAINED IN THIS CONTRACT SHALL SUPERSEDE ANY AND ALL SUBSEQUENT TERMS AND CONDITIONS WHICH MAY APPEAR ON ANY ATTACHED PRINTED DOCUMENTS SUCH AS PRICE LISTS, ORDER FORMS, SALES</p>					

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<p>AGREEMENTS OR MAINTENANCE AGREEMENTS, INCLUDING ANY ELECTRONIC MEDIUM SUCH AS CD-ROM.</p> <p>REV. 05/26/2009</p> <p style="text-align: center;">NOTICE</p> <p>A SIGNED BID MUST BE SUBMITTED TO:</p> <p style="text-align: center;">DEPARTMENT OF ADMINISTRATION PURCHASING DIVISION BUILDING 15 2019 WASHINGTON STREET, EAST CHARLESTON, WV 25305-0130</p> <p>THE BID SHOULD CONTAIN THIS INFORMATION ON THE FACE OF THE ENVELOPE OR THE BID MAY NOT BE CONSIDERED:</p> <p>SEALED BID</p> <p>BUYER: CB-23</p> <p>RFQ. NO.: DEP15456</p> <p>BID OPENING DATE: 06/23/2011</p> <p>BID OPENING TIME: 1:30 PM</p> <p>PLEASE PROVIDE A FAX NUMBER IN CASE IT IS NECESSARY TO CONTACT YOU REGARDING YOUR BID:</p> <p style="text-align: center;">-----</p> <p>CONTACT PERSON (PLEASE PRINT CLEARLY):</p> <p style="text-align: center;">-----</p>						

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DEP15456**BENTHIC MACROINVERTEBRATE SAMPLE PROCESSING
AND/OR IDENTIFICATION****AREA OF WORK/BID AWARD**

The West Virginia Department of Environmental Protection, Division of Water and Waste Management is seeking bids for the processing and identification of benthic macroinvertebrate samples collected from West Virginia waters. Benthic macroinvertebrates will be collected primarily from riffle/run habitats of flowing waters using rectangular frame kick nets. DWWM's Watershed Assessment Branch (WAB) performs the majority of the macroinvertebrate sampling. WAB collects an average of around 500 benthic macroinvertebrate samples annually.

Bids should be submitted by vendors in connection with the following:

- Sample pick-up and delivery
- Removal of organisms from stream debris – sorting the samples
- Identification of the sample to the genus level and electronic submission of results
- Legal representation (\$/hour)

Resumes of taxonomists including proof of North American Benthological Society (NABS) taxonomic certifications shall be included in the bid package or upon request prior to award.

QUALIFICATIONS/REQUIREMENTS

The West Virginia Department of Environmental Protection's (DEP) Division of Water and Waste Management (DWWM) conducts inspections of permitted and non-permitted facilities, investigates complaints, monitors ambient quality of surface water, groundwater and sediments, performs special studies, and provides water quality information to the citizens of West Virginia and other government agencies.

Legal action based upon benthic macroinvertebrate identification results is possible. Therefore, the vendor selected shall have a quality control program in place and shall meet the following qualifications:

1. Must have degreed biologists on staff performing the benthic macroinvertebrate identifications. NABS certification for genus level EPT (eastern) and genus level chironomidae (eastern) is required to perform the identifications. Identification of organisms by non-professional personnel or those without NABS certification is strictly forbidden. Biologists performing the identifications must be dedicated taxonomists; that is, the majority of their work on a daily basis involves the identification of benthic macroinvertebrates.
2. Must be capable of attending and providing expert testimony in legal proceedings, upon

request.

3. Minimum of 5 years of experience with sorting / identifying benthic macroinvertebrates.
4. Completed results must be delivered to DEP/DWWM according to the following schedule:
 - Samples submitted by April 1 are due August 31;
 - Samples submitted by August 31 are due Dec. 1;
 - Samples submitted by December 31 are due Feb. 28;
 - Results of smaller, site-specific projects must be available within one month of sample receipt or within some other negotiated time period.

Submissions shall include the following for each sample:

- a) benthic macroinvertebrate identifications reported in MS Excel or Access (WAB will provide a data template);
 - b) copies of bench sheets completed during identifications;
 - c) all organisms identified (except reference taxa specimens, which will be returned when the contract or project is complete);
 - d) all QA/QC information associated with sorting and identification of the samples.
5. Must be able to complete large-scale macroinvertebrate processing and identification projects (e.g., projects with >200 samples per year). Must have a minimum of 5 years of experience dealing with large-scale macroinvertebrate processing and identification projects (e.g., projects with >200 samples per year).

SCOPE

In administering and enforcing most of the pollution control laws of the state, the importance of quality control cannot be overstated. Quality control measures must be strictly adhered to in all phases of sample collection, preservation, transportation, and analysis. The quality control and analytical processes, as they relate to the vendor's responsibility, are divided into five (5) major steps:

- Step 1** - Receipt of sample at specified location – generally WAB office in Charleston, WV.
- Step 2** - Sorting of samples in a timely and professional manner.
- Step 3** - Identification of samples in a timely and professional manner.
- Step 4** - Establishment of continuing program to ensure the reliability of data (Quality Assurance/Quality Control).
- Step 5** - Legal Testimony

Step 1 - Receipt of Samples

Benthic macroinvertebrate samples will be collected by DEP/DWWM personnel. Due to the size of the sample containers (1 gallon jar) and the total number of samples collected annually (approx. 500), DEP/DWWM will not ship samples to the contractor using commercial transport such as UPS or Federal Express. Therefore, the vendor shall provide sample pick-up and delivery services. Generally, samples will be housed at DEP/DWWM's office in Charleston, WV. DEP/DWWM will bear the cost of sample transport, however, and the vendor shall include sample transport costs as part of the bid package. Typically, there are four to five sample pick-ups per year.

DEP/DWWM will provide Chain-of-Custody forms when samples are received by the vendor. The vendor shall be responsible for maintaining preservation of the samples and the internal chain of custody from the time the vendor obtains the samples until the results of benthic macroinvertebrate identifications are accepted by the DEP/DWWM. The vendor shall also maintain records of the results of identifications for a minimum of five (5) years.

Step 2 - Requirements for Sorting Benthic Macroinvertebrate Samples

Introduction

1. Benthic macroinvertebrate samples shall be sorted/processed in accordance with the procedures outlined below: "WVDEP Watershed Assessment Branch - Standard Operating Procedures for Processing Benthic Macroinvertebrate Samples". This procedure must be reviewed and understood fully before submitting bids.
2. For the majority of the samples, sorting requires removing a sub-sample consisting of 200 (+/- 20%) benthic macroinvertebrate organisms from the entire sample. Any vertebrates (salamanders, fish) encountered during subsampling should be retained with the sample, but not identified. Specimens should be stored in archival quality containers that will prevent loss of preservative through evaporation: glass vials with leak-proof screw caps, polypropylene jars with screw caps, etc.
3. Occasionally, the entire sample will need to be sorted and identified (i.e., artificial substrate samples and special surveys). DEP/DWWM will notify the vendor of these special cases and realizes that these samples may require significantly more time to process and identify than 200-organism subsamples. Therefore, vendors are asked to bid on whole-sample sorting separately.
4. Vendor will be responsible for examining sorting efficiency for 5% of all submitted samples for QA/QC purposes and reporting the information with each data submission.
5. Sorting macroinvertebrates from benthic survey samples (a procedure often referred to as "bug sorting") is an extremely important step in the biological research performed by the Department of Environmental Protection. The quality of the work performed by the "sorter" influences the quality of subsequent processes, such as identification and data analysis. A competent "sorter" must be able to recognize the morphological diversity of aquatic organisms, as well as the various methods these organisms may use to hide themselves from predators. The outcome of the final study may be affected, even if only a few organisms are

overlooked during the sorting process.

The processes described below were derived with some modifications from: Barbour, M. T. et al. "Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish", Second Ed., EPA 841-B-99-002. These protocols may be downloaded from the Internet at <http://www.epa.gov/owowwtr1/monitoring/rbp/download.html>.

Definitions

MACROINVERTEBRATES - Animals that are large enough to be seen with the naked eye and do not have a backbone.

BENTHIC ORGANISMS (or BENTHOS) - Living organisms that reside on the bottom of streams, rivers, or lakes. Benthos may be vertebrates, invertebrates, or plants.

REFERENCE COLLECTION – A reference collection is a set of specimens, each representing some taxonomic level and not necessarily limited to a specific project. For the purposes of DEP/DWWM's studies, a reference collection does not have to be limited to a particular watershed. Reference collections should have expert confirmation of each taxon. These collections are used to verify identifications of subsequent samples.

VOUCHER COLLECTION – The voucher collection consists of the actual specimens collected during the project. Following identification and enumeration, all specimens collected for this project should be maintained in a voucher collection. This collection will be returned to the DEP/DWWM.

Materials for Sorting

1. Sample Jar - Contains the unprocessed sample, which consists of benthic organisms and stream debris.
2. Sample Vial - for storage of processed sample. This container may be a plastic/glass vial or a larger plastic bottle. Most samples will fit into a 10 ml or 4-6 dram vial, however, large organisms such as crayfish and snails, will require larger vials/bottles.
3. Sorting tray - a homemade plastic or Plexiglas tray used to evenly distribute the sieved sample and for randomly selecting the sub-sample. The internal dimensions of the tray shall be 10 inches x 40 inches - divided into 100 2 inch x 2 inch grids.
4. White foam board or other schematic 10 inches x 40 inches – marked with 100 2 inch x 2 inch grids for placing sorting tray on to demark grids and randomly select them for sorting.
5. White Flat-bottom Pans – used for picking specimens removed from 100 grid sorting tray.
6. Denatured Alcohol - preservative used in unprocessed and processed samples.

7. Sieve - #30 sieves (595 um) are used to separate alcohol and fine debris from the sample prior to sorting.
8. Labels – Archival paper is used to internally identify the contents of the sample vials/bottles (i.e., the sorted sample) and self-adhesive labels are used to externally identify (if necessary) the sample vials/bottles. External labels may be omitted for samples stored in transparent glass containers, as long as the internal label is clearly visible.
9. Clear Tape - Used on label as additional external adhesive.
10. Pencil - used to label sample bottle.
11. Small container/vial used for short term, intermediate storage of the sample during the sorting process.
12. Forceps - Fine tipped forceps are used to remove the organisms from the debris.
13. 10X Illuminated Magnifier - an optical aid to illuminate and magnify the sample during the sorting process. Alternatively, magnifying visors and a desk lamp can be used.
14. Squirt bottle - filled with alcohol, used to rinse organisms into sample vial.
15. Plexiglas - used to cover sample partially sorted overnight to prevent evaporation.

Procedures for Sorting

1. Select the sample to be sorted. If a sample is in two or more jars, the contents of the jars must be combined before sorting is initiated. Samples requiring more than one jar will be labeled as “1 of 2” and “2 of 2”.
2. Select a vial that will hold the organisms after sorting is completed. Usually a 10 mL or 4-6 dram vial is adequate for a 200-organisms subsample. Additional vials/bottles may be needed if the sample contains large organisms.
3. Prepare an *internal* label out of archival paper for the sample using permanent, alcohol-proof, archival ink (e.g., pigma ink; regular ink will run if alcohol is spilled on the label) or a pencil. The label must include the following information:

Stream Name

Station Number (AN-code)

Random Number (if provided)

Lab Sample ID# (Lab’s internal id to link electronic results to final database)

Sample Date

County

Initials of Sample Collector

Initials of Sample Processor

of grids sorted (the numbers must be kept separate if several iterations of sorting are necessary; see below)

of organisms sorted for final sample

If any of this information is missing from the original sample jar label, notify the DEP/DWWM biologists so that the error can be corrected.

External labels may be omitted for samples stored in transparent glass containers, as long as the internal label is clearly visible. External label should contain the same information as required above. Place the external label on the bottle and apply clear tape over it for additional adhesion to the vial/bottle surface.

4. Prepare the sample for sorting. This step is performed in a sink and should be done under a fume hood or in a well ventilated area.
 - a. Under a fume hood, open sample jar and pour contents into a #30 sieve (595 micron).
 - b. Rinse sample jar into sieve and examine jar to make sure all detritus and organisms have been removed.
 - c. Rinse the contents of the sieve in tap water to remove remaining alcohol and to rinse out fine sand and sediment.
 - d. Carefully rinse any large detritus (i.e. leaves) or stones, making sure that all organisms on these items are returned to the sieve. Discard large leaves and gravel, or other large materials after rinsing.
 - e. Place the 10 inch x 40 inch - 100 grid sorting tray on top of 100 grid foam board/ schematic with grids and numbers plainly visible through the plexiglas bottom. After cleaning is complete, pour the entire contents of the sieve into the gridded sorting tray. Add a small quantity of water and gently swirl or stir the sample materials until the contents are evenly distributed in the tray. ***Even distribution is extremely important in this step.*** If debris is clumped, the organisms will not be distributed evenly and the final subsample may not accurately represent the full sample. If the sample was divided into more than one jar (labeled as "1 of 2" and "2 of 2"), the jars are to be combined at this point. Only when the sample is evenly distributed throughout the gridded sorting tray is it ready for sub-sampling and sorting.
 - f. Using a random number generator, select the first grid to be sorted. Using the same concept as a "cookie cutter", isolate the organisms within the chosen grid and scoop the contents of the grid place into a white enamel pan. Be careful not to damage any organisms during this step. Organisms with their head inside the grid are to be included within the grid. If you can't tell which end is the head, then the organism belongs in the grid that contains the largest portion of the body. A minimum of 4 grids must be sorted in order to ensure that a representative sub-sample has been obtained from the sorting tray.

- g.** Fill a small container or vial with 75% alcohol for temporary storage of sub-sampled organisms. A properly labeled vial for final storage can be used at this point as well.
- h.** Using fine-tipped forceps and 10X illuminated magnifier or magni-visor (sorter should use magnification of at least 2x), remove all macroinvertebrates from the subsample and transfer to the alcohol filled sample container/vial. Keep a running tally of the number of organisms that have been sorted. If there are a significant number of invertebrates that appear to be terrestrial, include them in the sample, but do not include them in the 200-organism count. The taxonomist will verify whether these organisms are truly terrestrial or semi-aquatic. Do not include empty clam or snail shells, or parts of organisms that are easily disconnected from the specimen (legs, gills, etc.).
- i.** If leaves are present, be sure to examine both surfaces. Watch for unusual clumps of twigs, leaves, or sand, which may be protective cases for some organisms. If cases are found, both the case and the organism should be sorted. If the organism is in the case, the case and organism should be kept together. If an empty case is found, it should also be removed but not counted.
- j.** If there is any doubt to the identity of an object (is it a seed or a bug?), it should be sorted, but not counted. A senior biologist should be notified if a large number of questionable objects are present.
- k.** When all the organisms appear to have been removed from the pan, agitate the contents of the pan and examine again. Often the agitation will reorient an organism that was previously overlooked.
- l.** Have a senior biologist inspect the pan after sorting has been completed. The biologist will point out any organisms that have been overlooked or misidentified as detritus. As the sorter becomes more proficient at his/her task, this step may be reduced in frequency. For the set quantity of QA samples, the number of organisms recovered by the senior biologist should be documented along with the initial number of organisms picked in order to calculate the percent sorting efficiency (see below).
- m.** If 200 (+/- 20% which is 160 to 240) organisms have been picked from the initial 4 grids chosen, sub-sampling is complete. If fewer than 160 organisms have been picked, an additional grid is randomly chosen and sorted entirely even if 160 organisms have picked while sorting the additional grid. (Note: Once a grid is started – it must be fully picked). This is repeated until at least 160 organisms are obtained or until the entire sample has been sorted. All attempts should be made (i.e., picking additional grids) to get as close to 200 organisms in the subsample. If more than 240 organisms are obtained from the initial 4 grids, then those individuals must be re-sampled down to the 200 (+/- 20%) goal. The remainder of the sample (i.e., the non-selected grids) may be discarded unless otherwise directed by DEP/DWWM.

- n. If using a temporary storage container/vial, pour contents of the sub-sample into the labeled bottle/vial. Make sure that all organisms in the bottle are fully submerged in the alcohol. If some remain on the vial sides, use the squirt bottle to rinse them into the alcohol.
- o. After a sample has been sorted, record the date and your initials in the sample log book. The total number of organisms picked and the number of grids sorted should also be documented for each sample on the vial label and on the bench sheet. If a re-subsampling is necessary (subsampling a subsample that exceeds 240 organisms), record the number of grids sorted for each iteration of the subsampling process separately. This last step is very important as these values are used to calculate organism density and to determine sample comparability.
- p. Sorting efficiency shall be evaluated for 5% of the samples. Recovery errors cannot exceed 10% (i.e., no more than 20 organisms can be missed by the sorter for a given sample) of the total sample (composite of remnants from each grid sorted). If the sorter does not meet this standard, the sorted sample remnants shall be re-checked until the recovery limits are attained. A record of all samples that were sorted, a list of quality control (QC) checks and documentation of any corrective action taken shall be maintained by the vendor to document the process. DEP/DWWM reserves the right to review QA/QC documentation upon request. All QA/QC associated with sorting and identification of each sample shall also be submitted with the results.

Step 3 - Requirements for Identification of Benthic Macroinvertebrates

Introduction

1. Benthic macroinvertebrate samples shall be identified in accordance with procedures outlined below: "WVDEP-DWWM Standard Operating Procedures for Identifying Macroinvertebrate Samples". This procedure must be reviewed and understood fully before submitting bids.
2. Vendor must have degreed biologists on staff performing the benthic macroinvertebrate identifications. NABS certification for genus level EPT (eastern) and genus level chironomidae (eastern) is required to perform the identifications. Identification of organisms by non-professional personnel or those without NABS certification is strictly forbidden. Biologists performing the identifications must be dedicated taxonomists; that is, the majority of their work on a daily basis involves the identification of benthic macroinvertebrates.
3. All aquatic insects (including Diptera), crustaceans, and molluscs, are to be identified to the genus-level of taxonomy. (NOTE: samples may include a significant number of chironomid larvae, which MUST be identified to genus). *Hydropsyche* individuals must be separated into *Hydropsyche* vs. *Ceratopsyche* according to Merritt, Cummins, and Berg (2008). Oligochaeta, Turbellaria, and Hirudinea are to be identified to family level. Macroinvertebrates that do not require family/genus level identification are Nemertea,

Nematoda, Hydroida, and Bryozoa. These organisms need only be identified to the taxonomic level (phylum, class, order, etc.) indicated in the previous sentence. However, it would be desirable to report lower taxonomic levels if these organisms are easily identified. Vertebrates and terrestrial organisms are not to be identified.

4. Taxonomists are permitted to use taxonomic identification keys other than those suggested in the operating procedures. However, all keys must be current and up-to-date. All results submitted to DEP/DWWM shall include a bibliography of publications used in identification of the specimens. Vendor will be responsible for identification and enumeration only; data analysis will not be required.
5. Results of identifications shall be submitted on the paper form(s) styles provided by DEP/DWWM and in electronic format (Microsoft Excel or Access compatible format; WVDEP will provide a data template for this purpose). All QA/QC associated with sorting and identification of each sample shall also be submitted with the results.
6. Identification of samples is not deemed completed until the data has been submitted to and accepted by the DEP/DWWM. Should the DEP/DWWM not provide notice of acceptance within four weeks of the date results were mailed by the vendor, the firm may consider the data to be acceptable by the Division.
7. The vendor shall be responsible for maintaining preservation of the samples. Vendor shall return all sample jars, voucher specimens, and reference collections to the DEP/DWWM in addition to the results of identification. Unused sample residues (i.e. detritus and unpicked portions) are to be properly disposed by the vendor unless otherwise directed on a small scale, project specific basis.
8. Vendor will be required to provide identification services only. No data analysis will be required. At the completion of the projects (or portions of the project) the vendor will submit the completed "WVDEP/ WAB BENTHIC MACROINVERTEBRATE LAB SHEET", voucher specimens, and identification results in Excel or Access format (WVDEP will provide an electronic data template with required fields). The voucher specimens are essentially all specimens in the 200 organism sub-sample that have not been included in the reference collection. Vendor may retain the DEP/DWWM reference specimens until the contract or project has been completed or upon request by DEP/DWWM. Specimens retained by the laboratory permanently must be first represented in the DEP/DWWM reference collection by individuals in good condition and documented on all paper and electronic forms.

Materials for Identification of Benthic Macroinvertebrates

1. Dissecting Microscope - for examination of gross features.
2. Compound Microscope - for examining minute features. Phase-contrast microscopes are preferable.
3. Fine-tipped forceps and probes - for manipulating specimens.

4. Petri dishes – or other container to hold specimens during identification.
5. Alcohol - 75% ethanol or isopropanol is used to preserve the samples and to prevent desiccation during identification.
6. Wash Bottle - used for alcohol storage.
7. Microscope Slides and glass cover slips - for examination of tiny specimens and/or body parts under a compound microscope. Slides and cover slips should be clean.
8. Mounting Medium – CMC-10 mounting medium or a similar permanent mounting medium is used to prepare permanent mounts of microscopic specimens.
9. Benthic Macroinvertebrate Lab Sheet - standard for recording results of identification and enumeration (Figure 1).
10. Taxonomic Keys for the Identification of Benthic Macroinvertebrates

Procedures for Mounting Chironomidae (and other small specimens)

The procedures that follow are summarized from Epler's *Identification Manual for the Larval Chironomidae (Diptera) of North and South Carolina*.

1. Label a clean glass slide. Label should include, at a minimum, the stream name, stream code, collection data and sample ID number.
2. Place 2-5 drops of CMC-10, or other permanent mounting medium, on the slide.
3. Place the specimens in the mounting medium, ventral side up, head pointing down ("south"). Tease out larger bubbles.
4. Gently lower coverslip over the mounting medium at an angle.
5. Use the cover slip to reposition larvae, if desired. Then gently press down the cover slip over the head capsules with pencil eraser to spread the mouthparts and over the anal end to spread the hind pro-legs.
6. Lay the slide on a flat surface and allow it to cure for 2-3 hours. If air bubbles form, fill them in with fresh medium and allow curing for 1-2 more hours. Then ring the slide with more medium or clear fingernail polish.
7. Add to the label the # of organisms on the slide and a general description of the type of organisms (e.g., Chironomidae, Oligochaeta, Acarina, etc.)

List of Taxonomic Keys

The primary taxonomic keys are listed below. The contractor may use other taxonomic keys for lower level identification; however, these references must be current and up-to-date. The contractor shall provide a list of references used in the identification of all specimens.

General Keys

- Brigham, A.R., W.U. Brigham, and A. Gnilka (eds.). 1982. Aquatic Insects and Oligochaetes North and South Carolina. Midwest Aquatic Enterprises, Mahomet, IL.
- Merritt, R.W., and K.W. Cummins (eds.). 1995. An Introduction to the Aquatic Insects of North America. 3rd edition. Kendall/Hunt Publishing Company, Dubuque, Iowa.
- Merritt, R.W., K.W. Cummins, and M.B. Berg (eds.). 2008. An Introduction to the Aquatic Insects of North America. 4th edition/revised edition. Kendall/Hunt Publishing Company, Dubuque, Iowa.
- Peckarsky, B.L., P.R. Fraissinet, M.A. Penton, and D.J. Conklin, Jr. 1990. Freshwater Macroinvertebrates of Northeastern North America. Cornell University Press, Ithaca, New York.
- Pennack, R.W. 1978. Fresh-water Invertebrates of the United States. 2nd edition. John Wiley & Sons, New York.
- Pennak, R.W. 1989. Fresh-water Invertebrates of the United States – Protozoa to Mollusca. 3rd Edition. John Wiley and Sons, Inc., New York, New York. 628 pp.
- Pfeiffer, J., Kosnicki, E., Bilger, M., Marshall, B.D. and W. Davis. 2008. Taxonomic Aids for Mid-Atlantic Benthic Macroinvertebrates (Ephemeroptera: Baetidae; Pleoptera: Capniidae/Leuctridae; Diptera: Simuliidae). EPA-260-R-08-014. United States Environmental Protection Agency, Office of Environmental Information, Environmental Analysis Division, Washington, DC. Available on-line at:
<http://www.epa.gov/bioindicators/html/publications.html>
- Smith, D.G. 2001. Pennak's Freshwater Invertebrates of the United States: Porifera to Crustacea. 4th edition. John Wiley & Sons, New York.
- Thorp, J.H and A.P. Covich, Eds. 2001. Ecology and Classification of North American Freshwater Invertebrates. Second Edition. Academic Press.

Annelida

- Brinkhurst, R.O. 1986. Guide to the freshwater aquatic microdile oligochaetes of North America. *Canadian Special Publication of Fisheries and Aquatic Sciences* **84**: 259 pp.
- Klemm, D.J. (ed.). 1985. A guide to the freshwater Annelida (Polychaeta, nauidid and tibuficid Oligochaeta, and Hirudinea) of North America. Kendall/Hunt Publishing Co., Dubuque, Iowa.
- Klemm, D.J. 1997. Identification Guide to the Freshwater Leeches (Annelida: Hirudinea) of Florida and Other Southern States. Florida Department of Environmental Protection, Division of Water Facilities, Tallahassee, FL. Available on-line at: <http://publicfiles.dep.state.fl.us/dear/labs/biology/biokeys/leeches.pdf>
- Milligan, M.R. 1997. Identification Manual for the Aquatic Oligochaeta of Florida: Volume I- Freshwater Oligochaetes. Florida Department of Environmental Protection, Division of Water Facilities, Tallahassee, FL. Available on-line at: <http://publicfiles.dep.state.fl.us/dear/labs/biology/biokeys/oligofw.pdf>

Crustacea

- Hobbs, H.H., Jr. 1972. Biota of Freshwater Ecosystems, Identification Manual no. 9. Crayfishes (Astacidae) of North and Middle America. EPA-WPCRS No. 18050, ELD05/72. Supt. Doc. No. 5501-0399, United States Environmental Protection Agency, Washington, D.C. 173 pp. Available on-line at: <http://www.epa.gov/nscep/index.html>
- Holsinger, J.R. 1972. Biota of Freshwater Ecosystems, Identification Manual no. 5. Freshwater amphipod crustaceans (Gammaridae) of North America. WPCRS No. 18050, ELD04/72. Supt. Doc. No. 5501-0369, United States Environmental Protection Agency, Washington, D.C. 89 pp.
- Jezerinac, R.F., G.W. Stocker, and D.C. Tarter. 1995. The Crayfishes (Decapoda: Cambaridae) of West Virginia. *Ohio Biological Survey Bulletin. New Series. Vol. 10, No.1.*
- Rogers, D.C. and M. Hill. 2008. Key to the Freshwater Malacostraca (Crustacea) of the Mid-Atlantic Region. EPA-230-R-08-017. United States Environmental Protection Agency, Office of Environmental Information, Environmental Analysis Division, Washington, DC. Available on-line at: <http://www.epa.gov/bioindicators/pdf/EPA-230-R-08-017KeystotheFreshwaterMalacostracaoftheMid-AtlanticRegion.pdf>
- Taylor, C.A., and G.A. Schuster. 2004. The Crayfishes of Kentucky. Illinois Natural History Survey Special Publication No. 28. 219 pp.

Williams, W.D. 1972. Biota of Freshwater Ecosystems, Identification Manual no. 7. Freshwater isopods (Asellidae) of North America. WPCRS No. 18050, ELD05-72. Supt. Doc. No. 5501-0390, United States Environmental Protection Agency, Washington, D.C. 45 pp.

Acarina

Pluchino, E.S. 1984. Guide to the Common Water Mite Genera of Florida. Florida Department of Environmental Regulation, Technical Series Vol. 7 No. 1. Orlando, Florida. Available on-line at: <http://publicfiles.dep.state.fl.us/dear/labs/biology/biokeys/mites.pdf>

Ephemeroptera

Bednarik, A.F. and W.P. McCafferty. 1979. Biosystematic revision of the genus *Stenonoma* (Ephemeroptera: Heptageniidae). *Canadian Bulletin of Fisheries and Aquatic Sciences* **21**:1-73.

Berner, L. and M.L. Pescador. 1988. 2nd Ed. The mayflies of Florida. Univ. Florida Press, Gainesville, Florida. 352 pp.

Burks, B.D. 1953. The mayflies, or Ephemeroptera, of Illinois. Illinois Natural History Survey (Urbana) Bulletin 26, Part 1:1-211.

Edmunds, G.F., Jr., S.L. Jensen, and L. Berner. 1976. Mayflies of North and Central America. University of Minnesota Press.

Lugo-Ortiz, C.R., and W.P. McCafferty. 1998. A New North American Genus of Baetidae (Ephemeroptera) and Key to *Baetis* Complex Genera. *Entomological News* **109**: 345-353.

Lugo-Ortiz, C.R., W.P. McCafferty, and R.D. Waltz. 1999. Definition and reorganization of the genus *Pseudocloeon* (Ephemeroptera: Baetidae) with new species descriptions and combinations. *Transactions of the American Entomological Society* **125**:1-37.

McCafferty, W.P. 1975. The burrowing mayflies (Ephemeroptera: Ephemeridae) of the United States. *Transactions of the American Entomological Society* **101**:447-504.

McCafferty, W.P. and R. D. Waltz. 1995. *Labiobaetis* (Ephemeroptera: Baetidae): New status, new North American species, and related new genus. *Entomological News* **106**(1):19-28.

McCafferty, W.P., M.L. Wigle, and R.D. Waltz. 1994. Systematics and biology of *Acentrella turbida* (McDunnough) (Ephemeroptera: Baetidae). *Pan-Pacific Entomologist* **70**(4):301-308.

Morihara, D.K. and W.P. McCafferty. 1979. The *Baetis* larvae of North America (Ephemeroptera: Baetidae). *Transactions of the American Entomological Society* **105**(2):129-221.

Pescador, M.L. and L. Berner. 1981. The mayfly Baetiscidae (Ephemeroptera). Part 2. Biosystematics of the genus *Baetisca*. *Transactions of the American Entomological Society* **107**:163-228.

Pescador, M.L. and B.A. Richard. 2004. Guide to the Mayfly (Ephemeroptera) Nymphs of Florida. Florida Department of Environmental Protection, Division of Water Facilities, Tallahassee, Florida. Available on-line at:
<http://publicfiles.dep.state.fl.us/dear/labs/biology/biokeys/mayflyguide.pdf>

Provonsha, A.V. 1990. A revision of the genus *Caenis* in North America (Ephemeroptera: Caenidae). *Transactions of the American Entomological Society* **116**(4):801-884.

Tarter, D.C. and R.F. Kirchner. 1978. A new species of *Baetisca* from West Virginia (Ephemeroptera: Baetiscidae). *Entomological News* **89**(9-10):209-213.

Odonata

Needham, J.G. and M.J. Westfall, Jr., and M.L. May. 2000. Dragonflies of North America. Scientific Publishers, Gainesville, FL. 940 pp.

Richardson, J.S. 2003. Identification Manual for the Dragonfly Larvae (Anisoptera) of Florida. Florida Department of Environmental Protection, Division of Water Facilities, Tallahassee, FL. Available on-line at:
<http://publicfiles.dep.state.fl.us/dear/labs/biology/biokeys/dragonflykey.pdf>

Richardson, J. 2010. Identification Manual for the Damselfly Larvae (Zygoptera) of Florida. Florida Department of Environmental Protection, Division of Water Facilities, Tallahassee, FL. Available on-line at:
<http://publicfiles.dep.state.fl.us/dear/labs/biology/biokeys/zygoptera.pdf>

Westfall, M.J. and M.L. May. 1996. Damselflies of North America. Scientific Publishers, Inc., Gainesville, FL. 650 pp.

Plecoptera

Frison, T.H. 1935. The stoneflies, or Plecoptera, of Illinois. *Illinois Natural Survey Bulletin* **20**: 280-471.

Pescador, M.L., B.A. Richard, and A.K. Rasmussen. 2000. A Guide to the Stoneflies (Plecoptera) of Florida. Florida Department of Environmental Protection, Division of Water Facilities, Tallahassee, FL. Available on-line at:
<http://publicfiles.dep.state.fl.us/dear/labs/biology/biokeys/stonefly.pdf>

Stewart, K.W. and B.P. Stark. 1988. Nymphs of North American Stonefly Genera (Plecoptera). Entomological Society of America.

Stewart, K.W. and B.P. Stark. 2002. Nymphs of North American stonefly genera (Plecoptera). Second Edition. The Caddis Press, Columbus, OH. 510 pp.

Heteroptera

Epler, J.H. 2006. Identification Manual for the Aquatic and Semi-Aquatic Heteroptera of Florida (Belostomatidae, Corixidae, Gelastocoridae, Gerridae, Hebridae, Hydrometridae, Mesoveliidae, Naucoridae, Nepidae, Notonectidae, Ochteridae, Pleidae, Saldidae, Veliidae). Florida Department of Environmental Protection, Division of Water Facilities, Tallahassee, FL. Available on-line at:
<http://publicfiles.dep.state.fl.us/dear/labs/biology/biokeys/heteroptera.pdf>

Coleoptera

Brown, H.P. 1972. Aquatic Dryopoid Beetles (Coleoptera) of the United States. U. S. Government Printing Office. Available on-line:
<http://www.archive.org/details/aquaticdryopoidb00brow>

Epler, J.H. 1996. Identification Manual for the Water Beetles of Florida (Coleoptera: Dryopidae, Dytiscidae, Elmidae, Gyrinidae, Haliplidae, Hydraenidae, Hydrophilidae, Noteridae, Psephenidae, Ptilodactylidae, Scirtidae). Florida Department of Environmental Protection, Division of Water Facilities, Tallahassee, FL. Available on-line at:
<http://publicfiles.dep.state.fl.us/dear/labs/biology/biokeys/beetles96.pdf>

Epler, J.H. 2010. Freshwater Beetles of Florida: An identification manual for the families Crysomelidae, Curculionidae, Dryopidae, Dytiscidae, Elmidae, Gyrinidae, Haliplidae, Helophoridae, Hydraenidae, Hydrophilidae, Noteridae, Psephenidae, Ptilodactylidae, Scirtidae). Florida Department of Environmental Protection, Division of Water Facilities, Tallahassee, FL. Available on-line at:
<http://publicfiles.dep.state.fl.us/dear/labs/biology/biokeys/beetles10.pdf>

Megaloptera and Neuroptera

Rasmussen, A.K. and M.L. Pescador. 2002. A Guide to the Megaloptera and Aquatic Neuroptera of Florida. Florida Department of Environmental Protection, Division of Water Facilities, Tallahassee, FL. Available on-line at:
<http://publicfiles.dep.state.fl.us/dear/labs/biology/biokeys/megaloptera.pdf>

Trichoptera

Chapin, J.W. 1978. Systematic of nearctic *Micrasema* (Trichoptera: Brachycentridae). Ph.D. Dissertation, Clemson University, Clemson, South Carolina, 136 pp.

Flint, O.S. 1962. Larvae of the Genus *Rhyacophila* in eastern North America (Trichoptera: Rhyacophilidae). *Proceedings of the U.S. National Museum* (Washington, D. C.) **113**:465-493.

Flint, O.S. 1984. The genus *Brachycentrus* in North America, with a proposed phylogeny of the genera of Brachycentridae (Trichoptera). *Smithsonian Contributions to Zoology* No. 398.

Floyd, M.A. 1995. Larvae of the caddisfly genus *Oecetis* in North America. *Bulletin of the Ohio Biological Survey, New Series*, Vol. 10, No. 2, 85 pp.

- Glover, J.B. 1996. Larvae of the caddisfly genera *Triaenodes* and *Ylodes* (Trichoptera: Leptoceridae) in North America. *Bulletin of the Ohio Biological Survey, New Series*, Vol. 11, No. 2, vii+89 pp.
- Pescador, M.L., A.K. Rasmussen, and S.C. Harris 2004. Identification Manual for the Caddisfly (Trichoptera) Larvae of Florida. Revised Edition. Florida Department of Environmental Protection, Division of Water Facilities, Tallahassee, Florida. Available on-line at: <http://publicfiles.dep.state.fl.us/dear/labs/biology/biokeys/caddisfly.pdf>
- Prather, A.L. and J.C. Morse. 2001. Easter Neactic *Rhyacophila* species, with revision of the *Rhyacophila invaria* group (Trichoptera: Rhyacophilidae). *Transactions of the American Entomological Society* 127:85-166.
- Ross, H.H. 1944. The Caddisflies, or Trichoptera, of Illinois. *Bulletin of the Illinois Natural History Survey* 23: 1-326.
- Scheffer, P.W. and G.B. Wiggins. 1986. A systematic study of the Nearctic larvae of the *Hydropsyche morosa* group (Trichoptera: Hydropsychidae). Royal Ontario Museum, Toronto, Canada. 94 ppp.
- Schuster, G.A. and D.A. Etnier. 1978. A manual for the identification of the larvae of the caddisfly genera *Hydropsyche* Pictet and *Symphitopsyche* Ulmer in eastern and central North America (Trichoptera: Hydropsychidae). EPA-600/4-78-060. United States Environmental Protection Agency, Washington, D.C. 129 pp. Available on-line at: <http://www.epa.gov/nscep/index.html>
- Wiggins, G.B. 1977. Larvae of the North American Caddisfly Genera (Trichoptera). University of Toronto Press, Toronto, Canada.
- Wiggins, G.B. 1996. Larvae of the North American Caddisfly Genera (Trichoptera). 2nd edition. University of Toronto Press, Toronto, Canada.

Diptera

- Adler, P.H. and K.C. Kim. 1986. The Black Flies of Pennsylvania (Simuliidae, Diptera). Bionomics, Taxonomy, and Distribution. The Pennsylvania State University Agricultural Experimental Station Bulletin. 856, 85 pp.
- Bode, R.W. 1983. Larvae of North American *Eukiefferiella* and *Tventenia* (Diptera: Chironomidae). *Buletin of the New York State Museum* 452:1-40.
- Epler, J.H. 1995. Identification Manual for the Larval Chironomidae (Diptera) of Florida. Revised Edition. Florida Department of Environmental Protection, Division of Water Facilities, Tallahassee, Florida. Available on-line at: <http://publicfiles.dep.state.fl.us/dear/labs/biology/biokeys/midges.pdf>

- Epler, J.H. 2001. Identification Manual for the Larval Chironomidae (Diptera) of North and South Carolina. North Carolina Department of Environmental and Natural Resources, Division of Water Quality, Raleigh, North Carolina. . Available on-line at: http://www.esb.enr.state.nc.us/BAUwww/Chiron_manual/intro.pdf
- Gelhaus, J.K. 2002. Manual for the Identification of Aquatic Crane Fly Larvae for Southeastern United States. Unpublished.
- Gelhaus, J.K. 2008. Manual for the Identification of Aquatic Crane Fly Larvae for North America. North American Benthological Society Workshop. Unpublished Draft.
- McAlpine, J.F. (Ed.). 1989. Manual of Nearctic Diptera. Vols. 1-3. Research Branch Agriculture Canada. Monograph No. 32
- Pechuman, L.L., D.W. Webb, and H.J. Teskey. 1983. The Diptera, or true flies, of Illinois. I. Tabanidae. *Illinois Natural History Survey Bulletin* **33**(1):1-122.
- Simpson, K.W., R.W. Bode, and P. Albu. 1982. Keys for the genus *Cricotopus* adapted from "Revision der Gattung *Cricotopus* vander Wulp und ihrer Verwandten (Diptera, Chironomidae)" by M. Hirvenoha. Bull. 450. New York State Museum, Albany, NY.
- Webb, D.W. 1977. The Nearctic Athericidae. *Journal of the Kansas Entomological Society* **50**:473-495.

Mollusca

- Branson, B.A. 1987. Keys to the aquatic gastropoda known from Kentucky. Transactions of the Kentucky Academy of Sciences. 48(1-2):11-19.
- Burch, J.B. 1972. Biota of Freshwater Ecosystems, Identification Manual no. 3. Freshwater Sphaeriacean Clams (Mollusca: Pelecypoda) of North America. WPCRS No. 18050, ELD03/72. Supt. Doc. No. 5501-0367, United States Environmental Protection Agency, Washington, D.C. 31 pp.
- Burch, J.B. 1973. Biota of Freshwater Ecosystems, Identification Manual no. 11. Freshwater Unionacean Clams (Mollusca: Pelecypoda) of North America. WPCRS No. 18050, ELD03/73. Supt. Doc. No. 5501-0367, United States Environmental Protection Agency, Washington, D.C. 181 pp. Available on-line at: <http://www.epa.gov/nscep/index.html>
- Burch, J.B. 1982. Freshwater Snails (Mollusca: Gastropoda) of North America. EPA-600-3-82-026. United States Environmental Protection Agency, Washington, D.C. Available on-line at: <http://www.epa.gov/nscep/index.html>
- Heard, W.H. 1979. Identification Manual of the Freshwater Clams of Florida. Florida Department of Environmental Regulation, Technical Series Vol. 4 No. 2. Orlando, Florida. Available on-line at: <http://publicfiles.dep.state.fl.us/dear/labs/biology/biokeys/clams.pdf>

Parmalee, P.W. and A.E. Bogan. 1998. *The Freshwater Mussels of Tennessee*. University of Tennessee Press. Knoxville, Tennessee. 328 pp.

Step 4 - Quality Control

1. Vendor will be required to retain all voucher specimens and establish reference collections for this project. Voucher specimens are the actual specimens identified from the samples. A reference collection is defined as a set of biological specimens, representing each specific taxon observed in the samples submitted by DEP/DWWM. Reference collections are to be arranged/curated based on taxonomic and/or phylogenetic order. Any specimens removed from the voucher collection for purposes of building the reference collection must be documented on both the paper and electronic reporting forms. The reference taxa specimens should be delivered to DEP/DWWM at the end of the contract/project period, or upon request if desired earlier. A small subset of the reference taxa specimens may be retained by the vendor permanently for internal use if the retained specimens are already represented by an individual or set of individuals in good condition in the DEP/DWWM reference collection. The retention of specimens for any purpose must be fully documented on laboratory bench sheets.
2. Vendor shall compile genus-level reference and voucher collections to be submitted to DEP/DWWM at end of contract period or upon request for DEP/DWWM use.
3. With the exception of organisms approved to be used in the laboratories' internal reference collection, all specimens identified in the 200-organism subsamples are to be returned to DEP/DWWM. Slide mounted specimens should be labeled to indicate, at a minimum, DEP sample ID, lab number, count of organisms on slide, and general grouping of organisms (e.g., Chironomidae, Oligochaeta, etc.). All other specimens are to be stored in a single sample vial (additional vials may be used when large organisms, such as crayfish, are present).
4. Vendor shall evaluate sorting efficiency for 5 % of all samples. Recovery errors may not exceed 10% of the total sample. A record of all samples sorted, a list of quality control checks, and documentation of any corrective action taken shall be maintained by the vendor to document the process. This information shall be provided each time the taxonomic results are submitted to DEP/DWWM.
5. In addition, the vendor shall re-identify a minimum of 5 % of the samples. A taxonomist other than the original identifier shall perform this check. Errors are brought to the attention of the original taxonomist and subsequent identifications are subject to scrutiny until errors are resolved. A record of all samples re-identified; a list of quality control (QC) checks; and documentation of any corrective action taken shall be maintained by the vendor to document the process. All reports documenting QA/QC will be submitted to DEP/DWWM with all other completed results in the delivery group or upon request.
6. If any significant changes in taxonomy occur during the life of this contract, the vendor shall notify DEP/DWWM and provide supporting references. This process will allow our own records to remain current.

7. DEP/DWWM biologists and/or another contract laboratory will verify identifications for a minimum of 2.5% of the samples. Samples subjected to verification are selected randomly and will encompass checks on all taxonomists. The vendor will be advised upon analysis of the two identifications if significant¹ differences in identification are encountered. Cancellation of the contract will result if discrepancies continue.

Step 5 - Legal Testimony

The selected firm may be requested by the DEP/DWWM to testify concerning the validity of the laboratory sorting and identification process. The firm will only be required to testify to the following areas:

1. Time of notification by the DEP/DWWM of sample shipment and by whom.
2. Condition of sample.
3. How sample was preserved by the firm.
4. Dates of analysis and by whom.
5. Chain of Custody procedures within the laboratory.
6. Methods used.
7. Results of sorting, identification, and internal QA/QC processes.

At no time will the firm respond to questions concerning interpretation of results. The Division shall reimburse the firm for the costs of any such testimony.

SUBCONTRACTORS

The vendor who is awarded a contract, when performing work under the terms and conditions of this contract, are solely responsible for the satisfactory completion of the work. The prime vendor shall be responsible for ensuring that any subcontractor has all the necessary permits, certifications (including NABS certifications), experience and insurance to perform the work. All subcontractors must be approved by DEP/DWWM before subcontractor initiates work. The primary contractor shall supply resumes and/or other documents to prove sub-contractor's qualifications. DEP/DWWM will consider the prime vendor to be the sole point of contact with regard to authorized work under the contract; however, this provision does not prohibit the DEP/DWWM from directly contacting subcontractors.

CONFIDENTIALITY

The vendor agrees that any and all data, analyses, materials, reports or other information, oral or written, prepared by the vendor with respect to this requisition shall, except for information which has been publicly available, be treated as confidential and shall not be utilized, released, published, or disclosed, by the vendor at any time for any purpose whatsoever other than to provide consultation or other service to the DEP/DWWM.

¹ "Significant" differences will include, but will not be limited to, consistent misidentification of an organism(s) during QA/QC checks.

BID PREPARATION

The bidder shall include the information below with their bid. The contract award will be made to the qualified vendor with the lowest bid. We expect to collect approximately 500 samples per year, however there is no minimum number of samples that will be sent to the successful bidder.

Omission of any of the information listed below may result in disqualification.

- 1) Description of how the project will be managed by the contractor.
- 2) Summary of experience with sorting and identification of benthic macroinvertebrates. Must have minimum of 5 years of experience with sorting / identifying benthic macroinvertebrates.
- 3) Resumes of taxonomists and copies of NABS certifications shall be included in the bid package.
- 4) List of taxonomic references used in the identification of all specimens.
- 5) Description of vendor's internal QA/QC procedures, stating specifically how errors are tracked and resolved, which will insure the highest level of accuracy in both the sorting and identifying processes.
- 6) Specific description of product that will be returned to DEP/DWWM (i.e., reporting format, specimens, etc.)

DEP15456
BID SHEET

Item No.	Quantity	Description	Unit Price	Amount
A	500	Per sample un-sorted, identified to Genus level: 200-organism subsample		
E	4	Per each "sample pick-up/delivery" not "per sample" (Assume 100 samples per pickup)		
F	5 hr	Cost/hour for professional staff representation of data in legal/administrative setting		

TOTAL =

Contractor: _____

Signature: _____

Date: _____

Quantities listed on the bid schedule are for bid evaluation purposes only and are not a guarantee of quantities to be ordered over the life of the contract. Actual quantities ordered may be more or less than those stated on this schedule.

State of West Virginia
VENDOR PREFERENCE CERTIFICATE

Certification and application* is hereby made for Preference in accordance with *West Virginia Code*, §5A-3-37. (Does not apply to construction contracts). *West Virginia Code*, §5A-3-37, provides an opportunity for qualifying vendors to request (at the time of bid) preference for their residency status. Such preference is an evaluation method only and will be applied only to the cost bid in accordance with the *West Virginia Code*. This certificate for application is to be used to request such preference. The Purchasing Division will make the determination of the Resident Vendor Preference, if applicable.

- 1. **Application is made for 2.5% resident vendor preference for the reason checked:**
 Bidder is an individual resident vendor and has resided continuously in West Virginia for four (4) years immediately preceding the date of this certification; or,
 Bidder is a partnership, association or corporation resident vendor and has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or 80% of the ownership interest of Bidder is held by another individual, partnership, association or corporation resident vendor who has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or,
 Bidder is a nonresident vendor which has an affiliate or subsidiary which employs a minimum of one hundred state residents and which has maintained its headquarters or principal place of business within West Virginia continuously for the four (4) years immediately preceding the date of this certification; or,
- 2. **Application is made for 2.5% resident vendor preference for the reason checked:**
 Bidder is a resident vendor who certifies that, during the life of the contract, on average at least 75% of the employees working on the project being bid are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; or,
- 3. **Application is made for 2.5% resident vendor preference for the reason checked:**
 Bidder is a nonresident vendor employing a minimum of one hundred state residents or is a nonresident vendor with an affiliate or subsidiary which maintains its headquarters or principal place of business within West Virginia employing a minimum of one hundred state residents who certifies that, during the life of the contract, on average at least 75% of the employees or Bidder's affiliate's or subsidiary's employees are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; or,
- 4. **Application is made for 5% resident vendor preference for the reason checked:**
 Bidder meets either the requirement of both subdivisions (1) and (2) or subdivision (1) and (3) as stated above; or,
- 5. **Application is made for 3.5% resident vendor preference who is a veteran for the reason checked:**
 Bidder is an individual resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard and has resided in West Virginia continuously for the four years immediately preceding the date on which the bid is submitted; or,
- 6. **Application is made for 3.5% resident vendor preference who is a veteran for the reason checked:**
 Bidder is a resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard, if, for purposes of producing or distributing the commodities or completing the project which is the subject of the vendor's bid and continuously over the entire term of the project, on average at least seventy-five percent of the vendor's employees are residents of West Virginia who have resided in the state continuously for the two immediately preceding years.

Bidder understands if the Secretary of Revenue determines that a Bidder receiving preference has failed to continue to meet the requirements for such preference, the Secretary may order the Director of Purchasing to: (a) reject the bid; or (b) assess a penalty against such Bidder in an amount not to exceed 5% of the bid amount and that such penalty will be paid to the contracting agency or deducted from any unpaid balance on the contract or purchase order.

By submission of this certificate, Bidder agrees to disclose any reasonably requested information to the Purchasing Division and authorizes the Department of Revenue to disclose to the Director of Purchasing appropriate information verifying that Bidder has paid the required business taxes, provided that such information does not contain the amounts of taxes paid nor any other information deemed by the Tax Commissioner to be confidential.

Under penalty of law for false swearing (West Virginia Code, §61-5-3), Bidder hereby certifies that this certificate is true and accurate in all respects; and that if a contract is issued to Bidder and if anything contained within this certificate changes during the term of the contract, Bidder will notify the Purchasing Division in writing immediately.

Bidder: _____ Signed: _____

Date: _____ Title: _____

*Check any combination of preference consideration(s) indicated above, which you are entitled to receive.

RFQ No. _____

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

West Virginia Code §5A-3-10a states: No contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and the debt owned is an amount greater than one thousand dollars in the aggregate

DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Debtor" means any individual, corporation, partnership, association, Limited Liability Company or any other form or business association owing a debt to the state or any of its political subdivisions. "Political subdivision" means any county commission; municipality; county board of education; any instrumentality established by a county or municipality; any separate corporation or instrumentality established by one or more counties or municipalities, as permitted by law; or any public body charged by law with the performance of a government function or whose jurisdiction is coextensive with one or more counties or municipalities. "Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceed five percent of the total contract amount.

EXCEPTION: The prohibition of this section does not apply where a vendor has contested any tax administered pursuant to chapter eleven of this code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

Under penalty of law for false swearing (*West Virginia Code* §61-5-3), it is hereby certified that the vendor affirms and acknowledges the information in this affidavit and is in compliance with the requirements as stated.

WITNESS THE FOLLOWING SIGNATURE

Vendor's Name: _____

Authorized Signature: _____ Date: _____

State of _____

County of _____, to-wit:

Taken, subscribed, and sworn to before me this ____ day of December, 20____.

My Commission expires _____, 20____.

AFFIX SEAL HERE

NOTARY PUBLIC _____