# FLORIDA DEPARTMENT OF Environmental Protection

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3900 Commonwealth Boulevard
Tallahassee, FL 32399

**Ron DeSantis**
Governor

**Jay Collins**
Lt. Governor

**Alexis A. Lambert**
Secretary


VIA EMAIL
*Read receipt requested*

November 3, 2025

Shannon McMorrow, Assistant Vice President - Ecologist
WSP USA, Inc.
3701 NW 98th Street
Gainesville, FL 32606

**Re: Final Audit Report for Stream Condition Index, BioRecon, Ponar, Wetland Condition Index, Lake Condition Index, and Hester-Dendy Laboratory Records Audit of WSP**

Dear Ms. McMorrow:

Thank you for responding to the preliminary audit report for this Stream Condition Index, BioRecon, Ponar, Wetland Condition Index, Lake Condition Index, and Hester-Dendy Laboratory Records Audit. The Florida Department of Environmental Protection (DEP or department) has reviewed your response and determined that the taxonomic data produced by WSP meets the department's data quality objectives upon implementation of corrective actions from this audit.

Attached is the final audit report detailing the audit procedure, details of the department's review, and the department's recommendation for usability of the data. The final audit report will also be posted on the department's website at https://floridadep.gov/dear/florida-dep-laboratory/content/fdep-biological-and-audit-report-search. As noted in the report, the department's use of WSP's data for assessment and compliance purposes is contingent upon the implementation of the corrective actions outlined in this report. The Aquatic Ecology and Quality Assurance Section has determined that your invertebrate taxonomy analysis procedures after implementing the corrective actions from this audit meet the data quality objectives and recommends that the data may be used for DEP related purposes and in support of the scope of projects covered in this audit. Data users should ensure they have the recalculated results from the audited period that includes February 2020 through April 2024. The usability of the audited data for other purposes must be determined separately according to applicable requirements in Rule 62-160.670, Florida Administrative Code (F.A.C).

Under Chapter 120 of the Florida Statutes, you and any other person whose substantial interests are affected by the department's agency action may challenge the attached final audit report, including the corrective actions and the data usability analysis. The process to challenge any portion of this agency action is described below in the Notice of Rights section.

If you have any questions or concerns about this final audit report, please feel free to contact Jessica Patronis at (850) 245-8980 or Joy Jackson at (850) 245-8074.

## Notice of Rights

This action is final and effective on the date filed with the Clerk of the Department unless a sufficient petition for an administrative hearing is timely filed under sections 120.569 and 120.57 of the Florida Statutes as provided below. If a sufficient petition for an administrative hearing is timely filed, this agency action becomes only proposed agency action, subject to the result of the administrative review process. Therefore, on the filing of a timely and sufficient petition, this action will not be final and effective until further order of the department. Because an administrative hearing may result in the reversal or substantial modification of this action, the petitioner is advised not to proceed until the deadlines noted below for filing a petition for an administrative hearing or request for an extension of time have expired.

Petition for Administrative Hearing

A person whose substantial interests are affected by the Department's action may petition for an administrative proceeding (hearing) under Sections 120.569 and 120.57, F.S. Pursuant to Rules 28-106.201 and 28-106.301, F.A.C., a petition for an administrative hearing must contain the following information:

(a) The name and address of each agency affected and each agency's file or identification number, if known;
(b) The name, address, any e-mail address, any facsimile number, and telephone number of the petitioner, if the petitioner is not represented by an attorney or a qualified representative; the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination;
(c) A statement of when and how the petitioner received notice of the agency decision;
(d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate;
(e) A concise statement of the ultimate facts alleged, including the specific facts that the petitioner contends warrant reversal or modification of the agency's proposed action;
(f) A statement of the specific rules or statutes that the petitioner contends require reversal or modification of the agency's proposed action, including an explanation of how the alleged facts relate to the specific rules or statutes; and
(g) A statement of the relief sought by the petitioner, stating precisely the action that the petitioner wishes the agency to take with respect to the agency's proposed action.

The petition must be filed (received by the Clerk) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, or via electronic correspondence at Agency_Clerk@FloridaDEP.gov. Also, a copy of the petition shall be mailed to the addressee of this order at the address indicated above at the time of filing.

Time Period for Filing a Petition

In accordance with Rule 62-110.106(3), F.A.C., petitions for an administrative hearing by the addressee of this order must be filed within 21 days of receipt of this written notice. Petitions filed by any persons other than the addressee of this order must be filed within 21 days of publication of the notice or within 21 days of receipt of the written notice, whichever occurs first. The failure to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57, F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention (in a proceeding initiated by another party) will be only at the discretion of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205, F.A.C.

Extension of Time

Under Rule 62-110.106(4), F.A.C., a person whose substantial interests are affected by the Department's action may also request an extension of time to file a petition for an administrative hearing. The Department may, for good cause shown, grant the request for an extension of time. Requests for extension of time must be filed with the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, or via electronic correspondence at Agency_Clerk@FloridaDEP.gov, before the deadline for filing a petition for an administrative hearing. A timely request for extension of time shall toll the running of the time period for filing a petition until the request is acted upon.

Mediation

Mediation is not available in this proceeding.

Judicial Review

This determination constitutes an order of the department. Subject to the provisions of paragraph 120.68(7)(a) of the Florida Statutes, which may require a remand for an administrative hearing, the addressee of this order has the right to seek judicial review of the order under section 120.68 of the Florida Statutes, by the filing of a notice of appeal under rules 9.110 and 9.190 of the Florida Rules of Appellate Procedure with the Clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida, 32399-3000, or via electronic correspondence at Agency_Clerk@FloridaDEP.gov and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate district court of appeal. The notice of appeal must be filed within 30 days from the date when the final order is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

David Whiting, Deputy Director
Division of Environmental Assessment and
Restoration
2600 Blair Stone Road
Tallahassee, FL 32399
Tel No.: (850) 245-8191

Attachments:
Final Audit Report

Copies furnished to:
Katie Slattery, Florida DEP Office of General Counsel
File

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this determination, including all copies, was e-mailed before the close of business on November 3, 2025 to the above listed persons.

FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to 120.52(7),
Florida Statutes, with the designated Department Clerk,
receipt of which is hereby acknowledged.

Clerk 11/3/2025 Date

# Final Audit Report
# WSP USA, Inc.
# Macroinvertebrate Laboratory Records Audit




**Aquatic Ecology and Quality Assurance Section**
**Water Quality Standards Program**
**Division of Environmental Assessment and Restoration**
**Florida Department of Environmental Protection**

**October 2025**

# MACROINVERTEBRATE LABORATORY RECORDS AUDIT REPORT

## Introduction and Scope

The Department of Environmental Protection (DEP or department) initiated a records audit of the WSP USA Inc. (WSP) laboratory after receiving Stream Condition Index (SCI) refresher audit results. WSP conducts macroinvertebrate analysis to generate data submitted to DEP for various methods in addition to the SCI, so the scope of the audit was to ensure that WSP processes adhered to DEP SOP SCI 2000, Stream Macroinvertebrate Laboratory Procedures and Index Determination, DEP SOP BRN 1000 Biological Reconnaissance Field Method and DEP SOP LT 7000 Determination of Biological Indices. The initial records request was made on November 7, 2024. WSP Assistant Vice President, Shannon McMorrow, sent the records on April 7, 2025. A preliminary report of audit findings was sent to WSP on July 1, 2025. WSP responded and provided clarifications to the items highlighted in the preliminary report on August 13, 2025.

This audit assessed items that could be evaluated via laboratory records that were provided by WSP and cover the scope of samples that were processed for DEP-related projects between February 24, 2020, and April 24, 2024, which includes 515 samples or subsamples. Out of the 515 samples, 12 samples that represent projects and sample types across the audited period were selected for review (**Table 1**). The SOPs that were referenced throughout this audit included BRN 1000, SCI 2000, and the following sections in FS 7400 Benthic Macroinvertebrate Sampling: FS 7430 Hester-Dendy; FS 7440 Core; FS 7450 Dredge; FS 7460 Lake Condition Index (LCI); FS 7470 Wetland Condition Index (WCI): Macroinvertebrates; and LT 7000 Determination of Biological Indices. In addition, WSP processed modified BioRecons to sample a wetland that was described in a report entitled, "Modified BioRecon February 2020 Sampling Report (C-11) produced by Wood Environment & Infrastructure Solutions, Inc (2020). **Table 1** lists the samples reviewed, the collection dates, site names and sample types. WSP's staff sorted and identified samples to the lowest practical taxonomic level and calculated individual metrics and final scores (except where noted). The audit findings, required corrective actions, and WSP responses and implementation dates are provided in **Table 2**.

## Records Evaluated

1. List of the taxonomic literature most often consulted (at least the ten most relied upon).
2. List of all samples processed for DEP-related projects for 2020 through 2024, indicating which samples were used for taxonomic QC purposes.
3. List of taxa in the reference collection, including the verifying taxonomists' names.
4. Brief description of the laboratory protocols for precautionary and corrective measures taken if sorting efficiency or taxonomic QC results fail to meet the required targets.

5. Sorting efficiency tracking records for all active employees involved in the processing of DEP samples.
6. Taxonomic quality control tracking records for all active employees involved in the processing of DEP samples.
7. Original bench sheets associated with DEP samples.
8. Metric and index calculation records for each requested sample showing the final taxonomic list for calculations, indication of which taxa were used to calculate each metric, numbers or percentages of appropriate taxa for metric calculation, calculated metrics, and final scores.

**Table 1**. Samples reviewed as part of this audit.

| Date Collected | Site Name | Sample Type | QA Sample | Comments |
|---|---|---|---|---|
| 2/24/2020 | Transect 5 – Plot 1 | WCI | | No organisms in sample |
| 8/5/2020 | Miller Bayou SCIA | SCI | | |
| 8/19/2020 | Econfina – 1/7 and 2/7 | Ponar | | Processed each ponar separately. |
| 4/28/2021 | CB BI SCIA | SCI | | Metrics calculated by client |
| 6/2/2021 | BER 213 | LCI | | Metrics calculated by client |
| 3/28/2022 | Mustang Ranch SCIA | SCI | x | |
| 5/31/2022 | MIR-N 117 | LCI | | Metrics calculated by client |
| 8/5/2022 | ER6LC-1 | Hester-Dendy | | |
| 3/8/2023 | HCSW-1 SCIA | SCI | | |
| 4/14/2023 | WIM-E1 | SCI | | |
| 4/1/2024 | HOWC 107 | BioRecon | | Metrics calculated by client |
| 4/24/2024 | PR-SCI-1 SCIA | SCI | | |

## Findings

Three items were noted in the preliminary report sent on July 1, 2025. WSP submitted responses for each item on August 13, 2025 (**Table 2**).

Auditors noted issues in the collapsing of taxa in a few of the marine replicates reviewed. WSP clarified that while they routinely collapse data for Stream Condition Index samples, they were not aware that it was a requirement for other types of samples. WSP also clarified that non-collapsed taxa were used in the calculations for both the control and test site samples for this particular project (Fenholloway/Econfina) making comparisons valid but would recalculate metrics and provide updated findings to the affected customers by December 31, 2025

(**Table 2**). DEP also noted an issue with the mislabeling of metrics produced in Primer™. WSP had previously identified and corrected the mislabeling of Shannon's Diversity index and subsequently sent DEP auditors the updated documents. Finally, DEP was not initally provided the taxonomic QC resolution form in the initial submission but upon request, this form was provided. DEP found WSP's responses and corrective actions acceptable.

Lab Quality System

WSP maintains copies of pertinent taxonomic identification keys for specimens encountered in the samples processed for this audit. Record #1 (Taxonomic References) contained a list of 24 references and had the expected and necessary resources. Record #2 (WSP_2020-2024 Sample List) contained a list of all samples processed by WSP for DEP-related projects between February 24, 2020, and April 24, 2024. WSP's reference collection as presented in Record #3 (WSP Master Voucher List for 2025 FDEP Audit) was well organized and contained 454 specimens, 419 had been verified by an additional taxonomist. DEP compared the organisms from the samples reviewed for this audit and noted that several taxa from the samples were not represented in the reference collection. While the reference collection is thorough and well-organized, approximately 11% of the collection still requires external verification. An externally verified reference collection of commonly occurring Florida taxa is a critical element of a lab's quality system. DEP encourages WSP to continue to have specimens verified by external experts as time allows. This can be achieved informally through meetings, workshops, or as a professional courtesy among taxonomists.

Sample Sorting and Identification Process

Overall, WSP is properly following DEP SOPs for sample sorting and identification except for a few instances noted below and in **Table 2**.

Sample Sorting QC

According to Record #4 (2020-2024 QAQC Summary), if a single sorting QA efficiency falls below 95%, the missed organisms are shown to the original sorter. If a single sorting QC efficiency falls below 90%, the sorting technician must reread the SOP, all aliquots for that sample are rechecked, and future samples picked by the individual are QAed until they consistently demonstrate acceptable (target) sorting efficiency. If annual sorting efficiencies fall below 95%, the technician will be suspended from sorting samples for 6 months, at which time they will be retrained and complete a demonstration of capabilities. This practice complies with DEP SOPs. According to Record #5 (2020-2024 QA/QC Summary), WSP had four taxonomists and eight technicians processing samples during the period covered in this audit. There were several occasions when the single sorting efficiency fell below the target level of 90% but Record #5 did not mention a corrective measure as a result of falling below the target level. Additionally, there was one instance (SEM 2021) when the annual cumulative sorting efficiency fell below the target level of 95%. Although the logs did not

mention a corrective action, Record #7 (2020-2024 Audit Original Benchsheets_Optimized) noted a corrective action.

Taxonomic Identification QC

According to Record #4, if a single taxonomy QC efficiency fails to meet the 95% target, the taxonomist must go over taxonomic discrepancies with the QC taxonomist to identify the reasoning for any misidentifications and ensure correct identification in the future. If annual taxonomy QC efficiencies fall below specified targets, the taxonomist must undergo additional training, and all samples identified by this individual will be identified by a second taxonomist until they can consistently demonstrate acceptable (target) efficiencies. This practice adheres to DEP SOPs. Attachment #4 (2020-2024 QAQC Summary) shows QC results show that a minimum of 5% of samples were reidentified by a second taxonomist or each analyst between 2020 and 2024. Details of how discrepancies were resolved were not provided. DEP requested details of how taxonomic QC discrepancies were handled using the Mustang Ranch SCI QC sample listed in Table 1 as a demonstration.

Metric and Index Calculation

Based on the records provided as part of Record #8 (Attachment- 6 2020-2024 Audit Reports and Metrics), there were instances where WSPs metrics for ponar and Hester-Dendy samples were not calculated correctly due to taxa that were not collapsed prior to richness and diversity calculations. These errors resulted in higher values for these measures. In the sample ER6LC-1, taxa richness was 8 taxa higher, and diversity went from 2.82 to 2.99. For sample BER 213, the total taxa metric was 2 taxa higher (diversity was not calculated by WSP for this sample). Taxa richness was 1 taxon higher in each Econfina replicate resulting in slightly higher diversity measures (1.77 vs 1.76 for Rep 1/7 and 2.57 vs 2.56 for Rep 2/7) (**Table 2**). All taxa were correctly assigned to the various metric categories. Samples were assigned to the correct SCI regions. The metrics and final scores were calculated correctly except for the collapsing issue mentioned above. As was stated earlier, collapsing errors can impact the metrics and potentially the final score although they did not in this case.

**Data Usability Recommendation**

The department's use of WSP's data for assessment and compliance purposes is contingent upon the implementation of the corrective actions outlined in this report. After implementing the corrective actions from this audit, the Aquatic Ecology and Quality Assurance Section has determined that WSP's procedures meet the data quality objectives and recommends that the data may be used for DEP related purposes and in support of the scope of projects covered in this audit. Data users should ensure they have the recalculated results from the audited period that includes February 2020 through April 2024.

**Table 2.** Audit findings and/or requests for additional information for selected sample data produced by WSP.

| SOP Reference | Sample ID | Audit Finding | Recommended or Required Corrective Action(s) | WSP Response | Corrective Action and Implementation Date | DEP Comments |
|---|---|---|---|---|---|---|
| LT 7040, Sections 1-3 | ER6LC-1, BER 213, Econfina Rep 1/7 and 2/7 – 8/19/2020. | Taxa were not collapsed prior to richness and diversity calculations, resulting in higher values for these measures. Taxa richness was 8 taxa higher, and diversity went from 2.82 to 2.99 in sample ER6LC-1. Total taxa were 2 taxa higher for BER 213 (diversity was not calculated by WSP for this sample). Taxa richness was 1 taxon higher in each Econfina Rep resulting in slightly higher | **Required:** Starting at the bottom of the phylogenetic tree (e.g. species), determine if any entries have a higher taxonomic entry (genus, family or order). Remove the higher-level entry and add its number of individuals to the lower-level entries proportional to their count. | WSP has always collapsed data in accordance with SCI 1000 for Stream Condition Index Samples. It was not clear to WSP that collapsing is required for marine, Hester-Dendy, dredge, or other sample types, and to be consistent with previous sampling events/reports, WSP has continued to not collapse for those samples. Moving forward for taxonomic data that is reported to FDEP, WSP will | WSP will recalculate metrics for the FPL Gulf Clean Energy Center 2022 Hester Dendy Samples with collapsed data and provide summary of changes by December 31, 2025<br><br>WSP will notify Seminole County of these findings and remind them to collapse data before calculating metrics.<br><br>WSP will recalculate the | DEP accepts these corrective actions, and emphasizes the need to collapse all taxonomic data prior to metric calculation going forward. |

| SOP Reference | Sample ID | Audit Finding | Recommended or Required Corrective Action(s) | WSP Response | Corrective Action and Implementation Date | DEP Comments |
|---|---|---|---|---|---|---|
| | | diversity measures (1.77 vs 1.76 for Rep 1/7 and 2.57 vs 2.56 for Rep 2/7) | | collapse prior to calculating metrics. ER6LC-1 – FPL Gulf Clean Energy Center Thermal Plan of Study 2022- NPDES Permit No. FL0002275 BER 213- Seminole County calculated their own metrics.<br><br>Econfina- Econfina/ Fenholloway Petite Ponar Samples for Stantec for Georgia Pacific | metrics for Econfina/ Fenholloway samples with collapsed data, and provide summary of changes by December 31, 2025. | |
| FD 100 Section 3 | Econ-fina Rep 1/7 and 2/7 - 8/19/2020 | Shannon's Diversity was improperly labeled. The Shannon Diversity Index was labeled as Simpon's Diversity Index. It was correctly identified in the - | **Required:** Correct labels and resubmit correct diversity values to client, as appropriate. | WSP identified this error in February 2021, and issued a corrected report (see attached). WSP inadvertently provided the original calculations and report with the FDEP Audit. | Corrective Action implemented 02/12/2021, with reissuance of the Econfina Report, and correction to the data report template. | Acceptable. |

| SOP Reference | Sample ID | Audit Finding | Recommended or Required Corrective Action(s) | WSP Response | Corrective Action and Implementation Date | DEP Comments |
|---|---|---|---|---|---|---|
| | | original print-out from Primer-e that was provided upon request. There were four indices labeled as Shannon's Diversity. The values ranged from 0.9006 to 3.7556. It is unclear which result was reported to the client. | | | | |
| SCI 2221 Section 1 | Mustang Ranch SCIA | Details of how taxonomic QC discrepancies were resolved were not provided. | **Required:** DEP requests details of how taxonomic QC discrepancies were handled using the Mustang Ranch SCI QC sample listed in Table 1 as an example. | WSP utilizes the Taxonomy QAQC Resolution Form to document QAQC (See Attached for Mustang Ranch SCI A). Following QC for taxonomy, the second taxonomist notifies the original taxonomist of any | WSP did not intially provide the internal taxa QC resolution form but it was sent upon request in the preliminary audit report. | Acceptable. WSP provided the taxonomy QAQC resolution form for Mustang Ranch with their response on 8/12/25. |

| SOP Reference | Sample ID | Audit Finding | Recommended or Required Corrective Action(s) | WSP Response | Corrective Action and Implementation Date | DEP Comments |
|---|---|---|---|---|---|---|
| | | | | discrepancies, pointing out where the original taxonomist may have made an error. The original taxonomist will relook at the specimen and agree or disagree. We are usually able to come to a conclusion together, or pull in a third taxonomist to look at the specimen. If the species in question is in other samples IDed by the original taxonomist, we will re-evaluate those identifications too. | | |