LIMS QC Manager Data Uploading Instructions for Bench Biology and Microbiology Samples

1. INTRODUCTION

1.1. This procedure provides instruction for uploading data after analyzing bench biology samples. The Bench Biology lab analyzes chlorophyll and microbiology samples (LIMS Analysis IDs: CHLSUITE-W, CHL-CORR-P, CHL-MDFL-W, DW- PLATECT, ECOLI-18QT, TCOLI-18QT, EC-18QT-CL, FCOLI-MF, FC-MF-CL, ENT-24-QT, EN24-QT-CL). Sample data is saved as a raw data file at the end of analysis. The analyst uploads the results using LIMS QC Manager. A raw and review file are created, and the data are verified between analysts.

2. DATA ENTRY

2.1. Log into LIMS and select Laboratory → QC → QC Manager.

2.2. Choose the appropriate Biology Instrument from dropdown menu: Chlorophyll Lambda UV 365, Biology: Chlorophyll Fluoro TD-Trilogy, Biology: Microbial Analysis LogBook Data, or Biology: Micro QuantiTray.

2.3. Select File → Convert Instrument File from the menu. Select and Open file.

2.4. In the Save To LIMS window, use the run ID to name the .raw data file. For micro samples, use the batch ID. Click OK.

2.4.1. Chlorophyll samples: In the **Convert LAMBDA_365 File** (or **Convert TD-Trilogy File**) window, select the analyst and enter the date/time that the samples were extracted. For chlorophyll spectrophotometer samples, change the test ID to CHLSUITE-W. For periphyton samples, change the test ID to CHL-CORR-P. For chlorophyll fluorometer samples, do not change the test ID (test ID should be CHL-MDFL-W). Click **Convert**.

2.4.2. Micro-MF samples: In the **Convert MICROLOGBK File** window, select the batch ID, then click **Convert**.

2.5. Make any date/time, analyst name corrections as necessary in the Sample Table.

2.5.1. Micro-MF and -QT samples: Enter the name of the analyst who read the samples and date/time the samples were read from Prep Worksheet Manager. Make date/time adjustments if samples have multiple read times.

2.6. Highlight all data and select the "Prep Batch" column button and click the **New** button.

2.6.1. Chlorophyll samples: Select the "Analysis Batch" column button and click the **New** button.

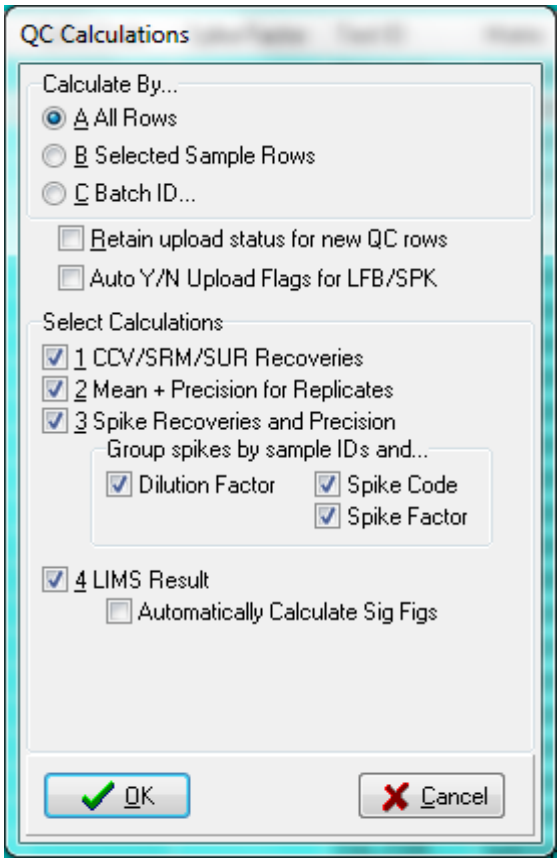
2.6.2. Micro-MF and -QT samples: Do not change the Analysis Batch ID.

2.7. If QCM has not already recognized duplicates, check Sample IDs. Highlight the lab duplicate samples. Click the "Type" column button and select the type as "REPL". Each duplicate set should have a different replicate ID ("A", "B", "C"…). Click **OK**. If QCM has not recognized method blanks, highlight and change "Type" to "MBLK".

2.7.1. Chlorophyll samples: Select the standard and click the "Spike Code" column button. Select the appropriate Spike Code. The codes are as follows: CSTD for chlorophyll spectrophotometer, and CSTD_mmddyy (where the month, date, and year correspond to the current/used calibration) for chlorophyll fluorometer. Click **Add** and enter "1" for the Spike Factor. Note: for chlorophyll fluorometer, a new spike code and standard value must be entered into LIMs after each calibration that corresponds to the recovered concentration of solid standard for the given calibration. Set the 'Type' for any samples followed by an underscore (except for **cstd_1**) to NONE

2.7.2. Select **Tools → Calculate** from the menu. Set QC Calculations as shown in Figure 1 and click **OK**.

Figure 1



2.7.3. Click the **Component Table** tab to switch to the Component Table. To upload data, first highlight the samples, then click on the "**Upload**" column button. Select "**Y**" and click **OK**.

2.7.4. Chlorophyll samples: For spectrophotometer blanks, upload all components. For standards, upload only the "Chlorophyll-a, Corrected" component. For all other samples (except duplicates), upload all three components.

2.7.5. Micro samples: Upload all data except RPD and Micro-MF Blk_B. For these, Select upload flag "N".

2.8. Uploading duplicates:

2.8.1. Chlorophyll samples: For each duplicate, upload only the average and the RPD data if both duplicate results were above PQL (i.e., neither has a "U" or an "I" remark). If one or both were below PQL (i.e., either has a "U" or an "I" remark), do not upload the average and RPD. Upload the duplicate with the higher LIMS result and report the other duplicate result in the comment: "Laboratory duplicate result is (number and qualifier) for [component]. Precision data is unavailable due to the small amount of analyte in the QC sample." Add any comments to both dups, the average, and the RPD. Add the "Precision data is not available for at least one component due to the small amount of analyte in the QC sample. Refer to QA report for available precision data." comment to the rest of the samples in the batch

2.8.1.1. For spectrophotometer samples, the duplicate rules apply to each component individually. Refer to Figure 7.1 for a flowchart explanation on uploading chlorophyll duplicates.

2.8.2. Micro-MF samples: For Micro sample duplicates, upload only the average if both duplicate results were within ideal colony count range (i.e., neither has a "B" or "U" remark). If one or both were not within ideal colony count range (i.e., either has a "B" or "U" remark), upload the result that was within ideal colony count range or the higher LIMS result if neither was within ideal colony count range and report the other duplicate result in the comment: "Laboratory duplicate result is the numerical value and qualifier (e.g., '**2U**' for undetected fecal coliforms. Precision data for this duplicate is unavailable due to the colony count falling outside of method acceptable range." Add the comment "Precision data for QC sample is unavailable due to the colony count falling outside of method acceptable range." to the rest of the samples with the same test ID in the batch.

2.8.3. Quanti-Tray samples: For each duplicate, upload only the average if both duplicate results were detected and quantifiable. If one or both has a "U" or "J" remark, do not upload the average. Upload the duplicate with the higher LIMS result and report the other duplicate result in the comment: "Laboratory duplicate result is the numerical value and qualifier (e.g., '10.0 **U**') for [component]. Precision data is unavailable due to the [small or high] amount of analyte in the QC sample." Add any comments to both dups and the average. Add the comment "Precision data is unavailable for [component] due to the [small or high] amount of analyte in the QC sample for the batch." to the rest of the samples with the same test ID in the batch.

2.9. Handling Control Failures (An "F" in the P/F column of Component Table. See method SOPs for quality control acceptance limits.

2.9.1. Determine cause of failure and if appropriate, qualify data as shown below.

2.9.1.1. Method Blank Failures:

2.9.1.1.1. Micro samples: All samples within the batch that are above MDL should be "V" qualified.

2.9.1.1.2. Chlorophyll spectrophotometer samples: Only "V" qualify the components corresponding to the blank components that failed. If the component result is greater than 10 times the blank, no qualifier is needed, just a comment that there was a laboratory blank failure but the result is > 10 times the blank result.

2.9.1.1.3. Chlorophyll fluorometer samples: If sample/component result is greater than 10 times the blank, no qualifier is needed, just a comment that there was a laboratory blank failure but the result is > 10 times the blank result.

2.9.1.2. Lab Sample replicate failures:

2.9.1.2.1. Chlorophyll spectrophotometer samples: Report sample replicate average result with a "J" qualifier and comment: "Result is J-qualified due to a laboratory duplicate RPD failure." Refer to Figure 7.2 for a flowchart explanation on handling lab sample replicate failures. Specify which components are "J" qualified in the comment and add the comment to both dups, the average, and the RPD.

2.9.1.2.2. Micro samples: If uploading the average result, check the precision in the control chart. If the precision fails, report sample replicate average with a "J" qualifier and comment: "Result is J-qualified due to a lab replicate precision failure." Add the comment " Precision data is unavailable for [Test ID] due to the laboratory duplicate precision not being within criteria limits" to the rest of the samples in the batch.

2.9.1.3. Control Sample failures (Spinach for chlorophyll spectrophotometer samples and solid standard for chlorophyll fluorometer samples): Report all samples within the batch with a "J" qualifier. Add the comment, "Refer to QA report for QC exceeding limits."

2.10. Micro-MF samples: A "Z" qualifier will be added to any sample result that is listed as too numerous to count in the LIMS MICRO_DATA_LOG. If it is a result from typical growth, report result as a calculated value using the upper limit of the ideal range and the lowest filtration volume analyzed with a "Z" qualifier. If it is a result from atypical growth, report as "No result" with a "Z" qualifier in Results Editor.

2.11. Micro-QT samples: If all wells are positive and the result is >2419.6 [or >24196.0 for diluted samples], report as 2419.6 or 24196.0, make sure it has a "J" qualifier, and add the comment "All Quanti-Tray wells were positive. Result may be higher than reported." to the corresponding sample.

2.12. Highlight all samples. Select **Tools → Show NCRs for selected samples** from the menu. Add a comment and/or appropriate qualifier to any sample/result that has an NCR related to the test/analysis that affects sample results. Attach a copy of any associated NCR to the packet.

2.12.1. If samples were received outside temperature limits or chlorophyll samples are received in a transparent bottle, add a "Y" qualifier to results and a comment that references the NCR.

2.12.1.1. Chlorophyll: Samples must be received at temperature ≤ 6ºC.

2.12.1.2. Micro Samples: Samples must be received at temperature ≤ 10ºC.

2.13. Save the data as a review file by selecting **File → Save** in the menu.

2.14. Select **File → Print**. Select **Report → Template → Open** to open the appropriate template. A template may be selected under a different analyst and then saved as your own. Type the file name (run ID for chlorophyll) in the "Report Title" text box.

2.15. Go to **Report → Print.** In next screen, select **Print.**

2.16. Exit the QC Manager.

3. COMPILATION OF DATA

3.1. Stamp the last page of the QC Manager Results printout with the verification stamp and sign your initials and date on the **Data Entry** line.

3.2. Compile printouts in order shown below. Attach with a paperclip.

3.2.1. Chlorophyll:

3.2.1.1. Photocopy Chlorophyll Run Log page

3.2.1.2. Perkin Elmer Sample Table printout or TD-Trilogy

3.2.1.3. Final results stamped QCM page

3.2.2. Micro:

3.2.2.1. Completed Membrane Filtration or Quanti-Tray Read Template

3.2.2.2. LIMS Lab logbook verification printout or verified Excel QT data sheet

3.2.2.3. Final results stamped QCM page

4. VERIFICATION (Follow SOP BG-01)

4.1. Verification requires two analysts: a reader and a verifier. The reader should not be the person who entered the data.

4.2. Verify that the correct analyst, analysis date and time from the logbook copy are on the QCM printout.

4.2.1. Chlorophyll samples: The reader calls out the Sample #, Filter vol (mL), and Extract vol (mL) columns from the Chlorophyll Run Log copy, while the verifier follows along using the sample table printout and makes corrections as needed. Calculations for dilutions and p-numbers should be checked by a different person than the one who originally calculated them.

4.2.2. Micro-MF samples: Before uploading, the reader calls out sample #, dilution, and result from the **QUANTI-TRAY and Membrane Filter Primary Count Log** (MB-QT-MF-COUNT), while the verifier follows along using the LIMS lab logbook verification printout.

4.2.3. Micro-QT Samples: Print the MPN-generated Excel file (Excel QT data sheet). Verify the following details: date and analyst (from the Prep Worksheet Manager), Sample ID, dilution, number of positive large wells, and number of positive small wells, as recorded in the QUANTI-TRAY and the Membrane Filter Primary Count Log (MB-QT-MF-COUNT).

4.3. Verify that the correct data sets for the duplicates have been uploaded. Checkmark and initial any errors that have been corrected in QCM.

4.4. After verification is completed, both analysts should sign and date the **Verified** line on the stamped final results printout.

5. DATA UPLOAD

5.1. Select Tools → Upload → By Upload Flag.

5.2. Note: If the message "Warning! You are uploading a spike RPD without its corresponding recoveries." appears in the QC Manager & Results Upload window, click OK.

5.3. Check the Error Log for corrections to be made.

5.4. Click on the shortcut button to Upload Data: . When complete, click OK.

5.5. Sign and date the **Uploaded** line on the stamped final results printout.

5.6. Place data in the appropriate "Data Packets" folder for authorization.

6. REFERENCES

6.1. DEP SOP BG-01, Data-Entry Verification

7. TABLES AND DIAGRAMS

Figure 7.1 Uploading chlorophyll duplicates

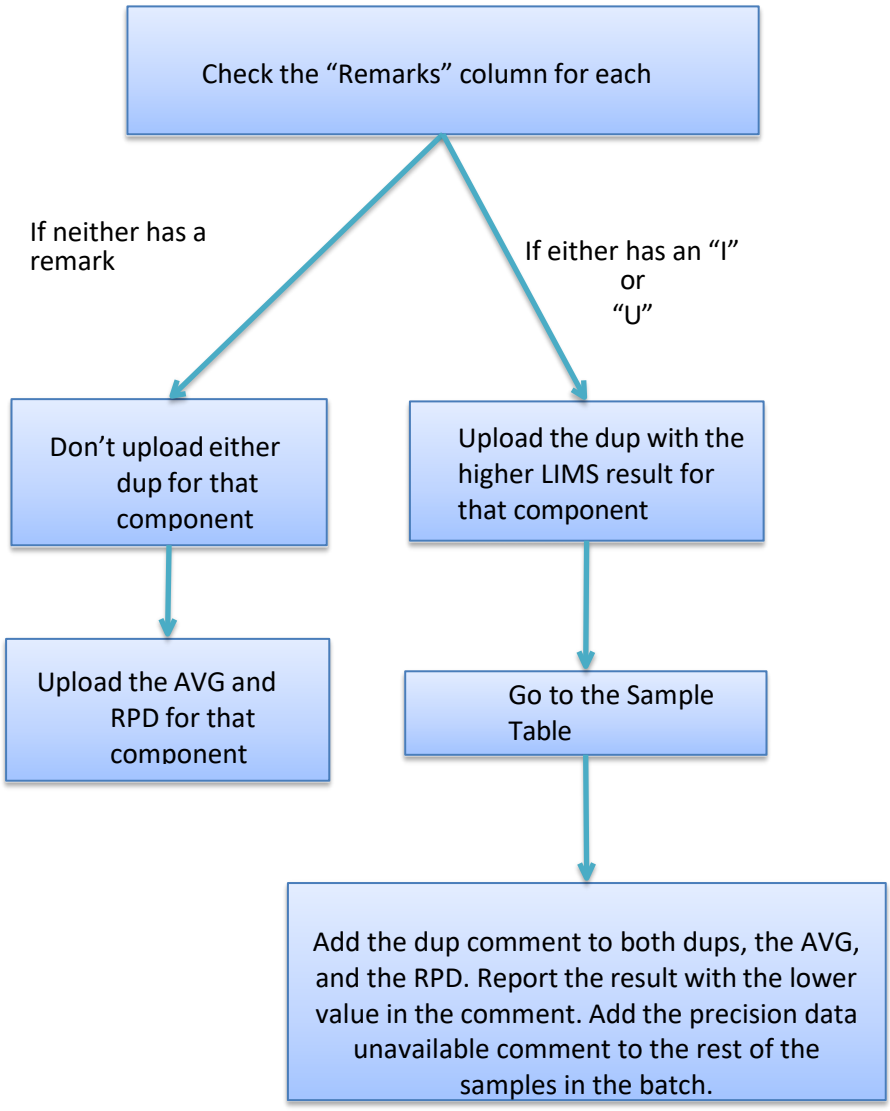
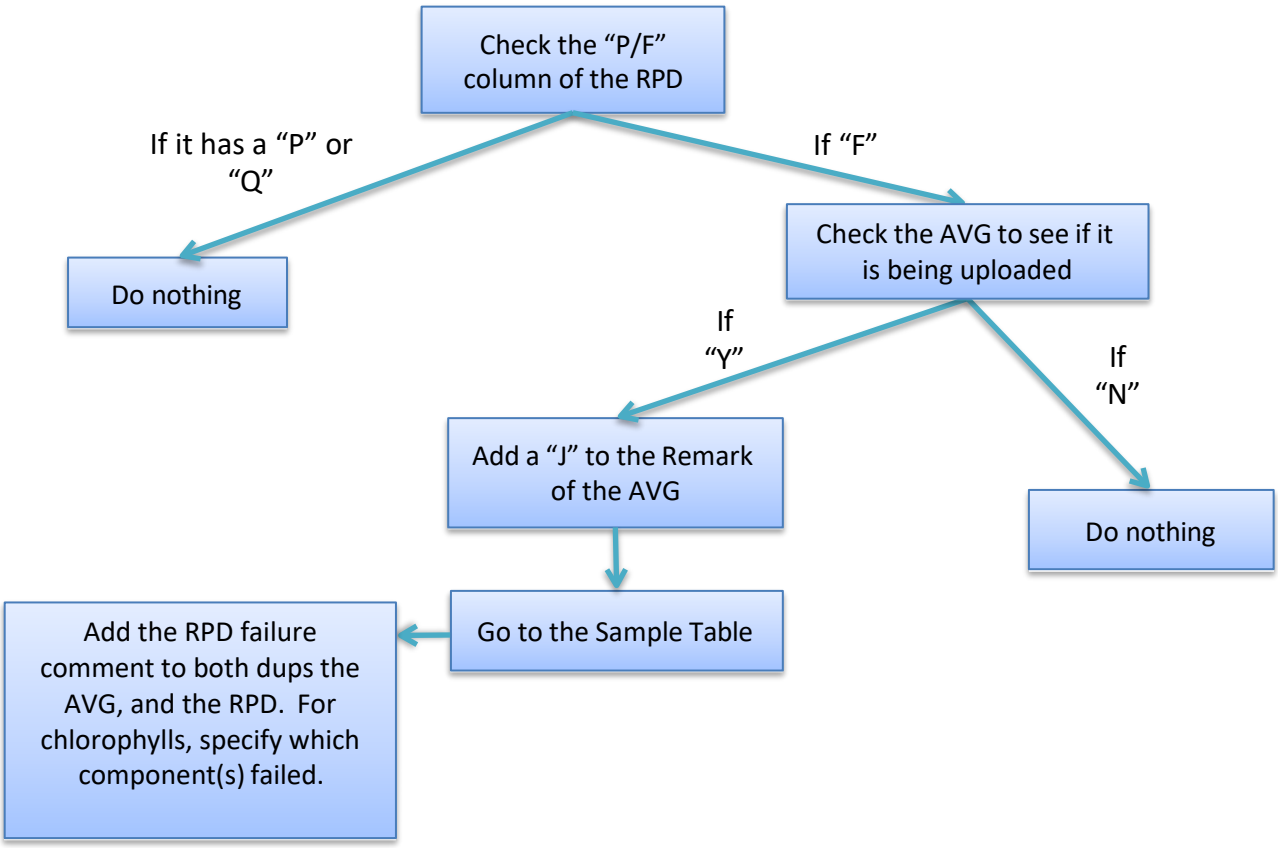


Figure 7.2. Handling lab sample replicate failures for chlorophyll



APPENDIX OF CHANGES

06/22/2009 SOP reviewed and edited to update according to current procedures. Changes made to reporting replicate RPD data in Section 2.13.

07/20/2010 SOP reviewed and edited to update according to current procedures. Added flowcharts in Section 6.

06/16/2011 SOP reviewed and edited to update according to current procedures. Changes made to chlorophyll duplicate uploading and qualifying procedures.

06/05/2012 Added instructions to change the analyst, date, and time for sediments. Moved directions for "K" qualifying sediments to occur before the dup directions and included directions for uploading dups with "K" qualifiers.

04/29/2013 Added "Prep Worksheet" to Section 3.2.3. Added step for using spike codes.

07/17/2014 Added more test IDs to Section 1. Differentiated between Micro-MF and Micro-QT. Removed Show NCR step from the beginning of Section 2. There was already a step for that later in the same section. Added 0.1% for the sediment laser limit.

01/22/2015 Formatted for 508 compliance.

03/02/2015	Added instructions for BOD dilutions that are not uploaded and batches of any samples that do not have the RPD uploaded. Removed instructions for L-qualifier. Added uploading step.
05/07/2015	Updated blank failure and BOD duplicate uploading instructions.
12/26/2016	Updated chlorophyll information to reflect the upload of all components, corrected chlorophyll dup upload, updated chlorophyll dup uploading flowchart, clarified micro precision failure instructions, and added micro dup verification step.
12/14/2017	Revised information in sections 2.18, 5.3 and 5.6.
01/07/2019	Revised information in section 2 and in Tables and Diagrams.
12/30/2019	Updated information pertaining to chlorophyll uploads, made small clarification edits throughout and removed references to Sediment Particle Size analysis.
02/16/2022	Added T. coli to list of tests. Remove references to BOD analysis.
08/23/2023	Removed references to analyses that are no longer performed. Made clarifications to the instructions for uploading duplicates. Remove references to the “chlorophyll/phaeophytin ratio” component. Updated instructions for verification.
01/08/2025	Changes were made to the micro QCM time/date instructions, as well as to the micro compilation of data section. Modifications were also made to the Chlorophyll QCM instructions for blank uploading and the “Type” designation for “_#” samples. QCM corrections were made to the Membrane Filtration comment instructions. Additionally, the document formatting was updated to comply with SOP formatting protocols, instructions for verification procedures were clarified, and the SOP was reviewed and edited to reflect current procedures.