Lab Director Approval: Mark Tolbert / 08/19/2021

QA Manager Approval: Jeffrey Moore / 08/19/2021

# Standard Operating Procedure for Reviewing QA/QC Batch Reports

Access to this SOP shall be available within the laboratory for reference purposes; the official copy of this SOP resides on the official Georgia EPD website at https://epd.georgia.gov/about-us/epd-laboratory-operations. Printed copies of this SOP will contain a watermark indicating the copy is an uncontrolled copy.

## 1 Scope and Application

1.1 QA/QC Batch Reports are issued for most analyses with the completion of each batch of samples. These reports have all the pertinent information that was entered for the QC sample assigned for this analysis. A QC sample is the sample chosen for analysis of Matrix Spikes (MS) and Matrix Spike Duplicates (MSD) for a particular analysis. Each analysis may have a different QC sample depending on the analysis. Therefore each batch associated with a sample set may have a different QC sample for different analyses.



1.2 Each QA/QC Batch Report has all the information needed to determine the overall acceptability of the Quality Control Results. It has results for the Blank, Laboratory Control Sample (LCS), Laboratory Control Sample Duplicate (LCSD), Matrix Spike (MS), Matrix Spike Duplicate (MSD), and their respective % recoveries and Relative Percent Differences (RPD). Each Report also lists the sample IDs associated with the QC sample in the upper right corner along with the Batch Report ID number. The bottom left corner has the Labworks (LIMS) analysis code and the batch number again for reference.

1.3 Most % Recovery and RPD results have acceptance limits that are calculated twice a year and entered in the test code data fields. These numbers are not listed in the QA/QC report, however if the result for % Recovery and/or RPD are above or below the limits, the result is in BOLD type and either a U (upper) or L (lower) letter respectively, is put by the value. Most bold-faced values will also have a comment explaining the situation and a corrective action number which was generated to explain the problem and its resolution. These “flagged” results, as they are referred to, are what is scrutinized along with any comments. Most QC results will not be flagged.

## 2 Definitions

2.1 Refer to Chapter 3 of the Georgia EPD Laboratory Quality Assurance Manual for

Quality Control Definitions.

## 3 Quality Control

3.1 References to Quality Control violations are Method and/or SOP specific.

## 4 Procedure

4.1 Each Laboratory will generate QA/QC Batch Reports on a regular basis. These will be generated when an analysis of a batch of samples is complete and the data validated. Each Manager will place all completed Batch Reports in the appropriate in-box (QA/QC Reports), in the QA manager's office, to be reviewed. These will come in groups and there are about 100 test codes that may be used overall.

4.2 Each QA/QC Batch Report will be reviewed as time permits. But should be reviewed as soon as possible.



4.3 Most flagged results are for QC values slightly outside the acceptable limits. These will require no further action, if a corrective action and comment are noted. However, if there are unusual problems or a multitude of failures in any of the spikes, a closer look should be made into the problem. The Lab Director should also be notified of these types of failures.

4.4 Comments made for unusual problems will sometimes answer questions that are raised for unusual results. If the cause and resolution are effectively noted this is usually sufficient.

4.5 If there are still questions, it is time to discuss the problem with the associated manager, supervisor and/or analyst. Depending on the situation it may require pulling the raw data for review, but this is rare. The Lab Director should also be notified of these types of failures.

4.6 If an issue arises that is not adequately covered by comments or a corrective action, the manager should be consulted and different comment or addition to the corrective action should be made to clarify.

4.7 All reviewed Batch Sheets are stamped with APPROVED stamp which includes the date, then initialed and must be filed in the QA office. The most efficient way is to stack the Sheets into five groups: Inorganics, Metals, GCMS, Organics, and Crypto. Then separate each test code out alphabetically and group all of the same test codes together. This will greatly speed up the filing process.

4.8 All QA/QC Batch Sheets six months or older can be purged from the files. Some test codes will have a considerably larger number than others. These can be purged more often but try to keep at least 3 months on file. These copies are just for QA review. Copies of all of these sheets are available electronically as well as filed with each batch in each Laboratory.

## 5 Calculations

Not Applicable

## 6 References

6.1 GA EPD Laboratory Quality Assurance Plan, online revision.

## 7 Attachments

7.1 Example of a GCMS QA/QC Batch Report

Georgia Environmental Protection Division
5804 Peachtree Corners East
Norcross, GA 30092-3403

# QA/QC BATCH REPORT

To: Georgia Env Protection Divison
Hazardous Waste Mgmt Branch
205 Butler St SE Suite 1154E
Atlanta, GA 30334

Sample ID: AJ76884
Location Code: HWMB
Date Collected: 1/22/2018 4:27:00 PM
Date Received: 1/23/2018 12:08:00 PM

QA/QC Batch Name: $827CW-170385
Project: HW
Sample Description: SWAINSBORO ELECTROPLATING INC./HW

Samples in Batch #: 170385

| | | | |
|---|---|---|---|
| AJ76671 | AJ76672 | AJ76875 | AJ76876 |
| AJ76877 | AJ76878 | AJ76879 | AJ76880 |
| AJ76881 | AJ76882 | AJ76883 | AJ76884 |
| AJ76885 | | | |

| Analysis/Analyte $827CW | Result ug/L | Method Blank ug/L | MA Spiked ug/L | MS Result ug/L | MS Dup Result ug/L | MSD Prec RPD | MS Rec % | MSD Rec % | LCA Spiked ug/L | LCS Result ug/L | LCSD Result ug/L | LCSD Prec RPD | LCS Rec % | LCSD Rec % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1'-Biphenyl | ND | <10 | | | | | | | | | | | | |
| 1,2,4,5-Tetrachlorobenzene | ND | <10 | | | | | | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | <10 | 100 | 57.4 | 46.4 | 21.2 | 57.4 | 46.4 | 100 | 55.8 | 54.7 | 1.99 | 55.8 | 54.7 |
| 1,2-Dichlorobenzene | ND | <10 | | | | | | | | | | | | |
| 1,2-Diphenylhydrazine | ND | <10 | | | | | | | | | | | | |
| 1,3-Dichlorobenzene | ND | <10 | | | | | | | | | | | | |
| 1,4-Dichlorobenzene | ND | <10 | 100 | 55.8 | 44.1 | 23.4 | 55.8 | 44.1 | 100 | 49.8 | 50.4 | 1.20 | 49.8 | 50.4 |
| 1,4-Dioxane | ND | <10 | | | | | | | | | | | | |
| 1-Chloronaphthalene | ND | <10 | | | | | | | | | | | | |
| 1-Naphthylamine | ND | <10 | | | | | | | | | | | | |
| 2,3,4,6-Tetrachlorophenol | ND | <10 | | | | | | | | | | | | |
| 2,4,5-Trichlorophenol | ND | <10 | | | | | | | | | | | | |
| 2,4,6-Tribromophenol(Surrogate QC Std.) | 40.2 | 52.2 | 100 | 15.6 | 30.6 | | | | 100 | 77.0 | 75.9 | | | |
| 2,4,6-Trichlorophenol | ND | <10 | | | | | | | | | | | | |
| 2,4-Dichlorophenol | ND | <10 | | | | | | | | | | | | |
| 2,4-Dimethylphenol | ND | <10 | | | | | | | | | | | | |
| 2,4-Dinitrophenol | ND | <50 | | | | | | | | | | | | |
| 2,4-Dinitrotoluene | ND | <10 | 100 | 78.2 | 73.6 | 6.06 | 78.2 | 73.6 | 100 | 86.5 | 86.8 | 0.346 | 87.0 | 86.8 |
| 2,6-Dichlorophenol | ND | <10 | | | | | | | | | | | | |
| 2,6-Dinitrotoluene | ND | <10 | | | | | | | | | | | | |
| 2-Chloronaphthalene | ND | <10 | | | | | | | | | | | | |
| 2-Chlorophenol | ND | <10 | 100 | 20.1 | 27.9 | **U*32.5** | **L*20.1** | 27.9 | 100 | 64.9 | 67.1 | 3.33 | 64.9 | 67.1 |
| 2-Fluorobiphenyl(Surrogate QC Std.) | 52.0 | 58.5 | 100 | 68.7 | 58.9 | | | | 100 | 71.5 | 70.0 | | | |
| 2-Fluorophenol(Surrogate QC Std.) | 16.4 | 31.1 | 100 | **L*7.73** | 11.0 | | | | 100 | 38.2 | 39.0 | | | |
| 2-Methylnaphthalene | ND | <10 | | | | | | | | | | | | |
| 2-Methylphenol | ND | <10 | | | | | | | | | | | | |
| 2-Naphthylamine | ND | <10 | | | | | | | | | | | | |
| 2-Nitroaniline | ND | <50 | | | | | | | | | | | | |
| 2-Nitrophenol | ND | <10 | | | | | | | | | | | | |
| 2-Picoline | ND | <10 | | | | | | | | | | | | |
| 3,3'-Dichlorobenzidine | ND | <20 | | | | | | | | | | | | |
| 3-Methylcholanthrene | ND | <10 | | | | | | | | | | | | |
| 3-Nitroaniline | ND | <50 | | | | | | | | | | | | |
| 4,6-Dinitro-2-Methylphenol | ND | <50 | | | | | | | | | | | | |
| 4-Aminobiphenyl | ND | <20 | | | | | | | | | | | | |

Georgia Environmental Protection Division
5804 Peachtree Corners East
Norcross, GA 30092-3403

# QA/QC BATCH REPORT

| Analysis/Analyte $827CW | Result ug/L | Method Blank ug/L | MA Spiked ug/L | MS Result ug/L | MS Dup Result ug/L | MSD Prec RPD | MS Rec % | MSD Rec % | LCA Spiked ug/L | LCS Result ug/L | LCSD Result ug/L | LCSD Prec RPD | LCS Rec % | LCSD Rec % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-Bromophenyl-phenylether | ND | <10 | | | | | | | | | | | | |
| 4-Chloro-3-Methylphenol | ND | <20 | 100 | 42.0 | 52.8 | 22.8 | 42.0 | 52.8 | 100 | 78.9 | 77.4 | 1.92 | 78.9 | 77.4 |
| 4-Chloroaniline | ND | <20 | | | | | | | | | | | | |
| 4-Chlorophenyl-Phenylether | ND | <10 | | | | | | | | | | | | |
| 4-Methylphenol | ND | <10 | | | | | | | | | | | | |
| 4-Nitroaniline | ND | <20 | | | | | | | | | | | | |
| 4-Nitrophenol | ND | <50 | 100 | 10.5 | 9.65 | 8.44 | 10.5 | **L*9.65** | 100 | 34.4 | 37.2 | 7.82 | 27.3 | 37.2 |
| 7,12-Dimethylbenz(a)anthracen | ND | <10 | | | | | | | | | | | | |
| aa-Dimethyl-Phenethylamine | ND | <10 | | | | | | | | | | | | |
| Acenaphthene | ND | <10 | 100 | 69.4 | 62.0 | 11.3 | 69.4 | 62.0 | 100 | 76.4 | 78.2 | 2.33 | 76.5 | 78.2 |
| Acenaphthylene | ND | <10 | | | | | | | | | | | | |
| Acetophenone | ND | <10 | | | | | | | | | | | | |
| Aldrin | ND | <10 | | | | | | | | | | | | |
| Alpha-BHC | ND | <10 | | | | | | | | | | | | |
| Aniline | ND | <10 | | | | | | | | | | | | |
| Anthracene | ND | <10 | | | | | | | | | | | | |
| Atrazine | ND | <10 | | | | | | | | | | | | |
| Benzaldehyde | ND | <10 | | | | | | | | | | | | |
| Benzidine | ND | <10 | | | | | | | | | | | | |
| Benzo[a]anthracene | ND | <10 | | | | | | | | | | | | |
| Benzo[a]pyrene | ND | <10 | | | | | | | | | | | | |
| Benzo[b]fluoranthene | ND | <10 | | | | | | | | | | | | |
| Benzo[g,h,i]perylene | ND | <10 | | | | | | | | | | | | |
| Benzo[k]fluoranthene | ND | <10 | | | | | | | | | | | | |
| Benzoic Acid | ND | <50 | | | | | | | | | | | | |
| Benzyl Alcohol | ND | <20 | | | | | | | | | | | | |
| Beta-BHC | ND | <10 | | | | | | | | | | | | |
| Bis(2-Chloroethoxy)methane | ND | <10 | | | | | | | | | | | | |
| bis(2-Chloroethyl)ether | ND | <10 | | | | | | | | | | | | |
| Bis(2-Chloroisopropyl)ether | ND | <10 | | | | | | | | | | | | |
| Bis(2-Ethylhexyl)phthalate | ND | <10 | | | | | | | | | | | | |
| Butylbenzylphthalate | ND | <10 | | | | | | | | | | | | |
| Caprolactam | ND | <10 | | | | | | | | | | | | |
| Carbazole | ND | <10 | | | | | | | | | | | | |
| Chrysene | ND | <10 | | | | | | | | | | | | |
| Delta-BHC | ND | <10 | | | | | | | | | | | | |
| Dibenz(a,j)acridine | ND | <10 | | | | | | | | | | | | |
| Dibenz[a,h]anthracene | ND | <10 | | | | | | | | | | | | |
| Dibenzofuran | ND | <10 | | | | | | | | | | | | |
| Dieldrin | ND | <10 | | | | | | | | | | | | |

Georgia Environmental Protection Division
5804 Peachtree Corners East
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# QA/QC BATCH REPORT

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Diethylphthalate | ND | <10 | | | | | | | | | | | | |
| Dimethylphthalate | ND | <10 | | | | | | | | | | | | |
| Di-n-Butylphthalate | ND | <10 | | | | | | | | | | | | |
| Di-n-octylphthalate | ND | <10 | | | | | | | | | | | | |
| Diphenylamine | ND | <10 | | | | | | | | | | | | |
| Endosulfan 1 | ND | <50 | | | | | | | | | | | | |
| Endosulfan 2 | ND | <50 | | | | | | | | | | | | |
| Endosulfan Sulfate | ND | <25 | | | | | | | | | | | | |
| Endrin | ND | <20 | | | | | | | | | | | | |
| Endrin Aldehyde | ND | <10 | | | | | | | | | | | | |
| Ethylmethanesulfonate | ND | <20 | | | | | | | | | | | | |
| Fluoranthene | ND | <10 | | | | | | | | | | | | |
| Fluorene | ND | <10 | | | | | | | | | | | | |
| Gamma-BHC | ND | <10 | | | | | | | | | | | | |
| Heptachlor | ND | <10 | | | | | | | | | | | | |
| Heptachlor Epoxide | ND | <25 | | | | | | | | | | | | |
| Hexachlorobenzene | ND | <10 | | | | | | | | | | | | |
| Hexachlorobutadiene | ND | <10 | | | | | | | | | | | | |
| Hexachlorocyclopentadiene | ND | <10 | | | | | | | | | | | | |
| Hexachloroethane | ND | <10 | | | | | | | | | | | | |
| Indeno[1,2,3-cd]pyrene | ND | <10 | | | | | | | | | | | | |
| Isophorone | ND | <10 | | | | | | | | | | | | |
| Methylmethanesulfonate | ND | <10 | | | | | | | | | | | | |
| Naphthalene | ND | <10 | | | | | | | | | | | | |
| Nitrobenzene | ND | <10 | | | | | | | | | | | | |
| Nitrobenzene-d5(Surrogate QC Std.) | 54.9 | 61.2 | 100 | 65.6 | 53.5 | | | | 100 | 70.7 | 71.3 | | | |
| n-Nitrosodimethylamine | ND | <10 | | | | | | | | | | | | |
| N-Nitroso-di-n-butylamine | ND | <10 | | | | | | | | | | | | |
| N-Nitroso-di-n-propylamine | ND | <10 | 100 | 67.4 | 55.3 | 19.7 | 67.4 | 55.3 | 100 | 73.6 | 78.0 | 5.80 | 73.6 | 78.0 |
| N-Nitrosodiphenylamine | ND | <10 | | | | | | | | | | | | |
| N-Nitrosopiperidine | ND | <20 | | | | | | | | | | | | |
| p,p'-DDD | ND | <10 | | | | | | | | | | | | |
| p,p'-DDE | ND | <10 | | | | | | | | | | | | |
| p,p'-DDT | ND | <10 | | | | | | | | | | | | |
| p-Dimethylaminoazobenzene | ND | <10 | | | | | | | | | | | | |
| Pentachlorobenzene | ND | <10 | | | | | | | | | | | | |
| Pentachloronitrobenzene | ND | <20 | | | | | | | | | | | | |
| Pentachlorophenol | ND | <50 | 100 | 23.7 | 30.2 | 24.1 | 23.7 | 30.2 | 100 | 68.3 | 70.4 | 3.03 | 68.2 | 70.4 |
| Phenacetin | ND | <20 | | | | | | | | | | | | |
| Phenanthrene | ND | <10 | | | | | | | | | | | | |

$827CW-170385

Georgia Environmental Protection Division
5804 Peachtree Corners East
Norcross, GA 30092-3403

# QA/QC BATCH REPORT

| Analysis/Analyte $827CW | Result ug/L | Method Blank ug/L | MA Spiked ug/L | MS Result ug/L | MS Dup Result ug/L | MSD Prec RPD | MS Rec % | MSD Rec % | LCA Spiked ug/L | LCS Result ug/L | LCSD Result ug/L | LCSD Prec RPD | LCS Rec % | LCSD Rec % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phenol | ND | <10 | 100 | 9.52 | 13.6 | **U*35.3** | **L*9.52** | 13.6 | 100 | 27.4 | 28.0 | 2.17 | 27.4 | 28.0 |
| Phenol-d5(Surrogate QC Std.) | 16.2 | 22.3 | 100 | **L*9.96** | 13.8 | | | | 100 | 27.4 | 28.9 | | | |
| Pronamide | ND | <10 | | | | | | | | | | | | |
| Pyrene | ND | <10 | 100 | 76.5 | 72.4 | 5.51 | 76.5 | 72.4 | 100 | 86.9 | 86.8 | 0.115 | 86.9 | 86.8 |
| Pyridine | ND | <10 | | | | | | | | | | | | |
| Terphenyl-d14(Surrogate QC Std.) | 77.4 | 82.7 | 100 | 86.6 | 80.2 | | | | 100 | 97.8 | 98.0 | | | |

Comments: $RD827CW- EPA 8270CW- Matrix spike duplicate had one compound, 4-Nitrophenol (9.65% recovery, limits 10-100%) with a recovery outside acceptable control limits. LCS results were within acceptable control limits. 7-020618-22

Comments: $R_827CW- EPA 8270CW- Matrix spike had two compounds, Phenol (9.52% recovery, limits 11-100%) and 2-Chlorophenol (20.1% recovery, limits 23-100%) with recoveries outside acceptable control limits. LCS results were within acceptable control limits. 7-020618-22

Comments: $S_827CW- EPA 8270C-Matrix spike had two surrogate compounds, 2-Fluorophenol (7.73% recovery, limits 10-100%) and Phenol-d5 (9.96% recovery, limits 10-100%) with recoveries outside acceptable control limits. LCS results were within acceptable control limits. 7-020618-22

Comments: $P_827CW-EPA 8270C-MS/MSD precision has two compounds, Phenol (35.3% precision, limit <30%) and 2-Chlorophenol (32.5% precision, limit <30%) with precisions outside acceptable control limit. LCS/LCSD precision were within acceptable control limits. 7-020618-22