

Dates available: May 26, 2020 – October 18, 2021

The Clemson Wastewater Data folder contains the following files

1. Clemson Wastewater Data Dictionary.docx (this file)
2. Clemson University SARS-CoV-2 in Wastewater Monitoring Record.xlsx
3. Folder of SiREM Reports (raw data that is summarized in the Excel file)
4. Folder of SiREM Reports, Manholes (raw data that is summarized in the Excel file)
5. Folder of SiREM Reports, Variants (raw data that is summarized in the Excel file)

Clemson University SARS-CoV-2 in Wastewater Monitoring Record.xlsx
Full Data, Headworks Sheet

CU SEWAGE SAMPLES

Composite Wastewater Sample Collection Section

Label (Column)	Format	Description
Start (A)	MM/DD/YY HH:MM AM/PM	Beginning of time window of sample collection
End (B)	MM/DD/YY HH:MM AM/PM	End of time window of sample collection
Flow Rate (gal/d) (C)	Integer	Number of gallons flowing through the collection location during the collection time period defined by Start and End
Rainfall (in) (D)	###	Amount of rainfall at the collection location during the collection time period defined by Start and End

Sample Retrieval

Label	Format	Description
By (E)	Char	Last name of person(s) collecting the sample
Date and Time (F)	MM/DD/YY HH:MM AM/PM	Time at which sample was collected

Sample Volume (mL)

Label	Format	Description
Sample Volume (mL) (G)	Integer	Volume of sample collected

Clemson University Sample ID

Label	Format	Description
Clemson University Sample ID (H)	Char	Unique identifier for the sample

Sample Shipping

Label	Format	Description
Method (I)	Char	How the sample was shipped
Time (J)	MM/DD/YY HH:MM AM/PM	Time at which sample was delivered to shipper
By (K)	Char	Last name of person(s) shipping the sample

FedEx Tracking Number

Label	Format	Description
FedEx Tracking Number (L)	12 numbers	FedEx tracking number

SiREM Sample Handling

Label	Format	Description
Date Received (N)	MM/DD/YYYY	Date the sample was received

Label	Format	Description
RNA Extraction Date (O)	MM/DD/YYYY	Date the RNA was extracted from the sample

CU Sewage Sample

Label	Format	Description
SARS-CoV-2 Targets: ORF1ab (P)	NEG / POS / AR	Categorization of results
SARS-CoV-2 Targets: N gene (Q)	NEG / POS / AR	Categorization of results
SARS-CoV-2 Targets: S gene (R)	NEG / POS / AR	Categorization of results
MS2 Matrix Spike (S)	NEG / POS / AR	Categorization of results
Detected? (T)	Yes / No	Yes if the sample contains measurable virus
Quantity (gene copies/L) (U)	Real number	Number of virus particles detected

Variants

Label	Format	Description
UK B.1.1.7: % of total (V)	BLD / Integer	Of the virus particles detected, the percentage of the variant
UK B.1.1.7: (copies/L) (W)	Real number	Number of virus particles detected
SA B1.351: % of total (X)	BLD / Integer	Of the virus particles detected, the percentage of the variant
SA B1.351: (copies/L) (Y)	Real number	Number of virus particles detected

MS2 Matrix Spike

Label	Format	Description
Result (Z)	NEG / POS / AR	Categorization of results
Detected? (AA)	Yes / No	Yes if the sample contains measurable virus

Trip Negative Control

Label	Format	Description
SARS-CoV-2 Targets: ORF1ab (AB)	NEG / POS / AR	Categorization of results
SARS-CoV-2 Targets: N gene (AC)	NEG / POS / AR	Categorization of results
SARS-CoV-2 Targets: S gene (AD)	NEG / POS / AR	Categorization of results

Label	Format	Description
Detected? (AE)	Yes / No	Yes if the sample contains measurable virus
Mass rate (10 ¹² copies/d) (AF)	Real number	Number of virus particles detected
Minimum Estimated Individuals (AG)	Integer	Estimate of how many people are shedding SARS-CoV-2

CITY OF CLEMSON COCHRAN ROAD SEWAGE SAMPLE

Composite Wastewater Sample Collection Section

Label	Format	Description
Start (AI)	MM/DD/YY HH:MM AM/PM	Beginning of time window of sample collection
End (AJ)	MM/DD/YY HH:MM AM/PM	End of time window of sample collection
Flow Rate (gal/d) (AK)	Integer	Number of gallons flowing through the collection location during the collection time period defined by Start and End
Rainfall (in) (AL)	#.##	Amount of rainfall at the collection location during the collection time period defined by Start and End

Sample Retrieval

Label	Format	Description
By (AM)	Char	Last name of person(s) collecting the sample
Date and Time (AN)	MM/DD/YY HH:MM AM/PM	Time at which sample was collected

City of Clemson Sample ID

Label	Format	Description
City of Clemson Sample ID (AO)	Char	Unique identifier for the sample

City of Clemson Cochran Road Sewage Sample

Label	Format	Description
SARS-CoV-2 Targets: ORF1ab (AP)	NEG / POS / AR	Categorization of results
SARS-CoV-2 Targets: N gene (AQ)	NEG / POS / AR	Categorization of results
SARS-CoV-2 Targets: S gene (AR)	NEG / POS / AR	Categorization of results
MS2 Matrix Spike (AS)	NEG / POS / AR	Categorization of results

Label	Format	Description
Detected? (AT)	Yes / No	Yes if the sample contains measurable virus
Quantity (gene copies/L) (AU)	Real number	Number of virus particles detected
Mass rate (10 ¹² copies/d) (AV)	Real number	Number of virus particles detected
Minimum Estimated Individuals (AW)	Integer	Estimate of how many people are shedding SARS-CoV-2

Variants

Label	Format	Description
UK B.1.1.7: % of total (AX)	BLD / Integer	Of the virus particles detected, the percentage of the variant
UK B.1.1.7: (copies/L) (AY)	Real number	Number of virus particles detected
SA B1.351: % of total (AZ)	BLD / Integer	Of the virus particles detected, the percentage of the variant
SA B1.351: (copies/L) (BA)	Real number	Number of virus particles detected

PENDLETON/CLEMSON SEWAGE SAMPLE

Composite Wastewater Sample Collection Section

Label	Format	Description
Start (BC)	MM/DD/YY HH:MM AM/PM	Beginning of time window of sample collection
End (BD)	MM/DD/YY HH:MM AM/PM	End of time window of sample collection
Flow Rate (gal/d) (BE)	Integer	Number of gallons flowing through the collection location during the collection time period defined by Start and End
Rainfall (in) (BF)	###	Amount of rainfall at the collection location during the collection time period defined by Start and End

Sample Retrieval

Label	Format	Description
By (BG)	Char	Last name of person(s) collecting the sample
Date and Time (BH)	MM/DD/YY HH:MM AM/PM	Time at which sample was collected

Pendleton/Clemson Sample ID

Label	Format	Description
Pendleton / Clemson Sample ID (BI)	Char	Unique identifier for the sample

Clemson / Pendleton Sewage Sample

Label	Format	Description
SARS-CoV-2 Targets: ORF1ab (BJ)	NEG / POS / AR	Categorization of results
SARS-CoV-2 Targets: N gene (BK)	NEG / POS / AR	Categorization of results
SARS-CoV-2 Targets: S gene (BL)	NEG / POS / AR	Categorization of results
MS2 Matrix Spike (BM)	NEG / POS / AR	Categorization of results
Detected? (BN)	Yes / No	Yes if the sample contains measurable virus
Quantity (gene copies/L) (BO)	Real number	Number of virus particles detected
Mass rate (10^{12} copies/d) (BP)	Real number	Number of virus particles detected
Minimum Estimated Individuals (BQ)	Integer	Estimate of how many people are shedding SARS-CoV-2

Variants

Label	Format	Description
UK B.1.1.7: % of total (BR)	BLD / Integer	Of the virus particles detected, the percentage of the variant
UK B.1.1.7: (copies/L) (BS)	Real number	Number of virus particles detected
SA B1.351: % of total (BT)	BLD / Integer	Of the virus particles detected, the percentage of the variant
SA B1.351: (copies/L) (BU)	Real number	Number of virus particles detected

Label	Format	Description
Mass rate (10^{12} copies/d) (BW)	Real number	Number of virus particles detected
Minimum Estimated Individuals (BX)	Integer	Estimate of how many people are shedding SARS-CoV-2

Clemson University SARS-CoV-2 in Wastewater Monitoring Record.xlsx

Summary, Headworks Sheet

Summarizes the data in Full Data, Headworks Sheet for graphing in Summary Graph – Line, Headworks

Label (Column)	Format	Description
Date (A)	MM/DD/YY	Date of sample
Rainfall (in) (B)	###	Amount of rainfall at the collection location during the collection time period defined by Start and End

University WWTP Section

Label (Column)	Format	Description
Flow Rate (gal/d) (C)	Integer	Number of gallons flowing through the collection location during the collection time period defined by Start and End
Virus Copies Per Liter (D)	Integer	Number of viruses per liter based on the testing results
Concern Level (E)	Char	0, I, II, III, IV, AR – Categorization of Virus Copies into one of five levels or Awaiting results ¹
% UK B.1.1.7 (F)	Integer	Percent of Variant in sample
% SA B1.351 (G)	Integer	Percent of Variant in sample

Cochran Road Section

Label (Column)	Format	Description
Flow Rate (gal/d) (H)	Integer	Number of gallons flowing through the collection location during the collection time period defined by Start and End
Virus Copies Per Liter (I)	Integer	Number of viruses per liter based on the testing results
Concern Level (J)	Char	0, I, II, III, IV, AR – Categorization of Virus Copies into one of five levels or Awaiting results
% UK B.1.1.7 (K)	Integer	Percent of Variant in sample
% SA B1.351 (L)	Integer	Percent of Variant in sample

¹ 0 = virus is below detection; infected individuals may be present, but virus levels are too low to detect

I = virus is above the minimum detection level but still at a low concentration; watch for increasing trends (4,000 to 9,000 copies per liter)

II = virus level of concern; pay close attention to a potential for active transmission (10,000 to 99,000 copies per liter)

III = significant concern; large numbers of infected individuals are likely (100,000 to 999,000 copies per liter)

IV = major concern; high numbers of infected individuals (>1,000,000 copies per liter)

Pendleton / Clemson Section

Label (Column)	Format	Description
Flow Rate (gal/d) (M)	Integer	Number of gallons flowing through the collection location during the collection time period defined by Start and End
Virus Copies Per Liter (N)	Integer	Number of viruses per liter based on the testing results
Concern Level (O)	Char	0, I, II, III, IV, AR – Categorization of Virus Copies into one of five levels or Awaiting results
% UK B.1.1.7 (P)	Integer	Percent of Variant in sample
% SA B1.351 (Q)	Integer	Percent of Variant in sample

Label (Column)	Format	Description
Home Football (S)	Char	Yes if there was a home football game on Clemson's campus

Campus Section

Label (Column)	Format	Description
Date (T)	MM/DD/YY	Date of sample
Q (gpd) (U)	Integer	Gallons per day of water flow
Copies / L (V)	Integer	Number of viruses per liter based on the testing results

Cochran Road Section

Label (Column)	Format	Description
Date (X)	MM/DD/YY	Date of sample
Q (gpd) (Y)	Integer	Gallons per day of water flow
Copies / L (Z)	Integer	Number of viruses per liter based on the testing results

Pendleton / Clemson Section

Label (Column)	Format	Description
Date (AB)	MM/DD/YY	Date of sample
Q (gpd) (AC)	Integer	Gallons per day of water flow
Copies / L (AD)	Integer	Number of viruses per liter based on the testing results

Clemson University SARS-CoV-2 in Wastewater Monitoring Record.xlsx**Summary Graph - Line, Headworks Sheet**

Graphs Data from the data in Full Data, Headworks Sheet

Clemson University SARS-CoV-2 in Wastewater Monitoring Record.xlsx

Full Data, Manholes Sheet

Label (Column)	Format	Description
Date (A)	MM/DD/YYYY	Date of sample

Sample Shipping

Label	Format	Description
Method (B)	Char	How the sample was shipped
Time (C)	HH:MM AM/PM	Time at which sample was delivered to shipper
By (D)	Char	Last name of person(s) shipping the sample
FedEx Tracking Number (E)	12 numbers	FedEx tracking number

M1 - Core Campus Complex

Label	Format	Description
Sample # (F)	Integer	How the sample was shipped
Time of collection (G)	HH:MM AM/PM	Time at which sample was collected
Operator (H)	Char	Last name of person(s) collecting the sample
Comment? (I)	Char	Yes if there is a comment entered
# Students (J)	Integer	Number of residents assigned to this dorm
~Flow Rate (gal/d) (K)	Integer	Number of gallons flowing through the collection location during the day of collection

M2 - Holmes & McCabe

Label	Format	Description
Sample # (L)	Integer	How the sample was shipped
Time of collection (M)	HH:MM AM/PM	Time at which sample was collected
Operator (N)	Char	Last name of person(s) collecting the sample
Comment? (O)	Char	Yes if there is a comment entered
# Students (P)	Integer	Number of residents assigned to this dorm
~Flow Rate (gal/d) (Q)	Integer	Number of gallons flowing through the collection location during the day of collection

M3 - Shoe Box Residence Halls

Label	Format	Description
Sample # (R)	Integer	How the sample was shipped
Time of collection (S)	HH:MM AM/PM	Time at which sample was collected
Operator (T)	Char	Last name of person(s) collecting the sample

Label	Format	Description
Comment? (U)	Char	Yes if there is a comment entered
# Students (V)	Integer	Number of residents assigned to this dorm
~Flow Rate (gal/d) (W)	Integer	Number of gallons flowing through the collection location during the day of collection

M4 - Stadium Suites

Label	Format	Description
Sample # (X)	Integer	How the sample was shipped
Time of collection (Y)	HH:MM AM/PM	Time at which sample was collected
Operator (Z)	Char	Last name of person(s) collecting the sample
Comment? (AA)	Char	Yes if there is a comment entered
# Students (AB)	Integer	Number of residents assigned to this dorm
~Flow Rate (gal/d) (AC)	Integer	Number of gallons flowing through the collection location during the day of collection

M5 -Lo Rises

Label	Format	Description
Sample # (AD)	Integer	How the sample was shipped
Time of collection (AE)	HH:MM AM/PM	Time at which sample was collected
Operator (AF)	Char	Last name of person(s) collecting the sample
Comment? (AG)	Char	Yes if there is a comment entered
# Students (AH)	Integer	Number of residents assigned to this dorm
~Flow Rate (gal/d) (AI)	Integer	Number of gallons flowing through the collection location during the day of collection

M6 -Hi Rises

Label	Format	Description
Sample # (AJ)	Integer	How the sample was shipped
Time of collection (AK)	HH:MM AM/PM	Time at which sample was collected
Operator (AL)	Char	Last name of person(s) collecting the sample
Comment? (AM)	Char	Yes if there is a comment entered
# Students (AN)	Integer	Number of residents assigned to this dorm
~Flow Rate (gal/d) (AO)	Integer	Number of gallons flowing through the collection location during the day of collection

M7 - Douthit Hill West (apartments)

Label	Format	Description
Sample # (AP)	Integer	How the sample was shipped
Time of collection (AQ)	HH:MM AM/PM	Time at which sample was collected
Operator (AR)	Char	Last name of person(s) collecting the sample
Comment? (AS)	Char	Yes if there is a comment entered
# Students (AT)	Integer	Number of residents assigned to this dorm
~Flow Rate (gal/d) (AU)	Integer	Number of gallons flowing through the collection location during the day of collection

M8 - Douthit Hills East (freshman residence halls)

Label	Format	Description
Sample # (AV)	Integer	How the sample was shipped
Time of collection (AW)	HH:MM AM/PM	Time at which sample was collected
Operator (AX)	Char	Last name of person(s) collecting the sample
Comment? (AY)	Char	Yes if there is a comment entered
# Students (AZ)	Integer	Number of residents assigned to this dorm
~Flow Rate (gal/d) (BA)	Integer	Number of gallons flowing through the collection location during the day of collection

M9 - Lightsey Bridge Apartment Complex

Label	Format	Description
Sample # (BB)	Integer	How the sample was shipped
Time of collection (BC)	HH:MM AM/PM	Time at which sample was collected
Operator (BD)	Char	Last name of person(s) collecting the sample
Comment? (BE)	Char	Yes if there is a comment entered
# Students (BF)	Integer	Number of residents assigned to this dorm
~Flow Rate (gal/d) (BG)	Integer	Number of gallons flowing through the collection location during the day of collection

M10 - Calhoun Courts Apartment Complex

Label	Format	Description
Sample # (BH)	Integer	How the sample was shipped
Time of collection (BI)	HH:MM AM/PM	Time at which sample was collected
Operator (BJ)	Char	Last name of person(s) collecting the sample
Comment? (BK)	Char	Yes if there is a comment entered
# Students (BL)	Integer	Number of residents assigned to this dorm

Label	Format	Description
~Flow Rate (gal/d) (BM)	Integer	Number of gallons flowing through the collection location during the day of collection

M11 - Thornhill Village Duplex West

Label	Format	Description
Sample # (BN)	Integer	How the sample was shipped
Time of collection (BO)	HH:MM AM/PM	Time at which sample was collected
Operator (BP)	Char	Last name of person(s) collecting the sample
Comment? (BQ)	Char	Yes if there is a comment entered
# Students (BR)	Integer	Number of residents assigned to this dorm
~Flow Rate (gal/d) (BS)	Integer	Number of gallons flowing through the collection location during the day of collection

M12 - Thornhill Village Duplex East

Label	Format	Description
Sample # (BT)	Integer	How the sample was shipped
Time of collection (BU)	HH:MM AM/PM	Time at which sample was collected
Operator (BV)	Char	Last name of person(s) collecting the sample
Comment? (BW)	Char	Yes if there is a comment entered
# Students (BX)	Integer	Number of residents assigned to this dorm
~Flow Rate (gal/d) (BY)	Integer	Number of gallons flowing through the collection location during the day of collection

M13 – Quad (there is no M14)

Label	Format	Description
Sample # (BZ)	Integer	How the sample was shipped
Time of collection (CA)	HH:MM AM/PM	Time at which sample was collected
Operator (CB)	Char	Last name of person(s) collecting the sample
Comment? (CC)	Char	Yes if there is a comment entered
# Students (CD)	Integer	Number of residents assigned to this dorm
~Flow Rate (gal/d) (CE)	Integer	Number of gallons flowing through the collection location during the day of collection

M15 – Martin Inn

Label	Format	Description
Sample # (CF)	Integer	How the sample was shipped
Time of collection (CG)	HH:MM AM/PM	Time at which sample was collected

Label	Format	Description
Operator (CH)	Char	Last name of person(s) collecting the sample
Comment? (CI)	Char	Yes if there is a comment entered
# Students (CJ)	Integer	Number of residents assigned to this dorm
~Flow Rate (gal/d) (CK)	Integer	Number of gallons flowing through the collection location during the day of collection

SiREM Sample Handling

Label	Format	Description
Date Received (CM)	MM/DD/YYYY	Date the sample was received
RNA Extraction Date (CN)	MM/DD/YYYY	Date the RNA was extracted from the sample

M1 - Core Campus Complex

Label	Format	Description
Quantity (gene copies/L) (CP)	Integer	Number of viruses per liter based on the testing results
Min Estimated Individuals (CQ)	Integer	Time at which sample was collected

M2 - Holmes & McCabe

Label	Format	Description
Quantity (gene copies/L) (CR)	Integer	Number of viruses per liter based on the testing results
Min Estimated Individuals (CS)	Integer	Time at which sample was collected

M3 - Shoe Box Residence Halls

Label	Format	Description
Quantity (gene copies/L) (CT)	Integer	Number of viruses per liter based on the testing results
Min Estimated Individuals (CU)	Integer	Time at which sample was collected

M4 - Stadium Suites

Label	Format	Description
Quantity (gene copies/L) (CV)	Integer	Number of viruses per liter based on the testing results
Min Estimated Individuals (CW)	Integer	Time at which sample was collected

M5 -Lo Rises

Label	Format	Description
Quantity (gene copies/L) (CX)	Integer	Number of viruses per liter based on the testing results
Min Estimated Individuals (CY)	Integer	Time at which sample was collected

M6 -Hi Rises

Label	Format	Description
Quantity (gene copies/L) (CZ)	Integer	Number of viruses per liter based on the testing results
Min Estimated Individuals (DA)	Integer	Time at which sample was collected

M7 - Douthit Hill West (apartments)

Label	Format	Description
Quantity (gene copies/L) (DB)	Integer	Number of viruses per liter based on the testing results
Min Estimated Individuals (DC)	Integer	Time at which sample was collected

M8 - Douthit Hills East (freshman residence halls)

Label	Format	Description
Quantity (gene copies/L) (DD)	Integer	Number of viruses per liter based on the testing results
Min Estimated Individuals (DE)	Integer	Time at which sample was collected

M9 - Lightsey Bridge Apartment Complex

Label	Format	Description
Quantity (gene copies/L) (DF)	Integer	Number of viruses per liter based on the testing results
Min Estimated Individuals (DG)	Integer	Time at which sample was collected

M10 - Calhoun Courts Apartment Complex

Label	Format	Description
Quantity (gene copies/L) (DH)	Integer	Number of viruses per liter based on the testing results
Min Estimated Individuals (DI)	Integer	Time at which sample was collected

M11 - Thornhill Village Duplex West

Label	Format	Description
Quantity (gene copies/L) (DJ)	Integer	Number of viruses per liter based on the testing results
Min Estimated Individuals (DK)	Integer	Time at which sample was collected

M12 - Thornhill Village Duplex East

Label	Format	Description
Quantity (gene copies/L) (DL)	Integer	Number of viruses per liter based on the testing results
Min Estimated Individuals (DM)	Integer	Time at which sample was collected

M13 – Quad (there is no M14)

Label	Format	Description
Quantity (gene copies/L) (DN)	Integer	Number of viruses per liter based on the testing results
Min Estimated Individuals (DO)	Integer	Time at which sample was collected

M15 – Martin Inn

Label	Format	Description
Quantity (gene copies/L) (DP)	Integer	Number of viruses per liter based on the testing results
Min Estimated Individuals (DQ)	Integer	Time at which sample was collected

Clemson University SARS-CoV-2 in Wastewater Monitoring Record.xlsx**Summary, Manholes Sheet**

Summary of Data from the data in Full Data, Manholes Sheet

Clemson University SARS-CoV-2 in Wastewater Monitoring Record.xlsx**University Manholes Sheet**

Label	Format	Description
Manhole #	Char	Label of manhole
Location	Char	Description of location
Buildings Serviced	Char	List of buildings with sewage draining through this manhole
# students served	Integer	Number of students in residence in buildings
Estimated Q, DLF (gpd)	Integer	Estimated daily flow through manhole (Daily Loading Flow)
Estimated Q, BB (gpd)	Integer	Estimated daily flow through manhole (Base Building Flow)
Who Samples	Char	Assignment of sample collection
Comment on Access to the Manhole	Char	Free text