WQIP Section 4.2.3.1.4 describes permit requirements for estimating jurisdictional non-stormwater volumes and pollutant loads discharged from all major MS4 outfalls discharging to receiving waters, with an estimate of the percent contribution from each known source for each known major outfall.

Outlined below is a process describing how non-stormwater discharges and loads have been calculated, and how to collaborate moving forward.

* **GitHub**

A new repository should be created for each monitoring year. Each repository includes a variable guide (Attachment 1. Variable Guide), data files (rainfall , provisional flow, and water chemistry) to load into R[[1]](#footnote-1) , and data files created as output from R[[2]](#footnote-2) , RStudio project, R scripts, files to connect with the ArcGIS geodatabase (.sde files, arcgisbinding), a README file, .and git files

* + On-line
    - Create new repository in GitHub on-line for each monitoring year
  + Desktop App
    - Clone repository from GitHub on-line onto the desktop (File🡪Clone repository)
    - Note: if you copy and paste folder from previous year on your desktop, delete .git files and recreate them
    - once R Scripts are run and data files are QC’d on the local drive:
      * Click button ‘Commit to Master’ or ‘Commit to Main’; must provide a summary
      * Click button ‘Push to Origin’
  + Desktop/local drive
    - Create a folder that matches the name of the repository
    - Update the README.md file for the current monitoring year
    - Update the file name for ‘WQIP-Annual-Report-XXXX-XX.Rproj’ with the current monitoring year
    - Add a text file called .gitignore for each new repository (copy and paste code from previous folder)
    - Create .gitattributes file using GLS (<https://docs.github.com/en/repositories/working-with-files/managing-large-files/configuring-git-large-file-storage>)
    - Type ‘Git Bash’ in File Explorer in the working directory and type the following code at the prompt: git lfs track "\*.csv"
    - Commit your local *.gitattributes* file into your repository
    - As another option, connect R Studio to GitHub desktop (Read this to learn more about connecting R Studio to GitHub: <https://happygitwithr.com/rstudio-git-github.html>)
    - Update data files on local drive in ‘Input’ with current monitoring year (rain, flow, and chemistry)
    - Note: Update files so that only the most recent continuous flow data is provided (eg remove from current year analysis any historic medians from old prioritization files from Geosyntec if there is more recent continuous flow data)
    - Update the Variable Guide, as necessary
  + QC resulting data files
* Ensure dry outfalls have a discharge of 0
* Ensure there is an estimated result for unvisited major outfalls (e.g. J01-9313-1, DP05-12190-1, J07-9110-1)
* **R-Studio**

R Studio is used to manage data (load and join datasets, and compute non-stormwater discharges and loads. Attachment 1 (Variable Guide) is a guide to files to import into R, and variables and files created from calculations in the script.

* + Set working directory to folder linked to GitHub on your computer
  + For the 2021-22 monitoring year, the script will be stream-lined with the hopes of simplifying the process and to keep better track of the calculations and results Several individual R scripts would be used in the R project
    - * setup – run this each time you work on the script to load the libraries
        + update the working directory with the current monitoring year, and set common values. Each file after will refer to the script
      * drydays – should only need to run once to import raw data and create file showing number of dry days for each rain gauge per monitoring year
      * tribs – shows percentage of each jurisdiction within each tributary for all major outfalls and estimates areas at major outfalls not delineated
      * flow – 1) imports and formats flow instantaneous and continuous flow data and estimate flow at outfalls without flow measurements (ponded outfalls and outfalls not visited for the current monitoring year), 2) estimates average daily discharge for each outfall (includes dry observations), 3) estimates flow at ponded outfalls, or at outalls without flow measurements (log mean of flow within jurisdiction used to estimate), 4) estimates total non-stormwater discharge by jurisdiction
      * connectivity – estimates connectivity parameter for each outfall
      * discharge\_cnx – estimates total non-stormwater discharge, and non-stormwater discharge reaching receiving water (using average annual connectivity), 6) estimates non-stormwater discharge for sampled and unsampled outfalls,
      * chem – loads and formats chemistry data, estimates chemistry result at unsampled outfalls
      * loading – computes and summarizes dry weather loads for unsampled and sampled outfalls per jurisdiction, and summarizes dry weather loads for just parameters with numeric action levels for each outfall and per jurisdiction

1. C:\GitHub\_Feb2022\WQIP-Annual-Report-2020-21\A.2 Outfall Assessments\DryWeatherLoadingCalcs\Input [↑](#footnote-ref-1)
2. C:\ GitHub\_Feb2022\WQIP-Annual-Report-2019-20\_update\A.2 Outfall Assessments\DryWeatherLoadingCalcs\Output [↑](#footnote-ref-2)