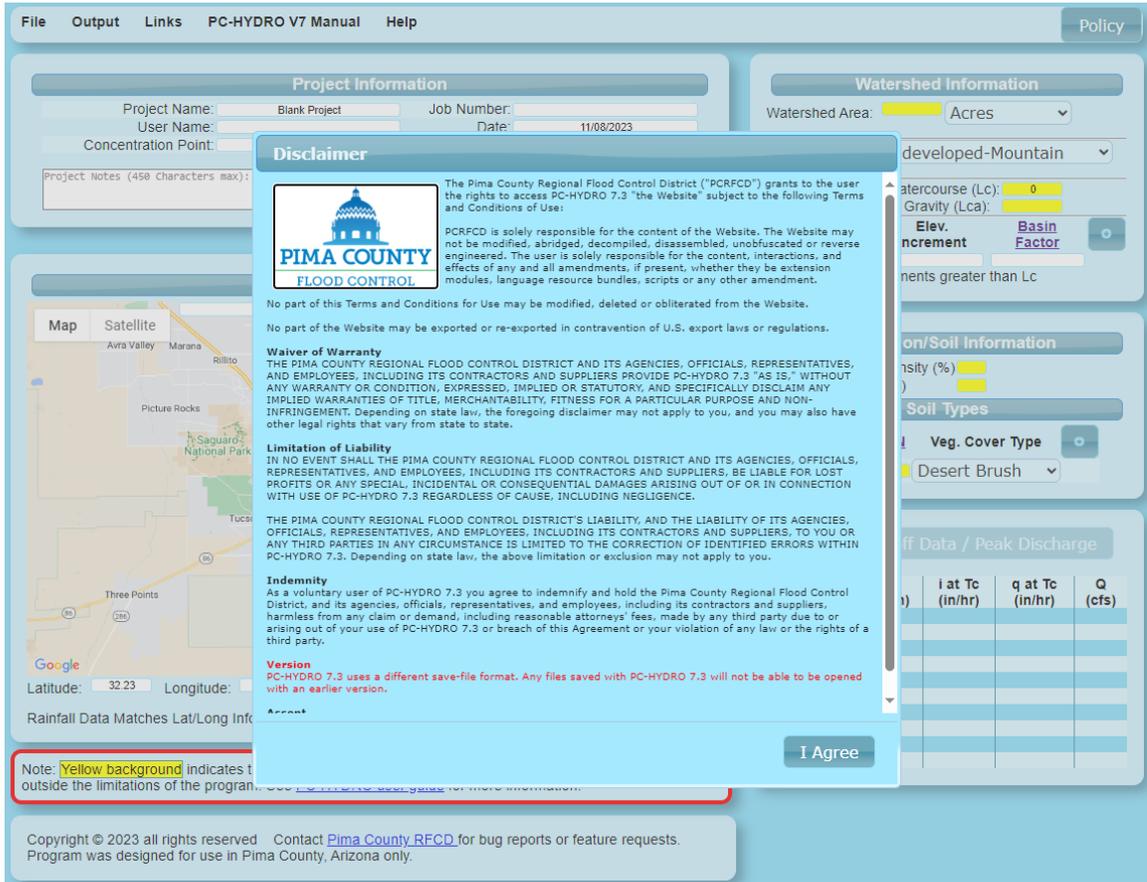


Appendix C – Quick Start Guide

Quick Start Guide to PC-HYDRO

1. **Open the webpage.** The first step to using PC-HYDRO is to open the webpage at <http://pchydro.rfcd.pima.gov>.



2. **Read and Agree to the Terms and Conditions of Use.** Press the **I Agree** button on the Terms and Conditions of Use screen. By doing so, the user agrees to rigidly uphold certain stipulations of use, including the Waiver of Liability, Limitations of Liability, Indemnity, and the voluntary Consent to all Terms and Conditions of Use. Pressing the **I Agree** button will cause the PC-HYDRO webpage to appear.

The screenshot displays the PC-HYDRO web application interface. At the top, there is a navigation menu with 'File', 'Output', 'Links', 'PC-HYDRO V7 Manual', and 'Help'. A 'Policy' button is located in the top right corner. The main content area is divided into several sections:

- Project Information:** Contains fields for Project Name (Blank Project), User Name, Concentration Point, Job Number, Date (11/08/2023), and Client Name. A text area for Project Notes (450 characters max) is also present.
- Watershed Information:** Includes a Watershed Area field (Acres), Watershed Type (Undeveloped-Mountain), Length of Longest Watercourse (Lc), Length to Center of Gravity (Lca), and a table for Length Increment, Elev. Increment, and Basin Factor. A 'Total of Length Increments greater than Lc' field is also shown.
- Rainfall Data:** Features a map of Tucson, Arizona, with a search bar and 'Fetch Rainfall Data' and 'Show/Hide' buttons. The map shows various neighborhoods and landmarks like Saguaro National Park and Mt. Lemmon.
- Vegetation/Soil Information:** Includes fields for Vegetative Cover Density (%), Impervious Cover (%), Soil Type (Type B), and Veg. Cover Type (Desert Brush).
- Calculate Runoff Data / Peak Discharge:** A table with columns for Yr, Cw, Tc (min), i at Tc (in/hr), q at Tc (in/hr), and Q (cfs). The table has rows for years 1, 2, 5, 10, 25, 50, 100, 200, 500, and 1000.

A red-bordered note at the bottom left states: "Note: Yellow background indicates that data input is needed, a data format error, or that data entered is outside the limitations of the program. See PC-HYDRO user guide for more information." The copyright notice at the bottom reads: "Copyright © 2023 all rights reserved. Contact Pima County RFCD for bug reports or feature requests. Program was designed for use in Pima County, Arizona only."

3. **Getting to know the menu options:**

- Under the Output menu **Generate Hydrographs** will generate and save a standard Pima County hydrograph from an active calculation.
- The **Links** dropdown menu will direct the user to data sites or other related sites. The **PC Hydro VX Manual** drop down menu will provide the user with pdf versions of the user manual for information on how to use the calculator.
- Pressing the **File** toolset button and selecting **Save to .pk6 format** will allow the user to browse and save the input data. *Closing the webpage will close the program without saving the input data.*
- Pressing the **Calculate Runoff Data/Peak Discharge** button will cause the program to calculate and display Runoff Data using the new or updated information.
- Selecting the **Help** menu button directs you to information about the current version of the webpage through the **About** button or how to contact the District regarding comments, feature requests or to report a bug through the **Support** button. Pressing the Policy button on the right side of the webpage directs you to the Pima County Regional Flood Control District's page containing "Rules and Procedures".



4. **Start a New calculation or Open an existing calculation.**

- For new projects, proceed to step 5.
- To open an existing file, press the **File** toolset button, select **Open .pk5 or .pk6 file**, and then browse for and open an existing PC-HYDRO file. Version 7.3 of PC-HYDRO will open existing data sets having a *.pk5 or the newer *.pk6 file extensions. Opening an existing calculation will populate the web page fields.

5. **Enter Project Data.** Within the "Project Information" area enter information describing the project and drainage concentration point, consisting of: **Project Name**, **Username**, **Concentration Point** (including whether the analysis is for existing or future hydrologic conditions; for example: "CP#30 Existing"), **Job Number**, **Date** of calculation or revision, and **Client Name**, in the appropriate fields. A **Notes** field is available to annotate the calculation with up to 450 characters of information relevant to the calculation, i.e., Existing Conditions, Developed Conditions, LID calculations, etc.

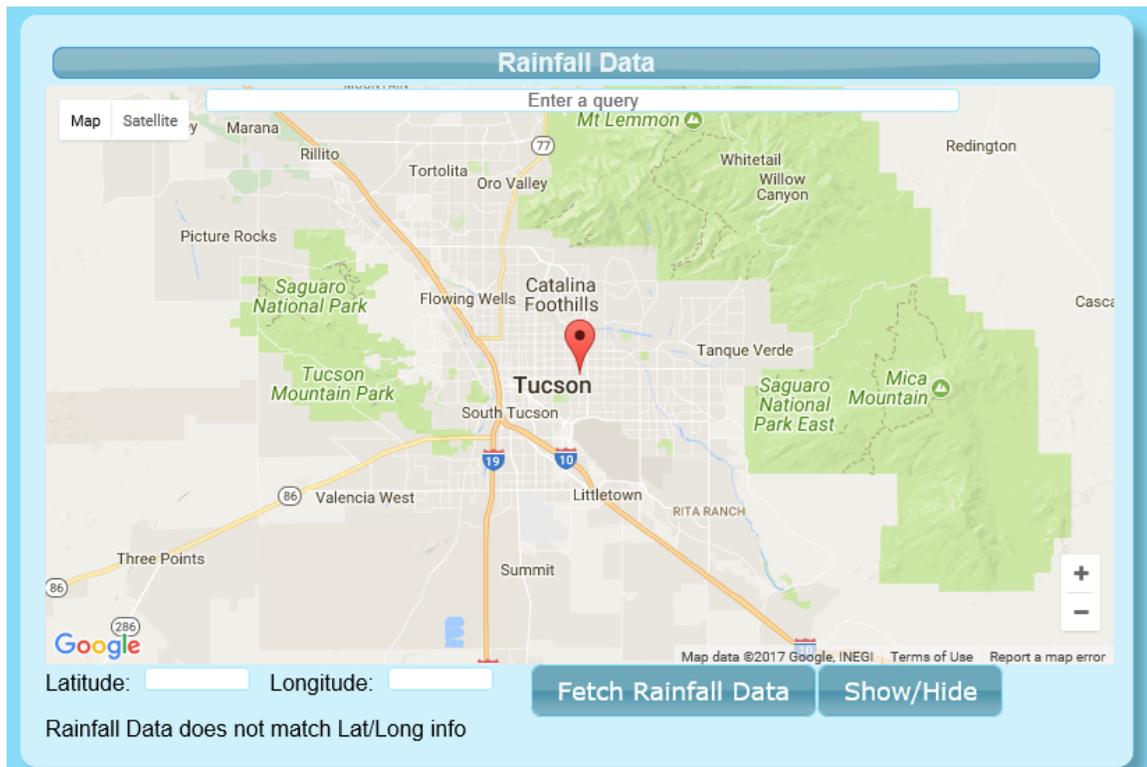
6. **Enter Watershed Information.** Enter **Watershed Information**, general **Watershed Area** with a drop down to indicate the appropriate units as either Acres or Square Miles, **Watershed Type** from the drop down, **Length of Longest Watercourse** and the **Length to the Center of Gravity**, and representative **Length Increments**, **Elevation Increments** and **Basin Factors**. When selecting values for these parameters, assume existing land uses and watershed characteristics within those basins identified as Balanced or Critical, and where stormwater detention will be required as a condition of new development. Otherwise, assume future land uses and watershed characteristics for those watersheds where stormwater detention will not be required. In this second case, consideration should be given to the maximum probable urbanization likely to occur within the watershed's boundaries. Do this by looking at the Land Use Intensities given in the current Pima County Comprehensive Plan.

The screenshot shows a light blue dialog box titled "Watershed Information". It contains the following fields and controls:

- Watershed Area:** A yellow input field followed by a dropdown menu currently set to "Acres".
- Watershed Type:** A dropdown menu currently set to "Undeveloped-Mountain".
- Length of Longest Watercourse (Lc):** A yellow input field containing the value "0".
- Length to Center of Gravity (Lca):** A yellow input field.
- Length Increment:** A white input field containing the value "0".
- Elev. Increment:** A white input field.
- Basin Factor:** A white input field with a blue plus sign button to its right.

Important: unless granted prior approval by the PCRFC, PC-HYDRO shall not be used to calculate flood peaks for watersheds larger than 10 square miles or having 100-year Times of Concentration longer than 180 minutes.

- Enter Rainfall Data.** Enter rainfall and flood **Return Period**, **Rainfall Input** (entering either Latitude and Longitude coordinates for the watershed centroid, or rainfall intensity/duration values independently obtained from the NOAA Atlas 14, Upper 90% Confidence Limits). Values representing Latitude and Longitude, in decimal degrees, can be entered with up to 4 significant figures. After entering Latitude and Longitude manually or panning/zooming within the map window to the watershed centroid, press **Fetch Rainfall Data** to populate the precipitation-depth entry fields. (If you pan to a new centroid location you must reload the data from NOAA by again pressing the **Fetch Rainfall Data** button. The webpage links to the current NOAA Atlas 14 web page to retrieve the most current information. The rainfall data can be hidden and shown again by pressing the **Show/Hide** button.



- Enter Soil and Vegetation Data.** Enter **Vegetation Cover Density**, **Vegetative Cover Type**, percentage of **Impervious Cover**, and the **Percent** and **Curve Number** corresponding to NRCS-SCS Hydrologic Soil Types B, C, and D. When selecting representative values for vegetation, bare soil, and impervious cover types, assume existing watershed conditions, if stormwater detention will be required as a condition of future development within the entire watershed, otherwise, assume future conditions based on allowable Land Use Intensities given in the Pima County Comprehensive Plan. Representative NRCS-SCS Curve Numbers from the Graph on Figure 1 are automatically inserted/updated into the CN field. The CN may be manually modified if justified.

Vegetation/Soil Information

Vegetative Cover Density (%)

Impervious Cover (%)

Soil Types

Soil Type	%	CN	Veg. Cover Type
Type B	0	<input style="background-color: yellow;" type="text"/>	Desert Brush

- Calculate the Resulting Flood Peak and Save the Input Data** Perform the calculation by pressing the **CALCULATE Runoff Data/ Peak Discharge** button located near the bottom right corner of the page. Check the input for correctness, and output for consistency and reasonableness. If all of the fields in yellow have not been entered, an error message will be returned. Either **PRINT** the output to a pdf file or **SAVE** the input by first pressing the **FILE** button found in the toolset at the top of the PC-HYDRO Summary Page and then Browsing to the desired storage location. Closing the webpage, will the close the page without saving the input data.

Calculate Runoff Data / Peak Discharge

Yr	Cw	Tc (min)	i at Tc (in/hr)	q at Tc (in/hr)	Q (cfs)
1					
2					
5					
10					
25					
50					
100					
200					
500					
1000					

10. **Optional --- Print or Export a Synthetic Hydrograph.** If needed, a Pima County Synthetic Hydrograph can be generated, with user-defined time increments, and either sent directly to a pdf file, or Browsed and Saved as Comma Separated (*.csv) Text File at a user-defined location. These hydrograph output files will have a *.hyd extension, which can be later used in Microsoft Word, Microsoft Excel, HEC-HMS, or other similar programs, as desired. A third output option for the Hydrograph is an *.xlsx file that can be copied and pasted into the PC Route spreadsheet. You will need to select your desired return intervals for the *.pdf files. For the Excel format and *.csv, all return periods are automatically generated. The output Hydrograph Increment and Volume Units must also be selected. Press **Generate Hydrograph** when finished.

Generate Hydrograph [X]

Output Format: .PDF
 .CSV

Volume Units: .XLSX (Excel/PC-ROUTE)

Hydrograph Increment (min): 1

Select Return Periods to Output:

- 1-yr
- 2-yr
- 5-yr
- 10-yr
- 25-yr
- 50-yr
- 100-yr
- 200-yr
- 500-yr
- 1000-yr

Generate Hydrograph

Generate Hydrograph [X]

Output Format: .PDF [v]

Volume Units: Acre-Foot
 Cubic Feet

Hydrograph Increment (min): 1