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Software for Engineers,By Engineers

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May 7, 2008

TO: All Users of CivilDesign® Program UNRIV

SUBJECT: P R O G R AM U P D AT E R E Q U I R E D

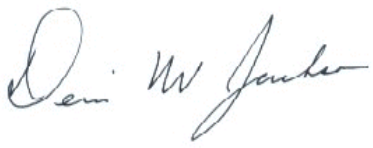
Dear Sir,

The Riverside County Flood Control and Water Conservation District(RCFC&WCD) has approved a change to, and, is requiring an update to Version 7 of the Unit Hydrograph Hydrology Program, UNRIV, for Riverside County. **Version 8** of the UNRIV program replaces Version 7 of the program. All study evaluation of storms with frequencies less than 100-Year storm events now require use of Version 8.

Licensed Users of the UNRIV program may purchase an update to Version 8 for $150.00 plus sales tax. If your office has multiple copies of the software, added workstation authorizations are priced at $37.50 for each additional computer or workstation authorization. All purchases are also charged California Sales Tax for the amount of purchase and $35.00 for overnight shipping (if desired).

To order the software, please call, FAX, or e-mail us the following information. The Serial Number of your Current UNRIV Program, Company Name, Address, Phone Number. The software may be ordered using a purchase order or request or a Credit Card.

For your added information, attached to this letter is the correspondence sent to RCFC&WCD regarding this program. Option Number 2 of the proposed actions is required by RCFC&WCD, and they have also stated that the older versions of the UNRIV program are only approved for use with 100-Year or larger capital storm events.



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March 19, 2008

Attn: Steve Clark
Riverside County Flood Control and Water Conservation District

Dear Sir,

Reference my telephone conversation with you on Monday. Two of our customers have noticed discrepancies in the calculations performed by the Unit Hydrograph Hydrology program, UNRIV, Version 7.0. In one case, which is attached, the runoff volume from a 5 year storm event (AMC I), exceeded that of the 10-year storm (AMC II). Upon investigation, the problem may occur under situations where the Low Loss Percentage Rate is much less than 0.80 - 0.90 as described on Plate E-1.1 (3 of 6) of the hydrology manual.

Per the procedure in the manual of Paragraph 5, Plate E-1.1(3 of 6), the low loss rate is used when the maximum loss rate exceeds the unit period rainfall intensity, or, if the rainfall intensity is less than the maximum loss rate, otherwise, the maximum loss rate is used. Because of a change in RCFC&WCD procedures to calculate the Low Loss Rate as equal to 0.9 - 0.8(Impervious Ratio), the result is if the Maximum Loss Rate is applied when the rainfall intensity exceeds it, a large increase in loss or infiltration occurs, in accordance with the manual, in calculating the effective rainfall.

However, the Hydrology Manual does not require a verification of whether the Minimum Loss Rate, for that period, is less than the Maximum Loss rate, it only tests the Maximum Loss Rate Vs. Rainfall Intensity. If the Hydrology Manual required another test, it may find that the Low Loss Rate is still less than the Maximum Loss Rate, and, if used, results in a greater Effective Rainfall Value.

This problem may be corrected using one of the following procedures:

1) Restrict use to only the recommended Low Loss Rate Percentage of 0.8 to 0.9 were used as described in the Hydrology Manual. This would, result in lower runoff volumes in most cases because the low loss rate would be greater resulting in lower effective rainfall values (except when the maximum loss rate is applied).

2) Revise the hydrology manual procedures to require the use of the low loss value at all times if it is less than the maximum loss rate value. This would result in greater volume of runoff and peak flow rates because the lower loss rate would be applied in some of the cases where the maximum loss rate is now used because of the rainfall intensity test. If the lower loss rate is less, then the resulting effective rainfall would be greater.

(Continued)

The current RCFC&WCD hydrology manual, Para 5 and 6, Plate E-1.1(3of6), states:

5. Compute the low loss rate for each unit time period where the maximum loss rate exceeds the rainfall rate for that period. The low loss rate should normally be 80 to 90-percent times the rainfall rate. See Column 22 of Plate E-2.2.

6. Compute the rainfall rate for each unit time period by subtracting the loss rate from the rainfall rate. See Column 23 of Plate E-2.2. Be sure to use the low loss rate where the maximum loss rate exceeds the unit period intensity.

The revision to the RCFC&WCD hydrology manual, Para 5 and 6, Plate E-1.1(3of6), should be:

5. Compute both the low loss and maximum loss rates for each unit time period. The low loss rate should normally be [0.90 - 0.80 times the (Impervious Ratio)] times the rainfall rate. See Column 22 of Plate E-2.2.

6. Compute the effective rain rate for each unit time period by subtracting the lowest value loss rate from the rainfall rate. See Column 23 of Plate E-2.2. Be sure to use the loss rate (low or max) which results in the maximum effective rainfall value.

If the revision is approved by RCFC&WCD. The UNRIV program, Version 7.0, must be changed to include the above method of calculation.

Attached to this letter are copies of the output files in question using both Version 7.0 and a revised Version 8.0 which corrected the discrepancy using the proposed change to the manual above. Under separate cover, the input data file for the output files and a copy of Version 8.0 of the UNRIV program is also included for your evaluation. Note that Version 8 of the program shows both the low and max loss rates and places parenthesis ( ) around the loss rate which is not used.

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Project Engineer

Attachments (Removed)

1. 5 yr Storm (Version 7)
2. 10 yr Storm (Version 7)
3. 100 yr Storm (Version 7)
4. 5 yr Storm (Version 8)
5. 10 Year Storm (Version 8)
6. 100 Year Storm (Version 8)

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