Appendix J

QUAL2E Input File and PAR Calculations for Cold Weather Scenario

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TITLE01             PWQ1.25T14TP0.2RL4SODR1 WWTF 8.76, TP=0.2, B1=0.5,
TITLE02             Contoocook River Jaffrey
TITLE03  YES        CONSERVATIVE MINERAL I      TDS     mg/L
TITLE04   NO        CONSERVATIVE MINERAL II
TITLE05   NO        CONSERVATIVE MINERAL III
TITLE06   NO        TEMPERATURE
TITLE07  YES        BIOCHEMICAL OXYGEN DEMAND (2-STAGES)
TITLE08  YES        PHYTOPLANKTON AS CHL-A in MG/L
TITLE09  YES        PHOSPHORUS CYCLE AS P IN MG/L
TITLE10                (ORGANIC-P; DISSOLVED-P)
TITLE11  YES        NITROGEN CYCLE AS N IN MG/L
TITLE12                (ORGANIC-N; AMMONIA-N; NITRITE-N, NITRATE-N)
TITLE13  YES        DISSOLVED OXYGEN IN MG/L
TITLE14   NO        INDICATOR BACTERIA
TITLE15   NO        ARBITRARY NON-CONSERVATIVE
TITLE16  YES        PERIPHYTON IN MG CHL-A/FT2
ENDTITLE
LIST DATA INPUT
WRITE OPTIONAL SUMMARY
NO FLOW AUGMENTATION
STEADY STATE SIMULATION
DISCHARGE COEFFICIENTS
PRINT SOLAR/LCD DATA
PLOT DO AND BOD
FIXED DNSTRM CONC (YES=1)         0
5D-ULT SLOW BOD CONV K CO                    5D-ULT FAST BOD CONV K CO
INPUT METRIC (YES=1)              0          OUTPUT METRIC (YES=1)             0
NUMBER OF REACHES                17          NUMBER OF JUNCTIONS               0
NUM OF HEADWATERS                 1          NUMBER OF POINT LOADS             8
TIME STEP (HOURS)                            LNTH COMP ELEMENT (mi)          0.1
MAXIMUM SSTATE ITERATIONS       200          TIME INC. FOR RPT2 (HRS)
LATITUDE OF BASIN (DEG)        42.8          LONGITIUDE OF BASIN (DEG)        72
STANDARD MERIDIAN (DEG)          75          DAY OF YEAR START TIME          183
EVAP COEF:AE (ft/hr-inHg)   0.00068          EVAP COEF:BE (ft/hr-inHg-   0.00027
ELEV OF BASIN (ft)              843          DUST ATTENUATION COEF.         0.06
ENDATA1
O UPTAKE BY NH3 OXID               4.33  O UPTAKE BY NO2 OXID(MG O/MG N)    1.14
O PROD BY ALGAE (MG O/MG A)         1.6  O UPTAKE BY ALGAE (MG O/MG A)         2
N CONTENT OF ALGAE (MG N/MG A)     0.08  P CONTENT OF ALGAE (MG P/MG A)    0.011
ALG MAX SPEC GROWTH RATE(1/DAY)     2.8  ALGAE RESPIRATION RATE (1/DAY)     0.13
N HALF SATURATION CONST (MG/L)     0.03  P HALF SATURATION CONST (MG/L)    0.005
LIN ALG SHADE CO (1/H-UGCHA/L)  0.00268  NLIN SHADE (1/H-(UGCHA/L)**2/3)  0.0165
LIGHT FUNCTION OPTION (LFNOPT)        2  LIGHT SATURATION COEF (INT/MIN)     0.3
DAILY AVERAGING OPTION (LAVOPT)       2  LIGHT AVERAGING FACTOR (AFACT)     0.94
NUMBER OF DAYLIGHT HOURS (NDLH)      14  TOTAL DAILY SOLAR RADTN (INT)   994.332
ALGY GROWTH CALC OPTION (LGROPT)      2  ALGAL PREF FOR NH3-N (PREFN)        0.9
ALG/TEMP SOLR RAD FACTOR (TFACT)   0.44  C CONTENT OF ALGAE (MG C/MG A)      0.4
OXY PROD BY PERI (MG O/MG AP)       1.6  OXY UPTAKE BY PERI (MG O/MG AP)       2
NTRGN CNT OF PERI (MG N/MG AP)     0.08  P CONTENT OF PERI (MG P/MG AP)    0.011
CARB  CNT OF PERI (MG C/MG AP)      0.4  PERI PREF FOR NH3-N (PPREFN)        0.9
MAX SPEC GRTH RATE: PERI (1/DAY)      2  RESP RATE FOR PERI (1/DAY)       0.0267
N SAT COEF FOR PERI (MG/L)         0.03  P SAT COEF FOR PERI (MG/L)        0.005
PERI LIGHT  SAT COEF (INT/MIN)      0.3  PERI DENS SAT CO (MG-CHLA/AREA)     1.5
ENDATA1A
ENDATA1B
ENDATA1C
STREAM REACH       1                      FROM         68.2    TO          67.5
STREAM REACH       2                      FROM         67.5    TO          67.2
STREAM REACH       3                      FROM         67.2    TO          66.9
STREAM REACH       4                      FROM         66.9    TO          66.5
STREAM REACH       5                      FROM         66.5    TO          66.3
STREAM REACH       6                      FROM         66.3    TO          65.6
STREAM REACH       7                      FROM         65.6    TO          65.3
STREAM REACH       8                      FROM         65.3    TO          64.9
STREAM REACH       9                      FROM         64.9    TO          64.4
STREAM REACH      10                      FROM         64.4    TO          63.6
STREAM REACH      11                      FROM         63.6    TO          62.9
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STREAM REACH      12                        FROM         62.9    TO          62.8
STREAM REACH      13                        FROM         62.8    TO          61.5
STREAM REACH      14                        FROM         61.5    TO          61.3
STREAM REACH      15                        FROM         61.3    TO          60.6
STREAM REACH      16                        FROM         60.6    TO          59.5
STREAM REACH      17                        FROM         59.5    TO          58.7
ENDATA2
ENDATA3
FLAG FIELD RCH=    1         7           1 2 2 2 2 2 7
FLAG FIELD RCH=    2         3           2 2 2
FLAG FIELD RCH=    3         3           6 2 2
FLAG FIELD RCH=    4         4           2 2 2 2
FLAG FIELD RCH=    5         2           2 2
FLAG FIELD RCH=    6         7           2 2 2 2 2 2 2
FLAG FIELD RCH=    7         3           2 6 6
FLAG FIELD RCH=    8         4           2 2 2 2
FLAG FIELD RCH=    9         5           2 2 2 7 6
FLAG FIELD RCH=   10         8           2 2 2 2 2 2 2 2
FLAG FIELD RCH=   11         7           2 2 2 2 2 2 2
FLAG FIELD RCH=   12         1           2
FLAG FIELD RCH=   13        13           2 2 2 2 2 2 2 2 2 2 2 2 2
FLAG FIELD RCH=   14         2           6 2
FLAG FIELD RCH=   15         7           2 2 2 2 2 2 2
FLAG FIELD RCH=   16        11           2 2 2 2 7 2 2 2 2 2 2
FLAG FIELD RCH=   17         8           2 2 2 2 2 2 2 5
ENDATA4
HYDRAULCS RCH=     1    0                0.7       0.1       0.40.15695443  0.05
HYDRAULCS RCH=     2    0               0.67      0.08      0.340.29068628 0.065
HYDRAULCS RCH=     3    0               0.46      0.15       0.40.29068628  0.04
HYDRAULCS RCH=     4    0               0.48      0.15     0.3750.29068628  0.04
HYDRAULCS RCH=     5    0               0.48      0.15      0.280.39605994  0.04
HYDRAULCS RCH=     6    0                0.6       0.1      0.280.39605994  0.04
HYDRAULCS RCH=     7    0               0.55       0.1      0.320.30961755  0.04
HYDRAULCS RCH=     8    0               0.55       0.1      0.250.41739805  0.04
HYDRAULCS RCH=     9    0               0.45      0.15      0.150.41739805 0.065
HYDRAULCS RCH=    10    0               0.45      0.15      0.11      0.45 0.065
HYDRAULCS RCH=    11    0              0.065      0.15       0.9      0.45  0.02
HYDRAULCS RCH=    12    0                0.4      0.15      0.15      0.45  0.03
HYDRAULCS RCH=    13    0                0.2      0.15       0.2      0.45 0.025
HYDRAULCS RCH=    14    0               0.12      0.15      0.45      0.45  0.02
HYDRAULCS RCH=    15    0               0.05     0.688     0.4070.26863542 0.025
HYDRAULCS RCH=    16    0               0.12      0.15      0.36      0.45  0.02
HYDRAULCS RCH=    17    0                0.1     0.572     0.2330.32605732  0.04
ENDATA5
ENDATA5A
CBOD/DO REACT C    1             0.2      10                     0.1       8            0.11
CBOD/DO REACT C    2             0.2      10                    0.05       8            0.11
CBOD/DO REACT C    3             0.2      10                   0.019       8            0.11
CBOD/DO REACT C    4             0.2      10                   0.019       8            0.11
CBOD/DO REACT C    5             0.2      10                   0.019       8            0.11
CBOD/DO REACT C    6             0.2      10                   0.019       8            0.11
CBOD/DO REACT C    7             0.2      10                   0.012       8            0.11
CBOD/DO REACT C    8             0.2      10                   0.012       8            0.11
CBOD/DO REACT C    9             0.2      10                   0.012       8            0.11
CBOD/DO REACT C   10             0.2      10                   0.012       8            0.11
CBOD/DO REACT C   11             0.2      10                   0.077       8            0.11
CBOD/DO REACT C   12             0.2      10                   0.016       8            0.11
CBOD/DO REACT C   13             0.2      10                   0.016       8            0.11
CBOD/DO REACT C   14             0.2      10                   0.077       8            0.11
CBOD/DO REACT C   15             0.2      10                   0.012       8            0.11
CBOD/DO REACT C   16             0.2      10                   0.028       8            0.11
CBOD/DO REACT C   17             0.2      10                   0.009       8            0.11
ENDATA6
N AND P COEF   RCH=    1   0.05  0.001    0.5             2   0.01  0.001             0
N AND P COEF   RCH=    2   0.05  0.001    0.5             2   0.01  0.001             0
N AND P COEF   RCH=    3   0.05  0.001    0.5             2   0.01  0.001             2
N AND P COEF   RCH=    4   0.05  0.001    0.5             2   0.01  0.001             2
N AND P COEF   RCH=    5   0.05  0.001    0.5             2   0.01  0.001             2
N AND P COEF   RCH=    6   0.05  0.001    0.5             2   0.01  0.001             0
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N AND P COEF   RCH=    7   0.05  0.001    0.5             2   0.01  0.001             0
N AND P COEF   RCH=    8   0.05  0.001    0.5             2   0.01  0.001             0
N AND P COEF   RCH=    9   0.05  0.001    0.5             2   0.01  0.001             2
N AND P COEF   RCH=   10   0.05  0.001    0.5             2   0.01  0.001             2
N AND P COEF   RCH=   11   0.05  0.001    0.5             2   0.01  0.001             2
N AND P COEF   RCH=   12   0.05  0.001    0.5             2   0.01  0.001             0
N AND P COEF   RCH=   13   0.05  0.001    0.5             2   0.01  0.001             0
N AND P COEF   RCH=   14   0.05  0.001    0.5             2   0.01  0.001             0
N AND P COEF   RCH=   15   0.05  0.001    0.5             2   0.01  0.001             0
N AND P COEF   RCH=   16   0.05  0.001    0.5             2   0.01  0.001             0
N AND P COEF   RCH=   17   0.05  0.001    0.5             2   0.01  0.001             0
ENDATA6A
ALGAE/PERI/OTHER CO    1      10     0.5    0.05    0.06      10    0.05    0.25
ALGAE/PERI/OTHER CO    2      10     0.5    0.05    0.06      10    0.05    0.25
ALGAE/PERI/OTHER CO    3      10     0.5    0.05    0.06      10    0.05    0.25
ALGAE/PERI/OTHER CO    4      10     0.5    0.05    0.06      10    0.05    0.25
ALGAE/PERI/OTHER CO    5      10     0.5    0.05    0.06      10    0.05    0.25
ALGAE/PERI/OTHER CO    6      10     0.5    0.05    0.06      10    0.05    0.25
ALGAE/PERI/OTHER CO    7      10     0.5    0.05    0.06      10    0.05    0.25
ALGAE/PERI/OTHER CO    8      10     0.5    0.05    0.06      10    0.05    0.25
ALGAE/PERI/OTHER CO    9      10     0.5    0.05    0.06      10    0.05    0.25
ALGAE/PERI/OTHER CO   10      10     0.5    0.05    0.06      10    0.05    0.25
ALGAE/PERI/OTHER CO   11      10     0.5    0.05    0.06      10    0.05       0
ALGAE/PERI/OTHER CO   12      10     0.5    0.05    0.06      10    0.05    0.25
ALGAE/PERI/OTHER CO   13      10     0.5    0.05    0.06      10    0.05    0.25
ALGAE/PERI/OTHER CO   14      10     0.5    0.05    0.06      10    0.05       0
ALGAE/PERI/OTHER CO   15      10     0.5    0.05    0.06      10    0.05    0.25
ALGAE/PERI/OTHER CO   16      10     0.5    0.05    0.06      10    0.05       0
ALGAE/PERI/OTHER CO   17      10     0.5    0.05    0.06      10    0.05    0.25
ENDATA6B
INITIAL COND-1         1   57.2   6.04         2.094  90.78
INITIAL COND-1         2   57.2   6.65          1.38  98.96
INITIAL COND-1         3   57.2   6.65           3.4  98.96
INITIAL COND-1         4   57.2   6.53         3.397  127.6
INITIAL COND-1         5   57.2   6.79         3.099 125.85
INITIAL COND-1         6   57.2   6.86         2.487  140.4
INITIAL COND-1         7   57.2   7.07         2.858 130.62
INITIAL COND-1         8   57.2   7.12         2.624  97.89
INITIAL COND-1         9   57.2   7.31         2.368  92.66
INITIAL COND-1        10   57.2   7.72         2.157  92.09
INITIAL COND-1        11   57.2   6.46         2.021  80.76
INITIAL COND-1        12   57.2      7         3.038  83.46
INITIAL COND-1        13   57.2      7         3.038  83.46
INITIAL COND-1        14   57.2   6.86          2.16   71.6
INITIAL COND-1        15   57.2   6.88         2.102  74.36
INITIAL COND-1        16   57.2    5.6         2.075  81.86
INITIAL COND-1        17   57.2   6.71         2.654  74.78
ENDATA7
INITIAL COND-2         1   2.06    0.3   0.05          0.05  0.006   0.01      1
INITIAL COND-2         2    2.3   0.27   0.13          0.07  0.006   0.01      1
INITIAL COND-2         3    4.5   0.27   0.13          0.07  0.006   0.01      1
INITIAL COND-2         4   4.53    0.3    0.1           0.3  0.048  0.062      1
INITIAL COND-2         5   4.91   0.44   0.06          0.32  0.054  0.051      1
INITIAL COND-2         6   5.43   0.35   0.05          0.33  0.058  0.053      1
INITIAL COND-2         7   2.52   0.25   0.05          0.32  0.045  0.047      1
INITIAL COND-2         8   3.06   0.35   0.05          0.34  0.041   0.04      1
INITIAL COND-2         9   2.32   0.35   0.05          0.31  0.026  0.028      1
INITIAL COND-2        10   2.13   0.25   0.05          0.29  0.041   0.01      1
INITIAL COND-2        11  16.39   0.45   0.05          0.17  0.032   0.01      1
INITIAL COND-2        12   7.42   0.45   0.05          0.17  0.032   0.01      1
INITIAL COND-2        13   7.42   0.55   0.05          0.18  0.029  0.011      1
INITIAL COND-2        14    1.8   0.35   0.05          0.08  0.013   0.01      1
INITIAL COND-2        15   3.98   0.35   0.05          0.12  0.021   0.01      1
INITIAL COND-2        16   3.25   0.35   0.05          0.15  0.022   0.01      1
INITIAL COND-2        17   2.66   0.35   0.05          0.16  0.021   0.01      1
ENDATA7A
INCR FLOW-1  RCH=      1  0.019   57.2  7.48           2    80
INCR FLOW-1  RCH=      2  0.127   57.2  8.72           2    80
INCR FLOW-1  RCH=      3  0.013   57.2  7.48           2    80
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INCR FLOW-1  RCH=      4   0.09   57.2  7.48           2    80
INCR FLOW-1  RCH=      5  0.002   57.2  7.48           2    80
INCR FLOW-1  RCH=      6  0.012   57.2  7.48           2    80
INCR FLOW-1  RCH=      7  1.055   57.2  7.48           2    80
INCR FLOW-1  RCH=      8  0.012   57.2  7.48           2    80
INCR FLOW-1  RCH=      9  0.711   57.2  7.48           2    80
INCR FLOW-1  RCH=     10   0.06   57.2  7.48           2    80
INCR FLOW-1  RCH=     11  0.109   57.2  7.48           2    80
INCR FLOW-1  RCH=     12  0.001   57.2  7.48           2    80
INCR FLOW-1  RCH=     13  0.301   57.2  7.48           2    80
INCR FLOW-1  RCH=     14  0.442   57.2  7.48           2    80
INCR FLOW-1  RCH=     15  0.026   57.2  7.48           2    80
INCR FLOW-1  RCH=     16  0.165   57.2  7.48           2    80
INCR FLOW-1  RCH=     17  0.111   57.2  7.48           2    80
ENDATA8
INCR FLOW-2  RCH=      1           0.1   0.05      0   0.01  0.001  0.015
INCR FLOW-2  RCH=      2           0.1   0.05      0   0.01  0.001  0.015
INCR FLOW-2  RCH=      3           0.1   0.05      0   0.01  0.001  0.015
INCR FLOW-2  RCH=      4           0.1   0.05      0   0.01  0.001  0.015
INCR FLOW-2  RCH=      5           0.1   0.05      0   0.01  0.001  0.015
INCR FLOW-2  RCH=      6           0.1   0.05      0   0.01  0.001  0.015
INCR FLOW-2  RCH=      7           0.1   0.05      0   0.01  0.001  0.015
INCR FLOW-2  RCH=      8           0.1   0.05      0   0.01  0.001  0.015
INCR FLOW-2  RCH=      9           0.1   0.05      0   0.01  0.001  0.015
INCR FLOW-2  RCH=     10           0.1   0.05      0   0.01  0.001  0.015
INCR FLOW-2  RCH=     11            10   0.05      0   0.01  0.001  0.015
INCR FLOW-2  RCH=     12           0.1   0.05      0   0.01  0.001  0.015
INCR FLOW-2  RCH=     13           0.1   0.05      0   0.01  0.001  0.015
INCR FLOW-2  RCH=     14           0.1   0.05      0   0.01  0.001  0.015
INCR FLOW-2  RCH=     15           0.1   0.05      0   0.01  0.001  0.015
INCR FLOW-2  RCH=     16           0.1   0.05      0   0.01  0.001  0.015
INCR FLOW-2  RCH=     17           0.1   0.05      0   0.01  0.001  0.015
ENDATA8A
ENDATA9
HEADWTR-1 HDW=    1                     1.69   57.2   7.73      0   2.35  85.89
ENDATA10
HEADWTR-2 HDW=     1                    2.94   0.35   0.05      0   0.05  0.007  0.008
ENDATA10A
POINTLD-1 PTL=    1    Jaffrey             0
POINTLD-1 PTL=    2    Jaffrey     1    1.93   57.2   8.76          12.8  558.6
POINTLD-1 PTL=    3    Town Far         0.26   57.2   8.52          1.22  67.98
POINTLD-1 PTL=    4    Gridley          1.14   57.2   8.11          1.21  46.02
POINTLD-1 PTL=    5    Upland S        -0.02
POINTLD-1 PTL=    6    Meadow B         0.72   57.2   8.65          0.81  41.06
POINTLD-1 PTL=    7    Nubanusi         3.26   57.2   8.93          1.22  49.77
POINTLD-1 PTL=    8    Peterbor        -0.39
ENDATA11
POINTLD-2 PTL=     1
POINTLD-2 PTL=     2                       1   2.92   7.55          9.87   0.02   0.18
POINTLD-2 PTL=     3                    1.98   0.25   0.05          0.28  0.011 0.0085
POINTLD-2 PTL=     4                    4.67    0.4   0.05          0.05  0.014 0.0085
POINTLD-2 PTL=     5
POINTLD-2 PTL=     6                    1.34   0.23   0.05          0.05 0.0065 0.0085
POINTLD-2 PTL=     7                    1.27   0.25   0.05          0.05 0.0065  0.009
POINTLD-2 PTL=     8
ENDATA11A
DAM DATA    DAM NO.    1     1     1   1.6   0.7   0.9    10
DAM DATA    DAM NO.    2    12     1   1.6   0.7   0.7    12
DAM DATA    DAM NO.    3    15     1   1.6   0.8   0.9     4
DAM DATA    DAM NO.    4    17     1   1.6   0.7   0.9     5
ENDATA12
ENDATA13
ENDATA13A
BEGIN  RCH    1
PLOT   RCH    1    2    3    4    5    6    7    8    9   10   11   12   13   14
PLOT   RCH   15   16   17
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Winter PAR Worksheet

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20050208: This program is from a diskette provided with the following reference;
        S. Lawrence Dingman, Physical Hydrology, University of New Hampshire, Macmillan Publishing Co., NY, 1994.

SOLARRAD W K1      DAILY GLOBAL RADIATION ON AN INCLINED SURFACE
                   See Appendix E.
            Units: MJ = MJ/m^2 h; W = W/m^2; cal = cal/cm^2 day
SolarCon (Isc) =          4.921 MJ   =        1367 W    =          2821 cal
======== ======== ======== ======== ======== ======== ========== ========
------>    ENTER            LOCATION: Jaffrey NH
------>    ENTER    LATITUDE (Lambda):    42.800 degrees=>       0.747 radians
------>    ENTER    SLOPE ANGLE (beta):    0.000 degrees=>       0.000 radians
------>    ENTER SLOPE AZIMUTH (alpha):    0.000 degrees=>       0.000 radians
------>    ENTER        YEAR   DAY (J):     105  => Date =     14-Apr
------>    ENTER OPTICAL AIR MASS (Mopt) FROM FIG. E-4:          3.2          QUAL2e: keep at 3.2
------>    ENTER    AIR TEMP:      15.5 C
------>    ENTER    REL HUM:         70 %
Vap Pres=      12.35 mb Dew Pt=     10.1 C Precip   Water=          2.1 cm
------>    ENTER    SURFACE ALBEDO:     0.05                             ALBEDO = Surface Reflectivity (set=~ 0.05 for water)
------>    ENTER    DUST ATTENUATION (gamma-dust):              0.06     Dust Attenuation: Range = 0 - 0.15 per QUAL2E
======== ======== ======== ======== ======== ======== ========== ========
HORIZONTAL         Day Angle (Gamma) =     1.790 radians =      102.575 degrees
            Declination        (delta) =     0.165 radians =        9.481 degrees
   Eccentricity = (ro/r)^2 =               0.993
   Sunrise      Thr=     -6.593 h Sunset      Ths =     6.593 h
PolarSum        Thr=            h Sunset      Ths =           h
PolarWin        Thr=            h Sunset      Ths =           h
      Day Length =  13.186  h          PolarSum          PolarWin
Extraterr      K ET =    33.910 MJ   =    9.42E+03 W    =        809.980 cal
PolarSum * K ET =               MJ   =    0.00E+00 W    =          0.000 cal
                     tau-sa =     0.577      tau =     0.517
Direct         Ktdir=    17.526 MJ   =    4.87E+03 W    =        418.628 cal
PolarSum * Ktdir=               MJ   =    0.00E+00 W    =          0.000 cal
                     tau-s =      0.703 gamma-s =     0.357
Diffuse        Ktdif=     6.046 MJ   =    1.68E+03 W    =        144.426 cal
PolarSum * Ktdif=               MJ   =    0.00E+00 W    =          0.000 cal
Global          Ktg =    23.573 MJ   =    6.55E+03 W    =        563.054 cal
PolarSum * Ktg =                MJ   =    0.00E+00 W    =          0.000 cal

Backscat       Ktbs =     0.210 MJ   =    5.84E+01 W    =          5.020 cal

PolarSum * Ktbs =               MJ   =    0.00E+00 W    =          0.000 cal
CLEAR SKY  K'cs =    23.783 MJ   =    6.61E+03 W    =      568.073 cal <===
POLARSUM *                      MJ   =    0.00E+00 W    =          0.000 cal<===
======== ======== ======== ======== ======== ======== ========== ========
SLOPE:         Delta Omega =     0.000 radians =      0.000 degrees
Equivalent tLatitude = e    =        0.747 radians =     42.800 degrees
             Noon =     0.000 h            0.000 radians =        0.000 degrees
   Sunrise     (Tsr) =    -6.593 h           -1.726 radians =      -98.896 degrees
  Sunset    (Tss) =    6.593 h            1.726 radians =       98.896 degrees
      Day Length =  13.186 h
Extraterr      K ET =  28.626 MJ     = ######## W      =      683.767 cal
Polar Sum* K ET =  13.128 MJ     = ######## W      =      313.578 cal
CLEAR SKY  Kcs =  21.052 MJ     = ######## W      =      502.842 cal <===
POLARSUM*          6.785 MJ     = ######## W      =      162.069 cal <===
SlopeFactor (f sd) Direct :  0.844     Polar   Sum* =   #DIV/0!
SlopeFactor (f sl)  Total :  0.885     Polar   Sum* =   #DIV/0!
======== ======== ======== ======== ======== ======== ========== ========
       * Ignore "Polar Summer" results unless other values = ERR
       * If all values = ERR, clear-sky radiation = 0.
```

BTU/ft2	Fraction available for photosynthesis	Fraction Cloud Cover	Forest Canopy Density	QUAL2e Total Daily Solar Radiation (Input for Option 2 Light Ave Method) = Total Daily PAR
2094.487	0.440	0.010	0.010	911.228
Range	.43-.45	0-1.0	0-1.0	