STEADY STATE RESULTS FOR CLOSEDLOOP
i.e. constant input file and ideal sensors/actuators, control strategy
according to BSM1 description
(Results from Matlab/Simulink implementation by Dr Ulf Jeppsson, IEA, Lund
University, Sweden, May 21 2009 — based on Matlab R2008b (ver 7.7.0))

Influent characteristics
****
    SI = 30 mg COD/l
    SS = 69.5 mg COD/l
    XI = 51.2 mg COD/l
    XS = 202.32 mg COD/l
    XBH = 28.17 mg COD/l
    XBA = 0 mg COD/l
    XP = 0 mg COD/l
    SO = 0 mg -COD/l
    SNO = 0 mg N/l
    SNH = 31.56 mg N/l
    SND = 6.95 mg N/l
    XND = 10.59 mg N/l
    SALK = 7 mol HCO3/m3
    TSS = 211.2675 mg SS/l

Flow conditions
****
    Influent flow to WWTP = 18446 m3/d
    Influent flow to AS = 53377.6075 m3/d
    Internal recirculation = 16485.6075 m3/d
    Settler feed flow = 36892 m3/d
    Returned sludge flow = 18446 m3/d
    Wastage sludge flow = 385 m3/d
    Effluent flow = 18061 m3/d

Input to AS
****
    SI = 30 mg COD/l
    SS = 24.5463 mg COD/l
    XI = 1149.1683 mg COD/l
    XS = 113.7148 mg COD/l
    XBH = 2533.1267 mg COD/l
    XBA = 151.7894 mg COD/l
    XP = 445.766 mg COD/l
    SO = 1.3088 mg -COD/l
    SNO = 8.8506 mg N/l
    SNH = 11.3461 mg N/l
    SND = 2.8366 mg N/l
    XND = 6.8699 mg N/l
    SALK = 4.924 mol HCO3/m3
    TSS = 3295.1739 mg SS/l

Reactor 1
****
    SI = 30 mg COD/l
    SS = 3.2439 mg COD/l
    XI = 1149.1683 mg COD/l
    XS = 98.6029 mg COD/l
    XBH = 2552.1095 mg COD/l
    XBA = 151.6721 mg COD/l
    XP = 446.9249 mg COD/l
    SO = 0.0076964 mg -COD/l
    SNO = 3.5133 mg N/l
    SNH = 11.8312 mg N/l
    SND = 1.3621 mg N/l

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    XND = 6.1775 mg N/l
    SALK = 5.3399 mol HCO3/m3
    TSS = 3298.8583 mg SS/l

Reactor 2
*********
    SI =  30 mg COD/l
    SS =  1.6707 mg COD/l
    XI =  1149.1683 mg COD/l
    XS =  91.7032 mg COD/l
    XBH = 2552.3711 mg COD/l
    XBA = 151.5303 mg COD/l
    XP =  448.0839 mg COD/l
    SO =  6.0271e-05 mg -COD/l
    SNO = 1 mg N/l
    SNH = 12.5482 mg N/l
    SND = 0.78899 mg N/l
    XND = 5.9537 mg N/l
    SALK = 5.5706 mol HCO3/m3
    TSS = 3294.6426 mg SS/l

Reactor 3
*********
    SI =  30 mg COD/l
    SS =  1.2195 mg COD/l
    XI =  1149.1683 mg COD/l
    XS =  69.6594 mg COD/l
    XBH = 2560.2025 mg COD/l
    XBA = 152.6873 mg COD/l
    XP =  449.6336 mg COD/l
    SO =  1.635 mg -COD/l
    SNO = 6.2289 mg N/l
    SNH = 7.3197 mg N/l
    SND = 0.8307 mg N/l
    XND = 4.7131 mg N/l
    SALK = 4.8236 mol HCO3/m3
    TSS = 3286.0133 mg SS/l

Reactor 4
*********
    SI =  30 mg COD/l
    SS =  0.97326 mg COD/l
    XI =  1149.1683 mg COD/l
    XS =  54.4484 mg COD/l
    XBH = 2563.3104 mg COD/l
    XBA = 153.7108 mg COD/l
    XP =  451.1853 mg COD/l
    SO =  2.4745 mg -COD/l
    SNO = 11.0693 mg N/l
    SNH = 2.7825 mg N/l
    SND = 0.75276 mg N/l
    XND = 3.8403 mg N/l
    SALK = 4.1538 mol HCO3/m3
    TSS = 3278.8674 mg SS/l

Reactor 5
*********
    SI =  30 mg COD/l
    SS =  0.80801 mg COD/l
    XI =  1149.1683 mg COD/l
    XS =  44.4828 mg COD/l
    XBH = 2562.8514 mg COD/l
    XBA = 154.163 mg COD/l
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    XP =   452.7367 mg COD/l
    SO =   2 mg -COD/l
    SNO = 13.5243 mg N/l
    SNH = 0.67193 mg N/l
    SND = 0.6645 mg N/l
    XND = 3.2605 mg N/l
    SALK = 3.8277 mol HCO3/m3
    TSS = 3272.5517 mg SS/l

Settler underflow
****************
    SI =   30 mg COD/l
    SS =   0.80801 mg COD/l
    XI =   2247.1366 mg COD/l
    XS =   86.9837 mg COD/l
    XBH = 5011.5177 mg COD/l
    XBA = 301.4575 mg COD/l
    XP =   885.3022 mg COD/l
    SO =   2 mg -COD/l
    SNO = 13.5243 mg N/l
    SNH = 0.67193 mg N/l
    SND = 0.6645 mg N/l
    XND = 6.3757 mg N/l
    SALK = 3.8277 mol HCO3/m3
    TSS = 6399.2982 mg SS/l

Settler effluent
***************
    SI =   30 mg COD/l
    SS =   0.80801 mg COD/l
    XI =   4.39 mg COD/l
    XS =   0.16993 mg COD/l
    XBH = 9.7905 mg COD/l
    XBA = 0.58893 mg COD/l
    XP =   1.7295 mg COD/l
    SO =   2 mg -COD/l
    SNO = 13.5243 mg N/l
    SNH = 0.67193 mg N/l
    SND = 0.6645 mg N/l
    XND = 0.012455 mg N/l
    SALK = 3.8277 mol HCO3/m3
    TSS = 12.5016 mg SS/l

Settler internal (1 is top layer)
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    TSS1 = 12.5016 mg SS/l
    TSS2 = 18.1183 mg SS/l
    TSS3 = 29.548 mg SS/l
    TSS4 = 69.0015 mg SS/l
    TSS5 = 356.2825 mg SS/l
    TSS6 = 356.2825 mg SS/l
    TSS7 = 356.2825 mg SS/l
    TSS8 = 356.2825 mg SS/l
    TSS9 = 356.2825 mg SS/l
    TSS10 = 6399.2982 mg SS/l

Other variables
**************
    Trad. sludge age (XS + XP + XI + XBH + XBA in reactors) = 7.3273 days
    Spec. sludge age (XBH + XBA in reactors and settler) = 9.139 days
    Total hydraulic retention time = 15.6118 hours
    Reactor hydraulic retention time = 7.8053 hours
    Thickening factor at bottom of settler(TSSu/TSSfeed) = 1.9554
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      Thinning factor at top of settler (TSSeff/TSSfeed) = 0.0038201

Dimensions
**********
   Reactor 1 is anoxic
   Volume reactor 1 = 1000 m3
   Reactor 2 is anoxic
   Volume reactor 2 = 1000 m3
   Reactor 3 is aerobic
   Volume reactor 3 = 1333 m3
   Reactor 4 is aerobic
   Volume reactor 4 = 1333 m3
   Reactor 5 is aerobic
   Volume reactor 5 = 1333 m3
   Settler height = 4 m
   Settler area = 1500 m2
   Settler volume = 6000 m3
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