eff\_BOD5 = BOD\_COD\_eff \* (eff\_S\_S + eff\_X\_S + (1 - f\_P) \* (eff\_X\_BA1 + eff\_X\_BA2 + eff\_X\_BH)); % WDK20101019

BOD\_COD\_eff = 0.25; % BOD/COD in the efffluent

f\_P = 0.08; % Fraction of biomass to particulate products

BOD5eav = (BOD5\_SSload + BOD5\_XSload + BOD5\_XBHload + BOD5\_XBA1load + BOD5\_XBA2load+ BOD5\_XPload)/Qetot;%%%% XBA2 is included in the whole BOD5 balance

BOD5\_SSload = 0.25\*(SSeload);

BOD5\_XSload = 0.25\*(XSeload);

BOD5\_XBHload = 0.25\*(1-f\_P)\*(XBHeload);

BOD5\_XBA1load = 0.25\*(1-f\_P)\*(XBA1eload);

BOD5\_XBA2load = 0.25\*(1-f\_P)\*(XBA2eload);%%%% New variable included in the balance XBA2

BOD5\_XPload = 0.25\*(1-f\_P)\*(XPeload);

i\_X\_B = 0.086;

i\_X\_P = 0.06;

BTSS=2;

BCOD=1;

BNKj=30;

BNO=10;

BBOD5=2;

TSSin=inpart(:,14);

CODin=inpart(:,1)+inpart(:,2)+inpart(:,3)+inpart(:,4)+inpart(:,5)+inpart(:,6)+inpart(:,7) + inpart(:,21);%% XBA2 is included in COD

SI SS XI XS XBH XBA1 Xp XBA2

BOD5in=0.65\*(inpart(:,2)+inpart(:,4)+(1-f\_P)\*(inpart(:,5)+inpart(:,6) + inpart(:,21)));%% XBA2 is included in BOD

SS XS XBH XBA1 XBA2

SNKjin=inpart(:,10)+inpart(:,11)+inpart(:,12)+i\_X\_B\*(inpart(:,5)+inpart(:,6) + inpart(:,21))+i\_X\_P\*(inpart(:,3)+inpart(:,7));%%% XBA2 is inclued in TKN

SNH SND XND XBH XBA1 XBA2 XI XP

SNOin=inpart(:,9) + inpart(:,17)+ inpart(:,18)+ inpart(:,19);%%%%%% the dissolved forms of N are included in NOx

SNO3 SNO2 SN2O SN2

IQIvec=(BTSS\*TSSin+BCOD\*CODin+BNKj\*SNKjin+BNO\*SNOin+BBOD5\*BOD5in).\*Qinvec;

IQI=sum(IQIvec)/(totalt\*1000);

EQIvec=(BTSS\*TSSe +BCOD\*CODe +BNKj\*SNKje +BNO\*SNOe +BBOD5\*BOD5e).\*Qevec;

EQI=sum(EQIvec)/(totalt\*1000);

i\_XB = 0.08; % Fraction nitrogen in biomass

i\_XP = 0.06; % Fraction nitrogen in particulate products

b\_TSS = 2; % wheight for PI

b\_COD = 1; % wheight for PI

b\_BOD5 = 2; % wheight for PI

b\_TKN = 30; % wheight for PI

b\_NO = 10; % wheight for PI

BOD\_COD\_inf = 0.65; % BOD/COD in the influent

inf\_COD = inf\_S\_I + inf\_S\_S + inf\_X\_S + inf\_X\_I + inf\_X\_P + inf\_X\_BA1 + inf\_X\_BA2 + inf\_X\_BH;

inf\_BOD5 = BOD\_COD\_inf \* (inf\_S\_S + inf\_X\_S + (1 - f\_P) \* (inf\_X\_BA1 + inf\_X\_BA2 + inf\_X\_BH));

inf\_TKN = inf\_S\_NH + inf\_S\_ND + inf\_X\_ND + i\_XB \* (inf\_X\_BA1 + inf\_X\_BA2 + inf\_X\_BH) + i\_XP \* (inf\_X\_I + inf\_X\_P);

inf\_S\_NOx = inf\_S\_NO3;

inf\_TN = inf\_TKN + inf\_S\_NOx;

inf\_TSS = (inf\_X\_BH + inf\_X\_BA1 + inf\_X\_BA2 + inf\_X\_I + inf\_X\_S + inf\_X\_P) \* TSS\_COD;

inf\_TN\_load\_aver = sum(inf\_TN .\*Qinvec)/(totalt\*1000); %kgN/d

IQIvec = (b\_TSS \* inf\_TSS + b\_COD \* inf\_COD + b\_BOD5 \* inf\_BOD5 + b\_TKN \* inf\_TKN + b\_NO \* inf\_S\_NOx).\*Qinvec;

IQI=sum(IQIvec)/(totalt\*1000); %kg poll.units/day

% Sludge production

TSSreactors\_start = (reac1part(1,14)\*VOL1+reac2part(1,14)\*VOL2+reac3part(1,14)\*VOL3+reac4part(1,14)\*VOL4+reac5part(1,14)\*VOL5)/1000;

TSSreactors\_end = (reac1part(end,14)\*VOL1+reac2part(end,14)\*VOL2+reac3part(end,14)\*VOL3+reac4part(end,14)\*VOL4+reac5part(end,14)\*VOL5)/1000;

TSSsettler\_start=(settlerpart(1,32)\*DIM(1)\*DIM(2)/10+settlerpart(1,33)\*DIM(1)\*DIM(2)/10+settlerpart(1,34)\*DIM(1)\*DIM(2)/10+settlerpart(1,35)\*DIM(1)\*DIM(2)/10+settlerpart(1,36)\*DIM(1)\*DIM(2)/10+settlerpart(1,37)\*DIM(1)\*DIM(2)/10+settlerpart(1,38)\*DIM(1)\*DIM(2)/10+settlerpart(1,39)\*DIM(1)\*DIM(2)/10+settlerpart(1,40)\*DIM(1)\*DIM(2)/10+settlerpart(1,41)\*DIM(1)\*DIM(2)/10)/1000;

TSSsettler\_end=(settlerpart(end,32)\*DIM(1)\*DIM(2)/10+settlerpart(end,33)\*DIM(1)\*DIM(2)/10+settlerpart(end,34)\*DIM(1)\*DIM(2)/10+settlerpart(end,35)\*DIM(1)\*DIM(2)/10+settlerpart(end,36)\*DIM(1)\*DIM(2)/10+settlerpart(end,37)\*DIM(1)\*DIM(2)/10+settlerpart(end,38)\*DIM(1)\*DIM(2)/10+settlerpart(end,39)\*DIM(1)\*DIM(2)/10+settlerpart(end,40)\*DIM(1)\*DIM(2)/10+settlerpart(end,41)\*DIM(1)\*DIM(2)/10)/1000;

TSSproduced=sum(TSSuvec)+TSSreactors\_end+TSSsettler\_end-TSSreactors\_start-TSSsettler\_start;

TSSproducedperd = TSSproduced/totalt; %for OCI

TSSproduced=sum(TSSsludgevec)+TSSreactors\_end+TSSsettler\_end-TSSreactors\_start-TSSsettler\_start;

TSSproducedperd = TSSproduced/totalt; %for OCI

Sludgetoeff=TSSeload/1000;

Sludgetoeffperd=TSSeload/(1000\*totalt);

Totsludgeprod=TSSproduced+TSSeload/1000;

Totsludgeprodperd=TSSproduced/totalt+TSSeload/(1000\*totalt);