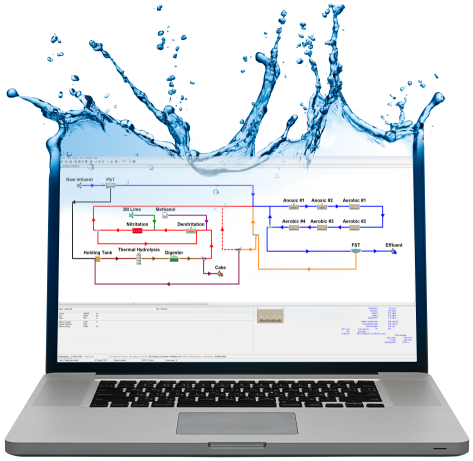
What's New in BioWin 6.1



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Introduction

- **The BioWin Manual is provided in two forms:**
  1. As a PDF (default install location is C:\Program Files(x86)\EnviroSim\BioWin 6.1\Manuals)
  2. In “Windows Help” format from within BioWin

- **To Use PDF**
  - Open it from directory above
  - Or copy it to any other location of your choice (*e.g.* Desktop, My Documents)

- **To Use Windows Help**
  - Select Help > Contents & Index
  - Click Help button 
  - Press F1 key on your keyboard (context-sensitive method; will open a relevant topic in the manual)

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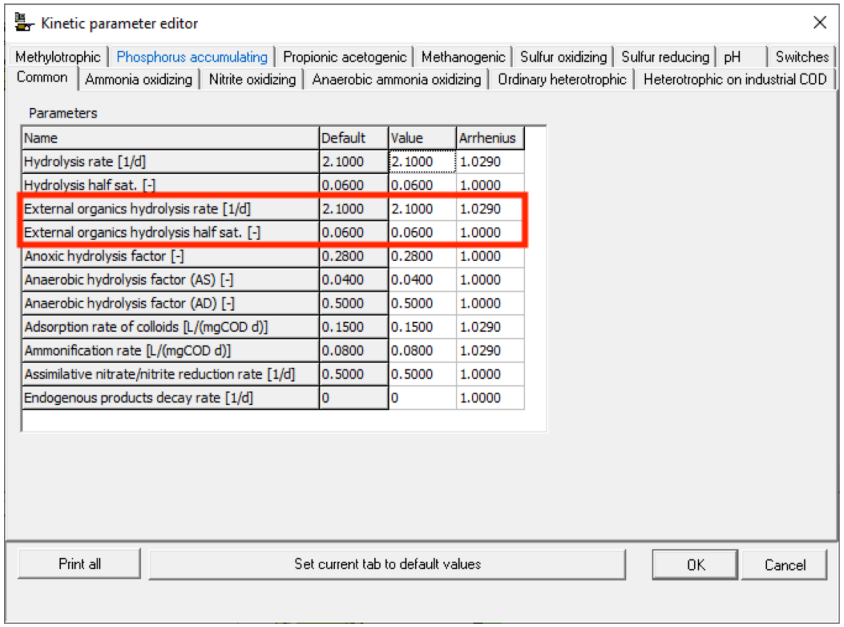
Separate Hydrolysis Rate for External Organics

- Degradable external organics state variable (*i.e.* CODp – Degradable external organics) now has its own kinetic hydrolysis rate parameter (*c.f.* BioWin 6.0 where hydrolysis rate for slowly degradable particulate COD was used)
- Hydrolysis rate for external organics can be independently adjusted *via* **Project > Parameters > Kinetic > Common**
- Also can be adjusted locally as per other kinetic parameters



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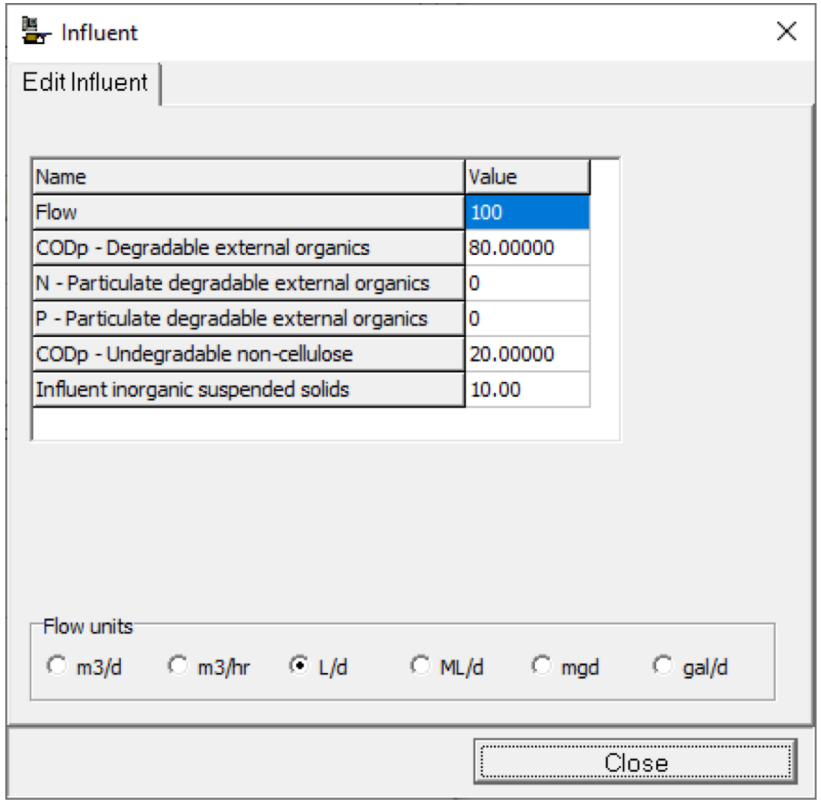
Additional State Variables in Source Separated Organics Input

- Particulate COD can now consist of both degradable and non-degradable components
- VSS / TSS ratio for SSO stream can now be adjusted through addition of ISS if desired



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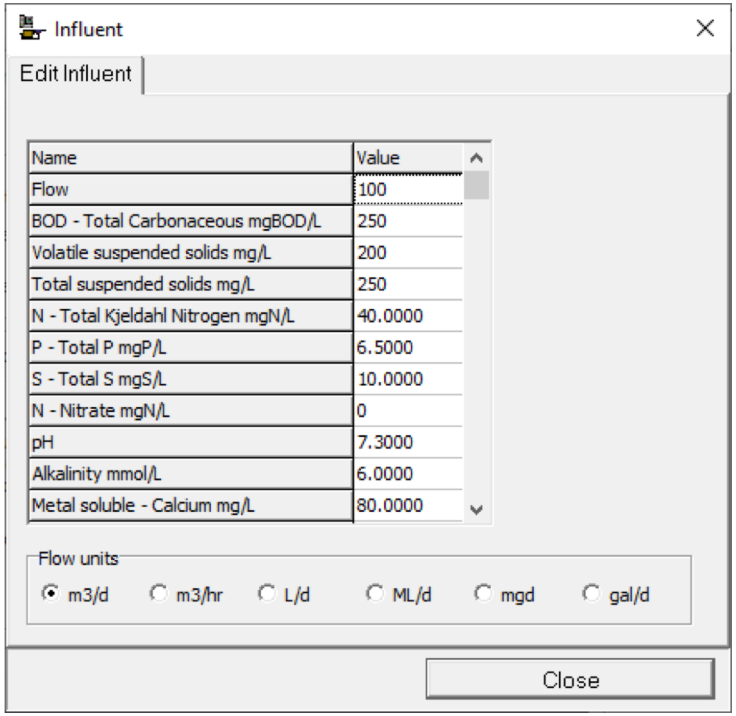
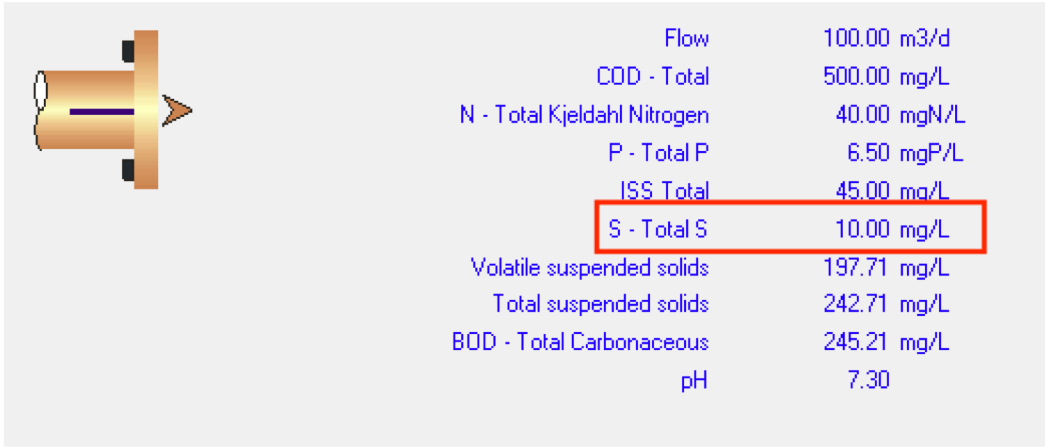
Sulfur in BOD Input

- Sulfur component now available for BOD inputs
- Also displayed in main window summary pane





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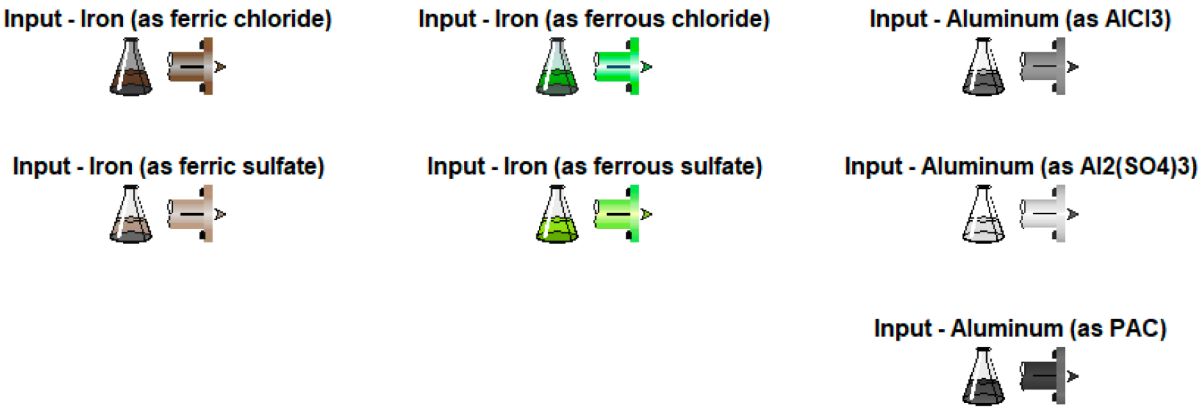
Additional Metal Salt Inputs

- Now seven separate metal salt inputs
- Ferric Chloride; Ferric Sulfate
- Ferrous Chloride; Ferrous Sulfate
- Aluminum Chloride; Aluminum Sulfate; PAC/ACH
- More distinct coloration for flowsheet clarity



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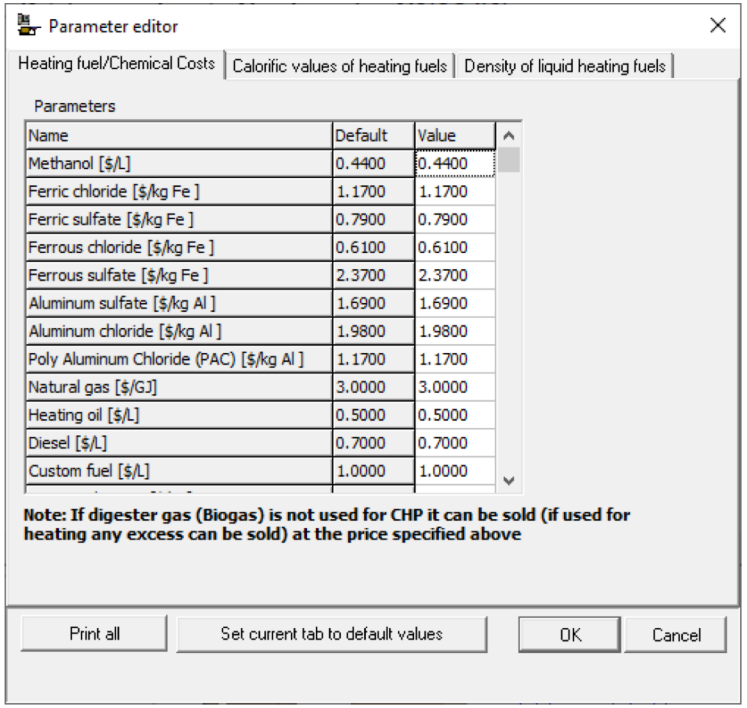
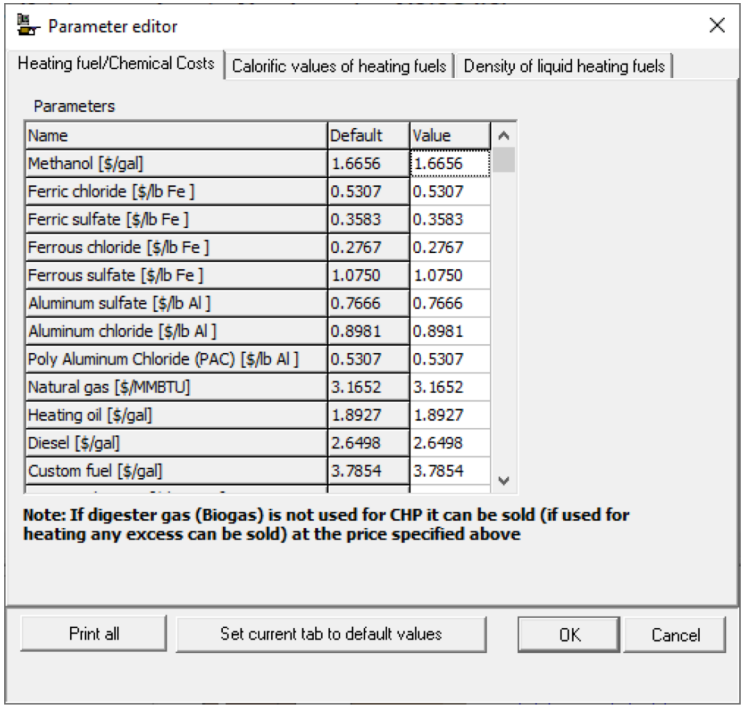
Metal Salt Pricing Information

- Pricing now input as price per unit weight of ***metal***
- Input *via* **Project > Costs/Energy > Fuel/Chemical**
- $ per kilogram metal for SI units
- $ per pound metal for US units
- ***Not $ per unit weight of metal salt or metal salt solution***





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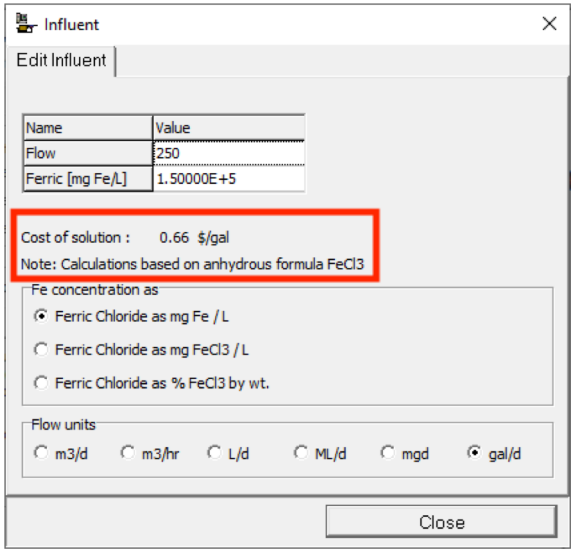
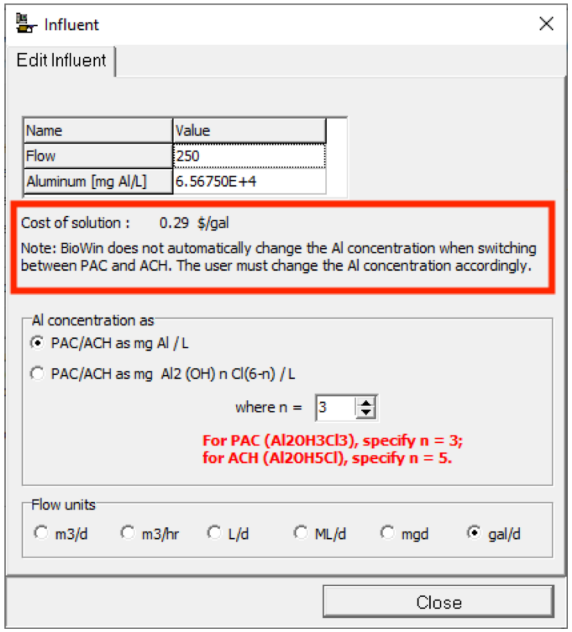
Metal Salt Dialogue Improvements

- Cost per unit volume of actual input solution is displayed in input dialogue
- Based on input price of pure solution under **Project > Costs/Energy > Fuel/Chemical**, pure solution density under **Project > Parameters > Physical/Chemical > Metal salt solution densities**, and strength of input solution
- Additional clarification notes provided (*e.g.* basis for metal salt chemical composition with or without waters of hydration)





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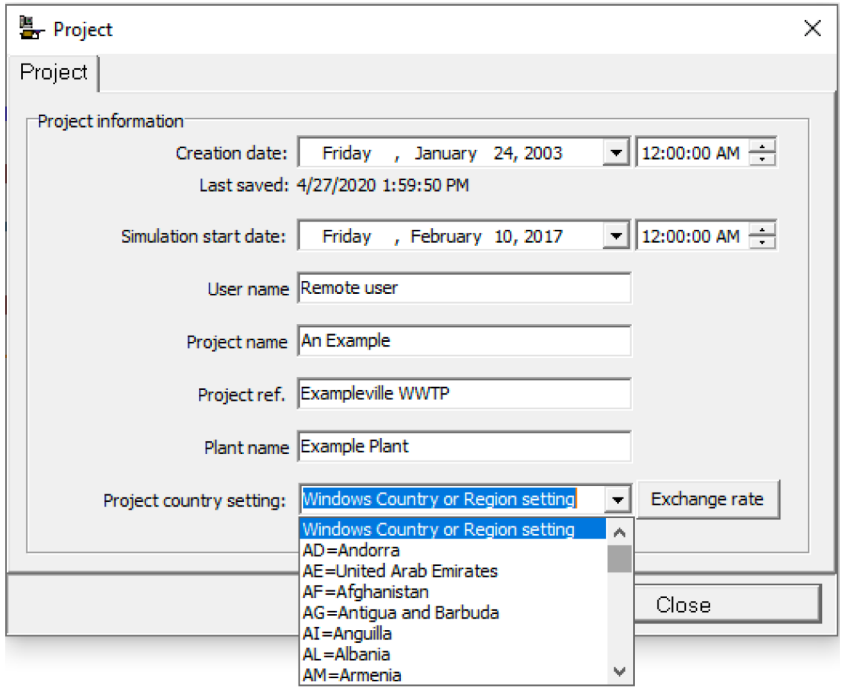
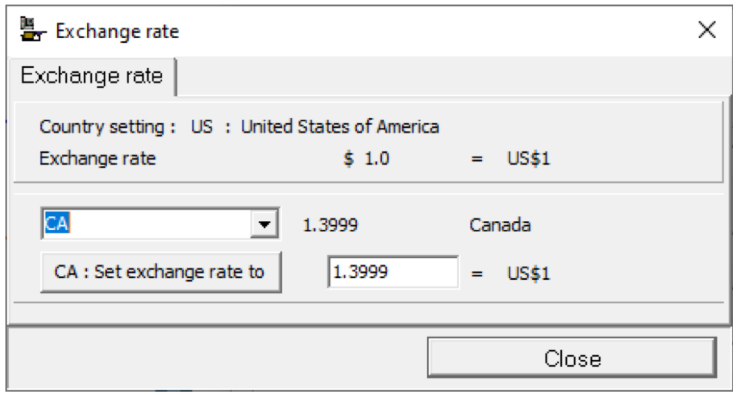
Project Location and Currency Exchange Rates

- Location of project can now be specified *via* **Project > Info**
- Ensures proper currency conversion rates *versus* the US dollar for costing calculations
- Currency exchange rates can now be edited / set directly within BioWin using the **Set exchange rate to** button; editing of external ***.ini*** files no longer required





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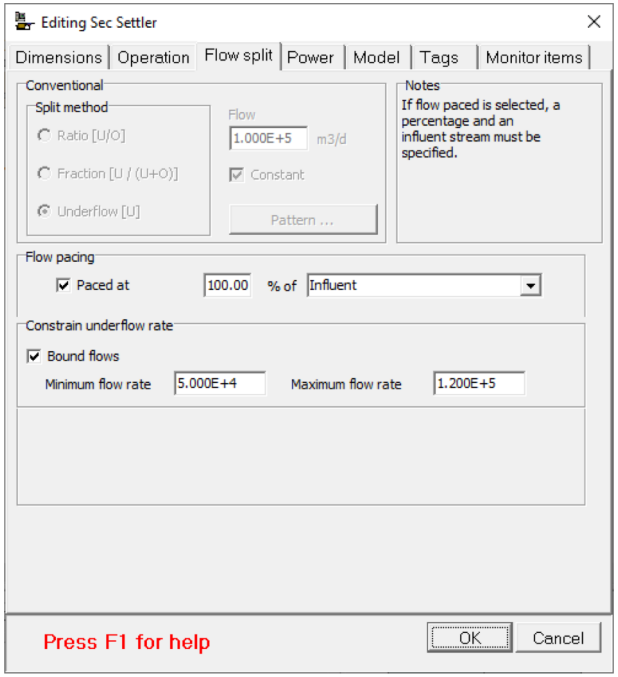
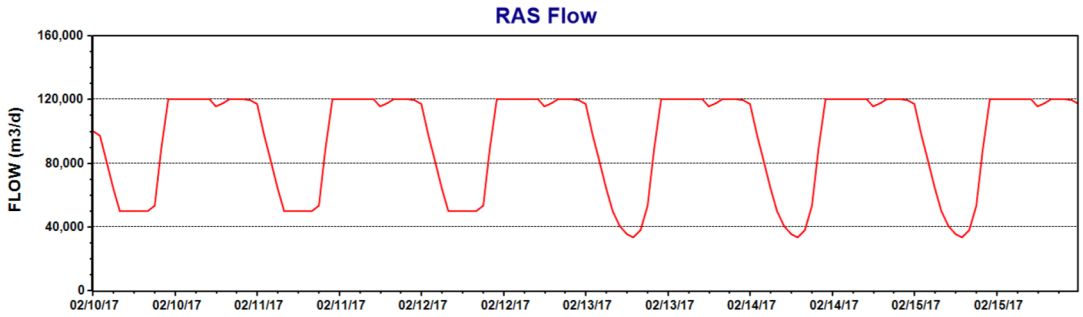
Upper / Lower Flow Split Bounds

- Applicable for any flow-splitting element that can be flow-paced based on an influent element
- Splitters, primary and secondary clarifiers, dewatering units, MBRs, grit tanks, cyclones, *etc.*
- Useful for modelling pumping limitations (*e.g.* upper and/or lower limits on RAS flow pacing)





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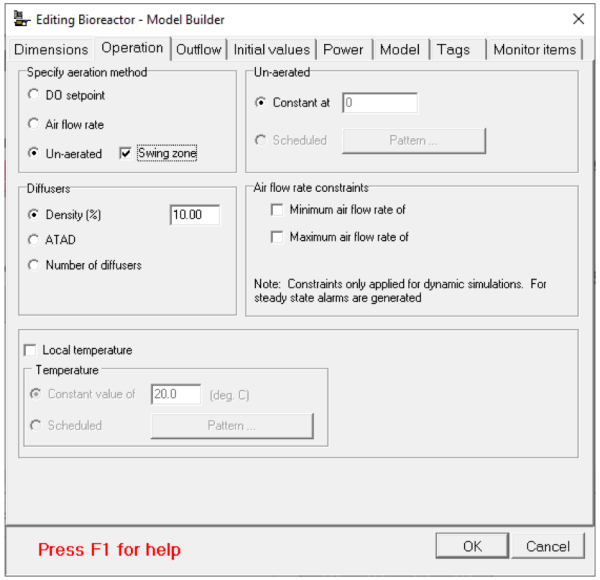
Swing Zone Setting

- Bioreactor-type elements can be designated as “swing zones” if there is on/off aeration if they are set as *unaerated*
- This setting allows input of diffuser coverage even if zone is set as unaerated (this was not possible in previous BioWin versions)
- The element can display the number of diffusers in tables and this information also is available to BioWin Controller
- Allows for proper implementation of BioWin Controller’s air distribution tool in aeration control strategy simulations involving swing zones



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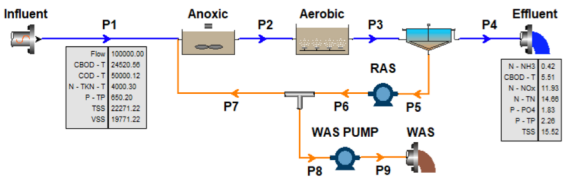
Report to Excel Refinements

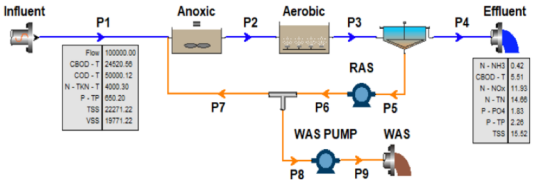
- If multiple unmerged templates are used in report creation, each output report can be saved with unique name/location
- Color has been added to default mass balance tables
- State variable table is now available (default table excludes pipe elements but these can be added through use of filtering)
- AlphaF, Beta, and Diffuser Density now available for bioreactor-type elements

BioWin Mass Balance Summary



PARAMETER	UNITS	P1	P2	P3	P4	P5	P6	P7	P8	P9
FLOW	m3/d	100,000.0	196,570.0	196,570.0	96,570.0	100,000.0	100,000.0	96,570.0	3,430.0	3,430.0
COD	mg/L	500	2,719	2,603	45	5,074	5,074	5,074	5,074	5,074
	kg/d	50,000	534,401	511,678	4,316	507,362	507,362	489,960	17,403	17,403
BOD	mg/L	245	731	658	6	1,281	1,281	1,281	1,281	1,281
	kg/d	24,521	143,682	128,674	532	128,142	128,142	123,747	4,395	4,395
TSS	mg/L	223	2,334	2,287	16	4,481	4,481	4,481	4,481	4,481
	kg/d	22,271	458,834	449,613	1,498	448,115	448,115	432,744	15,370	15,370
VSS	mg/L	198	1,842	1,778	12	3,483	3,483	3,483	3,483	3,483
	kg/d	19,771	362,040	349,511	1,165	348,346	348,346	336,398	11,948	11,948
TKN	mg/L	40	149	134	3	262	262	262	262	262
	kg/d	4,000	29,247	26,422	264	26,159	26,159	25,262	897	897
NH_4-N	mg/L	26	15	0	0	0	0	0	0	0
	kg/d	2,640	3,035	82	40	42	42	40	1	1
NO_x-N	mg/L	0	0	12	12	12	12	12	12	12
	kg/d	0	4	2,345	1,152	1,193	1,193	1,152	41	41
TP	mg/L	7	66	66	2	126	126	126	126	126
	kg/d	650	12,803	12,803	219	12,585	12,585	12,153	432	432
PO_4-P	mg/L	3.25	6.24	1.83	1.83	1.83	1.83	1.83	1.83	1.83
	kg/d	325	1,226	360	177	183	183	177	6	6

BioWin Overall Element State Variable Summary



State Variables By Element (O - Overflow; U - Underflow)

State Variable	Units	Aerobic	Anoxic	Effluent	Influent	RAS	Sec Settler	Sec Settler (U)	WAS
Sample Location		O	O	O	O	O	O	U	O
Flow	m3/d	196,570.00	196,570.00	96,570.00	100,000.00	100,000.00	96,570.00	100,000.00	3,430.00
Biomass - Acetoclastic methanogenic	mgCOD/L	0.09	0.11	0.00	0.05	0.18	0.00	0.18	0.18
Biomass - Ammonia oxidizing	mgCOD/L	21.23	20.25	0.14	0.05	41.59	0.14	41.59	41.59
Biomass - Anaerobic ammonia oxidizing	mgCOD/L	0.58	0.58	0.00	0.05	1.13	0.00	1.13	1.13
Biomass - Endogenous products	mgCOD/L	526.74	509.92	3.57	0.00	1,031.96	3.57	1,031.96	1,031.96
Biomass - Hydrogenotrophic methanogenic	mgCOD/L	0.02	0.05	0.00	0.05	0.04	0.00	0.04	0.04
Biomass - Methylotrophic	mgCOD/L	0.45	0.46	0.00	0.05	0.89	0.00	0.89	0.89
Biomass - Nitrite oxidizing	mgCOD/L	12.99	12.40	0.09	0.05	25.45	0.09	25.45	25.45
Biomass - Ordinary heterotrophic	mgCOD/L	944.29	913.68	6.41	10.00	1,850.01	6.41	1,850.01	1,850.01
Biomass - Phosphorus accumulating	mgCOD/L	55.44	53.34	0.38	0.05	108.61	0.38	108.61	108.61
Biomass - Propionic acetogenic	mgCOD/L	0.11	0.13	0.00	0.05	0.21	0.00	0.21	0.21
Biomass - Sulfur oxidizing	mgCOD/L	56.23	54.21	0.38	0.05	110.17	0.38	110.17	110.17
Biomass - Sulfur reducing acetotrophic	mgCOD/L	0.52	0.52	0.00	0.05	1.01	0.00	1.01	1.01
Biomass - Sulfur reducing hydrogenotrophic	mgCOD/L	16.08	16.43	0.11	0.05	31.51	0.11	31.51	31.51
Biomass - Sulfur reducing propionic acetogenic	mgCOD/L	0.55	0.55	0.00	0.05	1.07	0.00	1.07	1.07
CODp - Adsorbed hydrocarbon	mgCOD/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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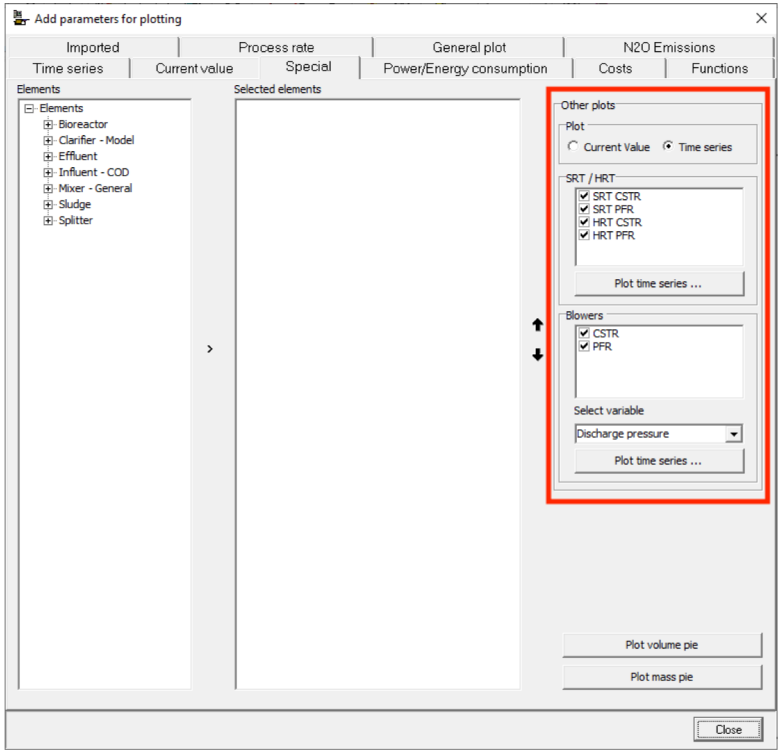
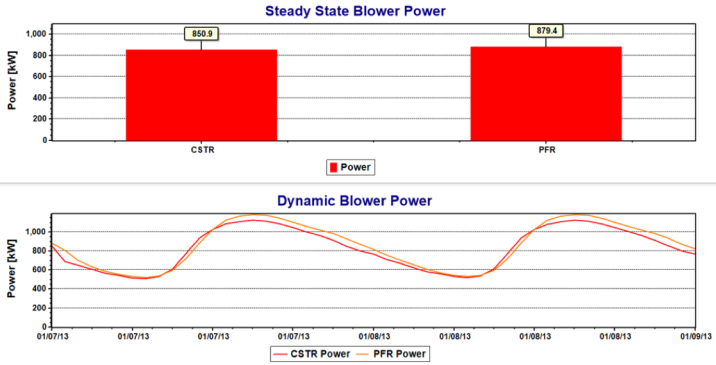
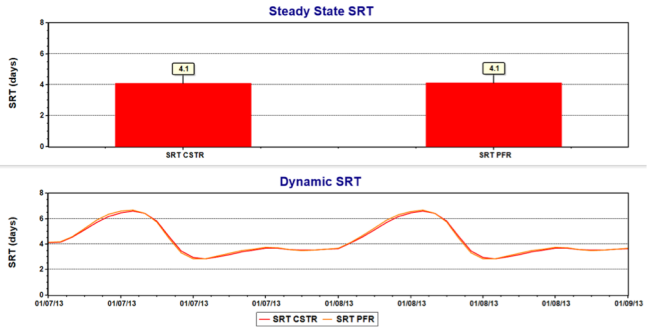
Plotting Blower Group Information

- Variables of interest for blower groups (*e.g.* intake airflow, power requirement) can now be plotted in current value or time series charts *via* **Special** tab of **Add Series** dialogue
- Capability of SRT / HRT plotting has been expanded to allow for current value plots (only time series were available in previous versions of BioWin)







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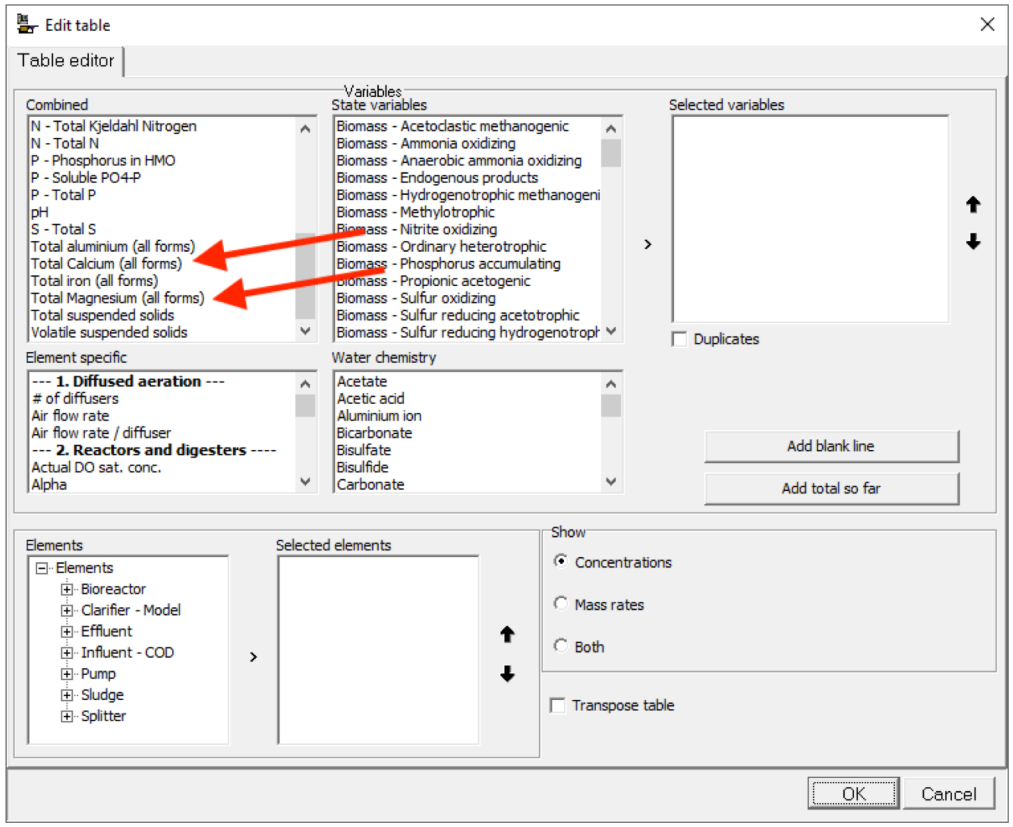
New Variables

- Total Calcium and Total Magnesium available under Combined variables group for tables and charts
- Aids in overall mass balance-checking for nutrient recovery systems



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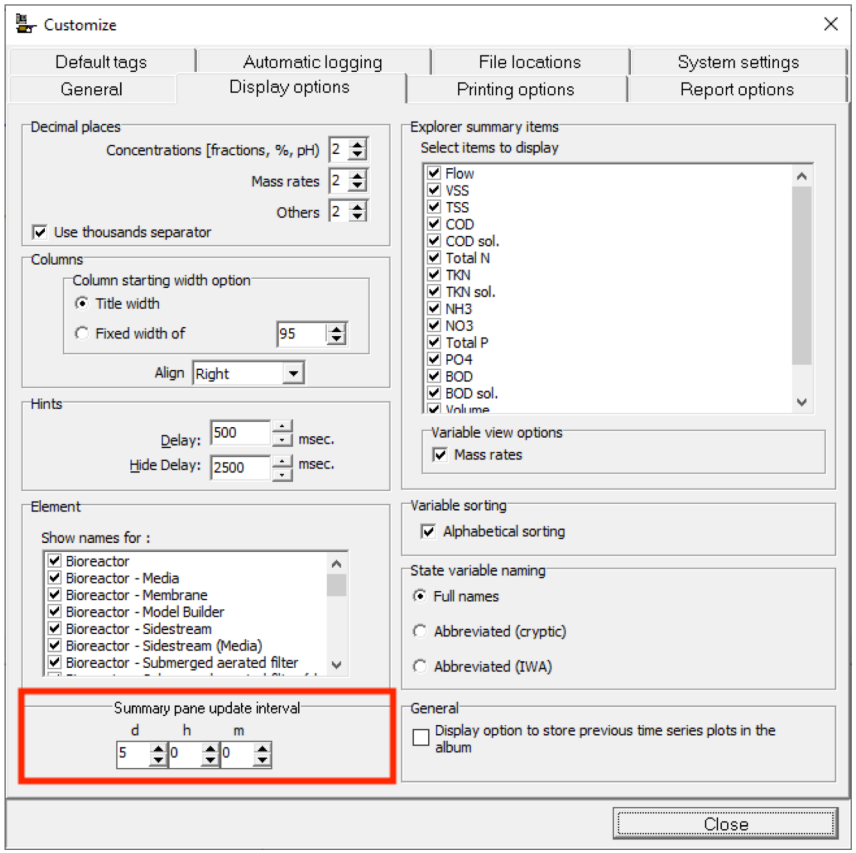
Screen Redraw Moved to Customize Settings

- Frequency of screen refresh / summary pane update moved to **Tools > Customize** dialogue
- Reduces screen “flicker” if drawing board tags are used



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Minor Bug Fixes

- User manual additions / corrections
- Spurious generation of pH alarm for variable volume bioreactors
- Error message when switching from DO setpoint to power supply schedule for surface-aerated bioreactors
- Equalization tank outflow is now available to BioWin Controller even if it is set to have constant volume in BioWin
- Fixed typo in process names of some HFO reduction processes in the stoichiometric matrix view
- Addressed an issue where values in cost summary tables were not adding up correctly
- Fixed a rounding issue with time values in flow split patterns

Enjoy Using BioWin 6.1

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