Supplementary Information for:

Effect of side-stream conditions on the release of dissolved organic matter in side-stream enhanced biological phosphorus removal process

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1.Figures:

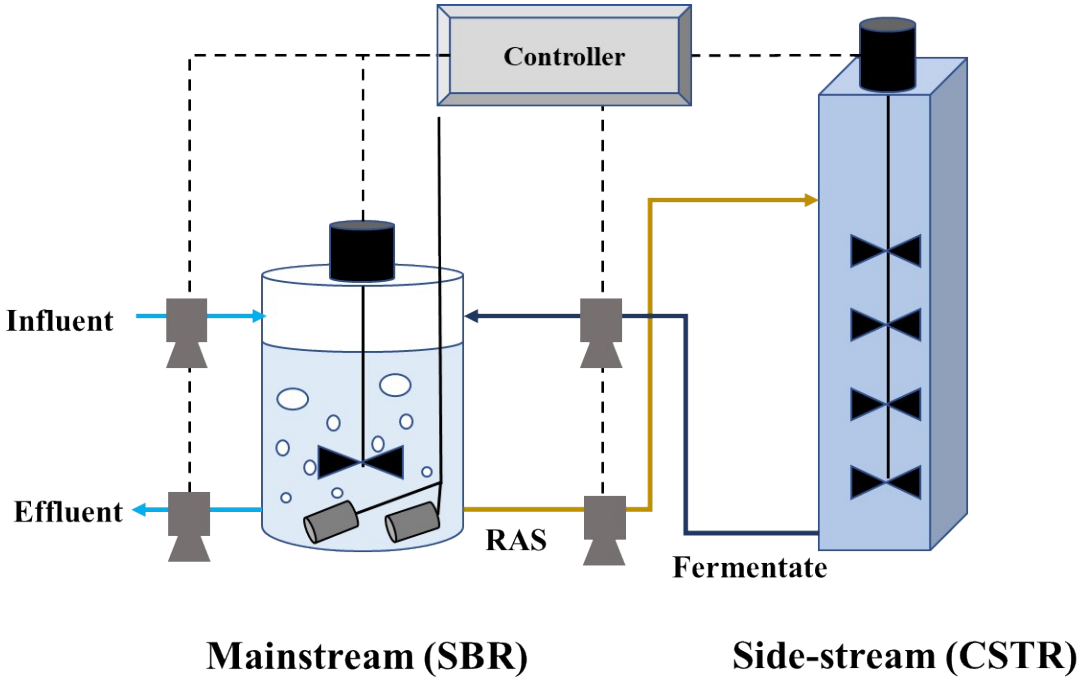

Fig. S1 Schematic of the S2EBPR reactor and operational configuration.

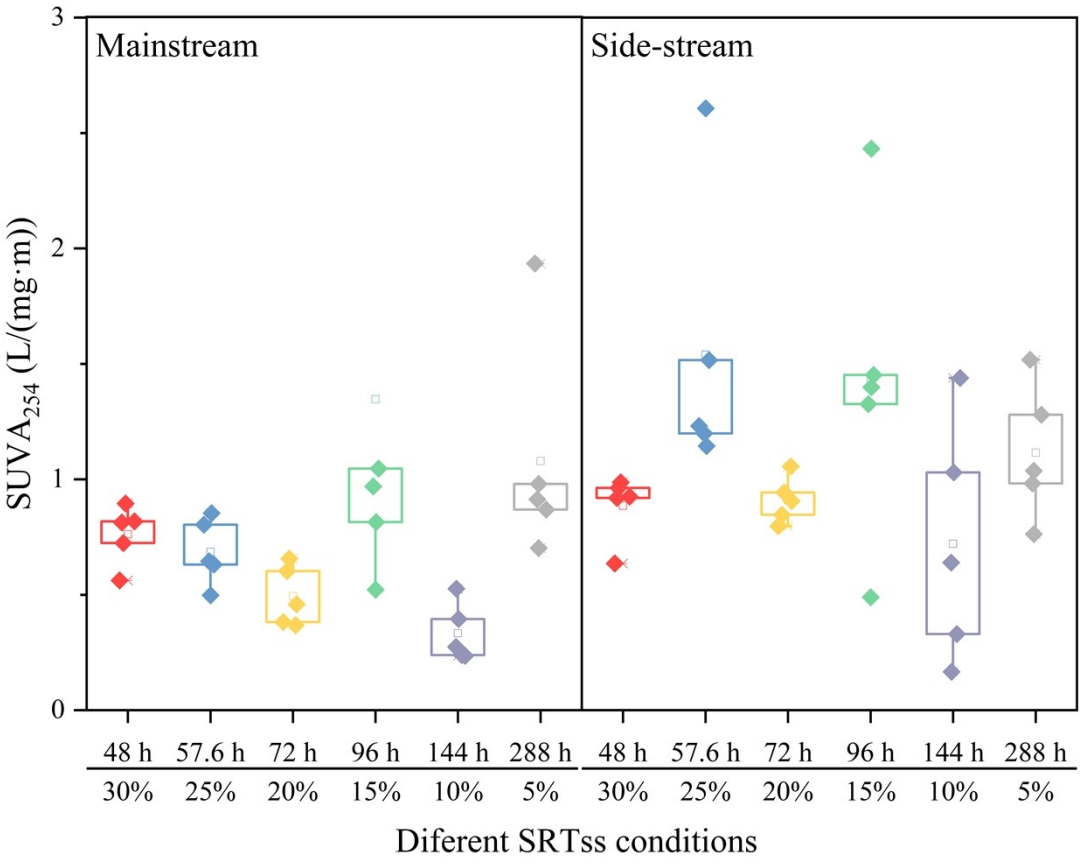

Fig. S2 Changes in the degree of DOM humification.

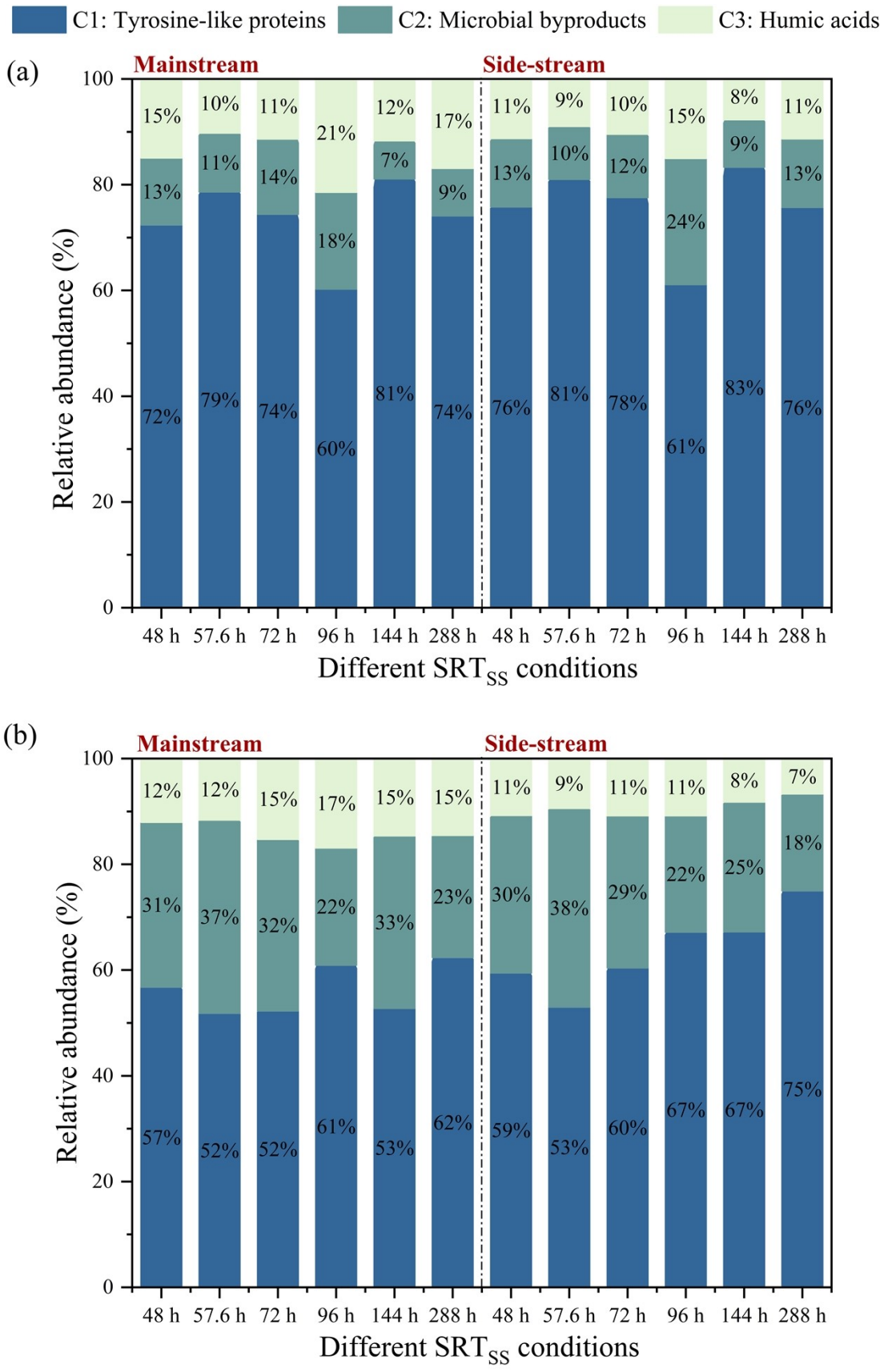

Fig. S3 Relative abundance of fluorescent components in EPS: (a) LB-EPS; (b) TB-EPS.

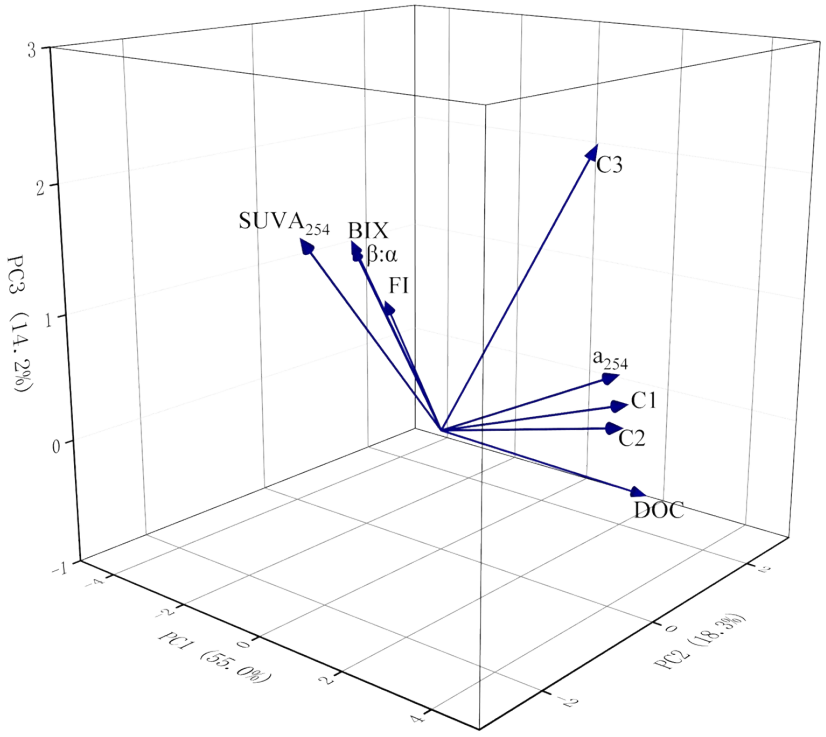

Fig. S4 Principal component analysis of DOM-related spectral parameters.

2.Tables:

Table S1 Corresponding relationship between SRT_{SS} and RAS split ratio.

RAS split ratio (%)	**SRT_{SS} (h)**
30	48
25	57.6
20	72
15	96
10	144
5	288

Table S2 Three-dimensional fluorescence spectral region.

Region	Excitation (Ex) (nm)	Emission (Em) (nm)	Representative Substances	Description & Characteristics
Region I	200 - 250	280 - 330	Tyrosine-like proteins	Aromatic protein-like substance I; typically associated with high biodegradability.
Region II	200 - 250	330 - 380	Tryptophan-like proteins	Aromatic protein-like substance II; reflects impacts from domestic sewage or microbial activity.
Region III	200 - 250	380 - 550	Fulvic acid-like	Highly soluble with relatively low molecular weight; ubiquitous in various natural water bodies.
Region IV	250 - 450	280 - 380	Microbial byproducts	Soluble microbial products (SMPs); closely related to microbial growth and decay processes.
Region V	250 - 450	380 - 550	Humic acid-like	Higher molecular weight and hydrophobicity; represents more mature/stable organic matter.

Table S3 PCA component loading matrix.

	Component		
	C1	C2	C3
DOC	2.735	1.929	-0.660
$SUVA_{254}$	-0.244	-2.133	1.789
FI	-2.588	0.750	0.764
β:α	-3.739	0.917	1.126
BIX	-3.683	0.857	1.192
C1	4.275	0.054	0.588
C2	4.307	-0.059	0.433
C3	2.308	1.047	2.282
a_{254}	4.032	0.084	0.786

3.Methods:

UV absorbance index:

i. a_{254}

$$a_{254} = 2.303 \times \frac{A_{254}}{L}$$

where:

A_{254} is UV absorbance at 254 nm;

L (m) is optical path length;

a_{254} (m^{-1}) is the absorbance coefficient at 254 nm representing the abundance of humus in DOM.

ii. $SUVA_{254}$

$$SUVA_{254} = \frac{UV_{254} \times 100}{DOC}$$

where:

UV_{254} (m^{-1}) is the UV absorbance of the water sample at 254 nm;

DOC (mg/L) is the dissolved organic carbon concentration;

$SUVA_{254}$ (L/(mg·m)) is the specific UV absorbance at 254 nm representing DOM aromaticity.