Calculation of residence times in seawater of some important solutes

Element	A Concentration in rivers ppm (ppm)	B Input to ocean from rivers (grams/yr)	C Concentration in ocean (ppm)	D Amount in ocean (grams)	E Residence time in ocean (years)
Cl	6	2×10^{14}	19,350	261×10^{20}	130×10^{6}
Na	5	2×10^{14}	10,760	145×10^{20}	72×10^{6}
SO_4	8	3×10^{14}	2,712	37×10^{20}	12×10^{6}
Mg	3	1×10^{14}	1,294	17×10^{20}	17×10^{6}
Ca	13	5×10^{14}	412	6×10^{20}	1×10^{6}
K	1	0.3×10^{14}	399	5×10^{20}	16×10^{6}
HCO_3	52	20×10^{14}	145	2×10^{20}	0.1×10^{6}
Si	10	4×10^{14}	0.5-10 (6)	0.08×10^{20}	$.02 \times 10^{6}$ (20k)

B: River Input of element = Concentration (in rivers) x Amount of water flowing from rivers to oceans

$= A \times 0.374 \times 10^{20}$ grams/year

D: Amount of element in oceans = Concentration (in oceans) x Amount of water in oceans

$= C \times 1.35 \times 10^{24}$ grams / 10^{6}

E. Residence Time = Amount of element in ocean ÷ Rate of input from rivers

(i.e., how long it would take rivers to resupply oceans with their present mass of a given element)

$= D \div B$