Supplementary Materials

Table S1. Composition of the precipitates obtained at pH 10.5 from acidic wastewater obtained after sequential acid leaching tests of GRPW at 90 °C for 2 hours using a 3 wt% H_2SO_4 solution and stirring rate of 50 rpm.

	Municipal water	Treated water 1	Treated water 2	Treated water 3	Treated water 4	Treated water 5	Treated water 6
Na_2O	2.7	7.8	8.8	6.7	4.4	10.5	5.8
MgO	20.2	33.5	37.9	34.5	25.7	50.3	32.1
Al_2O_3	0.8	2.1	1.7	1.4	0.6	1.0	1.7
SiO_2	1.8	3.9	3.7	3.3	1.8	1.0	4.1
P_2O_5	2.7	1.3	1.2	1.6	2.3	1.1	1.5
SO_3	42.3	22.7	22.2	26.4	38.1	20.2	24.7
Cl	1.4	1.7	1.5	1.3	1.3	1.4	1.3
K_2O	0.2	0.2	0.2	0.2	0.2	0.3	0.3
CaO	23.0	15.0	12.3	18.0	22.0	12.9	20.6
MnO	0.6	0.8	0.7	0.5	0.5	0.6	0.6
Fe_2O_3	4.3	11.0	9.8	6.0	3.0	0.7	7.2
Ni_2O_3	0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	0.1
SrO	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

Table S2. LCA normalization analysis for the three approaches evaluated in this work.

Impact category	Approach 1	Approach 2	Approach 3
Global warming	0.193868259	0.220244065	0.193106091
Stratospheric ozone depletion	0.009937175	0.011621974	0.00942081
Ionizing radiation	0.824928517	1.132593019	0.853643466
Ozone formation, Human health	0.143977104	0.160847943	0.13550603
Fine particulate matter formation	0.145629073	0.150556772	0.137407625
Ozone formation, Terrestrial ecosystems	0.1700956	0.189846903	0.160084716
Terrestrial acidification	0.291181492	0.300345837	0.287489258
Freshwater eutrophication	1.061056054	1.053439006	0.993245642
Marine eutrophication	0.313924883	0.292823845	0.28919638
Terrestrial ecotoxicity	1.268267671	1.283963716	1.253082362
Freshwater ecotoxicity	7.399062304	7.595000845	7.359375197
Marine ecotoxicity	5.629337486	5.785071772	5.596770488
Human carcinogenic toxicity	9.878508968	9.854297486	9.119677506
Human non-carcinogenic toxicity	0.116851289	0.11882389	0.114770277
Land use	0.013542634	0.01683086	0.013943576
Mineral resource scarcity	-5.05522E-06	-3.88073E-06	-5.18982E-05
Fossil resource scarcity	0.470909642	0.549992577	0.470996776
Water consumption	0.144898742	0.152367648	0.156087088

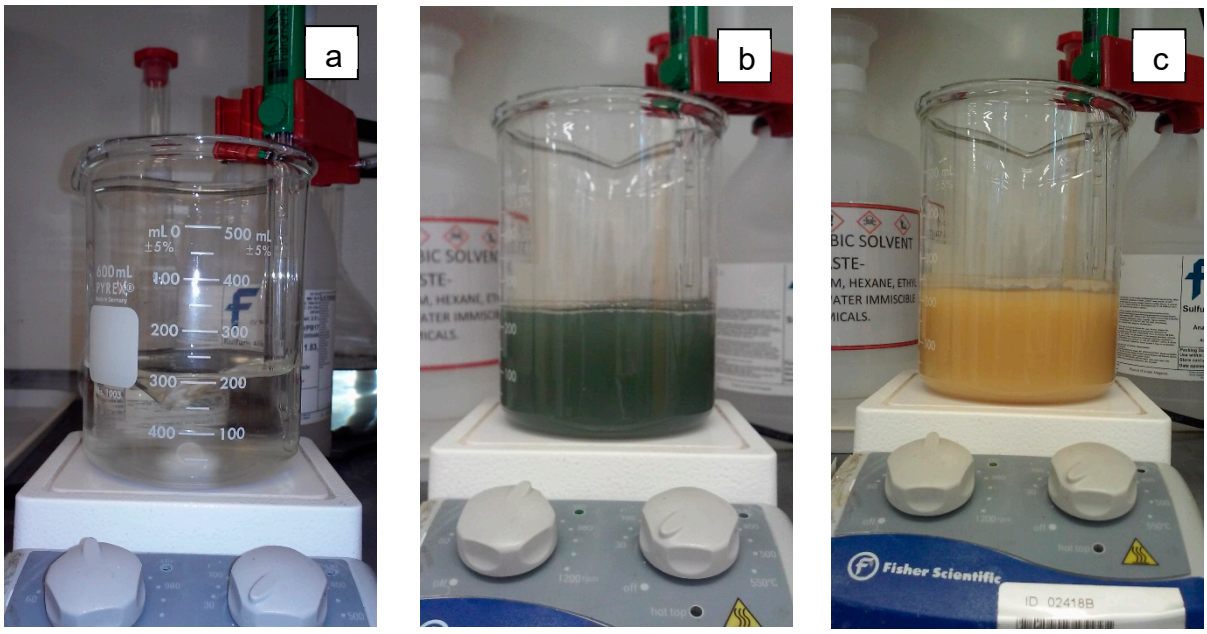

Figure S1. Beaker with wastewater at pH 5.5 (a), pH 8.0 (b) and pH 10.5 (c).

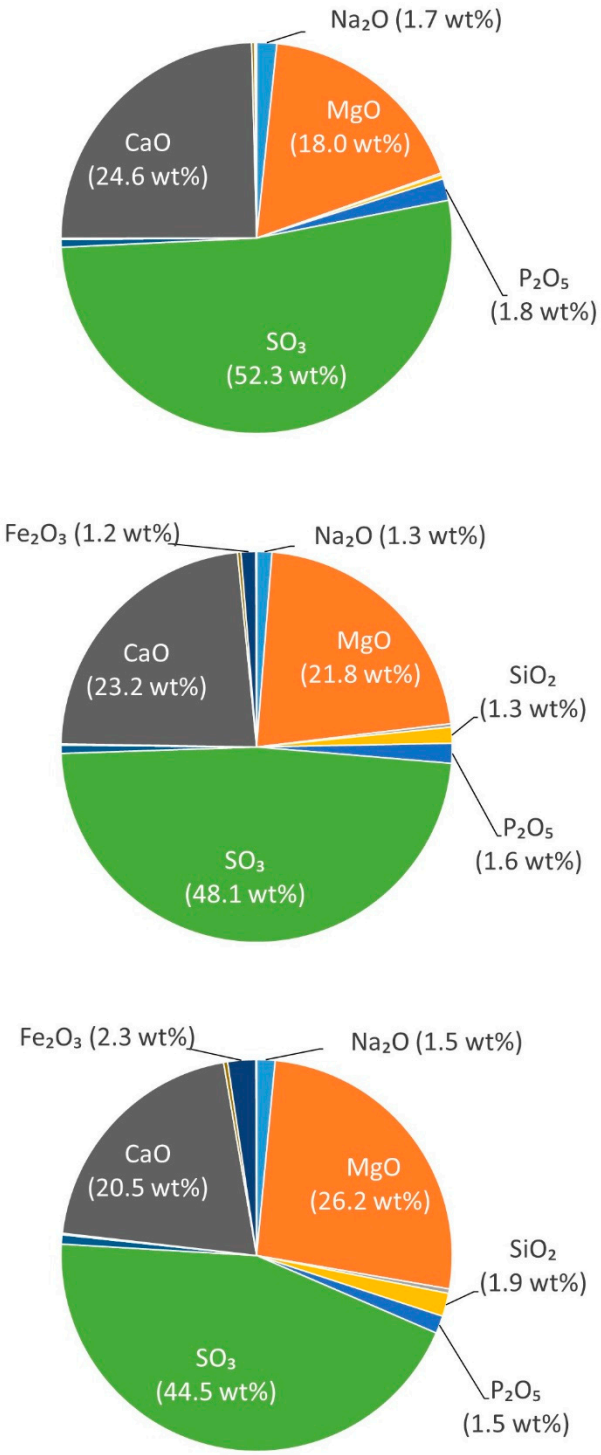

Figure S2. Chemical composition of precipitates produced at pH 10.5 from acidic wastewater obtained after acid leaching of GDPW at 90 °C for 2 hours using 3 wt% H_2SO_4 solutions prepared with purified water (top), treated water 1 (middle) and treated water 2 (bottom) and stirring rate of 50 rpm.