Supplementary Materials

Table S1. Sampling depth of the collected samples.

Zone of the TSF	Station	X (m)	Y (m)	Z (m)	Sampling Depth (cm)
South zone	S-AJ1	689980.272	5484289.84	296.611	8
	S-AJ2	690007.933	5484385.67	296.484	6
	S-AJ3	690161.238	5484327.4	297.06	7
	S-AJ4	690146.129	5484459.5	296.536	14
	S-AJ5	690245.324	5484438.8	297.136	8
	S-AJ6	690229.444	5484552.71	296.71	21
	S-AJ7	690304.69	5484520.36	296.917	6
	S-H02	689481.162	5485506.02	297.945	24
	S-H04	689482.477	5485414.61	296.724	4.5
	S-J02	689578.521	5485508.7	297.566	20
	S-J04	689579.696	5485410.89	296.816	14
	S-J06	689594.349	5485317.99	296.642	24
	S-L04	689680.179	5485407.98	297.347	7
	S-L06	689682.409	5485310.34	297.101	19
	S-L08	689702.614	5485223.91	296.751	7
	S-N04	689775.191	5485369.46	297.99	8
	S-N06	689780.342	5485309.62	297.947	14
	S-N08	689779.863	5485208.86	297.067	13
	S-N10	689776.04	5485112.32	296.811	17
	S-N12	689777.207	5485009.17	296.8	13
	S-N14	689804.204	5484909.26	296.437	8
	S-P04	689879.61	5485366.7	298.758	16
	S-P06	689879.679	5485311.27	298.386	14
	S-P08	689879.092	5485209.71	297.67	14
	S-P10	689881.616	5485108.79	297.084	19
	S-P12	689878.473	5485008.71	297.134	6.5
	S-P14	689879.567	5484909.27	296.709	9
	S-R04	689977.005	5485375.69	298.663	10
	S-R06	689998.379	5485310.32	298.489	15
	S-R08	689980.923	5485207.71	298.124	9
	S-R10	689978.831	5485109.55	297.623	2
	S-R12	689978.287	5485009.43	296.703	5
	S-R14	689979.835	5484910.56	296.823	12
	S-R16	689983.97	5484830.08	296.54	21
	S-T04	690079.21	5485386.76	299.078	28.5
	S-T06	690079.212	5485310.65	298.921	6
	S-T08	690073.546	5485206.29	298.419	19
	S-T10	690078.511	5485110.03	297.595	17
	S-T12	690075.994	5485008.81	296.918	12
	S-T14	690082.708	5484911.09	296.46	17
	S-T16	690083.424	5484828.07	296.449	12
	S-V04	690185.246	5485406.2	299.613	19
	S-V06	690208.114	5485318.02	300.463	12
	S-V08	690190.115	5485206.1	298.587	14
	S-V10	690178.958	5485109.49	297.768	20

	S-V12	690178.122	5485008.72	297.369	13
	S-V14	690179.227	5484918.1	296.366	20
	S-X02	690288.11	5485494.94	300.751	10.5
	S-X04	690278.622	5485409.23	300.98	32
	S-X06	690284.657	5485304.85	299.527	30
	S-X08	690282.794	5485206.72	298.698	14
	S-X10	690278.454	5485109.19	298.216	10
	S-X12	690276.664	5485010.89	297.651	22
	S-X14	690276.509	5484911.86	296.625	25
	S-Z02	690380.55	5485505.85	300.464	21
	S-Z04	690379.917	5485412.72	300.372	11
	S-Z06	690358.39	5485307.01	299.573	8
	S-Z08	690360.972	5485211.55	298.677	13
	S-Z14	690379.314	5484908.8	297.177	17
	S-Z17	690372.672	5484851.96	297.065	12
	S-Z21	690420.569	5484781.99	297.044	10
	Z19	690470.616	5484696.24	296.86	7
	ZA-18	690434.899	5484803.27	297.1	12
	ZA-20	690460.754	5484752.3	297.346	4.5
	ZY-18	690387.929	5484793.86	296.908	11
	ZY-20	690429.222	5484718.13	296.514	14
North zone	N-A04	689302.042	5485882.76	298.83	14
	N-A06	689301.15	5485784.39	299.852	14
	N-B02	689349.348	5485972.35	298.777	78
	N-B04	689349.957	5485885.89	299.002	21
	N-B06	689348.749	5485783.79	300.035	14
	N-B08	689349.112	5485684.8	300.523	21
	N-D01	689451.829	5486029.53	299.942	26
	N-D02	689447.614	5485981.72	299.659	14
	N-D04	689451.238	5485884.23	300.202	23
	N-D06	689448.679	5485782.56	299.853	15
	N-D08	689449.851	5485683.42	300.947	17
	N-D09	689449.2	5485633.88	301	17
	N-F10	689549.261	5485583.97	301.359	10
	N-F02	689549.705	5485984.09	300.617	5
	N-F04	689546.548	5485882.25	300.732	3
	N-F06	689549.656	5485783.2	300.952	8
	N-F08	689549.658	5485682.51	301.112	20
	N-H10	689649.165	5485582.44	301.837	5
	N-H04	689649.509	5485883.41	300.917	20
	N-H06	689649.611	5485784.1	301.4	7
	N-H08	689649.139	5485684.47	301.627	17
	N-J10	689749.355	5485584.21	302.252	12
	N-J12	689749.715	5485484.29	302.454	18
	N-J05	689749.154	5485832.73	301.549	11
	N-J06	689749.673	5485782.96	301.757	30
	N-J08	689748.958	5485683.96	302.044	8
	N-L10	689849.985	5485584.04	302.722	7
	N-L12	689849.935	5485484.74	302.905	10
	N-L13	689849.684	5485433.65	302.976	16
	N-L04	689849.247	5485879.19	301.933	7

N-L06	689849.486	5485784.11	302.174	17
N-L08	689850.086	5485684.24	302.372	12
N-N10	689949.883	5485583.8	302.997	10
N-N12	689948.366	5485483.4	303.335	23
N-N13	689950.379	5485433.07	303.365	10
N-N04	689949.348	5485876.46	302.335	14
N-N06	689949.387	5485781.8	302.251	32
N-N08	689949.218	5485685.02	302.402	24
N-P10	690049.938	5485585.68	303.654	16
N-P12	690050.175	5485484.73	303.388	8
N-P13	690051.541	5485434.51	303.467	12
N-P04	690049.682	5485855.49	302.371	13
N-P06	690050.267	5485784	302.761	11
N-P08	690049.835	5485685.22	303.307	23
N-R10	690149.238	5485584.49	303.232	13
N-R12	690150.23	5485484.15	302.984	19
N-R13	690149.838	5485444.77	303.255	16
N-R05	690149.174	5485833.54	302.336	16
N-R06	690148.69	5485786.62	302.578	22
N-R08	690150.453	5485683.24	302.815	9
N-T10	690249.849	5485583.76	302.75	15
N-T06	690248.981	5485764.47	302.335	19
N-T08	690249.496	5485685.07	302.703	22
N-V11	690349.409	5485556.43	302.477	26
N-V09	690349.317	5485619.04	302.296	23
N-W10	690371.105	5485586.26	302.376	17

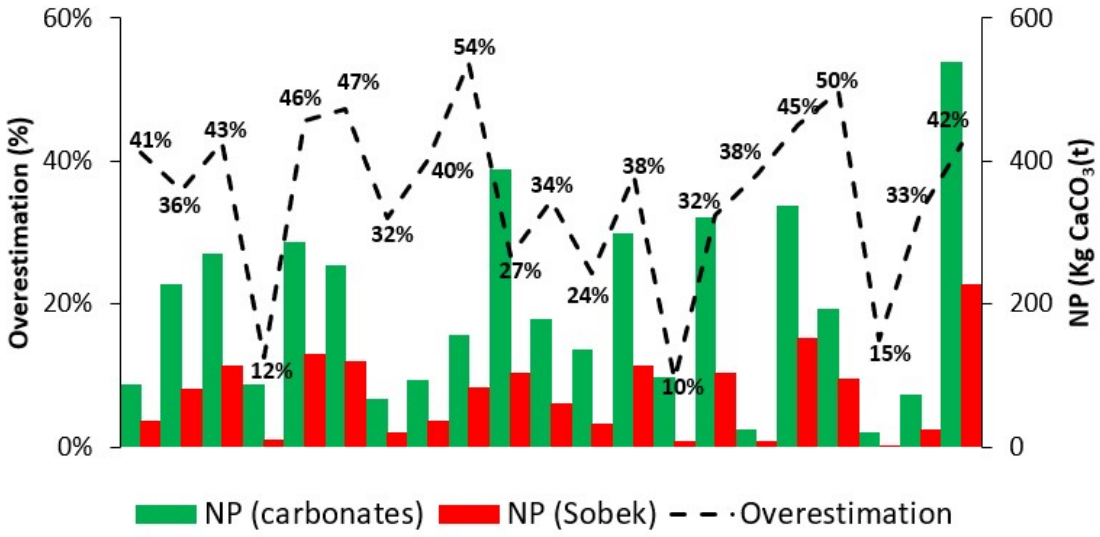

Figure S1. Graph comparing the NP calculated based on carbonate contents and NP analyzed using the Sobek method (1978) [36] as modified by Lawrence et Wang (1996) [67].

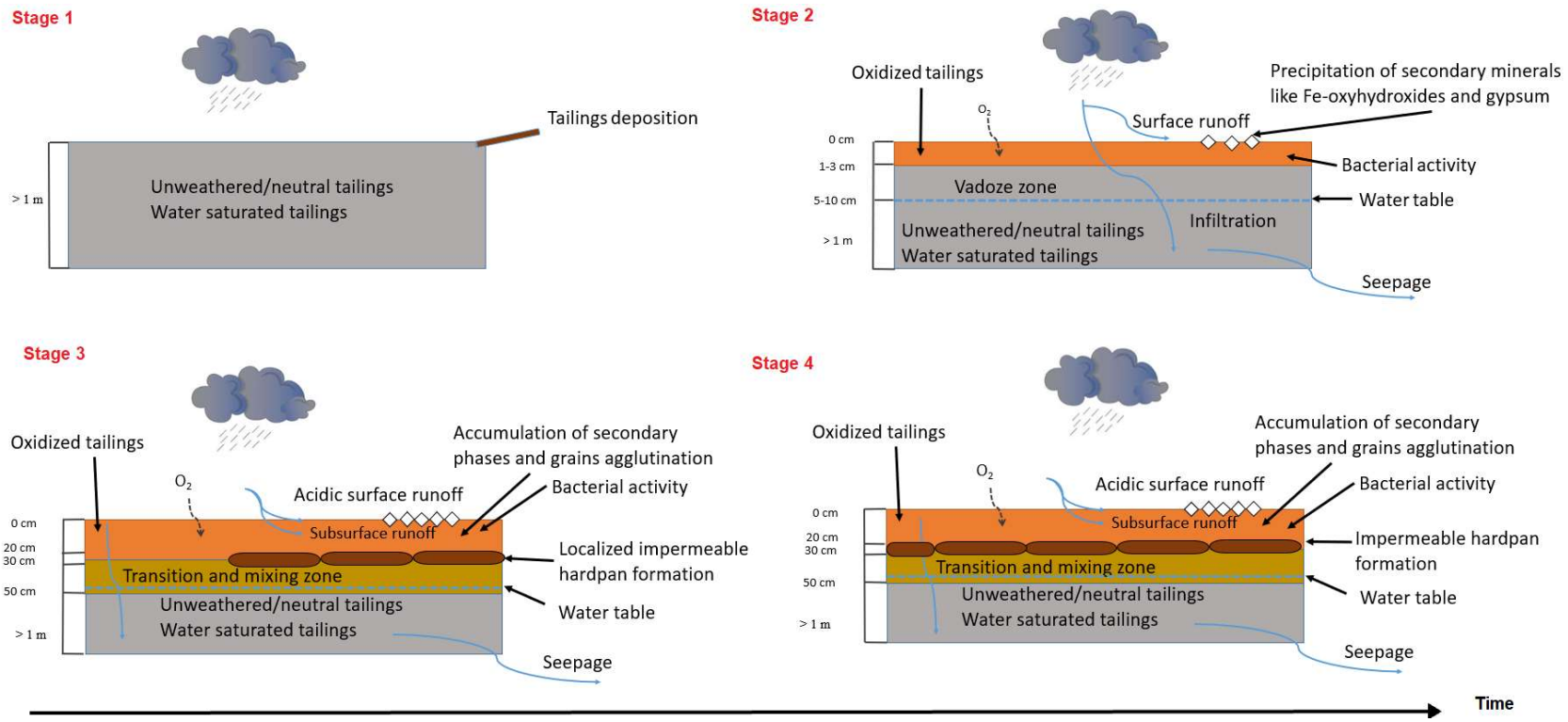

Figure S2. Conceptual model illustrating the geochemical evolution of the Joutel tailings (Reproduced with permission from Elghali et al (2019) [19]).