

**Supplementary material 1. Summary of the grain size and geochemical results**

Station	Sand	Silt	Clay	Al	Ba	Ca	Cr	Cu	Fe	K	Mg	Mn	Ni	Sc	Sr	Ti	Zn
421	4.52	88.07	7.41	28676.2	107.85	80809.8	19.58	13.43	16266.3	6966.4	9145.4	429.35	11.56	4.08	278.35	1428.86	40.69
422	7.71	84.57	7.73	29554.1	98.31	111641.0	22.30	10.55	21983.6	6699.1	10101.3	549.88	15.83	4.40	384.42	1400.99	46.13
423	27.47	66.80	5.74	18960.6	61.26	134474.0	21.76	5.30	20836.6	6055.1	8416.1	440.68	10.59	2.98	585.01	1023.66	37.30
426	5.37	87.85	6.78	4827.2	79.61	60373.3	31.40	15.42	22218.9	5928.3	4811.1	323.09	12.83	0.53	276.91	1684.87	43.95
427	40.21	56.55	3.24	9714.3	63.37	78612.7	184.55	11.36	53268.1	8733.8	9448.2	490.10	23.58	1.53	353.34	1822.08	54.42
428	9.36	85.95	4.68	13102.0	107.79	40885.1	75.67	15.52	30515.8	8965.5	6308.7	534.39	19.27	0.54	264.24	2341.75	49.26
429	75.32	22.54	2.14	20496.3	38.63	73668.7	351.36	5.95	98693.1	11988.3	8947.6	443.39	38.19	5.56	288.75	2956.02	85.43
430	63.03	32.48	4.49	21583.3	46.64	102405.0	154.25	7.38	81031.7	11153.4	7632.8	408.98	36.12	5.52	347.16	2117.33	67.01
431	7.47	86.19	6.34	11065.6	108.10	96310.9	27.74	16.60	23084.4	6871.6	7925.8	435.54	12.84	1.06	370.93	1565.11	45.57
432	26.64	68.73	4.63	20347.5	73.55	56893.6	36.47	8.00	23004.3	7289.8	8807.6	345.83	9.81	2.67	218.14	1268.48	34.50
433	48.93	47.23	3.85	8307.2	55.91	52849.0	137.08	12.80	63425.6	14588.7	8135.3	396.90	19.17	0.63	219.51	1777.92	49.96
434	5.59	85.73	8.68	9217.5	67.27	123538.0	13.89	8.14	12769.9	4629.3	6031.1	330.50	9.64	1.32	831.84	934.19	29.37
435	3.63	88.15	8.22	10338.3	40.68	146166.0	10.44	8.62	11713.8	2477.7	5532.8	268.52	7.01	1.73	1254.25	505.74	23.82
6811	34.58	62.92	2.50	22827.9	93.02	74534.9	36.33	7.98	14738.4	5663.7	6188.6	434.56	12.68	3.58	306.35	1354.41	34.69
6813	45.39	52.88	1.73	27092.1	117.19	27702.0	19.49	7.43	13355.0	7129.6	7113.1	129.20	7.83	4.30	173.48	1435.71	35.02
6814	22.69	75.06	2.25	13172.6	76.19	5551.8	24.01	10.45	15782.5	5637.7	4425.7	170.69	11.48	1.54	51.27	1367.11	46.56
6821	31.59	66.83	1.58														
6855	72.83	26.36	0.81	12586.3	47.06	37833.6	88.53	5.84	30073.4	8902.7	7311.2	228.50	14.94	3.36	193.42	953.85	36.75
6857	49.47	48.77	1.76	17700.0	86.97	61617.8	16.91	6.42	9714.5	5081.4	6455.7	135.37	7.14	3.15	370.30	819.81	36.14
6858	31.13	64.28	4.60	14704.3	81.36	6508.1	26.33	12.99	16792.3	5806.7	4379.4	165.72	13.07	1.38	54.78	1387.14	65.43

**Supplementary material 2. Stereomicroscopic images of the distinct sand fraction composition. 1) Siliciclastic with less than 20% of phosphorite, 2) Siliciclastic with 20% to 50% of oxidized phosphorite, 3) 50% - 80% of oxidized phosphorite and, 4) Oxidized phosphoritic sand.**

