

Table 1: Sample list and location key

Sample Name	Tectonostratigraphic Unit
msp-i_1.0	lower
msp-i_10.1	lower
msp-ii_21.8	lower
msp-ii_39.8	lower
msp-ii_52	middle
msp-iii_53	middle
msp-iii_99.8	middle
msp-iv_49.1	middle
msp-v_16.7	middle
msp-v_37.8	middle
msp-vi_12.4	middle
msp-vi_32.8	middle
RRVW-Z	upper
RRVW-D	upper
msp-ix_230.4	upper

	<i>fracture faces</i>	<i>subparallel linear fractures</i>	<i>conchoidal fractures</i>	<i>curved grooves</i>	<i>straight grooves</i>	<i>sharp angular features</i>	<i>low relief</i>	<i>medium relief</i>	<i>high relief</i>	<i>crescentic gouges</i>	<i>arc shaped steps</i>	<i>linear steps</i>	<i>deep troughs</i>	<i>mechanically-upturned pla</i>	<i>lattice shattering</i>	<i>abrasion features</i>	<i>dissolution etching</i>	<i>preweathered surfaces</i>	<i>weathered surfaces</i>	<i>precipitation features</i>	<i>adhering particles</i>	<i>v-shaped percussion sca</i>	<i>edge rounding</i>	<i>breakage blocks</i>
Marine facies																								
msp-i_1.0 consisting of 39 quartz grains	1	7	15	1	1	10	20	17	1	5	5	4	2	0	0	1	6	0	1	37	0	10	26	16
msp-ii_39.8 consisting of 32 quartz grains	0	6	2	0	1	1	15	6	0	2	6	3	0	0	0	2	1	0	1	21	0	3	14	3
msp-iii_99.8 consisting of 21 quartz grains	2	3	6	1	0	1	10	13	1	5	6	4	0	0	0	3	3	0	0	24	0	5	7	5
Total # of grains with microtexture in sample	3	16	23	2	2	12	45	36	2	12	17	11	2	0	0	6	10	0	2	82	0	18	47	24
Percentage	3.66%	19.51%	28.05%	2.44%	2.44%	14.63%	54.88%	43.90%	2.44%	14.63%	20.73%	13.41%	2.44%	0.00%	0.00%	7.32%	12.20%	0.00%	2.44%	100.00%	0.00%	21.95%	57.32%	29.27%
Debris Flow																								
msp-v_16.7 consisting of 14 quartz grains	0	4	6	0	1	4	1	11	1	2	3	3	2	0	0	3	4	0	1	14	0	1	5	7
Percentage	0.00%	28.57%	42.86%	0.00%	7.14%	28.57%	7.14%	78.57%	7.14%	14.29%	21.43%	21.43%	14.29%	0.00%	0.00%	21.43%	28.57%	0.00%	7.14%	100.00%	0.00%	7.14%	35.71%	50.00%
Fluvial facies																								
msp-i_10.1 consisting of 32 quartz grains	6	7	11	2	5	12	14	16	2	4	7	7	0	1	0	13	0	0	0	29	0	10	20	10
msp-ii_21.8 consisting of 24 quartz grains	2	6	8	1	3	6	11	12	1	2	5	1	2	1	0	3	7	0	1	23	0	8	17	5
msp-ii_52 consisting of 27 quartz grains	3	10	6	1	7	4	12	15	0	6	6	4	0	0	0	10	0	0	0	22	0	7	22	10
msp-iii_53 consisting of 11 quartz grains	2	6	5	0	0	1	3	8	0	0	2	1	1	0	0	1	3	0	1	11	0	1	4	1
msp-iv_49.1 consisting of 10 quartz grains	0	0	5	1	2	2	3	7	0	2	0	2	0	0	0	0	1	0	1	10	0	1	4	1
msp-v_37.8 consisting of 28 quartz grains	3	14	15	3	6	13	6	18	2	10	8	9	3	1	0	4	12	0	11	27	0	9	16	14
msp-vi_12.4 consisting of 18 quartz grains	1	6	9	0	1	3	3	12	4	3	7	4	1	2	0	5	6	0	3	19	0	4	4	5
msp-vi_32.8 consisting of 18 quartz grains	0	2	3	0	0	5	3	4	2	2	1	1	0	1	0	0	2	0	1	9	0	1	2	5
RRVW-Z consisting of 23 quartz grains	4	8	11	1	1	2	5	15	3	4	2	4	1	0	0	7	1	0	0	22	0	5	17	4
RRVW-D consisting of 17 quartz grains	1	5	8	0	0	2	7	8	2	0	5	6	0	0	0	3	1	0	3	17	0	7	10	3
msp-ix_230.4 consisting of 29 quartz grains	1	8	8	1	6	3	6	22	1	8	8	8	0	0	0	9	2	0	4	28	0	5	23	8
Total # of grains with microtexture in sample	23	72	89	10	31	53	73	137	17	41	51	47	8	6	0	55	35	0	25	217	0	58	139	66
Percentage	9.83%	30.77%	38.03%	4.27%	13.25%	22.65%	31.20%	58.55%	7.26%	17.52%	21.79%	20.09%	3.42%	2.56%	0.00%	23.50%	14.96%	0.00%	10.68%	92.74%	0.00%	24.79%	59.40%	28.21%
Comprehensive Summary of all Samples																								
Total # of grains with microtexture in study	26	92	118	12	34	69	119	184	20	55	71	61	12	6	0	64	49	0	28	313	0	77	191	97
Percentage	7.88%	27.88%	35.76%	3.64%	10.30%	20.91%	36.06%	55.76%	6.06%	16.67%	21.52%	18.48%	3.64%	1.82%	0.00%	19.39%	14.85%	0.00%	8.48%	94.85%	0.00%	23.33%	57.88%	29.39%
Lower Fountain Tectonostratigraphic Unit																								
Total # of grains with microtextures	8	13	19	3	8	18	25	28	3	6	12	8	2	2	0	16	7	0	1	52	0	18	37	15
Percentage	14%	23%	34%	5%	14%	32%	45%	50%	5%	11%	21%	14%	4%	4%	0%	29%	13%	0%	2%	93%	0%	32%	66%	27%
Middle Fountain Tectonostratigraphic Unit																								
Total # of grains with microtextures	9	38	43	5	16	28	30	64	8	23	24	21	5	4	0	20	24	0	17	98	0	23	52	36
Percentage	8%	35%	39%	5%	15%	26%	28%	59%	7%	21%	22%	19%	5%	4%	0%	18%	22%	0%	16%	90%	0%	21%	48%	33%
Upper Fountain Tectonostratigraphic Unit																								
Total # of grains with microtextures	6	21	27	2	7	7	18	45	6	12	15	18	1	0	0	19	4	0	7	67	0	17	50	15
Percentage	9%	30%	39%	3%	10%	10%	26%	65%	9%	17%	22%	26%	1%	0%	0%	28%	6%	0%	10%	97%	0%	25%	72%	22%