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Appendix C

Climate Change Assessment

Flood Modelling Catchment Overview

IFD Parameters for 20% Rainfall Intensity Increase Scenario

RAFTS Climate Change Flow Result Summary

MIKE11 Climate Change Flood Level Result Summary

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Table C2 - RAFTS Climate Change Flooding Summary

Eastern Creek - Flooding Catchments RAFTS Model
100-year ARI, 2hour Duration

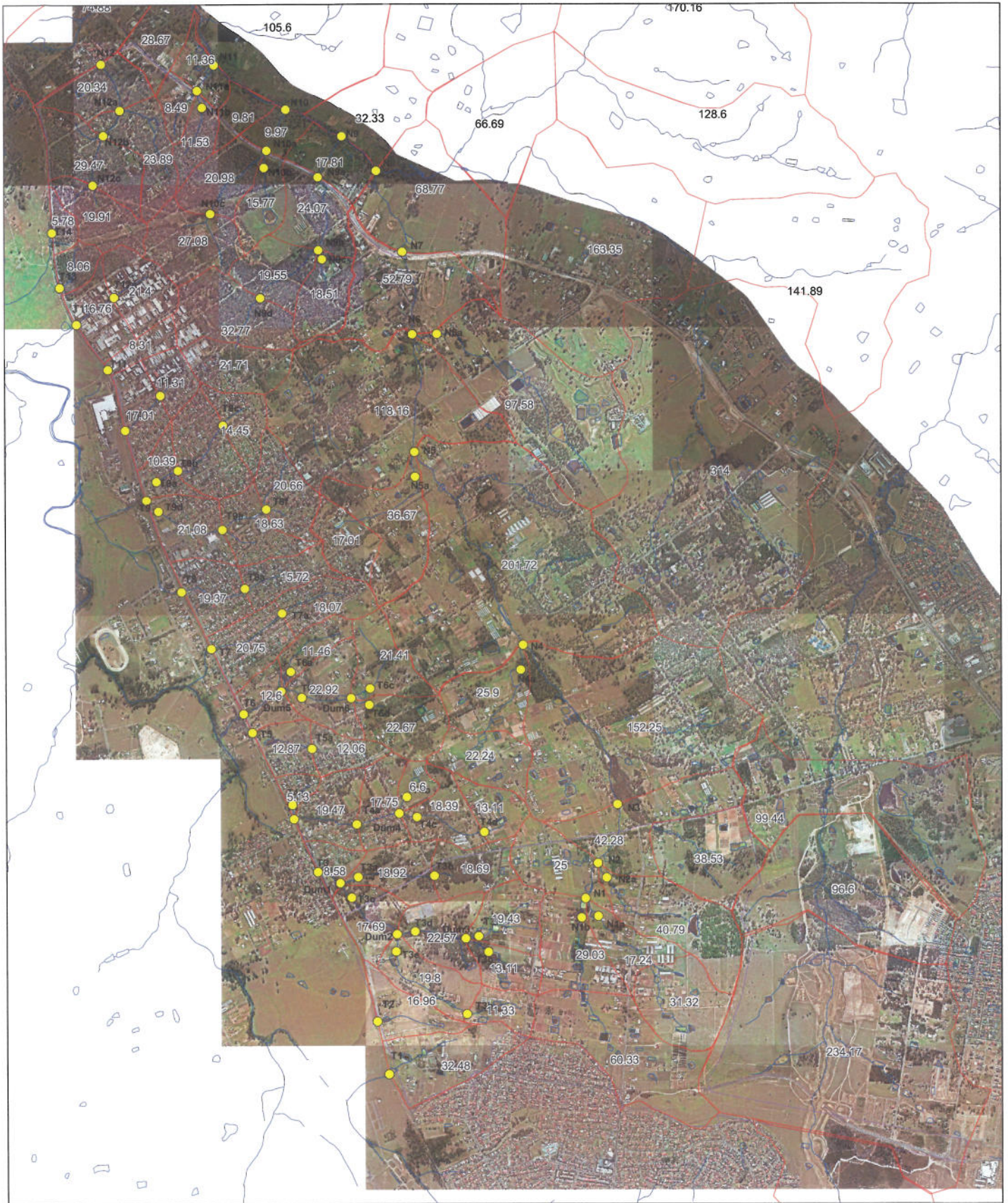
Subcatchment	Peak Outflow (m3/s)		Change
	Current Climate	20% Rainfall Increase	
T1	13.843	16.898	22%
T2	7.321	8.941	22%
T3	45.072	55.03	22%
T3a	13.711	16.754	22%
T3c	32.963	39.935	21%
T3b	8.233	9.977	21%
T3d	21.557	26.194	22%
T3e	10.704	13.101	22%
T3f	8.567	10.368	21%
T3g	5.705	6.939	22%
T3h	4.943	6.025	22%
T4	25.207	30.935	23%
T4a	18.471	22.751	23%
T4b	2.774	3.424	23%
T4c	11.032	13.599	23%
T4d	5.387	6.618	23%
T5	9.035	11.121	23%
T5a	4.914	6.053	23%
T6	36.331	44.543	23%
T6a	4.667	5.72	23%
T6b	24.1	29.507	22%
T6c	8.504	10.406	22%
T6d	9.124	11.136	22%
T7	13.222	16.248	23%
T7a	7.161	8.772	22%
T8	12.127	14.854	22%
T8a	6.328	7.751	22%
T9	33.043	40.525	23%
T9a	16.05	19.699	23%
T9d	17.55	21.57	23%
T9b	13.759	16.816	22%
T9c	5.882	7.24	23%
T9e	13.985	17.073	22%
T9f	8.247	10.12	23%
T10	10.33	12.76	24%
T10a	4.705	5.745	22%
T12	14.79	18.195	23%
T12a	8.827	10.774	22%
T4e	2.146	2.623	22%

**First Ponds Creek - Flooding Catchments RAFTS Model
 100-year ARI, 1.5hour Duration**

Subcatchment	Peak Outflow (m3/s)		Change
	Current Climate	20% Rainfall Increase	
N1a	14.484	17.74	22%
N1b	21.94	26.741	22%
N1	36.424	44.481	22%
N2a	15.46	18.955	23%
N2	54.05	65.855	22%
N3	74.196	90.698	22%
N4	97.524	118.64	22%
N4a	12.575	15.353	22%
N5	120.83	148.27	23%
N5a	16.017	19.61	22%
N6	143.73	176.34	23%
N6a	42.189	51.444	22%
N7	150.01	183.99	23%
N8	401.18	490.47	22%
N9	429.27	524.71	22%
N9a	28.768	34.695	21%
N9c	7.389	9.023	22%
N9d	16.696	20.389	22%
N9b	24.799	30.075	21%
N10	438.04	535.5	22%
N10a	19.914	24.378	22%
N10b	6.388	7.807	22%
N10c	11.208	13.702	22%
N11	441.77	540.08	22%
N11a	8.374	10.288	23%
N11b	4.777	5.867	23%
Outlet	468.31	573.07	22%
N12	28.29	34.591	22%
N12a	24.851	30.432	22%
N12b	11.581	14.182	22%
N12c	8.174	9.974	22%
2P1	44.233	53.948	22%
2P2	85.347	103.37	21%
2P3	97.112	119.21	23%
2P4	109.56	134.58	23%
N10.5	439.01	536.68	22%
N8a	270.9	332.77	23%
N8f	148.83	181.66	22%
N8b	41.252	50.238	22%
N8c	113.75	139.03	22%
N8d	76.563	93.762	22%
N8e	31.977	39.328	23%
N8g	132.12	161.65	22%
N8h	96.747	118.39	22%
N9e	13.576	16.54	22%
N15	468.31	573.07	22%
N14	450.4	550.95	22%
N13	452.58	553.55	22%
N1d	12.086	14.766	22%
N1c	17.816	21.88	23%
N3a	11.384	13.978	23%
N4b	8.55	10.448	22%
N5b	6.369	7.815	23%
N9f	7.823	9.56	22%

Table C1 - Climate Change IFD Parameters

Parameter	Existing Climate	20% Increased Rainfall
50-I-1	59	70.8
50-I-12	12.9	15.48
50-I-72	4.34	5.208
2-I-1	30.6	36.72
2-I-12	6.58	7.896
2-I-72	1.97	2.364
G (Skew)	0.011	0.011
F2	4.298	4.298
F50	15.83	15.83



LEGEND

- RAFTS catchment
- Site boundary
- RAFTS node
- River system

Growth Centres Commission
Riverstone and Alex Avenue

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**RAFTS Flooding Catchments Model Layout
Figure C1**

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 56

Table C3 - Climate Change Hydraulic Modelling Results

Flood modelling results are shown for selected MIKE11 cross-sections.
The developed case, 100-year ARI flood model was used for this assessment.
Design storms of 90-minute and 120-minute duration were adopted for Eastern and First Ponds Creeks respectively, which give the highest peak response.

Location	100-year ARI Flood Level (mAHD)		Increase (m)
	Current Climate	20% Rainfall Increase	
Eastern Creek Reach A			
TRIBUTARY1 100.00	33.32	33.402	0.082
TRIBUTARY1 200.00	31.21	31.314	0.104
TRIBUTARY1 300.00	29.041	29.122	0.081
TRIBUTARY1 408.69	28.295	28.353	0.058
TRIBUTARY1 490.41	26.339	26.374	0.035
TRIBUTARY1 600.84	24.626	24.67	0.044
TRIBUTARY1 704.34	23.328	23.354	0.026
Eastern Creek Reach B			
TRIBUTARY3 100.00	36.913	36.952	0.039
TRIBUTARY3 200.00	31.724	31.789	0.065
TRIBUTARY7 100.00	41.706	41.75	0.044
TRIBUTARY7 200.00	39.563	39.613	0.05
TRIBUTARY8 100.00	33.248	33.282	0.034
TRIBUTARY8 200.04	31.675	31.711	0.036
TRIBUTARY8 300.40	29.056	29.148	0.092
TRIBUTARY8 400.46	26.45	26.525	0.075
TRIBUTARY8 499.84	24.809	25.016	0.207
TRIBUTARY8 600.13	23.473	23.561	0.088
TRIBUTARY8 699.51	22.44	22.667	0.227
TRIBUTARY2 100.16	46.464	46.49	0.026
TRIBUTARY2 199.60	44.921	44.948	0.027
TRIBUTARY2 300.12	42.081	42.11	0.029
TRIBUTARY2 400.08	39.896	39.945	0.049
TRIBUTARY2 500.07	38.031	38.075	0.044
TRIBUTARY2 599.90	36.231	36.273	0.042
TRIBUTARY2 700.21	34.429	34.474	0.045
TRIBUTARY2 819.88	33.345	33.416	0.071
TRIBUTARY2 899.75	31.682	31.775	0.093
TRIBUTARY2 999.88	30.347	30.427	0.08
TRIBUTARY2 1099.95	28.392	28.44	0.048
TRIBUTARY2 1200.23	26.938	26.982	0.044
TRIBUTARY6 99.83	45.204	45.226	0.022
TRIBUTARY6 200.03	41.828	41.889	0.061
TRIBUTARY6 319.98	39.563	39.613	0.05
TRIBUTARY6 459.94	34.019	34.062	0.043
TRIBUTARY6 599.61	31.489	31.544	0.055
TRIBUTARY6 699.74	30.213	30.291	0.078
TRIBUTARY6 800.36	28.682	28.765	0.083
TRIBUTARY6 900.17	27.467	27.548	0.081
TRIBUTARY6 997.72	26.422	26.52	0.098
TRIBUTARY6 1100.31	25.555	25.625	0.07
TRIBUTARY6 1199.58	24.084	24.223	0.139
TRIBUTARY6 1300.08	23.842	23.948	0.106
TRIBUTARY6 1399.77	22.442	22.669	0.227
TRIBUTARY6 1507.07	22.438	22.667	0.229
TRIBUTARY6 1600.11	22.438	22.666	0.228
TRIBUTARY5 100.00	40.998	41.047	0.049
TRIBUTARY5 200.11	39.781	39.823	0.042
TRIBUTARY5 299.42	36.654	36.694	0.04
TRIBUTARY5 400.00	33.526	33.583	0.057
TRIBUTARY4 100.04	41.71	41.74	0.03

Eastern Creek Reach C			
TRIBUTARY9 100.00	36.244	36.285	0.041
TRIBUTARY9 200.00	33.134	33.165	0.031
TRIBUTARY9 300.00	31.082	31.131	0.049
TRIBUTARY9 400.00	29.018	29.082	0.064
TRIBUTARY9 500.00	27.692	27.755	0.063
TRIBUTARY9 600.00	26.363	26.409	0.046
TRIBUTARY9 700.00	23.975	24.027	0.052
TRIBUTARY9 800.00	22.713	22.793	0.08
TRIBUTARY9 900.00	21.604	21.701	0.097
TRIBUTARY9 1000.00	20.393	20.465	0.072
TRIBUTARY9 1100.00	20.343	20.391	0.048
TRIBUTARY9 1196.86	19.825	19.884	0.059
TRIBUTARY11 100.00	37.645	37.678	0.033
TRIBUTARY11 200.00	33.32	33.352	0.032
TRIBUTARY11 300.00	29.515	29.54	0.025
TRIBUTARY10 100.00	37.714	37.746	0.032
TRIBUTARY10 200.00	34.752	34.788	0.036
Eastern Creek Reach D			
TRIBUTARY12 100.00	23.403	23.441	0.038
TRIBUTARY12 200.00	20.222	20.306	0.084
TRIBUTARY12 300.00	20.043	20.102	0.059
TRIBUTARY12 320.00	19.991	20.044	0.053
TRIBUTARY12 340.00	19.947	19.992	0.045
TRIBUTARY12 360.00	19.871	19.904	0.033
TRIBUTARY12 380.00	19.25	19.25	0
Eastern Creek Reach E			
TRIBUTARY13 100.00	28.948	28.989	0.041
TRIBUTARY13 200.00	27.622	27.683	0.061
TRIBUTARY15 100.00	19.659	19.694	0.035
TRIBUTARY15 200.00	18.143	18.235	0.092
TRIBUTARY14 100.00	30.387	30.423	0.036
TRIBUTARY14 200.00	29.057	29.097	0.04
TRIBUTARY14 300.00	26.414	26.502	0.088
TRIBUTARY14 400.00	24.554	24.626	0.072
TRIBUTARY14 500.00	23.356	23.434	0.078
TRIBUTARY14 600.00	22.201	22.275	0.074
TRIBUTARY14 700.00	20.66	20.734	0.074
TRIBUTARY14 800.00	19.567	19.651	0.084
TRIBUTARY14 900.00	18.143	18.235	0.092
TRIBUTARY14 1000.00	18.141	18.233	0.092
TRIBUTARY14 1100.00	18.141	18.233	0.092

First Ponds Creek			
TRIB2RIVERSTONE 218.37	39.758	39.785	0.027
TRIB2RIVERSTONE 406.17	37.458	37.514	0.056
TRIB2RIVERSTONE 590.22	36.248	36.316	0.068
TRIB2RIVERSTONE 803.99	33.593	33.63	0.037
TRIB3ALEX 109.71	50.092	50.112	0.02
TRIB4ALEX 203.72	47.69	47.745	0.055
TRIB4ALEX 402.86	45.136	45.238	0.102
TRIB4ALEX 605.74	42.934	42.999	0.065
TRIB4ALEX 794.73	41.2	41.231	0.031
TRIB12RIVERSTONE 200.09	26.811	26.866	0.055
TRIB12RIVERSTONE 388.14	24.14	24.177	0.037
TRIB12RIVERSTONE 594.02	22.041	22.087	0.046
TRIB12RIVERSTONE 800.44	20.151	20.194	0.043
TRIB12RIVERSTONE 1001.19	18.886	18.954	0.068
TRIB12RIVERSTONE 1225.25	16.598	16.747	0.149
TRIB12RIVERSTONE 1540.05	15.822	16.133	0.311
TRIB12RIVERSTONE 1920.75	13.775	13.912	0.137
TRIB2ALEX 198.39	54.627	54.647	0.02
TRIB2ALEX 400.03	50.504	50.611	0.107
TRIB2ALEX 602.28	48.493	48.556	0.063
TRIB2ALEX 797.33	46.582	46.655	0.073
TRIB2ALEX 1029.38	44.216	44.256	0.04
TRIB9RIVERSTONE 198.80	26.558	26.586	0.028
TRIB9RIVERSTONE 407.11	23.403	23.467	0.064
TRIB10RIVERSTONE 207.29	24.143	24.193	0.05
TRIB10RIVERSTONE 394.87	21.761	21.838	0.077
TRIB10RIVERSTONE 601.70	19.1	19.168	0.068
TRIB11RIVERSTONE 198.81	22.235	22.267	0.032
TRIB11RIVERSTONE 395.12	17.237	17.288	0.051
KILLARNEYCHAIN 251.45	20.062	20.296	0.234
KILLARNEYCHAIN 411.99	19.568	19.706	0.138
KILLARNEYCHAIN 600.00	18.983	19.112	0.129
KILLARNEYCHAIN 783.04	18.413	18.526	0.113
KILLARNEYCHAIN 1031.89	17.66	17.793	0.133
KILLARNEYCHAIN 1166.83	17.363	17.508	0.145
KILLARNEYCHAIN 1417.87	16.947	17.076	0.129
KILLARNEYCHAIN 1614.70	16.34	16.502	0.162
KILLARNEYCHAIN 1879.38	15.996	16.175	0.179
KILLARNEYCHAIN 2039.54	15.686	15.901	0.215
KILLARNEYCHAIN 2201.37	15.506	15.745	0.239
KILLARNEYCHAIN 2443.35	15.087	15.397	0.31
KILLARNEYCHAIN 2742.66	13.775	13.912	0.137
TRIB6RIVERSTONE 199.99	31.993	32.033	0.04
TRIB6RIVERSTONE 398.50	29.517	29.541	0.024
TRIB6RIVERSTONE 600.74	28.037	28.093	0.056
TRIB8RIVERSTONE 215.46	30.714	30.788	0.074
TRIB8RIVERSTONE 406.91	29.108	29.18	0.072
TRIB8RIVERSTONE 594.03	27.605	27.666	0.061
TRIB8RIVERSTONE 835.88	25.69	25.727	0.037
TRIB8RIVERSTONE 1050.00	23.101	23.188	0.087
TRIB8RIVERSTONE 1210.00	21.794	21.866	0.072
TRIB8RIVERSTONE 1411.35	21.247	21.333	0.086

TRIB5ALEX 223.90	48.673	48.708	0.035
TRIB5ALEX 401.07	45.563	45.587	0.024
TRIB5ALEX 598.94	43.102	43.155	0.053
TRIB5ALEX 796.06	41.603	41.649	0.046
FIRSTPONDCRK 212.21	49.297	49.349	0.052
FIRSTPONDCRK 406.87	48.06	48.129	0.069
FIRSTPONDCRK 583.06	46.97	47.036	0.066
FIRSTPONDCRK 801.10	45.401	45.45	0.049
FIRSTPONDCRK 1000.33	43.563	43.65	0.087
FIRSTPONDCRK 1193.97	42.904	43.043	0.139
FIRSTPONDCRK 1585.81	40.567	40.664	0.097
FIRSTPONDCRK 1795.20	39.935	40.035	0.1
FIRSTPONDCRK 2050.89	38.669	38.762	0.093
FIRSTPONDCRK 2236.08	37.828	37.922	0.094
FIRSTPONDCRK 2402.34	37.652	37.71	0.058
FIRSTPONDCRK 2618.78	36.705	36.791	0.086
FIRSTPONDCRK 2809.57	35.79	35.9	0.11
FIRSTPONDCRK 3110.20	33.798	33.907	0.109
FIRSTPONDCRK 3203.36	33.219	33.324	0.105
FIRSTPONDCRK 3395.98	32.488	32.595	0.107
FIRSTPONDCRK 3600.01	31.51	31.597	0.087
FIRSTPONDCRK 3814.89	30.495	30.612	0.117
FIRSTPONDCRK 4003.51	29.656	29.783	0.127
FIRSTPONDCRK 4207.16	28.852	29.103	0.251
FIRSTPONDCRK 4439.41	28.405	28.585	0.18
FIRSTPONDCRK 4618.26	27.483	27.59	0.107
FIRSTPONDCRK 4808.18	26.605	26.71	0.105
FIRSTPONDCRK 4986.51	26.039	26.176	0.137
FIRSTPONDCRK 5212.36	25.337	25.478	0.141
FIRSTPONDCRK 5380.02	24.546	24.665	0.119
FIRSTPONDCRK 5594.42	23.878	24.032	0.154
FIRSTPONDCRK 5851.23	22.983	23.117	0.134
FIRSTPONDCRK 6005.22	22.548	22.708	0.16
FIRSTPONDCRK 6201.12	22.348	22.533	0.185
FIRSTPONDCRK 6411.87	21.191	21.286	0.095
FIRSTPONDCRK 6630.61	20.506	20.629	0.123
FIRSTPONDCRK 6799.64	20.115	20.331	0.216
FIRSTPONDCRK 6928.03	20.062	20.296	0.234