

APPENDIX I- CHEMICAL DATA FOR SOIL PROFILES

APPENDIX 1
CHEMICAL DATA FOR SOIL PROFILES

Profile no. Soil description Parent material	Horizon	Field texture	Sample depth	1 : 5 soil : water suspension			Org C	Total N	1:3C N	Fe ₂ O ₃	P (available)	K (available)	HCl extract			Exchangeable cations								
				pH	EC _{250C}	Cl ⁻							P	K	Ca	Milliequivalents/100g				% of CEC				
																Mg	K	Na	CEC	Ca	Mg	K	Na	H
901 Shallow stony red duplex soil Ordovician sediments	A ₁	L	0-10	5.7	32	0.002	2.3	0.13	23	1.7	7	160	0.22	0.016	2.2	1.6	0.4	0.07	17.6	12	9	2	<1	77
	A ₂	SCL	10-20	4.8	24	0.003	0.88	0.071	16	2.0	3	80	0.22	0.010	0.3	0.6	0.3	0.07	13.2	2	5	2	1	90
	B ₁	MC	30-60	5.1	25	0.002				6.2	2	90	0.38	0.013	0.1	1.9	0.4	0.2	16.6	1	11	2	1	85
	B ₂	SiC	72-90	5.8	19	0.001				2.0	3	20	0.22	0.009	0.04	2.0	0.09	0.2	8.5	<1	24	1	2	73
902 Yellow sodic duplex soil Tertiary gravel	A	L	0-4	5.3	79	0.007	6.2	0.33	24	1.7	12	240	0.017	0.17	1.6	2.4	0.7	0.4	30.6	5	8	2	1	84
	B ₁	MC	4-10	5.2	75	0.008	1.1	0.08	18	3.6	30	220	0.009	0.33	0.9	7.5	0.7	0.8	24.4	4	31	3	3	59
	B ₂	MC	10-20	5.0	180	0.019	0.37	0.04	12	3.6	5	140	0.007	0.38	0.2	10.3	0.5	1.5	21.9	1	47	2	7	43
	B ₂	MC	30-60	5.5	770	0.089				4.3	11	70	0.006	0.42	0.01	14.5	0.3	5.1	28.2	<1	51	1	18	30
903 Yellow sodic duplex soil Devonian granite	A ₁	FSL	0-10	5.9	120	0.012	5.1	0.33	20	1.1	16	320	0.019	0.14	4.6	2.5	0.7	0.3	21.0	22	12	3	1	62
	A ₂	LCOS	20-30	4.8	33	0.003	0.21	0.016	17	0.7	4	40	0.003	0.059	0.01	0.3	0.1	0.07	2.7	<1	11	4	3	82
	A ₃	LCOS	30-40	5.5	41	0.004				0.8	7	50	0.003	0.10	0.1	0.8	0.1	0.2	2.9	3	28	3	7	59
	B ₁	MC	40-60	5.4	520	0.064				3.5	2	140	0.005	0.58	3.3	8.6	0.5	2.7	24.8	13	35	2	11	39
	C ₁	SC	80-90	6.5	530	0.064				2.1	2	90	0.003	0.44	2.7	6.4	0.3	1.9	19.2	14	33	2	10	41
	C ₂	SCL	120-150	7.7	770	0.089				1.6	1	80	0.004	0.38	2.8	6.0	0.2	1.8	11.1	25	54	2	16	3
904 Stony red duplex soil Ordovician sediments	A ₁	SL	0-10	5.4	36	0.002	3.5	0.21	22	2.2	12	220	0.013	0.12	2.8	1.1	0.4	0.09	20.5	14	5	2	<1	79
	A ₂	SCL	10-20	5.2	34	0.002	0.5	0.037	18	2.4	5	160	0.005	0.11	0.3	0.3	0.4	0.05	9.4	3	3	4	1	89
	B ₁	LMC	20-30	4.8	62	0.007	0.37	0.036	14	4.7	5	240	0.006	0.20	0.3	0.9	0.6	0.2	10.0	3	9	6	2	80
	B ₂	LMC	30-60	4.9	52	0.005				7.4	5	300	0.009	0.30	0.5	2.0	0.9	0.2	18.4	3	11	5	1	80
	B ₃	LMC	70-90	4.6	67	0.010				5.2	4	90	0.008	0.26	0.05	2.6	0.3	0.3	16.6	<1	16	2	2	80
905 Yellow sodic duplex soil Devonian granite	A ₁	COSL	0-5	5.9	50	0.003	2.9	0.22	17	0.8	11	90	0.011	0.066	3.9	1.7	0.3	0.2	14.6	27	12	2	1	58
	A ₂	LCOS	20-30	5.6	22	0.001	0.37	0.03	16	0.5	7	50	0.004	0.045	0.7	0.4	0.1	0.08	3.9	18	10	3	2	67
	A ₃	COS	39-45	6.0	23	0.002				5.1			0.005	0.28	0.9	0.6	0.2	0.07	4.2	21	14	5	2	58
	B ₂₁	MC	45-60	6.1	94	0.009					2	200			2.8	4.9	0.6	0.8	20.7	14	24	3	4	55
	B ₂₂	MC	60-90	5.8	140	0.014				4.2	4	140	0.005	0.29	1.8	5.9	0.4	1.1	19.3	9	31	2	6	52
	B ₃	MC	90-119	6.4	150	0.015				1.7	3	50	0.002	0.52	1.8	4.6	0.1	2.2	12.1	15	38	1	18	28
906 Red sodic duplex soil Tertiary gravel	A ₁	L	0-5	5.3	96	0.008	8.0	0.42	25	1.5	14	280	0.017	0.24	1.5	2.9	0.7	0.6	33.3	5	9	2	2	83
	A ₂	CL	10-14	5.1	57	0.008	0.65	0.055	15	2.9	5	140	0.006	0.26	<0.01	1.5	0.4	0.3	11.6	<1	13	3	3	81
	B ₁	MC	30-60	5.1	530	0.054				7.1	2	60	0.006	0.54	<0.01	8.1	0.2	3.0	21.3	<1	38	1	14	47
	B ₂	LMC	66-90	5.3	1200	0.12				6.9	4	30	0.005	0.45	<0.01	9.5	0.2	4.5	19.7	<1	48	1	23	28
907 Mottled reddish yellow duplex soil Tertiary gravel	A ₁	SL	0-4	5.3	36	0.003	3.53	0.13	35															
	A ₂	LS	4-10	5.1	22	0.002	1.1	0.032	45	2.2	4	50	0.006	0.044	0.2	0.3	0.2	0.05	8.9	3	4	2	1	90
	A ₂	LS	10-20	4.9	18	0.002	0.42	0.021	26	2.1	5	30	0.005	0.035	<0.01	0.2	0.1	0.05	5.7	<1	4	2	1	93
	B ₁	LC	30-60	5.3	34	0.003				7.1	5	140	0.013	0.2	0.06	3.5	0.5	0.5	21.9	<1	17	2	2	79
	B ₂	LC	90-120	4.9	52	0.006				11.5	4	100	0.011	0.21	0.06	5.0	0.4	0.7	25.5	<1	20	2	3	75
	B ₃	MC	120-150	4.8	61	0.006				6.4	3	60	0.009	0.19	0.06	4.6	0.3	0.8	27.0	<1	17	1	3	79
908 Yellowish brown sodic duplex soil Tertiary gravel	A ₁	LFS	0-10	6.1	32	0.002	2.2	0.13	22	0.5	7	100	0.010	0.095	3.0	0.8	0.3	0.06	8.7	34	9	3	1	53
	A ₂	FS	20-30	6.0	17	0.002	0.11	0.013	11	0.4	1	20	0.004	0.072	0.06	0.16	0.06	0.05	1.3	5	12	5	4	74
	B ₁	LMC	34-55	6.4	430	0.045				3.1	2	40	0.008	0.39	0.5	5.3	0.1	2.8	12.9	4	41	1	22	32
	B ₂	LC	60-68	7.1	500	0.051				2.4	10	30	0.007	0.31	0.6	5.4	0.1	2.9	11.3	5	48	1	26	20
	B ₃	LMC	68-90	7.2	460	0.049				2.1	3	30	0.006	0.32	0.5	5.0	0.1	2.7	10.9	5	46	1	25	23
	D ₁	MC	93-104	7.3	650	0.064				3.3	4	40	0.006	0.41	1.1	8.1	0.2	2.7	17.0	6	48	1	16	29
	D ₂	FSCl	104-120	7.3	490	0.056				3.2	4	40	0.007	0.28	0.8	5.6	0.1	3.2	12.0	7	47	1	27	18
	D ₃	SC	120-150	7.3	470	0.056				2.3	2	30	0.006	0.21	0.5	4.7	0.1	2.6	9.3	5	51	1	28	15

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				pH	EC ₂₅ 9C	Cl ⁻							P	K	Ca	Milliequivalents/100g				% of CEC					
																Mg	K	Na	CEC	Ca	Mg	K	Na	H	
909 Red sodic duplex soil Quaternary alluvium	A ₁	FSL	0-10	5.8	23	0.002	1.6	0.11	19	0.9	9	140	0.011	0.13	1.7	0.5	0.3	0.05	8.0	21	6	4	1	68	
	A ₂	FSL	10-20	5.1	11	0.001	0.23	0.024	12	0.7	4	40	0.004	0.11	0.24	0.17	0.09	0.02	3.3	7	5	3	1	84	
	B ₁	LMC	30-60	5.0	150	0.019				4.0	3	220	0.005	0.52	2.3	5.0	0.7	1.0	15.3	15	33	5	7	40	
	B ₂	LC	78-90	6.3	240	0.031				3.1	3	160	0.005	0.32	1.9	5.3	0.4	1.2	12.4	15	43	3	10	29	
	C	CFS	102-120	6.1	71	0.009				1.1	3	50	0.005	0.12	0.6	1.8	0.1	0.3	4.4	14	41	2	7	36	
910 Shallow stony red gradational soil Ordovician sediments	A ₁	L	0-6	5.0	78	0.009	2.9	0.13	29	2.3	6	140	0.2	0.016	0.5	0.6	0.4	0.3	15.2	3	4	3	2	88	
	A ₂	L	6-10	4.8	55	0.006	0.81	0.046	23	2.8	3	60	0.16	0.014	0.1	0.5	0.2	0.2	9.2	1	5	2	2	90	
	B ₁	CL	10-20	4.8	55	0.005	0.66	0.043	20	2.9	2	50	0.2	0.016	0.05	0.8	0.1	0.2	8.8	1	9	1	2	87	
	B ₂	LMC	30-46	5.1	62	0.007				4.1	1	30	0.3	0.017	0.1	2.2	0.1	0.4	10.1	1	22	1	4	72	
911 Red sodic duplex soil Ordovician sediments	A ₁	FSL	0-6	6.4	44	0.003	3.53	0.21	22	1.5	10	200	0.014	0.18	9.7	1.2	0.5	0.06	18.2	53	7	3	<1	27	
	A ₂	FSL	6-10	5.6	42	0.004	1.0	0.057	23	1.9	4	100	0.008	0.15	2.1	0.7	0.3	0.08	8.5	25	8	4	1	62	
	B ₂	MC	10-20	4.6	150	0.020	0.54	0.042	17	3.2	2	140	0.007	0.27	1.1	2.4	0.4	0.5	12.5	9	19	3	4	65	
	B ₂	MC	30-60	5.3	630	0.078				6.1	2	260	0.007	0.55	1.5	7.8	2.3	1.5	20.3	7	38	11	7	27	
912 Yellow sodic duplex soil Ordovician sediments	A ₁	SL	0-5	6.0	46	0.005	1.7	0.12	18	1.3	7	200	0.010	0.16	2.0	0.8	0.6	0.2	12.0	17	7	5	2	69	
	A ₂	FSL	10-17	5.1	57	0.006	0.27	0.031	11	2.1	3	60	0.006	0.14	0.3	1.6	0.2	0.5	8.0	4	20	3	6	67	
	B ₁	SC	20-30	5.0	150	0.018	0.24	0.025	12	2.9	3	50	0.007	0.19	0.4	2.5	0.2	1.0	9.8	4	26	2	10	58	
	B ₂	MC	30-60	5.6	890	0.11				4.5	4	80	0.006	0.52	1.2	9.3	0.4	5.3	24.2	5	38	2	22	33	
913 Red sodic duplex soil Lower Devonian granite	A ₁	SL	0-5	5.5	180	0.021	1.7	0.094	23	1.2	6	240	0.008	0.10	2.2	2.8	0.6	0.5	9.8	22	29	6	5	38	
	A ₂	COS	5-10	6.3	26	0.002	0.42	0.023	24	0.8	3	60	0.004	0.035	0.7	1.2	0.2	0.2	4.4	16	27	5	5	48	
	B ₁	SC	11-20	5.9	220	0.023	0.29	0.022	17	1.8	3	100	0.005	0.11	0.6	5.4	0.4	1.5	12.1	5	45	3	12	35	
	B ₁	SC	30-49	5.3	470	0.051				1.8	2	70	0.005	0.16	0.3	6.8	0.3	2.8	14.6	2	47	2	19	30	
	B ₂	SC	60-90	4.7	680	0.078				1.6	1	60	0.005	0.18	0.4	7.6	0.3	3.3	18.2	2	42	2	18	36	
B ₃	LMC	120-140	4.2	1100	0.12				5.0	4	50	0.007	0.15	0.1	9.5	0.3	4.8	26.6	<1	36	1	18	45		
914 Yellowish brown sodic duplex soil Lower Devonian granite	A ₁	FSL	0-10	5.9	50	0.005	1.5	0.11	18	0.6	11	220	0.010	0.090	2.7	1.5	0.6	0.1	8.2	33	18	7	1	41	
	A ₂	LFS	12-20	6.0	13	0.001	0.21	0.019	14	0.4	3	80	0.004	0.045	0.8	0.7	0.2	0.06	3.7	22	19	5	2	52	
	A ₂	LFS	20-29	6.3	58	0.006	0.14	0.015	12	0.4	2	120	0.004	0.064	1.2	1.3	0.3	0.4	4.6	26	28	7	9	30	
	B ₁	SC	30-54	6.4	230	0.023				0.8	2	260	0.004	0.18	4.5	4.8	0.7	1.8	15.4	29	31	5	12	23	
	B ₂	CCOS	54-60	6.2	200	0.021				0.8	2	180	0.004	0.15	2.8	3.1	0.5	1.3	10.5	27	30	5	12	26	
	B ₃	LMC	64-90	7.3	300	0.036				1.5	1	320	0.005	0.24	5.0	5.6	0.9	2.4	16.9	30	33	5	14	18	
C	COS	138-150	8.0	130	0.014				0.8	3	200	0.004	0.12	2.4	3.3	0.4	1.4	8.8	20	37	5	16	15		
915 Grey calcareous sodic uniform clay soil, coarsely structured Quaternary alluvium	A	LC	0-10	7.7	93	0.004	1.4	0.14	13	1.0	7	300	0.011	0.52	27.4	9.7	1.5	0.5	45.5	60	21	3	1	15	
	B ₁	MC	30-60	9.0	440	0.027				0.9	3	140	0.006	0.40	14.3	18.4	0.8	6.3	41.0	35	45	2	15	3	
	B ₂	HC	90-120	8.6	1800	0.14				0.8	2	200	0.005	0.41	10.9	20.7	0.7	12.1	44.4	24	47	2	27	0	
916 Grey calcareous sodic uniform clay soil, coarsely structured Quaternary alluvium	A ₁	CL	0-4	6.6	150	0.008	4.0	0.34	15	0.7	18	580	0.021	0.47	15.1	6.2	1.6	0.5	33.1	46	19	5	2	28	
	A ₂	CL	4-10	6.8	62	0.004	2.0	0.16	16	0.8	6	400	0.011	0.38	13.7	5.5	1.2	0.6	25.4	54	22	5	2	17	
	B ₁	MC	10-20	7.6	62	0.003	0.66	0.055	16	0.8	3	280	0.006	0.28	9.6	4.9	0.8	0.8	19.6	49	25	4	4	18	
	B ₁	MC	30-60	8.9	360	0.025				0.8	10	240	0.005	0.39	10.1	12.5	0.8	5.0	29.9	34	42	3	17	4	
	B ₂	HC	60-90	8.7	1400	0.11				0.8	2	160	0.005	0.43	9.7	17.6	0.9	10.2	38.4	25	46	2	27	0	
	B ₂	HC	90-120	8.3	2000	0.18				0.7	2	200	0.004	0.47	10.1	19.8	0.8	11.8	42.5	24	46	2	28	0	
917 Red calcareous sodic duplex soil Quaternary alluvium	A ₁	L	0-5	6.0	97	0.010	2.9	0.20	19	1.1	11	340	0.010	0.28	4.3	3.7	0.9	0.5	18.4	23	20	5	3	49	
	B ₁	LC	5-10	6.7	200	0.020	0.9	0.068	17	1.5	4	360	0.008	0.40	5.2	7.7	1.1	1.8	21.2	25	36	5	9	25	
	B ₁	LC	10-20	7.6	380	0.039	0.49	0.056	11	1.7	3	460	0.008	0.53	6.4	12.6	1.5	3.6	27.4	23	46	6	13	12	
	B ₂	LMC	23-30	7.8	450	0.049	0.47	0.051	12	1.6	3	460	0.008	0.53	6.0	12.6	1.5	4.2	27.7	22	46	5	15	12	
	B ₂	LMC	30-60	8.7	960	0.12				1.3	2	460	0.007	0.50	4.8	13.5	1.4	5.1	25.5	19	53	6	20	4	
	B ₃	MC	67-90	9.1	1300	0.13				0.9	1	260	0.005	0.46	4.3	12.9	1.0	5.0	23.2	19	55	4	22	0	
D	LMC	107-120	9.0	1500	0.13				1.0	1	280	0.005	0.50	3.2	14.5	1.0	6.1	24.8	13	58	4	25	0		

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				pH	EC _{250C}	Cl ⁻							P	K	Ca	Milliequivalents/100g				% of CEC					
																Mg	K	Na	CEC	Ca	Mg	K	Na	H	
927 Red calcareous sodic duplex soil Quaternary aeolian calcareous deposits overlying Tertiary deposits	A ₁	FSL	0-10	5.9	83	0.008	2.1	0.16	17	1.4	9	380	0.018	0.30	5.2	2.6	1.1	0.3	15.7	33	17	7	2	41	
	A ₁	FSL	10-20	6.3	53	0.005	1.2	0.094	17	1.4	4	280	0.015	0.26	5.4	2.3	0.8	0.2	13.6	40	17	6	1	36	
	A ₂	FSL	30-41	6.3	47	0.004				1.2	3	180	0.009	0.20	3.1	2.0	0.5	0.4	9.7	32	21	5	4	38	
	B ₁	LC	41-60	6.2	130	0.015				1.8	1	380	0.009	0.38	5.0	6.2	1.3	1.7	19.5	26	32	7	9	26	
	B ₁	LC	60-82	7.6	320	0.032				2.6	1	760	0.014	0.62	9.3	13.2	2.9	3.9	33.2	28	40	9	12	11	
	B ₂	LMC	90-120	8.9	600	0.068				2.1	2	520	0.010	0.52	6.4	12.1	2.3	4.5	25.7	25	47	9	18	1	
B ₃	SC	150-170	9.1	560	0.062				3.0	2	520	0.012	0.52	2.6	7.5	1.4	3.6	15.1	17	50	9	24	0		
928 Red calcareous sodic duplex soil Quaternary aeolian calcareous deposits overlying Ordovician granite	A ₁	L	0-10	6.0	110	0.008	1.7	0.15	15	1.5	8	340	0.019	0.46	7.6	3.4	1.1	0.3	19.6	39	17	6	2	36	
	A ₂	LS	10-20	6.2	54	0.004	0.73	0.064	15	1.2	5	160	0.012	0.28	4.9	2.2	0.5	0.2	32.0	15	7	2	1	75	
	A ₃	LCOS	30-41	7.1	41	0.002				1.1	2	70	0.007	0.20	1.1	1.6	0.2	1.0	5.8	19	28	3	17	33	
	B ₁	LC	60-82	9.1	420	0.025				2.0	2	300	0.013	0.56	4.8	10.6	1.0	7.1	25.2	19	42	4	28	7	
	B ₂	C	90-120	9.2	620	0.047				1.9	2	280	0.011	0.60	5.7	13.1	1.3	10.0	31.0	18	42	4	32	4	
	B ₂	C	190-210	9.2	810	0.071				4.8	2	200	0.011	0.36	4.7	9.0	0.9	8.0	23.0	20	39	4	35	2	
929 Reddish brown calcareous sodic uniform clay soil Quaternary aeolian calcareous deposits overlying Ordovician granite	A	LC	0-10	7.1	75	0.003	1.6	0.13	16	1.3	5	440	0.014	0.52	14.5	4.1	1.5	0.2	25.9	56	16	6	1	21	
	B ₂₁	SC	10-20	7.5	67	0.003	1.0	0.084	15	1.3	3	440	0.009	0.46	15.2	3.9	1.5	0.2	24.8	61	16	6	1	16	
	B ₂₁	SC	20-30	7.8	33	0.001	0.77	0.055	18	1.0	3	260	0.008	0.36	10.5	3.0	0.9	0.3	17.4	60	17	5	2	16	
	B ₂₂	LMC	30-60	8.4	74	0.005				1.6	2	340	0.011	0.62	13.7	10.6	1.4	3.5	32.5	42	33	4	11	10	
	B ₂₃	MC	90-120	9.1	880	0.085				1.4	1	200	0.010	0.74	6.7	13.7	1.6	7.9	30.5	22	45	5	26	2	
B ₂₄	LMC	180-210	9.0	1200	0.084				0.9	2	360	0.008	0.66	5.4	13.6	1.8	9.4	30.2	18	45	6	31	2		
930 Red calcareous sodic duplex soil Recent Quaternary aeolian calcareous deposits	A	LS	0-10	6.9	50	0.002	1.1	0.075	19	0.8	7	320	0.007	0.12	4.6	2.0	0.9	0.2	10.5	44	19	9	2	26	
	B ₁	SCL	20-30	7.7	190	0.020	0.31	0.025	16	1.3	3	220	0.007	0.22	3.6	4.4	0.7	1.7	12.5	29	35	6	14	16	
	B ₂₁	MC	30-57	8.3	680	0.081				2.1	2	480	0.012	0.56	7.5	13.5	1.8	5.7	30.8	24	44	6	19	7	
	B ₂₂	LMC	60-90	8.9	1100	0.11				1.2	2	220	0.007	0.42	5.6	12.4	1.4	5.8	25.2	22	49	6	23	0	
	B ₂₃	SC	150-180	8.9	1200	0.12				1.1	2	340	0.004	0.28	4.9	14.0	1.3	8.1	28.3	17	49	5	29	0	
B ₃	SC	195-210	8.4	850	0.093				0.8	1	260	0.004	0.24	2.9	10.7	0.9	6.5	21.6	13	50	4	30	3		
931 Reddish brown sodic gradational soil Ordovician sediments	A	L	0-10	5.0	140	0.012	3.8	0.20	25	2.0	12	200	0.014	0.20	0.5	1.3	0.6	0.8	26.6	2	5	2	3	88	
	B ₁	SCL	20-30	5.1	99	0.011	0.96	0.057	22	2.2	10	120	0.009	0.28	0.1	1.5	0.4	0.6	12.5	1	12	3	5	79	
	B ₂	LC	30-60	5.5	310	0.036				3.0	8	100	0.011	0.36	0.2	4.7	0.4	1.8	13.1	2	36	3	14	45	

Field Texture abbreviations

S = sand FS = fine sand, COS = coarse sand, GCOS = gravelly coarse sand, LFS = loamy fine sand, LS = loamy sand, LCOS = loamy coarse sand, CL = clay loam, FSCL = fine sandy clay loam, SCL = silty clay, LC = light clay, SC = sandy clay, LMC = light medium clay, MC = medium clay, HC = heavy clay.