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ROSEIRES SOIL SURVEY

REPORT No. 8

THE NILE

FROM KAREIMA TO THE THIRD CATARACT

SEMI-DETAILED SOIL SURVEY AND LAND
CLASSIFICATION OF SELECTED AREAS

VOLUME II

APPENDICES 1 — 5

HUNTING TECHNICAL SERVICES LTD.
4 ALBEMARLE STREET
LONDON, W.1

MAY 1965

SIR M. MACDONALD & PARTNERS
CONSULTING ENGINEERS
LION HOUSE
RED LION STREET
LONDON .. W.C.1

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APPENDIX I. DESCRIPTIONS OF THE SAMPLE AREAS

SAMPLE AREA I

Location

The area is situated on the western edge of the Kerma Basin, to the east of the road approximately $1\frac{1}{2}$ km north of the Seliem village.

Topography

The entire area is in a large seasonally flooded depression.

Vegetation

The ground surface is usually covered by a moss-like growth, Heliochloa schoenoides, small patches of wheat, Egyptian beans, and a lupin, Lupinus termis, are grown without irrigation, and trees are absent in the basin bottom. Tamarix and Acacia spp. are found near to the two outside sites on higher ground, and near site 3466 which is situated on the edge of a tongue of higher ground stretching into the basin.

Soil Profile

Six of the profiles are identical, with only the most easterly differing slightly. The position of the site is reflected by the thickness of the top clay horizon and depth below the surface of the water table. As the area flooded each year depends upon the level of the Nile, the lower lying sites are subjected to more flooding than those on a higher level, consequently more fine material is deposited on the surface.

The following table shows the thickness of the clay horizon and depth of the water table for the 6 sites within the basin:-

<u>3468</u>	<u>3467</u>	<u>3466</u>	<u>3465</u>	<u>3469</u>	<u>3470</u>	
42 cm	52 cm	27 cm	55 cm	37 cm	50 cm	depth of clay
	150 cm	150 cm	120 cm	122 cm	124 cm	water table.

It can be seen that site No. 3465 is situated at the lowest level in the basin. Site 3466 is on slightly higher ground as previously mentioned and has a much reduced clay horizon, with the water table at the same level as the previous site. Site 3470 is possibly in a hollow at the edge of the basin.

This top horizon is very hard and very strongly cracked vertically, over the top 15 cm, forming columnar structures, in which there may be incipient blockiness or platiness. The usual colour is very dark grey brown (10 YR 3/2) or intergrades, and some calcium carbonate and gypsum is usually found near to the surface. Below the level of vertical cracking the soil becomes massive, down to the abrupt transition to sand.

The sand horizon, of many different coloured grains, structureless and single-grain, contains abundant quartz and mica, and reaches down to the water table.

The chemical data shows a slight decrease in E.C. in the second horizon, and slight pH increase. Figures for pH paste range between 6.65 and 8.8 and for pH 1:5 suspension, between 6.9 and 9.3.

Exchangeable sodium decreases in the second horizon with the exception of 3469, which strangely enough increases! Site 3470 shows a decrease in all values in the second horizon.

Soluble sodium figures are variable from less than 0.5 up to 4.7, with some sites having a maximum in the top horizon, some in the bottom, and others in the middle.

See table 1.1.

All these sites are classified as Orthic and Vertic Hapludents.

The most easterly site 3471, is situated on the edge of the basin, with the water table at 190 cm. It consists of light clay, to 15 cm, and sandy loam below. The top horizon is dark grey brown (10 YR 4/2), while the second horizon has various 10 YR lines. This site verges on an orthic haplaquent.

Table 1.1 Chemical Analyses of 7 Profiles from Sample Area I.

Sample No.	Bore No.	Depth (cm.)	Mechanical Analysis			E.C. mmhos/cm. at 25°C.	Sol.Na. Meq. 100g.	Exch.Na. Meq. 100g.	pH paste	pH 1:5
			Sand 2.0-0.02 mm.	Silt 0.02-0.002 mm.	Clay 0.002 mm.					
31444	3465	0-55	15	13	72	0.44	0.37	2.8	7.68	8.30
31445		55-120	93	2	5	0.40	0.12	1.88	7.70	8.30
31437	3466	0-27	13	10	77	0.20	0.1	3.1	7.18	7.40
31438		27-150	94	1	5	0.22	0.06	1.1	8.10	8.35
31439	3467	0-32	23	15	62	2.60	1.68	6.3	7.65	8.20
31440	3467	32-52	30	15	55	4.50	4.30	10.1	7.95	8.6
31441		52-150	93	2	5	0.40	0.17	3.0	8.3	8.8
31442	3468	0-42	8	15	77	0.72	1.35	8.6	7.9	8.6
31443		42-115	88	5	7	0.65	0.51	8.7	8.8	9.3
31446	3469	0-37	5	13	82	0.24	0.20	2.4	7.3	7.6
31447		37-122	93	2	5	0.18	0.05	3.2	7.95	8.38
31448	3470	0-50	94	1	5	5.40	4.7	6.9	8.4	9.00
31449		50-124	83	5	12	0.26	0.08	1.9	6.65	6.90
31450	3471	0-4	73	15	12	0.98	0.24	2.16	6.65	6.90
31451		4-15	40	15	45	0.22	0.04	1.56	6.98	7.25
31452		15-190	78	10	12	0.20	0	1.6	7.70	8.25

SAMPLE AREA II

Location

The area consists of seven sites spread over 2 km in an east-west direction across the middle of the El Bakri Plain. The area can be located by travelling south alongside the river until one has passed through the continuous chain of villages. The area is then approximately $1\frac{1}{2}$ km south-west of the last village.

Topography

The area is a flat plain.

Vegetation

There was no vegetation whatsoever, but root hairs in the top few centimetres indicated some grass cover at some time.

Soil Profiles

The profiles of this area are all similar with the exception of 6415, the second most easterly site. Of the others, the three sites on the western edge are the most alike, with sandy clay loam topsoil and loamy sand at the bottom. The next two have sandy clay loam and sandy loam top horizons, with clay loam at the bottom, the one with sandy loam going to loamy sand before changing to clay loam. Site 6415 consists of sand all the way down, and the most easterly site changes from sandy clay loam to loam.

The predominant top horizon colour is dark grey brown (10 YR 4/2) with some sites having grey brown (2.5 Y 5/2), yellowish brown (10 YR 5/4), and the sandy profile brown (10 YR 5/3). Bottom horizons sometimes have 2.5 Y hues but usually are difficult to colour due to different coloured sand grains.

The structure of the loamy sites showed a gradual change from columnar or blocky, with incipient platiness, to massive. The three sites with loamy sand towards the bottom had almost a rock-like structure due to cementation by calcium carbonate. When the compacted loams were broken up they broke into angular peds with sharp edges and were extremely hard. The hardness of the peds is possibly due to very fine sand, which led the surveyors to texture in the field as silty instead of sandy.

The surface of this area was littered with kankar and white calcium carbonate concretions. These concretions, together with gypsum in various forms were common throughout the profiles.

The structure of the sandy site was single-grain and structureless throughout, though depositional horizons were apparent, often on a diagonal plane.

As usual with alluvial soils the chemical data are variable. The E.C. increases with depth, often in remarkable quantity, such as the increase from 2.1 to 20.4 in pit 5410. pH increases with depth, and soluble and exchangeable sodium vary, though often with a maximum in the middle horizon where one is present. In the sandy soil exchangeable sodium still exceeds soluble, although there is only 6% clay present.

The appearance of the sandy site 6415 was surprising, as there was no suggestion of any change in surface phenomena. Further inspection of the area, with knowledge of this site, could still produce no surface evidence of a change in soil type.

See Table 1.2.

Table 1.2 Chemical Analyses of 4 Profiles from Sample Area II.

Sample No.	Bore No.	Depth (cm.)	Mechanical Analysis			E.C. mmhos/cm. at 25°C.	Sol.Na. Meq. 100g.	Exch.Na. Meq. 100g.	pH paste	pH 1:5
			Sand 2.0-0.02 mm.	Silt 0.02-0.002 mm.	Clay 0.002 mm.					
51326	5411	0-8	65	13	22	1.40	0.19	1.0	8.10	8.45
51327		8-95	50	25	25	5.60	4.30	9.7	8.30	8.55
51328		95-113	68	17	15	24.00	12.8	19.8	8.85	9.25
51329		113-200	83	7	10	19.2	6.9	9.9	8.85	9.32
51330	5412	0-8	83	7	10	2.40	0.43	0.77	7.99	8.10
51331		8-60	55	25	20	2.60	0.82	1.98	7.90	8.16
51332		60-100	55	20	25	0.65	0.41	19.6	8.52	9.1
51333		110-200	88	2	10	18.00	7.50	5.3	8.85	9.42
61238	6415	0-200	90	4	6	3.60	1.5	2.5	8.10	8.55
61239	6416	0-22	60	22	18	7.20	3.7	16.7	7.20	8.65
61240		22-65	80	12	8	12.00	6.4	1.8	8.00	8.65
61241		65-200	43	26	31	8.50	7.3	10.3	8.22	8.70
		F 4								
		F 6								
		F 10								
		H 1								
		H 5								

APPENDIX 2. SPECIMEN SOIL
DESCRIPTIONS TOGETHER WITH
LABORATORY DATA OF 15 PROFILES
REPRESENTING SOIL SERIES

<u>Soil Series</u>	<u>Site No</u>	<u>Locality</u>
P 2	6321	Kerma Basin
F 1	6358	Urbi Plain
	5392	Letti Basin
F 2	3488	Gureir Extension
	3500	" "
	6416	El Bakri Plain
	8161	" "
F 4	3464	West Dongola Plain
	6414	El Bakri Plain
F 6	6392	El Bakri Plain
F 10	8147	El Bakri Plain
H 1	4434	Affat Basin
	5400	Letti Basin
	3446	Kerma Basin
H 5	3447	Kerma Basin

P 2

SOIL SERIES P 2

Depth (cm)	Soil Particles%	Incorp.	pH
	Coarse sand Fine sand Silt Clay	Carbonate	Soil
	0.02 under		1:5
	mm. -0.02 mm. mm.		

Pit 6321

Location: Kerma Basin, Air Photo No. 028, Mosaic C, Sheet 1.

Topography: In bottom of dry lake bed.

Cultivation and Land Use: No cultivation.

Vegetation: Dense sunt surrounding the area. Occasional Tamarix.

Surface: Hard surface with cracks up to 2cm. wide every 10 cm,

Surface: Hard surface with cracks up to 2cm. wide every 10 cm, forming blocks. There is a moss-like growth "gugheib" on the surface.

Depth (cm)	E.C.	Total	Total	Total Extractable
	cm	%	Org. Carbon	Phosphorus Mg/100g. soil
				Potassium Mg/100g. soil
0-7 cm.			10 YR 4/2 - 3/3.	Clay, very slightly moist and very firm. Strong, coarse, subangular to blocky structure. Few horizontal cracks but vertical cracks to sand horizon separate the clay horizon into individual blocks. Frequent roots. Some gravel and carbonate aggregates.
0-7	0.3	0.048	1.41	58
7-200	0.3	0.008	0.12	24

7-200 cm.

Variously coloured sand, dry to 145 cm. where

Depth (cm)	Soluble Anions m.	
	CO ₃	HCO ₃
0-7	0	2.8
7-200	0	2.6

capillary fringe is encountered. Structureless but laminated at about 30 degrees to the horizontal plane. Occasional lenses of gravel and black sand. There is a hard layer of cemented coarse sand every 20 cm. or so. There is also cemented sand in the shape of old roots.

LABORATORY ANALYSES

SERIES P 2

Pit No. 6321

Sample Nos. 61038 61039

Depth (cm)	Soil Particles%				Incorp. Carbonate	pH	
	Coarse sand 2-0.2 mm.	Fine sand 0.2 -0.02 mm.	Silt 0.02 -0.002 mm.	Clay under 0.002 mm.		Soil Paste	1:5 suspension
0-7	16	24	14	46	0.4	7.4	7.4
7-200	56	32	6	6	0.7	8.0	8.0

Depth (cm)	E. C. mmhos cm Sat. Ext	Total Nitrogen %	Total Org. Carbon %	Total Extractable	
				Phosphorus Mg/100g. soil	Potassium Mg/100g. soil
0-7	0.3	0.048	1.41	58	218
7-200	0.3	0.008	0.12	24	84

Depth (cm)	Soluble Anions m. e. /litre				Soluble Cations m. e. /litre			
	CO ₃	HCO ₃	Cl	SO ₄	Na	K	Ca	Mg
0-7	0	2.8	1.8	0	2.0	0.1	2.3	1.2
7-200	0	2.6	2.0	0	2.0	0.2	1.3	1.7

Depth (cm)	Exchangeable Cations m. e. %				Total Exch. Cations	E. S. P.	Exchange Capacity Meq./100g. soil
	Na	K	Ca	Mg			
0-7	1.5	1.8	25.3	12.3	40.9	4	42
1-200	1.1	0.8	4.9	2.0	8.8	12	9

LABORATORY ANALYSES

SOIL SERIES F 1
Pit No. 6358
Sample Nos. 6118
6119

Depth (cm)	Soil Particles%				Incorp. Carbonate	pH	
	Coarse sand mm.	Fine sand 0.2 -0.02 mm.	Silt 0.02 -0.002 mm.	Clay under 0.002 mm.		Soil Paste	1:5 suspension
<u>SOIL SERIES</u>							
<u>Pit</u>							
F 1 6358							
0-1	<u>Location:</u> Urbi Plain, Air Photo 063, Mosaic F, Sheet 2.						8.4
15-20	<u>Topography:</u> Level.						8.9
<u>Cultivation and Land Use:</u> Sorghum cultivated. Irrigation by canals.							

Vegetation: Tushi and selernerka growing on sides of canals.

Surface: Loose and sandy.

Surface: Loose and sandy.					
Depth (cm)	E.C. mmhos	Total Nitrogen	Total Org. Carbon	Total Extractable	
				Phosphorus Mg/100g. soil	Potassium Mg/100g. soil
<u>Profile Description:</u>					
	Sat. Ext		%		
0-15 cm.			10 YR 4/2, loamy sand, very slightly moist,		
0-15	9.0	0.026		very friable. Structureless with coarser	
15-200	0.8	0.029		material at bottom. No cracks or roots.	
			Frequent pores.		

15-200 cm. 10YR 4/2, loamy sand, very slightly moist, very friable. Structureless with coarser material at bottom. No cracks or roots. Frequent pores.

10YR 4/2 - 3/2 silt loam, slightly moist, firm. Structureless. No cracks or roots. Frequent pores. Frequent small carbonate concretions throughout layer.

Depth (cm)	Soluble Anions		Soluble Cations				
	CO ₃	HCO ₃	Na	K	Ca	Mg	
0-15	0	2.4	22.5	124	78	3	46
15-200	0	2.4	4.5	-	8	1	4

Depth (cm)	Exchangeable Cations m. e. %				Total Exch. Cations	E.S.P.	Exchange Capacity Meq/100g. soil
	Na	K	Ca	Mg			
0-15	1.1	1.4	11.0	3.0	16.5	7	15
15-200	3.6	2.0	27.0	7.3	39.9	10	36

SOIL SERIES F 1
Pit No. 6358
Sample Nos. 6118
6119

LABORATORY ANALYSES

Depth (cm)	Soil Particles%				Incorp. Carbonate	pH	
	Coarse sand 2-0.2 mm.	Fine sand 0.2 -0.02 mm.	Silt 0.02 -0.002 mm.	Clay under 0.002 mm.		Soil Paste	1:5 suspension
0-15	23	50	14	13	1.2	7.9	8.4
15-200	3	36	33	28	0.6	8.0	8.9

Tamarix spp and *Acacia* seyal.

Depth (cm)	E. C. mmhos cm Sat. Ext	Total Nitrogen %	Total Org. Carbon %	Total Extractable	
				Phosphorus Mg/100g. soil	Potassium Mg/100g. soil
0-15	9.0	0.026	0.25	42	690
15-200	0.8	0.029	0.07	32	550

Depth (cm)	Soluble Anions m. e. /litre				Soluble Cations m. e. /litre			
	CO ₃	HCO ₃	Cl	SO ₄	Na	K	Ca	Mg
0-15	0	2.4	22.5	124	78	3	46	15
15-200	0	2.4	4.5	-	8	1	4	2

Depth (cm)	Exchangeable Cations m. e. %				Total Exch. Cations	E. S. P.	Exchange Capacity Meq /100g. soil
	Na	K	Ca	Mg			
0-15	1.1	1.4	11.0	3.0	16.5	7	15
15-200	3.6	2.0	27.0	7.3	39.9	10	36

LABORATORY ANALYSES

SOIL SERIES F1

Pit No. 5392

Sample Nos. 52263

51264

51265

Depth (cm)	SOIL PARTICLES %				Incorp. Carbonate	pH	
	SOIL SERIES	Fine sand	Silt	Clay		Soil Paste	1:5 suspension
Pit	2-0.2 mm.	0.2 -0.02	0.02 -0.002 mm.	under 0.002 mm.			
0-20							
20-80							
80-200							

F1

5392

Location: Letti Basin, Air Photo 080, Mosaic H, Sheet 2.

Topography: Series of hollows and knolls giving a hummocky surface.

Cultivation and Land Use: No cultivation. Browsing for livestock.

Vegetation: Open woodland of Capparis decidua, Calotropis spp, Tamarix spp and Acacia seyal.

Surface: Loose sand.

Depth (cm)	E.C.	Total Nitrogen	Total Org. Carbon	Total Extractable	
				Phosphorus Mg/100g. soil	Potassium Mg/100g. soil
0-20					
0-20	1.4	0.042			
20-80	4.0	0.017			
80-200		0.014			

Profile Description:

0-20 cm.

10 YR 4/2 - 4/3 loamy sand passing to sandy loam. Dry and loose. Mostly structureless but in places laminated. Frequent roots.

20-80 cm.

10 YR 3/2 clay, dry and hard. Coarse columnar passing to coarse subangular blocky structure. Cracks separate columns about 12 cm. apart.

80-200 cm.

Frequent roots. Carbonates and gypsum present. 10 YR 3/2 Clay and sandy clay, fairly dry and hard. Massive with few cracks. Few roots. Sand fills soil cracks. About 3 per cent gypsum in the upper part of this layer.

Depth (cm)	Soluble Anions m.e./litre		Soluble Cations m.e./litre	
	HCO ₃		Ca	Mg
0-20	0.8	10.6		
20-80	0.5	3.7		
80-200	0.6	3.7	14	43

Depth (cm)	Exchangeable Cations m.e. %				Total Exch. Cations	E.S.P.	Exchange Capacity Meq/100g. soil
	Na	K	Ca	Mg			
0-20	1.3	4.3	9.7	3.6	18.9	3	17
20-80	14.5	3.4	9.6	6.2	33.7	44	33
80-200	34.0	3.4	2.7	6.0	46.1	74	46

LABORATORY ANALYSES

Depth (cm)	Soil Particles%				Incorp. Carbonate	pH	
	Coarse sand 2-0.2 mm.	Fine sand 0.2 -0.02 mm.	Silt 0.02 -0.002 mm.	Clay under 0.002 mm.		Soil Paste	1:5 suspension
0-20	16	56	13	17	1.8	7.8	8.0
20-80	12	41	19	28	3.3	8.3	9.3
80-200	5	33	26	36	2.6	8.4	9.5

Depth (cm)	E.C. mmhos cm Sat. Ext	Total Nitrogen %	Total Org. Carbon %	Total Extractable	
				Phosphorus Mg/100g. soil	Potassium Mg/100g. soil
0-20	1.4	0.042	1.26	76	300
20-80	4.0	0.017	0.42	78	380
80-200	3.9	0.014	0.60	66	304

Depth (cm)	Soluble Anions m. e. /litre				Soluble Cations m. e. /litre			
	CO ₃	HCO ₃	Cl	SO ₄	Na	K	Ca	Mg
0-20	0.8	10.6	3.8	13	9.0	3.0	7.8	3.2
20-80	0.5	3.7	18	44	55	0.7	3.0	2.5
80-200	0.6	3.7	14	43	52	0.2	1.5	1.0

Depth (cm)	Exchangeable Cations m. e. %				Total Exch. Cations	E.S.P.	Exchange Capacity Meq/100g. soil
	Na	K	Ca	Mg			
0-20	1.3	4.3	9.7	3.6	18.9	8	17
20-80	14.5	3.4	9.6	6.2	33.7	44	33
80-200	34.0	3.4	2.7	6.0	46.1	74	46

LABORATORY ANALYSES

- 15 -

- 14 -

SOIL SERIES F 2

Pit No. 3488

Sample Nos. 31494

31495

31496

Depth (cm)	Soil Particles%				Incorp. Carbonate	pH	
	Coarse mm.	Fine sand mm.	Silt 0.02 mm.	Clay 0.002 mm.		Soil Paste	1:5 suspension
<u>SOIL SERIES</u>							
F 2							
<u>Pit</u>							
3488							
<u>Location:</u> Run Merowe Korti Photo AP 238020, Map Sheet 3,							
Gureir extension.							
<u>Topography:</u> Flat at site; small undulations and weak gullyng nearby.							
<u>Cultivation and Land Use:</u> Nil.							

Vegetation: Scattered Acacia albida near the sand-dunes.

Surface: Abundant black and white calcium carbonate kankars, rounded quartz pebbles, chert chips and rock fragments.

Profile Description:

Depth (cm)	E. C. mmhos cm	Total Nitrogen %	Total Carbon %	Total Extractable Mg/100g. soil	Total Extractable Mg/100g. soil
0-4 cm.	6.1	0.023	0.19	55	910
50-105	11.5	0.026	0.19	46	670
105-200	11.0	0.029	0.19	46	980
4-50 cm.					
10 YR 4/3. Fine sandy loam. Dry, hard. Moderate fine sub-angular blocky. Breaks easily into strong peds. Weak cleavage lines parallel to the surface. Abundant cracks occasionally large and penetrating below 50 cm. No roots. Occasional weak calcium carbonate streaks and patches.					
50-105 cm.					
10 YR 4/3 - 4/2. Sandy loam. Dry, very hard. Massive, possibly cemented. No roots. Abundant small quartz grains and rare calcium carbonate patches. Possibly very small gypsum crystals. Strong small mottling 10 YR 3/2.					
105-200 cm.					
7.5 YR 4/4. Silt loam. Dry, very hard. Massive breaking easily into medium angular blocky. Appearance of honeycomb structure fading out with depth.					

LABORATORY ANALYSES

Depth (cm)	Soil Particles%				Incorp. Carbonate	pH	
	Coarse sand 2-0.2 mm.	Fine sand 0.2 -0.02 mm.	Silt 0.02 -0.002 mm.	Clay under 0.002 mm.		Soil Paste	1:5 suspensic
4-50	24	42	13	21	1.5	8.2	8.9
50-105	20	46	16	18	0.4	8.0	8.8
105-200	12	42	15	31	8.2	8.1	9.0

Vegetation: Nil.

Depth (cm)	E. C. mmhos cm Sat. Ext	Total Nitrogen %	Total Org. Carbon %	Total Extractable	
				Phosphorus Mg/100g. soil	Potassium Mg/100g. soil
4-50	6.1	0.023	0.19	55	910
50-105	11.5	0.026	-	46	670
105-200	11.0	0.029	0.19	46	980

Depth (cm)	Soluble Anions m. e. /litre				Soluble Cations m. e. /litre			
	CO ₃	HCO ₃	Cl	SO ₄	Na	K	Ca	Mg
4-50	0.3	1.7	31	60	69	1	14	4
50-105	0.2	2.6	83	68	120	1	19	8
105-200	0	2.4	118	17	118	1	15	5

Depth (cm)	Exchangeable Cations m. e. %				Total Exch. Cations	E. S. P.	Exchange Capacity Meq/100g. soil
	Na	K	Ca	Mg			
4-50	7.4	0.8	14.1	2.7	25.0	30	25
50-105	9.5	0.8	9.0	3.5	22.8	56	17
105-200	11.7	0.8	12.0	3.9	28.4	47	25

SOIL SERIES F 2
Pit No. 3500
Sample Nos. 31523
31529
31530

LABORATORY ANALYSES

SOIL SERIES		F 2		Incorp.		pH	
Depth (cm)	Coarse sand	Fine sand	Silt	Clay under	Carbonate	Soil Parts	1:5 suspension
Pit	2-0.2 mm.	0.2 -0.02 mm.	0.02 -0.002 mm.	0.002 mm.	3500		

Location: Run Merowe photo, AP 238018, Map Sheet 3, Gureir Expansion.

Topography: Gentle slope to N.W. Nearby sand dunes (2-3 metres high) and slight gullying.

Cultivation and Land Use: Nil.

Vegetation: Nil.

Surface: Gravelly, soft to 1 cm., then firm. Abundant calcium carbonate kankars (0-5 mm.) and occasional quartz pebbles.

Profile Description:

0-7 cm.

7.5 YR 4/4 - 5 YR 4/4. Sandy loam. Dry, hard. Fine platy, imperfect structural surfaces due to sandiness. Slight honeycomb structure in finer bands. Frequent cracks parallel, and occasionally at right angles to the surface. No roots. No salts observed though possibly a high percentage of calcium carbonate. Abundant quartz and rock fragments.

7-28 cm.

7.5 YR 4/4 - 4/2. Silt loam. Dry, very friable. Very fine crumb to granular, tending towards moderate platy. No cracks. No roots. No salts observed. Frequent quartz particles.

28-200 cm.

7.5 YR 4/4. Silty clay loam. Dry, extremely hard. Fine to medium angular blocky, slightly cemented and very compact. Larger cracks show much well-developed slickensiding. No roots. Some dark mottling, possibly due to manganese dioxide.

LABORATORY ANALYSES

Depth (cm)	Soil Particles%				Incorp. Carbonate	pH	
	Coarse sand 2-0.2 mm.	Fine sand 0.2 -0.02 mm.	Silt 0.02 -0.002 mm.	Clay under 0.002 mm.		Soil Paste	1:5 suspension
0-7	8	63	8	21	5.6	8.25	9.75
7-28	15	20	32	33	4.9	8.63	9.15
28-200	5	29	25	41	8.4	8.34	9.19

Surface: Fairly compact sandy crust to 3 cm. Abundant kankars and

Depth (cm)	E. C. mmhos cm Sat. Ext	Total Nitrogen %	Total Org. Carbon %	Total Extractable	
				Phosphorus Mg/100g. soil	Potassium Mg/100g. soil
0-7	1.3	0.035	-	46	980
7-28	44.0	0.053	0.44	43	620
28-200	16.0	0.029	0.12	43	1,600

32-65 cm. 10 YR 4/3. Sand and loamy sand partly cemented,

Depth (cm)	Soluble Anions m.e./litre				Soluble Cations m.e./litre			
	CO ₃	HCO ₃	Cl	SO ₄	Na	K	Ca	Mg
0-7	0	5.4	6	4	18	0	1	1
7-28	0	6.6	164	440	544	1	38	6
28-200	0.4	4.6	56	160	192	1	11	5

with frequent cracks. Few kankars, gypsum

Depth (cm)	Exchangeable Cations m.e.%				Total Exch. Cations	E.S.P.	Exchange Capacity Meq/100g. soil
	Na	K	Ca	Mg			
0-7	4.7	1.4	8.3	1.7	16.1	31	15
7-28	35.0	0.8	13.6	2.8	52.2	66	53
28-200	21.2	1.6	10.2	3.2	36.2	56	38

LABORATORY ANALYSES

SOIL SERIES					F 2	Incorp.	pH	
Depth (cm)	Coarse sand	Fine sand	Silt	Clay		Carbonate	Soil Paste	1:5 suspension
Pit	2-0.2 mm.	0.2 -0.02	0.02 -0.002 mm.	under 0.002 mm.	6416			
Location: El Bakri Plain, Air Photo No. 103, Mosaic H, Sheet 2.								
0-22						8.0	8.4	9.2
22-65						3.3	8.2	8.6
65-200						11.0	8.3	8.8
Topography: Flat desert.								
Cultivation and Land Use: None.								
Vegetation: None.								

Surface: Fairly compact sandy crust to 3 cm. Abundant kankars and small carbonate concretions. Frequent fine gravel.

small carbonate concretions. Frequent fine gravel.					
Depth (cm)	E. C. mmhos	Total Nitrogen	Total Org. Carbon	Total Extractable	
				Phosphorus Mg/100g. soil	Potassium Mg/100g. soil
<u>Profile Description:</u>					
	Sat. Ext		%		
0-22 cm.				10 YR 5/4. Silt loam, dry and very hard.	
0-22	8.2	0.018	0.23	Strong, fine to medium angular blocky structure	
22-65	8.0	0.014	0.23	with frequent cracks and many pores. Few	
65-200	7.0	0.014	0.23	kankars and many carbonate concretions. Sand	
				infiltrating down cracks.	

22-65 cm. 10 YR 4/3. Sand and loamy sand partly cemented,

Depth (cm)	Soluble Anions		
	CO ₃	HCO ₃	
0-22	0.6	4.2	dry and hard. Weak fine platy structure at top
22-65	0.4	2.6	above a cemented layer which overlies a
65-200	3.4		structureless zone at bottom. Frequent kankars,
			gravel, spiral shells, gypsum crystals and
			amorphous carbonate.
65-200 cm.			2.5 Y 5/2. Silty clay, dry and extremely hard.

Medium to coarse, strong angular blocky structure with frequent cracks. Few kankars, gypsum crystals and carbonate concretions.

Depth (cm)	Exchangeable Cations				Exch. Cations	E. S. P.	Exchange Capacity Mg/100g. soil
	Na	K	Ca	Mg			
0-22	14.2	0.9	13.1	1.7	29.9	51	28
22-65	5.5	0.4	8.0	2.0	15.9	40	14
65-200	18.4	1.2	19.4	4.3	43.3	44	42

LABORATORY ANALYSES

Depth (cm)	Soil Particles%				Incorp. Carbonate	pH	
	Coarse sand 2-0.2 mm.	Fine sand 0.2 -0.02 mm.	Silt 0.02 -0.002 mm.	Clay under 0.002 mm.		Soil Paste	1:5 suspension
0-22	15	43	19	23	8.0	8.4	9.2
22-65	43	32	14	11	3.3	8.2	8.6
65-200	12	26	31	31	11.0	8.3	8.8

Vegetation: Sellim bushes, widely spaced (200-400 yards apart).

Depth (cm)	E. C. mmhos cm Sat. Ext	Total Nitrogen %	Total Org. Carbon %	Total Extractable	
				Phosphorus Mg/100g. soil	Potassium Mg/100g. soil
0-22	8.2	0.019	0.24	37	128
22-65	8.0	0.014	0.21	40	72
65-200	7.0	0.014	0.39	32	164

Depth (cm)	Soluble Anions m. e. /litre				Soluble Cations m. e. /litre			
	CO ₃	HCO ₃	Cl	SO ₄	Na	K	Ca	Mg
0-22	0.6	4.2	41	81	115	1	7	3
22-65	0.4	2.6	66	55	101	1	13	5
65-200	0.3	3.4	50	55	91	1	9	5

Depth (cm)	Exchangeable Cations m. e. %				Total Exch. Cations	E.S. P.	Exchange Capacity Meq/100g. soil
	Na	K	Ca	Mg			
0-22	14.2	0.9	13.1	1.7	29.9	51	28
22-65	5.5	0.4	8.0	2.0	15.9	40	14
65-200	18.4	1.2	19.4	4.3	43.3	44	42

LABORATORY ANALYSES

Depth (cm)	Soil Particles%				Incorp. Carbonate	pH	
	SOIL SERIES sand 2-0.2 mm.	Fine sand 0.2 mm.	Silt 0.02 -0.002 mm.	Clay under 0.002 mm.		Soil Paste	1:5 suspension
				F 2 8161			
0-26	Location: Run 855, AP 122, Mosaic H, Sheet 2, El Bakri Plain.					9.7	
26-110	Topography: Flat.					7.9	8.5
110-200	Cultivation and Land Use: Nil.					8.1	9.1

Vegetation: Sellim bushes, widely spaced (200-400 yards apart).

Surface: Firm dry sand. Much quartz and calcium carbonate concretions. Some gravel and scattered stones.

Profile Description:

Depth (cm)	0-26 cm.	26-110 cm.	110-200 cm.
0-26	0.036	0.026	0.029
26-110	5.0	0.026	0.029
110-200	2.5	0.026	0.029

26-110 cm. 10 YR 4/2. Sandy loam. Dry, hard. Structureless

Depth (cm)	Soluble Anions		coarse sub-angular blocky, very compact. Few vertical cracks and no pores. No roots. Common small white calcium carbonate aggregations. Few mottles 10 YR 5/6.
	CO ₃	HCO ₃	
0-26	0.2	4.0	5
26-110	0	2.0	37
110-200	0	2.2	25

110-200 cm. 10 YR 4/2. Sandy loam. Dry, hard. Structureless coarse sub-angular blocky, compact. Few fine cracks. No roots. Many white calcium carbonate aggregations and concretions.

Depth (cm)	Exchangeable Cations m. e. %				Total Exch. Cations	E.S.P.	Exchange Capacity Meq/100g. soil
	Na	K	Ca	Mg			
0-26	6.0	0.5	14.8	2.0	23.3	29	21
26-110	2.6	0.4	18.8	2.0	23.8	13	20
110-200	2.1	0.4	16.6	4.9	24.0	10	21

LABORATORY ANALYSES

Depth (cm)	Soil Particles%				Incorp. Carbonate	pH	
	Coarse sand 2-0.2 mm.	Fine sand 0.2 -0.02 mm.	Silt 0.02 -0.002 mm.	Clay under 0.002 mm.		Soil Paste	1:5 suspension
0-26	16	45	13	26	0.8	8.5	9.7
26-110	17	47	10	26	0.6	7.9	8.5
110-200	19	42	11	28	3.2	8.1	9.1

Vegetation: Nil.

Depth (cm)	E. C. mmhos cm Sat. Ext	Total Nitrogen %	Total Org. Carbon %	Total Extractable	
				Phosphorus Mg/100g. soil	Potassium Mg/100g. soil
0-26	0.6	0.036	0.07	38	720
26-110	5.0	0.026	0.07	53	760
110-200	2.5	0.029	0.10	52	680

Depth (cm)	Soluble Anions m.e. /litre				Soluble Cations m.e. /litre			
	CO ₃	HCO ₃	Cl	SO ₄	Na	K	Ca	Mg
0-26	0.2	4.0	3	-	5	0	1	1
26-110	0	2.0	37	37	40	1	23	7
110-200	0	2.2	25	-	22	1	7	2

Depth (cm)	Exchangeable Cations m.e. %				Total Exch. Cations	E.S.P.	Exchange Capacity Meq/100g. soil
	Na	K	Ca	Mg			
0-26	6.0	0.5	14.8	2.0	23.3	29	21
26-110	2.6	0.4	18.8	2.0	23.8	13	20
110-200	2.1	0.4	16.6	4.9	24.0	10	21

Depth (cm)	Soil Particles%				Incorp. Carbonate	pH	
	Coarse mm.	Fine sand mm.	Silt 0.02 -0.002 mm.	Clay under 0.002 mm.		Soil Paste	1% suspension
<u>SOIL SERIES</u>							
				F 4			
<u>Pit</u>				3464			
<u>Location:</u> Run 832, AP 133, Mosaic E. Sheet 1. West Dongola Plain.							
<u>Topography:</u> Gentle easterly slope, slightly gullied.							
Cultivation and Land Use: Nil							

Location: Run 832, AP 133, Mosaic E. Sheet 1. West Dongola Plain.

Topography: Gentle easterly slope, slightly gullied.

Cultivation and Land Use: Nil.

Vegetation: Nil.

Depth (cm)	mmhos cm	Nitrogen %	Org. Carbon %	Phosphorus Mg/100g. soil	Potassium Mg/100g. soil
Surface: Thin (2 cm.) layer of sand, black and white kankars and quartz pebbles.					
Profile Description:					
0-25	25.0	0.023	0.03	40	800
25-100	12.0	0.029	0.29	44	850
100-200	4.5	0.025	0.08	45	850

2-25 cm.

10 YR 4/2. Silty clay loam. Dry, soft. Weak, coarse sub-angular blocky. Some cracks running up from horizon below. Roots nil. 20% small white calcium carbonate concretions at surface.

25-200 cm.

10 YR 4/2. Silty clay loam. Dry, very hard. Strong, medium angular blocky. Wide (5-10 cms.) vertical cracks often infilled with large patches of 10 YR 4/3 - 5/4 sandy material. Pronounced slickensiding on all joint planes. Gypsum crystals frequent throughout and on the slickenside surfaces. Occasional shells and shell fragments (mainly gastropods).

Depth (cm)	Exchangeable Cations m. e. %				Total Exch. Cations	E. S. P.	Exchange Capacity Meg/100g. soil
	Na	K	Ca	Mg			
0-25	20.0	1.2	41.1	6.0	69.3	50	40
25-100	18.8	1.2	30.1	9.2	59.3	40	47
100-200	16.5	0.8	20.7	10.7	48.7	33	49

LABORATORY ANALYSES

Pit No. 3464

Sample Nos. 31434

31435 31436

Depth (cm)	Soil Particles%				Incorp. Carbonate	pH	
	Coarse sand 2-0.2 mm.	Fine sand 0.2 -0.02 mm.	Silt 0.02 -0.002 mm.	Clay under 0.002 mm.		Soil Paste	1:5 suspension
0-25	4	42	19	35	0.7	8.2	8.5
25-100	5	26	21	48	1.3	7.5	8.3
100-200	7	17	20	56	1.6	8.3	9.2

Vegetation: Nil.

Depth (cm)	E. C. mmhos cm Sat. Ext	Total Nitrogen %	Total Org. Carbon %	Total Extractable	
				Phosphorus Mg/100g. soil	Potassium Mg/100g. soil
0-25	25.0	0.023	0.03	40	800
25-100	12.0	0.029	0.29	44	630
100-200	4.5	0.023	0.06	33	800

infilled with sand. No roots. Frequent kankars.

Depth (cm)	Soluble Anions m. e. /litre				Soluble Cations m. e. /litre			
	CO ₃	HCO ₃	Cl	SO ₄	Na	K	Ca	Mg
0-25	0	1.8	179	171	294	2	33	12
25-100	0	2.4	104	60	116	0	28	16
100-200	0	3.0	22	39	52	0	5	3

10 cm. dropping to 5% at greater depth. Sandy

Depth (cm)	Exchangeable Cations m. e. %				Total Exch. Cations	E. S. P.	Exchange Capacity Meq/100g. soil
	Na	K	Ca	Mg			
0-25	20.0	1.2	41.1	6.0	69.3	50	40
25-100	18.8	1.2	30.1	9.2	59.3	40	47
100-200	16.5	0.8	20.7	10.7	48.7	33	49

SOIL SERIES F 4
Pit No. 6414
Sample Nos. 61236
61237

LABORATORY ANALYSES

SOIL SERIES

F 4

Pit

6414

Location: Run 833, AP 077, Mosaic H, Sheet 2, El Bakri Plain.

Topography: Flat.

Cultivation and Land Use: Nil.

Vegetation: Nil.

Surface: 4 cm. loose sand. Abundant kankars. Frequent fine gravel.

Profile Description:

0-100 cm.

2.5 Y 5/2. Silty clay loam. Dry, slightly hard to hard, weak platiness, becomes more compact with depth and breaks up into moderate medium sub-angular blocky. Frequent vertical cracks infilled with sand. No roots. Frequent kankars. Some fine gravel. Calcium carbonate throughout, but increasing up to 20% in the bottom 10 cm. Some small 60% mottles 10 YR 4/2 - 4/3.

100-200 cm.

Indefinable colouring. Sand - sandstone. Dry, extremely hard, massive. Clean straight cracks. Abundant pores. No roots. Frequent fine gravel and small pebbles. 40% calcium carbonate in top 10 cm., dropping to 5% at greater depth. Sandy clay loam. (2.5 Y 5/2) in spherical hollows.

LABORATORY ANALYSES

Depth (cm)	Soil Particles%				Incorp. Carbonate	pH	
	Coarse sand 2-0.2 mm.	Fine sand 0.2 -0.02 mm.	Silt 0.02 -0.002 mm.	Clay under 0.002 mm.		Soil Paste	1:5 suspension
0-100	12	39	13	36	5.6	8.6	9.8
100-200	13	55	12	20	18.1	8.3	9.2

Depth (cm)	E. C. mmhos cm Sat. Ext	Total Nitrogen %	Total Org. Carbon %	Total Extractable	
				Phosphorus Mg/100g. soil	Potassium Mg/100g. soil
0-100	0.6	0.023	0.21	38	460
100-200	10.5	0.023	-	16	200

Depth (cm)	Soluble Anions m. e. /litre				Soluble Cations m. e. /litre			
	CO ₃	HCO ₃	Cl	SO ₄	Na	K	Ca	Mg
0-100	0	5.6	3.0	-	6	0	1	1
100-200	0	4.2	38.0	107	124	1	12	4

Depth (cm)	Exchangeable Cations m. e. %				Total Exch. Cations	E. S. P.	Exchange Capacity Meq/100g. soil
	Na	K	Ca	Mg			
0-100	6.9	0.6	21.8	4.7	34.0	23	30
100-200	7.8	0.3	13.5	2.5	24.1	65	12

LABORATORY ANALYSES

SOIL SERIES		F 6			Incorp.	pH	
Depth (cm)	Coarse sand	Fine sand	Silt	Clay	Carbonate	Soil Paste	1:5 suspension
Pit	2-0.2 mm.	0.2 -0.02 mm.	0.02 -0.002 mm.	under 0.002 mm.	6392		
Location: El Bakri Plain, Air Photo 105, Mosaic G, Sheet 2.							
0-48	27	21	46	3.5	8.1	8.4	
48-90	10	33	21	36	11.7	8.2	8.6
90-200	5	40	24	31	7.9	8.1	8.6
Topography: Flat							
Cultivation and Land Use: None							
Vegetation: None.							

Surface: Loose, sandy, with abundant kankars and small carbonate concretions. Few pebbles.

Depth (cm)	E.C. mmhos	Total Nitrogen	Total Org. Carbon	Total Extractable	
				Phosphorus Mg/100g. soil	Potassium Mg/100g. soil
	Sat. Ext		%		
0-48 cm.				10 YR 4/1 - 4/2. Silty clay loam, dry, extremely hard. Strong, coarse columnar structure with frequent vertical cracks, often containing sand.	
0-48	12.8	0.0			
48-90	12.6	0.0		Weak platiness. Frequent fine roots and pores. Frequent small carbonate deposits.	
90-200	7.2	0.0			

48-90 cm. 10 YR 4/2. Silt loam, dry, extremely hard.

Depth (cm)	Soluble Anion		Weak, fine platy structure, almost massive in parts. Few cracks. Few rootlets. Many pores. Some carbonate concretions, and deposits. Few small shells.				
	CO ₃	HCO ₃					
0-48	0.2	2.2	119	167	0.4	20	7.5
48-90	0.2	2.0	116	165	0.4	20	8.5
90-200 cm.	0	5.8	58	45	0.4	18	8.7
90-200							

90-200 cm. 10 YR 4/2. Silt loam, dry, extremely hard.

Depth (cm)	Exchangeable				Exch. Cations	E.S.P.	Exchange Capacity
	Na	K	Ca	Mg			Meq/100g. soil
0-48	22.0	1.1	19.9	2.6	45.6	50	4
48-90	16.9	1.1	17.5	2.3	37.8	44	38
90-200	12.2	1.8	16.4	5.5	35.9	34	36

Strong coarse angular blocky structure, massive in parts. Frequent cracks. No roots. Many fine pores. Occasional fine carbonate deposits. Few fine shells. Occasional pebbles.

LABORATORY ANALYSES

Depth (cm)	Soil Particles%				Incorp. Carbonate	pH	
	Coarse sand 2-0.2 mm.	Fine sand 0.2 -0.02 mm.	Silt 0.02 -0.002 mm.	Clay under 0.002 mm.		Soil Paste	1:5 suspension
0-48	6	27	21	46	3.5	8.1	8.4
48-90	10	33	21	36	11.7	8.2	8.6
90-200	5	40	24	31	7.9	8.1	8.6

Surface: Firm dry sand, much gravel and dark rounded calcium

Depth (cm)	E. C. mmhos cm Sat. Ext	Total Nitrogen %	Total Org. Carbon %	Total Extractable	
				Phosphorus Mg/100g. soil	Potassium Mg/100g. soil
0-48	12.8	0.011	0.36	32	192
48-90	12.6	0.017	0.33	42	168
90-200	7.2	0.029	0.63	64	184

Depth (cm)	Soluble Anions m. e. /litre				Soluble Cations m. e. /litre			
	CO ₃	HCO ₃	Cl	SO ₄	Na	K	Ca	Mg
0-48	0.2	2.2	81	119	167	0.4	20	7.5
48-90	0.2	2.0	116	81	165	0.4	20	8.5
90-200	0	5.8	58	48	92	0.4	18	6.7

Depth (cm)	Exchangeable Cations m. e. %				Total Exch. Cations	E.S.P.	Exchange Capacity Meq/100g. soil
	Na	K	Ca	Mg			
0-48	22.0	1.1	19.9	2.6	45.6	50	44
48-90	16.9	1.1	17.5	2.3	37.8	44	38
90-200	12.2	1.8	16.4	5.5	35.9	34	36

Depth (cm)	Soil Particles%				Incorp. Carbonate	pH	
	SOIL SERIES	Fine sand	Silt	Clay		Soil Paste	1:5 suspension
Pit	2-0.2 mm.	0.2 -0.02 mm.	0.02 -0.002 mm.	under 0.002 mm.	F 10 8147		
Location: Run 855, AP 124, Mosaic H, Sheet 2, El Bakri Plain.							
0-26	48	28	8	16	0.4	8.3	9.2
26-94	67	22	3	8	0.2	8.6	9.3
94-200				6	0.2	8.6	9.2
Topography: Flat.							
Cultivation and Land Use: Nil.							
Vegetation: Nil.							

Surface: Firm dry sand, much gravel and dark rounded calcium carbonate concretions. Scattered stones. Thin white platy crust at 1 cm. depth.

Depth (cm)	E. C.		Total Carbon %	Phosphorus Mg/100g. soil	Potassium Mg/100g. soil
	mmho/cm	Sat. Ext			
0-26	0.3	0.026	0.24	0.03	0.03
26-94	0.4	0.038	0.03	0.03	0.03
94-200	0.4	0.038	0.03	0.03	0.03

Profile Description:

0-26 cm. 10 YR 4/2. Sandy loam. Dry, slightly hard.

Weak, medium sub-angular blocky. Few fine

cracks, many fine pores. Roots rare. Infrequent soft calcium carbonate nodules.

26-94 cm. 10 YR 5/2. Sand. Dry, very soft. Structureless, medium sub-angular blocky. Few roots, some old channels filled with loamy sand. No salts.

94-200 cm. 2.5 Y 5/3. Sand. Dry, very soft and loose. Structureless medium sub-angular blocky. No roots. No salts.

Depth (cm)	Soluble Anions		CO ₃	HCO ₃	Mg
	CO ₃	HCO ₃			
0-26	0	3.0	0	3.0	1
26-94	0	3.2	0	3.2	1
94-200	0	3.2	0	3.2	0

Depth (cm)	Exchangeable Cations m.e. %				Total Exch. Cations	E.S.P.	Exchange Capacity Meq/100g. soil
	Na	K	Ca	Mg			
0-26	1.9	0.4	12.5	1.8	16.6	13	15
26-94	1.6	0.2	4.7	0.6	7.1	32	5
94-200	1.6	0	3.6	0.8	6.0	60	2

LABORATORY ANALYSES

SOIL SERIES F 10

PitNo. 8147

Sample Nos. 80451

80452 80453

Depth (cm)	Soil Particles%				Incorp. Carbonate	pH	
	Coarse sand 2-0.2 mm.	Fine sand 0.2 -0.02 mm.	Silt 0.02 -0.002 mm.	Clay under 0.002 mm.		Soil Paste	1:5 suspension
0-26	48	28	8	16	0.4	8.3	9.2
26-94	67	22	3	8	0.2	8.6	9.3
94-200	66	25	3	6	0.2	8.6	9.2

Depth (cm)	E. C. mmhos cm Sat. Ext	Total Nitrogen %	Total Org. Carbon %	Total Extractable	
				Phosphorus Mg/100g. soil	Potassium Mg/100g. soil
0-26	0.3	0.026	0.04	24	280
26-94	0.4	0.038	0.03	15	140
94-200	0.4	0.032	0.07	16	110

Depth (cm)	Soluble Anions m. e. /litre				Soluble Cations m. e. /litre			
	CO ₃	HCO ₃	Cl	SO ₄	Na	K	Ca	Mg
0-26	0	3.0	5	-	2	1	1	1
26-94	0	3.2	4	-	2	0	1	1
94-200	0	3.2	3	-	1	1	1	0

Depth (cm)	Exchangeable Cations m. e. %				Total Exch. Cations	E. S. P.	Exchange Capacity Meq/100g. soil
	Na	K	Ca	Mg			
0-26	1.9	0.4	12.5	1.8	16.6	13	15
26-94	1.6	0.2	4.7	0.6	7.1	32	5
94-200	1.6	0	3.6	0.8	6.0	80	2

LABORATORY ANALYSES

Depth (cm)	Soil Particles%				Incorp. Carbonate	pH	
	SOIL SERIES	Fine sand	Silt	Clay		Soil Paste	1:5 suspension
		0.02	0.002	0.002			
	2-0.2	0.2	-0.002	0.002			
Pit	mm.	-0.02	mm.	mm.	4434		
		mm.					
63-100	Location: Affat Basin, Aerial Photograph 074, Mosaic K. Sheet 3.						
100-200	23	65	6	6	0.4	8.1	7.4
	Topography: Flat.						
	Cultivation and Land Use: Newly sown crop.						

Vegetation: Cleared agricultural land.

Surface: Puddled due to recent irrigation.

Depth (cm)	E.C.	Total Nitrogen	Total Org. Carbon	Total Extractable	
	mmhos		%	Phosphorus Mg/100g. soil	Potassium Mg/100g. soil
	Sat. Ext.				
0-63 cm.			10 YR 3/3 - 4/2.	Fine sandy silty loam, dry	
63-100	0.5	0.04		and slightly hard. Readily moisture absorbent.	
100-200	0.3	0.00		Rather massive but with moderate pore space.	
				Frequent roots. Abundant mica in soil.	
63-100 cm.			10 YR 3/3 - 4/2 with small weak mottles, frequently		
			7.5 YR 5/6 and stronger mottling along the		
			cleavage planes. Fine sandy silty loam, dry and		
			hard but readily moisture absorbent. Medium,		
			coarse angular blocky structure, finer at the top.		
63-100	0.4	4.2	This is a bedded depositional layer with abundant		
100-200	0.2	2.3	mica.	0	3.0
				0.3	1.5
100-200 cm.			10 YR 6/2 is the average colour. Sand, dry and		
			loose. Prominent current bedding. Abundant		
			mica and mafic minerals.		

Depth (cm)	Exchangeable Cations m. e. %				Total Exch. Cations	E.S.P.	Exchange Capacity Meg/100g. soil
	Na	K	Ca	Mg			
63-100	2.1	1.7	17.6	6.6	28.0	8	26.5
100-200	1.1	0.6	4.6	2.3	8.6	14	8.0

(OTE. Sample 41426 was lost in road accident.

LABORATORY ANALYSES

Depth (cm)	Soil Particles%				Incorp. Carbonate	pH	
	Coarse sand 2-0.2 mm.	Fine sand 0.2 -0.02 mm.	Silt 0.02 -0.002 mm.	Clay under 0.002 mm.		Soil Paste	1:5 suspension
63-100	1	47	26	26	2.6	7.8	8.2
100-200	23	65	6	6	0.4	8.1	7.4

Vegetation: *Cyperus rotundus* dominant. *Acacia albida*,

Acacia senegal, *Tamarix* sp.

Depth (cm)	E. C. mmhos cm Sat. Ext	Total Nitrogen %	Total Org. Carbon %	Total Extractable	
				Phosphorus Mg/100g. soil	Potassium Mg/100g. soil
63-100	0.5	0.045	0.99	84	244
100-200	0.3	0.008	0.30	45	96

stained. No salts or unweathered minerals observed.

Depth (cm)	Soluble Anions m.e./litre				Soluble Cations m.e./litre			
	CO ₃	HCO ₃	Cl	SO ₄	Na	K	Ca	Mg
63-100	0.4	4.2	2.5	0	4.0	0.3	2.5	3.0
100-200	0.2	2.3	2.3	0	3.0	0.3	1.5	1.0

Grass roots rare and tree roots occasional.

Depth (cm)	Exchangeable Cations m.e.%				Total Exch. Cations	E.S.P.	Exchange Capacity Meq./100g. soil
	Na	K	Ca	Mg			
63-100	2.1	1.7	17.6	6.6	28.0	8	26.5
100-200	1.1	0.6	4.6	2.3	8.6	14	8.0

NOTE. Sample 41426 was lost in road accident.

LABORATORY ANALYSES

Depth (cm)	Soil Particles%				Incorp. Carbonate	pH	
	<u>SOIL SERIES</u> sand 2-0.2 mm.	fine sand 0.2 -0.02 mm.	Silt 0.02 -0.002 mm.	Clay under 0.002 mm.		Soil Paste	1:5 suspension
					H 1 5400		
0-35	<u>Location:</u> Run 834, AP 084, Mosaic H, Sheet 2, Letti Basin.						8.0
35-85		60	8	28	1.6	7.9	8.6
85-200	<u>Topography:</u> Depression, seasonally flooded. Small undulations.						8.8
	<u>Cultivation and land use:</u> Grazing compound.						

Vegetation: Cyperus rotundus dominant. Acacia albida,
Acacia seyal, Tamarix sp.

Depth (cm)	E. C. cm	Total % Carbon	Total Mg/100g. soil	Total Extractable Potassium Mg/100g. soil
	Sat. Ex.	%		
	<u>Surface:</u> Firm with small irregular cracks.			
	<u>Profile Description:</u>			
0-35	0-35 cm.	0.053	10 YR 3/2 (humus staining concealed when soil	
35-85		0.029	moistened). Silty clay. Dry, hard. Moderate	
85-200		0.026	fine sub-angular blocky. Abundant and small	
			cracks. Abundant root channels strongly iron-	
			stained. No salts or unweathered minerals observed.	

Depth (cm)	CO ₃	HCO ₃	Mg
	35-85 cm.		10 YR 3/2. Silty clay loam. Very slightly moist,
			friable. Massive. Frequent roots becoming
			occasional in the lower part of the horizon. No
0-35	0	5.5	salts or unweathered minerals observed.
35-85	0	5.0	
85-200		5.4	
	85-200 cm.		10 YR 3/2. Silty clay (with occasional patches of
			silty clay loam). Slightly moist, friable, massive.
			Grass roots rare and tree roots occasional.

Depth (cm)	Exchangeable Cations m. e. %				Total Exch. Cations	E.S.P.	Exchange Capacity Meq/100g. soil
	Na	K	Ca	Mg			
0-35	1.2	1.6	21.4	12.2	36.4	3	36
35-85	0.9	1.4	16.4	7.6	26.3	4	23
35-200	3.4	1.2	16.7	11.7	33.0	10	33

LABORATORY ANALYSES

Pit No. 5400

Sample Nos. 51284

51285 51286

Depth (cm)	Soil Particles%				Incorp. Carbonate	pH	
	Coarse sand 2-0.2 mm.	Fine sand 0.2 -0.02 mm.	Silt 0.02 -0.002 mm.	Clay under 0.002 mm.		Soil Paste	1:5 suspension
0-35	4	30	25	41	0.4	7.2	8.0
35-85	4	60	8	28	1.6	7.9	8.6
86-200	5	41	23	31	2.0	7.8	8.8

Depth (cm)	E.C. mmhos cm Sat. Ext	Total Nitrogen %	Total Org. Carbon %	Total Extractable	
				Phosphorus Mg/100g. soil	Potassium Mg/100g. soil
0-35	0.4	0.053	0.42	44	660
35-85	0.4	0.029	0.35	48	780
85-200	0.5	0.026	0.06	36	930

Depth (cm)	Soluble Anions m. e. /litre				Soluble Cations m. e. /litre			
	CO ₃	HCO ₃	Cl	SO ₄	Na	K	Ca	Mg
0-35	0	5.5	3.6	-	5	1	2	2
35-85	0	5.0	2.8	-	6	0	2	1
85-200	0	5.4	2.8	-	5	0	1	1

Depth (cm)	Exchangeable Cations m. e. %				Total Exch. Cations	E.S.P.	Exchange Capacity Meq/100g. soil
	Na	K	Ca	Mg			
0-35	1.2	1.6	21.4	12.2	36.4	3	36
35-85	0.9	1.4	16.4	7.6	26.3	4	23
35-200	3.4	1.2	16.7	11.7	33.0	10	33

LABORATORY ANALYSES

SOIL SERIES H 1

Pit No. 3446

Sample Nos. 31379

31380 31381

Depth (cm)	Soil Particles%				Incorp. Carbonate	pH	
	Coarse sand	Fine sand	Silt	Clay under		Soil Paste	1:5 suspension
	2-0.2 mm.	0.2 -0.02 mm.	0.02 -0.002 mm.	0.002 mm.			
	SOIL SERIES				H 1		
	Pit				3446		
0-50	5	31	31	33	0.7	7.55	8.02
50-100							8.30
100-200	1	43	31	25	0.3	7.98	8.45

Location: Run 834, AP 036, Mosaic D, Sheet 1, Kerma Basin.

Topography: Flat (soil pit site on side of well).

Cultivation and Land Use: Small (15 feddan) pump scheme irrigated from well.

Vegetation: Occasional *Calotropis procera*, also irrigated crops:- wheat, Egyptian beans, "Semar".

Surface: About 10 cm. fine sand.

Depth (cm)	E. C. mmhos		Nitrogen %	Org. %	Total Extractable	
	Sal. Ext				Phosphorus Mg/100g. soil	Potassium Mg/100g. soil
0-50			0.20		60	380
50-100	2.8	0.023	0.31		75	430
100-200	2.1	0.035				

Profile Description:

0-250 cm.

10 YR 4/2 changing to 10 YR 4/2 - 3/2 with depth. Silty clay loam. Dry, hard. Coarse sub-angular blocky tending towards columnar. Cracks present down to 30 cm. and occasionally penetrating to 300-400 cm. Some cracks infilled with sand. Rapidly moisture absorbent. Roots frequent in top 30 cm. becoming occasional to rare below 30 cm.

Depth (cm)	Soluble Anions m.e./litre		Soluble Cations m.e./litre				
	CO ₃	HCO ₃	Ca	Mg	Na	K	Mg
0-50	0	2.6	79	79	1	42	22
50-100	0.4	2.6	14	34	29	7	4
100-200		2.2					

250-400 cm.

10 YR of various values and chroma. Texture varies from coarse sand to silty clay loam. Slightly moist, firm and occasionally soft. Bands of bedded massive material. Rapidly to moderately moisture absorbent. No roots.

Depth (cm)	Exchangeable Cations m.e.%				Total Exch. Cations	E. S. P.	Exchange Capacity Meg/100g. soil
	Na	K	Ca	Mg			
0-50	3.7	1.0	28.2	11.7	44.6	8	44
50-100	6.3	1.2	24.7	10.7	42.9	13	49
100-200	2.8	1.0	22.7	10.6	37.1	9	33

LABORATORY ANALYSES

- 35 -

SOIL SERIES H 1

Pit No. 3446

Sample Nos. 31379

31380 31381

Depth (cm)	Soil Particles%				Incorp. . Carbonate	pH	
	Coarse sand 2-0.2 mm.	Fine sand 0.2 -0.02 mm.	Silt 0.02 -0.002 mm.	Clay under 0.002 mm.		Soil Paste	1:5 suspension
0-50	5	31	31	33	0.7	7.55	8.02
50-100	2	35	30	33	0.3	7.55	8.30
100-200	1	43	31	25	0.3	7.58	8.45

Vegetation: *Cynodon dactylon*.

Depth (cm)	E.C. mmhos cm Sat. Ext	Total Nitrogen %	Total Org. Carbon %	Total Extractable	
				Phosphorus Mg/100g. soil	Potassium Mg/100g. soil
0-50	8.2	0.026	0.20	60	380
50-100	2.8	0.023	0.31	75	430
100-200	2.1	0.035	0.17	75	400

Depth (cm)	Soluble Anions m. e. /litre				Soluble Cations m. e. /litre			
	CO ₃	HCO ₃	Cl	SO ₄	Na	K	Ca	Mg
0-50	0	2.6	72	79	79	1	42	22
50-100	0.4	2.6	14	34	29	2	7	4
100-200	0	3.2	12	21	18	1	10	4

Depth (cm)	Exchangeable Cations m. e. %				Total Exch. Cations	E. S. P.	Exchange Capacity Meq/100g. soil
	Na	K	Ca	Mg			
0-50	3.7	1.0	28.2	11.7	44.6	8	44
50-100	6.3	1.2	24.7	10.7	42.9	13	49
100-200	2.8	1.0	22.7	10.6	37.1	9	33

LABORATORY ANALYSES

Sample Nos. 31382 31384
31383 31385
31386

SOIL SERIES				H 5	Incorp.	pH	
Depth (cm)	Coarse sand	Fine sand	Silt	Clay	Carbonate	Soil Paste	1:5 suspension
Pit	0-0.2 mm.	0.2 -0.02 mm.	0.02 -0.002 mm.	under 0.002 mm.	3447		
Location: Run 834, AP 037, Mosaic D, Sheet 1,, Kerma Basin.							
0-30				31	2.2	7.8	8.5
30-44				46	2.5	7.8	8.4
44-80							
80-137							
137-200							
Topography: Flat, level basin.							
Cultivation and Land Use: Irrigated intensely cultivated area, irrigated by means of a Saghiya.							

Vegetation: Cynodon dactylon.

Surface: Blocky and cracked.

Depth (cm)	E.C. mmhos	Total Nitrogen	Total Org. Carbon	Total Extractable	
				Phosphorus Mg/100g. soil	Potassium Mg/100g. soil
Profile Description:					
0-30 cm. 10 YR 3/2 - 4/2. Silty clay loam. Very slightly moist, firm. Weak columnar and medium sub-angular blocky. Frequent fine cracks. Rapidly moisture absorbent. Frequent roots. No salts or unweathered minerals observed.					
0-30	1.3	0.066			
30-44	0.8	0.070			
44-80	0.6	0.056			
80-137	3.2	0.053			
137-200	4.0	0.029			
30-44 cm. 10 YR 3/1 - 3/2. Silty clay. Moist, plastic, Weak columnar and very weak fine sub-angular blocky. Moderately moisture absorbent. Frequent roots. No salts or unweathered minerals observed.					
44-80 cm. 10 YR 4/2 - 3/2. Silty loam. Moist, firm. Massive though also weakly platy. Rapidly moisture absorbent. Occasional roots. No salts or unweathered minerals observed.					
0-30	0	4.2			
30-44		5.6			
44-80	0.2	4.0			
80-137	0	6.0			
137-200	0	8.4			
80-137 cm. 10 YR 3/2. Silt. Moist, firm. Weak angular blocky. Slowly moisture absorbent. Occasional roots. No salts or unweathered minerals observed.					
137-200 cm. 10 YR 4/2 - 2.5 Y 4/2. Sandy clay loam. Fine lenses of medium to coarse sand between 137-140 cm. Moist, firm to friable. Massive. Slowly moisture absorbent. Occasional to rare roots.					
0-30		1.2			
30-44	4.3	1.4			
44-80	3.6	1.0			
80-137	22.4	1.6			
137-200	31.0	1.0			

SOIL SERIES H5

Pit No. 3447

LABORATORY ANALYSES

Sample Nos. 31382

31384

31383

31385

31386

Depth (cm)	Soil Particles%				Incorp. Carbonate	pH	
	Coarse sand 2-0.2 mm.	Fine sand 0.2 -0.02 mm.	Silt 0.02 -0.002 mm.	Clay under 0.002 mm.		Soil Paste,	1:5 suspension
0-30	6	28	35	31	2.2	7.8	8.5
30-44	1	38	15	46	2.5	7.8	8.4
44-80	1	21	48	30	2.5	8.0	8.8
80-137	1	13	35	51	2.6	8.2	9.1
137-200	2	43	32	23	1.5	7.7	9.0

Depth (cm)	E. C. mmhos cm Sat. Ext	Total Nitrogen %	Total Org. Carbon %	Total Extractable	
				Phosphorus Mg/100g. soil	Potassium Mg/100g. soil
0-30	1.3	0.066	1.06	39	530
30-44	0.8	0.070	0.92	39	900
44-80	0.6	0.056	0.55	40	550
80-137	3.2	0.053	0.12	51	680
137-200	4.0	0.029	0.24	35	530

Depth (cm)	Soluble Anions m. e. /litre				Soluble Cations m. e. /litre			
	CO ₃	HCO ₃	Cl	SO ₄	Na	K	Ca	Mg
0-30	0	4.2	4.4	4	11	1	5	2
30-44	0	5.6	4.0	-	7	2	2	1
44-80	0.2	4.0	3.2	-	6	0	1	1
80-137	0	6.0	7.6	30	36	1	2	-
137-200	0	8.4	16.8	34	52	0	1	1

Depth (cm)	Exchangeable Cations m. e. %				Total Exch. Cations	E. S. P.	Exchange Capacity Meq/100g. soil
	Na	K	Ca	Mg			
0-30	2.9	1.2	22.1	10.5	36.7	8	35
30-44	4.3	1.4	27.0	12.2	44.9	10	41
44-80	3.6	1.0	21.6	13.1	39.3	10	36
80-137	22.4	1.6	16.1	2.0	42.1	59	38
137-200	31.0	1.0	6.5	5.7	44.2	74	42

APPENDIX 3 LABORATORY ANALYSES OF REPRESENTATIVE AND ROUTINE SOIL SAMPLES

Table 3.1 Analyses of 26 Representative Pit Sites

Table 3.2 Analyses of 364 Routine Auger Sites

Lab. Nos.	Pit Nos.	Depth (cm)	Field Tex	pH paste	E.C. mhos/cm at 25°C	Sat. %	Mechanical Analysis			Sol. Na. meq.	Ex. Mg %/100	Total Est. Mg.	E.S.P.	Soil and sand Class
							CS	Sand FS	Silt 0.02-0.002mm	Clay 0.002 mm				
31350	3436	0-79	Sl.Cl. Loam	7.52	0.34	40	8	17	35	40	1.8	2.0	4	F5, 2a
31351		79-104	Sand lm.	7.8	0.30	31	38	57	5	10	0.7	0.8	7	
31352		104-200	Various Sandy	7.9	0.26	30	30	13	1	7	1.1	1.2	16	
31379	3446	0-50	Sl.Cl. Loam	7.32	8.00	59	4	39	37	20	5.9	9.6	29	H ₂ 5as
31380		50-100	"	7.3	2.45	57	8	42	35	15	6.7	8.4	45	
31381		100-200	"	7.4	2.00	45	8	45	30	17	4.0	4.8	23	
31382	3447	0-30	Sl.Cl. Loam	7.69	1.15	64	0	30	40	30	4.0	4.8	13	H ₅ 1
31383		30-44	Sl.Cl.	7.7	0.60	68	0	10	45	45	5.1	5.6	11	
31384		44-80	Sl. Loam	7.8	0.60	60	0	40	18	22	3.47	4.0	16	
31385		80-137	Silt	8.32	3.5	76	0	38	20	42	15.4	18.4	37	
31386		137-200	F.S/Clay Loam	8.45	3.80	64	8	55	27	10	34.06	38.4	34	
31434	3464	0-25	Silty 0.Lm.	8.00	16.80	53	12	38	0	30	12.6	24.8	42	F ₄ 5as
31435		25-100	"	7.60	12.00	65	4	31	13	32	19.1	28.8	60	
31436		100-200	"	8.08	4.50	66	0	33	7	50	13.1	17.6	26	
80451	8147	0-26	SL	8.5	0.42	26	0	18	70	12	1.9	2.0	80	F ₁₀ 4al
80452		-94	S	8.25	0.30	25	52	41	5	5	0.6	1.6	36	
80453		-200	S	8.85	0.40	24	60	35	3	2	1.08	1.2	54	
80490	8161	0-26	SCL	8.30	1.05	39	16	52	7	15	6.7	7.2	45	F ₂ 5a
80491		-110	SL	7.85	4.40	44	40	25	0	15	3.2	5.2	21	
8-492		-200	SL	7.85	3.20	60	24	39	22	15	2.85	4.8	19	

Table 3.1 Laboratory Analyses of Profiles Representative of Mapping Units.

Lab. Nos.	Pit Nos.	Depth (cm)	Field Tex	pH paste	E.C. mmhos/cm at 25°C	Sat. %	Mechanical Analysis				Sol. Na. meq.	Ex. Na. me/100.	Total Ext. Na.	E.S.P.	Soil and land Class
							Sand CS	Sand FS	Silt 0.02-0.002mm.	Clay 0.002 mm					
31350	3436	0-79	Si.Cl.Loam	7.52	0.34	40	8	17	35	40	0.15	1.8	2.0	4	F5, 2h
31351		79-104	Sand Lm.	7.8	0.30	31	28	57	5	10	0.08	0.7	0.8	7	
31352		104-200	Various Sandy	7.9	0.26	30	30	13	1	7	0.08	1.1	1.2	16	
31379	3446	0-50	Si.Cl.Loam	7.32	8.00	59	4	39	37	20	3.70	5.9	9.6	29	H ₂ 5as
31380		50-100	"	7.3	2.45	57	8	42	35	15	1.70	6.7	8.4	45	
31381		100-200	"	7.4	2.00	45	8	45	30	17	0.79	4.0	4.8	23	
31382	3447	0-30	Si.Cl.Loam	7.69	1.15	64	0	30	40	30	0.80	4.0	4.8	13	H ₅ 1
31383		30-44	Si.Cl.	7.7	0.60	68	0	10	45	45	0.51	5.1	5.6	11	
31384		44-80	Sl. Loam	7.8	0.60	60	0	40	38	22	0.53	3.47	4.0	16	
31385		80-137	Silt	8.32	3.5	76	0	38	20	42	3.00	15.4	18.4	37	
31386		137-200	F.S/Clay Loam	8.45	3.80	64	8	55	27	10	4.34	34.06	38.4	34	
31434	3464	0-25	Silty C.Lm.	8.00	16.80	53	12	38	20	30	12.2	12.6	24.8	42	F ₄ 5as
31435		25-100	"	7.60	12.00	65	4	31	33	32	9.68	19.1	28.8	60	
31436		100-200	"	8.08	4.50	66	0	33	17	50	45	13.1	17.6	26	
80451	8147	0-26	SL	8.5	0.42	26	0	18	70	12	0.1	1.9	2.0	80	F ₁₀ 4al
80452		-94	S	8.25	0.30	25	52	41	2	5	0.64	0.6	1.6	38	
80453		-200	S	8.85	0.40	24	60	35	3	2	0.12	1.08	1.2	54	
80490	8161	0-26	SCL	8.30	1.05	39	16	52	17	15	0.49	6.7	7.2	45	F ₂ 5a
80491		-110	SL	7.25	4.50	44	40	25	20	15	1.97	3.2	5.2	21	
80492		-200	SL	7.85	3.20	60	24	39	22	15	1.94	2.86	4.8	19	

Table 3d Laboratory Analyses of Profiles Representative of Mapping Units.

Lab. Nos.	Pit Nos.	Depth (cm)	Field Tex	pH paste	E.C mmhos/cm at 25°C	Sat. %	Mechanical Analysis				Sol. Na. meq.	Ex. Na. me/100.	Total Ext. Na.	E.S.P.	Soil and Land Class
							Sand CS	Sand FS	Silt 0.02-0.002mm.	Clay 0.002 mm					
31494 31495 31496	3488	4-50 50-105 105-200	Si. F.S. Lm. S. Loam Si. Loam	7.5 7.45 7.80	9.00 13.60 9.20	38 34 35	28 20 12	17 63 38	13 7 30	42 10 20	4.6 6.2 4.4	11.0 11.0 14.0	15.6 17.2 18.4	26 100 70	F ₂ 5ast/6ast
31528 31529 31530	3500	0-7 7-28 28-200	Grit Lm. Si. Lm. Si. Lm.	8.55 8.30 7.58	1.05 27.00 0.60	26 46 62	32 8 12	43 57 28	8 20 28	17 15 32	0.49 20.4 0.31	6.3 15.6 2.09	6.8 36.0 2.4	37 100 6	F ₂ 5ast
41269 41270 41271 41284	4377	0-60 60-90 90-115 115-200	SiL SiL S LSiFS/FS	8.20 8.20 8.70 8.65	1.05 0.46 0.50 0.58	52 44 29 38	4 4 56 48	61 69 39 30	21 15 1 15	14 12 4 7	0.78 0.22 0.15 0.38	33.2 8.18 5.4 0.4	34.0 8.4 5.6 0.8	100 58 100 6	F ₂ 5a
41278 41279 41280	4381	0-50 50-100 100-200	SiCL FSSiL FSL	8.10 8.80 7.90	15.00 1.35 5.00	58 59 61	12 4 20	43 49 33	16 30 20	29 17 27	11.60 1.03 4.5	22.0 27.37 17.1	33.6 28.4 21.6	76 100 53	F ₄ 5as
41310 41311 41312 41313	4389	0-28 28-55 55-85 85-200		7.30 8.70 7.90 7.55	0.32 0.24 0.23 0.24	44 41 37 23	16 12 8 28	39 46 80 62	15 12 2 3	30 20 10 7	0.06 0.05 0 0.03	5.5 0.7 1.2 0.17	5.6 1.8 1.2 0.8	18 4 12 02	F ₃ /F ₄ 3a
41380 41381	4410	0-55 55-200	SiFSL S.SL	8.30 7.60	2.20 0.44	31 31	12 8	58 47	16 36	14 9	0.96 0.16	9.0 4.6	10.0 4.8	64 51	F ₂ 5a
41426 41427 41428	4434	0-63 63-100 100-200	FSSiL FSSiL S.	7.50 7.75 7.80	0.40 0.26 0.14	61 68 34	4 0 58	46 33 30	30 30 1	20 27 4	0.08 0.17 0.04	1.1 1.0 1.16	1.2 1.2 1.2	5 4 29	F ₃ 1

Table 3.1

Laboratory Analyses of Profiles Representative of Mapping Units.

Lab. Nos.	Pit Nos.	Depth (cm)	Field Tex	pH paste	E.C. mmhos/cm at 25°C	Sat. %	Mechanical Analysis				Sol. Na. meq.	Ex. Na lie/100.	Total Ext. Na.	E.S.P.	Soil and Land Class
							Sand CS	Sand FS	Silt 0.02-0.002mm.	Clay 0.002 mm					
41449 41450	4441	0-33 33-110	S-SL S	8.00 7.60	0.36 0.26	22 23	60 52	33 38	2 3	6 7	0.08 0.03	0.32 0.37	0.4 0.4	05 05	C ₁ 61
41458 41459 41460 41461	4444	4-24 24-40 40-117 117-160	SiL. SiCL SiL. SiCL FSSil S	9.0 8.85 8.52 8.30	0.70 6.00 36.00 8.00	64 76 70 51	8 8 44 44	20 22 27	30 13 16 1	32 57 14 9	0.72 6.80 40.24 5.8	29.68 52.4 14.16 5.8	30.4 59.2 54.4 11.6	92 92 100 64	F ₂ 5ast
51202 51203	5372	0-98 98-200	Sandy Lm. Sand	7.9 7.5	4.00 0.75	42 25	56 44	14 26	20 2	10 5	1.8 0.13	6.2 0.27	8.0 0.4	62 05	F ₂ 5a
51220 51221	5377	0-12 12-200	Sandy Lm. "	7.7 8.8	0.98 1.05	59 59	4 4	56 24	18 40	22 32	0.45 0.89	1.5 31.9	2.0 32.8	7 99	F ₁ 5a
51263 51264 51265	5392	0-20 20-800 80-200	Sandy Lm. Sandy Clay "	7.48 8.40 8.80	1.40 2.20 4.40	37 60 117	16 44 8	54 24 27	15 15 23	15 17 42	0.23 1.80 7.6	0.97 11.0 10.4	1.2 12.8 18.0	6 64 25	F ₁ 5a
51284 51285	5400	0-35 35-85	Silty Clay Silty Cl. Loam	6.70 7.70	0.34 0.26	59 44	8 8	27 62	25 5	40 25	0.15 0	0.6 2.0	0.8 2.0	2 8	F ₅ 2t
51286		85-200	Silty Clay	7.75	0.32	44	4	44	25	27	0.17	2.2	2.4	8	
51317 51318	5409	0-28 28-200	Silty Clay Loam Silt	8.35 8.00	7.50 8.00	46 53	8 20	50 10	17 30	25 22	4.7 5.2	10.1 11.2	14.8 16.4	40 51	F ₄ 5as
51322 51323 51324 51325	5410	0-8 8-34 34-64 64-200	Silt Loam Silty Clay " "	8.25 8.00 8.70 8.05	0.65 2.10 20.4 11.6	45 47 56 75	20 8 12 4	35 47 33 26	18 20 28 33	27 25 27 37	0.45 0.35 15.9 11.6	4.3 0.8 23.3 14.4	4.8 1.2 39.2 26.0	16 3 87 39	F ₄ 5as

Table 3.1. Laboratory Analyses of Profiles Representative of Mapping Units.

Lab. Nos.	Pit Nos.	Depth (cm)	Field Tex	pH paste	E.C. mmhos/cm at 25°C	Sat. %	Mechanical Analysis			Sol. Na. meq.	Ex. Na. me/100.	Total Ext. Na.	E.S.P.	Soil and land Class
							Sand CS	Sand FS	Silt 0.02-0.002mm.	Clay 0.002 mm				
61038 61039	6321	0-7 7-200	C S	6.9 7.98	0.32 0.20	63 30	24 24	16 71	9 5	51 3	0.34 0	0.96 0.8	2 27	P ₂ 61
61056 61057	6331	0-44 44-200	SiL S	7.88 7.80	0.28 0.22	56 28	12 56	3 39	37 5	48 3	0 0	1.2 1.6	3 53	H ₅
61118 61119	6358	0-15 15-200	LS SiL	7.78 7.70	1.30 0.30	51 50	8 4	50 81	39 4	13 11	0.4 0.06	2.0 2.3	15 21	F ₁ /F ₂ 2
61192 61193 61194	6392	0-48 48-90 90-200	SiCL SiL SiL	7.93 7.80 7.75	14.00 17.4 9.00	64 67 50	24 20 4	16 15 56	17 19 22	43 46 18	12.00 15.00 5.7	13.6 15.4 7.1	31 33 39	F ₆ 5as
61236 61237	6414	0-100 100-200	SiCL SiL	8.08 8.20	1.25 6.00	46 27	12 32	41 53	19 7	28 8	0.74 2.4	10.86 7.2	38 90	F ₄ 5as

TABLE NO. 3.2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol.Na.meq.per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002 mm	Clay ≤ 0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
3414	S 5as	31308	0-45	71	16	13	30.00	20.4	21.2	100
		31309	45-90	37	54	9	0.75	0.43	8.4	93
		31310	90-150				0.65			
3415	P2 5a1	31311	0-45	88	8	4	0.58	0.14	2.2	55
		31312	45-90	93	5	2	0.50	0.07	3.1	100
3416	S 5as	31313	0-45	58	24	18	28.00	16.0	24.0	100
		31314	45-90	83	10	7	8.00	5.1	10.1	100
		31315	90-150				8.50			
3417	S 5as	31316	0-45	83	6	11	8.90	3.6	14.0	100
		31317	45-90	88	4	8	2.80	1.3	9.3	100
		31318	90-150				2.90			
3418	H1 3a1	31319	0-45	41	40	19	0.85	0.15	2.2	12
		31320	45-90	93	5	2	0.95	0.11	1.9	95
		31321	90-150				0.40			
3419	C4 5as1	31322	0-50	81	12	7	9.50	3.24	9.5	100
		31323	50-100	68	21	11	0.55	0.19	0.2	21
		31324	100-200				0.60			
3420	C2 61	31325	0-50	91	5	4	0.46	0.07	1.5	37
3421	H4 41	31326A	0-16	26	20	54	2.80	1.53	8.1	15
		31328B	16-50	91	5	4	0.34	0.11	1.5	37
		31327	50-100				0.40			
3422	C2 61	31328	0-50	91	7	2	0.28	0.08	1.1	55

TABLE NO. 3.2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol. Na meq. per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay ≤ 0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
3423	H5 41	31329A	0-32	23	18	59	0.32	0.08	1.5	2
		31329B	32-50	91	7	2	0.36	0.16	0.6	30
3424	H 31	31330	0-50	58	25	17	1.40	0.35	1.2	7
3425	C2 61	31331	0-50	93	5	2	4.50	1.03	3.0	100
3426	P4 5a1	31332	0-50	81	11	8	0.48	0.12	3.1	39
3427	H1 21	31333	0-50	36	35	29	0.50	0.13	0.47	2
		31334	50-100	81	12	7	0.45	0.5	1.1	
3428	H1 3a	31335	0-50	43	23	34	0.46	0.06	3.9	11
		31336	50-100	73	18	9	0.36	0.05	1.5	17
		31337	100-145				0.40			
3429	H7 3h	31338A	0-20	18	28	54	0.28	0.07	2.3	4
		31338B	20-50	86	5	9	0.25	0.13	2.27	25
3430	H2 5a	31339	0-50	51	20	29	1.90	1.09	31.3	100
		31340	50-100	56	31	13	2.60	2.0	38.0	100
3431	H8 5a	31341A	0-30	26	22	52	3.00	1.94	11.3	22
		31341B	30-50	68	23	9	0.46	0.11	1.5	17
3432	H3 41	31342A	0-10	43	30	27	0.38	0.13	1.47	5
		31342B	10-50	86	7	7	0.34	0.18	2.22	32
3433	H7 41	31343A	0-20	21	15	64	0.80	0.28	3.72	4
		31343B	20-50	93	3	4	0.22	0.04	1.5	37

TABLE NO. 3.2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol.Na.meq.per 100g.	Exch. Na meq.per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay ≤0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
3434	H1 3a	31344	0-50	57	20	23	1.20	0.40	2.8	12
		31345	50-100	24	31	45	3.80	2.32	8.5	19
		31346	100-200				3.40			
3435	H5 3h	31347	0-50	9	41	50	2.80	0.85	4.7	9
		31348	50-100	54	13	33	3.00	1.3	3.9	12
		31349	100-200				6.50			
3436	H1 1	31353	0-50	47	23	30	0.36	0.15	1.4	5
		31354	50-100	49	21	30	0.32	0.12	2.3	8
		31355	100-200				0.48			
3437	H2 5a	31356	0-50	39	26	35	1.12	0.60	11.0	31
		31357	50-100	24	43	33	1.80	0.86	36.1	100
		31358	100-200				1.52			
3438	H1 2a	31359	0-50	49	28	23	0.65	0.17	3.0	13
		31360	50-100	7	28	65	4.50	3.84	7.4	11
		31361	100-170				3.90			
3439	C3 51t	31363	0-50	79	11	10	0.70	0.19	1.4	14
3440	H5 2a	31362	0-50	34	21	45	7.00	2.86	4.3	9
		31364	50-100	24	36	40	0.46	0.09	1.9	5
3441	F2 6ast	31365	0-50	46	33	21	6.60	4.30	42.1	100
		31366	50-100	54	34	12	0.57	0.25	12.1	100
		31367A	10-150				0.52			
		31367B	150-200				0.50			

TABLE NO. 3.2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol. Na. meq. per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay ✓ 0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
3442A	H2 5ad	31368	0-50	59	27	14	0.50	0.18	2.2	16
		31369	50-100	56	26	18	1.20	0.57	2.6	14
		31370	100-140				0.38			
3442 B	H5 3h	31371	0-50	9	44	47	0.33	0.09	3.9	8
		31372	50-100	74	9	17	0.46	0.04	0.7	4
3443	H1 2a	31373	0-50	19	42	39	0.75	0.16	2.2	6
		31374	50-100	59	17	24	0.50	0.11	3.9	16
3444	C4 5a1	31375	0-50	86	7	7	0.34	0.12	3.1	44
3445	H2 5a	31376	0-50	59	22	19	1.36	0.51	14.7	77
		31377	50-100	41	37	22	0.95	0.36	15.6	70
		31378	100-200				0.65			
3446	F2 5as									
3447	H1 3a	31387	0-50	21	47	32	0.95	0.52	4.3	13
		31388	50-100	31	37	32	0.65	0.24	12.5	35
		31389	100-200				3.40			
3448	H2 5a	31390	0-50	34	37	29	0.78	0.34	7.6	26
		31391	50-100	84	7	9	3.10	0.98	2.2	24
		31392	100-200				0.80			
3449	F4 5as	31393	0-50	30	39	31	7.00	5.3	18.7	60
		31394	50-100	30	42	28	3.60	3.0	18.6	66
		31395	100-200				1.50			

TABLE NO. 3.2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol.Na.meq.per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay ✓ 0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
3450	F4 5as	31396	0-50	36	32	32	15.00	6.44	9.2	29
		31397	50-100	51	22	27	9.00	6.10	17.9	66
		31398	100-200				9.00			
3451	F4 5as	31399	0-50	39	42	19	9.20	3.94	6.9	36
		31400	50-100	64	17	19	7.00	3.60	8.4	44
		31401	100-200	91	5	4	7.00	0.11	2.	57
3452	F2 5at	31402	0-50	66	15	19	3.20	1.90	10.9	57
		31403	50-100	38	21	41	8.50	5.2	13.	32
3453	F4 5as	31403	0-50	60	24	16	9.50	5.20	12.4	77
		31404	50-100	49	32	19	2.15	1.62	17.2	90
		31405	100-200	42	31	27	4.80	10.0	17.	64
		31406	50-100	42	21	37	3.60	3.1	15.	46
3454	F4 5as	31406	0-50	46	27	27	9.00	4.3	10.1	37
		31407	50-100	36	40	24	11.60	7.4	11.0	46
		31408	100-200	62	19	19	8.50	4.7	12.	64
		31409	100-200				5.00			
3455	F4 5as	31409	0-50	41	37	22	6.20	3.4	10.2	46
		31410	50-100	69	19	12	4.60	2.7	8.5	71
		31411	100-200	27	24	49	3.80	5.4	15.	31
		31412	100-200				3.10			
3456	F4 5as	31412	0-50	56	27	17	5.40	3.35	13.4	79
		31413	50-100	41	25	34	5.80	4.1	10.3	30
		31414	100-200	42	31	27	1.30	0.15	1.8	7
		31415	100-200				0.50			
3457	F4 5as	31415	0-50	64	19	17	9.00	5.5	8.1	48
		31416	50-100	59	24	17	8.80	4.8	14.4	85
		31417	100-200	64	19	17	5.80	0.13	2.3	34
		31418	100-200				1.05			

TABLE NO. 3.2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol.Na.meq.per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay 0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
3458	F4 5a	31418	0-50	48	41	11	1.30	0.41	14.8	100
		31419	50-100	46	32	22	4.20	1.2	3.6	16
		31461	100-200				0.38			
3459	C2 61	31420	0-20	89	4	7	2.50	0.45	3.5	50
		31421	20-50	94	4	2	4.00	1.26	1.9	95
		31463	50-100	54	28	18	0.34	0.07	1.1	6
3460	C2 61	31422	0-50	91	5	4	1.05	0.11	2.3	57
3461	F6 5as	31423	0-50	37	21	42	12.00	7.1	15.3	36
		31424	50-100	38	21	41	8.50	5.2	13.2	32
		31425	100-120				5.00			
3462	F4 5as	31426	0-50	42	31	27	12.00	10.0	17.2	64
		31427	50-100	42	21	37	3.60	3.1	16.9	46
		31469A	0-30	39	37	23	0.48	0.05	1.5	7
3463	F4 5as	31428	0-50	49	24	27	10.00	7.5	21.3	79
		31429	50-100	62	19	19	7.00	4.7	12.1	64
		31430	100-200				5.00			
3464	F4 5as	31431	0-50	35	32	33	16.00	9.5	14.5	44
		31432	50-100	27	24	49	9.00	5.4	15.0	31
		31433	100-200				3.10			
3472	H1 1	31473	0-50	42	28	30	1.40	0.85	1.1	10
		31453	0-50	24	44	32	1.05	0.14	1.5	5
		31454	50-100	42	31	27	0.80	0.15	1.8	7
3473	F1 1	31455	100-200	64	18	18	0.50	11.5	1.1	100
		31456	0-50	54	27	19	0.46	0.13	0.7	4
		31457	50-100	64	19	17	0.48	0.13	2.3	14
		31458	100-200	41	16	13	1.05	10.02	1.0	100
		31479					9.00			

TABLE NO. 3.2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol.Na.meq.per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002 mm	Clay ≤0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
3474	H1 1	31459	0-50	52	21	27	0.36	0.06	0.7	13
		31460	50-100	46	25	29	0.40	0.14	1.5	5
		31461	100-200				0.38			
3475	H1 1	31462	0-50	29	34	37	0.70	0.06	3.9	11
		31463	50-100	54	28	18	0.34	0.07	1.1	6
		31464	100-200				0.55			
3476	H3 4lt	31465	0-28	59	21	20	0.30	0.10	1.5	7
		31466	28-50	94	1	5	0.22	0.0	1.6	32
3477	H3 4lt	31467	0-16	67	18	15	0.38	0.04	0.7	5
		31468	16-50	94	3	3	0.18	0	0	
3478	H1 1	31469A	0-30	39	37	23	0.46	0.05	1.5	7
		31469B	30-50	44	33	23	0.50	0.10	1.1	5
		31470	50-100				0.60			
3479	C4 5alt	31471	0-50	84	6	10	8.00	2.62	5.4	54
3480	F2 5ast	31472	0-50	74	13	13	14.00	8.5	22.7	100
3481	F3 3	31473	0-50	42	28	30	1.40	0.85	3.1	10
3482	F2 5alt	31474	0-50	84	6	10	5.00	1.95	6.0	60
		31475	50-100	64	18	18	14.00	11.5	26.1	100
		31476	100-200				6.40			
3483	F2 5as	31477	0-50	44	41	15	18.80	15.2	32.0	100
		31478	50-100	41	46	13	12.00	10.02	30.0	100
		31479					9.00			

TABLE NO. 3.2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol. Na meq. per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay <0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
3484	F2 5as	31480	0-50	67	20	13	9.00	5.1	26.9	100
		31481	50-100	47	35	18	18.00	11.7	192.7	100
		31482	100-200				8.00			
3485	F2 5as	31483	0-50	66	18	16	9.20	4.7	33.7	100
		31484	50-100	31	38	31	29.10	22.2	29.0	94
		31485	100-200				12.00			
3486	C4 4cl	31486	0-50	84	8	8	0.58	0.23	1.4	17
		31487	50-100	87	3	10	0.33	0.33	2.5	25
3487	F2 5as	31488	0-50	69	21	10	21.00	9.66	30.3	100
		31489	50-100	78	16	6	21.00	12.00	20.0	100
		31490	100-200				19.00			
3488	F2 5ast	31491	0-50	72	18	10	11.4	0.10	10.3	100
		31493	50-100	79	11	10	18.0	8.7	7.3	73
		31494	100-200				11.8			
3489	F4 5ast	31497	0-50	59	21	20	20.0	12.5	15.5	77
		31498	50-100	49	23	28	21.3	13.0	23.2	94
		31499	100-200				14.4			
3490	F3 31t	31500	0-50	49	31	20	0.44	0.14	2.3	11
		31501	50-100	84	8	8	2.3	0.61	2.2	29
		31502	100-200				4.0			
3491	F2 5ast	31503	0-50	79	11	10	23.2	5.2	11.6	100
		31504	50-100	62	23	15	14.7	7.2	21.6	100
		31505	100-200				10.0			

TABLE NO. 3.2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol. Na meq. per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay <0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
3492	F2 5ast	31506	0-50	59	21	20	8.8	3.86	8.9	44
		31507	50-100	42	27	31	29.4	16.5	36.3	100
		31508	100-200				20.10			
3493	F2 5ast	31509	0-50	52	29	19	24.00	13.3	36.3	100
		31510	50-100	35	25	40	23.2	14.2	34.6	86
		31511	100-200				11.4			
3494	C1 61	31512	0-50	92	4	4	0.8	0.19	3.8	95
3495	F2 5as	31513	0-50	65	24	11	6.0	3.4	13.8	100
		31514	50-100	25	68	7	21.0	6.4	6.8	97
		31515	100-200				8.0			
3496	F2 5ast	31516	0-50	68	21	11	32.0	22.2	32.2	100
		31517	50-100	70	19	11	12.8	7.2	23.2	100
3497	F2 5ast	31518	0-50	50	34	16	13.6	8.74	26.1	100
		31519	50-90	46	36	18	31.0	21.6	50.4	100
3498	F2 5ast	31520	0-50	58	29	13	30.0	20.0	39.2	100
		31521	50-100	50	34	16	37.6	17.3	49.9	100
		31522	100-200				28.2			
3499	F2 5ast	31523	0-50	77	9	14	24.0	9.6	6.4	46
		31524	50-100	87	4	9	29.4	7.2	4.8	53
3500	F2 5ast	31525	0-50	72	17	11	36.0	19.7	25.9	100
		31526	50-100	40	30	30	4.8	3.5	25.3	84
		31527	100-200				1.8			

TABLE NO. 3.2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol.Na.meq.per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay ✓ 0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
4375	F2 5a	41260	0-50	73	11	16	1.00	0.42	3.18	20
		41261	50-100	80	9	11	0.80	0.25	4.5	41
		41262	100-200				0.75			
4376	F2 5as	41263	0-45	63	19	18	6.50	4.50	12.7	71
		41264	45-90	73	19	8	0.65	0.44	10.76	100
		41265	90-150				0.36			
4377	F2 5as	41266	0-50	55	27	18	9.00	6.40	19.2	100
		41267	50-100	70	19	11	0.68	0.43	9.17	83
		41268	100-200				0.65			
4378	F10 5a	41285	0-15	70	19	11	1.80	0.56	1.8	16
		41286	50-100	75	12	13	0.60	0.08	0.7	5
4379	F12 6a1	41287	0-30	92	5	3	1.05	0.21	1.4	47
		41288	30-50	73	16	11	0.55	0.24	6.96	63
		41289	55-100				1.30			
		41290	100-130				0.70			
4380	F1 1	41272	0-50	73	14	13	0.75	0.01	1.59	12
		41273	50-100	73	16	11	0.55	0	0.80	7
		41274	100-200				0.50			
4381	F8 5as	41275	0-45	28	14	58	13.00	10.2	27.4	47
		41276	45-90	45	24	31	4.60	4.6	25.8	83
		41277	90-150				0.95			
4382	H2 3a	41281	0-45	43	34	23	0.70	0.4	4.0	17
		41282	45-90	63	21	16	0.46	0.2	3.4	21
		41283	90-150				0.40			

TABLE NO. 3.2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol.Na.meq.per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay ≤ 0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
4383	C6 61	41291	0-50	93	1	6	0.70	0.2	2.2	37
		41292	50-100	53	26	21	1.00	0.4	2.8	13
		41293	100-200	70	7	23	0.78	0.73	2.87	100
4384	F2 5a	41294	0-50	68	24	8	1.60	0.62	6.2	77
		41295	50-100	75	14	11	0.85	0.60	3.4	31
		41296	100-200	35	37	28	0.52	7.5	2.5	100
4385	F9 3a1	41297	0-15	70	12	18	0.98	0.24	1.36	7
		41298	50-100	95	2	3	0.25	0.04	0.76	25
4386	F1 31t	41299	0-50	73	19	8	0.75	0.06	1.1	14
		41300	50-100	83	11	6	0.38	0.04	0.76	13
4387	H2 5a	41301	0-50	55	29	16	1.55	0.45	6.7	42
		41302	50-100	58	29	13	1.15	0.63	8.2	63
		41303	100-200				2.20			
4388	F2 5a	41304	0-50	55	29	16	0.72	0.20	3.0	19
		41305	50-100	60	29	11	0.70	0.07	1.5	14
		41306	100-200				0.64			
4389	F3 31	41307	0-50	50	19	31	0.33	0.06	0.7	2
		41308	50-100	83	6	11	0.28	0.09	0.7	6
		41309	100-200				0.20			
4390	F9 31	41314	0-25	60	14	26	1.80	0.42	1.6	6
		41315	50-100	95	2	3	0.32	0.03	0.37	12
4391	H7 31st	41316	0-15	35	17	48	6.10	6.00	2.4	5
		41317	50-100	93	4	3	0.20	0	0.4	13

TABLE NO. 3.2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol.Na.meq.per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002 mm	Clay ≤ 0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
4392	F4 5as	41318	0-50	45	22	33	6.00	5.74	23.45	71
		41319	50-100	70	7	23	2.32	0.73	24.87	100
		41320	100-200				1.50			
4393	H2 5as	41321	0-50	35	29	36	2.60	2.3	22.9	64
		41322	50-100	35	37	28	6.80	7.5	28.5	100
		41323	100-200				7.70			
4394	C4 6asl	41324	0-50	88	6	6	16.0	3.70	4.3	72
4395	F1 2a	41325	0-50	53	31	16	1.4	0.56	1.0	6
		41326	50-100	70	12	18	0.4	0.01	2.79	15
		41327	100-200				6.8			
4396	F3 3a	41328	0-50	48	24	28	0.95	0.33	3.67	13
		41329	50-100	48	24	28	1.70	1.05	7.7	27
		41330	100-200				1.10			
4397	P2 5a	41331	0-50	90	4	6	0.27	0.04	1.16	19
		41332	50-100	93	4	3	0.22	0.03	0.77	26
		41333	100-200				0.24			
4398	P1 61	41334	0-50	90	4	6	0.36	0.04	0.36	6
		41335	50-100	90	4	6	0.24	0.10	0.3	5
		41336	100-200				0.24			
4408	P1 /P2 3a/3a	41357	0-50	48	39	13	1.05	0.39	3.2	29
		41358	50-100	59	31	10	4.20	2.58	9.4	36
		41359	100-200				3.40			

TABLE NO. 3.2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol.Na.meq.per 100g.	Exch. Na meq.per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay <0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
4399	F9 4alt	41337	0-10	48	21	31	0.78	0.25	1.3	4
		41338	50-100	93	1	6	0.14	0.04	1.16	19
4400	C1 6lt	41339	0-50	90	4	6	0.38	0.07	0.7	12
		41340	50-100	93	1	6	0.17	0.06	0.7	12
4401	C2 6l	41341	0-50	95	2	3	0.44	0.11	0.69	23
4402	P1 6lt	41342	0-50	90	4	6	0.25	0.04	0.76	13
4403	C1 6l	41343	0-6	73	6	21	0.72	0.15	1.4	7
			50-100	93	1	6	0.20	0.04	0.36	6
Pump scheme	S 5as	J.100	0-20	20	34	46	29.4	10.5	24.7	54
4404	H2 5at	41345	0-50	70	9	21	1.2	0.84	21.16	100
		41346	50-100	60	24	16	3.2	3.04	36.96	100
		41347	100-150				4.0			
4405	P1 3al	41348	0-8	55	9	36	0.8	0.40	2.8	8
		41349	50-100	90	2	8	1.15	0.51	2.3	29
4406	P2 6lt	41350	0-50	93	1	6	2.2	0.85	2.7	45
		41351	50-100	88	4	8	1.35	0.53	11.87	15
		41352	100-160				1.1			
4407	F2 5as	41354	0-50	68	14	18	15.6	12.00	22.8	100
		41355	50-100	63	19	18	7.2	5.48	28.1	100
		41356	100-200				2.2			
4408	F1 /F2 3a/5a	41357	0-50	48	39	13	1.05	0.39	3.2	25
		41358	50-100	59	31	10	4.20	2.58	9.0	90
		41359	100-200				3.40			

TABLE NO. 3.2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol.Na.meq.per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay ≤ 0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
4409	F1 2	41360	0-50	60	26	14	1.60	0.44	0.36	3
		41361	50-100	49	35	16	0.80	0.30	3.3	21
		41362	100-200				0.75			
4410	F2 5a	41377	0-50	65	19	16	2.00	0.98	7.8	49
		41378	50-100	82	9	9	0.60	0.14	3.06	34
		41379	100-200				0.36			
4421	F7/78	41339	0-50	34	18	48	1.60	1.13	10.4	22
4411	C1 6L	41363	0-20	92	2	6	0.44	0.03	0.77	13
		41364	50-100	95	1	4	0.75	0.03	0.17	29
4412	C2 6L	41366	0-50	92	4	4	0.32	0.04	1.16	29
		41367	50-100	92	4	4	0.62	0.04	2.76	69
4423	F6 5a	41383	0-50	42	23	35	7.5	4.9	24.7	21
4413	C4 4L	41368	0-50	82	12	6	1.35	0.05	1.95	32
		41369	50-90	90	4	6	0.38	0	3.2	53
4414	F2 5a	41370	0-50	57	29	14	3.20	2.13	9.87	70
		41371	50-100	55	31	14	2.80	1.87	11.7	84
		41372	100-200				2.40			
4415	O2 6L	41373	0-50	95	1	4	0.40	0.01	0.79	20
		41397	50-100	57	22	21	0.52	0.02	9.1	44
4416	F1/F2 3a/5a	41374	0-50	67	12	21	0.37	0.0	4.0	19
		41375	50-100	70	16	14	0.50	0.18	6.6	47
		41376	100-200	67	12	21	0.52	0	1.6	8
4426	F2 2a	41403	50-100	57	27	16	0.18	0.1	4.3	27
4417	C1 6LT	41382	0-60	92	2	6	0.10	0.11	0.50	8
4418	F1 3L	41383	8-50	74	16	10	1.35	0.05	0.3	3
		41384	50-100	90	4	6	0.48	0	0.4	7
		41406	50-100	45	33	22	1.25	0.43	3.1	14
4427		41407	100-200				0.32			

TABLE NO. 3.2

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Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol.Na.meq.per 100g.	Exch. Na meq.per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay <0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
4419	F1 3L	41385A	0-15	82	4	14	1.40	0.03	1.57	11
		41385B	15-50	85	6	9	2.10	0.75	2.0	22
		41386	50-90				2.90			
4420	F2 5a	41387	0-50	72	16	12	1.80	0.73	3.67	31
		41388	50-95	60	34	6	1.00	0.34	4.86	81
4421	F7/F8 3a/5a	41389	0-50	34	18	48	1.60	1.13	10.47	22
		41390	50-100	24	28	48	2.40	2.13	14.67	31
		41391	100-200				1.75			
4422	F4 5as	41392	0-50	40	51	9	14.4	2.4	9.2	100
4423	F6 5as	41393	0-50	42	23	35	7.5	4.9	24.7	71
		41394	50-100	34	37	29	5.4	3.34	11.46	40
		41395	100-200				6.0			
4424	F4 5as	41399	0-50	55	19	26	6.8	5.6	11.6	45
		41400	50-100	52	14	34	6.0	3.92	9.68	28
		41401	100-200				7.0			
4425	F3 2a	41396	0-50	57	14	29	0.36	0.01	1.99	7
		41397	50-100	57	22	21	0.52	0.02	9.18	44
		41398	100-200				1.50			
4426	F1 2a	41402	0-50	67	12	21	0.29	0	1.6	8
		41403	50-100	57	27	16	0.48	0.1	4.3	27
		41404	100-200				1.02			
4427		41405	0-50	55	29	16	0.36	0	1.2	7
		41406	50-100	45	33	22	1.25	0.43	3.17	14
		41407	100-200				0.32			

TABLE NO. 3.2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol.Na.meq.per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002 mm	Clay ≤0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
4428	H1 3L	41408	0-50	72	11	17	0.34	0	1.6	9
		41409	50-100	60	23	17	0.42	0	1.2	7
		41410	100-200	90	5	5	0.32	0.41	6.8	100
		41435	50-100				3.80			
4429	F3 2t	41411	0-50	35	33	32	1.05	0.3	0.5	2
		41412	50-100	17	43	40	0.42	0	1.6	4
		41413	100-200	67	21	12	0.43	8.26	14.5	100
4430	F11 3lt	41414	0-50	72	13	15	0.62	0	0.8	5
		41415	50-100	50	28	22	0.42	0	2.4	11
		41416	100-200				0.60			
4431	F1 2t/3t	41417	0-50	67	16	17	0.38	0	1.2	7
		41418	50-100	72	13	15	0.44	0.05	6.3	42
		41419	100-200				0.82			
4432	F5 2t	41420	0-50	37	19	44	0.46	0	1.6	4
		41421	50-100	34	34	32	0.30	0	1.2	4
		41422	100-200				0.38			
4433	H1 2t	41423	0-50	30	35	35	0.65	0.08	1.1	3
		41424	50-100	75	10	15	0.46	0	1.2	8
		41425	100-200				0.38			
4434	H1 1	41451	0-50	92	2	6	0.46	0.06	1.5	25
		41429	0-50	47	36	17	0.44	0.01	0.79	5
		41430	50-100	62	18	20	0.24	0.01	1.99	10
		41431	100-200	87	2	11	0.59	0.29	2.5	25
4435	C2 6lt	41454	50-100	87	4	9	1.85	0.63	2.5	29
		41432	0-50	95	3	2	0.24	0.07	0.7	35
		41433	50-100	95	3	2	0.30	0.06	1.1	55
		41456	50-100	70	14	16	35.50	25.50	43.4	100
		41457	100-200				22.50			

TABLE NO. 3.2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol.Na.meq.per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay ✓ 0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
4436	F2/F10 4a1	41434A	0-30	62	23	15	2.50	1.06	4.9	33
		41434B	30-50	90	5	5	0.85	0.41	6.0	100
		41435	50-100				3.80			
4437	F2 5as	41436	0-50	61	18	21	27.00	15.24	21.56	100
		41437	50-80	67	21	12	14.40	8.26	14.5	100
4438	F2 3/4a	41438	0-50	71	14	15	6.40	1.94	5.26	35
		41439	50-100	70	13	17	8.00	3.62	18.8	100
		41440	100-200				4.20			
4439	F3/F5 1/2	41441	0-50	42	23	35	0.57	0.25	1.7	5
		41442	50-100	27	36	37	1.60	1.02	6.8	17
		41443	100-200				1.12			
4440	F3 1	41444	0-50	58	16	26	0.38	0.01	1.19	5
		41445	50-100	45	21	34	0.52	0.19	1.4	4
		41446	100-200				0.46			
4441	C1 61	41447	0-50	92	2	6	0.42	0.07	1.1	18
		41448	50-100	95	1	4	0.30	0.03	2.37	59
4442	C2 6L	41451	0-50	92	2	6	0.48	0.06	1.5	25
		41452	50-100	92	4	4	0.33	0.07	1.5	37
4443	C4 4L	41453	0-50	87	2	11	1.10	0.29	2.9	26
		41454	50-100	87	4	9	1.85	0.63	2.57	29
4444	F2 5ast	41455	0-50	44	19	37	3.60	2.80	20.4	55
		41456	50-100	70	14	16	35.50	25.50	43.4	100
		41457	100-200				22.50			

TABLE NO. 3.2

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Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol. Na meq. per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay <0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
4445	C4 4L	41462	0-50	87	4	9	13.0	13.2	4.8	53
		41463	50-100	79	5	16	7.8	3.1	7.3	46
		41464	100-200				12.0			
4446	F12 3L	41465A	0-15	92	3	5	0.34	0.11	6.29	100
		41465B	15-50	64	12	24	2.30	0.81	3.2	13
		41466	50-100	77	9	14	7.00			
		41467	100-200				3.10			
4447	F4 5as	41468	0-50	44	30	26	16.00	9.9	6.5	25
		41469	50-100	57	16	16	7.00	2.8	7.2	45
		41470	100-150				18.6			
4448	F11 3L	41471	0-50	84	7	9	0.34	0.05	1.1	12
		41472	50-100	77	4	19	0.46	0.16	1.8	9
		41473	100-200				1.35			
4449	F4 5as	41474	0-50	49	20	31	21.00	10.5	16.7	54
		41475	50-100	54	20	26	23.40	13.5	13.3	51
		41476	100-200				24.60			
4450	F2 5as	41477	0-50	52	32	16	14.00	4.24	4.56	28
		41478	50-100	77	4	19	17.40	7.92	2.90	15
		41479	100-200				15.20			
4451	F12 5as	41480A	0-20	94	2	4	1.15	0.32	0.88	22
		41480B	20-50	54	8	38	9.20	4.94	9.46	25
		41481	50-100	58	19	23	2.20			
		41482	100-200				8.80			
4452	F4 5as	41483	0-50	54	20	26	32.00	12.52	10.3	40
		41484	50-100	53	13	34	28.00	14.4	12.4	36
		41485	100-200				22.50			

TABLE NO. 3.2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol.Na.meq.per 100g.	Exch. Na meq.per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay ≤0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
4453	F2 5as	41486	0-50	59	20	21	25.60	12.0	11.2	53
		41487	50-100	54	20	26	21.60	11.4	13.8	53
		41488	100-200				18.00			
4454	F2/F4 5as	41489	0-50	66	9	25	35.00	15.0	14.2	57
		41490	50-100	59	18	23	28.00	11.68	12.7	55
		41491	100-200				29.70			
4455	F2 5as	41492	0-50	62	15	23	33.00	10.38	18.4	80
4456	C4 4L	41493	0-50	89	8	3	0.65	0.92	1.1	37
		41494	50-100	87	7	6	2.60	0.33	7.67	100
5358	H1 2a	51170	0-50	57	23	20	0.52	0.10	1.5	8
		51171	50-100	82	8	10	0.32	0.14	0.26	3
		51172	No sample taken							
5359	H2 5a	51173	0-50	74	14	12	0.60	0.20	2.2	18
		51174	50-100	82	8	10	0.68	0.20	2.6	26
		51175	100-200				0.79			
5360	H1 2a	51176	0-50	62	18	20	1.40	0.57	1.4	7
		51177	50-100	54	29	17	1.15	0.35	0.8	5
		51178	100-200				0.58			
5361	F1 2a	51179		69	19	12	0.42	1.16	1.0	8
		51180		67	21	12	0.60	0.33	1.67	14
		51181					0.68			
5362	F2 5a	51182		37	41	22	7.80	4.8	7.6	35
		51183		50	33	17	4.00	2.0	4.8	28
		51184					3.40			

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol.Na.meq.per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay ✓ 0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
5363	F2 5a	51185	0-50	70	21	9	3.4	2.5	20.7	100
		51186		85	8	7	0.98	0.48	6.70	96
5374	H7 41	51187	0-12	35	16	49	0.65	3.90	6.9	14
5364	C2 6alt	51188	0-50	90	6	4	1.35	0.33	0.87	22
		51212	50-100	75	15	10	0.50	0.13	1.47	35
5365	H1 1	51189	5-32	28	38	34	0.36	0.18	0.6	2
		51190	No sample taken							
5376	P3 41	51214	0-50	73	12	15	1.02	0.23	2.17	14
5367	P1 61	51191	0-5only	68	10	22	0.41	0.1	1.5	7
		51216	00-200				2.30			
5368	S 5as	51192	0-50	38	33	29	10.8	9.8	47.8	100
5381	H2 4a1	51193	50-100	33	8	59	1.9	0.94	46.26	78
		51194	100-200				1.25			
5382	P3 2a	51233	0-50	40	40	20	1.05	0.21	0.4	3
5369	H4 5as	51195	0-50	83	8	9	0.28	0	3.2	36
		51196	50-100	75	16	9	0.22	0	1.6	18
		51197	100-200				0.34			
5383	H2 4a1	51236	0-50	55	20	25	0.94	0.38	4.8	27
5370	C2 6a1	51198	0-50	90	3	7	0.80	0.43	5.57	80
		51199	50-100	75	16	9	0.48	0.15	1.4	16
		51200	100-200				0.48			
5384	H1 2a	51239	0-50	60	20	20	0.90	0.45	2.3	2
5371	H4 5a	51201	0-10	43	13	44	3.60	2.64	12.56	29
		51241	00-200				0.20			
5372	C4 5a1	51204	0-50	75	18	7	4.20	1.8	5.4	77
5385	H1-5 5a	51205	50-100	83	10	7	1.80	0.6	3.4	49
		51206	100-200	45	17	38	0.90	5.4	11.8	35
51207	C4 5a	51207	3-8	38	17	29	0.46	0.40	6.4	22
		51208	8-130	75	33	8	0.44	0.23	6.97	87

TABLE NO. 3.2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol.Na.meq.per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay ≤ 0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
5373	C4 5a	51209	0-50	78	8	14	0.80	0.13	0.27	19
5374	H7 41	51210	0-12	35	16	49	5.00	3.90	6.9	14
5375	P4 5a	51211	0-50	83	7	10	0.95	0.20	5.0	50
		51212	50-100	75	15	10	0.50	0.13	5.47	55
		51213	100-200				0.33			
5376	P3 41	51214	0-50	73	12	15	1.02	0.23	2.17	14
		51215	50-100	90	3	7	0.45	0.11	0.09	1
		51216	100-200				2.30			
5381	H2 4a1	51231	0-40	58	14	28	2.90	1.63	13.17	47
5382	F3 2a	51233	0-50	40	40	20	1.05	0.21	0.6	3
		51234	50-100	55	20	25	0.65	0.41	15.06	60
		51235	100-200				2.70			
5383	H2 4at	51236	0-50	55	20	25	0.94	0.38	6.8	27
		51237	50-100	53	17	30	4.00	4.02	21.18	71
		51238	100-200				1.35			
5384	H1 2t	51239	0-50	60	20	20	0.90	0.45	0.3	2
		51240	50-100	48	19	33	0.24	0.07	0.3	1
		51241	100-200				0.20			
5385	H1-5 5a	51242	0-50	45	15	40	2.80	2.01	8.39	21
		51243	50-100	45	17	38	7.50	5.4	13.8	36

TABLE NO. 3.2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol. Na meq. per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay ≤ 0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
5377	H1 2a	51217	0-50	48	25	27	2.8	2.83	1.01	4
		51218	50-100	60	23	17	0.90	0.61	29.0	100
		51219	100-200				0.85			
5378	F2 5a	51222	0-50	68	23	9	23.2	10.28	20.9	100
		51223	50-100	75	16	9	7.0	2.88	7.9	88
		51224	100-200				4.0			
5379	F6 5as	51225	0-50	53	10	37	22.5	11.8	19.4	52
		51226	50-100	43	15	42	9.8	7.2	24.0	57
		51227	100-200				7.9			
5380	H1 2a	51228	0-50	65	10	25	1.18	0.55	2.2	9
		51229	50-100	55	35	10	1.00	0.5	5.9	59
		51230	100-200				0.60			
5390	H2 5as	51257	0-50	28	43	27	5.80	4.14	7.46	100
		51258	50-100	38	26	36	3.92	3.68	2.5	87
		51259	100-200				3.60			
5391	H2 5as	51260	0-50	55	19	26	0.52	0.21	5.4	21
		51261	50-100	43	16	41	12.20	7.0	23.4	62
		51262	100-200				4.20			
5392	F2/H2 5a	51266	0-50	60	14	26	1.30	0.88	5.5	2
		51267	50-100	43	19	38	6.40	0.81	13.6	88
		51268	100-200				3.00			
5393	H1 2a	51269	0-50	53	19	28	0.40	0.18	2.0	4
		51270	50-100	53	24	23	0.30	0.12	0.6	3
		51271	100-200				0.30			

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol. Na. meq. per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay 0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
5386	H1 2d1	51245	0-50	73	14	13	0.26	0.15	0.2	2
		51246	50-100	48	19	33	0.22	0.07	4.3	13
		51247	100-200				0.26			
5387	F3 2d	51248	0-50	53	16	31	0.64	0.07	0.3	1
		51249	50-100	53	19	28	0.26	0.13	0.27	1
		51250	100-200							
5388	H1 2d	51251	0-50	75	12	13	0.36	0.04	1.56	12
		51252	50-100	73	9	18	2.00	1.18	6.8	38
		51253	100-200				2.40			
5389	F6 5at	51254	0-50	35	22	43	3.00	2.6	8.2	19
		51255	50-100	50	24	26	3.00	0.23	0.97	4
		51256	100-200				0.58			
5390	H2 5asd	51257	0-50	28	45	27	5.80	4.14	37.46	100
		51258	50-100	38	26	36	3.92	3.68	31.5	87
		51259	100-200				3.60			
5391	H2 5as	51260	0-50	55	19	26	0.52	0.21	5.4	21
		51261	50-100	43	16	41	12.20	7.0	25.4	62
		51262	100-200				4.20			
5392	F2/H2 5a	51266	0-50	60	14	26	1.30	0.88	5.5	21
		51267	50-100	43	19	38	6.40	0.81	33.6	88
		51268	100-200				3.00			
5393	H1 2t	51269	0-50	53	19	28	0.40	0.18	1.0	4
		51270	50-100	53	24	23	0.30	0.12	0.68	3
		51271	100-200				0.30			

TABLE NO. 3.2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol.Na.meq.per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay ✓ 0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
5392	F2/H2 5a	51266	0-50	60	14	26	1.30	0.88	5.5	21
		51267	50-100	43	19	38	6.40	0.81	33.6	88
		51268	100-200				3.00			
5393	H1 2t	51269	0-50	53	19	28	0.40	0.18	1.0	4
		51270	50-100	53	24	23	0.30	0.12	0.68	3
		51271	100-200				0.30			
5394	H1 2ad	51272	0-50	53	14	33	0.40	0.13	3.47	11
		51273	50-100	40	27	33	0.30	0.21	0.2	1
		51274	100-200				0.32			
5395	H1 1	51275	0-50	55	14	31	0.42	0.12	0.68	2
		51276	50-100	63	16	21	0.28	0.09	0.7	3
		51277	100-200				0.30			
5396	C3 61t	51278	0-50	88	6	6	5.40	0.6	0.2	4
5397	H1 41	51279	0-50	50	24	26	0.54	0.23	2.9	11
		51280	50-100				0.24			
5398	H3 41	51281	0-50	55	27	18	0.26	0.06	0.7	4
		51282	50-100	83	9	8	0.22	0.11	0.29	4
5399	H7 41	51283	0-50	38	11	51	1.05	0.14	4.86	11
5400	H1 2t	51287	0-50	68	11	21	0.36	0.05	0.3	1
		51288	50-100	38	21	41	0.32	1.14	0.66	2
		51289	100-200				0.50			

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol.Na.meq.per 100g.	Exch. Na meq.per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay <0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
5401	H1 1/2a	51290	0-50	55	22	23	0.52	0.31	1.3	6
		51291	50-100	48	29	23	0.75	0.67	9.6	41
		51292	100-200				2.00			
5402	H1 1	51293	0-50	65	17	18	0.42	0.11	0.7	4
		51294	50-100	70	17	13	0.38	0.11	1.1	8
		51295	100-200				0.35			
5403	H1 1	51296	0-50	70	15	15	0.30	0.09	0.3	2
		51297	50-100	65	19	16	0.26	0.10	1.1	7
		51298	100-200				0.22			
5404	F1 1/2t	51299	0-50	60	25	15	0.30	0.30	0.12	3
		51300	50-100	68	21	11	0.25	0.05	0.3	3
		51301	100-200				0.26			
5405	H1 1	51302	0-50	65	12	23	1.80	0.88	1.5	7
		51303	50-100	28	34	38	0.32	0.16	1.0	3
		51304	100-200				0.32			
5406	F3 1	51305	0-50	43	31	26	0.42	0.06	0.3	1
		51306	50-100	53	18	18	0.26	0.06	3.9	22
		51307	100-200				0.22			
5407	H2 2a	51308	0-50	53	21	26	4.20	2.32	5.28	20
		51309	50-100	55	24	21	3.40	2.05	5.9	28
		51310	100-200				6.80			
5408	H1 1	51311	0-50	40	34	26	0.36	0.14	1.46	6
		51312	50-100	53	26	21	0.30	0.19	1.8	9
		51313	100-200				0.26			

TABLE NO. 3.2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol.Na.meq.per 100g.	Exch. Na meq.per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay <0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
5409	F2 5as	51314	0-50	58	21	21	4.40	2.90	15.5	74
		51315	50-100	48	34	18	7.00	5.34	11.46	64
		51316	100-200				4.50			
5410	F4 5as	51319	0-50	55	27	18	8.00	5.5	15.7	87
		51320	50-100	45	34	21	15.00	13.0	25.4	100
		51321	100-200				7.20			
6317	H2 5a	61024	0-45	60	29	11	2.40	1.46	9.3	100
		61025	45-90	90	1	9	0.78	0.38	10.4	95
		61026	90-150				3.20			
6318	H2 5as	61027	0-45	45	24	31	7.80	6.6	30.2	97
		61028	45-90	62	19	19	3.60	2.24	16.56	87
		61029	90-150				1.60			
6319	F2 5as	61030	0-45	67	22	11	1.65	0.69	4.9	45
		61031	45-90	70	19	11	0.50	0.27	3.7	34
		61032	90-150				0.70			
6320	H1 4L	61033	0-45	57	29	14	0.40	0.08	0.7	5
		61034	45-90	97	2	1	0.45	0.6	0.1	10
6321	P1 6L	61035	0-50	95	1	4	0.32	0.07	0.1	2
		61036	50-100	79	20	1	0.20	0.03	0.37	37
		61037	100-200				0.24			
6322	C2 6L	61040	0-50	90	4	6	0.52	0.07	0.7	12
6323	C3 4L	61041	0-50	87	4	9	0.65	0.11	0.79	9
6324	P3 4L	61042	0-50	87	4	9	0.70	0.16	0.2	2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol.Na.meq.per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002 mm	Clay ≤0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
6325	F1 1	61043	0-50	57	19	24	0.80	0.24	0.56	2
		61044	50-100	75	14	11	0.42	0.09	0.7	6
		61045	100-200				0.40			
6326	F1 4L	61046	0-50	77	9	14	0.36	0.06	0.3	2
		61047	50-100	95	1	4	0.21	0.04	0.36	9
		61048	100-200				0.25			
6327	C3 4L	61049	0-50	87	7	6	0.67	0.24	0.56	9
6328	C1 6L	61050	0-50	90	4	6	9.00	1.72	0.68	11
6329	C2 6L	61051	0-50	92	4	4	8.00	2.15	1.0	25
6330	P3 4L	61052	0-50	87	4	9	0.48	0.17	0.2	2
6331	H5 3L	61053	0-50	20	34	46	0.30	0.02	0.78	2
		61054	50-100	95	4	1	0.26	0.07	0.1	10
		61055	100-200				0.25			
6332	P1 6L	61058	0-50	90	4	6	0.34	0.06	0.3	5
6333	H2 5a	61059	0-50	42	39	19	3.30	2.24	18.6	96
		61060	50-100	45	39	16	1.30	0.61	4.6	29
		61061	100-200				1.30			
6334	H2 5a	61062	0-50	67	12	21	0.96	0.56	6.2	30
		61063	50-100	60	16	24	2.20	1.62	35.2	100
		61064	100-200				2.65			
6335	P6 5a1	61065	0-50	80	6	14	0.55	0.16	3.4	24
		61066	50-100	65	24	11	0.80	0.25	0.5	5
		61067	100-200				0.34			

TABLE NO. 3.2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol.Na.meq.per 100g.	Exch. Na meq.per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay <0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
6336	C1 6L	61068	0-50	90	4	6	0.48	0.06	1.1	18
6337	C1 6L	61069	0-50	92	4	4	0.54	0.06	0.3	7
6338	P3 4L	61070	0-50	85	6	9	0.40	0.08	0.7	8
		61071	50-100	87	7	6	0.40	0.08	0.7	12
		61072	100-200				0.32			
6339	H1 2a	61073	0-50	45	34	21	1.35	0.39	2.01	10
		61074		65	26	9	0.65	0.24	2.16	8
		61075					0.64			
6340	C1 6L	61076	0-50	95	1	4	1.50	1.84	-	?
6341	F1 3L	61077	0-47	67	19	14	0.26	0.12	0.68	5
		61078	47-100	82	12	6	0.32	0.1	0.2	3
6342	H6 5a	61079A	0-25	35	19	46	3.20	2.4	8.0	17
		61079B	25-50	52	14	34	5.50	3.4	8.2	24
		61080	50-100	92	4	4	0.34			
		61081	100-200				0.32			
6343	H5 3h	61082	0-50	12	27	61	0.36	0.07	0.73	1
		61083	50-100	95	1	4	0.30	0.06	0.34	8
		61084	100-200				0.32			
6344	C3 4L	61085	0-50	85	4	11	0.56	0.08	0.72	7
6345	H2 5a	61086	0-50	42	27	31	6.00	3.90	9.3	30
		61087	50-100	55	26	19	2.25	0.97	5.4	28
		61088	100-200				1.60			
6346	C1 6L	61089	0-50	92	4	4	0.54	0.06	0.3	7
6347	C1 6L	61090	0-50	92	4	4	0.54	0.06	0.3	7
6348	C1 6L	61091	0-50	92	4	4	0.54	0.06	0.3	7
6349	C1 6L	61092	0-50	92	4	4	0.54	0.06	0.3	7
6350	C1 6L	61093	0-50	92	4	4	0.54	0.06	0.3	7
6351	C1 6L	61094	0-50	92	4	4	0.54	0.06	0.3	7
6352	C1 6L	61095	0-50	92	4	4	0.54	0.06	0.3	7
6353	C1 6L	61096	0-50	92	4	4	0.54	0.06	0.3	7
6354	C1 6L	61097	0-50	92	4	4	0.54	0.06	0.3	7
6355	C1 6L	61098	0-50	92	4	4	0.54	0.06	0.3	7
6356	C1 6L	61099	0-50	92	4	4	0.54	0.06	0.3	7
6357	C1 6L	61100	0-50	92	4	4	0.54	0.06	0.3	7
6358	C1 6L	61101	0-50	92	4	4	0.54	0.06	0.3	7
6359	C1 6L	61102	0-50	92	4	4	0.54	0.06	0.3	7
6360	C1 6L	61103	0-50	92	4	4	0.54	0.06	0.3	7
6361	C1 6L	61104	0-50	92	4	4	0.54	0.06	0.3	7
6362	C1 6L	61105	0-50	92	4	4	0.54	0.06	0.3	7
6363	C1 6L	61106	0-50	92	4	4	0.54	0.06	0.3	7
6364	C1 6L	61107	0-50	92	4	4	0.54	0.06	0.3	7
6365	C1 6L	61108	0-50	92	4	4	0.54	0.06	0.3	7
6366	C1 6L	61109	0-50	92	4	4	0.54	0.06	0.3	7
6367	C1 6L	61110	0-50	92	4	4	0.54	0.06	0.3	7
6368	C1 6L	61111	0-50	92	4	4	0.54	0.06	0.3	7
6369	C1 6L	61112	0-50	92	4	4	0.54	0.06	0.3	7
6370	C1 6L	61113	0-50	92	4	4	0.54	0.06	0.3	7
6371	C1 6L	61114	0-50	92	4	4	0.54	0.06	0.3	7
6372	C1 6L	61115	0-50	92	4	4	0.54	0.06	0.3	7
6373	C1 6L	61116	0-50	92	4	4	0.54	0.06	0.3	7
6374	C1 6L	61117	0-50	92	4	4	0.54	0.06	0.3	7
6375	C1 6L	61118	0-50	92	4	4	0.54	0.06	0.3	7
6376	C1 6L	61119	0-50	92	4	4	0.54	0.06	0.3	7
6377	C1 6L	61120	0-50	92	4	4	0.54	0.06	0.3	7
6378	C1 6L	61121	0-50	92	4	4	0.54	0.06	0.3	7
6379	C1 6L	61122	0-50	92	4	4	0.54	0.06	0.3	7
6380	C1 6L	61123	0-50	92	4	4	0.54	0.06	0.3	7
6381	C1 6L	61124	0-50	92	4	4	0.54	0.06	0.3	7
6382	C1 6L	61125	0-50	92	4	4	0.54	0.06	0.3	7
6383	C1 6L	61126	0-50	92	4	4	0.54	0.06	0.3	7
6384	C1 6L	61127	0-50	92	4	4	0.54	0.06	0.3	7
6385	C1 6L	61128	0-50	92	4	4	0.54	0.06	0.3	7
6386	C1 6L	61129	0-50	92	4	4	0.54	0.06	0.3	7
6387	C1 6L	61130	0-50	92	4	4	0.54	0.06	0.3	7
6388	C1 6L	61131	0-50	92	4	4	0.54	0.06	0.3	7
6389	C1 6L	61132	0-50	92	4	4	0.54	0.06	0.3	7
6390	C1 6L	61133	0-50	92	4	4	0.54	0.06	0.3	7
6391	C1 6L	61134	0-50	92	4	4	0.54	0.06	0.3	7
6392	C1 6L	61135	0-50	92	4	4	0.54	0.06	0.3	7
6393	C1 6L	61136	0-50	92	4	4	0.54	0.06	0.3	7
6394	C1 6L	61137	0-50	92	4	4	0.54	0.06	0.3	7
6395	C1 6L	61138	0-50	92	4	4	0.54	0.06	0.3	7
6396	C1 6L	61139	0-50	92	4	4	0.54	0.06	0.3	7
6397	C1 6L	61140	0-50	92	4	4	0.54	0.06	0.3	7
6398	C1 6L	61141	0-50	92	4	4	0.54	0.06	0.3	7
6399	C1 6L	61142	0-50	92	4	4	0.54	0.06	0.3	7
6400	C1 6L	61143	0-50	92	4	4	0.54	0.06	0.3	7

TABLE NO. 3.2

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Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol. Na meq. per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay <0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
6346	H1 3L	61089	0-50	72	9	9	0.44	0.1	0.7	3
		61090	50-100	90	4	6	0.23	0.4	0.36	6
		61091	100-200	95	1	4	0.50	0.1	1.1	27
6347	P1 6L	61092	0-50	90	4	6	0.54	0.06	0.3	5
6348	P4 5aL	61093	0-50	85	11	4	1.15	0.61	11.0	100
		61094	50-100	77	17	6	1.00	0.46	6.3	100
		61095	100-200	85	6	9	0.84	0.46	0.7	8
6349	H1 3L	61096	0-50	65	16	19	0.48	0.1	1.1	6
		61097	50-100	95	1	4	0.24	0.04	0.36	9
		61098	100-200	85	6	9	0.32	0.38	0.8	100
6350	P4 5aL	61099	0-50	80	11	9	0.55	0.18	3.4	38
		61100	50-100	80	9	11	0.75	0.28	2.5	23
		61101	100-200	30	19	51	1.25	6.04	3.96	28
6351	C3 3L	61102	0-50	82	7	11	0.33	0.06	0.7	6
		61103	50-100	75	14	11	0.38	0.07	0.7	6
		61104	100-200	57	22	21	0.30	6.2	2.2	58
6352	C3 4L	61105	0-50	87	4	9	3.40	1.0	1.0	11
		61106	50-100	72	19	9	4.30	1.91	7.7	86
		61107	100-200	70	14	16	0.98	0.14	0.6	4
6353	C2 6L	61108	0-50	92	2	6	0.28	0.1	1.1	18
		61109	50-100	77	9	14	2.40	0.68	4.1	29
		61110	100-200	40	26	34	4.60	5.7	5.1	44
6354	C1 6L	61111	0-50	92	4	4	0.53	0.07	0.3	7
6355	C1 6L	61112	0-50	90	4	6	0.44	0.07	0.7	12

TABLE NO. 3.2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol.Na meq.per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay ≤0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
6356	C3 4L	61113	0-50				0.36			
6357	C2 6L	61114	0-50	95	1	4	0.70	0.1	1.1	27
6358	F1 2	61115	0-50	67	19	14	2.30	0.42	1.18	8
		61116	50-100	67	24	9	0.36	0.14	1.46	16
		61117	100-200				0.48			
6359	C3 4L	61120	0-50	85	6	9	1.46	0.46	0.7	8
		61121	50-100	85	9	6	1.34	0.54	1.06	18
		61122	100-200				1.18			
6360	F11/C3	61123	0-50	85	6	9	1.05	0.38	10.8	100
		61124	50-100	45	34	21	9.00	4.4	9.2	44
		61125	100-200				8.20			
6361	F8 5as	61126	0-50	30	19	51	4.80	6.04	13.96	28
		61127	50-100	60	16	24	12.8	8.4	12.4	52
		61128	100-200				8.0			
6362	F2 5as	61129	0-50	57	22	21	9.8	6.2	12.2	58
6363	C3 4L	61130	0-50	87	4	9	4.40	0.84	0.76	8
6364	F1 1	61131	0-50	70	14	16	0.32	0.14	0.66	4
		61132	50-100	65	19	16	0.42	0.12	0.68	4
		61133	100-200				0.62			
6365	F6 5as	61134	0-50	40	26	34	6.80	5.7	15.1	44
6366	F2 5as	61135	0-50	75	14	11	29.0	21.5	23.3	100

TABLE NO. 3.2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol.Na.meq.per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002 mm	Clay ≤ 0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
6367	F4 5as	61136	0-50	47	27	26	3.40	2.0	8.4	32
		61137	50-100	45	29	26	15.6	12.2	22.6	87
		61138	100-200				13.4			
6368	F1 2a	61139	0-50	70	11	19	0.62	0.3	2.1	11
		61140	50-100	72	9	19	0.38	0.17	3.0	16
		61141	100-200				0.75			
6369	F6 5as	61142	0-50	35	26	39	23.4	15.6	45.2	100
		61143	50-100	32	34	34	20.7	13.0	20.6	61
		61144	100-200				8.5			
6370	F2 5a	61145	0-50	62	17	21	3.45	1.9	6.5	31
		61146	50-100	90	6	4	0.34	0.15	0.6	15
6371	F8 5as	61147	0-50	25	34	41	21.00	20.7	19.3	47
		61148	50-100	25	41	34	8.20	8.5	17.9	53
		61149	100-200				8.00			
6372	F4 5as	61150	0-50	57	22	21	24.00	17.4	15.4	73
6373	F1 3L	61151	0-50	77	9	14	0.58	0.19	1.0	7
		61152	50-100	72	7	21	0.30	0.07	0.7	3
		61153	100-200				0.60			
6374	C3 4L	61154	0-50	87	4	9	0.28	0.06	0.3	3
		61155	50-100	77	7	16	0.28	0.06	0.7	4
		61156	100-200				0.26			
6375	C1 6L	61157	0-50	90	4	6	0.32	0.11	0.69	11
6376	F1/F2	61158	0-50	57	19	24	0.55	0.28	4.5	19
		61159	50-100	77	12	11	4.00	1.5	1.7	15
		61160	100-200				3.60			

TABLE NO. 3.2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol. Na. meq. per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay <0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
6377	F4 5as	61161	0-50	55	21	24	24.00	9.0	8.6	36
		61162	50-100	46	21	33	14.00	8.0	8.4	14
6378	C2 6L	61163	0-50	91	4	5	0.55	0.11	1.1	22
6379	F4 5a	61164	0-50	58	17	25	2.00	1.02	7.38	30
		61165	50-100	66	19	15	6.80	3.54	8.06	54
6391	C2 6L	61166	100-200	93	2	5	5.20	0.11	1.89	38
6380	F1/F2 3aL	61167	0-50	63	19	18	2.25	0.74	3.26	18
		61168	50-100	81	9	10	2.62	0.31	1.3	13
6381	F2 5as	61169	0-50	61	21	18	6.80	3.30	5.1	28
6393	F2 5as	61195	0-50	73	9	18	14.80	10.8	8.8	100
6382	F6 5s	61170	0-50	49	17	34	42.5	41.50	2.5	7
		61171	50-100	40	26	34	12.4	12.4	11.2	22
6394	F4 5as	61172	100-200	40	21	39	7.0	13.6	24.8	99
6383	F5 2	61173	0-50	52	9	39	0.55	0.71	4.09	10
		61174	50-100	53	14	33	4.00	2.35	6.8	21
6395	F2 5a	61175	100-200	42	40	18	3.00	0.7	2.1	12
6384	F6 5as	61176	0-50	42	14	44	9.50	9.0	10.6	24
		61202	50-100	76	9	15	0.36	0.07	1.5	30
6385	F2 5a	61177	0-50	63	17	20	0.38	0.14	6.26	31
		61178	50-100	43	27	30	4.50	3.10	6.9	23
6397	C4 4L	61179	0-50	86	9	5	3.40	0.08	1.1	22
6386	F4 5as	61180	0-50	50	16	34	7.30	6.6	12.6	37
		61181	50-100	53	27	20	6.50	4.70	11.7	58
6387	F1 3L	61182	0-50	80	6	14	0.79	0.20	0.2	1
		61183	50-100	85	6	9	0.95	0.30	0.5	6

TABLE NO. 3.2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol. Na. meq. per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002 mm	Clay ≤ 0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
6388	F1 3L	61184	0-50	65	11	24	0.76	0.30	3.3	14
		61185	50-100	86	6	8	0.88	0.24	1.76	22
6389	C3 4L	61186	0-50	85	3	12	0.50	0.10	1.1	9
6390	F2 5as	61187	0-50	56	29	15	48.00	31.2	44.4	100
6391	C2 6L	61188	0-50	93	2	5	0.50	0.11	1.89	38
6392	F5 2	61189	0-50	38	24	38	2.45	0.9	2.7	7
		61190	50-100	58	22	20	12.40	7.8	10.6	53
		61191	100-200	68	17	15	7.20	3.0	3.6	100
6393	F2 5as	61195	0-50	73	9	18	14.80	10.8	18.8	100
		61196	50-100	41	29	30	21.00	19.5	18.9	63
6394	F4 5as	61197	0-50	56	19	25	23.40	13.6	24.8	99
		61198	50-100	88	9	10	16.00	12.0	12.0	100
6395	F2 5a	61199	0-50	81	9	10	0.96	0.4	3.6	36
		61200	50-100	42	40	18	3.00	0.7	2.1	12
6396	F1 3L	61201	0-50	83	7	10	0.45	0.06	1.5	15
		61202	50-100	76	9	15	0.36	0.07	1.5	10
		61203	100-200				0.42			
6397	C4 4L	61204	0-50	86	9	5	0.44	0.08	1.1	22
6398	F2 5as	61205	0-50	88	4	8	7.60	3.9	7.3	57
		61206	50-100	71	14	15	9.00	3.24	7.56	50
6399	C2 6L	61207	0-50	95	2	3	0.52	0.12	0.68	23

TABLE NO. 3.2

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol. Na. meq. per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay ≤ 0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
6400	F2 5as	61208	0-50	58	22	20	9.20	5.5	12.5	62
		61209	50-100	76	14	10	3.40	2.1	8.7	87
6401	F3 2	61210	0-50	41	31	28	0.42	0.02	1.18	4
		61211	50-100	81	9	10	0.30	0.04	0.76	8
6402	F4 5a	61212	0-50	56	14	30	0.58	0.23	9.17	31
		61213	50-100	68	12	20	3.10	1.03	7.37	37
6403	C4 4L	61214	0-50	86	9	5	0.38	0.13	1.87	37
6404	F2 5as	61215	0-50	68	17	15	6.00	3.60	15.6	100
		61216	50-100	68	12	20	5.00	3.00	18.6	93
		61217	100-200				3.40			
6405	F2 5as	61218	0-50	53	27	20	18.90	12.00	17.2	86
		61219	50-100	51	29	20	8.00	5.50	13.3	66
6406	F2 5as	61220	0-50	61	21	18	6.80	3.60	6.8	38
		61221	50-100	78	14	8	8.20	4.30	8.5	106
6407	F4 5as	61222	0-50	43	24	33	8.50	4.34	8.06	24
6408	C4 4L	61223	0-50	83	9	8	0.48	0.25	1.7	21
6409	F2 5a	61224	0-50	78	14	8	2.70	1.43	3.37	42
		61225	50-100	43	34	23	0.60	0.20	3.0	13
		61226	100-200				1.00			
6410	F4 5a	61227	0-50	41	26	33	0.50	0.46	20.3	62
		61228	50-100	48	29	23	6.00	4.50	11.5	50
		61229	100-200				2.30			

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol. Na meq. per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay ≤0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
6411	C3 41	61230	0-50	81	9	10	0.52	0.2	1.4	14
6412	C4 4a1	61231	0-50	87	4	9	3.40	1.0	17.4	100
6413	C3 41	61232	0-50	83	4	13	1.55	0.4	1.2	9
6414	F2 5as	61233	0-50	63	14	23	4.50	4.05	8.3	36
		61234	50-100	47	16	37	7.90	6.8	12.4	34
		61235	100-200				7.20			
8122	H1 2t/3t	80391	0-45	63	11	26	1.10	0.21	0.6	2
		80392	45-90	63	14	23	7.00	0.85	1.1	5
		80393	90-150				8.40			
8123	P6 6as1t	80394	0-45	83	9	8	20.8	2.12	2.68	33
		80395	45-90	73	14	13	13.6	5.2	6.0	46
		80396	90-150				11.6			
8124	F1 2t/3t	80397	0-45	63	21	16	3.00	1.05	0.1	1
		80398	45-90	55	29	16	1.30	0.13	0.7	4
		80399	90-150				1.15			
8125	C1 61t	No samples								
8126	F5 2t	80400	0-45	45	17	38	0.95	0.24	0.16	1
		80401	45-90	45	27	28	0.42	0.07	0.7	2
		80402	90-150				0.40			
8127	H5 3ht	80403	0-45	38	16	46	0.65	0.15	1.0	2
		80404	45-90	45	17	38	1.30	0.72	8.5	22
		80405	90-150				6.20			

TABLE NO. 3.2

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Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol. Na. meq. per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay <0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
8128	H1 2t	80406	0-45	53	21	26	2.00	0.28	0.5	2
		80407	45-90	63	16	21	1.40	0.34	0.46	2
		80408	90-150				1.50			
8129	H1 2t	80409	0-45	65	9	26	0.40	0.06	0.7	3
		80410	45-90	53	16	31	0.46	0.26	0.5	2
		80411	90-150				4.00			
8130	C5 61	No sample								
8131	C4 4a1	80412	0-45	85	7	8	11.6	3.70	5.1	64
		80413	45-90	88	6	6	14.00	5.08	6.1	100
8132	C5 4a1	80414	0-45	80	9	11	13.0	4.8	6.0	55
		80415	45-90	70	14	16	7.0	4.02	14.38	90
		80416	90-150				6.0			
8133	F2 5as	80417	0-45	60	17	23	7.0	4.3	14.9	65
		80418	45-90	80	7	13	4.6	1.74	9.06	70
8134	F2 5as	80419	0-45	53	26	21	16.0	10.2	21.0	100
		80420	45-90	78	11	11	12.0	4.86	8.7	79
8135	C4 4a1	80421	0-45	88	6	6	0.60	0.18	3.0	50
		80422	45-90	85	9	6	0.48	0.12	2.7	45
		80423	90-150				2.00			
8136	F2 3a/5a	80424	0-45	63	16	21	3.40	1.38	3.8	18
8137	C4 4a1	80425	0-45	83	9	8	7.20	4.0	4.4	55
		80426	45-90	83	6	11	5.00	1.73	4.7	43
		80427	90-150				7.00			

TABLE NO. 3.2

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Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol. Na meq. per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay ≤0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
8138	F11/C1 4L/6L	80428	0-45	90	4	6	0.36	0.06	0.7	100
8139	F12/C2 4L/6L	80429	0-45	88	4	8	1.40	0.38	2.0	25
8140	F4 5as	80430	0-45	49	23	28	23.2	16.6	18.6	66
		80431	45-90	43	29	28	18.6	14.6	12.6	45
		80432	90-150				21.00			
8141	F2 5as	80433	0-45	70	14	16	28.00	14.86	23.5	100
		80434	45-90	70	13	17	27.2	14.8	18.8	100
		80435	90-150				21.6			
8142	F2 5as	80436	0-45	63	14	23	11.2	5.4	14.6	63
		80437	45-90	80	9	11	6.5	2.9	5.9	54
8143	F2 5as	80439	0-45	70	17	13	5.8	2.22	8.2	63
		80440	45-90	80	14	6	2.9	1.25	5.5	92
		80441	90-150				5.0			
8144	4L/6L C1?	No samples								
8145	F1/F2 3a/5a	80442	0-45	50	22	28	0.52	0.20	4.6	16
		80443	45-90	48	24	28	0.60	0.31	6.5	
		80444	90-150				1.20			
8146	F2 5as	80445	0-45	54	25	21	24.00	10.95	23.4	100
		80446	45-90	54	23	23	19.2	7.8	25.0	100
		80447	90-150				8.2			
8147	F10 4a1	80448	0-45	80	12	8	0.28	0.07	1.9	24
		80449	45-90	90	7	3	0.25	0.07	1.5	50
		80450	90-150				0.30			

TABLE NO. 3.2

Pit No.	Soil Class	Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol.Na.meq.per 100g.	Exch. Na meq. per 100g.	E.S.P.
				Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay ≤ 0.002mm.				
1	2		3	4	5a	5b	5c	6	7	8	9
8148	C4	4a1	80454	0-45	83	9	8	0.42	0.16	3.0	37
			80455	45-90	83	9	8	1.10	0.4	2.4	30
			80456	90-150				5.00			
8149	F2	5a	80457	0-45	73	19	6	3.80	1.57	3.6	60
			80458	45-90	78	16	6	2.40	1.35	3.4	57
			80459	90-150				1.80			
8150	F2	5as	80460	0-45	74	13	13	14.40	7.0	10.6	82
			80461	45-90	61	19	20	9.00	6.68	20.9	100
			80462	90-150				8.00			
8151	F2	5a	80463	0-45	63	19	18	1.40	0.68	9.3	52
			80464	45-90	71	13	16	6.80	3.02	16.18	100
8152	F2	5as	80465	0-45	61	21	18	41.0	22.75	21.2	100
			80466	45-90	89	3	8	5.8	1.95	5.6	70
8153	F4	5as	80467	0-45	50	24	26	4.8	2.7	11.7	45
			80468	45-90	45	29	26	7.0	4.9	13.9	53
			80469	90-150				4.5			
8154	F1	F2	80470	0-45	63	16	21	0.3	0.17	2.2	10
			80471	45-90	68	14	18	0.65	0.25	4.1	23
			80472	90-150				5.0			
8155	C4	419	80473	0-45	85	9	6	0.48	0.17	1.8	30
			80474	45-90	85	9	6	1.20	0.40	1.2	20
8156	F2	5a	80475	0-45	60	19	21	1.55	0.77	7.2	34
			80476	45-90	83	11	6	2.70	1.37	5.4	90
			80477	90-150				8.00			

Pit No.	Soil Class Land Class		Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol.Na.meq.per 100g.	Exch. Na meq. per 100g.	E.S.P.
				Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002 mm	Clay ≤ 0.002mm.				
1	2		3	4	5a	5b	5c	6	7	8	9
8157	C1/C2/61		No samples								
8158	F6	5a	80478	0-45	43	21	36	2.80	1.85	10.1	28
			80479	45-90	35	29	36	5.80	4.20	11.4	32
			80480	90-150				4.00			
8159	F4	5as	80481	0-45	30	49	21	9.00	7.48	13.3	63
			80482	45-90	50	27	23	12.00	7.0	15.8	69
			80483	90-150				5.90			
8160	F2s	5as	80484	0-45	68	19	13	5.20	2.0	3.6	28
			80485	45-90	65	19	16	4.0	1.65	3.1	19
			80486	90-150				6.5			
8161	F2	5a	80487	0-45	65	19	16	3.6	1.44	6.1	38
			80488	45-90	65	24	11	5.6	1.86	3.7	34
			80489	90-150				4.2			
8162	F2	5a	80493	0-45	60	22	18	3.2	2.38	14.4	80
			80494	45-90	73	11	16	1.8	0.74	6.46	40
			80495	90-150				6.0			
8163	F2	5as	80496	0-45	83	9	8	7.00	2.4	4.8	60
			80497	45-90	65	22	13	3.45	1.85	6.5	50
8164	F2	5as	80498	0-45	65	22	13	14.4	8.26	12.9	99
			80499	45-90	78	11	11	7.00	4.2	7.4	67
			80500	90-150				8.0			
8165	C3	41	80501	90-150	38	29	33	5.6	4.4	11.6	35
8166	C3	41	No samples								

Pit No.	Soil Class Land Class	Sample No.	Mechanical Analysis				E.C. mmhos/cm at 25°C	Sol.Na.meq.per 100g.	Exch. Na meq. per 100g.	E.S.P.
			Depth cms.	Sand 2.0-0.02mm.	Silt 0.02-0.002mm	Clay ≤ 0.002mm.				
1	2	3	4	5a	5b	5c	6	7	8	9
8167	F3/f4 3a	80502	0-45	43	29	28	3.6	2.02	4.38	16
		80503	45-90	52	25	23	9.0	5.0	14.2	62
		80504	90-150				5.6			
8168	F2 5as	80505	0-45	82	8	10	5.2	1.78	7.0	70
8169	F2 5as	80506	0-45	72	10	18	27.0	11.1	12.9	72
		80507	45-90	82	8	10	18.0	6.42	8.38	84
8170	No samples									
8171	F2 5a	80508	0-45	85	10	5	0.74	0.35	2.8	56
8172	C3 41	80509	0-45	87	5	8	0.60	0.19	1.0	12
		80510	45-90	87	5	8	1.68	0.58	6.2	77
		80511	90-150				1.10			

SOIL AND LAND CLASSIFICATION

AT ALL SITES

(Pits shown thus x)

Locality	Site No	Soil Series	Land Class
1. <u>FITNA</u>	3487	F 2	5 as
	4443	C 4	4 1
	DR371		
2. <u>GUREIR</u>	3488 x	F 2	5 as
	3489	F 4	5 ast
	3490	F 3	3 R
	3491	F 2	5 ast
	3492	F 2	5 ast
	3493	F 2	5 ast
	3494	C 1	6 1
	3495	F 2	5 as
	3496	F 2	5 alt
			5 ast
		F 2	5 at
		F 2	5 ast
	3500 x	F 2	5 ast
	4444 x	F 2	5 ast
	4445	C 4	4 1
	4446	F 12	3 1
	4447	F 4	5 as
	4448	F 11	3 1
	4449	F 4	5 as
	4450	F 2	5 as
	4451	F 12	5 as
	4452	F 4	5 as
	4453	F 2	5 as
	4454	F 2	5 as
	4455	F 2	5 as
	4456	C 4	4 1
	DR374		
	DR375		
	DR378 x		
	DR379		
3. <u>KORTI</u>	3486	C 4	4 1
	4442	C 2	6 1
	DR366		
4. <u>KULUD</u>	3479	C 4	5 alt
	3480	F 2	5 ast
	3481	H 1	3
	3482	F 2	5 alt
	3483	F 2	5 as
	3484	F 2	5 as
	3485 x	F 2	5 as
	4435	C 2	6 1

APPENDIX 4 SOIL AND LAND CLASSIFICATION AT ALL SITES

SOIL AND LAND CLASSIFICATION

AT ALL SITES

Locality	Site No	Soil Series (Pits shown thus x)	Land Class
1. <u>FITNA</u>	3487	F 2	5 as
	4443	C 4	4 l
	DR371		
2. <u>GUREIR</u>	3488 x	F 2	5 as
	3489	F 4	5 ast
	3490	F 3	3 lt
	3491	F 2	5 ast
	3492	F 2	5 ast
	3493	F 2	5 ast
	3494	C 1	6 l
	3495	F 2	5 as
	3496	F 2	5 alt
	3497	F 2	5 ast
	3498	F 2	5 at
	3499	F 2	5 ast
	3500 x	F 2	5 ast
	4444 x	F 2	5 ast
	4445	C 4	4 l
	4446	F 12	3 l
	4447	F 4	5 as
	4448	F 11	3 l
	4449	F 4	5 as
	4450	F 2	5 as
	4451	F 12	5 as
	4452	F 4	5 as
	4453	F 2	5 as
	4454	F 2	5 as
	4455	F 2	5 as
	4456	C 4	4 l
	DR374		
	DR375		
	DR378 x		
	DR379		
3. <u>KORTI</u>	3486	C 4	4 l
	4442	C 2	6 l
	DR366		
4. <u>KULUD</u>	3479	C 4	5 alt
	3480	F 2	5 ast
	3481	H 1	3
	3482	F 2	5 alt
	3483	F 2	5 as
	3484	F 2	5 as
	3485 x	F 2	5 as
	4435	C 2	6 lt

Locality	Site No	Soil Series	Land Class
4. <u>KULUD</u> (cont.)	4436	F 2	4 al
	4437	F 2	5 as
	4438	F 2	3
	4439	H 1	1
	4440	H 1	1
	4441 ✕	C 1	6 l
	DR367		
	DR369 ✕		
5. <u>AFFAT</u>	3472	H 1	1
	3473	F 1	1
	3474	H 1	1
	3475	H 1	1
	3476	H 3	4 lt
	3477 ✕	H 3	4 lt
	3478 ✕	H 1	1
	4427	H 1	1 t
	4428	H 1	3 l
	4429 ✕	F 3	2 t
	4430 ✕	F 11	3 lt
	4431 ✕	F 1	2 t
	4432 ✕	F 5	2 t
	4433	H 1	2 t
	4434 ✕	H 1	1
	DR386		
6. <u>LETTI</u>	5381	H 2	4 al
	5382	F 3	2 a
	5383	H 2	4 at
	5384	H 1	2 t
	5385	H1/H5	5 a
	5386	H 1	2 d
	5387	F 3	2 d
	5388	H 1	2 d
	5389	F 6	5 at
	5390	H 2	5 asd
	5391	H 2	5 as
	5392 ✕	H 2	5 a
	5393	H 1	2 t
	5394	H 1	2 ad
	5395	H 1	1
	5396	C 3	6 lt
	5397	H 1	4 l
	5398	H 3	4 l
	5399	H 7	4 l
	5400 ✕	H 1	2 t
	5401	H 1	2 a
	5402	H 1	1
	5403	H 1	1
	5404	F 1	2 t

Locality	Site No	Soil Series	Land Class
6. <u>LETTI</u> (cont.)	5405	H 1	1
	5406	F 3	1
	5407	H 2	2 a
	5408	H 1	1
	8122	H 1	2 t
	8123	P 6	6 aslt
	8124	F 1	2 t
	8125	C 1	6 lt
	8126	F 5	2 t
	8127	H 5	3 ht
	8128	H 1	2 t
	8129	H 1	2 t
	DR300		
	DR304		
	DR306		
	DR307		
	DR311 ✕		
	DR312 ✕		
	DR313		
7. <u>EL BAKRI</u>	Sample Area 5409 ✕	F 2	5 as
	5410 ✕	F 4	5 as
	(5411 ✕		
	(5412 ✕		
	6359	C 3	4 l
	6360	C 3	4 l
	6361	F 8	5 as
	6362	F 2	5 as
	6363	C 3	4 l
	6364	F 1	1
	6365	F 6	5 as
	6366	F 2	5 as
	6367	F 4	5 as
	6368	F 1	2 a
	6369	F 6	5 as
	6370	F 2	5 a
	6371	F 8	5 as
	6372	F 4	5 as
	6373	F 1	3 l
	6374	C 3	4 l
	6375	C 1	6 l
	6376	F 2	3 a
	6377	F 4	5 as
	6378	C 2	6 l
	6379	F 4	5 a
	6380	F 2	3al
	6381	F 2	5 as
	6382	F 5	5 s
	6383	F 5	2
	6384	F 6	5 as
	6385	F 2	5 a
	6386	F 4	5 as

Locality	Site No	Soil Series	Land Class
7. <u>EL BAKRI</u> (cont).	6387	F 1	3 1
	6388	F 1	3 1
	6389	C 3	4 1
	6390	F 2	5 as
	6391	C 2	6 1
	6392 x	F 5	2
	6393	F 2	5 as
	6395	F 2	5 a
	6396	F 1	3 1
	6397	C 4	4 1
	6398	F 2	5 as
	6399	C 2	6 1
	6400	F 2	5 as
	6401	F 3	2
	6402	F 4	5 a
	6394	F 4	5 as
	6403	C 4	4 1
	6404	F 2	5 as
	6405	F 2	5 as
	6406	F 2	5 as
	6407	F 4	5 as
	6408	C 4	4 1
	6409	F 2	5 a
	6410	F 4	5 a
	6411	C 3	4 1
	6412	C 4	4 al
	6413	C 3	4 1
	6414 x	F 4	5 as
	(6415 x		
	(6416 x		
	8130	C 5	6 1
	8131	C 4	4 asl
	8132	C 4	4 asl
	8133	F 2	5 as
	8134	F 2	5 as
	8135	C 4	4 al
	8136	F 2	5 a
	8137	C 4	4 asl
	8138	C 1	6 1
	8139	C 2	6 1
	8140	F 4	5 as
	8141	F 2	5 as
	8142	F 2	5 as
	8143	F 2	5 as
	8144	C 2	6 1
	8145	F 2	5 a
	8146	F 2	5 as
	8147 x	F 10	4 al
	8148	C 4	4 al
	8149	F 2	5 a
	8150	F 2	5 as

Locality	Site No	Soil Series	Land Class
7. <u>EL BAKRI</u> (Cont.)	8151	F 2	5 a
	8152	F 2	5 as
	8153	F 4	5 as
	8154	F 1	2
	8155	C 4	4 1
	8156	F 2	5 a
	8157	C 2	6 1
	8158	F 6	5 a
	8159	F 4	5 as
	8160	F 2	5 as
	8161	F 2	5 a
	8162	F 2	5 a
	8163	F 2	5 as
	8164	F 2	5 as
	8165	C 3	6 1
	8166	C 3	6 1
	8167	F 4	3 a
	8168	F 2	5 as
	8169	F 2	5 as
	8170	C 1	6 1
	8171	F 2	5 a
	8172	C 3	4 1
8. <u>URBI</u>	6351	C 3	3 1
	6352	C 3	4 1
	6353	C 2	6 1
	6354	C 1	6 1
	6355	C 1	6 1
	6356	C 3	4 1
	6357	C 2	6 1
	6358 x	F 1	2
9. <u>W. DONGOLA</u>	3449	F 4	5 as
	3450	F 4	5 as
	3451	F 4	5 as
	3452	F 2	5 at
	3453	F 4	5 as
	3454	F 4	5 as
	3455	F 4	5 as
	3456	F 4	5 as
	3457	F 4	5 as
	3458	F 4	5 a
	3459	C 2	6 1
	3460	C 2	6 1
	3461	F 6	5 as
	3462	F 4	5 as
	3463	F 4	5 as
	3464 x	F 4	5 as
	4407	F 2	5 as
	4408	F 2	5 a
	4409	F 1	2
	4410 x	F 2	5 a

Locality	Site No	Soil Series	Land Class
9. <u>W. DONGOLA</u> (Cont.)	4411	C 1	6 l
	4412	C 2	6 l
	4413	C 4	4 l
	4414	F 2	5 a
	4415	C 2	6 l
	4416	F 2	5 a
	4417	C 1	6 lt
	4418	F 1	3 l
	4419	F 1	3 l
	4420	F 2	5 a
	4421	F 8	5 a
	4422	F 4	5 as
	4423	F 6	5 as
	4424	F 4	5 as
	4425	F 3	2 a
	4426	F 1	2 a
10. <u>KERMA</u>	3414	Salorthid	5 as
	3415	P 2	5 al
	3416	Salorthid	5 as
	3417	Salorthid	5 as
	3418	H 1	3 al
	3419	C 4	5 asl
	3420	C 2	6 l
	3421	H 4	4 l
	3422	C 2	6 l
	3423	H 5	4 l
	3424	H 1	3 l
	3425	C 2	6 l
	3426	P 4	5 al
	3427	H 1	2 l
	3428	H 1	3 a
	3429	H 7	3 h
	3430	H 2	5 a
	3431	H 8	5 a
	3432	H 3	4 l
	3433	H 7	4 l
	3434	H 1	3 a
	3435	H 5	3 h
	3436 x	H 1	1
	3437	H 2	5 a
	3438	H 1	2 a
	3439	C 3	5 lt
	3440	H 5	2 a
	3441	F 2	6 ast
	3442 A	H 2	4 ad
	3442 B	H 5	3 h
	3443	H 1	2 a
	3444	C 4	5 al
	3445	H 2	5 a
	Not on map → 3446 x	F 2	5 as

Locality	Site No	Soil Series	Land Class
10. <u>KERMA</u> (cont.)	3447 x	H 1	3 a
	3448	H 2	5 a
	(3465	C 4	5 a
	Sample Area (3466	H 7	4 1
	(3467	P 4	5 a
	(3468	P 3	4 1
	(3469	H 1	2 a
	(3470	P 2	5 a
	(3471	P 6	5 a
	4375	F 2	5 a
	4376	F 2	5 as
	4377 x	F 2	5 as
	4378	F 10	5 a
	4379	F 12	6 al
	4380	F 1	1
	4381 x	F 8	5 as
	4382	H 2	5 a
	4383	C 6	6 1
	4384	F 2	5 a
	4385	F 9	3 al
	4386	F 1	3 lt
	4387	H 2	5 a
	4388	F 2	5 a
	4389 x	F 3	3 1
	4390	F 9	3 1
	4391	H 7	3 1st
	4392	F 4	5 as
	4393	H 2	5 as
	4394	C 4	6 asl
	4395	F 1	2 a
	4396	F 3	3 a
	4397	P 2	5 a
	4398	P 1	6 1
	4399	F 9	4 alt
	(Not on map) 4400	C 1	6 lt
	4401	C 2	6 1
	4402	P 1	6 lt
	4403	C 1	6 1
	4404	H 2	5 at
	4405	P 1	3 al
	4406	P 2	6 lt
	5358	H 1	2 a
	5359	H 2	5 a
	5360	H 1	2 a
	5361	F 1	2 a
	5362	F 2	5 a
	5363	F 2	5 a
	5364	C 2	6 alt
	5365 x	H 1	1
	5367	P 1	6 1

Locality	Site No	Soil Series	Land Class
10. <u>KERMA</u> (cont.)	5368	Salorthid	5 as
	5369	H 4	5 as
	5370	C 2	6 al
	5371	H 4	5 a
	5372	C 4	5 al
	5373	C 4	5 a
	5374	H 7	4 l
	5375	P 4	5 a
	5376	P 3	4 l
	5377 x	H 1	2 a
	5378	F 2	5 a
	5379	F 6	5 as
	5380	H 1	2 a
	6317	H 2	5 a
	6318	H 2	5 as
	6319	F 2	5 as
	6320	H 1	4 l
	6321 x	P 1	6 l
	6322	C 2	6 l
	6323	C 3	4 l
	6324	P 3	4 l
	6325	F 1	1
	6326	F 1	4 l
	6327	C 3	4 l
	6328	C 1	6 l
	6329	C 2	6 l
	6330	P 3	4 l
	6331 x	H 5	3 l
	6332	P 1	6 l
	6333	H 2	5 a
	6334	H 2	5 a
	6335	P 6	5 al
	6336	C 1	6 l
	6337	C 1	6 l
	6338	P 3	4 l
	6339	H 1	2 a
	6340	C 1	6 l
	(Not on map) -> 6341	F 1	3 l
	6342	H 6	5 a
	6343	H 5	3 h
	6344	C 3	4 l
	6345	H 2	5 a
	6346	H 1	3 l
	6347	P 1	6 l
	6348	P 4	5 al
	6349	H 1	3 l
	6350	P 4	5 al

APPENDIX 5
INSPECTION OF ADDITIONAL
NORTHERN PROVINCE LANDS BETWEEN
THIRD AND DAL CATARACTS

At the request of the Director of Agriculture the Consultants carried out an inspection of lands between the 2nd and 3rd cataracts with a view to deciding whether there are any undeveloped lands worthy of investigation as possible development projects. The inspection party, which consisted of representatives of the Consultants and of the Ministry of Agriculture travelled in motor vehicles from Atbara to Wadi Halfa in the period 26th February to 4th March 1964. The inspection party found, as expected, that all low level silts are fully developed and that undeveloped lands are almost all barren rocky or sandy desert. The party did record the presence of a few high level silt terraces, however, the development of which is beyond the resources of the local inhabitants but which might be considered further as part of an overall government development plan for Northern Province. These lands are often uneven; gravel and stones are frequently present and it is probable that many sites (like those already investigated in Dongola and Shende Districts) have salinity-alkalinity problems. They would have quite a low priority for development under any development plan but it is considered worthwhile to record their presence in order to complete the inventory of all possible development areas in Northern Province. These high level silt terraces are located as follows:-

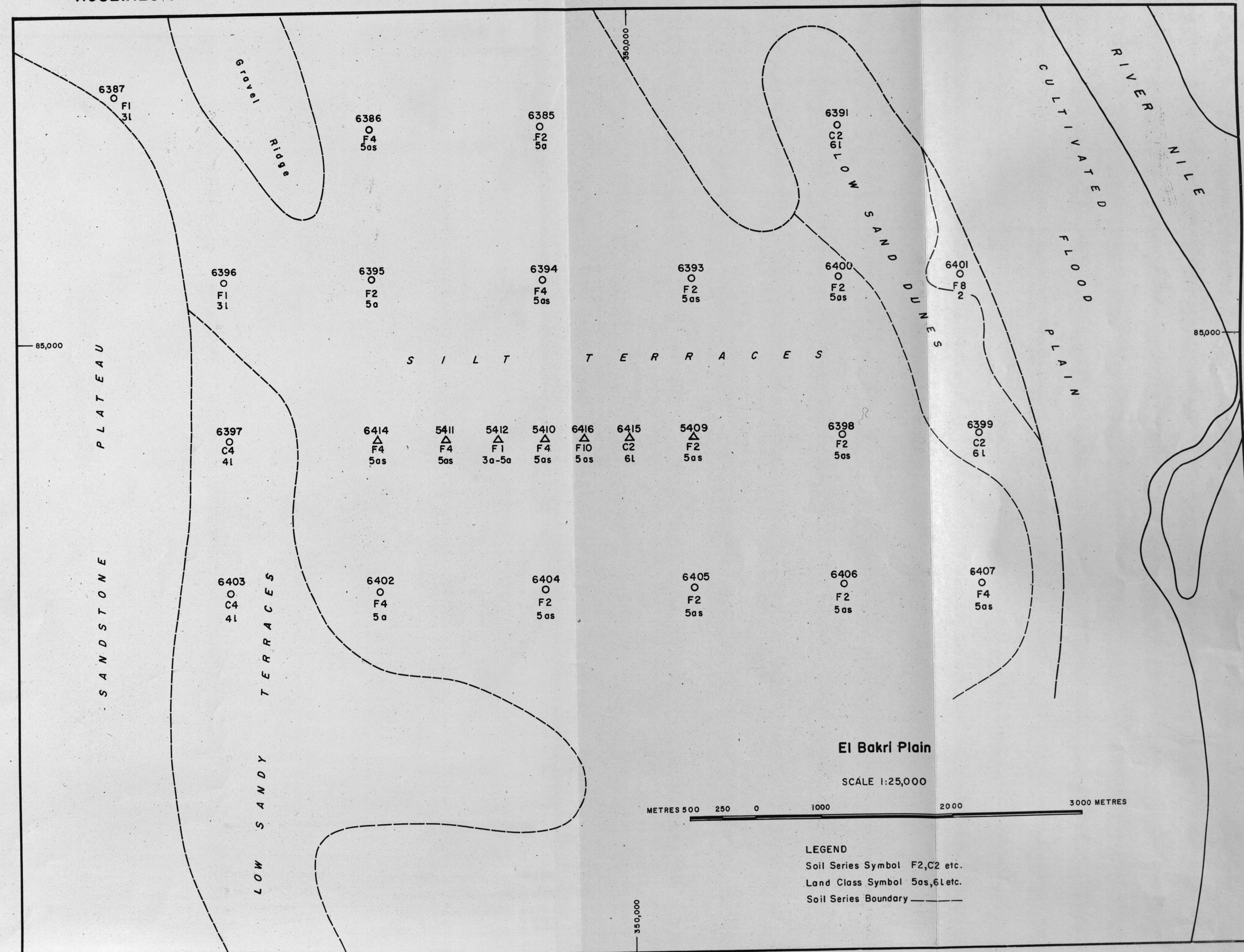
- (i) The Fereik village area is in Halfa District, on the right bank of the Nile just downstream of the Third Cataract. It is a small rough silt terrace above the level of existing irrigation. If suitable, the total area of about 300 feddans could probably be commanded by a pump at the existing pump site.
- (ii) The Jebel Gadein-Delgo area in Halfa District consists of elongated silt terraces on both banks of the river. The right bank silt terrace is narrow, rather uneven and only usable in patches. The left bank terrace, however, is much broader, with a maximum width of about 8 Km, and

ROSCHELY SOIL AREA 4A - MAIN NILE VALLEY

resembles the Wadi el Khawi plain in Dongola District.

The local Omdas claim there is an area of 30,000 feddans suitable for development. This is undoubtedly a considerable exaggeration. The land is quite rough in places but there appears to be a level area of about 5,000 feddans in the Kokka, Shadda, Sudla areas. Other, smaller areas of fairly level land exist in places.

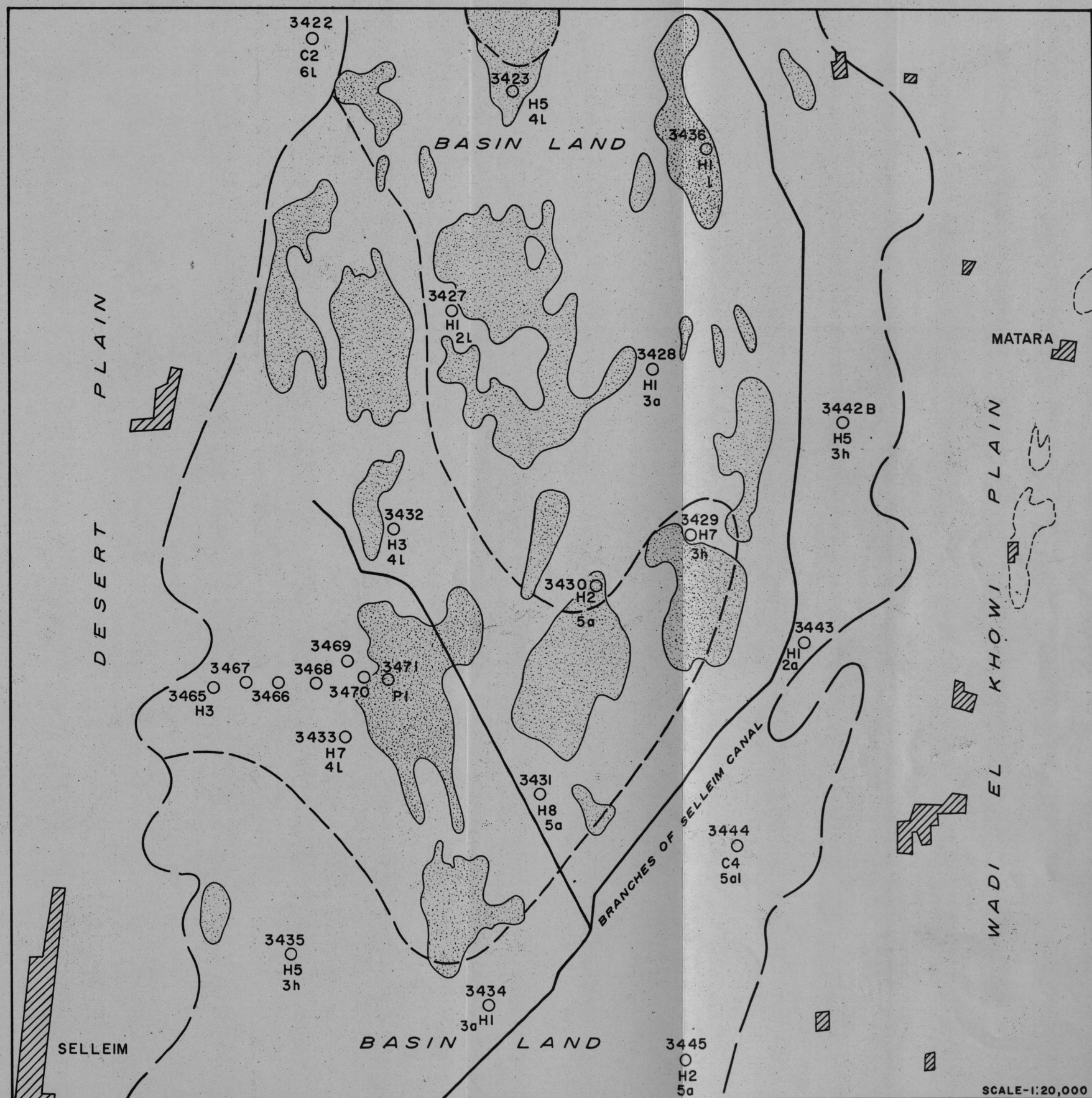
- (iii) The Wawa -Iraw area on the Nile right bank in Halfa District has a high level silt terrace said by the local inhabitants to be suitable for development.
- (iv) In the Abri area of Halfa District most of the existing cultivation is on Sai Island and on a low narrow silt terrace near the river. There are two higher silt terraces, quite rough in places, which might be suitable for development. One lies to the south of Abri village immediately above the existing irrigated land. The other is a narrow twisting belt of silt, probably an old high level river channel, that commences opposite the widest part of Sai Island, passes close under Jabel Abri and rejoins the riverain lands east of Awara village. It is separated from the river by a rough gravel ridge. Downstream of Abri, the high rocky and sandy land lies close to the river and there is no additional usable land.



ROSEIRES SOIL SURVEY

SAMPLE AREA I

AREA 4A-MAIN NILE VALLEY



KERMA BASIN

LEGEND

Soil Series Symbol.....H5,C2 etc

Land Class Symbol.....3h,4L,5a etc

Soil Association Boundary.....

Sand.....