

**APPENDIX 2.4-2 - TYPICAL SOIL SERIES PEDON DESCRIPTIONS**

**LIST OF ABBREVIATIONS**

Soil Horizon		General	
A	organic topsoil	Pct.	percent
B	zone of leaching	C.F.	coarse fragments
C	zone of least weathering	fg	fine gravel
k	accumulation of carbonates	Eff.	effervescence
n	accumulation of sodium	Vis.	visible
p	plowing	EC	Electrical Conductivity
r	weathered or soft bedrock	SAR	Sodium Adsorption Ratio
t	accumulation of silicate clays	<b>Roots</b>	
w	distinctive color or structure	v	very
y	accumulation of gypsum	f	fine
1	profile layer 1	m	medium
2	profile layer 2	1-3	relative abundance
3	profile layer 3	<b>Texture</b>	
<b>Structure</b>		C	Clay
F, VF, M, C	size - fine, very fine, medium, coarse	L	Loam
1-3	grade (relative strength)	Si	Silt or Silty
ABK	angular blocky	S	Sand or Sandy
SBK	subangular blocky		
GR	granular	<b>Effervescence (Eff)</b>	
SGR	single grain	NE	non-effervescent
SG	single grain	VE	violent effervescence
PL	platy	ST	strong effervescence
PR	prismatic	VS	very strong effervescence
MA	massive	SL	slight effervescence
<b>Munsell Color</b>			
2.5Y 3/2	Brownish Black	5y 5/6	Olive
2.5Y 3.5/2	Brownish Black	5y 6/1	Gray
2.5Y 3/1	Brownish Black	5y 6/2	Grayish Olive
2.5Y 3/3	Dark Olive Brown	5y 7/1	Light Gray
2.5Y 4/2	Dark Grayish Brown	5y 7/2	Light Gray
2.5Y 4/3	Olive Brown	5Y 8/6	Yellow
2.5Y 4.5/4	Olive brown	7.5YR 5/6	Bright Brown
2.5Y 5/2	Dark Grayish Yellow	10YR 2/1	Black
2.5Y 5/3	Yellowish Gray	10YR 3/1	Brownish Black
2.5Y 5/4	Yellowish Gray	10YR 3/2	Brownish Black
2.5Y 6/2	Grayish Yellow	10YR 3/3	Dark Olive Brown
2.5Y 6/3	Dull Yellow	10YR 4/1	Yellowish Gray
2.5Y 7/3	Light Yellow	10YR 4/2	Dark Grayish Yellow
2.5Y 8/2	Light Gray	10YR 4/3	Olive Brown
2.5Y 8/3	Pale Yellow	10YR 5/2	Dark Grayish Yellow
5Y 2.5/1	Olive Black	10YR 5/3	Yellowish Gray
5Y 3/1	Olive Black	10YR 6/1	Yellowish Gray
5Y 3/2	Olive Black	10YR 6/2	Grayish Yellow
5y 4/1	Gray	10YR 6/3	Dull Yellow
5y 4/2	Grayish Olive	10YR 7/1	Light Gray
5y 5/1	Gray	10YR 7/2	Grayish Yellow
5y 5/2	Grayish Olive	10YR 7/3	Light Yellow
5Y 5/3	Grayish Olive		

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 060926-T02

SERIES: AMOR

UTM NAD 83 Zone 13 North

Landform: RESIDUAL HILLSLOPE

Epipedon: MOLLIC

Easting: 650,552

Biota: WHEAT

Control Texture: FINE-LOAMY

Northing: 5,190,223

Landuse: CROP

Parent Material: SHALE/SILTSTONE

**Other Comments:** This profile has a fine-loamy control section bordering on fine-silty (Sen series). These borderline soils may have been misclassified as the very similar Sen series during the field survey. The organic matter is very low in the A-horizon of this profile.

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	Ap	0 - 6	1vf	moist in field	10YR 3/2	L 26.3	N	M1SBK	< 1%	NE	N	EC 1.12 SAR 0.37
2	Bw	6 - 13	1vf	--	10YR 3/3	CL 27.5	N	M2PR	< 1%	NE	N	EC 0.52 SAR 0.25
3	Bk	13 - 24	1vf	--	10YR 5/2	SiL 26.3	N	M1SBK	< 1%	VE	N	EC 0.33 SAR 0.37
4	Cr	24 - 60	--	--	--	SiL 17.5	N	MA	< 1%	VE	N	Soft Bedrock EC 0.66 SAR 1.44
5	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 061016-S29

SERIES: ARNEGARD

UTM NAD 83 Zone 13 North

Landform: MID-TOE SLOPE

Epipedon: PACHIC MOLLIC

Easting: 650,883

Biota: HARVESTED SAFFLOWER

Control Texture: FINE

Northing: 5,188,242

Landuse: CROPLAND

Parent Material: ALLUVIUM

**Other Comments:** This soil is not argillic, although a slight clay increase was noted in the subsoil. This profile's texture is slightly more fine than the OSD for this series. The EC and SAR are very low in all horizons. The top two horizons have 2.5 - 3.0 % Organic Matter.

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	Ap	0 - 7	1f	Mollic	10YR 3/1	CL 31.3	N	F-M1SBK	0 - 1% fg	NE	N	--
2	Bw (Bt)	7 - 17	1f	Moist in field	2.5Y 3/2	CL 33.8	Y	M1-2SBK ABK	0 - 1% fg	NE	N	Very slight clay increase is detectable.
3	Bk1	17 - 37	1f	--	2.5Y 4/2	CL 31.3	N	M2SBK	1-3% fg	ST	N	--
4	Bk2	37 - 58	--	--	--	SiC 41.3	N	MA	0-1% fg	SL	N	--
5	-	-	--	--	--	--	--	--	--	--	--	--
6	-	-	--	--	--	--	--	--	--	--	--	--

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 060822-T08

SERIES: CABBA

UTM NAD 83 Zone 13 North

Landform: RESIDUAL HILLSLOPE

Epipedon: OCHRIC

Easting: 646,470

Biota: CROP

Control Texture: LOAMY

Northing: 5,190,725

Landuse: CROP

Parent Material: RESIDUUM (SILTSTONE)

Other Comments: Depth to soft siltstone ranges from 5 -17 inches in most profiles near this typical pedon.

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	Ap	0 - 6	1f	10YR 7/3	10YR 5/3	SiL 25	N	F1SBK	< 1%	VE	N	--
2	Bk	6 - 12	1f	2.5Y 8/3	2.5Y 7/3	SiL 27	N	F1PR	< 1%	VE	N	--
3	Cr1	12 - 33	1vf	2.5Y 8/2	2.5Y 6/2	--	N	--	< 1%	ST	N	Soft Siltstone
4	Cr2	33 - 60	--	5Y 8/6	5Y 5/6	--	N	--	< 1%	ST	N	Soft Siltstone
5	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 070425-T01

SERIES: CHAMA

UTM NAD 83 Zone 13 North

Landform: UPLAND

Epipedon: MOLLIC

Easting: 646,155

Biota: CROP

Control Texture: FINE SILTY

Northing: 5,190,290

Landuse: CROP

Parent Material: WEATHERED SILTSTONE

Other Comments: **Chama occurs infrequently. This occurrence is located in a delineation of the similar Sen series.**

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/ Mottles	Moist Matrix								
1	Ap	0 - 7	3vf	10YR 4/2	10YR 3/2	SiCL 30	N	VF1SBK	< 1%	ST	N	--
2	Bk1	7 - 18	2vf	10YR 6/2	10YR 4/2	SiCL 31.3	N	V1PR	< 1%	VE	N	--
3	Bk2	18 - 24	1vf	10YR 7/1	10YR 4/1	SiCL 36.3	N	F1PR	< 1%	VE	N	--
4	Cr	24 - 60	--	--	--	SiCL 32.5	N	--	< 1%	--	N	Soft Siltstone
5	-											
6	-											

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 060822-T02

SERIES: DAGLUM t.

UTM NAD 83 Zone 13 North

Landform: LEVEL PLAIN

Epipedon: MOLLIC

Easting: 647,485

Biota: NATIVE

Control Texture: FINE

Northing: 5,190,445

Landuse: PASTURE

Parent Material: CLAYEY ALLUVIUM

**Other Comments:** This profile is a Daglum taxadjunct. The profile physically appears to have a natric horizon, but the SAR of the argillic horizon is slightly less than 13. Such profiles are common. This profile is an inclusion in a Rhoades unit commonly with salts at <16 in.

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	A1	0 - 6	3f	10YR 4/2	10YR 3/2	SiCL 30	N	VF1GR	< 1%	NE	N	--
2	Bt	6 - 10	1f	10YR 4/2	10YR 4/2	SiC 48	N	F3ABK	< 1%	NE	N	Large masses CaCo <sub>3</sub>
3	Btn	10 - 17	1f	10YR 5/2	10YR 3/2	SiC 50	N	F3ABK	< 1%	ST	N	SAR 11
4	Bkn1	17 - 30	1vf	10YR 4/2	10YR 3/2	SiC 50	N	M3PR	< 1%	ST	N	SAR 16.4 EC 16.1
5	Bkn2	30 - 43	1vf	10YR 4/2	10YR 3/2	SiC 50	N	M1SBK	< 1%	ST	N	SAR 18.5 EC 22.1 Large masses CaCo <sub>3</sub>
6	C	43 - 60	--	2.5Y 6/2	2.5Y 4/2	SiCL	N	--	< 1%	ST	N	SAR 18.5 EC 22.1 Few small masses CaCo <sub>3</sub>

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 060822-T03

SERIES: DOGTOOTH

UTM NAD 83 Zone 13 North

Landform: RESIDUAL UPLAND

Epipedon: OCHRIC

Easting: 647,504

Biota: NATIVE GRASS

Control Texture: FINE

Northing: 5,190,261

Landuse: PASTURE

Parent Material: RESIDUUM - SOFT SHALE

Other Comments: **This profile is located in a large area with very little vegetative cover and a light colored surface typical of this series.**

**This profile is entirely unsuitable for salvage.**

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	E	0 - 1	1f	2.5Y 6/2	2.5Y 4/2	SiC 47	N	F2PL	< 1%	NE	N	SAR 12.6 EC 7.02
2	Btn1	1 - 10	1f	2.5Y 6/2	2.5Y 5/2	SiC 50	N	F1SBK	< 1%	NE	Y	
3	Btn2	10 - 22	1f	5Y 5/1	5Y 4/1	SiC 53	N	F1SBK	< 1%	NE	Y	SAR 16.1 EC 8.9
4	Cr1	22 - 40	--	--	5Y 4/2	SiC	N	--	SHALE	--	N	SAR 22.1 EC 8.98
5	Cr2	40 - 60	--	--	5Y 5/3	SiC	N	--	SHALE	--	N	--
6		-		--								

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 070504-T01

SERIES: FLASHER

UTM NAD 83 Zone 13 North

Landform: UPLAND RIDGE

Epipedon: MOLLIC

Easting: 650,953

Biota: CROP

Control Texture: COARSE LOAMY BORDERING SANDY

Northing: 5,191,812

Landuse: WHEAT

Parent Material: WEATHERED SANDSTONE

**Other Comments:** This profile occurs in a Flasher delineation. The entire profile is suitable for salvage to the depth of bedrock contact (14 in).

The texture may be slightly more fine than normal for Flasher, but it is much more coarse than Cabba. No samples collected.

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	Ap	0 - 7	3f	10YR 5/2	10YR 4/2	SL 11.3	N	SGR	< 1%	NE	N	--
2	Bw	7 - 14	2vf	10YR 7/2	10YR 5/2	SL 11.3	N	SGR	< 1%	SL	N	--
3	Cr	14 - 60	--	--	--	--	--	--	--	NE	N	Sandstone bedrock
4	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-



**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 070516-S01

SERIES: GRAIL

UTM NAD 83 Zone 13 North

Landform: SWALE / DRAINAGE BOTTOM

Epipedon: PACHIC MOLLIC

Easting: 649,358

Biota: ALFALFA - CRESTED WHEATGRASS

Control Texture: FINE

Northing: 5,186,062

Landuse: CRP

Parent Material: ALLUVIUM

**Other Comments:** This profile is unsuitable for salvage below a depth of 49 inches. High sodium and salt content limits salvage in more than half of the profiles of this series, often at depths from 30 to 50 inches.

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	Ap	0 - 7	f1	Moist in Field	2.5Y 3/2	SiCL 30	N	F2GR	< 1%	NE	N	--
2	A2	7 - 14	f2	--	2.5Y 3/2	SiCL 31.3	N	F2GR	< 1%	NE	N	--
3	AB	14 - 24	f3	--	2.5Y 3/2	SiCL 33.8	N	F1SBK	< 1%	NE	N	SAR 1.91
4	Bt	24 - 34	none	--	2.5Y 3/2	SiC 42.5	Y	M2SBK M2PR	< 1%	NE	N	SAR 5.07
5	Bky	34 - 49	none	--	2.5Y 3.5/2	C 43.8	N	MA	< 1%	SL	Y	SAR 8.26 Carb/Gypsum filaments
6	Cy	49 - 60	none	--	2.5Y 4/2	SiC 41.3	N	MA	< 1%	SL	Y	SAR 13.9 Carb/Gypsum filaments

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 070425-T02

SERIES: HARRIET

UTM NAD 83 Zone 13 North

Landform: SWALE - SALINE LOWLAND

Epipedon: OCHRIC

Easting: 646,360

Biota: SALT GRASS

Control Texture: FINE

Northing: 5,191,518

Landuse: PASTURE

Parent Material: ALLUVIUM

Other Comments: This entire profile is unsuitable for salvage.

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/ Mottles	Moist Matrix								
1	A	0 - 7	3vf	2.5Y 6/2	2.5Y 4/2	SiCl 35	N	MA	< 1%	NE	Y	SAR 42.6 EC 32.4
2	Bt	7 - 21	1vf	2.5Y 6/3	2.5Y 4/3	SiCL 40	N	MA	< 1%	VS	Y	SAR 51.1 EC 52.9
3	Cg1	21 - 34	1vf	5Y 6/3	5Y 4/3	C 50	N	MA	< 1%	VS	Y	SAR 36.1 EC 22.3
4	Cg2	34 - 47	none	5Y 6/3	5Y 4/3	C 48.8	N	MA	< 1%	VS	Y	SAR 34.7 EC 18.2
5	Cg3	47 - 60	none	5Y 7/1	5Y 5/1	SiC 45	N	MA	< 1%	VS	Y	SAR 27.7 EC 14.4
6		-										

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 070511-S32

SERIES: HAVRELON t. (sodic subsoil)

UTM NAD 83 Zone 13 North

Landform: FIRST TERRACE ABOVE CHANNEL

Epipedon: OCHRIC

Easting: 650,473

Biota: SMOOTH BROME AND SNOWBERRY

Control Texture: FINE-LOAMY

Northing: 5,185,523

Landuse: GRASSLAND

Parent Material: ALLUVIUM

**Other Comments:** This profile represents the lower terrace and is chemically and physically very similar to the higher terrace at 070511-S32.

This profile is typical of the the s/s map units. The substratum is unsuitable for salvage. Lift 1 may be salvaged to a depth of 9 in.

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/ Mottles	Moist Matrix								
1	A	0 - 9	2f 2m	Moist in Field	2.5Y 4/2	SiL 18.8	N	F2GR	< 1%	VS	N	Very Moist
2	Bk(n)	9 - 23	1f	--	2.5Y 5/2	SiCL 40	N	M1SBK	< 1%	SL	N	EC 1.89 SAR 19.8
3	C	23 - 60	none	--	2.5Y 5/2	SiL 23.8	N	SGR	< 1%	ST	N	EC 5.0 SAR 34.9 No sample collected below 47 in
4	-											
5	-											
6	-											

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 061006-S41

SERIES: HOVEN

UTM NAD 83 Zone 13 North

Landform: SIDESLOPE SEEP

Epipedon: MOLLIC

Easting: 648,670

Biota: SALT TOLERANT GRASSES

Control Texture: FINE

Northing: 5,191,811

Landuse: GRASSLAND - NOT CULTIVATED

Parent Material: ALLUVIUM OVER RESIDUUM

Other Comments: **Very wet profile in an area too wet to farm. Saturated below 25 inches.**

**The entire profile is unsuitable for salvage.**

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	Ayz	0 - 8	1f	Mollic	5Y 3/2	C 51.3	N	F1SBK	< 1% fg	NE	Y	EC 12 SAR 27.6 Same seep filaments
2	Btyz	8 - 25	none	Moist	5Y 2.5/1	SiC/C 66.3	N	M1SBK	< 1% fg	SL	Y	EC 12.8 SAR 26.7 Gypsum filaments abundant
3	Byz	25 - 40	none	Mottle/10YR 5/6	5Y 5/2	SiC 37.5	N	MA	< 1% fg	SL	Y	EC 21.2 SAR 31.1 Totally saturated many gyp crystals
4	C/Cr	40 - 54	none	Moist	5Y 5/2	SiC 22.5	N	MA	--	ST	Y	EC 12.5 SAR 21.1 Soft weathered bedrock
5	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 060822-T07

SERIES: JANESBURG t.

UTM NAD 83 Zone 13 North

Landform: RESIDUAL PLAIN

Epipedon: MOLLIC

Easting: 646,633

Biota: CROP

Control Texture: FINE

Northing: 5,190,830

Landuse: WHEAT

Parent Material: RESIDUUM WEATHERED FROM SHALE

**Other Comments:** This profile does not quite meet the SAR requirements for natric (>13 in Bt) but does exhibit many other typical characteristics.

While technically a taxadjunct, this profile is very typical of this series as it occurs in the survey area.

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	Ap	0 - 6	2F	2.5Y 5/2	2.5Y 4/2	SiC 48	N	M1SBK	< 1%	NE	N	SAR 1.51 EC 0.91
2	Bt	6 - 20	2F	2.5Y 5/2	2.5Y 4/2	SiC 52	Y	M-C2PR	< 1%	ST	N	SAR 9.54 EC 0.78
3	Bkn	20 - 36	1F	2.5Y 6/2	2.5Y 4/2	SiC 52	N	M1SBK	< 1%	ST	N	SAR 14.9 EC 7.68
4	Cr	36 - 60	none	--	5Y 5/2	SHALE	--	--	--	ST	y	SAR 17 EC 10.1 Gypsum
5	-	-	-	--	-	-	-	-	-	-	-	-
6	-	-	-	--	-	-	-	-	-	-	-	-

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 070515-S08

SERIES: KORELL

UTM NAD 83 Zone 13 North

Landform: TERRACE

Epipedon: MOLLIC

Easting: 649,183

Biota: GRAIN FALLOW

Control Texture: FINE-LOAMY

Northing: 5,192,279

Landuse: CROPLAND

Parent Material: ALLUVIUM

**Other Comments:** This site was not fully described in the precise location of the site noted and is more appropriately a composite of similar adjacent profiles. This site was not sampled for chemical analysis. Some evidence of stratification is noticeable.

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	A	0 - 9	2f	2.5Y 5/2	2.5Y 3/3	CL 30	N	M1SBK	< 1%	NE	N	--
2	AB	9 - 18	2f	--	2.5Y 4/3	CL 30	N	M1SBK	< 1%	NE	N	--
3	Bk	18 - 29	1f	--	2.5Y 5/4	L 25	N	M1SBK	< 1%	ST	N	--
4	C	29 - 60	1f	--	2.5Y 5/4	L 25	N	MA	< 1%	ST	N	small carbonate nodules
5		-										
6		-										

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 060929-T04

SERIES: LALLIE

UTM NAD 83 Zone 13 North

Landform: OLD CHANNEL / SWALE

Epipedon: OCHRIC

Easting: 651,089

Biota: NATIVE

Control Texture: FINE

Northing: 5,188,875

Landuse: PASTURE

Parent Material: ALLUVIUM

**Other Comments:** This profile developed in a channel bottom filled with local alluvium but adjacent to river terraces. The entire profile is suitable for salvage, but wet conditions may limit salvage operations.

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	A	0 - 9	1vf	5Y 5/2	2.5Y 4/2 7.5YR 5/6	C 58.8	N	M2SBK	< 1%	NE	N	--
2	Bt	9 - 19	1vf	5Y 4/1 & 5Y 6/1	5Y 3/1 & 5Y 5/1	SiC 56.3	Y	M3SBK	< 1%	NE	N	mottled
3	2Cg	19 - 27	1vf	5Y 5/2 & 5Y 7/2	5Y 4/2 & 5Y 6/2	SiCL 38.8	N	M1SBK	< 1%	NE	N	mottled
4	2C1	27 - 43	none	5Y 4/2	5Y 3/2	SiC 46.3	N	M3SBK	< 1%	NE	N	mottled
5	2C2	43 - 60	none	5Y 5/2	5Y 4/2	SiC 42.5	N	M1SBK	< 1%	NE	N	mottled
6		-		--								

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 060926-T01

SERIES: LAWTHER

UTM NAD 83 Zone 13 North

Landform: SWALE

Epipedon: PACHIC MOLLIC

Easting: 648,862

Biota: WHEAT

Control Texture: FINE

Northing: 5,188,939

Landuse: CROPLAND

Parent Material: LOCAL ALLUVIUM

**Other Comments:** This series commonly has high SAR and/or EC in the lower horizons (30-60 inches). This profile is unsuitable for salvage below a depth of 41 inches due to elevated EC.

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	Ap	0 - 6	1vf	10YR 4/2	10YR 2/2	CL 27.5	N	M2SBK	< 1%	NE	N	--
2	Bt	6 - 13	1vf	10YR 5/2	10YR 3/2	C 46.3	Y	M3SBK	< 1%	NE	N	--
3	Bk	13 - 28	1vf	2.5Y 6/2	2.5Y 4/2	C 50	Y	M2SBK	< 1%	ST	N	Segregated line
4	Bky	28 - 41	1vf	2.5Y 6/2	2.5Y 4/2	C 50	Y	M1SBK	< 1%	ST	N	Slickenslides are evident at 30 in.
5	C	41 - 60	none	2.5Y 6/3	2.5Y 4/3	C 50	N	MASSIVE	< 1%	ST	Y	EC 7.27 SAR 6.67
6		-		--								



**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 061025-T01

SERIES: LOHLER

UTM NAD 83 Zone 13 North

Landform: LOW TERRACE

Epipedon: OCHRIO

Easting: 649,988

Biota: MIXED TREES AND GRASS

Control Texture: FINE

Northing: 5,188,243

Landuse: PASTURE

Parent Material: ALLUVIUM

**Other Comments:** This site was not sampled, but is assumed to have unsuitable C-horizon materials due to elevated EC and SAR. The light colored materials elsewhere in the valley bottom have been found to be unsuitable where massive and calcareous.

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	A1	0 - 7	3m	10YR 6/1	10YR 4/1	SiC 40	N	M3BSK	< 1%	NE	N	Suitable
2	C1	7 - 37	2f	10YR 8/1	10YR 6/1	STRATIFIED SiL 51	N	MA	< 1%	SL	N	Likely elevated EC and SAR
3	C2	37 - 60	1f	10YR 6/3	10YR 4/3	SiC	N	MA	< 1%	SL	N	Likely elevated EC and SAR
4	-											
5	-											
6	-											

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 061005-S12

SERIES: MANNING

UTM NAD 83 Zone 13 North

Landform: HIGH TERRACE REMNANT

Epipedon: MOLLIC (PACHIC)

Easting: 651,535

Biota: GRAIN STUBBLE

Control Texture: COARSE-LOAMY

Northing: 5,189,948

Landuse: CROPLAND

Parent Material: ALLUVIUM

**Other Comments:** This profile has a slightly thicker mollic epipedon (18 in) than the official series description. The Manning series occurs infrequently and is well drained. It is likely leached of salts and sodium and, therefore, was not sampled.

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	Ap	0 - 6	2f	moist in field	10YR 3/2	SL 18	N	F1SBK	< 1 %	NE	N	--
2	A2	6 - 18	2f	--	10YR 3/3	SL 18	N	F2SBK	1 - 5 % FG	NE	N	--
3	Bw	18 - 27	1f	--	10YR 4/3	SL 16	N	F1SBK	1 - 5 % FG	NE	N	--
4	2Bk	32 - 40+	--	--	very light carb	Gr. L 17	N	Structureless Gravelly	40+ % F-M Grav	ST	N	Free carbonates. Difficult to auger.
5		-										
6		-										

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 060921-T01

SERIES: MOREAU

UTM NAD 83 Zone 13 North

Landform: UPLAND

Epipedon: MOLLIC (borderline)

Easting: 649,765

Biota: WHEAT FALLOW

Control Texture: FINE

Northing: 5,190,642

Landuse: CROPLAND

Parent Material: WEATHERED SHALE

Other Comments: **Calcareous A and Bk are common in the Moreau Map Units.**

**This profile may be slightly too light to be Mollic, but is otherwise very typical of the Moreau series.**

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	Ap	0 - 6	1vf	moist in field	10YR (3) 4/2	SiCL 32.5	N	M2SBK	< 1%	NE	N	--
2	Bk1	6 - 14	1vf	--	2.5Y 5/2	CL 35	Y	M1PR to M1SBK	< 1%	VE	N	--
3	Bk2	14 - 27	1vf	--	2.5Y 5/3	L 26.3	N	M2SBK	< 1%	VE	N	EC 0.38 SAR 2.76 Small masses CaCO <sub>3</sub>
4	Cr1	27 - 36	vfvf	--	2.5Y 6/3	L 25	N	PL	< 1%	ST	N	EC 1.27 SAR 10
5	Cr2	36 - 60	0	--	2.5Y 6/3	L 20	N	PL	< 1%	SL	N	EC 7.63 SAR 10.5
6		-										

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 060929-T03

SERIES: MORTON

UTM NAD 83 Zone 13 North

Landform: UPLAND SLOPE/SWALE

Epipedon: MOLLIC

Easting: 649,854

Biota: WHEAT

Control Texture: FINE-SILTY

Northing: 5,189,303

Landuse: CROPLAND

Parent Material: RESIDUUM (SILTSTONE)

Other Comments: **This profile is suitable for salvage to the depth of bedrock contact (38 in).**

**The epipedon is nearly pachic (15 in mollic).**

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	Ap	0 - 7	1vf	10YR 4/2	10YR 3/2	SiCL 30	N	M2SBK	< 0.1%	NE	N	--
2	Bt1	7 - 15	1vf	10YR 4/2	10Y 3/2	SiCL 30	N	M3PR	< 0.1%	NE	N	--
3	Bt2	15 - 31	1vf	10YR 5/2	10YR 4/2	SiCL 30	N	M2SBK	< 0.1%	NE	N	EC 2.16 SAR 6.96
4	Bk	31 - 38	1vf	10YR 6/2	10YR 5/2	SiCL 30	N	M2SBK	< 0.1%	ST	N	EC 1.71 SAR 5.31
5	Cr	38 - 60	none	2.5Y 6/3	2.5Y 6/3	--	--	--	--	ST	N	Siltstone Beds EC 2.11 SAR 16
6		-		--								

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 060920-S19

SERIES: PARSHALL

UTM NAD 83 Zone 13 North

Landform: MID SLOPE

Epipedon: PACHIC MOLLIC

Easting: 647,873

Biota: GRASSES - DENSE MAT

Control Texture: COARSE LOAMY

Northing: 5,191,478

Landuse: GRASSLAND - RANGELAND

Parent Material: AEOLIAN DEPOSITS

**Other Comments:** This site is located in a typical leeward deposit on a steep east-facing slope. The lower horizon is slightly darker than overlying horizons, suggesting perhaps it is a buried A-horizon. The entire profile is suitable for salvage.

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	A1	0 - 7	2f 2m	Moist in Situ Mollic	2.5Y 3/2	SL 13.8	N	F1SBK	< 1%	NE	N	--
2	A2	7 - 16	2f 2m	--	2.5Y 3/2	SL 15	N	M1PR	< 1%	NE	N	--
3	Bw	16 - 25	1f	--	2.5Y 3.5/2	SL 15	N	M1SBK	< 1%	NE	N	--
4	Bk1	25 - 33	1f	--	2.5Y 4/2	SL 15	N	MA	1-2% fg	ST	N	--
5	Bk2	33 - 41	1f	--	2.5Y 4/2	SL 18.8	N	MA	< 1%	ST	N	--
6	C	41 - 53	none	--	2.5Y 4/2	SL 18.8	N	MA	< 1%	ST	N	Many carbonate filaments
7	Ab	53 - 60	none	--	2.5Y 3/2	SL 20	N	MA	< 1%	ST	N	Few carbonate filaments

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 060930-T02

SERIES: REEDER

UTM NAD 83 Zone 13 North

Landform: UPLAND

Epipedon: MOLLIC

Easting: 651,600

Biota: CROPLAND

Control Texture: FINE-LOAMY

Northing: 5,189,130

Landuse: CORN

Parent Material: SHALE/SILTSTONE RESIDUUM

Other Comments: **This profile is borderline fine-silty, which is common for this series.**

**All horizons above the bedrock contact are suitable for salvage.**

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/ Mottles	Moist Matrix								
1	Ap	0 - 6	1vf	10YR 4/2	10YR 3/2	SiL 21.3	N	M1SBK	< 1 %	NE	N	--
2	Bt1	6 - 9	1vf	10YR 4/2	10YR 3/2	L 25	Y	M2PR	< 1 %	NE	N	--
3	Bt2	9 - 18	1vf	10Y 5/2	10YR 4/2	L 25	Y	M2PR	< 1 %	NE	N	--
4	Bt3	18 - 23	1vf	10YR 5/2	10YR 4/2	SiCL 31.3	N	M2SBK	< 1 %	NE	N	--
5	C	23 - 34	1vf	10YR 6/3	10YR 5/3	SiCL 31.3	N	M1SBK	< 1 %	ST	N	--
6	Cr	34 - 60	none	--	--	C (beds) 51.3	N	--	--	--	--	Soft Bedrock EC 3.73

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 060823-T02

SERIES: REGENT

UTM NAD 83 Zone 13 North

Landform: RESIDUAL UPLANDS

Epipedon: MOLLIC (nearly pachic)

Easting: 647,967

Biota: NATIVE

Control Texture: FINE

Northing: 5,190,754

Landuse: PASTURE

Parent Material: SHALE RESIDUUM

Other Comments: Mollic colors of this series are slightly deeper than most profiles, but the profile is otherwise representative.

The entire profile is chemically suitable for salvage based on chemistry, but the contact with soft bedrock limits salvage depth.

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	A	0 - 9	2f	moist in field	10YR 3/2	L 22.5	N	M1SBK	< 1%	NE	N	--
2	Bt	9 - 16	2f	--	10YR 3/3	CL 30	Y	M2PR to M3ABK	< 1%	NE	N	--
3	Bky	16 - 28	2f	--	2.5Y 5/2	SCL 32.5	N	M3PR-SBK	< 1%	ST	Y	Gypsum
4	Cr1	28 - 37	1f	--	2.5Y 5/2	CL 32.5	N	MA	< 1%	VE	Y	Gypsum and masses CaCO <sub>3</sub>
5	Cr2	37 - 60	1f	--	--	L 25	N	--	< 1%	--	--	Soft Shale/Siltstone
6		-										

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 060930-T04

SERIES: RHOADES

UTM NAD 83 Zone 13 North

Landform: ALLUVIAL PLAIN

Epipedon: MOLLIC

Easting: 652,425

Biota: NATIVE

Control Texture: FINE

Northing: 5,188,854

Landuse: FALL PASTURE

Parent Material: LOCAL ALLUVIUM

**Other Comments:** This profile is typical of the Rhoades series. Taxadjuncts may not have SAR above 13 in the Bt, but will be notably sodium affected at depth. This entire profile is unsuitable for salvage due to elevated EC and SAR.

Horizon	Depth [inches]	Roots	Color		Texture	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	A	0 - 4	3vf	2.5Y 4/2	2.5Y 3/2	SiC	N	M2SBK	< 1%	NE	N	SAR 11.2 EC 6.34
2	Btn	4 - 11	3vf	2.5Y 4/2	2.5Y 3/2	SiC	Y	M3PR	< 1%	NE	N	SAR 15.3 EC 16.5 T Thin E materials on top of peds
3	Bkyn1	11 - 28	1vf	2.5Y 5/2	2.5Y 4/2	SiC	Y	M3SBK	< 1%	VE	Y	SAR 16.5 EC 17.9
4	Bkyn2	28 - 40	none	10YR 6/2	10YR 4/2	CL	N	M1SBK	< 1%	ST	Y	SAR 19.8 EC 20.7
5	C1	40 - 50	none	5Y 6/2	5Y 4/2	SiC	N	MA	< 1%	ST	N	SAR 20.8 EC 19.2
6		-		--								



**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 061006-S38

SERIES: SAVAGE

UTM NAD 83 Zone 13 North

Landform: MIDSLOPE UPLAND

Epipedon: MOLLIC

Easting: 648,589

Biota: HARVESTED WHEAT

Control Texture: FINE

Northing: 5,192,053

Landuse: CROPLAND

Parent Material: ALLUVIUM

Other Comments: **This profile is typical of the Savage profiles with elevated EC / SAR at depth.**

**Salvage is limited to a maximum of 30 inches.**

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	Ap	0 - 6	1f	moist in field	2.5Y 3/1	SiCL 33.8	N	M1SBK	< 1% fg	NE	N	--
2	Bt	6 - 14	1f	--	2.5Y 3/1	SiC 43.8	Y	M2SBK ABK	< 1% fg	NE	N	--
3	Btk	14 - 30	1f	--	2.5Y 3.5/2	SiC 45	Y	M2ABK	< 1% fg	ST	N	EC 0.76 SAR 5.43
4	Bky	30 - 48	none	--	2.5Y 3.5/2	SiC 41.3	N	M1SBK	3% fg	ST	Y	Gypsum crystals and filaments on ped faces EC 6.62 SAR 6.74
5	C	48 - 58	none	--	2.5Y 4/2	SiC 42.5	N	MA	< 1% fg	ST	Y	EC 5.21 SAR 8.94
6		-		--								

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 061007-T03A

SERIES: SEN

UTM NAD 83 Zone 13 North

Landform: FOOT SLOPE

Epipedon: MOLLIC

Easting: 652,655

Biota: CROP

Control Texture: FINE-SILTY

Northing: 5,190,220

Landuse: WHEAT

Parent Material: SILTSTONE RESIDUUM

**Other Comments:** This site was not sampled, but is representative of the Sen Series. The typical pedon for Amor is very similar, but slightly coarser textured. The entire profile is suitable for salvage to the depth of bedrock contact. No visible salts are present.

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	Ap	0 - 7	2vf	10YR 4/2	10YR 3/2	SiL	N	M1SBK	< .1%	NE	N	--
2	Bw	7 - 12	1vf	10YR 4/2	10YR 3/2	SiL	N	M1PR	< .1%	NE	N	--
3	Bk	12 - 23	1vf	10YR 5/2	10YR 4/2	SiL	N	M2SBK	< .1%	ST	N	--
4	Cr	23 - 60	--	--	--	--	--	--	--	--	--	Bedrock contact
5	-											
6	-											

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 060919-S32

SERIES: SHAMBO

UTM NAD 83 Zone 13 North

Landform: UPLAND SWALE

Epipedon: MOLLIC

Easting: 647,753

Biota: WHEAT - NON-HARVESTED

Control Texture: COARSE LOAMY

Northing: 5,191,181

Landuse: CROPLAND

Parent Material: AEOLIAN DEPOSITS AND ALLUVIUM

**Other Comments:** This profile is typical of the Shambo series in most upland (non-terrace) positions. The entire profile is suitable for salvage.

The weak argillic horizon is not typical and may instead reflect stratification of aeolian deposits common in this area.

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/ Mottles	Moist Matrix								
1	Ap	0 - 13	2f	Moist but Mollic	2.5Y 3/2	L 21.3	N	M1SBK	< 1% fg	NE	N	--
2	BA	13 - 22	1f	--	2.5Y 4/2	FSL 15	N	M2ABK	< 1% fg	NE	N	--
3	Bw	22 - 29	1f	--	2.5Y 4/3	FSL 17.5	N	M1SBK	< 1% fg	NE	N	--
4	Btk	29 - 41	1f	--	2.5Y 4/3	L 22.5	Y	M1SBK	< 1% fg	SL	N	slight indication of argillic properties not common to most profiles
5	Bk	41 - 63	none	--	2.5Y 4.5/4	L 22.5	N	M1SBK	< 1% fg	SL		--
6	C	63 - +	none	--	2.5Y 4.5/4	L 18	N	MA	< 1% fg	ST	N	--

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 070511-S33

SERIES: SHAMBO v. (saline / sodic)

UTM NAD 83 Zone 13 North

Landform: 2ND TERRACE

Epipedon: MOLLIC

Easting: 650,489

Biota: CRESTED WHEATGRASS

Control Texture: FINE SILTY

Northing: 5,186,124

Landuse: CRP

Parent Material: ALLUVIUM

Other Comments: **This profile is typical of the Shambo variants with saline / sodic substratum and silty textures.**

**Only the top two horizons are suitable for salvage. Deep light-colored materials are highly sodic.**

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/ Mottles	Moist Matrix								
1	Ap	0 - 6	2f	Moist in Field	2.5Y 3/1	SiL 18.8	N	F1GR	< 1%	NE	N	EC 0.89 SAR 0.66
2	Bw	6 - 10	1f	--	2.5Y 4/2	SiCL 36.3	N	M1GR	< 1%	NE	N	EC 1.05 SAR 9.34
3	Bk(n)1	10 - 19	1f	--	2.5Y 5/3	SiCL 38.8	N	M1SBK	< 1%	SL	N	EC 1.18 SAR 17.8
4	Bk(n)2	19 - 30	1f	--	2.5Y 5/2	SiL 20	N	M2SBK	< 1%	ST	N	EC 4.81 SAR 45.1
5	C	30 - 49	--	--	2.5Y 5/2	SiL 16.3	N	MA	< 1%	ST	N	EC 14.5 SAR 45.4
6		-										

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 060926-T04

SERIES: STADY

UTM NAD 83 Zone 13 North

Landform: ANCIENT STREAM TERRACE

Epipedon: MOLLIC

Easting: 649,669

Biota: WHEAT

Control Texture: FINE LOAMY OVER SAND & GRAVEL

Northing: 5,188,524

Landuse: CROPLAND

Parent Material: LOCAL ALLUVIUM

**Other Comments:** Included in mapping are areas of moderately fine and fine subsoil and areas where the gravel is at less than 20 inches.

**This profile occurs in a delineation almost entirely composed of similar soils, but identified as the more common Manning unit.**

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	Ap	0 - 7	2vf	10YR 4/2	10YR 3/2	L 23.8	N	M2SBK	< 1%	NE	N	--
2	Bw1	7 - 12	2vf	10YR 5/2	10YR 3/2	L 21.3	N	M2SBK	< 1%	NE	N	--
3	Bw2	12 - 20	2vf	10YR 6/3	L	L 26.3	N	M2SBK	< 1%	NE	N	--
4	2C	20 - 60	--	--	--	GR. SCL 23.8	--	--	40% Medium Gravel	--	--	Very high gravel content made it difficult to describe fully.
5	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 070501-T03

SERIES: TALLY

UTM NAD 83 Zone 13 North

Landform: HIGH RIVER TERRACE REMNANT

Epipedon: MOLLIC

Easting: 650,996

Biota: WHEAT

Control Texture: COARSE-LOAMY

Northing: 5,191,411

Landuse: CROPLAND

Parent Material: ALLUVIUM

**Other Comments:** This profile is typical of Tally with non-limiting materials found to a depth of 60 inches. The near-pachic A horizon is not typical of all profiles. The Ap and Bw textures are borderline Sandy Loam (51.3% Sand), which is more common for this series.

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	Ap	0 - 7	2vf	10YR 4/2	10YR 3/2	L 16.3	N	SGR	< 1%	NE	N	Adjacent profiles are not consistently pachic.
2	Bw1	7 - 16	1vf	10YR 4/2	10YR 3/2	L 15	N	SGR	< 1%	NE	N	
3	Bw2	16 - 25	1vf	10YR 6/3	10YR 4/3	SL 15	N	SGR	< 1%	NE	N	--
4	Bk	25 - 34	--	10YR 7/3	10YR 5/3	SL 18.8	N	SGR	< 1%	VE	N	--
5	C	34 - 60	--	10YR 7/2	10YR 6/2	LS 8.8	N	SGR	< 1%	ST	N	--
6		-										

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 060928-S30

SERIES: TREMBLES

UTM NAD 83 Zone 13 North

Landform: TERRACE

Epipedon: OCHRIC

Easting: 650,130

Biota: ALFALFA AND GRASSES

Control Texture: COARSE-LOAMY

Northing: 5,188,515

Landuse: CROPLAND/HAYLAND

Parent Material: ALLUVIUM

**Other Comments:** This profile is similar to the Shambo and Havrelon sodic profiles nearby, but with slightly coarser texture. This difference likely accounts for the suitable chemistry. Variable texture in the Fluvent units limit salvage where sodic materials may occur.

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	Ap	0 - 4	1f	Moist in Field	2.5Y 3/2	SiL 23	N	M1SBK	< 1 fg	NE	N	Sampled together.
2	Bt	4 - 6	2m	Moist in Field	2.5Y 3.5/2	SiL 27	Y	F1SBK F1GR	< 1 fg	NE	N	
3	C	6 - 60	1f	2.5Y 6/3	2.5Y 4/2	L 13.8	N	MA	< 1 fg	NE/ST	N	Patchy strong Eff. Sample represents materials to 30 in.
4	-											
5	-											
6	-											

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 060926-S19

SERIES: VEBAR

UTM NAD 83 Zone 13 North

Landform: UPLAND HILLSLOPE

Epipedon: MOLLIC

Easting: 649,037

Biota: FALLOW

Control Texture: COARSE-LOAMY

Northing: 5,189,805

Landuse: CROPLAND

Parent Material: RESIDUAL SANDSTONE

**Other Comments:** Salts generally not observed in these well drained profiles. Soil is suitable for salvage to a depth of 34 in. This profile was not sampled as the very similar Parshall (deep pachic) and Flasher (shallower) series did not exhibit limiting chemical characteristics.

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	Ap	0 - 9	2f	Moist in field	10YR 3/3	L 20	N	F1SBK	< 1 %	ST	N	--
2	Bw	9 - 20	1f	--	10YR 4/2	FSL 17	N	M1SBK	< 1 %	NE	N	--
3	Bk	20 - 34	1f	--	10YR 5/2	FSL 15	N	SGR	< 1 %	ST	N	--
4	Cr	34 - 40	none	--	--	--	--	--	--	--	--	Sandstone Bedrock
5		-		--								
6		-		--								



**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 060930-S05

SERIES: VELVA

UTM NAD 83 Zone 13 North

Landform: TERRACE

Epipedon: MOLLIC

Easting: 651,049

Biota: GRAIN STUBBLE

Control Texture: COARSE-LOAMY

Northing: 5,189,373

Landuse: CROPLAND

Parent Material: ALLUVIUM

**Other Comments:** This site was not fully described or sampled in the field and is more appropriately considered a composite of adjacent profiles.

This soil occurs to a very limited extent in the study area. It is very similar to Havrelon, but with Mollic colors.

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	Ap	0 - 11	2f	moist in field	2.5Y 3/2	FSL 15	N	F1SBK to SGR	< 1 %	NE	N	--
2	AC	11 - 25	1f	--	2.5Y 4/2	FSL 16	N	M1SBK-ABK	< 1 %	SL	N	--
3	Ab	25 - 31	1f	--	2.5Y 3/3	FSL 17	N	M2SBK	< 1 %	SL+	N	This dark horizon was very difficult to penetrate.
4	C	31 - 60	--	--	2.5Y 4-5/2	FSL 17	N	MA	< 1 %	ST	N	Light colored substrata may have high sodium.
5		-		--								
6		-		--								

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 060927-T02

SERIES: WAYDEN

UTM NAD 83 Zone 13 North

Landform: RESIDUAL UPLAND SLOPE

Epipedon: OCHRIC

Easting: 648,435

Biota: WHEAT

Control Texture: CLAYEY/FINE

Northing: 5,189,180

Landuse: CROPLAND

Parent Material: SHALE RESIDUUM

Other Comments: **The shale at the base of this profile is saline and sodic. All soil materials above the bedrock contact are suitable for salvage.**

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	Ap	0 - 5	1vf	10YR 5/2	10YR 3/2	SiC 41.3	N	M1SBK	< 1%	NE	N	--
2	Bk	5 - 14	1vf	2.5Y 6/2	2.5Y 4/2	C 56.3	N	M2SBK	< 1%	ST	N	--
3	Cr	14 - 60	none	--	--	SiC 43.8	N	--	SOFT SHALE	--	N	EC 15.1 SAR 15.6
4		-		--								
5		-		--								
6		-		--								

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 061015-S05

SERIES: STRAW

UTM NAD 83 Zone 13 North

Landform: TERRACE/FP

Epipedon: MOLLIC

Easting: 647,859

Biota: POA GRASSLAND

Control Texture: FINE-LOAMY

Northing: 5,192,624

Landuse: PASTURE

Parent Material: ALLUVIUM

Other Comments: **Hard and difficult to penetrate below 27 inches. C material is stratified w/some evidence of buried horizons/profile deep.**

**The EC/SAR are low in all horizons, but slightly more elevated in the Ck horizon. This profile is an inclusion of an Arnegard unit.**

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	A	0 - 8	1f 2m	2.5Y 5/2	2.5Y 3/2	SiCL 27.5	N	F2GR	0 - < 1% fg	NE	N	--
2	Bw	8 - 18	2m	2.5Y 5-6/2	2.5Y 3/2	SiCL 27.5	N	M2SBK	0 - < 1% fg	NE	N	Barely pachic dry colors.
3	Bk	18 - 27	1m	--	2.5Y 4/2	SiL 21.3	N	M-C2SBK TO ABK	0 - < 1% fg	SL	N	--
4	Ck	27 - 55	1f	--	2.5Y 3.5/2	SiCL 30	N	MA (HARD)	0 - < 1% fg	SLT ST	N	Carb Nodules/Threads EC 1.83 SAR 2.82
5	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 060926-T08

SERIES: WABEK

UTM NAD 83 Zone 13 North

Landform: STEEP SIDE SLOPE OF A DRAW

Epipedon: MOLLIC

Easting: 649,507

Biota: WHEAT

Control Texture: SANDY SKELETAL

Northing: 5,188,604

Landuse: CROPLAND

Parent Material: ALLUVIUM

Other Comments: **Some areas have a gravel substratum overlying weathered shale or siltstone at various depths.**

**This series occurs infrequently, therefore, the samples from this site were not analyzed.**

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	Ap	0 - 6	2f	10YR 4/2	10YR 3/2	L	N	M2SBK	10 % gr	NE	N	--
2	Bw	6 - 12	1f	10YR 6/2	10YR 4/2	GRL	N	M2SBK	10 % gr	NE	N	--
3	C	12 - 60	1vf	--	--	--	N	SGR	40 % gr	NE	N	High gravel content limited further description.
4	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-

**SOUTH HEART LIGNITE MINE**

**TYPICAL PEDON DESCRIPTION**

Site ID: 070427-T05

SERIES: FARLAND

UTM NAD 83 Zone 13 North

Landform: FOOT SLOPE

Epipedon: MOLLIC

Easting: 647,135

Biota: TAME GRASS

Control Texture: FINE-SILTY

Northing: 5,191,482

Landuse: HAY

Parent Material: LOCAL ALLUVIUM

Other Comments: **This profile occurs in a Shambo delineation - no Farland delineations were mapped.**

**The profile is unsuitable for salvage at depths below 28 inches. The Bk2 horizon frequently exhibits high EC, where present.**

Horizon	Depth [inches]	Roots	Color		Texture & Pct. Clay	Clay Films [Y / N]	Structure [size, grade, class]	C.F.% by Vol [note size and %]	Eff.	Vis. Salt	General Comment	
			Dry Matrix/Mottles	Moist Matrix								
1	Ap	0 - 7	3f	10YR 5/2	10YR 3/2	L	N	M2SBK	< 1%	NE	N	--
2	Bw	7 - 14	3f	10YR 5/2	10YR 3/2	L	N	M2PR	< 1%	NE	N	--
3	Bk1	14 - 28	3f	10YR 6/2	10YR 4/2	SiCL 27	N	M2SBK	< 1%	ST	N	SAR 3.18 EC 0.84
4	Bk2	28 - 42	3vf	10YR 6/2	10YR 4/2	SiCL 27	N	M2SBK	< 1%	ST	N	SAR 7.84 EC 4.99
5	C	42 - 60	--	10YR 6/2	10YR 4/2	SiCL 30	N	MA	< 1%	ST	N	SAR 8.97 EC 10.1
6		-										