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September 16, 1986

TO: Technical File

FROM: James S. Leatherwood, Reclamation Soils Specialist JSL

RE: Substitute Topsoil Suitability, Belina Complex, Valley Camp of Utah, Inc., ACT/007/001, Folder #2, Carbon County, Utah

Pursuant to Conditions #5 and #6, the operator has submitted analytical data for the Utah No. 2 and Belina Pad materials. This information has been presented to determine the suitability of these materials as substitute topsoils. The following delineates the submitted data with a corresponding topsoil substitute suitability rating as defined in Table 2 of the Draft Topsoil and Overburden Guideline (enclosed).

BELINA PAD

Sample Site No. 1
Overall Rating = Good-Fair

Parameter	Depth	Data	Rating(5)	Parameter	Depth	Data	Rating
pH				Texture			
	0-2	7.5	G		0-2	sl	G
	2-4	7.4	G		2-4	scl	G
	4-6	7.5	G		4-6	c	P
	6-8	7.8	G		6-8	c	P
$CaCO_3$%				EC(1)			
	0-2	0.45	G		0-2	0.80	G
	2-4	0.35	G		2-4	0.77	G
	4-6	0.29	G		4-6	0.85	G
	6-8	0.36	G		6-8	0.95	G

BELINA PAD

Sample Site No. 1 (Cont'd.)
Overall Rating = Good-Fair

Parameter	Depth	Data	Rating(5)	Parameter	Depth	Data	Rating
SAR(2)				OM%(3)			
	0-2	0.047	G		0-2	4.7	
	2-4	0.064	G		2-4	3.9	
	4-6	0.087	G		4-6	4.5	
	6-8	0.100	G		6-8	3.4	
SAT%(4)							
	0-2	22.5	P				
	2-4	21.9	P				
	4-6	19.3	P				
	6-8	24.6	P				

BELINA PAD

Sample Site No. 2
Overall Rating = Good-Fair

Parameter	Depth	Data	Rating(5)	Parameter	Depth	Data	Rating
pH				EC(1)			
	0-2	7.2	G		0-2	0.90	G
	2-4	7.3	G		2-4	0.75	G
	4-8	7.5	G		4-8	0.69	G
$CaCO_3$%				SAR(2)			
	0-2	0.21	G		0-2	0.039	G
	2-4	0.39	G		2-4	0.062	G
	4-8	0.44	G		4-8	0.063	G
Texture				OM%(3)			
	0-2	sil	G		0-2	3.6	
	2-4	l	G		2-4	5.4	
	4-8	cl	F		4-8	4.8	
Sat%(4)							
	0-2	23.4	P				
	2-4	18.7	P				
	4-8	25.7	F				

BELINA PAD

Sample Site No. B-5
Overall Rating = Good-Fair

Parameter	Depth	Data	Rating(5)
pH			
	0-2.5	7.2	G
	2.5-5.0	7.4	G
	5.0-7.5	7.8	G
	7.5-10.0	7.3	G
	10.0-12.5	7.5	G
	12.5-15.0	7.8	G
	15.0-17.5	7.4	G
	17.5-20.0	7.9	F
	20.0-22.5	7.5	G
	22.5-25.0	7.5	G
	25.0-27.5	7.4	G
	27.5-30.0	7.4	G
CaCO%			
	0-2.5	0.46	G
	2.5-5.0	0.42	G
	5.0-7.5	0.38	G
	7.5-10.0	0.39	G
	10.0-12.5	0.37	G
	12.5-15.0	0.35	G
	15.0-17.5	0.30	G
	17.5-20.0	0.41	G
	20.0-22.5	0.36	G
	22.5-25.0	0.32	G
	25.0-27.5	0.40	G
	27.5-30.0	0.40	G
Texture			
	0-2.5	c	P
	2.5-5.0	cl	F
	5.0-7.5	c	P
	7.5-10.0	scl	G
	10.0-12.5	c	P
	12.5-15.0	sl	G
	15.0-17.5	sl	G
	17.5-20.0	l	G
	20.0-22.5	sl	G
	22.5-25.0	scl	G
	25.0-27.5	scl	G
	27.5-30.0	sl	G

Parameter	Depth	Data	Rating
EC(1)			
	0-25	0.75	G
	2.5-5.0	0.80	G
	5.0-7.5	0.84	G
	7.5-10.0	0.90	G
	10.0-12.5	0.78	G
	12.5-15.0	0.88	G
	15.0-17.5	0.92	G
	17.5-20.0	0.88	G
	20.0-22.5	0.76	G
	22.5-25.0	0.80	G
	25.0-27.5	0.74	G
	27.5-30.0	0.75	G
SAR(2)			
	0-2.5	0.08	G
	2.5-5.0	0.06	G
	5.0-7.5	0.08	G
	7.5-10.0	0.10	G
	10.0-12.5	0.05	G
	12.5-15.0	0.06	G
	15.0-17.5	0.05	G
	17.5-20.0	0.06	G
	20.0-22.5	0.06	G
	22.5-25.0	0.08	G
	25.0-27.5	0.06	G
	27.5-30.0	0.06	G
OM%(3)			
	0-2.5	3.3	
	2.5-5.0	4.6	
	5.0-7.5	8.2	
	7.5-10.0	5.9	
	10.0-12.5	7.7	
	12.5-15.0	5.5	
	15.0-17.5	6.8	
	17.5-20.0	4.9	
	20.0-22.5	10.5	
	22.5-25.0	6.8	
	25.0-17.5	4.9	
	27.5-30.0	4.9	

Parameter	Depth	Data	Rating(5)	Parameter	Depth	Data	Rating
Sat%(4)							
	0-2.5	24.5	P				
	2.5-5.0	21.8	P				
	5.0-7.5	24.6	P				
	7.5-10.0	23.8	P				
	10.0-12.5	31.5	G-F				
	12.5-15.0	27.1	F				
	15.0-17.5	20.7	P				
	17.5-20.0	21.5	P				
	20.0-22.5	28.2	F				
	22.5-25.0	20.4	P				
	25.0-27.0	25.1	F				
	27.5-30.0	19.7	P				

UTAH NO. 2 PAD

Sample Site No. 1
10-ft. Depth
Overall Rating = Good

Parameter	Data	Rating(5)	Parameter	Data	Rating
pH	7.3	G	Texture	l	G
Sat%(4)	34.3	G-F	EC(1)	0.79	G
SAR(2)	0.65	G	OM%(3)	1.9	

UTAH NO. 2 PAD

Sample Site No. 2
8-ft. Depth
Overall Rating = Good

Parameter	Data	Rating(5)	Parameter	Data	Rating
pH	7.4	G	Texture	sl	G
Sat%(4)	30.5	G-F	EC(1)	1.08	G
SAR(2)	0.59	G	OM%(3)	2.5	

Sample Site No. 3
6-ft. Depth
Overall Rating = Good-Fair

Parameter	Data	Rating(5)	Parameter	Data	Rating
pH	5.5	F	Texture	1	G
Sat%(4)	32.2	G-F	EC(1)	0.31	G
SAR(2)	0.92	G	OM%(3)	4.5	

(1) Electrical Conductivity (mmhos/cm @ 25°C)

(2) Sodium Adsorption Rates

(3) Organic matter percent (Organic matter suitability ratings are undetermined at this time. Data is presented for information purposes only.

(4) Saturation Percent (Data on the Belina Pad materials is misleading. In some cases there is a high clay content and low saturation percentage- See Sample Site No. 1, 4-6 and 6-8 feet samples).

(5) Ratings:

Good = G
Fair = F
Poor = P
Unsuitable = U

Enclosure(s)
JSL/djh
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Table 2. Suitability Limits for Rating Topsoil Substitutes*

	Good	Fair	Poor	Unsuitable
Available water capacity	>0.10	0.05-0.10	<0.05	
pH	6.1-7.8	5.1-6.1 7.9-8.4	4.5-5.0 8.5-9.0	<4.5 >9.0
USDA Textural Class	SL L, SiL SCL VFSL FSL	CL,SICL, SC,LS LFS	SIC S, SC, C COS, FS, VFS	G, VCOS
Slope (%)	<8	8-15	>15	
Electrical Conductivity	0-4	5-8	9-15	>16
Sodium Adsorption Ratio (SAR)	5	6-10	10-12 Fine Texture 10-15 Coarse Texture	>12 Fine Texture >15 Coarse Texture
Boron	<5.0			>5.0
Selenium	<0.1	>0.1		
Rock Fragments (% Volume)				
3 inches	0-15	15-25	25-30	30
3-10 inches	0-15	15-25	25-30	30
More than 10 inches	0-3	3-7	7-10	10
Alkalinity as Calcium Carbonate %	0-15	15-25	25-40	>40
Saturation Percentage (%)			<25 >80	

* Many native species have their roots in soils that are determined poor to unsuitable by these values. Therefore, plant growth trials may be needed where re-establishment of native species is desired.