Appendix 5-7

Method Used to Determine Maximum Surface Limit of Possible Subsidence

Methodology Used in Calculation of Maximum Surface Limit of Possible Subsidency

The maximum surface limit of possible subsidence was calculated by the following procedure:

STEP 1: Multiply the tangent of the angle of draw by the overburden thicknesses present along the perimeter of the areas to be mined.

STEP 2: Points were plotted in a direction perpendicular to the mined perimeter, directly away from the area to be mined, at distances equal to the values obtained in Step 1.

STEP 3: As requested by the USFS on September 21, 1994 an additional 25' each side of the perennial stream channel was added to the buffer zone in areas above the forks of Crandall Canyon and the south fork of Horse Canyon. In addition in areas below the forks of Crandall Canyon an additional buffer of 50' each side of the stream channel was added.

STEP 4: Points plotted in step 3 were joined to delineate the maximum surface limit of possible subsidence.

North Fork Crandall Canyon Stream Buffer Calculations

Location	Surface Elevation	Top of coal	Overburden Thickness	Tangent 20 degrees	Buffer Width	Buffer + 50 feet
Confluence	8280	7890	390	.3639	284	334
650	8320	7910	410	.3639	302	353
1200	8400	7938	462	.3639	336	386
2100	8480	8000	480	.3639	349	399
2600	8560	8060	550	.3639	400	450
3100	8640	8120	520	.3639	378	428
3600	8720	8210	510	.3639	370	420
4200	8800	8272	528	.3639	384	434
4500	8880	8285	603	.3639	438	488
4700	8960	8292	668	.3639	486	536
5000	9040	8290	750	.3639	546	596
5250	9120	8288	832	.3639	606	656
5550	9200	8280	920	.3639	669	719

South Fork Crandall Canyon Stream Buffer Calculations

Location	Surface elevation	Top of Coal	Overburden Thickness	Tangent 20 degrees	Buffer Width	Buffer + 50 feet
Confluence	8280	7890	390	.3639	284	334
500	8320	7880	440	.3639	320	370
1400	8400	7865	535	.3639	339	389
2000	8480	7870	610	.3639	444	494
2700	8560	7885	675	.3639	491	541
3400	8680	7950	690	.3639	502	552
4000	8720	8015	705	.3639	513	563
4300	8800	8050	750	.3639	546	596
4700	8880	8070	810	.3639	590	640
5100	8690	8100	860	.3639	626	676

Main Crandall Canyon Stream Buffer Zone Calculations

Location	Surface Elevation	Top of Coal	Overburden Thickness	Tangent 20 degrees	Buffer Width	Buffer + 100 feet
300	8240	7890	350	0.36	255	355
1300	8160	7885	275	0.36	200	300
2300	8080	7880	200	0.36	145	245
2900	8040	7875	165	0.36	120	220

South Horse Canyon Stream Buffer Calculations

Location	Surface Elevation	Top of Coal Elevation	Overburden Thickness	Tangent 20 degrees	Buffer Width	Buffer + 50 feet
2300	8320	8280	40	0.36	29	79
2900	8400	8250	150	0.36	110	160
3400	8480	8240	240	0.36	174	286
4100	8560	8235	325	0.36	236	286
4700	8640	8240	400	0.36	291	341
5200	8720	8250	470	0.36	342	392
5500	8800	8260	540	0.36	394	444
5900	8880	8280	600	0.36	436	486
6300	8960	8305	6555	0.36	476	526
6700	9040	8330	710	0.36	516	566
6900	9120	8350	770	0.36	560	610
7200	9200	8374	826	0.36	601	651
7500	9280	8385	895	0.36	651	701
7700	9360	8395	965	0.36	702	752
7800	9400	8398	1002	0.36	729	779
8250	9440	8410	1030	0.36	750	800