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Table 2: Yucca Flats Explosions and Associated Lg Null and Peak Frequencies

No.	Date	Name	Shot Depth (m)	Depth to Paleozoic Layer (m)	Over-burden Velocity (km/sec)	Null Frequency (Hz)	Peak Frequency (Hz)
1	26 Apr 73	STARWORT	564	960	1.646	0.63	0.48
2	20 Dec 75	CHIBERTA	716	981	1.840	0.57	0.38
3	08 Dec 76	REDMUD	427	825	1.480	0.80	0.64
4	05 Apr 77	MARSILLY	690	970	1.716	0.54	0.45
5	04 Aug 77	STRAKE	518	824	1.500	0.77	0.55
6	09 Nov 77	SANDREEF	701	1085	1.853	0.54	0.42
7	23 Feb 78	REBLOCHON	658	1000	1.673	0.53	0.38
8	27 Sep 78	DRAUGHTS	442	640	1.534	0.75	0.61
9	29 Aug 79	NESSEL	464	975	1.505	0.64	0.52
10	06 Sep 79	HEARTS	640	1071	1.763	0.55	0.43
11	24 Oct 80	DUTCHESS	427	675	1.573	0.89	0.67
12	14 Nov 80	DAUPHIN	320	480	1.420	0.82	0.68
13	16 Jul 81	PINEAU	204	695	1.125	1.00	0.69
14	01 Oct 81	PALIZA	472	700	1.497	0.78	0.55
15	11 Nov 81	TILCI	445	719	1.600	0.84	0.64
16	12 Nov 81	ROUSANNE	518	779	1.580	0.60	0.48
17	03 Dec 81	AKAVI	494	785	1.730	0.82	0.62
18	28 Jan 82	JORNADA	640	860	1.695	0.53	0.42
19	17 Apr 82	TENAJA	357	625	1.310	0.86	0.65
20	10 Dec 82	MANTECA	413	737	1.610	0.90	0.70
21	26 May 83	FAHADA	384	601	1.500	0.82	0.62
22	02 Aug 84	CORREO	335	620	1.305	0.84	0.65
23	30 Aug 84	DOLCETTO	366	652	1.410	0.88	0.70
24	27 Sep 85	PONIL	366	678	1.455	0.94	0.65
25	13 Oct 88	DALHART	640	860	1.770	0.55	0.43
26	10 Feb 89	TEXARKANA	503	665	1.720	0.81	0.66
27	15 Nov 89	MULESHOE	244	373	1.330	0.87	0.73
28	10 Mar 90	METROPOLIS	469	945	1.515	0.68	0.49

OVERBURIED SHOTS

*	29 Sep 82	BORREGO	564	740	1.860	0.80	0.62
*	22 Sep 83	TECHADO	533	910	1.610	0.71	0.54

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Table 1: Yucca Flats Explosions and Associated Lg Null Frequencies

No	Date	Name	Depth (m)	Velocity (km/sec)	Frequency (Hz)
1	06 Sep 79	HEARTS	640	1.763	0.55
2	22 May 80	FLORA	335	1.257	0.85
3	14 Nov 80	DAUPHIN	320	1.420	0.82
4	15 Jan 81	BASEBALL	564	1.970	0.55
5	16 Jul 81	PINEAU	204	1.125	1.00
6	04 Sep 81	TREBBIANO	305	1.465	0.80
7	01 Oct 81	PALIZA	472	1.497	0.78
8	11 Nov 81	TILCI	445	1.600	0.80
9	12 Nov 81	ROUSANNE	518	1.580	0.60
10	03 Dec 81	AKAVI	494	1.730	0.82
11	28 Jan 82	JORNADA	640	1.695	0.53
12	17 Apr 82	TENAJA	357	1.310	0.86
13	10 Dec 82	MANTECA	413	1.610	0.90
14	11 Feb 83	COALORA	274	1.340	0.82
15	26 May 83	FAHADA	384	1.500	0.82
16	02 Aug 84	CORREO	335	1.305	0.84
17	21 May 88	LAREDO	350	1.600	0.91
18	30 Aug 88	BULLFROG	489	1.622	0.80
19	13 Oct 88	DALHART	640	1.770	0.56
20	15 Nov 89	MULESHOE	244	1.330	0.87
21	10 Mar 90	METROPOLIS	469	1.515	0.68
22	21 Jun 90	AUSTIN	351	1.370	0.85

For a homogeneous semi-infinite medium, one can determine (e.g. Aki and Richards, 1980) that the CLVD spectral null frequency occurs approximately at V/(16 h) where V is the P-wave velocity and h is depth of the CLVD source (Poisson's ratio of 0.25 is assumed). This means that the null frequency is inversely proportional to source depth and directly proportional to medium velocity. In order to understand the observed variation with depth of the Yucca Flats explosions, the wavenumber integration technique described by Herrmann and Wang (1985) was used for generating the Rg synthetics for vertically oriented CLVD sources at various depths. The crustal velocity model of Patton and Taylor (1995, Table 1, SMU Velocity Model) was used; the source was assumed to be an impulse. The epicentral distance was taken to be only 20 km since the Rg-to-S scattering is supposed to occur near the explosion source. Figure 9 shows the spectra of Rg for various depths of the CLVD source. It is interesting to note that the increase in the null frequency is slow at first but becomes much larger for shallower depths, remarkably similar to the observed variation in Figure 7. A comparison of the observed null frequencies (Table 1) with the theoretical results in Figure 9 suggests that, on average, depth of the CLVD source for each explosion is about one-third of its shot depth.