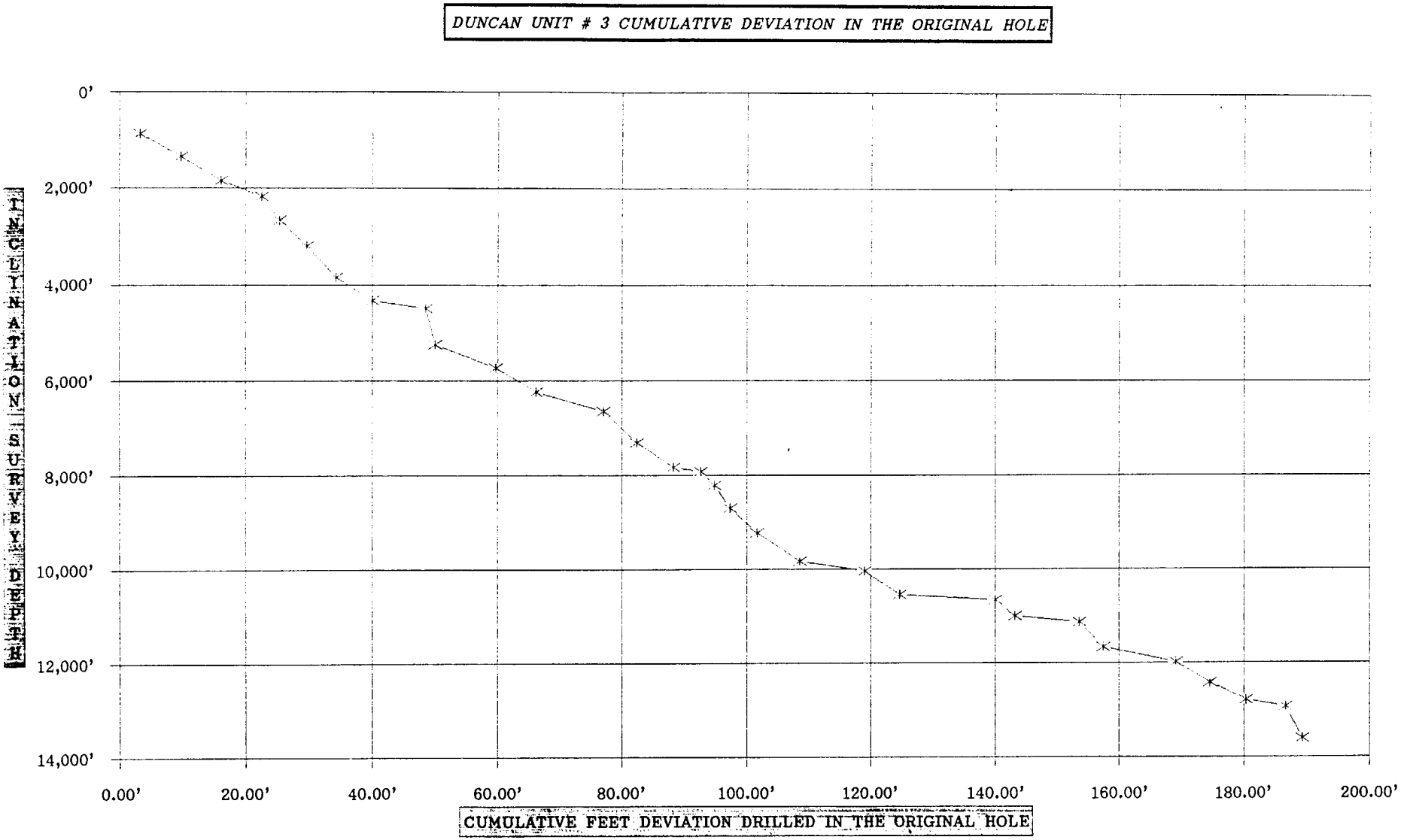


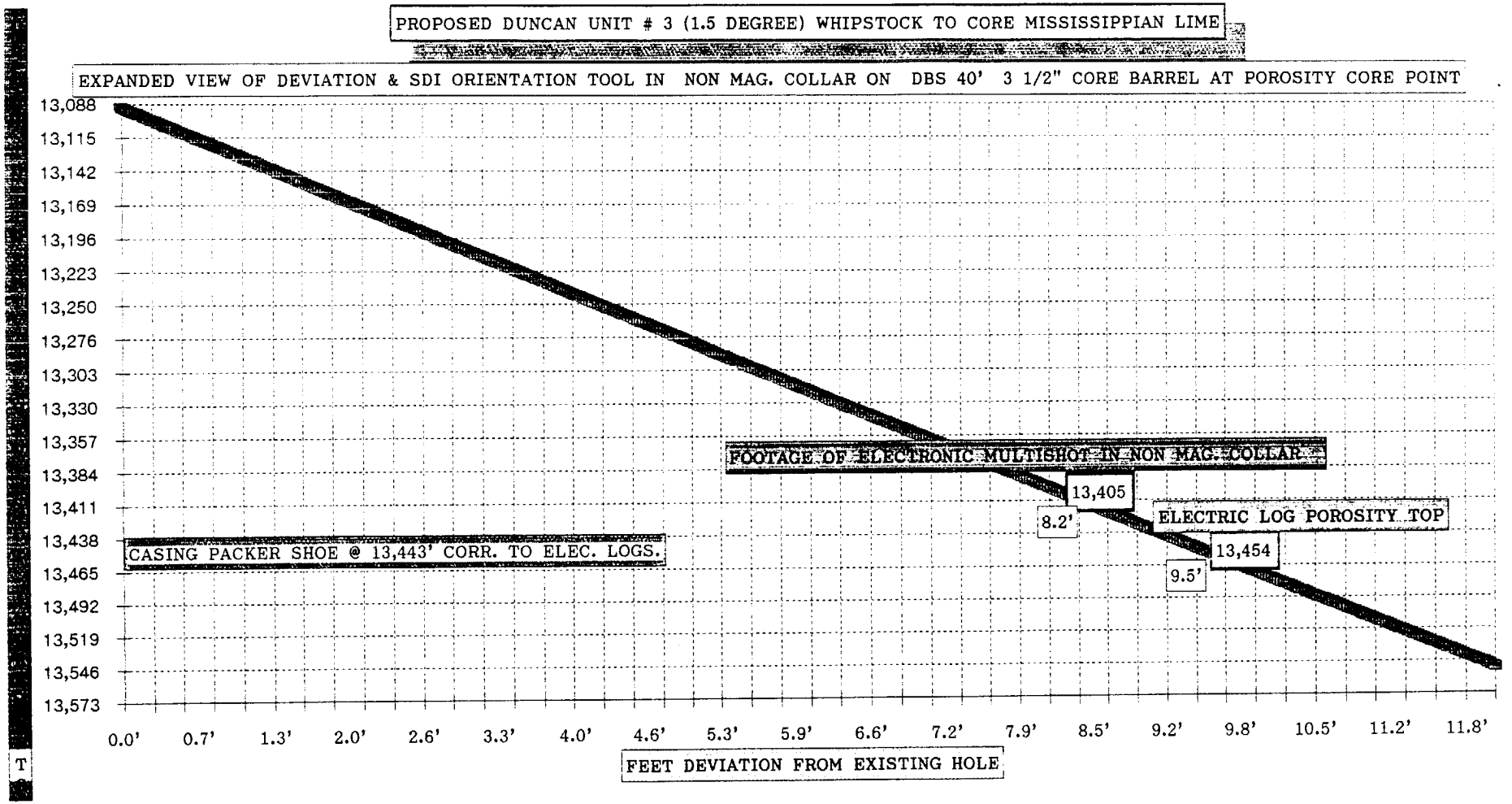
DUN3-DEV.XLC RAY F. NOKES 4/5/90

DUNCAN UNIT # 3 CUMULATIVE DEVIATION IN THE ORIGINAL HOLE

DATE: 5-Apr-90

WELL NAME: DUNCAN UNIT # 3
LEGAL LOCATION: N, 660' FSL & 1980' FWL
SEC. 26, T-13S, R-35E LEA CO., NM
OPERATOR: HARVEY E. YATES COMPANY
CONTRACTOR: HONDO DRILLING (INCLINATION SURVEY DATED FEB. 28TH, 1984)

	TOTCO DEGREES	SURVEY DEPTH (MD /FT)	DEVIATION IN FEET	CUM DEV. IN FEET
1	0.5	360'	3.14'	3.14'
2	0.75	863'	6.58'	9.73'
3	0.75	1,348'	6.35'	16.08'
4	0.75	1,840'	6.44'	22.52'
5	0.5	2,171'	2.89'	25.40'
6	0.5	2,660'	4.27'	29.67'
7	0.5	3,192'	4.64'	34.31'
8	0.5	3,845'	5.70'	40.01'
9	1	4,328'	8.43'	48.44'
10	0.5	4,500'	1.50'	49.95'
11	0.75	5,243'	9.73'	59.67'
12	0.75	5,736'	6.45'	66.13'
13	1.25	6,234'	10.87'	76.99'
14	0.75	6,650'	5.45'	82.44'
15	0.5	7,301'	5.68'	88.12'
16	0.5	7,826'	4.58'	92.70'
17	1.25	7,927'	2.20'	94.90'
18	0.5	8,212'	2.49'	97.39'
19	0.5	8,706'	4.31'	101.70'
20	0.75	9,230'	6.86'	108.56'
21	1	9,828'	10.44'	119.00'
22	1.5	10,047'	5.73'	124.73'
23	1.75	10,546'	15.25'	139.98'
24	1.5	10,668'	3.19'	143.18'
25	1.75	11,009'	10.42'	153.59'
26	1.75	11,135'	3.85'	157.44'
27	1.25	11,663'	11.52'	168.96'
28	1	11,982'	5.57'	174.53'
29	0.75	12,417'	5.69'	180.23'
30	1	12,787'	6.46'	186.69'
31	1	12,937'	2.62'	189.30'
32	1	13,600'	11.57'	200.88'
TOTALS:	29.00 DEGREES 0.91 AVERAGE		200.88'	



DUNCAN3B.XLC RAY F. NOKES 4/5/90

CALCULATION OF CUMULATIVE DEVIATION TO BE DRILLED.

DATE: 5-Apr-90

WELL NAME: *DUNCAN UNIT # 3*

LEGAL LOCATION: N, 660' FSL & 1980' FWL
SEC. 26, T-13S, R-35E LEA CO., NM

OPERATOR: HARVEY E. YATES COMPANY

CONTRACTOR: TBA

KOP: 13,090 FOOTAGE

FEET DRILLED	ANGLE OF DEVIATION	MD FT	TVD FT	DEVIATION PER FT DRILLED	CUMULATIVE DEV. IN FT.	CUMULATIVE DEV. IN INCHES
1	1.5	13,091	13,091	0.026	0.0'	0.31
2	1.5	13,092	13,092	0.026	0.1'	0.63
3	1.5	13,093	13,093	0.026	0.1'	0.94
4	1.5	13,094	13,094	0.026	0.1'	1.26
5	1.5	13,095	13,095	0.026	0.1'	1.57
6	1.5	13,096	13,096	0.026	0.2'	1.88
7	1.5	13,097	13,097	0.026	0.2'	2.20
8	1.5	13,098	13,098	0.026	0.2'	2.51
9	1.5	13,099	13,099	0.026	0.2'	2.83
10	1.5	13,100	13,100	0.026	0.3'	3.14
11	1.5	13,101	13,101	0.026	0.3'	3.46
12	1.5	13,102	13,102	0.026	0.3'	3.77
13	1.5	13,103	13,103	0.026	0.3'	4.08
14	1.5	13,104	13,104	0.026	0.4'	4.40
15	1.5	13,105	13,105	0.026	0.4'	4.71
16	1.5	13,106	13,106	0.026	0.4'	5.03
17	1.5	13,107	13,107	0.026	0.4'	5.34
18	1.5	13,108	13,108	0.026	0.5'	5.65
19	1.5	13,109	13,109	0.026	0.5'	5.97
20	1.5	13,110	13,110	0.026	0.5'	6.28
21	1.5	13,111	13,111	0.026	0.5'	6.60
22	1.5	13,112	13,112	0.026	0.6'	6.91
23	1.5	13,113	13,113	0.026	0.6'	7.22
24	1.5	13,114	13,114	0.026	0.6'	7.54
25	1.5	13,115	13,115	0.026	0.7'	7.85
26	1.5	13,116	13,116	0.026	0.7'	8.17
27	1.5	13,117	13,117	0.026	0.7'	8.48
28	1.5	13,118	13,118	0.026	0.7'	8.80
29	1.5	13,119	13,119	0.026	0.8'	9.11
30	1.5	13,120	13,120	0.026	0.8'	9.42
31	1.5	13,121	13,121	0.026	0.8'	9.74
32	1.5	13,122	13,122	0.026	0.8'	10.05
33	1.5	13,123	13,123	0.026	0.9'	10.37
34	1.5	13,124	13,124	0.026	0.9'	10.68
35	1.5	13,125	13,125	0.026	0.9'	10.99

36	1.5	13,126	13,126	0.026	0.9'	11.31
37	1.5	13,127	13,127	0.026	1.0'	11.62
38	1.5	13,128	13,128	0.026	1.0'	11.94
39	1.5	13,129	13,129	0.026	1.0'	12.25
40	1.5	13,130	13,130	0.026	1.0'	12.56
41	1.5	13,131	13,131	0.026	1.1'	12.88
42	1.5	13,132	13,132	0.026	1.1'	13.19
43	1.5	13,133	13,133	0.026	1.1'	13.51
44	1.5	13,134	13,134	0.026	1.2'	13.82
45	1.5	13,135	13,135	0.026	1.2'	14.14
46	1.5	13,136	13,136	0.026	1.2'	14.45
47	1.5	13,137	13,137	0.026	1.2'	14.76
48	1.5	13,138	13,138	0.026	1.3'	15.08
49	1.5	13,139	13,139	0.026	1.3'	15.39
50	1.5	13,140	13,140	0.026	1.3'	15.71
51	1.5	13,141	13,141	0.026	1.3'	16.02
52	1.5	13,142	13,142	0.026	1.4'	16.33
53	1.5	13,143	13,143	0.026	1.4'	16.65
54	1.5	13,144	13,144	0.026	1.4'	16.96
55	1.5	13,145	13,145	0.026	1.4'	17.28
56	1.5	13,146	13,146	0.026	1.5'	17.59
57	1.5	13,147	13,147	0.026	1.5'	17.91
58	1.5	13,148	13,148	0.026	1.5'	18.22
59	1.5	13,149	13,149	0.026	1.5'	18.53
60	1.5	13,150	13,150	0.026	1.6'	18.85
61	1.5	13,151	13,151	0.026	1.6'	19.16
62	1.5	13,152	13,152	0.026	1.6'	19.48
63	1.5	13,153	13,153	0.026	1.6'	19.79
64	1.5	13,154	13,154	0.026	1.7'	20.10
65	1.5	13,155	13,155	0.026	1.7'	20.42
66	1.5	13,156	13,156	0.026	1.7'	20.73
67	1.5	13,157	13,157	0.026	1.8'	21.05
68	1.5	13,158	13,158	0.026	1.8'	21.36
69	1.5	13,159	13,159	0.026	1.8'	21.67
70	1.5	13,160	13,160	0.026	1.8'	21.99
71	1.5	13,161	13,161	0.026	1.9'	22.30
72	1.5	13,162	13,162	0.026	1.9'	22.62
73	1.5	13,163	13,163	0.026	1.9'	22.93
74	1.5	13,164	13,164	0.026	1.9'	23.25
75	1.5	13,165	13,165	0.026	2.0'	23.56
76	1.5	13,166	13,166	0.026	2.0'	23.87
77	1.5	13,167	13,167	0.026	2.0'	24.19
78	1.5	13,168	13,168	0.026	2.0'	24.50
79	1.5	13,169	13,169	0.026	2.1'	24.82
80	1.5	13,170	13,170	0.026	2.1'	25.13
81	1.5	13,171	13,171	0.026	2.1'	25.44
82	1.5	13,172	13,172	0.026	2.1'	25.76
83	1.5	13,173	13,173	0.026	2.2'	26.07
84	1.5	13,174	13,174	0.026	2.2'	26.39
85	1.5	13,175	13,175	0.026	2.2'	26.70
86	1.5	13,176	13,176	0.026	2.3'	27.01
87	1.5	13,177	13,177	0.026	2.3'	27.33
88	1.5	13,178	13,178	0.026	2.3'	27.64
89	1.5	13,179	13,179	0.026	2.3'	27.96

90	1.5	13,180	13,180	0.026	2.4'	28.27
91	1.5	13,181	13,181	0.026	2.4'	28.59
92	1.5	13,182	13,182	0.026	2.4'	28.90
93	1.5	13,183	13,183	0.026	2.4'	29.21
94	1.5	13,184	13,184	0.026	2.5'	29.53
95	1.5	13,185	13,185	0.026	2.5'	29.84
96	1.5	13,186	13,186	0.026	2.5'	30.16
97	1.5	13,187	13,187	0.026	2.5'	30.47
98	1.5	13,188	13,188	0.026	2.6'	30.78
99	1.5	13,189	13,189	0.026	2.6'	31.10
100	1.5	13,190	13,190	0.026	2.6'	31.41
101	1.5	13,191	13,191	0.026	2.6'	31.73
102	1.5	13,192	13,192	0.026	2.7'	32.04
103	1.5	13,193	13,193	0.026	2.7'	32.35
104	1.5	13,194	13,194	0.026	2.7'	32.67
105	1.5	13,195	13,195	0.026	2.7'	32.98
106	1.5	13,196	13,196	0.026	2.8'	33.30
107	1.5	13,197	13,197	0.026	2.8'	33.61
108	1.5	13,198	13,198	0.026	2.8'	33.93
109	1.5	13,199	13,199	0.026	2.9'	34.24
110	1.5	13,200	13,200	0.026	2.9'	34.55
111	1.5	13,201	13,201	0.026	2.9'	34.87
112	1.5	13,202	13,202	0.026	2.9'	35.18
113	1.5	13,203	13,203	0.026	3.0'	35.50
114	1.5	13,204	13,204	0.026	3.0'	35.81
115	1.5	13,205	13,205	0.026	3.0'	36.12
116	1.5	13,206	13,206	0.026	3.0'	36.44
117	1.5	13,207	13,207	0.026	3.1'	36.75
118	1.5	13,208	13,208	0.026	3.1'	37.07
119	1.5	13,209	13,209	0.026	3.1'	37.38
120	1.5	13,210	13,210	0.026	3.1'	37.69
121	1.5	13,211	13,211	0.026	3.2'	38.01
122	1.5	13,212	13,212	0.026	3.2'	38.32
123	1.5	13,213	13,213	0.026	3.2'	38.64
124	1.5	13,214	13,214	0.026	3.2'	38.95
125	1.5	13,215	13,215	0.026	3.3'	39.27
126	1.5	13,216	13,216	0.026	3.3'	39.58
127	1.5	13,217	13,217	0.026	3.3'	39.89
128	1.5	13,218	13,218	0.026	3.4'	40.21
129	1.5	13,219	13,219	0.026	3.4'	40.52
130	1.5	13,220	13,220	0.026	3.4'	40.84
131	1.5	13,221	13,221	0.026	3.4'	41.15
132	1.5	13,222	13,222	0.026	3.5'	41.46
133	1.5	13,223	13,223	0.026	3.5'	41.78
134	1.5	13,224	13,224	0.026	3.5'	42.09
135	1.5	13,225	13,225	0.026	3.5'	42.41
136	1.5	13,226	13,226	0.026	3.6'	42.72
137	1.5	13,227	13,227	0.026	3.6'	43.03
138	1.5	13,228	13,228	0.026	3.6'	43.35
139	1.5	13,229	13,229	0.026	3.6'	43.66
140	1.5	13,230	13,230	0.026	3.7'	43.98
141	1.5	13,231	13,231	0.026	3.7'	44.29
142	1.5	13,232	13,232	0.026	3.7'	44.61
143	1.5	13,233	13,233	0.026	3.7'	44.92

144	1.5	13,234	13,234	0.026	3.8'	45.23
145	1.5	13,235	13,235	0.026	3.8'	45.55
146	1.5	13,236	13,236	0.026	3.8'	45.86
147	1.5	13,237	13,237	0.026	3.8'	46.18
148	1.5	13,238	13,238	0.026	3.9'	46.49
149	1.5	13,239	13,239	0.026	3.9'	46.80
150	1.5	13,240	13,240	0.026	3.9'	47.12
151	1.5	13,241	13,241	0.026	4.0'	47.43
152	1.5	13,242	13,242	0.026	4.0'	47.75
153	1.5	13,243	13,243	0.026	4.0'	48.06
154	1.5	13,244	13,244	0.026	4.0'	48.38
155	1.5	13,245	13,245	0.026	4.1'	48.69
156	1.5	13,246	13,246	0.026	4.1'	49.00
157	1.5	13,247	13,247	0.026	4.1'	49.32
158	1.5	13,248	13,248	0.026	4.1'	49.63
159	1.5	13,249	13,249	0.026	4.2'	49.95
160	1.5	13,250	13,250	0.026	4.2'	50.26
161	1.5	13,251	13,251	0.026	4.2'	50.57
162	1.5	13,252	13,252	0.026	4.2'	50.89
163	1.5	13,253	13,253	0.026	4.3'	51.20
164	1.5	13,254	13,254	0.026	4.3'	51.52
165	1.5	13,255	13,255	0.026	4.3'	51.83
166	1.5	13,256	13,256	0.026	4.3'	52.14
167	1.5	13,257	13,257	0.026	4.4'	52.46
168	1.5	13,258	13,258	0.026	4.4'	52.77
169	1.5	13,259	13,259	0.026	4.4'	53.09
170	1.5	13,260	13,260	0.026	4.5'	53.40
171	1.5	13,261	13,261	0.026	4.5'	53.72
172	1.5	13,262	13,262	0.026	4.5'	54.03
173	1.5	13,263	13,263	0.026	4.5'	54.34
174	1.5	13,264	13,264	0.026	4.6'	54.66
175	1.5	13,265	13,265	0.026	4.6'	54.97
176	1.5	13,266	13,266	0.026	4.6'	55.29
177	1.5	13,267	13,267	0.026	4.6'	55.60
178	1.5	13,268	13,268	0.026	4.7'	55.91
179	1.5	13,269	13,269	0.026	4.7'	56.23
180	1.5	13,270	13,270	0.026	4.7'	56.54
181	1.5	13,271	13,271	0.026	4.7'	56.86
182	1.5	13,272	13,272	0.026	4.8'	57.17
183	1.5	13,273	13,273	0.026	4.8'	57.48
184	1.5	13,274	13,274	0.026	4.8'	57.80
185	1.5	13,275	13,275	0.026	4.8'	58.11
186	1.5	13,276	13,276	0.026	4.9'	58.43
187	1.5	13,277	13,277	0.026	4.9'	58.74
188	1.5	13,278	13,278	0.026	4.9'	59.06
189	1.5	13,279	13,279	0.026	4.9'	59.37
190	1.5	13,280	13,280	0.026	5.0'	59.68
191	1.5	13,281	13,281	0.026	5.0'	60.00
192	1.5	13,282	13,282	0.026	5.0'	60.31
193	1.5	13,283	13,283	0.026	5.1'	60.63
194	1.5	13,284	13,284	0.026	5.1'	60.94
195	1.5	13,285	13,285	0.026	5.1'	61.25
196	1.5	13,286	13,286	0.026	5.1'	61.57
197	1.5	13,287	13,287	0.026	5.2'	61.88

198	1.5	13,288	13,288	0.026	5.2'	62.20
199	1.5	13,289	13,289	0.026	5.2'	62.51
200	1.5	13,290	13,290	0.026	5.2'	62.82
201	1.5	13,291	13,291	0.026	5.3'	63.14
202	1.5	13,292	13,292	0.026	5.3'	63.45
203	1.5	13,293	13,293	0.026	5.3'	63.77
204	1.5	13,294	13,294	0.026	5.3'	64.08
205	1.5	13,295	13,295	0.026	5.4'	64.40
206	1.5	13,296	13,296	0.026	5.4'	64.71
207	1.5	13,297	13,297	0.026	5.4'	65.02
208	1.5	13,298	13,298	0.026	5.4'	65.34
209	1.5	13,299	13,299	0.026	5.5'	65.65
210	1.5	13,300	13,300	0.026	5.5'	65.97
211	1.5	13,301	13,301	0.026	5.5'	66.28
212	1.5	13,302	13,302	0.026	5.5'	66.59
213	1.5	13,303	13,303	0.026	5.6'	66.91
214	1.5	13,304	13,304	0.026	5.6'	67.22
215	1.5	13,305	13,305	0.026	5.6'	67.54
216	1.5	13,306	13,306	0.026	5.7'	67.85
217	1.5	13,307	13,307	0.026	5.7'	68.16
218	1.5	13,308	13,308	0.026	5.7'	68.48
219	1.5	13,309	13,309	0.026	5.7'	68.79
220	1.5	13,310	13,310	0.026	5.8'	69.11
221	1.5	13,311	13,311	0.026	5.8'	69.42
222	1.5	13,312	13,312	0.026	5.8'	69.74
223	1.5	13,313	13,313	0.026	5.8'	70.05
224	1.5	13,314	13,314	0.026	5.9'	70.36
225	1.5	13,315	13,315	0.026	5.9'	70.68
226	1.5	13,316	13,316	0.026	5.9'	70.99
227	1.5	13,317	13,317	0.026	5.9'	71.31
228	1.5	13,318	13,318	0.026	6.0'	71.62
229	1.5	13,319	13,319	0.026	6.0'	71.93
230	1.5	13,320	13,320	0.026	6.0'	72.25
231	1.5	13,321	13,321	0.026	6.0'	72.56
232	1.5	13,322	13,322	0.026	6.1'	72.88
233	1.5	13,323	13,323	0.026	6.1'	73.19
234	1.5	13,324	13,324	0.026	6.1'	73.50
235	1.5	13,325	13,325	0.026	6.2'	73.82
236	1.5	13,326	13,326	0.026	6.2'	74.13
237	1.5	13,327	13,327	0.026	6.2'	74.45
238	1.5	13,328	13,328	0.026	6.2'	74.76
239	1.5	13,329	13,329	0.026	6.3'	75.08
240	1.5	13,330	13,330	0.026	6.3'	75.39
241	1.5	13,331	13,331	0.026	6.3'	75.70
242	1.5	13,332	13,332	0.026	6.3'	76.02
243	1.5	13,333	13,333	0.026	6.4'	76.33
244	1.5	13,334	13,334	0.026	6.4'	76.65
245	1.5	13,335	13,335	0.026	6.4'	76.96
246	1.5	13,336	13,336	0.026	6.4'	77.27
247	1.5	13,337	13,337	0.026	6.5'	77.59
248	1.5	13,338	13,338	0.026	6.5'	77.90
249	1.5	13,339	13,339	0.026	6.5'	78.22
250	1.5	13,340	13,340	0.026	6.5'	78.53
251	1.5	13,341	13,341	0.026	6.6'	78.84

252	1.5	13,342	13,342	0.026	6.6'	79.16
253	1.5	13,343	13,343	0.026	6.6'	79.47
254	1.5	13,344	13,344	0.026	6.6'	79.79
255	1.5	13,345	13,345	0.026	6.7'	80.10
256	1.5	13,346	13,346	0.026	6.7'	80.42
257	1.5	13,347	13,347	0.026	6.7'	80.73
258	1.5	13,348	13,348	0.026	6.8'	81.04
259	1.5	13,349	13,349	0.026	6.8'	81.36
260	1.5	13,350	13,350	0.026	6.8'	81.67
261	1.5	13,351	13,351	0.026	6.8'	81.99
262	1.5	13,352	13,352	0.026	6.9'	82.30
263	1.5	13,353	13,353	0.026	6.9'	82.61
264	1.5	13,354	13,354	0.026	6.9'	82.93
265	1.5	13,355	13,355	0.026	6.9'	83.24
266	1.5	13,356	13,356	0.026	7.0'	83.56
267	1.5	13,357	13,357	0.026	7.0'	83.87
268	1.5	13,358	13,358	0.026	7.0'	84.19
269	1.5	13,359	13,359	0.026	7.0'	84.50
270	1.5	13,360	13,360	0.026	7.1'	84.81
271	1.5	13,361	13,361	0.026	7.1'	85.13
272	1.5	13,362	13,362	0.026	7.1'	85.44
273	1.5	13,363	13,363	0.026	7.1'	85.76
274	1.5	13,364	13,364	0.026	7.2'	86.07
275	1.5	13,365	13,365	0.026	7.2'	86.38
276	1.5	13,366	13,366	0.026	7.2'	86.70
277	1.5	13,367	13,367	0.026	7.3'	87.01
278	1.5	13,368	13,368	0.026	7.3'	87.33
279	1.5	13,369	13,369	0.026	7.3'	87.64
280	1.5	13,370	13,370	0.026	7.3'	87.95
281	1.5	13,371	13,371	0.026	7.4'	88.27
282	1.5	13,372	13,372	0.026	7.4'	88.58
283	1.5	13,373	13,373	0.026	7.4'	88.90
284	1.5	13,374	13,374	0.026	7.4'	89.21
285	1.5	13,375	13,375	0.026	7.5'	89.53
286	1.5	13,376	13,376	0.026	7.5'	89.84
287	1.5	13,377	13,377	0.026	7.5'	90.15
288	1.5	13,378	13,378	0.026	7.5'	90.47
289	1.5	13,379	13,379	0.026	7.6'	90.78
290	1.5	13,380	13,380	0.026	7.6'	91.10
291	1.5	13,381	13,381	0.026	7.6'	91.41
292	1.5	13,382	13,382	0.026	7.6'	91.72
293	1.5	13,383	13,383	0.026	7.7'	92.04
294	1.5	13,384	13,384	0.026	7.7'	92.35
295	1.5	13,385	13,385	0.026	7.7'	92.67
296	1.5	13,386	13,386	0.026	7.7'	92.98
297	1.5	13,387	13,387	0.026	7.8'	93.29
298	1.5	13,388	13,388	0.026	7.8'	93.61
299	1.5	13,389	13,389	0.026	7.8'	93.92
300	1.5	13,390	13,390	0.026	7.9'	94.24
301	1.5	13,391	13,391	0.026	7.9'	94.55
302	1.5	13,392	13,392	0.026	7.9'	94.87
303	1.5	13,393	13,393	0.026	7.9'	95.18
304	1.5	13,394	13,394	0.026	8.0'	95.49
305	1.5	13,395	13,395	0.026	8.0'	95.81

306	1.5	13,396	13,396	0.026	8.0'	96.12
307	1.5	13,397	13,397	0.026	8.0'	96.44
308	1.5	13,398	13,398	0.026	8.1'	96.75
309	1.5	13,399	13,399	0.026	8.1'	97.06
310	1.5	13,400	13,400	0.026	8.1'	97.38
311	1.5	13,401	13,401	0.026	8.1'	97.69
312	1.5	13,402	13,402	0.026	8.2'	98.01
313	1.5	13,403	13,403	0.026	8.2'	98.32
314	1.5	13,404	13,404	0.026	8.2'	98.63
315	1.5	13,405	13,405	0.026	8.2'	98.95
316	1.5	13,406	13,406	0.026	8.3'	99.26
317	1.5	13,407	13,407	0.026	8.3'	99.58
318	1.5	13,408	13,408	0.026	8.3'	99.89
319	1.5	13,409	13,409	0.026	8.4'	100.21
320	1.5	13,410	13,410	0.026	8.4'	100.52
321	1.5	13,411	13,411	0.026	8.4'	100.83
322	1.5	13,412	13,412	0.026	8.4'	101.15
323	1.5	13,413	13,413	0.026	8.5'	101.46
324	1.5	13,414	13,414	0.026	8.5'	101.78
325	1.5	13,415	13,415	0.026	8.5'	102.09
326	1.5	13,416	13,416	0.026	8.5'	102.40
327	1.5	13,417	13,417	0.026	8.6'	102.72
328	1.5	13,418	13,418	0.026	8.6'	103.03
329	1.5	13,419	13,419	0.026	8.6'	103.35
330	1.5	13,420	13,420	0.026	8.6'	103.66
331	1.5	13,421	13,421	0.026	8.7'	103.97
332	1.5	13,422	13,422	0.026	8.7'	104.29
333	1.5	13,423	13,423	0.026	8.7'	104.60
334	1.5	13,424	13,424	0.026	8.7'	104.92
335	1.5	13,425	13,425	0.026	8.8'	105.23
336	1.5	13,426	13,426	0.026	8.8'	105.55
337	1.5	13,427	13,427	0.026	8.8'	105.86
338	1.5	13,428	13,428	0.026	8.8'	106.17
339	1.5	13,429	13,429	0.026	8.9'	106.49
340	1.5	13,430	13,430	0.026	8.9'	106.80
341	1.5	13,431	13,431	0.026	8.9'	107.12
342	1.5	13,432	13,432	0.026	9.0'	107.43
343	1.5	13,433	13,433	0.026	9.0'	107.74
344	1.5	13,434	13,434	0.026	9.0'	108.06
345	1.5	13,435	13,435	0.026	9.0'	108.37
346	1.5	13,436	13,436	0.026	9.1'	108.69
347	1.5	13,437	13,437	0.026	9.1'	109.00
348	1.5	13,438	13,438	0.026	9.1'	109.31
349	1.5	13,439	13,439	0.026	9.1'	109.63
350	1.5	13,440	13,440	0.026	9.2'	109.94
351	1.5	13,441	13,441	0.026	9.2'	110.26
352	1.5	13,442	13,442	0.026	9.2'	110.57
353	1.5	13,443	13,443	0.026	9.2'	110.89
354	1.5	13,444	13,444	0.026	9.3'	111.20
355	1.5	13,445	13,445	0.026	9.3'	111.51
356	1.5	13,446	13,446	0.026	9.3'	111.83
357	1.5	13,447	13,447	0.026	9.3'	112.14
358	1.5	13,448	13,448	0.026	9.4'	112.46
359	1.5	13,449	13,449	0.026	9.4'	112.77

360	1.5	13,450	13,450	0.026	9.4'	113.08
361	1.5	13,451	13,451	0.026	9.4'	113.40
362	1.5	13,452	13,452	0.026	9.5'	113.71
363	1.5	13,453	13,453	0.026	9.5'	114.03
364	1.5	13,454	13,454	0.026	9.5'	114.34
365	1.5	13,455	13,455	0.026	9.6'	114.66
366	1.5	13,456	13,456	0.026	9.6'	114.97
367	1.5	13,457	13,457	0.026	9.6'	115.28
368	1.5	13,458	13,458	0.026	9.6'	115.60
369	1.5	13,459	13,459	0.026	9.7'	115.91
370	1.5	13,460	13,460	0.026	9.7'	116.23
371	1.5	13,461	13,461	0.026	9.7'	116.54
372	1.5	13,462	13,462	0.026	9.7'	116.85
373	1.5	13,463	13,463	0.026	9.8'	117.17
374	1.5	13,464	13,464	0.026	9.8'	117.48
375	1.5	13,465	13,465	0.026	9.8'	117.80
376	1.5	13,466	13,466	0.026	9.8'	118.11
377	1.5	13,467	13,467	0.026	9.9'	118.42
378	1.5	13,468	13,468	0.026	9.9'	118.74
379	1.5	13,469	13,469	0.026	9.9'	119.05
380	1.5	13,470	13,470	0.026	9.9'	119.37
381	1.5	13,471	13,471	0.026	10.0'	119.68
382	1.5	13,472	13,472	0.026	10.0'	120.00
383	1.5	13,473	13,473	0.026	10.0'	120.31
384	1.5	13,474	13,474	0.026	10.1'	120.62
385	1.5	13,475	13,475	0.026	10.1'	120.94
386	1.5	13,476	13,476	0.026	10.1'	121.25
387	1.5	13,477	13,477	0.026	10.1'	121.57
388	1.5	13,478	13,478	0.026	10.2'	121.88
389	1.5	13,479	13,479	0.026	10.2'	122.19
390	1.5	13,480	13,480	0.026	10.2'	122.51
391	1.5	13,481	13,481	0.026	10.2'	122.82
392	1.5	13,482	13,482	0.026	10.3'	123.14
393	1.5	13,483	13,483	0.026	10.3'	123.45
394	1.5	13,484	13,484	0.026	10.3'	123.76
395	1.5	13,485	13,485	0.026	10.3'	124.08
396	1.5	13,486	13,486	0.026	10.4'	124.39
397	1.5	13,487	13,487	0.026	10.4'	124.71
398	1.5	13,488	13,488	0.026	10.4'	125.02
399	1.5	13,489	13,489	0.026	10.4'	125.34
400	1.5	13,490	13,490	0.026	10.5'	125.65
401	1.5	13,491	13,491	0.026	10.5'	125.96
402	1.5	13,492	13,492	0.026	10.5'	126.28
403	1.5	13,493	13,493	0.026	10.5'	126.59
404	1.5	13,494	13,494	0.026	10.6'	126.91
405	1.5	13,495	13,495	0.026	10.6'	127.22
406	1.5	13,496	13,496	0.026	10.6'	127.53
407	1.5	13,497	13,497	0.026	10.7'	127.85
408	1.5	13,498	13,498	0.026	10.7'	128.16
409	1.5	13,499	13,499	0.026	10.7'	128.48
410	1.5	13,500	13,500	0.026	10.7'	128.79
411	1.5	13,501	13,501	0.026	10.8'	129.10
412	1.5	13,502	13,502	0.026	10.8'	129.42
413	1.5	13,503	13,503	0.026	10.8'	129.73

414	1.5	13,504	13,504	0.026	10.8'	130.05
415	1.5	13,505	13,505	0.026	10.9'	130.36
416	1.5	13,506	13,506	0.026	10.9'	130.68
417	1.5	13,507	13,507	0.026	10.9'	130.99
418	1.5	13,508	13,508	0.026	10.9'	131.30
419	1.5	13,509	13,509	0.026	11.0'	131.62
420	1.5	13,510	13,510	0.026	11.0'	131.93
421	1.5	13,511	13,511	0.026	11.0'	132.25
422	1.5	13,512	13,512	0.026	11.0'	132.56
423	1.5	13,513	13,513	0.026	11.1'	132.87
424	1.5	13,514	13,514	0.026	11.1'	133.19
425	1.5	13,515	13,515	0.026	11.1'	133.50
426	1.5	13,516	13,516	0.026	11.2'	133.82
427	1.5	13,517	13,517	0.026	11.2'	134.13
428	1.5	13,518	13,518	0.026	11.2'	134.44
429	1.5	13,519	13,519	0.026	11.2'	134.76
430	1.5	13,520	13,520	0.026	11.3'	135.07
431	1.5	13,521	13,521	0.026	11.3'	135.39
432	1.5	13,522	13,522	0.026	11.3'	135.70
433	1.5	13,523	13,523	0.026	11.3'	136.02
434	1.5	13,524	13,524	0.026	11.4'	136.33
435	1.5	13,525	13,525	0.026	11.4'	136.64
436	1.5	13,526	13,526	0.026	11.4'	136.96
437	1.5	13,527	13,527	0.026	11.4'	137.27
438	1.5	13,528	13,528	0.026	11.5'	137.59
439	1.5	13,529	13,529	0.026	11.5'	137.90
440	1.5	13,530	13,530	0.026	11.5'	138.21
441	1.5	13,531	13,531	0.026	11.5'	138.53
442	1.5	13,532	13,532	0.026	11.6'	138.84
443	1.5	13,533	13,533	0.026	11.6'	139.16
444	1.5	13,534	13,534	0.026	11.6'	139.47
445	1.5	13,535	13,535	0.026	11.6'	139.78
446	1.5	13,536	13,536	0.026	11.7'	140.10
447	1.5	13,537	13,537	0.026	11.7'	140.41
448	1.5	13,538	13,538	0.026	11.7'	140.73
449	1.5	13,539	13,539	0.026	11.8'	141.04
450	1.5	13,540	13,540	0.026	11.8'	141.36
451	1.5	13,541	13,541	0.026	11.8'	141.67
452	1.5	13,542	13,542	0.026	11.8'	141.98
453	1.5	13,543	13,543	0.026	11.9'	142.30
454	1.5	13,544	13,544	0.026	11.9'	142.61
455	1.5	13,545	13,545	0.026	11.9'	142.93
456	1.5	13,546	13,546	0.026	11.9'	143.24
457	1.5	13,547	13,547	0.026	12.0'	143.55
458	1.5	13,548	13,548	0.026	12.0'	143.87
459	1.5	13,549	13,549	0.026	12.0'	144.18
460	1.5	13,550	13,550	0.026	12.0'	144.50
461	1.5	13,551	13,551	0.026	12.1'	144.81
TOTAL FT DRILLED		MD	TVD		CUMULATIVE DEVIATION FT	CUMULATIVE DEVIATION IN.

\RESCALC\AFE\

HARVEY E. YATES COMPANY

DATE: 5-Apr-90
WELL NAME: DUNCAN UNIT # 3 WO- AFE AFE # W-3
LOCATION: N,660' FSL & 1980' FWL : SEC. 26, T-13S, R-35E, LEA CO. NM
FIELD: AUSTIN MISSISSIPPIAN NORTHWEST
ELEVATION: 4020.8' GL (18.2' KB)
TD: 13,600'
PBTD: 13,000' (ORIGINALLY =13,600' (OPEN HOLE 13443-13600'))

FOREMAN	CURTIS TOLLE	624-1818	837	
FOREMAN	BOB WILLIAMS	624-1818	867	
OFFICE		623-6601		
SUPERVISION:	RAY F. NOKES	624-1818	834	OR AT OFFICE

RECOMMENDED PROCEDURE:

PHASE # 1

1. MI & RU PU. ND WH NU BOP. POOH w/ 2 3/8" TBG. GIH w/ MOD. "R" PKR & SET 600' ABOVE BOUGH PERF:(LOCATED @ 10,283-84' & 86-92'). SQZ. PERFS TO 3000#. UNSET PKR & REV. WITH ANNULAR VOL. PULL 20 STDS LOAD BACKSIDE & REV. TBG. CLEAN. SET PKR. & PRESS. UP TO 3000#. LEAVE SHUT IN OVER NIGHT.
2. POOH. GIH w/ BIT, SCRAPER , COLLARS & TBG. DRL OUT CMT & TEST SQZ PERFS. TO 1000#. CIRC. HOLE CLEAN & POOH.
3. PU BULL DOG BAILER w/ 4 5/8" OD X (4 .37" ID X 3.5" ID) X 13" LONG, w/ DOUBLE FLAPPER IN BAILER, 3-3.5" COLLARS, 4' X 2 3/8" PERF. SUB. ON 2 3/8" N-80 TBG.
4. GIH TO FISH RET. SET DOWN ON PARTIAL RETAINER & STROKE BAILER. POH.
5. IF SUCCESSFUL, RETR. LOK-SET BP & CONT. TO STEP # 8. IF NOT PU 4 5/8" BIT ON BAILER & GIH. SPUD ON RET. (NOTE: 2.65" (OD) "FL" ON\OFF RECEPT. ON LOK-SET PKR & TOP 1 1/2" OF "FL" RECEPTICAL HAS ONLY .14" WALL THICKNESS).
6. DRL ON RET. & GAIN POSS. 5 TO 7 INCHES & POH.
7. GIH WITH 4 5/8" OD X 3 13/16" ID WASH PIPE WITH KUTRITE ON BOTTOM & SLICK OUTSIDE. CLEAN OFF TO TOP OF LOK-SET BP & CIRC. HOLE CLEAN. POOH.

NOTE:>>>>>> HOLE TO BE CIRC. w/ NE AGENTS, CATIONIC SURFACTANTS & FOAMERS.

8. GIH WITH RETR. HEAD LATCH ONTO ON\OFF TOOL. RELEASE LOK-SET BP & POOH. IF UNABLE TO LATCH ONTO ON\OFF POOH & GIH w/ DRESS OFF MILL (2.65" ID) AND MILL OVER ON\OFF TOOL. POOH. GIH WITH SHORT CATCH (RIGHT HAND RELEASE) & BUMPER SUB, JARS, ACCELLARATOR & COLLARS ON 2 3/8" N-80 TBG.
9. REL. LOK-SET BP & POOH. IF UNABLE, POOH & GIH TO MILL OVER PKR. SLIPS & PUSH LOK-SET BP TO BOTTOM OF OPEN HOLE. POOH. GIH w/ 4.625" GR & JUNK BASKET TO 13,450'. RUN GR,CCL,CBL FROM 13,450 TO 12,450'.
10. ONCE THE LOK-SET BP IS REMOVED OR PUSHED TO BOTTOM THE WELL WILL BE SET UP TO TEST PRODUCTION FROM THE MISSISSIPPIAN. BHP BU WILL BE RUN IF PRODUCTION VOLUMES ARE FAVORABLE. (NOTE: RUN FULL BORE PKR WITH TAILPIPE TO BE RUN TO 13,560' + OR -.

PHASE # 2

11. MI & RU PU. ND WH NU BOP.
12. RU SDI & RUN FINDER INSIDE TBG, (WITHOUT/ THERMAL GUARD), FROM SURFACE TO 50' ABOVE SN & BACK. RU WEDGE & SET CIBP @ CASED HOLE DEPTH TO POSITION WHIPSTOCK.

13. PU BOTTOM TRIP WHIPSTOCK & CORRELATION SUB ON 2 7/8" DRL PIPE & GIH. POSITION WHIPSTOCK. FINDER WILL BE RUN FOR ORIENTATION OF RETR. WHIP STOCK AT KOP (13,090' CASED HOLE LOGS).
14. ONCE WHIPSTOCK IS ORIENTED, TAG RBP & SET WHIPSTOCK. SHEAR OFF OF WHIPSTOCK, (CSG COLLARS @ 13,062 & 13,105'. CASED HOLE CORRELATION FOR KOP (13,090'), POSITION OF BOTTOM WHIPSTOCK FACE.)
15. POOH. PU STARTING MILL ASSEMBLY GIH. START MILLING w/ 4 5/8" PILOT MILL AND ESTABLISH OPENING IN CASING. POOH.
16. LAY DOWN PILOT MILL ASSEMBLY. PU 4 5/8" WINDOW MILL, COLLARS, ON 2 7/8" DRILL PIPE. FOLLOW MILLING PROCEDURE UNTIL WHIPSTOCK SUPERVISOR IS SATISFIED. (DRLG WILL BE CONVENTIONAL).
17. POOH & PU 4 5/8" MILL TOOTH BIT, STABLIZER, 20- 30' -3.5" COLLARS, (1.5" ID) ON 2 7/8" DRILL PIPE. DRILL APPROX. 13 HOURS & TRIP FOR HYCOLOG BIT.
18. GIH & CONT. DRL APPROX. 344' TO CORE POINT (APPROX. 13,434' OH LOGS) & CIRC. HOLE CLEAN. (TOTCOS TO BE RUN WHILE DRILLING TO CORE POINT. (1 5/16" OD TOTCO))
19. ONCE CORE POINT IS REACHED THEN SURVEY WILL BE RUN TO DETERMINE DISTANCE FROM ORIGINAL HOLE & CASING POSITION RELATIVE TO NEW HOLE. (THIS WILL BE A "GYRO ON TOP OF EMS TOOL" SURVEY.)
20. RU TO RUN ORIENTATED CORES. GIH w/ 40' CORE BARRELS, MONEL COLLAR w/ ORIENTATION TOOL (EMS), COLLARS, & DRILL PIPE. (2 - 40' CORES TO BE TAKEN IF POSSIBLE).
21. ONCE CORES ARE TAKEN THEN HOLE WILL BE DEEPENED TO ALLOW FOR LOGGING. A POROSITY, RESISTIVITY AND CBIL LOG WILL BE RUN IN THE NEW HOLE & TIED BACK IN TO THE EXISTING HOLE.
22. ONCE LOGGING IS COMPLETED THE HOLE WILL BE PREPARED FOR STIMULATION & TESTING.
23. DRL PIPE & COLLARS WILL BE USED TO SPOT ACID IN SIDETRACK INTERVAL.
24. POOH. GIH w/ PKR & TBG. POSITION PKR @ 13,100'+ OR - & REVERSE HOLE CLEAN. SET PKR. & BREAKDOWN FORMATION.
25. SWAB TO TEST. PUT ON PROD TO TEST.
    NOTE: TEMP WHIPSTOCK MAY BE PULLED TO TO PRODUCE ORIGINAL PRODUCTION INTERVAL & MISSISSIPPIAN SIDETRACKED HOLE.

PHASE # 3

WE WILL PROCEED w/ PHASE # 3 DEPENDENT ON RESULTS OF ORIENTATED CORES & FRACTURE IDENTIFICATION.

NOTE: IF ABOVE INFORMATION IS FAVORABLE & DIRECTION CAN BE ACHIEVED FROM ORIGINAL WINDOW THEN SIDE TRACK WILL BE CMT'D & DRILLED OUT FOR MEDIUM RADIUS LATERAL. IF DIRECTION OF WHIPSTOCK IS NOT DESIRABLE THEN WHIPSTOCK WILL BE RETREV'D & RE-ORIENTATED.

26. POOH & PREPARE TO DRILL DIRECTIONAL HOLE UP TO 1000' FEET. KOP & DIRECTION TO BE PICKED AFTER PHASE # 2 CORES ARE ANALYZED.
27. INTERMEDIATE LATERAL WILL BE LINED W/ 4" LINER W/ HANGER.

NOTE: THIS PROJECT IS A JOINT VENTURE BY SANDIA LABORATORIES,

(FUNDED BY D.O.E.), AND THE WORKING INTEREST PARTNERS.

RAY F. NOKES
PROD. MGR/ ENG.
HARVEY E. YATES COMPANY
ROSWELL, NM

\1RESCALC\AFE\DUNCANW3

HARVEY E. YATES COMPANY

WO-AFE# W-3

LEASE NAME & WELL NUMBER: DUNCAN UNIT # 3
LEGAL LOCATION: N, 660' FSL & 1980' FWL of SEC. 26, T-13S, R-35E.
COUNTY: LEA CO., NM. DEPTH:
AFE TYPE: (3) RECOMPLETION (4) OTHERS (5) P & A= 3

ACCT NO. 19530-03-0

FORMATION: MISSISSIPPIAN

COMPLETION COSTS:

						DRY HOLE COST	PRODUCING WELL COST
924-000	INTANGIBLE COMPLETION COSTS:						
924-001	COMPLETION UNIT COST: DAYS & $/DAY	18/12HRS	28/24HRS	$1350/$2650		$98,500	$98,500
924-003	MUD, WATER & ADDITIVES					$24,000	$24,000
924-004	CEMENT, TOOLS & SERVICES (PROD.STRING...ETC)					$5,200	$5,200
924-005	ELECTRIC LOGS(CRC / WEDGE-GR CORR & DIR. SURVEY.....ETC.)					$58,000	$58,000
924-006	TOOL & EQUIPMENT RENTAL & TRUCKING(BOP,RACKS,CATWALK,REV. UNIT)					$300,548	$300,548
924-007	(PERFORATING), STIMULATION & TREATIN					$3,600	$3,600
924-008	COMPANY SUPERVISION					$16,100	$16,100
925-001	BITS, TOOLS & SUPPLIE					$2,440	$2,440
925-002	PLUG BACK					$0	$0
925-003	MISC. CONTINGENCIES					$5,084	$5,084
951-000	PLUGGING EXPENSE					$0	$0
	TOTAL INTANGIBLE COMPLETION COSTS					$513,472	$513,472
930-000	TANGIBLE DRILLING & COMPLETION COSTS:						
930-001	SURFACE CASING COSTS:(SIZE & FEET)					$0	$0
930-002	INTERMEDIATE CASING:(SIZE & FEET)					$0	$0
930-003	4" LINER:(SIZE & FEET)	4"	1000 FEET			$0	$11,000
930-004	PRODUCTION TUBING:(SIZE & FEET)	2 1/6"	1000 FEET			$0	$3,960
930-005	CASING HEAD						
930-006	CASING SPOOL						
930-007	TUBING HEAD						
930-008	CHRISTMAS TREE						
931-000	SUBSURFACE EQUIPMENT						$0
931-001	MISC PIPE CONNECTIONS						$0
931-002	PACKER & SPECIAL EQUIPMENT(LINER HANGER)						$10,460
931-003	MISCELLANEOUS CONTINGENCIES					$0	$636
	TOTAL TANGIBLE COMPLETIONS COSTS					$0	$26,056
	TOTAL INTANGIBLE COSTS:					$513,472	$513,472
	TOTAL TANGIBLE COSTS:					$0	$26,056
	TAXES:					$26,957	$28,325
	TOTAL COSTS==					$540,429	$567,852.57

PREPARED BY: RAY F. NOKES DATE: 5-Apr-90

APPROVED BY:

COMPANY:

DATE:

"IT IS RECOGNIZED THAT THE AMOUNTS PROVIDED FOR HEREIN ARE ESTIMATED ONLY, AND APPROVAL OF THIS AUTHORIZATION SHALL EXTEND TO THE ACTUAL COSTS INCURRED IN CONDUCTING THE OPERATIONS SPECIFIED, WHETHER MORE OR LESS THAN HEREIN SET OUT"

NOTE: THE ABOVE COSTS WILL BE REDUCED BY APPROXIMATELY $100,000 (D.O.E. FUNDING TO SANDIA LABS) FOR USE TOWARDS ORIENTATION, CORES, CORE EVALUATION & LOGGING.