aside 22:18 80:10 84:3 96:21 97:16 114:1 138:16 148:4 207:10 221:18,23 312:20
asked 16:10,12 17:11,22 63:18 70:6 81:24 102:10 105:11 121:21 124:23 140:1,12 146:10 176:11 176:17 179:1,5 278:23 284:1 284:16 293:21 300:24 302:12 315:22 317:25
asking 19:3 52:16 54:6 63:16 69:8,13 79:1,2 80:8 91:15,18 94:19 106:4,5 114:3 124:24 136:19 140:15,18 150:15,19 164:8 200:3 202:11,19 225:19 276:20 280:5 291:8 293:6,7,11,19 293:25 294:22 307:15,19
asks 19:7 172:6 216:9 304:14
aspect 64:17
aspects 314:8
assert 205:4
asserted 196:3 204:4 285:13
asserting 273:13 291:3
assertions 148:6 195:16 199:5 291:14
asserts 69:12 227:3
assess 26:6 70:9 70:11 77:20 206:21 218:22 219:11 250:25 251:7 252:2,19 298:1
assessed 70:12 80:24 207:7 252:3
assessing 27:19 30:3 90:18
assessment 25:13,18,25 26:2,4,17 27:3 27:15,17 28:3 28:9,9,10,11 28:11,17 29:1 29:2,21 36:15 54:10,16 55:24 64:12,13 175:20 176:7,8 206:14 232:8 232:13,19,24 233:12 243:6 243:17,21,21 243:24,25 251:14 261:25 262:11 263:1 264:2,6,19 265:10 301:15
assessments 26:11 28:8,20 31:20 36:5 176:12 265:14
asset 71:16
assign 212:23
assigned 76:4 295:18
Assistant 295:17
assisted 98:16
associated 138:7 138:12 197:15 197:23 320:7
association 33:20 34:3,6 59:19 196:10
assume 124:25 125:6 135:8 159:8 203:6 224:11 245:11
assumes 158:15 187:25
assuming 210:3 221:3 237:3 245:16 320:20
assumption 170:9 203:20 206:20 221:6 225:9 249:21
assumptions 247:1
ATCO 51:19,20 51:22
attached 18:23 21:22 72:19 84:17 90:4 101:5 103:5 122:12 123:10 126:5 127:5 128:8 131:17 133:16 141:5 143:12 144:7 145:5,11 151:17 152:7 152:11 154:19 157:11 160:2 160:14,23 161:3 183:8,23 187:4,18 193:15 197:16 200:13 210:6 244:21 277:16 281:11 303:21 304:11 309:15 309:21 313:5
attaching 187:11
attachment 6:6 6:11,18 7:17 9:7,12 10:13 144:25 151:25 152:2 160:6 183:18 184:2,3 187:12 304:3
attachments 85:9 97:21 142:22 157:23 159:23 275:19 277:11 301:8,9
attempt 182:12 248:15,20
attempt's 182:10
attempts 150:10
attention 173:18
attorney 5:24 6:6,8 9:13 10:12 17:14,17 26:9,23 28:22 46:10 68:13,16 69:5,9,24 72:1 79:23 92:14 132:23,25 133:23,25 134:13 141:12 141:16 163:16 195:16 201:15 202:16 242:24 280:20 291:22 292:1 322:6 325:25
Attorney- 144:18
attorney-client 6:17 9:6,10 20:24 74:18 80:2,9 92:13 133:25 163:17 187:10 195:16 201:15 202:16 203:13 242:24 303:7
Attorney-clie... 6:11
attorneys 25:8 291:17 292:6,8
author 310:12 310:17
authored 147:10
authorities 120:24
authority 235:11,12 286:5 297:15
authors 105:8 310:22
automotive 23:14
available 26:6 26:21 30:3 82:9,11 109:6 171:2 174:11 174:13 176:21 202:6 210:3 214:4 242:5 245:25 246:5,6 246:6 296:4 304:25
Avenue 2:20 3:20 11:20
Avisha 3:11 12:14
avoid 241:22 258:12 270:17
aware 46:22 76:2 78:10,18 102:5,12,20 121:3 167:22 201:21 223:22 226:4,9,10 231:9 235:9,14 246:17 248:21 258:1 259:17 265:2 271:3 274:16,16 276:7,10,12,23 283:20 286:5 297:15 299:13 302:14 303:9 307:23 314:10 314:16
awareness 82:3

B

b 232:23 234:17 250:25 314:2

back 14:4 32:3 37:3,7 56:10 63:19 70:22 74:6 75:2 81:5 81:6 94:25 104:18 112:6 112:14,14 114:11 116:15 117:18 118:23 121:9 122:7 126:16 148:18 148:21 149:12 155:21 159:17 159:21 163:14 163:23 164:1,3 164:13,17 165:4 166:17 172:17 176:23 176:24 180:4 188:22 189:16 194:25 207:8 210:4 212:25 222:4 226:17 226:19 230:22 235:23 239:17 250:21 254:1 255:23 256:23 272:10 275:18 280:6 294:16 299:9 302:24 305:3 315:9
background 275:11
Bacon 100:1
bad 37:16
balance 45:21
Ballona 54:15
bandwidth 319:25
Bar 47:12 291:24
barrier 236:1,3 236:7,12,22 237:17 238:9 238:16,20
base 37:10,15,19 37:22 59:20 167:19
based 25:3 26:12 27:12,18 28:12 59:17 60:3 67:6 77:3 89:9 91:7 131:4,7 140:3 168:16 169:20 173:4,24 174:2 174:5 175:1,7 176:6,14 193:10 205:4 218:25 219:2 220:22 225:9 227:20 244:3 247:22 249:8,9 249:22 259:24 266:5 276:1 278:1 285:14 298:15 302:7 311:15 319:3 319:12,19
basic 31:24 210:7 274:12
basically 38:10 44:10 243:16 255:1 316:24 316:25
basing 170:14
basis 169:6 172:6 198:6 205:13 206:18 207:7 222:5,25 233:19 234:18 247:17 277:5 287:20 288:18 291:18 293:7 293:21 294:1 319:4
basis' 288:4
bat 218:16
Bates 137:15
Bay 34:16
bean 44:10
bear 87:20 285:21 303:4 319:20 320:3,8
bearing 173:20 298:5
began 82:15 279:11
beginning 2:22 26:7 72:12 132:11 180:21 189:11 207:8 232:16 250:16 308:21
begins 11:12 76:22 116:5
behalf 2:19 11:21,24 12:3 12:14,16,18 77:2,14 131:22
behaving 64:3
behind-the-sc... 22:14
belief 228:5,10 228:17 247:17
believe 16:8,13 21:15 50:9 51:24 76:19 78:24 81:25 94:15 97:18 111:23 117:7 139:5 144:22 155:24 156:17 157:6 168:6 169:11,14 171:6,22 188:18 191:5 192:7 201:22 204:2 221:24 226:6 228:3 235:19 238:6 244:21 247:13 247:25 249:4 252:6 260:1 261:19 268:2 271:1 273:4,12 277:10 284:4 296:18
believed 31:3 170:6 174:3
Bellomo 9:21
benzene 278:15
best 40:14 108:20 109:5 135:12
better 222:15 267:13 268:25 270:18,20 294:10,18 309:9
beyond 51:12 210:15 216:2,3 252:13 266:21 284:23
Biehl 11:24 12:4 12:6
big 37:18 240:10
bigger 240:11 272:4
Bill 100:9 101:16
billed 118:5
biocide 260:17
bit 27:22 30:2 37:13 54:1 91:4 98:13 118:25 147:22 147:24 258:4 303:3
Blade 63:24 89:2,2,7 91:14 95:9,17 96:1 96:12 99:6 104:9,12 106:11 108:1,4 108:7,10,21,24 109:2,2 112:17 112:20 119:6 136:4 147:14 148:10,19,23 149:1,5,8 161:16,24 162:4 164:20 165:1,3 166:18 168:1,2,5 169:24 170:7 170:18,19,24 171:5,9 174:3 174:4,8 175:20 178:20,23,25 186:17,19,22 209:12,16 210:10 213:22 218:4 222:20 223:3,4 226:21 228:2,4 236:17 237:3 243:15 244:3,5,6 245:10,11,21 246:5,8,22 247:18,24 248:9 249:10 249:13,19 250:2 252:3 255:24 256:17 266:5,25 268:11,15 272:15,18,19 272:21,23 273:11 274:16 296:12,17,20 297:22 298:5,6 298:6 303:9 304:18 306:7 313:11 314:13
Blade's 138:25 139:4 162:25 165:16,19 166:1 167:5,23 168:11 170:2 174:8,23 175:12,16 176:3 227:21 229:8 268:10 273:5 274:17 298:2 313:24
blank 125:14
blending 45:22
blew 219:14,21 271:5
blowing 262:12 270:24
blowout 227:4,8 271:11,12,15 271:18,21

blue 113:9,10
board 41:25 235:3 316:7
boards 235:5
Bob 4:23 101:15 101:20,22 102:1 129:18 129:19 130:19 130:21 290:1,2
BOCKIUS 3:4
body 230:13
Bogdanovic 100:3
Boots 95:15 107:17 108:24 137:21 245:17 245:25 246:11 248:7,13,18,25 280:2 294:7
borders 30:12
bottom 53:11 71:7 73:13 77:7 126:12 139:22 148:18 162:13 173:13 178:11,12 180:2,3,6 189:24 237:9 247:5,13,24 251:19 281:17 304:6 313:18
bought 225:5
bound 137:11 137:13 138:5
box 188:11
boxes 94:14
brain 135:10
break 13:20 17:19,21,22 20:9 65:24,25 72:5 113:3,4 114:10 116:18 159:4,10 194:20 274:1
breaks 17:18
Brett 107:13,14
brief 13:20 292:25
briefable 289:2
briefing 205:18 288:12
briefly 43:4 70:19,25 99:7
briefs 78:2 287:1
brine 182:9
bring 294:3
broad 30:9 79:7
broadly 172:4
broke 267:19
Bruno 49:2,3,18 50:23 51:9 53:2 61:12 71:3 88:2,4 121:15 128:13 128:16 209:3 289:19 291:15 292:20 295:10
BTEX 278:16
bubbles 55:17
build 317:6
building 317:6
bullet 25:11,14 25:24 27:2 28:23,24 29:20 31:14
bulleted 227:2
bullets 32:19
bunch 35:25
buried 52:11 93:23
business 123:21 230:19,20
busy 34:2 321:1

C

c 1:15 2:15 4:4 4:13,14 5:21 11:13 13:3,13 72:8 115:15 146:1 233:23 234:17 274:19
C-L-E-M-E-N 41:6
C.2 196:10
Cagen 129:18 129:19 130:19 290:1,2,13
Cal 88:16,20
calculated 205:13
calculating 244:15 247:10
calculation 180:16 218:17 262:13 301:11
calculations 245:15,17 246:23,25 249:23
calculator 245:18
Calgary 51:24
California 1:2,5 1:7,16 2:2,5,7 2:19,22 3:3,7 3:10,13,17,18 3:20 4:12,15 5:7,10,12,17 6:13 7:5,9,11 8:5,9,11,14,18 8:20 9:17 10:6 10:7,16 11:1 11:16,21 12:11 12:13,15,17,19 13:6 14:23 15:9 24:8 30:13 31:25 33:19 34:5,12 34:14,15 35:6 41:4,13 43:6 47:2 48:22 53:22 56:17 59:18 71:14 72:24 75:6 77:19 81:8,12 88:11 115:2,5 115:7,16 116:1 117:23 120:4 120:11 122:18 161:21 181:4 194:7 215:24 234:23 235:10 261:18 282:6 291:25 315:24 317:1 325:7
call 31:5 64:19 64:25 76:18 91:21 92:3 94:12 173:18 183:16 184:5 191:2,7 205:23 217:3 230:3 257:17 258:15 295:16 296:1
called 82:17 92:5 93:23 110:17 121:21 199:13 212:22 266:22 315:24 315:24
calling 158:13 184:6 205:16 252:11 266:18 284:13,23 290:5 297:18
calls 74:18 79:7 79:23 92:13 163:16 171:25 187:24 190:22 224:24 233:14 276:8 282:21 284:7 299:20
Canada 51:23
Canyon 1:6,9 2:6,9 4:24 6:8 7:9,12 8:9,12 8:18,21 9:14 10:17 11:14 15:15 82:4,7 88:23 89:5 102:2,14 103:12 115:6,9 119:4,23 120:1 121:2 132:21 161:22 213:15 232:10,15 235:15 239:6 252:8 274:22 313:10
Canyon's 84:12 96:2
capability 307:13
capable 293:22
capacity 18:6 84:5,7 117:15
caption 272:22
captioned 19:13
capture 17:4,7
captures 286:12
car 212:20
carbon 165:11
care 212:24
carefully 148:19
carried 148:10
carry 39:13 253:25
case 11:14,16 21:11,15,16 23:24 24:3,6 25:8,22 26:25 27:11,20 42:1 42:4 47:24 48:18 49:1,2,3 49:4,6,8,8 50:8 50:9,18,24 51:5 52:5,6,22 54:5,17,19,20 54:23 57:1,14 57:15 61:5 71:7,10 83:10 83:10,13 84:1 86:15 102:15 109:24 111:16 113:19 116:21 117:5 118:1,2 118:3,5 121:5 121:13,16,19 122:4 128:13 128:16 129:23 130:4,21 131:24 173:11 192:8 204:2 209:3 226:5

236:12,17 239:4 247:25 250:25 251:19 251:21 290:21 295:5,10 298:23 305:12 309:4
cased 253:10
cases 22:13 23:6 24:21 25:12 26:16 28:24 29:3 33:21,25 34:13,13,14,16 34:20,20 36:16 41:19 42:3,6 58:5 65:11 67:18 70:24 207:17,23 257:19,20 308:23 312:13
casing 65:6,10 65:16,20 66:13 66:16 165:10 165:11,17 166:2,12,19 168:23 175:5,9 175:22 178:7 186:8 213:10 213:14,19,23 214:22 215:5 216:14,18,20 217:9,11,20 222:21 223:2,2 223:4 225:15 225:25 226:12 226:22 229:2 230:4,14 231:11,12 233:5 236:2,10 236:11,11,13 236:16,19 237:20 238:24 239:3,4 240:5 240:12 241:7 241:13,13,20 243:11 251:2,8 251:22 254:4 254:10,19 255:5,6,7,12 255:13,15,20 255:22 256:1,1 256:2,15,16 260:7,19 261:3 261:9,14 263:8 263:10,11,17 267:7,12,12 268:22 270:18 270:24 271:4 308:8
casings 62:14,16 149:10 213:10 215:13 222:18 226:23 227:10 251:16 252:21 259:8 260:23 298:17
catastrophic 270:17
catch 270:2,5
categories 218:15
categorize 265:1
category 29:2,4 317:8,9
cathode 254:20
cathodic 254:7,8 254:12,25 255:3,11 256:25 257:3,4 257:8,13,15,17 258:2,11 259:7 260:2,11,11
cause 1:7 2:7 7:10 8:10,19 15:16 22:25 115:7 176:5 207:15,16,18 208:4,4,12,14 208:18,21,23 209:1,6,12,22 210:1,21,24 211:3,10,14,18 211:19 212:5,7 212:9,12,15,19 213:8,18,21 214:1,9,11,14 214:16 215:7 216:23 217:3,5 225:24 229:4,4 255:21 256:19 264:10,22 313:20
caused 55:22 162:15 167:2 211:1,7 212:18 217:13,21 256:16 269:8,9
causes 161:23 162:4 211:11 211:16,19,21 211:23 214:4
causing 55:20 166:14,14 256:2
caveat 320:19
cc 134:11
CCP 13:6
Celanese 43:24 43:25 208:23
cement 231:19 232:3 262:14 263:8,18,25
cemented 186:8 215:14 261:5,9 261:14,18,20 263:17
cementing 231:16 262:2 263:13,14,21
CERCLA 32:19
certain 105:5 110:4 207:5 253:24
certainly 173:5 174:11 206:10 214:11 260:4 262:24
certification 11:7 46:19,21 181:3 325:21
certifications 46:21,24 318:2
certified 2:25 11:8,24 12:1,4 12:6 325:6,21
certify 325:8,23
cetera 287:22
Ceyhan 100:5
Chafsome 88:8
chain 4:22
chains 142:9
challenged 37:20
chance 270:18
change 41:2 152:21 189:3 190:16,19,20 190:25 191:1 192:23 206:14 245:22 323:5
changed 158:24
changes 103:23 152:22 191:5 192:10,12 323:1 324:14
changing 109:21
characteristics 244:24
characterizati... 59:6 102:9 158:13 165:19 229:21 294:12
characterize 134:3
charge 35:12 38:9 43:11,13 44:17 45:16 217:6
check 99:7 149:1
checked 108:25
checking 206:2 291:24
chemical 37:18 44:15 182:15 182:19 257:5
chemicals 260:6 260:14,15
Chief 37:8 39:23 40:17
Cho 9:22
choice 204:18 221:7 254:16
chose 263:8 291:6
chosen 205:23
circle 63:19 118:23 159:21
circling 254:1 299:9
circumscribe 211:24
circumstances 169:19 292:21
citation 202:13 302:15
citations 194:17 249:9
cite 193:17,22
cited 106:1,2 173:21 221:20
cites 175:20
city 52:10,11,15
civil 58:21,23
claim 70:16 207:4
claimed 70:13
claiming 200:4,7 207:1
claims 195:25 198:3
clarification 63:15 92:9 136:19 146:3 146:19 166:4 200:16 288:3 315:13
clarified 116:18
clarify 18:8,10 34:25 42:11 60:16 75:23,24 86:16 91:1 100:16 120:11 194:3,6 239:25 295:22 316:4

clarity 117:1
clause 178:18
clays 62:19
clean 7:17 157:24 158:23 160:7
Cleaned 157:19
cleaning 37:21 181:19
cleanup 32:18 35:18 317:13
cleanups 35:19 36:2 317:16
clear 15:20 139:13,14 164:4 182:9 248:8 295:20 304:1 317:24 318:5 320:12
clearly 17:2 128:20 250:1
Clemen 39:3,12 39:17 40:4,24 41:5,7,9 60:6
client 10:12 48:1 48:22 50:1 51:1,20 53:22 56:23 117:23 144:19
clients 37:6
clip 111:12
Clorfeine 10:6
close 105:19 123:21 178:11
closed 52:5
closely 149:13
closer 109:14 214:11
closure 83:6 190:8
co-counsel 287:15 290:22 295:16
co-located 258:7
coal-fired 42:1
coat 260:6
coattails 37:5
code 4:18 9:16 56:17 85:3,5 97:24 192:21 193:1,5 194:7 287:21 299:19
codes 193:6,7
collect 19:16 21:8 111:25 142:3 215:2 219:19 234:1,8
collected 19:21 20:14 25:4 83:15 170:18 209:25 210:16 258:24 259:3 271:18
collecting 82:12 82:14,16
collection 26:13
Colorado 13:14 89:24 120:13
column 53:11 56:14 71:19
columns 218:11
combined 27:24
combining 160:19
come 37:23 64:14 83:25 114:11 217:7 277:4 284:14 284:16,21 285:9 292:8 293:3 294:18 316:15
comes 243:15 316:10
comfortable 106:6 107:21 109:4 164:21 167:4 186:22 186:24 197:1 275:5,13
coming 29:10 55:14,25 102:16 121:13 256:6,8 271:8 271:9
comment 149:18 150:3 150:13 152:19 152:25 153:3 153:12 168:25 169:2,6 170:22 178:19 188:6 188:10,18 306:22
comments 158:25 188:4 315:4
Commission 1:1 2:1 3:17,19 6:13 7:6 8:6,15 10:7,18 11:15 12:20 36:14 41:13 43:6 48:23 52:2 53:23 54:17 72:25 75:6 81:9 115:1 117:24 119:17 120:4 126:22 130:6 132:14 147:17 219:23 234:25 235:2 289:18 290:10 290:12
Commission's 1:4 2:4,17 7:8 8:8,17 98:6 115:4 313:10
commissioner 103:15
common 178:9 186:13 206:10 243:23
commonly 142:8 254:8
communicate 89:14,19 92:11 92:21 110:10 174:15
communicated 87:23 88:10,15 88:19 93:6
communicating 66:21
communication 89:6,11 121:24
communicatio... 33:19 34:6 59:19 75:21 76:8,11,16,17 76:20 85:19 86:2,5,6 92:17 92:24 93:11 134:19 137:22
community 166:13
companies 29:16 34:2 212:22
company 1:5,8 2:5,8,20 3:3,10 5:11 7:9,11 8:9 8:11,18,20 9:17 10:16 12:17 23:8,22 31:19 38:22,23 39:6,8,10 41:3 45:1 47:25 48:11,12 50:22 52:7,23 54:6 56:16 60:6 71:14 77:19 100:18 115:5,8 122:18 215:24 240:14 313:19
Company's 4:12 5:8,12 10:6 15:9,10 161:22
comparable 164:5
compare 153:6 164:5 177:14 209:12
compared 108:24
comparing 189:17
comparison 188:24
compel 281:4 282:17 286:6 297:16
compelled 284:5
compensation 14:11
competitors 217:4
complained 55:13
complaint 27:25 36:8 55:18
complaints 55:3 55:5
complete 60:2 60:19,22 93:10 93:10 95:19 134:3 149:14 203:8
completed 53:7 224:5
completely 107:12 166:21 217:20 218:25 285:17
completion 314:7
complexion 24:21
compliance 77:20 292:4
complicated 34:23 258:4
complied 168:15
component 54:14 254:23
components 278:20
compounds 278:14
computer 155:3 155:23 245:18
conceding 295:5
concentrating 22:14
concept 267:15

300:17
concern 32:24 110:2 156:3 173:1 174:14 320:24
concerned 108:9 118:1 278:17 290:13 293:5
concerns 148:4 148:7 155:25 156:2 165:24 166:6 249:13 286:16
conclude 171:21 243:25
concluded 48:3 49:4 52:3,4 167:18
concluding 288:18
conclusion 163:6 167:15 167:20 170:11 171:15 172:1 176:5 205:16 227:21 233:15 282:22 284:8 284:13,23 290:5 293:8 294:23 296:1 297:19 299:21
conclusions 108:3 149:3 164:21 165:16 165:20 166:1,6 167:5,24 170:14 174:23 175:16 228:8 285:3 296:1 298:6,15
condition 27:9 70:4 135:12 203:7,7 216:20
conditions 214:24
conduct 224:13 225:12 233:18 234:11 291:7,8
conducted 85:10 170:3 213:16 243:6,18
conducting 211:20
conference 172:8 286:11 287:13 291:1 292:23
confidence 228:19
confidential 4:18 5:6,24 6:6 6:9 9:13 10:8,8 10:12 85:6 133:23 134:13 134:20 141:12 141:16 144:19
configuration 62:1,3,6,23 63:3
confirm 40:11 60:16,19 61:10 81:7 86:4 105:21 108:6 123:16 134:9 145:18 164:2 176:5 188:5,14 193:10 225:8 279:22 314:10 318:14
confused 317:23 318:7
connect 253:22 271:19
connected 30:11 235:13
connection 19:12 59:13 75:19 85:13 112:2 126:13 127:18 136:17 137:4 170:20 170:22 201:2 249:14 250:5 291:8 309:17
connections 165:10,17 166:2
consequences 264:23 265:12 266:16
consequential 265:1
conservative 221:7 223:7
consider 199:24 246:20 298:4 303:6
consideration 262:9 263:7
considered 163:19 165:1 174:10 214:10 223:12 225:18 277:22 282:14
considering 211:21 250:1 263:25 276:13
consistent 31:1 59:24 108:10 206:1 278:11
consistently 176:12 247:19
constant 240:4 241:5,15 267:11
constitute 251:9
constitutes 232:17 299:18
Construct 5:20
constructed 32:11
construction 34:23 171:11 317:1,10
consult 37:23 124:19 246:19
consultant 22:11 32:10 33:8,15 34:8 60:11 69:1,17 70:2,9 82:24 122:8 133:9 257:6
consulting 24:2 37:4 39:13 43:1 51:6 117:12 308:23
Consumer 5:16
contact 75:20 86:24 89:5 99:8,19 101:22 102:18 129:16 130:18 133:5
contacted 75:14 75:16
contacts 26:19
contain 4:18 190:6,13 236:20
contained 137:19 324:13
containing 57:25
contains 244:11
contaminated 36:5
contaminating 37:22
contamination 31:15,25 32:5 32:7,14 37:16 37:25 38:25 41:24 42:17 54:14 55:12,19 55:22 65:12 235:8
contend 213:18 243:10 247:8 248:7,13,18 262:14 266:14
contending 256:14
content 152:6 198:15 203:23
contention 261:13
contentions 294:1
contents 121:23 131:25 132:2 145:4 161:14 202:23 203:1 296:14
context 26:10 27:6 70:8 91:23,24 181:16 189:18 255:10 265:9 267:10 281:1 296:21 308:20
continental 30:18
continue 159:7 264:12,17,21 286:2 289:5 293:12 294:19 294:22,24 295:1
continued 5:1 6:1 7:1 8:1 9:1 10:1 39:4,6,13 40:15 50:9 182:1 291:21
continues 264:20
continuing 232:16 281:19 284:13 288:10
continuous 265:18 268:2 269:18 270:12 271:16
contract 40:13 40:24 52:4 72:24 73:11 74:25 75:12,15 75:17,20 76:9 76:12,22 78:21 79:9,16 81:6 81:18 84:4 85:20,21 91:5 92:2,5,6,23 93:4 95:24 96:5,14 97:4 98:14 109:19

109:25 110:3,7 110:10,17 134:19 181:13 283:19
contracted 127:17
contracting 180:24 181:12 181:17
contractor 38:19 41:18 215:2 244:15 247:9 315:23 315:25 316:3,7 317:5
contractor's 316:23 318:10
Contractor-H... 317:15
contractors 151:2 181:7 209:9 245:16 316:25
contracts 39:13 39:13 40:21 41:21,23 42:12 42:24 75:7,8 81:8,11 85:23 317:2
contractually 110:24
contributed 182:9
contributing 182:23 256:18
control 35:7 59:21 182:19 223:10 224:3,7 224:13,23
convenience 49:20
conversation 153:16 192:9
conversations 306:10
convert 241:2
converted 238:18
converting 239:6
convincing 52:17
cooperate 279:9 320:9
cooperating 284:11
cooperation 195:18,20
coordinated 45:15
coordination 85:22
Coots 95:15 107:18 108:24 137:21 245:17 245:25 246:11 248:7,13,18,25 280:2 294:7
copied 93:9 101:17 133:21 154:24
copies 15:1 92:6 95:13 97:19 137:19 144:12 317:19
copy 15:8 21:13 89:20 96:7,9 112:17,23 125:15,16 136:13 138:25 153:3
core 149:24
corner 103:14
Corp 38:19 40:15 41:8,9 59:16 60:6
corporate 22:13 23:20
Corporation 40:1,5,9
correct 18:15,18 19:4 21:6 22:2 22:6 23:17 30:23 33:5 34:8 35:8 46:12 49:19 50:4,7,18,24 51:2 53:16,24 57:7 58:3,21 63:11,14 68:13 71:16,24 75:22 77:6 84:24 85:10 89:10,12 90:9 102:18 103:12,18,21 103:22 104:2,9 105:10,17 107:7 117:2 118:20 119:6,7 119:11,12 124:5,17 127:19,20,24 127:25 128:2 128:22 132:6 135:13,17,25 136:1 140:13 140:21 142:19 143:1 144:1,13 144:16,20 145:2,19,22,25 152:4 155:6 157:3 159:2 160:9 162:5,22 164:22 165:13 168:2 169:25 170:7,20,21,22 170:23 171:3 173:24 174:4 174:21 175:2 175:10 178:6 180:13,18 183:14 184:20 184:23 187:13 192:3 195:17 196:17,20,23 197:23 198:11 204:12,13 205:10 207:23 208:12 209:7 218:3 221:10 221:13 226:1,2 226:5 227:17 227:22 228:7 228:11 229:18 234:2,13,19 238:20 239:3,8 242:9 244:4 246:5,12,15 247:11 249:11 249:12,15,16 250:5 254:4 255:8 256:7 257:20 260:20 272:16 275:16 277:8 279:2,15 279:24,25 283:17 299:15 304:4,19 306:14 307:17 309:25 310:15 311:16 312:7 313:10 314:11 324:12 325:18
corrected 49:20
correction 157:5 160:25
corrections 53:10 60:18 324:14
correctly 140:20 164:7 256:5 258:8
correspond 75:11
correspondence 198:17 280:16 296:23
corridor 52:9,19
corrode 255:16
corrosion 64:3 67:10 68:3 162:11,15,18 163:1,23 166:15 167:6 175:21 214:9 215:12 219:11 233:5 241:21 251:2,9 254:9 255:4,20 256:3 256:14,16,19 259:11,14,23 260:3,19 261:21 269:14
corrupted 108:18 305:6 305:19 307:8
cost 262:5,8,19 263:24
cost-effective 262:13
costs 54:7 223:18
counsel 3:10 12:8 13:22 15:11 17:25 18:2 76:5 80:11 86:7 87:3 189:2 289:25 291:23 292:9 295:17 295:18,21
Counselors 3:4
count 201:10 204:8 207:2,20 230:5,10 301:17
counted 41:19 204:19 205:8 205:17
counting 55:17 229:2
country 30:22
counts 228:3
County 9:21,22 120:19 324:3
couple 14:25 33:21 95:2 97:7 106:9 109:22 118:22 188:4 252:5 281:2 293:14 316:6
course 86:9 209:25 227:19 286:3 306:9,18

308:22 318:4 320:25
court 12:21 17:4 17:7 58:24
cover 54:6 60:12 125:4,15 128:20 132:5
covered 29:1 118:24
covers 60:15 242:25
CPCN 49:22
CPSD 129:2,17
CPUC 5:5 10:5 77:14 102:2 235:16 304:17
CPUC-Safety 9:18
crazy 56:9
create 262:22
created 300:18 311:10,11
credentials 168:4,6 318:2
creek 54:15 55:15,17,19,22
creep 146:4
criminal 50:24
critical 273:13
cross 30:12
cross-examina... 288:2 289:13 292:13,16 295:6,7
cross-examine 288:17
cross-examini... 287:19
crude 9:23 45:22,23,24 274:21 278:14 278:19
CSR 1:24 115:24 326:8
current 22:18 81:8,11 316:12
currently 47:1 132:13 226:15
Curriculum 4:14
curves 30:4,25
cut 217:8 289:4
Cyndy 101:17

D

D 10:9
D-O-G 97:20
daily 93:6,11 95:14 108:23 137:21
damage 268:13 268:20
Dames 34:8 36:23 37:6 59:18
Darryl 3:19 4:17 4:20 5:23 6:5 6:10,16 7:14 7:16 9:5,10 10:5,11 12:18 18:3 76:6,9 85:24 86:25 87:1 89:11,17 90:9 91:15 92:11,21 93:5 93:8 104:25 110:16 114:9 121:13,18 122:2,5 125:1 130:20,21 133:20 134:4 134:10,23 135:3 141:21 142:4,6,25 144:11,23,24 145:17 149:19 150:15,19 151:21 152:7 152:16 153:16 154:23 155:1,2 155:16 156:8 157:1,17 158:22 183:11 183:17 184:4,6 187:8 188:3,10 188:19 190:11 190:19,23 191:1,12,16 192:10,23 197:4 277:25 278:8 285:9 299:24 304:2 308:5 309:22 310:8,18
Darryl's 184:3 187:22
data 5:8,10,12 5:15 9:18 10:12 25:3 26:4 31:10 53:18 56:10,21 57:17 64:13,18 64:20 80:16,17 83:25 94:7,7 95:7 97:10,11 97:19,19,20,22 98:18,20 108:15,19 109:7 122:17 123:17,20 124:25 126:11 127:9,12,12,15 130:5,7 131:5 135:24 136:3,7 136:8,11,17 137:1,5,9 138:1 140:5,6 147:22 163:10 170:13,19 176:19,20 198:23 206:14 209:24 210:2 210:16 212:4,6 214:19 215:2 219:1,2 229:8 245:12,12,20 245:25 247:22 249:21 258:19 258:22 259:1,5 267:16,24 296:12,14,21 296:24 297:3,7 297:9,22 298:20,25,25 303:10 304:3,8 304:11,13,14 304:15,24 305:3,10,20 306:7,14,19 307:4 312:18
database 32:5 93:23,25 94:10 94:18 95:4 97:7,16 135:20 138:14,20 142:7 143:23 169:22 171:2 176:21 305:14
databases 92:25 93:20,22
date 11:17 40:4 41:1 60:15 61:4,11 67:5 73:3,7,9,14,24 74:3,10 85:16 86:4 94:20 96:11 97:4,4 109:14,20 110:4 126:12 126:17 129:12 146:21 152:4 218:12,12,14 218:14,19,25 219:4,5,9,9,13 219:13,17,20 219:21,21 220:2 221:2 222:5,6,25 223:1,6,7,16 223:24 225:8 225:14,21 226:6 227:5 232:17,25 234:3 244:25 309:5 320:18 322:3 323:3 326:1
dated 4:20,23 5:6,18,21,23 6:5,10,14,16 7:13,14,16 8:13,22 9:5,10 9:18,19,22 10:6,7,10,18 134:6 141:10 157:17 304:12 326:4
dates 40:8,11 41:14,17 43:5 59:23 86:16,17 86:19 95:1 218:22,23 223:24 275:21 276:16
dating 172:17
day 47:5 73:10 90:10,11 93:14 97:8 108:17 129:6,6 141:10 144:15 147:3,3 151:22 153:22 155:17 183:13 185:12 189:20 189:21 221:3,8 223:8 232:18 269:9 324:16
day-to-day 44:18
days 74:4 91:5 95:2 96:18 97:7 128:1 161:10,21
de-rate 5:20 52:14
dead 316:11
deadline 123:21 124:1,3 286:17 286:21,25
deal 36:1 104:8 104:11
dealing 38:3
dealt 45:21
December 123:22 124:3 227:5

decision 217:24 234:7 263:18
decisive 223:13
declare 324:10
deep 62:10 178:14
deepest 62:11
defendant 128:18
Defendants 11:22
Defense 37:9 38:5,14 39:5,9 39:15 40:18 59:20
deferred 36:12
define 179:16
defined 254:19
definition 19:25 20:3
definitional 193:18,18
degree 46:11 76:20 288:12
degrees 46:17
del 21:15 42:6 53:12,19 59:14 61:2,13 71:6 312:13
delay 110:2 203:25 206:21 207:6 300:17
delayed 201:16 202:17 203:14 219:23
delete 142:8,17 162:24 182:5 182:21
deleted 141:25 162:10,21 163:8,22 165:13 166:25 178:18 182:6 191:9
deliberately 231:10
deliberation 163:18
deliverability 239:8 240:2,6 240:19 241:4
Delta 13:14 47:16
demand 29:21 30:4,22,25,25 31:4,13 43:16 45:19
demands 132:4
demonstrate 150:10
department 4:15 9:21,22 35:7 37:9 38:4 38:13 39:5,9 39:15 40:17 51:2 59:20,21 73:19 76:3 81:13 120:21 171:12 234:24 235:22 274:23 275:8,15
depend 27:21
depending 62:17 209:14
depends 62:20 217:10 239:13 239:15 262:17
deponent 291:16
deposed 13:17 13:19 16:10
deposition 1:15 2:14 4:8,11,12 5:4 6:4 7:4 8:4 9:4 10:4 11:13 11:19 12:3 13:24 14:15,21 15:2,3,14 16:20,24 18:22 19:3,22 20:15 20:20 21:21 57:7 72:8,13 72:18 80:5 81:2 84:16 90:3 101:4 103:4 104:2 114:15 115:15 116:6 117:9,11 122:11 123:9 126:3 127:3 128:6 131:15 132:20 133:1 133:14 141:3 143:10 144:5 145:9 151:15 152:9 154:17 157:9 159:25 160:12 161:11 180:22 183:6 183:21 187:2 187:16 189:7 189:12 193:13 200:11 220:17 250:13,17 277:14 281:9 284:15,17,18 284:20 285:11 292:2 294:24 303:19 309:13 313:3 318:4 319:6,12,15,17 320:1,13,22 321:10,11 322:1 323:3 324:10 325:17
depositions 16:12
depot 37:17
depots 38:13
depth 147:22 178:10,15 215:10 245:2 249:5 253:11 253:16,24
depths 254:3
Deputy 35:6 39:21
describe 29:24 35:10 54:1 67:12 70:19 110:20 138:17
described 28:8 81:23 84:4
describes 268:2
description 53:17 168:11
design 62:1,2,5 62:18,21 63:2 190:9 239:18 258:8,13
designate 70:10
designated 292:9 295:21
designation 103:1 140:3
designed 62:7 236:8
desktop 83:17
despite 281:21 305:24
detail 150:17 165:5 182:23 183:3
detailed 179:15 209:17 213:9 230:6
details 163:5 255:23 298:22
detect 233:4 267:19 268:24
detectable 241:21
detected 175:21 267:21 270:15 271:21
detection 268:12 269:9
determination 229:4 264:9
determine 55:21 64:25 70:15 210:24 211:2 211:18 214:1 214:14,16 225:24 230:6 241:19 262:1 300:15
determined 214:4 215:8 266:5
determining 214:9 292:16 294:4
develop 26:7 283:14
developed 32:4 51:7 272:11 298:18
developing 25:3 38:3,10 270:4
development 22:15 269:20 272:3 273:6
deviations 267:13
DGS 73:4
diameter 238:22 260:19
diameters 238:23
Diamond 93:23 95:4 97:6,16 135:19 138:20 143:22 169:22 171:2 176:21 305:14
Diego 15:9
diesel 32:25
difference 208:6 208:7 258:1 273:1
differences 273:22
different 20:9 28:7,7 29:2,9 62:4,19 70:24 79:13 83:5 123:6 142:15 153:12 161:23 162:4 176:11 212:20 233:17 234:6,10 237:21 245:23 249:24 258:11 292:13,13

305:18 307:15 309:3
differently 152:20 231:8 301:22 302:1
difficult 108:14 202:6 306:8
difficulties 109:18
difficulty 93:2 108:14
diminished 31:13 92:24
dioxide 165:12
direct 24:18 28:15 73:13 76:21 149:17 154:6 165:6 168:17 178:16 179:12 181:21 189:23 192:17 199:12 201:6 213:2 218:7 224:14 225:11 232:4 250:22 295:17
directed 17:17 63:17 136:23 146:8 220:12 313:19
directing 194:11
direction 192:24 325:16
directly 14:14 62:2 180:14 246:16 306:5,7 306:25
Director 35:6 39:21 280:11 280:12
disabled 257:10
disagree 175:6 182:24
disagreed 169:24 174:22 175:1,3,12 178:25 227:20 228:6
disagreeing 178:23
discarded 306:23
discarding 37:18
discharge 235:6
disclose 274:23 279:2
disclosed 134:20 135:2
disclosing 301:5
discovery 22:14 24:20,25 25:2 51:7 55:9 68:15 80:16 84:1 117:6,7 117:21 118:6 176:22 204:25 289:14 292:12 293:20 319:16 320:2,9
discuss 78:1 125:8 150:13 191:2 277:25 279:17,19 284:13
discussed 34:5 60:18 90:12 96:22 136:3 151:23 156:16 157:6 159:21 185:3,15,17 197:4 270:10 278:8 288:11 298:9
discusses 227:1 237:5
discussing 38:24 135:20 185:1 186:7 297:23 308:8
discussion 59:17 63:10 92:7 125:17,20 147:23 156:18 156:22 162:11 172:8 182:15 192:15 237:13 250:7 254:7 281:22,23 282:4 290:25 295:11 305:2 307:14 308:1
discussions 14:11 91:6 121:10 156:13 275:3 306:13 306:18 307:10
disk 72:7,12 114:14 116:5 189:6,11 250:12,16 321:10
disks 189:3
dismantling 11:5 325:20
disposal 32:18
dispute 68:16 275:16 294:3
disputes 58:20
dissolving 232:3
distinction 292:17,18
distinguish 292:20
Division 3:19 5:5,8,13,17 6:13,14 7:5 8:5 8:14 9:18 10:17 12:19 36:14 37:8 39:23 40:17 53:23 56:23 71:9,21 77:3 77:15 88:12 226:7 228:4 313:17,18
Division's 215:22
divulge 80:9
djg@cpuc.ca.... 3:21
doc 298:25
docket 48:18,18 49:13,18 59:12 61:12 103:15 116:21
document 5:10 5:14,19 6:7,12 7:5 8:5,14 9:8 9:13,17 10:15 15:25 16:2 19:1,6 21:25 22:10 39:20 72:22 73:7,14 73:24 77:24 84:20 85:2 90:7 91:23 101:8 103:8 106:2,8 108:2 112:10,11 122:15 123:14 124:9 125:16 125:19 126:7 127:7 128:10 128:20 130:13 131:19 133:18 134:3 136:11 137:12,13,19 139:8,14,18 140:3,8 141:7 142:1,3 143:14 143:16,25 144:9 145:13 151:19 152:13 154:21 157:14 158:6 160:4,16 161:8,9,12,14 164:11,13,14 173:7 183:25 184:8 187:6,20 188:8 189:19 190:5 191:6 194:2,16 195:10 199:18 200:15,17,25 207:12 220:15 246:4 248:23 277:18 281:13 299:12 303:23 309:21 310:6 310:18 311:14 311:20,20 313:1,7,8 314:23
document-rel... 250:2
documentation 176:8 297:10
documented 173:13
documents 19:7 19:16 21:14 26:13 51:14 55:9 70:10,14 78:3 80:6 95:4 96:21 98:25 106:15 111:3,5 111:8,21,24 112:13,22 113:1 130:7 138:4 158:6 174:6 176:15 189:17,24 197:14,16 198:2,5,7,9 199:2,6,12,13 201:11 203:3 204:9,12,15,21 204:23,24 205:1,4,5,14 205:24,25 206:5,13 207:1 207:6 221:18 221:24,25 225:3,5 226:11 249:3 258:16 258:21,24 259:4 296:12 296:18 297:24 298:1,5 299:1 300:15,18,19 300:20,25 301:2,10,22 302:6,11,14 312:17 318:24

Dodge 13:14
DOGGR 97:20 119:25 170:15 193:6 228:10 228:18,20 229:11 235:16 304:18
doing 29:6 32:6 34:2 53:4 60:13 78:23 79:3 93:2 108:22 117:21 155:22 171:9 181:18 186:14 215:24 218:17 224:8 241:6 245:17 264:13 292:5 293:22
domestic 45:23
Don 133:6
doubt 165:16
doubting 165:19
doubts 175:15
download 96:3
downloading 313:11
DPH 275:3 276:4,21 277:4 277:9,10 278:12,23
DR 94:15 95:13 96:10 137:14 202:4,5 206:11 258:17,18,18
DR-1 97:22
draft 9:11 74:11 74:22 98:22 99:2,2,4 110:14,17 130:22 133:8 142:22,25 143:3,5,6,17 144:16 145:16 147:4 151:23 152:15 153:23 153:24 154:12 154:12,14 155:16 160:8 160:19,20 161:13 163:22 187:12,23 188:2 190:17 191:3 196:17 277:1 304:3,7 304:13 310:7
drafted 104:21 109:1 158:6 311:15
drafting 110:19
drawing 108:3,3 161:16 183:2 256:3
drawn 147:14 163:3,3
drew 109:14
drill 317:11
drilled 32:11 62:7 252:5
drilling 62:17,20 62:25 63:2,4 95:15 151:6,9 181:18 240:14 252:24,25 253:7,21 260:7
drills 251:17
drive 303:9,15 305:22 307:21
drives 94:9 305:11 306:22 306:24 307:1,4
drop 177:25 178:3 273:1
dropping 278:20
drug 36:2
dry 44:12
dual 235:25 236:7,21 237:17 238:8 238:16,19 241:1
due 93:18 109:12,20 110:4 178:6 185:12 247:5 266:8 319:24
duly 13:4
dump 297:7,22 299:1
dumps 296:12 296:15,21
duplicate 206:5 206:17
duplicates 137:20 206:9 206:11,11,13 206:16,24 300:25
duty 300:12

E

E-P-U-N-A 87:13
earlier 85:18 89:9 98:13 99:6 102:17 135:20 136:4 170:6 196:16 197:22 216:15 218:2 221:11 227:15 246:14 254:1 268:4,12 269:2,16,17 270:5,16 279:17 283:23 300:24 301:23 305:7 307:12 307:17 308:9 315:13,23 317:23
earliest 223:1,5
early 26:18 27:11 31:6 43:8 134:18 237:22 270:2 317:11
easier 31:11 60:11 153:6
easily 31:10
east 23:8,16
Ecolise 100:13 100:14,18
economic 261:25
Edison 53:13 282:6
edits 7:15 154:25 159:1
education 46:10 60:24
effective 9:16 262:5
effectiveness 262:8,19 263:24
efficiency 239:13 241:16
efficient 239:20
effort 214:13
efforts 137:2
Egan 291:23 293:17 294:16
either 31:3 40:24 63:23 92:11,21 94:8 120:14 130:21 171:15 184:23 209:8 215:10 231:13 272:12
electric 15:9 25:12 49:1 50:22 117:17
electrical 24:13 255:2
electricity 254:21
electronic 74:24 114:2 135:23 136:15 143:25 311:19
electronically 83:8 169:21
eleventh 284:12
elicit 85:4
elicited 132:16 132:19
eliminating 212:2
email 4:17,20,22 5:22 6:5,10,16 7:14,16 9:5,9 10:10 74:14,15 74:22 76:15,17 76:19 83:4,20 84:22 85:12,18 86:4 89:14 90:8,9,11 91:20,21,22 92:6 93:12 94:9 95:6,8,12 99:19 101:15 101:25 125:16 133:20 134:6,6 134:10 135:4 136:24,25 138:17 139:10 139:22,23 140:10,19,19 141:9,11,17,19 141:21,25 142:7,11,13,14 144:11,23 146:22 151:21 152:6 154:23 156:7,25 157:3 157:13 158:23 160:6,23 161:4 183:10,11,16 184:3 185:22 187:8 303:25 304:6,12 309:20,22
emailed 87:5 95:11
emails 83:19 86:20 93:8 95:1 134:10 137:20,20 139:20 142:8 198:13 206:12 301:8 304:1
embedded 237:5 237:8
emergencies 35:22

emergency 35:21,21
emission 34:19
emissions 38:9 44:21 235:4 278:21,24,25
employed 33:16 120:18
employee 325:25
employees 12:6 31:19
employment 33:6,13 38:1 60:3,23
empty 125:14
enabled 268:3,6
endeavor 174:7
ended 32:1 50:15 237:22 301:13
energy 22:13 31:8 32:15 43:5,6,9,18 46:14 60:6 89:2,7 120:4 181:16 234:25
enforcement 5:5 5:8,13 6:13,14 7:5,7 8:5,7,14 8:16 9:18 12:19 70:20,21 71:3,8 77:2,15 215:22
engage 79:21
engaged 78:10 79:15,19 81:17 82:21 84:4 88:17,21 89:1 89:4 90:18 91:7 98:12,15 109:10,21 110:14 119:1 119:17 129:2
engagement 75:15,19 76:13 82:7 86:23 90:20,23 91:3 94:20 121:7 311:3
engineer 34:11 43:24 44:2 45:1,5 64:15 64:19 122:3 150:24 151:9,9 180:14,17 233:25
engineering 34:12,17,19 37:9 39:23 40:17 42:15,16 44:19 45:8 46:4,5,15,25 47:7 61:22 62:25 64:17 132:4 151:1,4 177:2 180:16 181:1,2 209:18 211:25 217:24 237:10 315:25 316:1,23 317:15 318:9
engineering-r... 318:1
engineers 44:3 217:25 260:12
enlighten 295:24
entailed 29:24
enter 99:11
entered 13:23
entering 255:25 255:25 256:10
entire 131:1 196:24 281:23
entirely 67:6 228:2 244:3 272:18
entirety 105:13 126:18 127:22 131:2 148:1 165:1 200:17 312:5
entities 22:12 23:20 31:3
entitled 5:10,14 5:19 6:7,12 7:5 8:5,14 9:8,13 9:17 10:15 116:20 152:2 319:16
entity 100:13 286:7 297:17
entries 312:17
entry 118:16 256:15
environment 260:1
environmental 22:13 27:24 31:19,20 34:19 38:4,18 39:3 39:12,25 40:4 40:12,25 41:18 44:20 46:14 54:13 60:1 275:11,12
Epuna 87:11
equation 262:25
equivalent 35:14 52:1
ER 49:14 116:21
erosion 64:3 65:3 214:24
error 49:15,17 53:14 74:5
errors 61:1
escaping 179:14
especially 92:1
ESQ 3:5,11,11 3:19
essentially 319:19
established 146:22 219:17 225:15 318:9
estimate 223:18 270:19
estimation 265:21 270:10 270:14 273:2
et 4:23 5:23 11:24 12:4,6 287:21
ethylbenzene 278:15
EUO 90:14 107:8 221:15 221:19,22
EUOs 107:10,18
evaluate 168:4 242:11
evaluated 55:1
evaluating 64:18 200:1
evaluation 53:18 56:20 57:16,16
event 265:11,12 269:12
events 211:12 213:11
eventually 145:24 155:24 198:9
evidence 28:16 99:1 106:7,8 108:11 158:15 176:1 187:25 214:13 226:11
evidentiary 294:5
evolved 273:19 273:25 274:3,8
evolves 27:25
exact 74:10 80:20 207:20
exactly 25:17 81:5 93:8 110:12 117:19 156:17 178:14 217:1 231:24 236:6 238:6 251:24 267:16 288:3 309:4
exam 317:14
examination 4:3 13:9 26:12 28:15 280:2
examinations 85:9
examined 13:7
example 174:20 175:18 219:5 245:5 247:4 263:3 288:19 301:8
examples 248:3 250:4 259:17
excerpted 281:16
exchange 297:13
exchanged 225:4
excluded 173:14
excludes 19:25 281:22
exclusive 15:14
excuse 56:5 111:7 243:2 290:3
EXECUTED 324:16
executing 75:15
execution 76:12 85:19 109:25 110:3
exercise 292:12
exhibit 10:14 18:21,22 21:20 21:21 71:1,2 72:17,18 76:22 77:24 81:7 84:15,16 90:2 90:3 99:12 101:3,4 103:3 103:4 117:2 122:10,11 123:8,9 124:8 125:23 126:2,3 127:2,3,13 128:5,6 131:14 131:15 133:13 133:14 139:15

141:2,3,11 143:9,10 144:4 144:5 145:8,9 146:13,22 149:18 151:14 151:15 152:8,9 153:7,7 154:16 154:17 155:18 157:8,9 159:22 159:24,25 160:7,11,12,24 161:4 164:1,5 164:6 165:7 168:18 175:19 183:5,6,20,21 184:2,12 187:1 187:2,15,16 188:22 191:23 191:24 192:2 192:18 193:12 193:13 194:7 195:4 200:10 200:11 201:7 207:9 212:25 218:9 235:24 244:21 250:22 265:16 277:13 277:14 281:8,9 282:1 302:16 303:18,19 304:12 309:12 309:13,23,23 313:3,6
exhibited 156:5
exhibits 4:10 5:3 6:3 7:3 8:3 9:3 10:3 80:13 106:17,19,22 106:23 107:4 197:17 309:17
exist 39:4,6
existence 147:8
existing 52:10 240:1,3,5 261:4,17 262:15
expand 150:16
expect 57:11 143:5,19 154:13 205:24 234:25
expected 25:21 82:20
expenses 14:17 14:21,21,24
experience 60:23 61:17,25 62:5 63:7 64:5 64:20 65:5,9 66:12 67:9,12 67:17 68:9,11 69:13 70:20,21 91:8,11 149:21 151:1,3 168:16 176:25 180:13 207:13,14 209:11 229:12 246:15 256:25 308:10 312:10
expert 16:19 24:2,3,10 42:13,25 49:7 50:3 51:6 52:21 57:1 58:20 59:1 77:1,14 81:19 82:20 117:13 257:17 258:15 303:6
expertise 16:1 118:4 149:21 150:5,20 153:17 275:24 276:3,19 311:8
experts 119:14
expired 308:2,5
explain 27:5 31:16 204:14 236:6 237:16 243:13 245:8 258:12 270:12 293:21 299:17
explained 225:22
explanation 254:14
explosion 50:23 51:11 53:2
exposed 67:15 215:12 255:15
exposure 36:9 219:12 253:6
extending 32:1
extends 222:20
extensive 77:18 209:17 215:16 278:24
extent 22:22 74:18 79:7,22 85:3 92:13,16 132:9 146:3,7 172:4 200:19 218:4 242:25 266:18 290:12 292:15 297:10
external 149:20 149:24 152:24 209:9 231:3 236:10,11 256:2 260:21 260:24,25 261:1
extra 47:6 236:18
extract 231:13
extracting 241:3

F

F 3:5
facilities 21:6 24:13 36:7 38:14,16 118:14 251:25
facility 1:6,9 2:6 2:9 7:9,12 8:9 8:12,18,21 11:14 24:16 53:20 57:18 102:3 115:6,9 181:16 232:10 232:15
facsimile 3:8,14
fact 108:15 109:19 125:8 125:11 134:6 135:22 170:12 171:22 173:3,8 185:10 199:24 225:15 264:17 274:23 290:7 290:15 291:19 291:21 298:10 305:24
factor 172:24 245:9 246:25 263:25 264:3
factors 182:18 239:18 240:2
facts 108:11 158:15 187:25 197:10 220:1 273:15 283:2 283:15 285:16 292:21
factual 183:1 218:21 222:5 233:18 277:5 283:12 286:18 286:23
fail 264:17 270:22
failed 217:17 223:2 232:18 236:19 247:5 247:15 265:4,4 265:7 270:23
failing 264:14 264:16
failure 175:19 176:4 182:10 210:25,25,25 213:9,11,16 214:2 215:5,7 215:19,20 216:20 217:6 217:13 218:2 224:1,5,19 226:8,12 227:3 227:7,10,11,25 229:23 230:4,9 230:9 232:13 232:24 233:4 233:11 234:12 236:20 251:6 255:21 262:14 262:21 267:8 269:8 270:17 279:1 280:1 313:21
failures 182:3 214:2 215:9 223:5 226:23 229:3 263:2
fair 26:11 164:24
fairly 30:25 36:18 156:11 168:9 269:10 269:12
faith 167:23 293:6
fall 70:15 253:2
familiar 16:25 69:15 100:13 185:22 208:3 219:20 236:21 252:23 265:22 266:1 289:21 289:23
far 20:5 30:22 30:24 54:11 58:16 93:9 156:25 165:22 200:23 205:8 209:17 226:7
fast 107:24 212:3 239:17 269:6
fault 206:2
faulty 230:24
feasibility 262:23,24
February 1:17 2:24 11:2,17 72:9,14 114:16

115:17 116:2,7 129:8,10 189:8 189:13 250:14 250:18 319:24 321:12 322:3 323:3
fed 166:12
federal 120:24 235:9
feedback 274:12
feel 105:7 149:1 149:12 167:4 197:9 199:3 259:20 306:2
feeling 185:9
feet 62:12 178:14
felt 104:13 105:6 147:15 148:22 149:2 163:2 165:4 166:23 166:24 168:14 173:17 186:22 275:12 278:22
Felts 1:15 2:15 4:4,13,14,17 4:20 5:17,21 5:22 6:5,10,16 7:14,16 9:5,9 10:11 11:13 13:3,13,15 14:6,13 15:2,8 15:16 16:8 17:24 18:14 19:1,12 20:4,8 21:4,25 24:18 42:8 58:10,19 59:4,10 61:16 63:21 68:8,11 70:19 72:9,14 72:16,22 76:2 76:21 80:4 84:10,20 85:4 85:8 86:6 90:7 99:15 101:8 103:8 113:12 114:16 115:15 116:7,18 122:15 123:12 124:16 126:13 126:18 127:18 128:10,22 131:19 132:16 132:22 133:3 133:18,21 134:5,6 140:9 141:7 142:21 143:14 145:13 151:19 152:13 154:6,21 160:16 163:21 165:24 166:9 180:12 183:10 183:25 187:6 187:20 189:8 189:13,20 195:3 201:6 202:11 207:13 216:4 224:21 234:21 250:14 250:18,21 252:18 266:18 266:23 273:12 277:18 281:13 284:22 289:19 290:15 291:3 293:11,19 295:25 296:7 299:9 303:1,6 303:23 308:8 309:18 311:1 311:24 312:10 313:7 315:12 321:11 322:4 323:2 324:20
Felts' 14:12,20 15:25 79:9 158:16 318:20
Felts.2019 187:12
FERC 48:18 49:9,13,18 59:12 61:5,12 116:21
FF-34A 227:8
field 32:8,11 56:16,22 61:13 64:10 71:15 100:25 190:14 191:14 208:9 213:11 215:25 216:6 217:16 218:5,6 223:11 223:15,17 224:4,14,23 225:2 226:14 238:18 239:6 240:1,3,6,20 240:24,25 241:2,4 252:13 252:20 259:19 261:15
Fielding 3:25 11:23
fields 33:3 61:17 208:1 216:10 236:22,25 251:14 261:18 312:11,15
Fifth 3:12
figure 211:7,7 217:5
figured 135:11
figuring 218:19
file 10:14 21:11 82:12 83:17,20 94:3 97:9,9,12 97:13,16 117:18,22 118:8 135:6,15 135:19,24,25 138:16 139:1,4 143:22 145:1 148:12 151:25 152:1 169:7,9 171:2,13 173:11,14 176:2,9,10 177:9,15,16,20 178:21 190:7 191:17 244:10 245:6,13 246:1 246:2 247:3 249:10 298:14 299:3 307:8 309:20 310:6 311:10,19,19
filed 1:4 2:4 55:17 57:2 93:18 94:23 97:14 114:6 115:4 123:5 124:14,22,24 125:5,7 128:14 131:22 189:21
files 80:21,22 95:25 108:16 108:17 135:13 138:22 173:16 177:16 190:4,6 190:13 214:12 224:22 228:1 296:17 305:6 305:19 307:6,7 307:20,24
filing 99:2 113:1 299:3
fill 218:19
filled 182:4
final 21:16 50:11,16 54:19 185:24
finalized 185:16
finally 17:18 44:25 68:8
financially 325:24
find 104:5 215:3 217:2,20 220:18 222:11 229:10 265:6 290:10 305:14 305:18
finding 186:13 219:18 229:5 290:7
findings 98:23 98:25 130:14 162:25 163:14 174:8 175:16 186:20 314:3
fine 140:24 177:4 180:15 255:19
finish 17:12 41:14 155:11
finished 35:1 167:10 236:10 294:25 301:18
firm 37:4 48:1 48:15
firms 22:12
first 13:4,16 14:10 17:1 19:10 20:11 22:10,10 25:13 33:7 41:14 46:2 47:24,24 49:12 50:11,21 59:15 71:2 74:11,22 85:12 85:15 86:4 89:17 90:11 91:5 97:9 118:25 123:24 126:11 128:14 143:3,5 146:2 146:16,20 147:3 149:14 159:24 160:6 175:21 191:10 192:17 193:16 193:18 223:1 243:23 248:19 260:12 268:14 268:24 270:8 289:12 304:14 314:5
fit 291:5
five 28:7 33:18 33:23 45:11 74:4 128:1 161:13 230:1 250:17 277:23 321:10

fix 61:3,8 265:5
fixed 212:24
fixes 9:7,8 183:18 184:4 266:19
fixing 29:13 263:17 264:7
fjackson.stod... 3:8
flag 113:9
flagged 179:22
flight 37:17
flip 164:10
floor 2:21 11:20
flow 182:12 238:19 239:17 240:25 241:1,2 241:8,15 254:21 255:1,2 265:21 270:11 270:14,19,20 270:25 271:13 271:25 272:6 273:2,20
fluid 179:13 180:9 182:2,10
flung 30:22,24
flush 25:7
focus 212:3
focusing 216:17
folder 83:20
follow 86:1 164:15 212:6 297:5
follow-up 213:9 315:14
followed 83:13
following 83:4 89:4 92:14 273:8 279:10
follows 13:7 273:9,10
font 152:21
footnote 106:3 158:24 178:20 188:15 192:20 193:2 249:9
footnoted 274:16
footnotes 105:19 105:22,23 106:9 157:25 159:1 188:5 191:19,21 192:5 280:10 280:14
Force 37:10,15 59:20
Force/Army 37:17
forecast 31:5 264:11
forecasting 30:4 43:15
forecasts 31:10 31:12 43:14
foregoing 324:10,12 325:9,11,17
foreign 45:24
forget 133:7
Forgive 39:19
form 162:15 225:10 232:13
formal 84:13 243:6,17,21,24
format 185:20
formation 182:11 215:11 248:4,24
formatted 152:20
formatting 152:22 185:23
formed 248:8,9
former 122:3
formerly 88:12
forth 155:21 275:18 288:7 305:3 325:10
forward 32:4
found 171:1 178:19 222:22 227:19 256:18 278:14,18 305:17
foundation 314:20
four 28:7 189:12 222:17 227:8 250:13 278:18 296:11
Fourth 5:12
fracking 44:6
framed 279:1 299:14
Francisco 3:7,20 34:15 285:10
frankly 265:9 285:14 293:6 293:16
Fraternity 47:17
fraud 22:13 25:25 42:3
free 220:14
frequently 92:10,21
fresh 182:9 251:20
Frew-3 227:4
FREW2 214:8
Friday 84:23
front 44:17 59:24 123:14 125:13,24 137:11,17 138:10 191:8 204:21 212:1 289:18
FTP 95:21,22,24 307:11,13,24 308:2
fuel 23:14
fuels 43:13
full 95:17 168:20 181:25 245:2 278:10 305:3 325:17
full-blown 217:9
full-fledged 45:20
fully 272:20 313:24
funded 35:15
further 132:22 150:17 243:5 268:20 272:3 321:6,7 325:23
future 20:1 211:5,8 242:18 243:2 320:8

G

gained 94:18 95:3
Gao 100:7
gap 242:3
gas 1:5,7,7,9 2:5 2:7,7,9,19 3:3 3:10 4:12 5:7 5:11,12 7:9,10 7:11,12 8:9,10 8:11,12,18,19 8:20,21 9:17 10:6,16,16,17 12:11,13,15,17 14:23 15:9,9 24:14,15,16 25:11 27:14,20 27:23 28:3,24 29:1,16,20 30:3,6,7,15,20 31:4 33:2 36:7 36:7,9,12,14 38:16 42:1 43:13 50:22 51:23 52:10,18 52:23 53:12,19 54:6,11 55:4,9 55:14,25 56:21 57:17,25 58:7 58:17 61:17,19 61:23 62:1 63:2,4,4,5,6,7 65:14 66:20 71:6,14,15 77:19 83:6 115:5,7,7,9 118:13,15 122:18 132:3 149:24 161:21 161:22 165:11 165:12 166:12 166:25 171:12 179:14 207:25 215:24 226:7 226:21 228:4 230:18,19 231:3,14,22 234:22,24 235:13,20,20 235:22 236:3 236:20,22 238:24 239:16 241:1 251:14 251:25 252:21 256:12 259:8 259:14 261:17 265:9,21,22 266:1 269:11 270:11,19,20 270:25 271:8 273:2 274:21 274:22 278:25 312:11,15 313:19
gasoline 23:7,12 32:25 48:7,11 48:12
gauges 271:3
GD1 188:20
gee 122:2 219:10
general 3:10 4:15 17:14 46:25 48:17 62:3 73:19 116:21 118:10 180:23,23 181:7,12,17 204:25 295:17 315:25 316:1 316:22,24 317:4,5,15 318:9

generally 28:25 62:6,9,24 69:16 106:10 119:23 130:2,4 164:8 210:2,22 210:23 211:2 216:2 230:8 259:25 260:18
generate 31:12
generated 19:12 20:11,17 64:18 217:12 318:25
generating 308:14
generic 254:15
geologic 36:4,4 215:11 253:7
geologist 253:15
geology 57:24 252:24,25 253:25 260:1
Geothermal 10:17
gestures 17:5
getting 86:20 106:6 107:20 108:14 203:18 300:18 320:3
give 31:11 44:15 80:20 101:10 214:24 264:8
given 138:14 229:11 265:11 319:4
gives 26:23 316:25
giving 164:10
glean 311:23
glossed 165:3
go 10:9 13:21 23:1 26:25 31:4 35:25 40:8,11 44:14 112:6,14,14 116:9 117:4 140:24 146:8 149:12 154:4 155:11 156:8 160:22 165:4 166:17 172:5 200:23 218:19 240:11 250:8 255:23 256:23 272:10 285:21 285:23 290:20 294:16 295:13 299:22 300:5 300:10 301:18 302:19 315:2 315:16 317:5
goes 121:8 132:9 190:10 203:3 216:2,3 237:14 311:18
going 14:8 16:23 17:18 20:7,21 20:25 24:18 31:4 38:7 52:13,14 63:16 65:23 66:9 67:4 68:24 69:8 72:16 74:17 76:21 79:6,22,24 81:5 84:2,15 87:20 88:14 92:12 99:7,11 101:2 102:8 103:2 110:6 123:13 125:22 127:1 131:13 132:7 133:13 134:2 136:18 136:20,22 139:7 143:8 144:4 145:7 149:17 151:14 152:8 154:1 155:10,21 156:7 158:19 159:12,23 163:15 165:6 165:18 168:17 171:25 172:7 179:1,12 183:4 183:20 184:4 187:1 189:23 192:17 195:3 195:14 197:8 199:1,10,18 201:6 205:15 207:11 210:4 212:16 216:24 220:5 231:25 232:4,22 236:9 237:4 240:21 241:6,7,14 243:1,1 250:22 252:10 261:5 262:5 264:12 264:16,20 266:10,17 267:17 268:17 274:1 275:8 276:11 277:12 278:5 280:22 281:7 284:11 284:20,25,25 285:19,20 286:8,9,10 288:1,15 290:4 290:19 294:11 294:23 297:13 300:1 303:1,5 303:17 319:2
good 11:11 31:9 52:18 159:9 166:24 167:8 167:20,25 168:10 197:9 197:12 211:6 211:17,25 217:19 263:16 273:14 293:6 306:2,4 310:3 310:4
gotten 16:9 167:1 309:9 316:6
government 121:1
Governor's 120:6
graduate 46:3
Grand 2:20 11:20
granted 94:5
grate 49:1
Greg 99:24
grind 44:10,11
ground 33:1 259:15 261:5
grounds 20:22 20:24 201:14 202:15 203:13
groundwater 31:14,21,25 32:5,7,12,14 34:20 37:22,24 38:25 41:24 42:17 55:12,12 62:8 65:12 67:15 162:11 162:14 182:16 182:19 219:12 235:8 251:1,7 251:15,18,20 251:20 252:9 252:20 253:11 254:3 298:17 317:12
group 34:12 35:22 36:4 43:11,12
grow 319:23
Gruen 3:19 4:17 4:20 5:23 6:5 6:10,16 7:14 7:16 9:5,10 10:5,11 12:18 12:18 14:18 16:5 18:3,5,7 18:17 19:23 20:21 22:22 23:5 34:25 35:3 59:6 63:15 65:22 66:2 67:24 68:24 69:7 74:17 75:23 76:6,9 79:6,22 84:22 85:1 86:8,14,21 89:12 90:10,24 92:12 99:13 100:16,19 101:10 102:8 114:13 116:9 116:17 121:13 125:1 130:20 132:7 133:20 134:2,4,10 135:3 136:18 139:11,13,16 139:21 140:7 140:14,18,22 141:9 144:11 146:3,19 150:4 150:13 151:21 152:16 153:2,9 153:21 154:1 154:23 157:17 158:11,12,14 158:22 159:7 159:11 163:15 164:4,15 165:18 166:3 167:10 171:25 179:1,4 185:2 185:10 186:11 187:24 189:20 190:22,23 191:23 193:25 194:13,21 199:8 200:2,16 201:24 205:15 213:3,5 215:21 220:5 221:23 224:24 233:14 242:20,23 252:10 261:11 266:10,17 276:8 279:24 280:4,22 281:6 282:18,21

283:5 284:1,7 284:10,18 285:7,12,17 286:3,8 289:22 290:23 291:10 294:11 295:14 296:9 297:13 297:18 299:20 299:25 300:3,8 301:18 304:3 306:11 310:8 310:19 311:15 312:2,24 313:2 314:20 315:1,3 315:5,11,19,21 318:3,22 319:10,20 320:14,24 321:4,7
GSA 74:6
GSM 100:25
guar 44:4,8,10
guess 28:7 29:17 64:16 70:22 94:8 185:21 192:25 197:3 217:1 222:10 225:3 250:8 254:18 267:9 311:11 313:18 314:15
guessing 219:22 219:25 223:20 223:21 228:23 259:25 268:9
guilty 290:10
guts 237:23
guys 285:10

H

h 77:25
half 181:25 234:6 255:17
halfway 77:10
Halliburton 137:23 150:9 217:3 244:23 244:25
Halogan 290:17
hampered 267:18
hand 22:24 130:22 133:8 213:25 269:14
handle 296:3 317:7
handled 35:13 35:15,22 36:2 44:19 124:25
handling 85:22 122:6
hands 225:4
handwritten 107:22 114:2 190:14 191:13
happen 44:18 205:5 260:7 265:6
happened 108:25 250:1
happening 93:3 177:17,21 197:13 214:3
happy 217:6 285:9
hard 89:19 96:6 96:9 112:23 136:13 199:19 303:9 311:13
harder 320:3
HAZ 181:20
hazardous 32:18 35:18,23 181:19 317:13 317:14,17
head 239:19 271:4
header 235:25
heading 141:22 154:10,11 232:7,12 250:24 273:9,9
health 9:21,23 120:21 161:19 274:24 275:8 275:24 276:3 276:19
Health's 275:15
hear 122:7
heard 93:5 290:14
hearing 294:5
hearings 57:14 57:15 77:4
heavily 272:15
heavy 180:10 247:20 278:20
Heidi 3:25 11:23
Hello 102:1
Helms 42:2
help 25:2,8 29:10 52:17 78:25 117:6 122:25 124:11 218:18 260:21 264:19 294:2
helped 38:5 51:6 266:15
helpful 193:8,11 245:3
helping 121:19
helps 239:25
hereto 18:24 21:23 72:20 84:18 90:5 101:6 103:6 122:13 123:11 126:5 127:5 128:8 131:17 133:16 141:5 143:12 144:7 145:11 151:17 152:11 154:19 157:11 160:2 160:14 183:8 183:23 187:4 187:18 193:15 200:13 277:16 281:11 303:21 309:15 313:5
heretofore 324:14
hesitant 155:4,7
high 52:18 179:15
higher 221:9 247:23
highlight 111:9 288:9
highlighted 150:16 179:20
highlighting 111:21
highlights 111:23 112:1,4
highly 288:13
hire 64:13 313:19 317:5
hired 29:10 37:23 78:24
historic 171:23 172:17,23
historical 55:7 171:10 174:25 209:4 253:20
historically 82:17 263:4
histories 228:21
history 33:7,13 60:3,23 168:10 205:7 210:4 223:4 229:1 238:14
hit 253:19
hold 47:1 180:22 180:24 181:9 181:10 241:5
holding 240:3 241:15
hole 148:18 180:2,3,6 235:20 247:5 247:13,24
holes 230:1,7,11 231:10,18,21 264:18 269:15
Holter 4:23 87:7 101:16,25 102:5,12,18 310:12,15 311:5
home 13:12 16:9 112:18,23
homes 52:20
honestly 117:18
honor 47:18 287:16 288:5 290:4,8
hope 229:9
hoped 285:21
hopefully 303:2
hoping 109:13
hour 17:20 159:13 284:12
hours 269:3
house 56:9
housed 94:2
housekeeping 14:8 318:17
housing 52:12
huge 32:5
hydrate 248:8,9
hydrates 248:5 248:14,19,24 249:7
hydrocarbon 161:20
hydrostatic 182:11
hypothetically 224:12 265:8

I

I.11-02-016 5:18
I.19-06-016 1:4 2:4 5:11 115:4
I.19-06-016-S... 5:15
I1906016 304:16
idea 26:23 52:18 65:24 94:11 236:8 251:18 267:22 311:7
identification 18:23 21:22

59:13 72:19 84:17 90:4 101:5 103:5 122:12 123:10 126:4 127:4 128:7 131:16 133:15 141:4 143:11 144:6 145:10 151:16 152:10 154:18 157:10 160:1 160:13 176:3 183:7,22 187:3 187:17 193:14 200:12 265:20 267:7 268:3,6 270:9 277:15 281:10 303:20 309:14 313:4
identified 27:10 41:7 47:25 59:4,10 85:2 102:21 103:20 123:18 161:24 162:4 216:19 226:22 243:8 243:14 266:8 312:4 318:3
identifies 43:23 47:11 50:1 51:18 103:15 123:21 144:25 161:18 213:7 310:11,17
identify 12:8 33:7 58:5,10 103:17 122:22 125:18 126:12 126:17 164:11 211:10 212:7 214:18 215:23 216:5 266:13 287:8 310:22
identifying 70:4 199:17 215:4,7 216:22 263:5 269:20
II.B 220:18
II.B.1.a 222:8
II.C 220:18
images 210:16
imagine 225:5 306:10
immediate 38:3 265:19 267:7 270:9
immediately 38:1 40:12 104:8 147:7 266:8,12 268:19 278:13 320:25
impact 239:7 253:4
impacted 30:21
implement 175:19 176:4 232:8,13,19,24 233:12
implemented 38:8 176:6
important 91:11 201:22 230:17 255:10 265:2,2 273:13 289:8
importantly 17:1
impossible 258:10
Impressive 47:21
improve 241:16
improved 274:7
in-house 209:8
in-person 89:23 89:25
inability 219:19
inaccuracies 59:5,7,10
inaccurate 156:11 173:3
inactive 47:13 316:5,9,11,12
inappropriate 132:17 294:13
inch 255:6,6
incident 25:25 26:2,10,17,24 28:9 82:4,7,15 84:12 88:23 89:5 119:23 120:1,4 161:23 161:25 208:10 209:15,16 210:24 211:3 213:8,15 227:6 232:17 266:16 274:22 278:13 279:10
incidents 43:21 208:24 211:4 212:20
include 28:3 58:23 98:25 132:17 140:4 145:21 161:2 197:22 210:17 211:15,23 212:1 220:13 233:7 248:3 259:24 263:1 264:6 265:11 278:1
included 22:5 30:8 85:8 95:14,18 105:5 106:7 135:16 138:1 140:4 144:18 159:22 171:3 173:12 178:19 190:7 190:15 245:1 258:16 280:18 282:8 291:6,7 301:11
includes 78:1 105:15,19 132:2 139:23 151:24 152:2 157:23 304:1,3
including 39:14 58:20 76:6 137:6 140:5 150:6 161:23 162:3 173:16 216:10 262:19 278:15 296:24 304:16 306:13
inclusion 238:15
incomplete 59:15 304:25 305:1,5
inconclusive 169:18
incorporated 40:6 41:3 184:9 316:10
incorporating 324:13
incorporation 41:1
incorrect 174:3 174:5 247:5,13
indented 77:10
independent 55:11 139:24 249:9 313:19 313:25
INDEX 4:1 5:1 6:1 7:1 8:1 9:1 10:1
indicate 121:19 177:24 306:19 313:9
indicated 16:11 40:20 111:2 113:12 119:5,8 174:21,22 180:21 227:15 240:10 246:14 277:7 297:23
indicates 50:22
indicating 156:7 226:5
indication 86:11
indications 148:11,13
indicative 177:5 177:7
individual 97:12 97:13 102:20 204:22 205:13
individuals 99:8
indulge 285:20
industry 25:21 28:24 44:6 168:10 230:4 273:19,25 274:3
influenced 67:10 68:3 167:6
inform 298:22
informal 117:10
information 4:18 25:5 26:21,24 31:8 31:9 80:9 83:9 83:12 85:4 94:9 105:5 116:23 132:16 132:18,19 161:17 163:3 168:7 170:10 201:17,21 202:12,18,20 202:21 203:15 203:17 209:24 210:7,10 216:25 217:18 217:22 219:3 223:19 225:23 226:15 229:9 229:13 244:11 244:19 248:6 258:16 267:2 298:19,22 301:17 320:16
informative 249:5
infrastructure 30:21 38:16 43:19
initial 14:8 54:16 86:23

91:3 113:2 139:9 144:16 147:12 153:22 161:8 187:22 199:4 239:21 239:23 268:14
initially 37:23 95:16 109:10 129:18 188:3
initials 91:6 188:21
initiate 234:12
initiation 84:12 304:18
inject 231:13
injecting 236:13
injection 237:19 238:5
inputs 45:17
insert 59:25
inserted 145:24 146:14
inside 255:6
insight 267:13
inspected 175:23
inspection 51:16 65:6,10,17 66:13,16 175:24 176:1 215:5 216:21 241:19 242:4 243:7,11,19 308:9
inspections 28:18
install 238:3
installation 51:15 257:15
installed 52:9 237:20,21
installing 260:8
instance 35:24 66:7,16 135:8 204:14 210:9 218:24 230:1 230:15,16 248:5,24 264:17 301:15
instances 28:6 28:19 30:14 178:24 217:12 231:9 259:11 259:13 279:8
Instituting 1:4 2:4 7:7 8:7,16 15:15 22:25 115:4
instruct 21:1 79:24
instructed 10:21 293:4
instructing 285:5
instrumentation 271:14,15 274:6
instruments 271:10
insurance 212:22
integrated 30:16
integrity 11:9 27:3 28:10 43:19 53:12,19 54:25 56:2,3,5 56:21 58:1,2,2 59:14 63:8,11 63:14,22 64:7 64:9,16 71:7 168:23 175:5 175:10 220:24 232:9,14,25 233:13,24 234:4,12 243:7
intend 79:21
intended 64:4
interest 82:18 121:19 225:12 235:1,4 285:24
interested 121:17 122:4 325:24
interesting 44:9 45:24
interfere 258:7
interference 258:12
interim 26:22 54:15 60:5,12 153:16
internal 98:9 260:19 261:1
internally 122:7
international 30:14 47:17
interoffice 190:14 191:13
interpretation 66:5 79:1 174:24 175:13 177:1
interpreted 66:23 67:1
interpreting 65:5 66:12,15 66:15 308:16
interrupt 17:9 17:10 42:7
interrupted 272:13
interrupting 17:8
interveners 276:15
intervening 275:23 276:1,2 276:13,18
interview 28:21 117:8,9 168:2 221:14 296:20
introduce 90:1 101:2 102:1 103:2 122:10 123:7 125:22 127:1 128:4 131:13 133:13 143:8 144:4 145:7 151:14 152:8 157:8 159:23 160:11 183:4 187:1,15 193:9 277:12 281:7 303:17 309:12
Introducing 154:16
introduction 161:16
investigate 227:4,8,10,12 227:25 229:23 232:1 252:12
investigated 260:5
investigating 216:5,10
investigation 1:4 2:4 7:7 8:7 8:16 15:15 22:25 26:12 35:19 61:12 71:4,8 72:2 84:11 91:14 96:20,20 98:23 102:2 103:12 112:24 115:4 129:21 149:2 161:18 163:10 166:22 170:3 171:6 186:15 201:18,23,25 202:2,19 203:4 203:8,16,18 210:21 211:20 211:22 213:9 215:7,19 216:16,18 222:17 224:5 224:13 225:12 226:13 231:23 235:16 252:4 279:10,15 298:16 302:2 304:18 313:24 314:7,8,11,17
investigations 10:16 31:21 70:20,21 91:9 207:15 213:16 215:23 224:8 252:12 266:19
investigator 102:6,13,21,22 209:25 211:15 212:6
Invictus 38:19 40:1,5,8,15,23 40:25 41:8,9 42:12,19,25 59:16 60:6,8 316:10
invitation 47:19
involve 24:16 29:18 54:11 80:2
involved 35:23 68:15,19 69:3 84:10 93:1 208:23 209:2 234:22 275:2 279:14
involvement 38:15
involves 65:4
involving 24:21 42:3
iron 254:22,23
irrelevant 22:23
Ismail 100:5
isolate 62:19
isolation 215:20
issue 15:25 24:7 27:10,21,24 69:2 91:17 142:15 156:4,6 164:22 178:17 179:10 186:20 197:11 198:21 199:6 200:1 203:2 211:1 212:17 221:23 222:2 234:3 238:9 249:6,17 263:21 272:21

275:3,6 276:14 289:17 290:16 296:3,24 297:1 305:8
issues 25:7,9 29:9 51:8,10 51:12 54:11,25 55:12 65:11 81:21 91:12,13 110:21,24 117:17 143:18 148:17 196:20 198:8,24 250:3 272:24 275:12 288:8,9 289:3 291:11 294:3,4 298:5 305:9 309:8 311:6
item 21:9 32:17 33:7 34:4,24 35:5 38:18 43:4,23 49:12 49:13,22 50:20 50:21 51:18 53:1 59:14 71:13 116:20 318:17
items 14:8,25 28:7 59:11 61:11 250:3
iteration 74:9

J

J 9:20
Jack 12:10 88:6 159:7 199:8 200:16 294:18 319:22
JACKSON 3:5
James 220:22 237:10 238:1
January 101:18
Jason 291:23 293:17
jeopardized 300:16
Jerry 100:23
Jimmie 9:22
job 1:25 37:2 38:2,15 46:2 115:25 167:8 167:25 170:7
Joe 289:25 290:8
join 36:15
joined 39:9
joints 166:19
judge 103:16 290:19,21 295:11,13 296:2
judge's 291:2
judgment 203:23
juggle 320:1
July 10:7
jumping 37:8 53:11 56:14 81:4 303:3
jurisdiction 47:8 121:2 235:20
jurisdictions 181:5
Justice 51:2
justifications 286:19,24 287:2

K

Karen 3:24 10:11 76:8,12 86:25 87:1 89:12 92:11,22 92:24 94:15 96:7 133:22 134:11 144:13 304:2,7 308:5
keep 65:23 107:22 111:2,5 241:13 264:14 284:25 285:25 303:2 319:5
keeping 9:14 25:20
KELLEY 287:23
Ken 88:4
Kenny 286:15
kept 83:14 114:1 182:2,3
Key 10:15
kill 150:9 179:13 180:7 182:12 217:8,11 244:16 245:9 246:12 247:4 247:10 249:15 260:17 268:14 268:25
killed 214:21
killing 216:21
kills 247:25
kind 16:23 30:9 30:18 64:8 83:13 93:25 113:6,9 132:1 147:19 173:16 173:17 216:15 272:1 303:3 317:1
kinds 113:10 212:20 214:23 215:23 309:3
knew 31:24 53:14 109:12 109:13 274:20
know 16:23 17:19 23:3,4 27:25 30:24 35:20 41:20 52:5 54:16 57:15 69:1 73:12 75:2 78:23 83:8,11 86:19 87:9,10 87:23,25 88:12 91:4 93:7,9 94:25 99:10,10 99:15 100:21 101:19,20 102:15,19,25 104:22 107:13 109:20 110:18 111:18 119:9 120:12 121:8 122:8 125:10 125:12,14 134:22 147:6,9 147:10 153:21 155:19,22 158:21 169:2,3 170:12,12 171:10 175:13 179:24 184:8 184:10 191:9 191:12,13,16 202:7 203:5 204:18 205:23 206:22,23,25 208:6 210:16 212:21,23 214:6 215:13 219:9 220:1,3 221:10 224:7 224:19 226:1,2 229:6,8 230:5 231:6 234:21 236:23,24 238:10,22 245:18 251:24 252:3 253:4 260:9 264:15 264:16,21 265:4 269:6,6 272:10,12 273:1 276:22 283:18 285:25 289:23 293:18 294:17 295:9 298:3,23 299:25 301:21 301:25 302:18 305:23 310:14 311:7,8,22 319:15,18,20
knowing 249:17 249:19 302:3
knowledge 16:1 60:21 69:14 88:24 89:6 108:21 167:19 223:25 224:9 225:6 249:15 253:23 275:14 305:20
knowledgeable 291:13
known 192:6 206:23
knows 224:25 237:3
Krishna 100:11
Krishnamurthy 99:15,17,20 101:16

L

lab 36:2 163:5 210:6
labeled 138:3
lack 148:4 195:18,20 213:8 227:21 228:9 229:12 237:17 267:5 270:23 298:9
lacked 166:16 265:17
land 23:21 24:8 24:10
Lane 107:13,14
language 4:21 90:16 91:16 162:3,7 164:3 164:12 165:13 166:9
large 45:20 95:24
larger 239:13 307:7
LaSalle 46:15
late 43:8 170:13
latest 141:20 142:11 217:4

law 3:4 22:12 46:11,12 48:1 48:15 103:16 212:10,11 281:23 282:5 282:13 284:5 285:3,14 291:3 291:6,9 294:8
laws 324:11
lawyer 288:14 289:10 290:15
lead 22:11 36:12 93:16 102:2,6 102:13,21,22 288:24
leading 212:4
leak 4:24 10:17 27:23 47:25 48:11 102:3 148:11 156:5 172:17,22,23 173:2,13,15 177:7,10 178:8 178:9 216:14 216:18,19 228:23,24,25 229:22,24,24 230:3,4,5,12 230:16,17 231:1,4,22 233:1 241:22 248:4,5,10,24 249:1,4,6 264:21 265:20 266:8,13 267:19,24 268:4,24 269:20,22,23 269:24 270:1,5 270:9 271:21 272:4,4 273:6
leakage 55:3 57:17 166:20
leaked 67:14,14 67:16
leaking 23:7 56:8 57:18,22 57:24 64:2 231:21 268:21 268:23
leaks 148:13 169:4,5,9,15 169:17 171:16 171:23 213:10 213:14,19 216:10 226:22 227:11,12,24 229:3,15,17 230:13,15,23 230:23 263:2,5 263:17 264:7 264:10,22,24 265:1 267:25 269:15
leaving 236:2 262:2
Lee 87:18
left 36:21 37:1 39:9 103:14 159:19
legal 3:19 27:1 47:17 75:16 78:2,2 98:9 118:19 172:1,6 205:16,17 233:14 282:20 282:21,25 283:13 284:6,7 284:13,23 285:2 286:18 287:2,20 288:4 288:8,9,18,25 290:5,14,16 293:8,21 294:1 294:22 296:1,1 297:19 299:20
legally 234:18 282:17
Legislature 120:8,12
length 209:13
lens 253:16,17 253:22
lenses 62:19 253:1
lesser 271:22
let's 40:3 41:14 52:7 70:25 104:5 114:10 114:11,11 145:20 146:12 151:13 159:10 179:22 219:6 240:17 245:19 247:2 263:21 280:13 284:19
letter 9:20,23 10:5,7 277:9 277:20 278:3,7 280:11,12 281:16,24,25
letters 106:21 198:18 275:17 277:7 280:9
level 26:17,25 27:1 30:18 231:14 235:9
LEWIS 3:4
liability 212:23
liberal 281:21
license 46:25 47:7 180:17,19 180:22,24 181:1,2,7,12 181:17 315:23 315:25 316:1,7 316:9,11,13,23 316:25,25 317:21 318:10
licensed 291:25
licenses 318:2
life 122:3 262:3
lifetime 47:19
light 174:12 285:19
likelihood 265:11
limit 263:21
limited 97:3 319:25
limiting 174:18
Linda 1:24 2:24 12:3 115:24 322:2 326:8
line 5:20,20 10:22 40:13 41:18 66:22 90:15 131:23 133:22 134:12 134:21 140:2,5 141:12,17 144:18 145:4 154:25 157:19 205:16 220:6 220:10 285:2,7 289:4,5 290:3 292:14 293:13 294:24 295:1 301:18 308:13 323:5
linear 45:9,12 46:19
lined 52:12
lines 52:10,14 150:5 293:21 320:10
link 31:11 308:4 308:6
linked 45:10 204:15 234:14
list 32:17 34:4 53:9 58:13 80:20
listed 33:12 46:18 60:8 227:24
lists 24:21
litigated 294:5
litigation 33:8 33:15,21 60:11 60:13
little 37:13 54:1 83:3 91:4 98:13 108:13 113:10,13 118:25 121:9 147:22,24 149:13 173:20 185:5 188:11 258:4 273:9
live 13:13 89:24 319:2
lives 28:1
Liz 100:21
Lloyds 31:23 32:13
local 235:5
locate 57:4
location 217:17 217:18 230:2 254:18,20
log 4:8 66:16,17 66:19,23 67:1 69:20,23 70:1 70:6,7,8,15 136:16 137:8 137:11,16 138:7,9,12 177:5,6,14 178:4 197:23 197:25 199:7 206:25 207:2 215:1 216:21 228:6,9 229:13 231:5,7 274:11 274:12 322:1
logged 242:1,12 244:25
logistics 93:1
logs 64:22 65:6 65:10,17 66:13 168:22 169:15 169:17,19,21 174:24,25 175:4,13,14 176:24 177:1,9 178:18 214:23 215:5 227:20 227:22 228:12 242:4,11 308:9 308:12,16,24 309:1,3
London 31:24 32:13
long 29:11 45:25

58:15 96:17 121:20
longer 50:8 316:8
look 26:19,20 39:11 56:10 61:6 64:15 65:21 67:16 70:22 84:1 85:5 91:12,13 93:16 95:14,16 103:14 106:3 106:12 112:14 112:14 118:8 129:4 136:7,10 146:12 148:24 152:22 153:18 163:12 164:16 165:4 168:6 174:7 176:10 193:5 203:9 209:24 217:11 218:24 219:6 219:10 243:25 245:10,14 254:18 255:23 256:3,23 258:14 260:13 262:21 266:4 272:11 298:20 302:12 306:24 307:4 308:23 316:8
looked 21:10 60:25 65:10 80:21 93:8 109:7 130:17 137:1 138:13 148:21 163:9 168:7 169:7 171:19,19 174:11,11 185:21 193:2 197:20,24 209:23 214:12 237:1 278:3,3 278:5 309:3 312:14,16 315:23
looking 27:7 49:11 86:17 94:25 97:8 110:7 117:18 117:20 137:16 138:9 142:11 146:13 147:17 155:17 174:5 185:24 188:16 189:3 191:19 195:19 197:19 205:22 212:16 229:3,7 245:24 249:2 252:24 269:23 302:10
looks 49:15 103:22 129:8 145:16,20 153:18 183:11 185:4,22 187:21 188:4 220:21 272:23 297:11 303:24 304:5
Los 1:16 2:21 3:13 9:21,22 11:1,20 115:16 116:1 120:19 120:22 274:23
lose 230:18 236:14 305:22
losing 230:21
loss 182:2,10,11 269:11
lost 64:2 111:10 222:13,14,19 305:20,21 306:19,21
lot 45:16 95:9 108:14,16 130:16,16 137:19,20 210:12 212:20 212:22 217:7 257:2 264:8 274:10 282:12 285:14 307:7 309:9 311:23
low 52:15
low-producing 217:15
lower 250:25
lower-than-ac... 180:6
lunch 113:4 114:11,18 116:18 118:24
luxury 109:9

M

machine 325:15
mail 75:1,1,3 89:19 96:12,13
mailed 73:8 96:6 96:8,13
main 96:5 148:20 156:3 163:4 166:16 167:3 278:8
mainframe 45:9 45:12 94:11
maintain 289:6 292:17
maintenance 42:5 51:15 53:19 190:8
major 45:9 269:22,23 270:1 317:8
majority 196:2 196:6,7
making 45:18 173:1 206:20
Malashenko 280:11,12
Malkin 289:25 290:8
manage 78:6,14 149:24 317:16
management 25:13,17 28:9 35:21 94:3 132:3 176:4 217:16 220:24 232:9,14,25 233:13,24 234:4,13
manager 233:25 237:10 310:12
managing 45:17 79:3
manner 213:21 267:24 302:13
Mansdorfer 107:7,8 220:23 221:10 237:11 238:1
Mansdorfer's 221:22
manufactured 44:4
March 128:14 319:24 321:2
Margaret 1:15 2:15 4:4,13,14 4:17,20 5:17 5:21,22 6:5,10 6:16 7:14,16 9:5,9 10:11 11:13 13:3,13 19:12 72:8,14 114:16 115:15 116:7 124:16 126:13,17 128:21 133:20 134:5,6 139:23 140:9 150:4 159:1 183:16 188:14 189:8 189:13 250:13 250:18 321:11 322:4 323:2 324:20
margin 111:6 168:25
Maria 87:15,16
mark 18:21 21:19 72:17 84:15 85:6 111:5,8,14,16 112:13,13 127:1 131:13 141:1 159:24 183:20 193:12 313:6
marked 7:17 18:22 21:21 72:18 84:16 90:3 101:4 103:4 112:1 122:11 123:9 124:7 126:4 127:4 128:7 131:16 133:15 141:4,11 143:11 144:6 145:10 151:16 152:10 154:18 157:10,19 160:1,7,13,24 161:4 183:7,22 187:3,10,17 193:14 194:6 200:12 277:15 281:10 303:20 309:14 313:4
market 3:6 30:9
mass 44:5
material 138:2 203:17 247:20
materiality 298:1
materials 10:8 81:1 83:21
Matt 87:11
matter 11:14 19:13 23:9,19 24:22 48:3,6,8 48:9 50:6 52:3 54:2 64:11 65:7 69:14,16 70:3 73:1 75:21 76:5,13 78:11,19 79:5 79:19 81:19 82:21 84:5,8

85:13 88:16,20 90:23 102:6,14 118:10 119:4 119:15,20 121:3,8 130:14 132:5 193:10 199:24 202:23 208:25 229:22 241:12
matters 22:18 22:21 41:24 87:25
McClellan 37:9 37:15 39:14 59:20
McGeorge 46:11
mean 26:2 27:5 29:12 30:12 39:10 42:7 47:3 60:14 63:9 68:21 70:3 75:5 83:15 86:8 92:22 105:16 110:23,24 112:9 113:15 117:9 130:7 142:7 179:7 198:15 211:17 212:14 240:13 251:21 261:22 263:3 268:22 269:11 272:14 299:5,5 305:21 308:13 311:15 311:18
meaning 292:18
means 47:4 298:3 317:16
meant 135:8 236:6 243:14 288:4
measure 65:20 214:21 262:8 270:20,25
measurements 267:6 271:13
mechanical 231:1 236:1,7 236:22 237:17 238:9,16,19
mechanism 162:18
media 11:12 26:20
meet 80:8,10
meet-and-con... 198:19
meeting 89:25
meetings 89:23 198:19
member 47:16
membership 47:17,20
memo 4:21 90:16 219:10 238:1 242:9
memoranda 235:14
memory 104:14
memos 173:15 190:14 191:13
mention 295:4
mentioned 93:19 121:15 177:23 214:15 257:19 305:15 307:20
merge 158:3,19
merged 272:24
merging 158:18
message 89:16 89:17 307:8
met 45:18
metadata 10:14 309:20 310:6 311:16,18,23
metal 254:22
metallurgical 209:20 210:5
methane 161:21
methanogens 165:13,16
Mexico 30:8
MIC 67:22,24 68:2,6 162:18 166:1 179:10 256:19 260:17
microbes 162:15 167:16
microbial 162:25,25 163:23 166:13 168:12 269:14
microbially 67:10 68:3 167:6
microphone 111:10 222:13
mid-'70s 46:7
Mid-January 149:16
middle 201:9 236:9 241:17 243:4 273:18
mince 284:19
mind 26:18 108:22 109:15 171:18 175:15 234:10 319:21 320:4,9,19
mine 74:8 158:3 317:14
mineralogy 182:20
Ming 100:7
minute 49:21 266:24
minutes 66:1 269:3
Miodrag 100:3
mischaracteri... 158:16 165:22 283:5 294:14 295:15 312:3
mischaracteri... 201:24 202:1
mischaracteri... 285:17 294:12
miscounting 229:14,17,18
mispronounce 43:25
misread 314:15
missing 39:19 161:8
misspoke 316:2
misstated 108:5 108:7
misstatement 166:6
misstating 174:22
mistake 49:16
misunderstan... 294:8
misunderstood 316:3
Mitch 88:8
mitigate 266:15
mitigating 172:24
mitigation 35:13 35:18
model 38:4 179:15 245:10 245:23
models 245:16 247:18
modified 191:10 275:22 276:17 310:18,18
moisture 256:20 256:21,21
moment 13:20 14:1 39:16 42:10 72:6 116:10,12 134:25 159:5 159:14 164:2 189:3 193:23 195:23 200:14 250:9,10 295:2 300:7 301:19
moments 60:4
Monday 141:10
money 47:6 54:6 217:7 219:22 223:17 234:9
monitor 11:18 65:19 149:23 253:11
monitoring 32:12 56:3,6 62:8 63:8,11 63:14,22 64:1 64:7,9,11,16 181:18 243:8 243:22 253:9 253:14,19 265:18,24 266:3,9,14 267:11,23 268:3 269:17 269:19 270:13 270:23 271:17 271:20 273:20 273:22 274:4,9 298:17 317:12
Montebello 21:10 42:6 56:16,21 71:15 71:17 312:13
month 129:7
Moore 34:8 36:23 37:6 59:18
MORGAN 3:4
morning 1:18 11:11 89:18 116:24
Mortazavi 3:11 12:16,16
Moshfegh 3:5 12:12,12 123:6 131:12 300:6 318:14
Motion 1:4 2:4 7:8 8:8,17 115:4
motions 78:2
move 52:18 247:2 289:3 293:17

moved 38:7
movements 45:13
moving 33:6 154:15 265:15 285:25
Mulligan 88:6
multipage 205:14
multiple 57:9 93:14 150:9 194:1 205:6 279:8
multiple-page 204:23

N

nail 202:6
name 13:11 16:9 39:2 41:2,4 43:12 66:11 75:9 99:9 125:2,8 133:7 145:1 151:25 152:1 156:20 316:8 326:2
named 100:14
names 87:21 88:13 99:9
narrow 294:2
narrower 239:2
nationally 30:13
natural 1:7,9 2:7,9 7:10,12 8:10,12,19,21 10:16 29:20 30:3,5,7,15,20 31:3 33:2 36:7 36:7,9,12 38:16 43:13 55:4 115:7,9 118:13,15 274:21,22
naturally 278:18
nature 182:15 182:19 275:22 276:17
near 28:1 214:6
necessarily 223:13 239:9 278:19 287:17 318:16
necessary 62:24 77:5,20 78:3,6 78:7,13,15 81:5 105:8 106:13 149:21 149:23 166:17 174:16 182:7 254:2 259:22 270:13 293:19
need 17:20 104:14 159:4 200:20 218:18 245:19 265:6 280:8 306:11 318:16
needed 61:3 118:3 165:4 166:21 171:10 171:11,12 219:22 246:22 269:3 316:18
needs 220:15 262:1
neighbor 27:25
neighborhood 28:1
neighboring 258:13
neither 12:5 325:23
Ness 3:20
never 41:19 66:19 69:5,19 156:5 168:22 175:4,23 283:22,24 302:12
new 16:22 52:8 185:11 238:2 240:7,24 311:20 319:13 319:17 320:16
newer 253:21
newly-drilled 261:2
news 26:20 83:3 83:3
Nicholas 76:7 87:3 295:20
Nicholas's 289:9
Nick 144:13
Nicolas 10:5
Nigel 99:22
night 104:6 106:21,25
nods 17:4
noise 65:2 168:22 169:3 169:12,15,17 169:19 174:25 175:4 178:18
non-attorney 291:20 292:4
non-lawyer 290:16
Northern 24:7 34:12,14,15
note 15:4,19 16:2 19:23 22:22 33:11 69:8 74:17 112:5,15 113:25 132:7 134:2 136:23 139:7 140:8 152:19 154:1 161:7 166:5 172:7,10 215:21 238:1 242:20 252:10 266:17 281:21 286:9 291:12 314:20
noted 15:22 16:5 20:6 61:10 86:9 133:2 216:12 237:9 240:2 314:22 314:24 318:19 324:15
notes 14:19 107:23 111:3,6 111:9,13,16 112:1,18,20,24 113:5,6,13,19 113:21 114:2 173:17 177:10 190:14 191:14 325:18
notice 4:12 19:3 61:3 125:12 132:20,22 319:14,17
noticed 15:14 85:1
noticing 206:5
notified 74:4
noting 65:22 85:1 132:11 140:14 172:2 216:8 295:7 319:23
Notwithstandi... 74:19
November 4:17 73:15,20 84:23 85:14 90:10 127:19,23 133:21 134:7 134:11 135:5 136:5 140:9 141:10 144:12 146:23,24,25 151:22 152:16 154:25 157:18 304:13 309:21
NTSB 130:9 131:7,8 209:7
NULLIFY 11:8
number 11:12 11:16 16:15,18 21:4 33:12 41:19 47:12 48:19 58:5,20 59:4,7 61:6 65:11 67:17 72:7,8,13,13 83:10 103:15 114:15,15 116:5,6 144:20 145:1 152:3 173:12 188:21 189:7,7,12,12 195:13 204:20 207:1 215:9,12 219:5,15 222:7 222:8,16,23 225:2 229:15 230:10 250:12 250:13,17,17 274:20 292:6 316:9,13 321:10,11
numbered 188:7
numbers 158:24 220:13
numeric 177:11
Numerically 196:4
numerous 161:18
nutrient 165:12 166:13,25

O

O&M 172:25
oath 12:22 13:5 85:10 280:3 325:13
object 20:21 79:6,22 92:12 102:8 163:15 165:18 171:25 179:1 199:10 205:15 280:22 288:21 290:4 294:11
objected 318:19
objection 16:3 19:23 20:6 22:22 59:6 69:8 74:17

90:24 99:13 132:7,11,15 133:2 134:2 154:1,3 158:12 165:21 166:3,5 172:2,7,10 187:24 190:22 201:24 215:21 216:8 224:24 233:14 242:20 242:22,23 252:11 261:11 266:17 276:8 281:6 282:18 282:21 283:5 284:1,7 286:8 290:2,15 297:18 299:20 312:2 314:20 315:15 319:5 319:19
objections 15:5 15:19 17:15 286:1 299:23
obtain 96:1
obtained 161:17
obvious 177:11
obviously 94:13
occasion 231:18 308:23
occasional 142:10
occur 26:18 177:24 232:2
occurred 214:2 224:1 225:16 295:8
occurring 178:9 211:5 268:13 269:7
October 73:4,10 137:3 227:5 232:10,15 233:6,7 244:16 266:2 279:11
offer 200:10 315:12
offered 37:2 38:1 210:9
offhand 36:17 66:14 206:9 249:7
office 3:10 43:13 75:16 85:23 88:11,12 118:19 120:6
officer 75:7,8
offices 51:24
official 12:2 314:7,11,16
officially 75:1
officials 120:24 121:1
Oh 49:11 71:20 122:21 147:21 148:17 153:1,9 214:19 302:8
OII 53:1 61:4 71:3 84:13 129:12
oil 9:23 10:17 23:8,21 28:24 29:6,7,7,16 36:14 44:6 45:1,13 47:25 48:7,12 63:4,4 65:13,15 66:7 66:20 67:2 100:25 171:12 226:7 228:4 234:24 235:22 257:4 274:21 278:14,19,20
oils 45:22
okay 16:8,17,22 17:23 19:19 20:17 21:4 23:16 24:2,5 24:12,15,18 26:10 27:14 28:3,6,20,23 29:15 30:9 32:14,17 33:2 33:5 34:4,21 34:24 35:3 37:8,15 38:15 39:23 40:2,3 40:15,20 41:23 42:19,23 43:3 43:23 46:2,9 47:10 48:5,17 49:21 50:17 51:8,12 52:3,6 52:7 53:1,9 54:24 55:5 56:1,13 57:12 57:19 58:4,10 58:19 59:10 60:10 62:10 63:1,7 64:5 66:3,12,21,25 67:6,9 68:8 69:19 71:6,20 71:20 72:1 73:23 74:12 75:11,17 76:8 76:11,15,19,24 77:9 79:13,18 80:4 81:1 83:21 84:3 85:24 86:13,21 89:9,19 90:1 92:10 95:3 96:8,11 100:19 101:15 102:20 103:2 104:7,15 105:15 111:2 111:25 113:3 114:1,10 116:10 117:1,5 118:13,16,20 119:13 120:10 121:1,18 123:25 125:22 126:10 129:13 131:10 134:8 134:24 137:25 138:6,15 139:16 140:7 140:22 142:8 143:8 146:13 147:1 152:18 153:20 154:9 154:15 159:19 162:9 163:13 164:15 165:8 166:11 167:12 168:19 172:21 173:22 178:16 178:22 181:21 181:24 183:19 184:8,15,17,18 184:19 185:7,9 185:25 186:2,6 186:6,25 189:25 191:25 192:4,7 193:8 193:11 194:14 194:19,20,21 195:8,12 196:1 196:8 200:25 201:5,8 204:7 207:8 213:1 218:7,10 219:6 219:8,8 220:22 222:10,10,15 222:16,19,20 226:16 232:6 234:15 235:18 237:2,12 238:18 240:18 241:17 244:9 247:2 252:1 254:1,6 257:12 263:20,22 265:15 266:24 267:1 270:7 272:8 277:1 279:5,7,20 280:1 282:2 283:22 290:19 296:6,8,9 297:11 300:8 300:11 302:19 303:17 307:16 308:1 309:11 310:5,10,23 312:22 313:2 313:16 314:15 314:19 315:1 315:17 316:16 317:18,20 318:13 320:15 321:4,5
old 37:6 53:5 58:14 247:22 262:4 316:9,9
older 190:5
OLS 73:4
omitted 74:6
on-site 36:1
once 112:14 215:8 270:23 271:5
one-time 177:21
ones 80:19 113:11 237:21
ongoing 48:5 50:6 53:3,4,5 173:15 202:2
online 168:8
open 23:6 48:4 108:16,17 132:13 253:10 305:9 319:6,7
opened 311:9,14
opening 5:5 6:13 7:6 8:6,15 20:12,13,18 77:1 80:7,14 92:15,18 93:7 94:21 96:24 97:5,14,17,25 98:1 99:3,4 103:11 109:1 109:12 113:20 113:22,23 114:5 119:2,10 122:23 124:16 125:2 126:18 127:22 128:15 163:13 164:19 164:25 195:6 286:22 287:1 287:10,11

288:7,16 290:2 307:6,7 318:21 319:15
operate 240:25 257:11 300:12
operated 235:3
operating 217:23 218:6 230:25 241:1
operation 190:8 238:24 247:15 250:5 262:23
operational 57:20 61:16 179:16 211:1 212:17 223:16 224:14 267:13 267:24
operationally 238:15
operations 1:5 2:5 7:8 8:8,17 53:18 68:9 115:5 132:3 179:13 180:8 180:13 234:22 246:15 265:10
operator 61:20 61:23 66:22 149:25 215:25 231:10 246:11 246:19 263:4
operators 149:22 150:6 265:23 266:2
opinion 167:17 172:16 259:7 261:8 274:18 300:22 301:1
opinions 290:14
opportunity 101:11 290:23
opposed 208:4 287:17
option 79:10 252:23
options 252:22
ORA 290:2
orally 191:1
order 1:4,7 2:4,7 7:7,10 8:7,10 8:16,19 15:15 15:16 22:24,25 44:12 115:4,7 211:11,11 214:21 223:18 246:22 301:17
organized 137:22 305:17
original 11:6,9 51:15 140:19 157:25 159:1 190:16 268:25
originally 225:14 275:7
originated 144:23,24
outcome 209:15 268:25
outcrop 253:1,2
outflow 239:7
outgoing 45:19
outlined 277:23
outputs 45:17
outset 15:21 132:12
outside 41:18 79:8 165:11 176:10 210:18 236:15,19 239:5 266:20 269:9 271:8
overall 203:4 209:16
overcome 180:10 247:21
overlaps 33:12
overly 79:7
overnight 75:1,3 96:13
oversee 151:1
overseeing 208:23
overseen 35:20 69:5 208:20
oversight 35:13 35:17 125:6 317:8
Owens 75:9,10
owned 23:8
owner 23:21 24:9,11 224:20
owns 48:12

P

p.m 2:23 11:3 114:17 116:3,3 116:8,13,16 134:7 140:9 147:4 157:18 159:15,18 189:9,14 194:23 195:1 250:11,19 302:22,25 315:7,10 321:13 322:8,9 322:9,10,10,11 322:11,12,12 322:13,13,14 322:14,15,15
paced 107:24
Pacific 46:11 50:22
pack 239:16
packer 62:22
packet 194:12
pad 112:15
page 4:11,19,21 4:24 5:4,11,15 5:24 6:4,6,11 6:18 7:4,15,18 8:4 9:4,7,12 10:4,14,22 19:6 47:22 49:13 59:11,15 59:24 60:18 61:11 71:2,7 71:13,18 73:18 76:22,23 77:23 77:24 96:2 97:12 104:6 112:5 122:19 123:18,20,23 123:24 125:4 126:9,16 132:1 149:17 152:17 152:23 153:8 154:10 161:12 161:12 162:9 162:13 164:5,6 164:13 165:6 168:17 175:18 178:16 179:12 179:18 181:21 182:14 184:14 186:1 188:6,7 189:23 191:8 191:20,21 192:17 193:16 193:18,23 194:1,3,12 196:12,14 201:7,9 207:2 213:7 218:7 219:7 220:13 220:21 222:4,9 222:23 226:18 226:20 232:4 232:11 235:24 237:4,9,14 241:17 243:4 244:8 250:22 251:6 254:6 255:3 265:15 267:1 270:8 273:18 274:19 275:20 278:9 278:10 279:6 280:8,14 281:15,19,25 296:7 304:10 313:10,15 314:2 323:5
paged 137:15
pages 2:15 4:13 4:14,16 5:6,9 5:13,18,21 6:9 6:15 7:13 8:13 8:22 9:8,14,16 9:19,23 10:7 10:13,18 105:16,17 111:14,17 112:13 135:6 136:2 161:14 188:6 195:9 201:13,22 202:8,14,22,23 203:12,23 204:3,5,12,16 204:19,23 205:1,6,13,24 205:25 213:2 226:17 234:16 277:23 286:12 301:13
pagination 153:12
paid 47:6 50:11
Palmer 87:18
paper 94:14,15 95:13
papers 19:11,20 19:25 20:11,18 20:23 112:3 319:6,9 320:7 320:21
paragraph 77:8 77:11,25 78:5 78:13 92:1 123:20,23 168:21 181:25 182:21 191:9 191:11 235:24 241:18 243:4 244:12 245:4 250:4 267:5,9 270:8 273:18 278:10 279:8 279:12 314:6
paragraphs 277:23
parameters 179:16 240:2,4

part 27:11 57:16 57:21 76:2 90:20 104:3,4 104:19 109:17 143:6 145:21 146:9 166:22 173:6 201:17 202:4,18 203:15 230:21 242:18 246:24 246:24 253:3,3 262:12,24 264:5 270:7 282:13 283:15 289:8,10 305:6 305:8 317:14
parted 213:10 222:18,22,22 225:15,25 226:22 227:9 227:10
partial 278:22 278:23
participant 50:10
participation 282:24
particular 32:15 33:24 34:1 36:20,25 43:21 51:8 173:11,14 197:3 199:11 216:18 220:1 280:4 283:19 311:23 319:7
particularly 137:21 164:13 173:8
parties 35:19 275:23 276:1,2 276:6,10,12,18 276:20 294:2,3 304:19 325:25
Partners 89:2,7
party 15:11 23:23 83:9,9 132:14 150:8 281:4,4 282:17 283:24,25,25 313:20
pass 149:14
patch 230:10,11 231:25
patching 264:13
Patel 3:11 12:14 12:14
pay 14:13,13,16 14:23 47:4 181:11,12
paying 14:20
payment 50:11 50:16
PC 155:23
PDF 97:13
Peggy 75:9,9 85:23
pejam.moshfe... 3:9
Pejman 3:5 12:12
penalties 301:12
penalty 207:7 221:9 324:10
pending 275:23 276:18 300:6
Pennsylvania 23:9,18 45:2
people 28:21 31:10,11 173:19
perforate 231:12
perform 67:21 68:5 226:12 313:20
performed 64:6 212:19 213:19 243:19 246:11
period 31:2 33:11,17,18,25 35:11 38:19,21 39:24,25 40:7 40:16 93:15 102:13 109:16 134:17 170:3 219:24 269:20 274:5 283:11 308:22 311:3
periods 59:18 60:1,5,7,13,15
perjury 324:11
permeabilities 249:24
permeability 239:15 245:1,5 245:8,11,14,22 245:24 246:18 249:18,19,22 249:25 298:12
permit 286:6 297:16
permits 34:22 317:8
person 100:17 105:3 138:23 142:12 173:4 173:23 291:13
personal 18:6 275:14 308:10
personally 18:12 64:6 257:13 275:2 279:14
personnel 75:11 75:14,21,24 86:6 149:23 150:7 168:5
petroleum 122:3 150:24 151:1 177:2 257:24
PG&E 24:9,12 24:14,15 48:17 49:1 59:12 116:20 128:18 130:5 135:7 209:5,9,10 257:2 289:19 289:25 290:1 290:10 312:17
PG&E's 131:4
phase 50:12 68:2
Phi 47:16,16
PHMSA 235:12
phone 76:18 89:15,16 91:21 92:3 93:12 156:1 157:2,7 191:2,6 193:3
Photocopy 4:12 4:14,15,17,20 4:22 5:5,7,10 5:12,14,16,19 5:22 6:5,7,10 6:12,16 7:5,14 7:16 8:5,14 9:5 9:8,9,13,15,17 9:20 10:5,10 10:14,15
photographs 210:7
phrase 63:22,23 208:3
physical 28:15 28:18 135:25
pick 141:20 142:12 215:1
picked 41:16 221:3 269:16
picking 159:19 250:21
picky 156:10
piece 30:21 199:17 209:20 230:7 231:1 245:20
Pilko 4:23 101:15,20,22
pin 239:21
pipe 65:20 209:18 230:2,7 270:17
pipeline 23:8,12 24:17 27:3,8,9 27:10,16 28:10 29:2 30:11,15 47:25 48:7,11 48:13 49:23 50:23 51:11,16 51:19 52:7,8 207:17,22 210:25 254:20 254:24 257:20 265:13
pipelines 48:13 51:19 67:14 235:12 254:9
pipes 257:4 258:2
piping 257:8 271:14
pits 37:18
place 11:19 38:11 253:15 325:10
placed 325:12
places 179:7 257:7
plaintiff 24:1,10
plan 17:19 176:4 232:9,14,25 233:13 267:22 273:22
plant 42:1,1,2 44:3,9,19
Plastics 43:25
Playa 21:15 42:6 53:12,19 59:14 61:2,13 71:6 312:13
pleadings 98:16
please 11:5 12:8 12:22,25 13:11 13:25 17:1,3,9 17:21 27:5 31:16 37:13 49:19 53:9 54:1 60:19 67:12 72:6 116:12 122:19 123:19 124:7 152:17 159:14 162:9 164:1 243:4 244:8 250:9,10 267:4

279:6
plenty 83:25
plugged 231:18
plugging 264:18
plumbing 182:3
point 16:5 121:12,16 129:16 130:18 132:17 133:5 153:11 169:24 182:13 197:24 218:1 225:18 253:11 256:1 256:15 271:23 293:16 294:15 296:5 319:3
pointed 139:19
pointing 39:20
points 86:24 89:11
polarity 255:1
pole 28:10,17 42:4
political 36:22 37:3
portion 152:16 154:6 161:1 196:22 220:12 310:8 311:24 312:8
portions 163:21 202:5
position 37:1 38:2 44:23 45:25 199:4,16 199:25 273:5 287:7 292:11 293:10 294:10
positions 33:12 60:9 293:22
possess 224:22
possession 139:4 296:19 301:3 302:6 305:24
possibilities 212:1
possibility 82:23
possible 92:4,4,7 109:15 113:24 155:3 156:10 170:14 208:22 213:21 229:14 241:19,20 243:18 259:16 269:16 287:10 298:19
possibly 74:23 93:13,15 178:6 180:1 203:6 235:5
post 137:3
Post-it 113:6,13
Post-its 126:1
potential 83:5 177:10 211:15 211:21,23 216:16 235:5 248:19,22 276:6
potentially 59:19 159:8
powder 44:5,12 44:13
power 42:1,2 284:6
practical 213:24 218:3,5,6
practice 2:18 98:7 142:10 280:20 292:9
practices 1:5 2:5 7:8 8:8,17 25:20 56:4 90:19 115:5 172:25 251:13 251:25 312:11 312:15
practicing 292:7
pre-formal 201:18 202:19 203:15 279:10
pre-hearing 172:8 286:11 291:1 292:23
precise 275:22 276:17
predecessor 225:11
predicated 289:11
prefer 86:3
prehearing 287:13
preliminary 84:11 96:19,20 98:23 251:18 279:15
preparation 77:18 81:2 96:24 98:16 104:1 201:3 208:20 311:2
prepare 26:15 70:6,6 80:5 81:1 122:25 124:11 125:4 127:9 133:3 258:22 304:21 304:23 320:2
prepared 5:20 21:5 50:17 69:19,22,23 70:1 105:4 107:22 110:15 116:22 130:22 131:1,2 132:24 143:21 145:23 158:11,14,18 158:20,21 208:14 209:6 283:16
preparing 12:2 70:8 83:22 97:25 107:20 118:7 119:4 129:2,21 130:3 147:6 170:20 208:17 210:1 288:23 306:9 321:1
presence 172:16 178:7 259:25
present 3:23 15:11 28:22 33:8 53:1 60:12 66:17,19 102:10 132:25 241:21
presented 108:11
presently 112:24,25 240:5,24 241:1
pressure 52:16 52:18 148:18 180:2,3,7,11 182:11 239:17 247:6,14,21,24 265:18,23 266:3,9,13 267:6 268:2 269:18 270:13 271:3,17 273:20 274:4
pressures 267:12
presumably 319:3
pretty 31:9 107:15 155:21 156:10 167:8 177:10 186:22 197:12 198:12 212:2 243:23 262:4,6 274:10 275:12
prevent 211:4,8 211:11,12 272:3
prevented 182:3 203:18 265:19 267:6 268:12 268:20 271:20
preventible 269:24 270:1
preventing 273:6
previously 19:11 29:6 143:16 259:24
price 29:7,7,8,12 29:12
primarily 32:1 95:16 108:1 163:4 169:11 262:21
primary 86:24 90:23,25 171:9 234:25 235:19 236:3
print 94:13
printed 125:15 185:21
printout 177:12
prior 14:10 16:1 17:22 19:22 20:12,14 54:20 55:18,22 65:6 70:20 73:24 75:14,17,19 76:12 82:3,7 84:12 85:19 86:1,19 87:25 90:11 92:17,20 96:24 97:16,25 97:25 102:16 106:25 107:1,2 109:23,25 113:1,19,22 114:5 118:24 119:1,10 121:7 123:16 125:19 125:20 127:15 128:1 136:4 147:7 151:23 154:12 155:20 161:10 171:16 191:2 197:7 203:22 207:14 208:25 209:11 224:15,20 225:12 226:13 227:15 232:10 232:15,25 233:5,7 256:25

271:11,12,18
276:1 297:13
299:3 320:13
325:12
privacy 316:6
private 22:12
23:9,19,25
24:8 35:19
41:3 48:1,15
55:16 308:23
privilege 10:12
20:25 68:19,21
69:2,6,12,19
69:23 70:1,9
70:11,13,16
74:18 79:23
80:2,9 133:25
134:1,17
136:16 137:8
137:11,16
138:7,9,11
144:19 163:17
187:10 195:17
195:25 196:20
197:23,25
198:3,8,21,24
199:5,5,7,25
200:4,8 201:15
202:16 203:13
206:7,8,18,25
207:1,4 242:25
299:9,13,18
302:7 303:7
privilege-conf...
9:11
privilege-conf...
6:17
Privilege-Con...
9:6
privileged 70:5
70:18 135:1
301:9,10,10
probable 182:1
probably 17:19
26:7 31:6
36:13 54:5
62:12 66:1
67:5 69:22
83:19 93:6
95:23 121:15
122:2,6 129:4
131:8 134:20
142:6 143:5
144:24 150:14
154:13 157:6
162:8 167:20
170:9 178:11
185:3,7,15
192:13,25
193:2,3 198:25
199:1 200:8
205:25 206:2
207:2,21
209:15 216:24
216:24 217:3
222:9 223:16
225:23 230:8
235:3,7,10
238:3 242:18
262:17 268:8
268:10 271:20
301:16 309:8,9
probing 290:11
problem 36:1
37:16 38:3
56:7 155:22
166:14 180:7
203:25 211:2
217:21 223:23
262:22 264:11
269:7,16
270:15 305:19
problems 44:19
44:20
procedural 78:3
procedurally
319:5
procedure 2:18
98:7 168:15
proceeding
15:19 16:4
20:5,13 22:24
51:25 83:5
103:12 108:12
126:13 127:18
132:13,18,21
135:1 144:19
145:1 152:3
275:24 276:3
276:13,19
289:20 295:19
proceedings
13:24 58:21,23
325:9,12,14
process 43:24
44:2,9,15,17
45:1,5 64:6
74:21 107:20
109:4 130:3
167:24 199:22
223:14 225:1
264:9 268:10
282:20 290:11
produce 21:8
86:5 109:16
140:15,18
241:6 280:2
283:11 292:24
293:1 319:8,11
320:18
produced 19:8
19:11 20:5,14
20:19 21:12
22:4 44:5 97:2
136:11 139:8
139:18 142:7
169:21 198:10
221:24,25
243:2 256:12
302:5,8 303:10
320:17
producing 57:6
206:22 236:13
239:16 241:13
product 5:24 6:6
6:8 9:13 20:25
29:8 44:11,14
45:20 79:23
92:14 133:23
134:1,13
141:12,17
163:16 195:17
201:15 202:16
203:13 242:25
318:25 319:4
production
20:23 44:8
45:14 62:16
63:5,6 65:13
65:14 66:8
67:2 135:23
136:12 139:9
142:4 144:1
161:9 186:8
236:2,16
237:19 238:4
238:24 239:20
253:20 255:21
256:16 261:9
267:12 283:25
286:6 297:16
productions
170:18
products 45:14
45:18
program 28:10
28:17 35:13
38:4,8,9,12
45:9,12 175:20
176:7 219:23
220:24 232:8
232:14,19,24
233:12,24
234:4,9,13
programming
46:20
programs 38:11
63:14
prohibits 203:8
project 31:23
45:24 49:23
51:19
projections 29:7
projects 45:8
proliferated
38:12
promise 303:2
prompting
216:4
propane 35:25
properly 62:18
85:6 108:3
230:25 247:20
properties 44:13
44:16
property 24:7
53:21 54:9,10
71:11
proposal 5:19
137:24
proposed 53:20
54:8 287:13
propound
319:16
propounded
280:21
protect 254:9
260:18 261:20
protected 10:8
20:24 85:5
133:25 134:17
242:24 255:6
255:13
protection 5:16
236:14,18
254:7,8,13,25
255:4,4,12
257:1,3,4,8,13
257:16,18
258:2,11 259:7
260:2,11,12
262:3
protocols
168:12
proved 166:19
provide 77:18
78:6,7,14,14
81:19 86:19
112:2 118:4
142:3 149:20
150:16 152:24
217:18,21
238:16 249:23
250:4 267:13
277:4 284:22

291:13,17,20 291:21 292:1 304:14 312:18 316:13
provided 19:18 19:22 25:4 74:22 94:8 97:9 106:22 108:15,19 116:24 135:7 135:24 155:20 158:22 200:2 209:4 210:13 210:19 247:22 255:4 258:15 271:17 275:18 281:3 292:1,4 298:21 300:21 305:10 306:4 307:1
provides 26:24 132:1 140:11
providing 31:9 52:15 79:3 255:14
provision 79:2
proximity 252:7
prudent 132:3,4 261:16
PSRP 16:4
PU 4:18 85:5
public 1:1 2:1 3:17,19 6:13 7:6 8:6,15 9:21 9:22 10:7,18 11:15 12:19 29:18 36:13 41:13 48:23 52:2,17 53:22 54:16 56:17 72:25 75:6 81:9 83:1 85:2 88:11 97:24 115:1 117:23 120:21,24 192:20 194:7 235:2 274:24 275:8,15,24 276:3,19 299:19
publically 82:9 82:10
publication 92:14,17,20
publications 58:11,12,16
published 21:16 58:14 242:14
PUC 5:17 10:8 39:14 40:21 41:19 42:12,21 42:25 54:9 70:20,21 83:7 93:1,20 94:8 94:10 95:20 125:5 161:19 173:19 193:7 218:18 219:18 223:17 283:19 296:19 304:25 313:18
PUC's 77:2 94:18
pull 112:15 213:23
pulled 37:6 149:3 154:14
pumped 179:14
pumping 180:9 182:1
purchase 224:9
purpose 15:14 90:23 200:7 210:20 220:3 232:1 255:14 292:15,16 301:5 316:22
purposely 231:12
purposes 14:9 16:4,20 20:19 57:6 90:18 127:11 129:2 129:21 132:20 139:7 142:4,17 161:7 174:16 186:18,21 188:24 193:8 211:10,22 212:21 215:6 216:13,22 219:15 220:5 228:6,18 229:22 231:15 245:9 252:3 254:3 259:1 272:14 292:12 294:4,23 295:12 297:11 301:11 302:16 304:12 318:17 320:21
pursuant 4:18 10:8 13:6 56:17 79:16 191:6 192:13
purview 252:14 266:20
put 38:11 40:7 52:8 112:10,15 125:13 134:21 134:22,23 155:4,7 163:23 181:9,10 192:25 193:3,7 193:7 231:10 240:4,7 260:6 316:5
putting 60:11 240:23,24 260:14
PV 101:17

Q

qualifications 59:1 126:23
qualified 20:3
question 15:24 16:14 17:11,13 17:16,17,22 18:9 20:7 21:1 21:2,4 31:24 35:1 47:24 64:8 69:10 74:20 79:25 102:10 106:4 113:4 123:1,4 123:16,18 126:17 127:14 127:21 137:7 138:6 153:17 164:4 165:9 169:16 171:18 172:13,14 174:19 179:4 182:8 199:10 199:15,19,23 200:21,22 205:18 215:18 216:7,9,13 226:10 233:19 238:7 239:1,24 252:17 255:18 255:19 256:5 264:5 266:23 268:16 285:4,6 286:1,16,20 287:5 291:7 297:12 298:8 300:2,6,9 307:15 316:21 317:25
questioning 14:7 60:4 205:19 220:10 285:2,8 289:6 290:3 293:13 295:1
questions 15:12 17:3 20:9,22 20:22 22:8 25:2 79:14 85:4 104:13 105:4 118:6,22 123:13 132:10 132:12 136:22 146:5,8,9 172:5 176:22 184:7 195:4 198:1 199:1,14 207:11 216:4 218:21 274:2 284:22 288:25 292:11 293:7 293:11,19,24 293:25 294:9 294:20 295:14 295:25 296:5 314:24 315:15 318:20
quick 71:1 155:21 159:10 316:20
quite 27:22 29:5 29:9 30:2 55:9 152:1 209:14
quotation 281:22
quote 169:3 237:5,9,25 286:10,14 288:10
Quoting 287:6

R

raise 175:15 249:13 250:2
raised 249:17 290:17
raising 291:11
ran 34:11 166:18 169:19 247:18
Randy 4:23 87:7 101:15,25 102:5,12 310:12,15
range 211:19 212:1,21 238:23,25 250:1
rarely 111:8
rate 48:18 116:21 118:2,3 179:15 234:9

265:21 270:11 270:14,19,25 272:6 273:2
Ratepayer 53:23 56:24 71:9,21 88:12
Rates 234:2
rating 181:20
Ravi 99:15 101:16
RCA 213:10 217:9 218:2,4 252:4
RCR 298:2
RCRA 32:19 38:8,10
re-note 297:18
re-signed 74:7
RE:I1906016 10:11
reach 122:8
reached 121:18 298:6
reaction 44:15 147:12
reactivate 181:13
reactive 44:14
read 48:18 80:7 97:18 104:6 105:6,11,23 106:22 107:9 107:12,16,24 111:4 113:17 135:6 148:1,22 149:11,12 155:7 163:4,10 184:24,24 191:17 221:14 221:15 245:3 256:24 267:4,9 269:1 275:10 277:11 282:12 283:10 285:19 286:10 289:9 308:19 324:9
readily 305:1
reading 95:10 96:18 177:23 179:17 282:11 295:8,9 308:12
readings 245:1 271:23,25
reads 149:20 152:6 158:23 169:2 183:16
ready 74:25
real 148:17 163:7 269:8 273:19
real-time 265:17 265:23 266:3,8 266:13 267:6 267:16 268:2 269:18 270:12 271:16,19 274:4
realized 123:14
really 29:25 56:11 58:13 102:15 118:11 122:4 137:10 138:14 157:15 165:4 166:23 167:17 170:13 179:25 184:1 197:25 205:7 210:4 211:17 233:10 264:19 290:5 306:1 311:22
reason 33:24 34:1 36:20,25 171:14 173:1 177:19 217:19 247:14 264:15 264:15 323:5
reasonable 114:13 205:3 286:21
reasonableness 54:5 71:10,22 218:22
reasons 140:1 293:25 324:15
rebuttal 20:2 57:11 77:1 319:24 320:25 320:25
recalculated 247:22
recall 36:6,16 42:24 43:4 46:6 50:15 54:7,18,20,24 55:24 56:6,8 56:13 57:9,19 57:21 58:17 65:16 66:6,14 66:17,21,25 67:3,20 73:23 74:12 75:8 76:15 80:19,22 82:25 91:15 92:3 93:14,22 94:17 96:11,17 97:15 107:17 111:21 113:18 118:1,6 121:9 121:23 129:1 129:16,20 130:2,18 136:16 137:8 137:25 143:3 148:5 153:15 156:2 157:1,15 163:24 178:10 178:24 184:6 185:1,9,19,20 186:3,7,14 192:9 197:18 198:2,5,17,23 206:5,9 207:25 209:1 249:3 259:3 282:11 297:6 300:25 307:10 308:1
recap 159:22
receipt 15:7
receive 83:9 85:16 94:14 104:24 157:4 204:3
received 50:15 73:11,23 74:1 74:2,11 83:12 85:12 86:12 92:6 96:12,15 134:19 137:13 139:17 146:21 148:2 156:25 161:10 170:13 203:24 259:5 296:17 301:22 304:16,17 307:20,23 308:4
receiving 136:16 137:8 203:22
recess 114:18
recognize 19:1 21:25 72:22 84:20 90:7 103:8 122:15 124:9 126:7 127:7 128:10 131:19 133:18 141:7 143:14 144:9 145:13 151:19 152:13 154:21 157:14 160:4,16 183:10,25 184:10 187:6 187:20 200:25 277:18 281:13 303:23 309:18 313:7 314:23
recollection 116:19 184:16
recommend 252:11 266:18 266:19
recommendat... 186:15 220:23
recommended 9:8 183:18 184:4 221:1 233:25
recommending 289:3
record 9:14 13:22 14:2,3,4 14:9,19,24 15:4,7,21 17:15 18:8 19:24 27:18 60:22 64:11 67:24 69:7 72:10,11,15 80:1 85:25 86:3,9 113:12 114:17 116:8 116:10,13,14 116:15,17,23 127:11 132:8 132:18 139:8 140:8,14,16,23 159:15,16,17 161:7 172:3,11 173:11 174:1 189:9,10,14 190:13 193:9 193:25 194:4 194:22,24,25 215:21 216:8 226:8 242:21 245:6 247:8 250:7,8,11,15 250:19 253:23 263:16 285:19 285:23 292:23 293:15 294:16 295:21 297:11 297:14 299:22 300:5 301:19 302:20,21,23 302:24 304:12 314:21 315:2,6 315:8,9,11 318:8,18 321:13 322:6,6 325:14
recorded 173:9
recordkeeping

4:21 25:20 51:10,13 90:16 90:19 91:8,11 91:12,16 104:20 143:7 143:18 153:24 154:7 173:7 187:21,23 311:25 312:6,9 312:11,14,16
records 6:8 25:13,17,19 26:4,6,13 27:7 27:12 28:8,13 32:3 49:7 51:7 51:16 54:3 55:6,7,7 67:7 70:4,5 77:19 81:25 82:6 83:1,14 94:12 96:21 97:2,15 108:12 109:18 110:7 111:25 129:21 130:7 130:17 131:4 135:16,23 136:10 137:2 137:21,23 143:7 145:22 145:23 148:12 158:7,8,19 161:2 170:15 170:17,24 171:1,3,5,10 171:11,13,19 173:3,5,10,22 173:24 174:3,8 174:12,15 175:2,8,25 176:6,13 190:7 203:5,9 210:3 223:3,21 225:10 226:4,7 227:16 228:4 228:10,18,20 229:11 242:5 249:14 257:2 257:12 299:6 302:4,5 303:14 312:12,17 316:18
records-based 32:7,13
records-related 49:8
recount 16:23
recover 112:7 307:9
recovery 219:19
recurrence 232:2
red 188:11,11
redirect 312:23
redline 160:18 161:1,15 162:22
redlined 161:3
reduce 240:6,19 241:4
reduced 241:8 241:14
reduction 177:12
redundant 162:8
Reed 101:17
refer 81:5 122:18 124:7 136:24 182:14 184:12 232:22 235:23 237:4
reference 56:1 123:19 153:7 165:15 195:3 220:6,14,15 246:20 249:2 258:16 281:25 282:5 299:11 307:11 309:22
referenced 143:17 196:10 222:7 242:13 280:9 305:6
references 39:17
referencing 139:15 202:12 207:11 304:10
referred 131:8 136:21 140:11 166:10 194:4 278:16
referring 38:24 64:21 81:6 155:16,19 158:5,10 164:1 176:18,19 188:22 189:16 212:25 226:17 244:19 260:15 289:23
refers 58:1 77:13 202:21 220:11 276:20
refined 272:23
refineries 45:11
refinery 29:8 45:13,17,20,23 208:22 257:4,5
refining 43:14 45:7
reflect 174:1
reflected 109:2 291:1
refresh 104:14 184:16
refreshed 116:19
refused 283:11
regarding 6:14 7:7 8:7,16 9:23 14:11 16:3 116:20 132:12 134:24 138:6 143:17 153:17 162:14,18 165:17 166:1 172:16 174:23 174:25 175:19 178:17 227:21 228:8 243:7 249:14 252:19 257:15 291:15 295:25 296:20 309:6
Regardless 212:9
regional 216:16
regionally 30:6
regular 83:2,12 269:17
regulated 29:16
regulation 212:13 234:22
regulatory 22:12 25:12 58:20 72:2
reimbursement 14:11
reiterate 146:7 249:8 317:22
rejected 59:2
relate 24:12 33:2 36:6 43:18 56:2 58:7,17 118:13 118:23 195:15 237:17 238:8
related 14:21 15:13,18 20:22 21:6,14 24:15 29:15 30:5 41:23 42:15,16 43:15 44:20 48:25 50:23 53:2,18 54:11 55:6 56:21 59:11,11 61:11 61:25 65:12 66:7 67:1,22 68:6 69:12,14 71:3,11 72:25 75:12,15 79:3 79:4 80:23 81:25 82:6 84:11 88:23 90:14 91:16 98:22 112:23 119:3,14 123:17 130:3 130:13 137:2,5 137:8 143:7 148:17 161:20 162:25 163:23 165:25 166:1 168:22 171:3,5 172:8,24 181:15 182:15 192:20 193:1 196:19 197:10 198:8,18,24 206:6 207:17 207:22,25 215:18 222:2 227:9,16 229:13,22 234:8,11 235:15 248:23 250:3 257:12 265:17 273:15 275:3 277:8 279:23 280:24 290:3 291:14 294:1,7,8 296:11 300:11 304:7,16 311:25 314:13 318:20 319:15 320:17
relates 117:2 195:24 202:4 212:10 232:7 232:23 242:8 279:1 291:8 312:9
relating 88:16 175:5,9 251:14 275:15
relation 77:4
relationship 251:1,7,15 252:2,8,19
relative 27:19 94:20 108:7 109:1 190:16 199:5,6 238:23

relatively 30:22
release 1:6,9 2:6 2:9 7:10,12 8:10,12,19,21 115:6,9 161:20 201:14 202:15 202:22 203:2 203:12 231:2 314:6
released 201:11 204:9 274:21
releases 83:3
releasing 156:18 156:20
relevance 69:8 69:11 280:22
relevant 23:3 121:10,11 164:11,20 171:23 172:17 190:8 203:7 222:11 223:9 223:12 224:15 224:18,19 230:14 246:3 262:9 263:6,18 283:18 300:22 301:1,14,16 320:18
reliability 49:23 274:6 309:7
reliance 292:22
relied 19:12 80:13 106:8 210:8 295:11 302:15
rely 150:8 229:9
relying 186:18 186:22 228:2,4 228:10,16,17 229:11 272:15
remainder 134:5
remaining 242:2 242:12
remains 214:16 292:11 293:10
remarks 293:15
remember 41:1 43:12 49:17 56:12 57:13 61:6 65:14 66:10 74:10 83:10 91:24,25 117:21 118:10 118:11 130:15 137:10 150:14 156:17 163:25 178:13 179:25 183:12 197:20 198:13 249:6
remembering 244:23
remission 33:22
remote 94:6
remotely 93:2 94:12
removal 254:22
remove 217:20
removing 237:22,23
renovate 223:17
reoccurrence 211:12
repair 231:23 248:5,25
repairing 263:5
repeat 216:13
replace 178:20 239:12 241:11
Replacement 51:19 131:23
replacing 262:6
replied 141:19
reply 20:2 77:1 141:21 142:13 319:23 320:21 320:23
replying 142:9
report 5:17 26:8 26:15,22,22 96:1,6,12 99:7 104:9,12 106:7 106:11 108:2,4 108:4,7,10,21 109:2,8 112:17 112:21 128:13 128:21 130:9 130:11,12,13 130:15 131:7,8 136:4 147:13 147:15,19 148:19,23 161:17,24 162:4 163:4 164:20 165:1,3 166:16 167:3,5 173:3 174:9 175:20 186:17 186:19,21 209:12,23 210:5,7,11,17 222:21 223:2 228:25 230:9 244:4,5,24 245:22 246:22 249:10,18,24 250:6 253:22 255:24 266:5 272:16,18,19 272:23 274:17 298:2,7 313:11 314:7,11,13,14 314:17
reported 1:23 115:23 223:3,6 228:21,23 246:21
reporter 2:25 11:8 12:1,5,21 17:4,7 322:2 325:7,22
REPORTER'S 322:1
Reporters 11:25 12:4,7
reporting 169:8
reports 21:5,9 26:20 95:9,14 95:17,18 98:22 108:23 148:23 148:25 149:6,8 149:15 163:10 190:15 191:14 210:6,13,15 217:13 252:25
represent 12:9
representation 135:12 289:12
represented 17:24 18:11 147:16 291:23
representing 18:5,17 24:9 76:5 132:23 290:1,1
represents 273:11
request 5:15 9:18 10:12 14:22 19:10,17 19:21 85:25 86:1 92:8 97:10,11,19,19 97:20 112:2 122:17,19 123:17,20 126:11 127:12 127:15 135:24 136:8,11,17 137:1,6,9 138:1 161:10 259:5 284:17 288:24 291:13 291:15 304:4,8 304:11,13,14 304:21,23 306:9 312:19 319:6 320:5,6 320:7
requested 21:9 67:16 203:3 224:19 283:12
requesting 15:1 320:12
requests 5:8,12 21:4 80:16 94:8 98:18 126:22 176:19 176:20 204:25 229:8 304:15
require 256:20 259:21
required 44:13 212:10,11,14 212:15,18 252:7 289:1
requirements 45:19 77:21 244:16 247:10
requires 179:15 231:22 253:7
requiring 14:23
research 22:14 25:4,6,7 31:23 32:12 53:17 55:11,18 98:10 147:21 167:19 186:14
researched 32:3 54:25
reservation 320:22
reserves 14:22
reservoir 58:1 151:4,8 180:11 217:25 230:21 231:14 244:24 245:6 246:18 247:21 298:13
reservoirs 239:15
resident 55:16 120:12
resist 218:17
resolution 293:4
resolved 155:24 156:1
resource 30:20
Resources 10:17 192:21 194:7
respect 1:6 2:6 7:9 8:9,18 44:7 115:6 165:25 167:6 176:3,25

199:4,22,25 221:22 249:1 265:23 266:2 273:5 280:1 295:6 297:22 302:1 311:24 312:8
respond 17:3 36:9 122:5 287:5 290:23 300:19
responded 293:20
responding 142:18
response 5:10 5:15 9:19 10:6 15:23 19:16 35:22,22 94:7 97:10,11,21 108:19 122:25 123:3,21 124:11,13,25 127:9,12,17,21 134:4 135:24 136:11,14,15 136:17 138:6 138:19 139:12 144:22 155:1 202:5,5,8 214:19 238:13 248:11 249:1 258:17,19,22 259:1 268:1,7 268:8 278:2 287:24 291:12 291:15 293:9 297:3,7,9 312:18
responses 80:17 94:1,15 95:7 96:10 98:20 117:7 136:3,7 136:8 137:1 138:1 170:19 198:23 206:10 229:7 296:25
responsibility 69:16
responsible 132:23
responsive 19:21
responsiveness 177:18
rest 38:12,13 96:6 104:20 217:22 245:4 262:3
restate 20:7 29:17 78:12 79:10,13 123:13 165:23 172:7,20 198:4 199:23 218:1 238:12 239:1 248:17 252:16 263:19 265:25 266:11 274:1 276:11 283:23 286:8
restated 127:15
restating 158:17 286:1
result 92:8 221:8 230:24 254:22 269:12
resulted 26:4 66:23 161:25 162:5 233:4
resulting 242:3
results 64:15 77:3 243:22 245:10,24
resume 22:2,4 49:19 53:10 58:6 59:5,11 70:23 71:18 116:20 118:17 129:4
retained 117:12 126:12
retains 159:1
retention 312:17
retrofit 261:24
return 74:23
returned 74:3
reuse 112:6,9,12 112:16
reverse 255:1
review 25:19 26:11,13 28:13 29:10 32:3 51:7 54:3 55:9 67:7 68:20,22 69:2,6 71:22 74:22 77:19 78:2 80:6,13 80:16 82:1,10 83:21 94:12 95:10 96:19 97:24 98:6,9 98:22 101:11 104:11 105:21 106:23 107:4 107:11,25 108:23 123:3 124:13 130:4,9 130:11 131:4 137:9 148:12 149:5 164:2 167:9 168:11 169:20 170:17 171:5 174:2,6 174:18 175:1,7 176:6,14 193:24 195:23 197:14 200:14 200:17,18 201:2 206:4 210:10 211:25 221:17,18 227:19 228:1 249:10 280:3 280:18,19 296:14,23 297:8 298:11 298:25 299:2 313:23
reviewed 51:14 55:5 80:15 82:6 96:15 97:14,21 98:2 104:1,3 106:2 106:18 107:10 107:17 117:6 136:2 137:5 138:2,7,11,15 138:22,25 143:22 148:19 149:7 164:20 167:4 170:24 184:22 194:16 197:16 207:16 207:19 208:11 209:3 210:18 219:1,2 220:16 222:1 226:21 227:16 257:2 257:12 277:7 277:20 296:16 296:17,18 297:23 299:1 303:14 312:12
reviewing 64:20 70:14 97:15 104:7 106:7,21 108:21 111:3 129:20 135:22 198:2,5,17,23 209:2 228:20 283:14 297:6
reviews 27:18 209:22
revised 152:15 160:8,8,19 161:13 187:11 188:2
revisions 187:22
rewrite 60:14
Rey 21:15 42:6 53:12,19 59:14 61:2,13 71:6 312:13
ride 37:5
right 14:22 15:24 21:19 27:2 33:6 40:12 41:22 47:22 48:14 50:10,20 56:14 61:14,15 69:7 72:4 84:2 92:5 94:22 96:13 99:12 102:23 103:19 107:1 108:8 110:5,8 111:19 112:21 118:21 122:21 135:10 139:21 141:1 151:12 151:13 153:18 154:9 165:23 178:1 186:16 193:20 196:9 215:1 217:23 218:16 231:8 233:16 246:2 268:5 269:22 270:6 272:5 281:20 285:11 286:4 292:24 303:1 314:25 318:22 320:19 321:3
rights 288:1
risk 175:19 176:4,7,8,12 232:8,13,19,24 233:12 243:6 243:17,20,21 243:24,24 260:2 261:20 262:1,11,12,21 263:1 264:2,5 264:19,20 265:10,13
river 35:25
road 16:24 285:1 294:22
role 34:10 43:9 44:7 51:5 52:6 53:3 69:9 102:22 116:19 116:23 215:23

215:25 291:22
root 176:5 207:14,16,18 208:4,4,11,14 208:17,20,23 209:1,6,12,22 210:1,21 211:10,14,17 212:5,7,9,12 212:19 213:8 213:18,21 214:10 313:20
roughly 238:24
round 319:7,13
rounds 55:8 57:9
Rule 206:19 290:3,10
ruled 291:19
rules 2:17 16:23 98:6
ruling 14:23 291:2 292:3,5 295:9,12,23,24
run 45:8 52:19 64:14 66:18,19 214:20,23 215:5 216:20 242:4 253:2 257:7
running 66:22 245:23 308:13
Ryan 1:24 2:24 12:3 115:24 322:2 326:8

S

Sabina 10:5
safe 132:3 203:6 203:8
safely 300:12
safety 5:5,8,13 5:17 6:12,14 7:5,6 8:5,6,14 8:15 12:19 49:23 77:2,14 77:20 98:2 161:19 215:22 237:13,16 300:11,16
sake 65:23 117:1 189:18 224:11 318:8
sale 53:20 54:8 54:10 71:11,16
samples 278:11
sampling 168:12
San 3:7,20 15:9 34:15 49:2,3 49:18 50:23 51:9 53:2 61:12 71:3 88:2 121:15 128:13,16 209:3 285:10 289:19 292:20 295:10
Sanctioned 1:8 2:8 7:11 8:11 8:20 115:8
sand 215:11,13 253:1,2,5,17 253:22
sands 62:19 253:1,9,10
sat 117:7
satisfied 186:19 228:15
save 83:17
saved 83:19 311:19
saw 95:11 146:16 147:3 198:12 214:7 218:25 237:25 291:5
saying 17:8 40:3 200:8 236:17 243:16 244:3,6 272:21 285:18 295:1,24
says 15:17,18 24:19,20 25:25 27:3 34:24 50:20 53:12 56:20 71:23 73:3 76:25 77:17,25 101:25 113:16 122:22 142:21 145:4 155:10 157:24 165:9 168:21 178:18 178:20 179:13 188:14,20 201:13 202:14 203:10,11 204:8 220:18 222:17 226:18 242:1 243:5 245:22 273:18 275:21 276:16 278:9,11 313:17 317:15
scanned 74:24
scene 104:21
SCG 131:23
SCG's 9:14
schedule 59:25
school 46:3,4,5 46:12 62:25 308:21
science 163:12 167:9 177:4 180:16
scientific 167:19 167:23
scope 15:25 51:8 54:2 69:13 70:16 76:23 78:1 79:8 81:18,21,23 84:3 91:16 98:13 110:20 110:23,24 117:15 216:3 252:13 266:21 284:24 291:5 294:2
scoping 4:21 90:15 211:22 291:2 295:12
scraps 303:4
SDG&E 49:22 132:13
SDG&E's 5:19 131:23
second 5:8 21:2 49:12 71:19 74:7 111:7 152:22 168:20 181:25,25 192:20 194:12 196:13 207:10 227:7 234:6 236:15 242:13 244:12 248:15 270:7,10 278:10 285:22 285:23 289:13 299:22 319:11
second-to-last 188:7
secondary 235:1 310:17
Secondly 293:18
section 4:19 10:9 24:19 56:18 85:3,5 98:2,3 104:20 106:20 145:22 145:23 146:1 146:14 153:24 154:7 158:7,8 158:18 161:2 161:19 165:25 167:5 181:22 184:20,23 185:11 187:21 187:23 193:17 193:23 194:12 196:10,17 197:2 201:16 202:17,24 220:8 222:8,11 227:2 232:12 232:18,23 233:23 234:17 234:17,17,19 250:24 251:10 256:24 274:19 274:25 275:9 275:21
sections 104:8 104:11 164:11 164:20 166:25 192:21 193:1 194:8 232:23 234:16 287:21
sector 52:17
SED 3:24 6:17 7:17 10:12 14:15,19,19,22 15:1 18:11,15 18:17,18 75:11 75:14,21,24 76:3,5,6 78:8 78:11,15,22,23 79:5,19 82:22 84:5,7 85:10 85:13 86:6,7 86:24 87:3 88:21 89:11 91:6 95:5,20 95:21 96:20 97:4,20 98:9 98:12,15,22 102:6,21 103:11 110:10 112:2 119:1,10 121:8 122:18 124:19 125:3 126:12 127:17 129:17 130:11 130:12,13,15 130:19 135:7 138:8,12 139:3 139:8,23 144:20 145:1 147:17 152:3 152:16 155:12 156:9,13 157:19 158:20 163:19 174:15 174:18 176:19

197:23 198:18
203:18 204:3
252:11 266:20
266:21 279:9
280:11,12
286:17,22
287:1,8,16
292:24 293:1
293:20,22
296:24 301:21
301:25 303:10
305:25 307:20
307:23 314:6
314:16 315:12
315:15 321:7
SED's 20:12
84:10 122:23
124:16 126:18
127:11,17,22
129:20 138:20
146:16 147:4
160:8,19 161:1
161:8 169:21
201:10,16,22
202:17 203:14
204:8 205:21
252:13 279:14
287:19 288:13
288:23 294:8
294:12 301:3
305:23 310:8
314:14
see 15:5 19:7,15
22:16 24:23
25:15,19 27:2
29:22 32:21
33:9 37:11
39:17,18,20
46:9 48:20
49:24 52:7
56:15 58:8
70:23 71:17
73:3,16,21
76:25 77:9,13
77:25 78:16
99:7 101:24
104:5 118:9
122:20 123:23
124:2 126:11
126:14,20,24
127:14 139:19
141:13 142:21
142:23 145:20
149:18 150:1
150:11 151:13
153:4,9 155:1
155:14 157:21
158:1 161:15
162:1,10,19
165:9 168:8,20
171:21 177:16
178:4 179:19
181:21 184:17
185:6,23 188:6
190:1 193:2
195:13 196:14
200:21,23
201:9,19 204:7
213:12 214:13
215:2 218:11
222:23 226:18
226:24 227:13
229:16 232:7
232:20 233:2
236:4 237:7
238:14 239:24
241:24 242:6
243:5 244:10
245:25 251:4
251:11 254:6
266:24 267:16
267:23,24
272:11 273:23
274:25 275:20
278:10 279:8
279:12 280:8
280:13,15,15
280:17 281:16
282:3,4 286:1
289:16 310:11
310:20,24
313:14 314:2,5
317:18 319:2
seeing 311:1
seen 101:8,13
126:8 138:18
139:5 170:15
201:1 229:10
235:17,18
281:14 289:22
313:8 314:22
seeping 165:10
166:12,24
selecting 220:4
sell 56:16 71:15
send 49:20 75:2
91:15,25 94:14
112:8 141:24
sending 142:20
142:25 147:7
153:22
senior 34:7
sense 40:10
108:23 214:24
306:4 311:5
sensitive 173:8
sent 74:6 84:23
89:17 91:18,22
92:8 93:7
94:15 96:7
114:9 133:21
134:10 135:4
141:21 142:6
143:4 144:11
144:15,15
145:17 152:15
153:21 154:14
154:24 155:17
157:3 170:19
185:10 187:23
188:3 189:20
190:11
sentence 22:10
77:17 136:25
149:19 150:16
152:23,23
153:11 155:10
162:14,17
168:20 175:21
179:13 182:5,8
182:18 190:1
203:10 204:8
242:1,13 243:5
247:2 248:3
273:23 275:21
276:16 277:1
314:5
sentences
162:21,24
separate 139:9
139:19 165:15
232:17 236:11
274:2
Separately
270:7
separators
235:6
serve 22:11
185:13
served 50:18
52:24 57:3
124:5,20 125:3
129:14 163:24
164:25 166:13
183:14 189:22
195:7 283:16
283:24 319:8
serves 233:19
236:12
service 20:12,18
52:10,13,15,16
52:19 97:17
107:2 113:19
113:23 119:2
119:10 125:19
125:20 128:2
213:23 214:16
215:16 217:20
227:15 311:3
318:21 320:13
320:23
services 4:15
39:4,12 40:5
40:25 42:13,16
43:1 60:6
73:19 78:7,15
79:4 100:25
serving 98:1
166:25
SESSION 1:18
115:18
sessions 149:10
set 5:8,12 38:5
45:12 93:10
95:14,17,19
206:4,14,24
207:10 224:2
251:21 253:9
253:13,14
286:21,25
288:5,7,25
292:21 305:1,3
306:7 325:10
Setareh 3:11
12:16
sets 138:19
205:22
setting 29:7,8,12
254:4
settled 21:17
54:18,20
settling 69:3
shallow 62:13
169:5 248:4
249:4 256:21
share 95:21
190:9
shared 97:3
Shea 3:24 10:11
13:23 76:8,12
84:23 85:19
89:12 133:22
134:11 144:13
304:2,7 306:10
Sher 10:5 76:7
87:2,3 144:13
287:15 288:5
shift 37:7
shoe 148:13
173:13 178:8
178:12 230:16
230:17 256:9
short 26:22
36:18 93:16
289:4 303:2

shorthand 2:25 11:8,25 12:4,6 325:6,15,18,21
shortly 129:9,11 183:17
show 1:7 2:7 7:10 8:10,19 15:16 22:25 115:7 155:5,8 169:17 175:9 198:1 199:2 231:4,6 242:17
showed 163:6 166:19 169:4,9 169:15 247:19
showing 155:3
shown 168:22 175:4 241:20
shows 35:5 49:13 73:14,18 158:25 177:12
Shree 100:11
Shursen 100:23
shut 268:9,22 270:16,21 271:22,24 272:2
shutting 262:6 268:19 273:7
side 37:19 38:6 64:17 68:25 270:24
sign 75:2
signature 73:14 73:18 74:3,7 74:24 323:1
signed 4:16 73:15,24 74:3 75:1 76:10 83:2,7,8 92:5 92:24 93:5 96:14 109:20 110:18
significance 190:2,4,6,12 209:15
significant 30:20 121:9 239:7 264:24 273:21
significantly 239:2 268:23
signing 75:17,20 91:5
SILVER 322:2 326:8
similar 27:16,16 28:25 66:9 165:24 177:17 190:9 209:19 211:4,11,12 292:5 296:19
similarities 215:14
Similarly 36:23
simple 252:23
simply 174:17 231:23 294:7 294:13 295:7 305:23
single 122:19 156:6
sit 60:21 198:16 297:6
site 32:18 35:12 35:18 36:5,15 251:2 317:16
sites 35:14,14 36:5 181:19
sitting 112:18 249:4
situation 26:6 300:18
size 152:21 238:25 239:14 239:21,21,23 240:9,13 241:14
skill 149:24
skills 149:23 150:7
skimmed 149:11
skip 25:25
slate 45:20
sliding 290:13
slightly 152:20 191:10 234:9
slow 39:16
slowly 17:2
small 24:7 230:2 269:15
smaller 268:24 270:5 272:3
smell 267:20
smortazavi@s... 3:15
Snyder 282:5
SoCal 53:13
SoCalGas 5:15 9:19 14:13 15:24 19:11,22 20:14 22:5 53:15 56:3,15 63:24 66:10 85:6 97:2 108:15,19 119:19,22 123:17,20 132:13 135:9 142:5 150:6,25 151:8 161:22 170:13,19 177:18 198:3 198:18,24 200:4,7 201:14 202:15,22 203:11,12 206:10 207:4 214:1 215:4 216:5,9,20 217:11 221:25 223:3,10,13,22 224:3,4,12,21 225:5,9,22 226:3,11 228:22,23,25 229:20 230:8 232:8 233:23 234:7 235:25 242:1 243:10 244:14 247:9 247:23 248:25 250:25 252:12 261:8,13 264:25 265:17 266:6,12,14 267:22 268:7 274:20 275:16 277:10,10 278:6 279:9 282:16 284:5 286:6 287:5,12 287:18,23,25 288:15,20 291:12,16,20 291:20 292:7 292:10,22 293:5 296:24 297:16 298:20 299:6 304:15 305:10 306:4,5 307:21,24 315:12,14
SoCalGas's 15:23 63:13 83:2 90:19 127:12 135:13 135:23 172:25 195:16,24 199:4,25 217:25 223:25 225:21 229:7 232:12,23 233:11 237:10 251:6 277:22 278:1 280:1 287:7 288:24 291:14
Solas 87:15,16
sole 15:13
solid 163:7 306:4
Solution 186:7
solve 305:19
somebody 26:18 28:1 55:13 150:25 151:8 204:19 212:17 308:3
someone's 156:20
somewhat 267:18
soon 92:5 262:6
sooner 82:18 287:10
sorry 18:7 25:24 29:17 34:25 39:16,21 65:22 66:5 68:2 77:8 95:20 100:16 101:10 111:11 116:9 139:11 153:2 157:5 158:12 160:21 167:10 181:23 186:5 187:11 191:24 193:25 213:3 226:20 227:11 235:25 237:8 240:23 248:10,17 263:12 266:11 272:12 280:4 289:24 294:15 294:18 307:15 312:7
sort 25:6 27:23 31:5 33:21 37:4 51:12 64:21 70:17,17 151:4 235:6 238:4 253:18 257:23 260:15
sorts 24:25 34:17 65:16
sound 27:9 31:9 163:12 167:1 184:22
sounded 60:4
sounds 89:10 114:13 132:10 318:24 321:4
source 84:2 105:24 162:11

sources 82:25
South 2:20 11:20
Southern 1:5,7 2:5,7,19 3:3,10 4:12 5:7,10,12 7:8,10 8:8,10 8:17,19 9:17 10:6,16 12:10 12:12,14,17 14:23 15:8 71:14 77:19 115:5,7 122:17 161:21 215:24 282:5
spanning 227:4 227:9
speak 17:1 105:3 107:7 168:1 221:21 299:11
speaking 216:2 224:12 265:8
Spear 3:6
spec 240:15
specialist 43:5 43:10
specialists 149:20,24 150:8 152:24
specialize 25:1
specially 44:5
specially-treat... 260:22
Specialties 24:19 38:25 43:25
specific 36:16 44:7 54:24 66:7 91:16 93:22 94:19 174:20 177:4 199:1 201:21 215:18,20 216:14 220:10 227:3 256:4 259:17 275:16
specifically 17:16 42:16 56:3 161:9 197:18 198:22 202:8 219:4 248:23 249:3 308:18,25
specificity 287:9
specifics 262:17
specs 45:18
speculation 187:24 190:22 224:24 276:8
spell 41:5
spelling 118:19
spend 137:16 138:9 282:12 283:14
spent 45:16 97:8
spike 177:23
spill 26:3
spoke 119:3 157:1
spoken 87:2 89:1 99:17 119:3,5,8,13 119:19,22,25 120:3,14,18 121:12 221:13 310:14
sponsor 105:11 105:12 124:23 125:7,21 133:10 155:12 156:8,14 185:12 196:24 197:1 275:8
sponsoring 105:9 106:6 107:21 122:22 124:15 196:22 199:22 205:9 275:6 312:4
spots 226:22
spotted 61:2
Ss 324:2
SS-25 97:8 102:3 135:16 148:11 156:5 161:22,23,24 162:5 168:21 169:4 171:3,6 172:17,23,25 173:12 175:1,4 175:22,23 176:2 177:9,20 178:21 190:7,9 213:8,15 218:5 219:13 227:17 227:22 236:1 237:22 241:19 245:12 246:1 248:10 251:2,8 251:9 255:22 256:16 258:6 261:9,14 265:20 274:20 279:11 298:11 298:14
SS-25A 135:16 227:17 244:11 245:13 246:2 247:3 248:4,10
SS-25B 135:16 227:17
SS-6 80:25
SS25.COM 4:24
SSSV 238:16
SSSVs 237:6 238:8
SSV 237:18
stack 70:17 189:1
staff 76:4
stamp 73:19
standard 4:15 25:20 168:15
stapled 194:9
start 73:3 110:6 110:9 211:6 212:2 218:19 218:22 220:23 220:25,25 221:2,4 222:25 223:24 233:23 234:3,9 268:9 311:20
started 31:9 37:21 38:5 39:3,8,11 46:7 83:4 95:24 96:4 104:7 114:12 219:9 219:12 267:20
starting 40:4 104:6 146:4 186:1 190:1 195:13 213:7 242:2,12 250:25 281:16 282:5
starts 182:18 201:10 251:19 286:14
state 1:2 2:2 3:17,18 4:15 10:16 11:16 12:9 13:11 17:14 34:13 35:14,20 41:4 47:1,12 81:12 86:3 115:2 120:8,12,15 135:15 155:2 234:23 255:3 291:24 316:7 324:1,11 325:7
stated 85:18 138:8 170:6 173:22 196:16 199:18 221:11 265:17 273:5 290:2 299:23
statement 116:22 126:22 134:25 148:9 150:21 153:19 156:12 166:11 166:23 167:3 173:2 174:2,25 175:3,6,10 178:17 243:13 243:15 245:21 254:2 265:13 270:8 274:14 276:2 278:9,17 286:11 287:14 289:9 315:13 315:15
statements 156:4 163:8 173:25 278:11
states 22:11 25:11,12 30:8 32:2 50:21 51:2 56:15 78:5,13 101:24 124:3,15 127:21 128:20 136:25 150:4 161:16 190:5 190:12 232:12 236:25 241:18 244:10 251:6 254:7 314:6
statewide 35:12
Status 5:23 133:22 134:12
statutory 234:18
steel 254:23
stenographic 12:1
stepped 31:8
steps 241:22 306:6
sticky 111:9,13 111:16 112:1,5 112:15,18,20 112:24 113:5 113:18,21
stipulate 14:20
Stoddard 4:6 12:10,10 13:1 13:10,20,25 14:6 15:22 16:7 18:13,20 18:25 20:6 21:3,18,24

23:2,11 35:4 59:9 63:19 65:25 66:4 68:1 69:4,11 69:18 72:4,16 72:21 75:4 76:1 79:12 80:3 84:15,19 85:7,24 86:13 86:18,22 90:1 90:6 91:2 92:19 99:14 100:18,20 101:2,7,12,14 102:11 103:2,7 111:15 114:10 116:11,25 122:9,14 123:7 123:12 125:22 125:25 126:6 127:1,6 128:4 128:9 131:10 131:13,18 133:2,12,17 134:8 136:24 139:7,12,15,17 139:22 140:13 140:17,21 141:1,6 143:8 143:13 144:3,8 145:7,12 146:11,15,21 146:25 147:2 151:12,18 152:12 153:5 153:10 154:5 154:15,20 157:8,12 158:17 159:4 159:10,12,19 160:3,11,15 163:20 164:8 164:18 165:23 166:8 167:13 172:15 179:11 183:4,9,20,24 186:25 187:5 187:15,19 188:1 189:4,15 190:24 191:24 192:1 193:12 193:16,21 194:5,15,19 195:2 199:20 200:10,14,18 200:24 202:10 206:3 213:4,6 216:12 220:13 220:20 221:5 222:24 225:7 233:16 242:22 243:3 250:8,12 250:20 252:16 261:12 266:11 267:3 276:9 277:12,17 280:7,25 281:7 281:12 282:19 283:1,7 284:3 284:16 285:5,9 285:13,24 286:4 287:6,25 288:20 289:8 289:25 290:25 293:14 294:25 296:6,10 297:21 299:23 300:1,5,14 301:20 302:19 303:1,17,22 309:12,16 312:7,22,25 313:6 314:25 315:2,4 316:16 316:19 318:5 318:13,15,23 319:17 320:11 320:16 321:3,6 322:7

STODDARD,... 3:5

stop 264:21

storage 1:6,9 2:6 2:9 7:9,12 8:9 8:12,18,21 9:14 11:14 21:6,11 24:16 27:14,20,23 28:2,4,11 29:1 32:19,23 33:3 36:12 42:2,5 53:12,20 54:12 55:8,14,25 56:16,22 57:17 57:17,23 58:8 58:17 59:14 61:13,17,19,23 62:1 63:2,8 67:13 71:7,15 83:6 102:3 115:6,9 118:14 149:22,25 150:6 208:1 220:23 226:21 232:10,15 233:23,25 234:4,4,22 235:13,20,21 236:22,25 237:10 238:24 241:2 251:14 252:20 257:9 257:21,23 258:3 259:9,14 261:17 265:9 265:22 266:1 274:22 312:11 312:15

storing 230:19

storm 35:24

strata 253:3

strategies 24:20 25:1

strategy 22:15 25:3

Street 3:6,12 13:14

streets 52:11

strictly 147:14

strike 75:18 107:4 140:23 152:1 154:3 160:25 162:7 166:9 170:25

string 10:10

strings 254:10

struck 162:3 179:8

studied 63:1,2 177:2 180:15

study 57:21 62:25 214:7 215:17

stuff 82:12,14 82:16 93:17

sub 25:13 32:18

subcontract 317:3,4,7

subcontractor 78:25

subcontractors 78:6,10,14,18 78:20 79:4,8 79:15,19,21 119:9 151:2

subject 4:18,21 4:24 5:23 6:6 6:11,17 7:15 7:17 9:6,10 10:11 24:22 69:14,15 90:15 118:10 132:5 133:22 134:12 134:21 140:2,5 141:11,17 144:18 145:4 154:25 157:19 193:10 293:23

submission 136:4

submit 85:25 286:17,22 287:1

submitted 16:13 49:9 130:5

subpoena 281:3 283:24

subpoenas 280:15,17,21 283:17,20

subscribed 326:2

subsequent 132:6

subset 118:3

substance 132:9 132:11 182:24

Substances 35:7 59:21

substantive 109:24 110:9 166:16

substantively 110:25

subsurface 237:13,16

success 263:2,5 264:6

successful 264:18 268:14

successfully 94:17

sudden 269:10 269:12,15

sufficient 151:10 168:14 215:6 216:22 224:13

suggest 153:15

suggested 148:12

suggesting 156:8 203:16

Suite 3:12

summaries 99:1

summarize 42:9

summarizing 220:9

summary 218:8 304:15

Summer 100:21

Sunday 133:21

Superfund 35:14,14 38:6

supervisor

295:18
supplement 25:5
supplemental 95:18 138:1 148:23,24 149:5,7,15 210:13,15
supplements 165:2
supplies 30:12
supply 29:20 30:3,4,5,7 43:15
support 78:1,7 78:15 79:5 148:5 149:3 150:20 166:16 166:22 174:17 219:4,23 220:2 275:9 283:8 289:1
supported 148:25 163:11 167:7
supporting 106:15 156:19 163:7 273:15 275:13 277:5 302:16
suppose 204:19 231:24 264:25
supposed 94:2 155:6
sure 16:25 17:5 45:18 54:23 63:9 64:1 80:25 83:11 91:2 92:9 107:14,15 108:2,25 111:1 113:8 121:14 148:17 153:5 174:19 184:24 186:16 193:4,6 198:12 202:13 204:5 217:12 228:3 240:15 244:25 249:22 256:22 257:22 263:12 272:8 273:17 309:3 312:24 317:24 318:15
surface 53:20 54:8 62:14 182:1,2 186:9 235:7 251:2,8 251:22 254:4 254:10 255:12 255:15,20 256:1,15,21 259:8 261:10 261:14,15,19 261:20 262:15 262:22 263:9 263:11,17 264:1 267:12 267:20,25
surprisingly 273:21
surveillance 265:19
survey 65:2,3 177:11,12 179:9
surveys 169:4 169:11,12,15 169:17 171:20 173:12 177:15 298:9
Suryanarayana 101:17
suspended 180:17,19
sworn 12:23 13:4
system 30:15 93:24 94:3 236:1 258:8,13 265:18 266:14 267:23 269:19 271:17,20
systems 32:12 254:8 257:9

T

tab 111:18 112:5
table 131:25 132:2 161:14 218:8,11 220:9
tabs 112:6
tacked 272:9
take 33:25 52:10 65:25 72:5 104:18 112:11 113:3 114:10 159:4,10 164:1 174:20 184:19 193:23 194:20 195:23 200:14 213:22 215:15 217:19 219:5 240:3 296:2 317:13
taken 2:16,18 11:21 241:22 278:12 325:9 325:19
talk 96:4 179:22 179:24 180:2 279:23 307:17
talked 98:12 111:1 118:25 121:4 216:15 263:24 307:12
talking 17:8 92:16 99:6 179:19 195:19 196:5 220:7 231:2 263:10 269:3 299:6 308:25 320:20
tank 33:1 257:9
tanks 32:20,23 35:25 67:13 257:21,23
team 34:14 35:16 36:9,15 208:17
technical 22:11 24:20,25 25:7 25:8 26:25 51:10,12 54:11 56:20 69:17,25 70:2,9 78:7,15 79:4 108:20 109:17 119:14 137:23 149:10 165:2 208:3 209:18 210:13 212:16 254:14 282:25 313:20
technique 215:2 243:8,22
technologies 214:4 275:11
technology 217:5 236:24 238:2 260:4 273:19,25 274:3,8,12
telephone 34:2
tell 22:21 23:10 37:13 48:14 56:11 89:18 110:20 117:19 139:25 140:2 193:5 198:15 204:22 214:6 217:1,7 218:16 226:3 256:4 278:19 297:4,9 301:6 302:11 306:1 309:4 311:13
telling 56:12 256:12 293:3
temp 169:3
temperature 65:2 168:21 169:11,14,16 171:20 174:24 175:4 176:24 177:1,5,6,9,11 177:12,13,15 177:23,25 178:3,4,17 179:9 227:20 227:22 228:6,9 229:13 231:4,7 273:20 274:8 298:9
temporarily 214:21
ten 16:16,17
tense 102:10 201:25
tenure 36:18,23 43:5 59:15
tenures 60:7
term 75:25 201:25
terms 17:18 56:1 130:2 209:13 215:19 230:6 252:2 260:14,22
terribly 116:9
test 64:16 308:13
testified 13:7
testify 54:23 77:4 283:2,8 285:15
testifying 24:3 43:1 52:21 57:1,13,14 58:19 60:23 311:5 325:12
testimonies 58:15
testimony 5:5,17 5:20,24 6:8,14 6:18 7:6,15,17 8:6,15 9:11 15:8,10,13,18 16:1 20:1,2,4 20:12,13,19,23 21:5,9,10,13 21:16 22:6 26:16 49:9 50:17 52:24 54:19,21 57:2 57:3,10 58:24

77:18 80:7,14
81:19 83:22
92:15,18,20
93:7,17 94:21
94:23 96:25
97:5,14,17,25
98:1 99:3,4
103:11,23
104:8 105:4,10
105:13 107:1,2
107:21 109:1
109:12,13,16
110:4,14,21,25
113:2,20,22,23
114:5 117:22
119:2,4,11
121:10,11
122:23 124:4
124:16,23
125:3 126:19
127:23 128:2
128:15,21,24
129:3,14,22
130:3,22,24
131:22 132:2,6
132:10,24
133:3,9,23
134:12 136:5
136:20,21,22
142:22 143:1,6
143:17,21
144:20 145:5
145:16,19,21
146:5,9,14,17
147:4 149:4
152:3,7,17
154:7 155:1,11
155:12 156:4,9
156:14 157:19
158:6,11,13,13
158:16 160:8
160:19 161:2
161:13,18
163:14,21,22
163:24 164:19
164:25 165:19
165:22 166:7
170:20 171:24
172:6,19 173:5
173:6,9 174:12
174:17 179:8
182:7,23 183:3
183:13 184:9
184:11,25
185:11,23,24
187:12 189:21
189:22 195:6
196:3,23,25
197:7 199:12
199:17,22
200:1 201:3
202:12 205:9
216:3 220:6,8
220:11,12
222:8 223:9
224:2,16 227:1
227:16 232:5
235:23 242:14
242:19 243:1
255:11 268:17
275:6,23
276:18 277:11
278:7 280:5
281:15 282:9
282:24 283:6
283:15 286:22
287:10,11
288:16 289:2
291:4,5 292:2
294:13 299:4
299:11 302:15
310:7,9 311:2
311:4,9,15,25
312:3,5,8
315:13 318:21
319:2,8,15,23
320:2,8,13,17
320:21,23
321:1,2 324:13
Testimony.docx 145:2
testing 64:10
67:21 68:5
tests 64:14,20,21
65:3 166:18
Texas 44:4,4
text 89:16,16,17
140:11 141:19
273:8,10
thank 13:1,15
14:18 16:6,8
18:4,20 21:18
25:10,23 43:3
51:17 56:13
58:4 61:9,15
72:4 76:1
97:23 118:21
120:10 122:9
131:10 133:12
140:25 144:3
146:15 151:12
153:20 157:5
161:6 186:5,25
189:15 194:13
194:19 201:5
206:3 226:16
234:15 252:1
261:7 279:5
288:22 297:21
298:24 302:19
308:7 321:8
thereof 81:15
thick 137:14
thickness 64:2
65:1,20 175:22
176:2 214:22
214:22 243:7
243:19 253:5
thin 147:24
thing 41:2 96:5
112:5 117:5
131:1 177:17
177:21 179:8
185:23 195:19
212:14 233:11
235:7 260:12
261:16 275:17
278:8 292:2
295:4
things 82:18
108:4,6 155:20
156:11 173:4
173:23 179:10
206:22 213:25
239:14 243:23
260:5,9 264:13
264:16 278:18
297:8 305:8
think 15:5 19:24
21:12,17 26:23
26:24 32:4
34:1 36:3
39:17 40:14
42:9 43:7,8
45:10 49:17
50:9,14 54:15
54:18 55:23
60:25 62:11,12
63:23 64:25
65:15 69:21,21
74:2,19 75:9
83:4,19 85:21
86:8,15 88:3
90:20 91:10
92:1 95:7,15
96:13 97:10,21
101:13 106:15
107:11 110:16
112:22 113:21
118:5 127:25
129:17 136:13
137:22 138:3,4
138:18 140:15
140:18 142:6
144:24 146:1
147:16 148:9
148:20 150:24
151:11 155:12
156:3,3 157:1
163:12 166:4
167:8,20,25
168:7,16
169:13,18
170:8,8 173:20
174:10 177:8
179:9 182:6,6
185:14 188:20
190:21 191:11
191:18 192:12
197:12,20
198:25 199:8
200:6,6 202:21
203:1,2,20
204:13 205:3
206:1,1,20
211:24,25
212:8,11
213:25 214:8
214:19 215:1,8
215:15 217:10
223:15 224:17
225:22 228:24
230:3,8 235:10
237:21 238:10
239:11,20
240:12 242:18
243:15,16
244:2 248:21
252:5 256:17
256:20 257:7
258:4,15
259:10,16,19
259:22 260:9
260:11 261:25
262:11,20
267:15,21
268:11,15
269:2,22 272:7
272:22,22
273:8,10 274:5
275:19 278:7
280:6 281:14
284:12 285:2
290:4 292:19
294:21 295:10
295:11 297:8
298:8 301:16
302:18 305:12
308:3,4 309:2
311:4 312:18
312:22 313:8
313:12 316:2
316:15,17
317:18 318:16
319:10

thinks 253:15
third 150:8 241:18 267:5 281:4 282:17 283:24 289:15 304:19 313:20
third-party 209:9 286:6 297:16
thorough 149:2 170:7 171:7
thought 55:14 138:14 148:14 162:8 174:16 180:1,21 182:22 183:2 238:2 268:10 290:11 305:9 305:15 306:20 306:23
threat 259:11,14 259:23
three 40:16 42:3 46:1 61:11 95:23 107:12 116:6 189:7 234:16 237:21
three-quarters 313:14
three-year 39:24
thumb 94:9 305:11,22 306:22,24 307:1,3,21
Tidewater 224:20
tied 106:10 256:20
tier 316:24
tight 226:22
tighter 319:23
time 4:8 11:18 13:16 14:14,16 17:21 21:13 29:5,11 31:2 31:22 33:11,16 33:17,25 35:11 38:19,21 39:5 40:8 45:17 58:15 59:18,24 60:5,7 66:17 81:17 82:15 90:17 91:3 93:15,16 94:22 95:22 102:9,13 102:22 103:24 107:25 108:13 109:6,7,16,22 110:13 121:16 121:20 137:9 137:16 138:9 146:2,16,20,20 148:24 151:13 159:9 163:2,8 163:11 164:10 164:24 197:24 200:20 204:3 205:21 206:23 207:5 219:24 223:11 224:4,6 228:2 234:1 237:18 248:16 261:11 268:4 269:21 270:20 271:23 273:6 273:19 274:5 282:13 283:11 283:14 285:8 285:25 287:19 287:24 289:7 293:7 298:20 304:24 305:13 305:13 308:22 309:9 311:3 318:25 319:3 320:1 322:1 325:10
timeline 109:11 314:3
timelines 319:22
times 13:19 93:14 281:2
timing 65:23
titled 183:18 187:12 218:11 250:24
today 14:12,22 15:11,17 17:25 18:14 19:4 22:19 60:21 80:4 112:18 133:1 198:16 290:16 315:14 318:4,19 320:17
today's 11:17 12:2 14:14 15:2 19:22 20:14,20 57:6 80:5 104:2 220:17
told 110:16 122:6 171:15 176:12 192:5 276:25 290:9
toluene 278:15
tool 64:24 65:17 65:18,19 66:11 66:22 243:25 308:11 309:7
tools 66:6 214:15,18,20 243:11
top 103:14 123:24 134:10 140:5 152:23 162:10 226:17 236:10 304:2 316:24
topics 118:24
topography 182:20
TOTAL 322:6 322:16
touch 47:23 132:11
Tower 3:6
Toxic 35:7 59:21
track 105:8
tracking 140:19 153:2 155:2,23 164:7
trained 45:8
transcribed 325:16,19
transcript 11:6 11:9 12:2 16:3 90:14 221:19 221:22 286:11 289:18,22 324:12 325:18 325:20
transcripts 15:3 26:5 85:9 95:11
transfers 307:11
transient 179:15
transition 37:3,5
transmissibility 182:20
transmittals 308:2
transmitted 74:12 95:5 151:23 305:25 310:7
transmitting 151:24
travel 14:16,16 14:20
treatment 44:21
tree 28:9,17 42:4
tried 60:10 96:3 308:5
triggered 180:1
trimming 42:4
trouble 93:19 313:11
true 69:21 192:4 233:22 236:20 264:23 324:12 325:18
truth 285:15
try 17:2,10 31:12 286:1 306:7
trying 37:20 62:12 93:16 108:16 199:21 222:4 294:9
tube 241:3
tubing 62:22 214:22 236:9 236:14 237:20 238:18,23,25 239:2,7,12,13 239:14,22,23 240:4,7,10,12 240:24,25 241:2,7,11 267:11
tubular 231:10
Tuesday 146:23 309:21
turn 19:6 30:25 74:10 126:9,16 131:25 152:17 162:9 184:14 193:23 226:19 232:11 243:4 244:8 275:20 279:6 281:15
turned 38:2 148:15 204:6
turning 47:22 77:23 161:12 176:24 195:9 196:9 207:8 222:4 241:17 274:19 296:7 304:10 314:2
Twenty-Second 2:21
two 20:9 23:6,19 25:24 36:18,21 37:1 42:5 44:3 44:24 72:13 107:12,15 114:15 134:9 138:18 139:19 157:23 159:22 161:10 179:10 232:22 233:10

253:19 272:24 285:4 292:11 304:1
tying 287:21
type 147:13 150:25 151:3 168:8 208:10 216:16 229:21
types 29:9 32:23 64:23 66:6 190:13 226:23 293:11
typical 142:9 265:13
typically 36:11 65:21 111:8 112:6 214:3 246:19 260:16 278:14,16,18

U

U904G 1:10 2:10 7:12 8:12 8:21 115:10
UCAN 15:11 50:1,8 131:23 132:24,25 133:5,8
UCAN's 50:3 132:25
Uh-huh 51:21 129:24 179:21 192:16 240:8 263:12 310:13 310:25
unaware 243:10 248:14,19
UNBINDING 11:6
unclear 295:5
uncomfortable 185:10
uncontrolled 1:8 2:8 7:11 8:11,20 115:8 161:20
undercounted 229:20
undercounting 229:17
underground 9:14 21:6 27:14,20 28:2 28:11 29:1 32:19,23 42:5 67:13,15 149:22 150:6 257:9,21,23 258:3,5
underlies 290:11
underline 111:5
underlying 136:10 163:10 174:7 197:10 197:14 209:24 210:3 220:3 233:18 234:3 234:11 273:15 283:13 289:2
Underneath 27:2
undersigned 324:9 325:6
understand 20:2 25:8 68:21 81:18,21 86:16 110:13 150:15 150:19 166:18 166:21 174:19 184:17 199:3 199:21 222:5 248:8 252:8 268:1 269:25 272:20 273:4 276:2 279:3 291:22 292:6 293:16 294:10 294:15,17 296:3 318:9 320:5
understanding 14:15 15:12 63:21,25 86:15 90:17,22 91:7 91:10 109:11 121:8 132:19 133:24 134:16 139:3 167:1 170:2 197:10 197:13 210:20 235:15 251:13 252:18 253:1 254:3,12 255:24 266:6 269:8 273:14 275:7 276:5 277:3 286:13 288:23 291:18 292:3,22 309:6 313:23 319:18
understands 164:12
understood 23:5 85:7 105:6 110:3 146:11 194:13 199:20 200:3,6,9 231:24 291:16 304:24 319:14 320:14
Unfortunately 286:14
unit 9:14 21:11 27:24 55:8,14 55:25 57:17,23 83:6
United 30:8 32:2 50:21 51:1 236:25
unprotected 254:23
unrelated 22:23
unsafe 300:18
updating 116:23
uploaded 94:10 305:11,16 306:3,21,23 307:3,5
Urban 51:19
usage 236:21
use 15:17 16:3 64:24 90:24 111:9,13 113:5 141:21 142:17 155:11 156:9 182:9 199:13 201:24 247:5 271:24 300:20
useful 83:23 217:16,18 244:14 245:15 247:9 248:6,25 269:19 271:15
useless 271:5
uses 113:13
USIT 66:10
USITs 64:24
usually 26:8,17 27:23 62:10 70:11,12 82:17 156:10 218:18 254:22
utilities 1:1 2:1 3:17,19 6:13 7:6 8:6,15 10:7 10:18 11:15 12:20 25:12 29:18 36:13 41:13 42:4 48:23 52:2 53:23 54:17 56:17 72:25 75:6 81:9 85:3 97:24 115:1 117:24 235:2,3 280:24 299:19
utility 51:23 52:9 55:10 59:13 91:8 117:17
utilized 84:7

V

v 282:5
vague 90:25 102:9 199:10 261:11
vagueness 199:15
valid 181:14
validate 218:14
validating 108:22
valuable 290:6
valve 230:24
valves 237:14,16 237:23
Van 3:20
variation 209:14 253:16
variety 24:22 45:7
various 64:22 132:4
vary 27:22
vented 56:9
verbally 17:3
verbatim 325:14
verified 106:11 136:14
verify 105:23 106:10,13 175:24
Vernon 44:4
version 74:24 138:15,16 139:4,24 143:22 145:20 153:21 157:24 158:20,23,25 160:7,18 161:3 188:2 189:19 190:11
versions 7:17 138:19 157:20
versus 50:21 205:5 258:3 262:2
vertical 258:5
Vertilog 308:11 309:1,2,7
Vertilogs 308:18 309:7
vibration

273:20
video 11:18
videographer 3:25 11:11,23 12:21,25 13:21 14:1,4 72:6,12 111:10,12 114:14 116:5 116:12,15 159:14,17 189:2,6,11 194:22,25 222:13 250:10 250:16 300:7 300:10 302:21 302:24 315:6,9 321:9
videotape 15:2
Videotaped 2:14
view 29:3 172:18,24 202:20,24 205:12,21 215:5 228:17 230:14,25 231:22 255:21 268:20 299:17 301:14
viewing 225:4
views 229:12 285:3
violation 201:16 202:17,25 203:14 206:15 206:16,18 218:15,17 219:5,15 221:2 221:4 222:7,20 223:10,24,25 224:16 225:9 227:7 232:18 234:12,18 251:10 262:15 262:20 263:7 265:16,16 272:14,25 273:3 275:22 276:17 277:5,8 278:1 279:1 283:3,9,10 284:4 286:20 286:25 287:3 288:19 290:10 294:7 299:14 299:14,18,18 301:15,24
violations 69:12 99:1 110:21 147:18 161:19 171:24 172:5,6 172:19 173:21 195:13,15 196:2,11 197:4 197:15 198:6 202:7 204:4,11 204:15 205:4,8 205:12,17 218:8 220:9 227:3,8,11 229:22 233:10 233:20 255:11 273:14,16 274:20 279:23 285:13 286:18 286:23 287:9 287:21 288:6 288:24 291:3 292:24,25 293:2 296:11 299:10 300:23 301:2 302:7,17 312:1,10
Virginia 45:3,4
vitae 4:14
vital 217:22
void 11:7 325:21
volume 11:13 72:8,13 107:14 114:15 116:6 138:5 149:9 189:7,12 209:13 250:13 250:17 321:10
volumes 95:19 210:14
voluminous 94:13

W

wait 17:11,12 49:11 180:8 300:8 315:5
waiting 180:9 267:25
waive 15:24 288:1
walked 155:25 185:7
wall 64:2,25 65:20 175:22 176:2 236:15 243:7,18
want 31:6 34:25 59:23,25 78:12 79:11 102:1 105:3 112:14 159:11 181:11 184:7 195:23 198:25 199:12 200:17,18 212:3,23 225:17 230:21 235:23 238:25 254:14 260:10 265:5 285:25 288:15 289:5 293:23 294:19 296:2 300:13 312:23,24 315:17 316:14 317:9,23 318:5 319:11,12 320:6,7
wanted 15:20 52:8,12 54:9,9 148:25 172:10 179:24 180:1 217:2 285:10 292:23 295:4 306:5 316:4
wants 205:20 315:14
washed 35:24
Washington 34:13 47:11
wasn't 33:22 42:15 55:24 57:25 109:19 109:20,21 113:8 125:2,9 148:16,17 163:7 167:10 186:23 229:1 243:17,18 247:20 270:24 271:9,15 298:13 307:9 314:12 320:17
waste 32:18 35:18,23 37:18 44:20 181:19 205:21 287:19 289:7 317:13 317:17
wasting 285:8
water 42:2 62:7 178:7 182:9 215:11 235:5,6 253:2,6,16,20 253:23 255:16 255:25,25 256:6,13,15 259:25
way 20:3 31:4,4 74:5 112:7 138:3 173:21 183:2 202:3 205:8 224:10 229:16 233:17 261:9,14 267:21 270:25 271:19 288:5 290:6 291:6 296:3 300:19 305:18 307:9 313:15
ways 121:9 176:11 253:18
we'll 15:4,19 47:23 86:18 91:4 114:12 140:24 159:24 172:7 193:12 242:20 303:2 319:20 320:8 321:1
we're 14:7 17:7 17:8,18 22:19 27:7 85:24 86:20 92:16 101:2 143:8 144:4 145:7 146:4 172:7 195:18 216:7 220:7,8 263:10 279:19 284:12 284:20,25 285:20 289:6 290:13 291:8 292:5 294:19 295:14,21 299:12 308:25 315:5 318:6 319:22,23 320:20
we've 28:25 96:21 124:7 159:12 279:18 284:11,24 286:13 293:5 293:21 318:19
web 96:2 313:10
website 291:25
Wednesday 1:17 2:23 11:2 115:17 116:2 151:22 154:24 157:18 322:3 323:3
week 74:2
week's 74:10
weekend 135:6 136:3,8
weeks 73:24 95:23 124:4

269:4,17
weeks' 109:22
weight 180:10 264:8
weighting 247:19
weird 64:8 273:10
well-control 68:9 149:20 150:8 152:24 180:13 246:15 246:19
well-kill 68:9 137:2 247:14 248:15,20 250:5 268:10
wellbore 232:9 232:14,25 233:12 236:1
wells 28:4 37:22 55:4 56:7,8 57:20,22 62:1 62:3,6,7,10,13 80:22 135:16 177:17 178:9 181:19 190:9 214:25 215:10 215:12,15,16 217:11,22 219:11 223:19 224:8 225:6 226:21 235:21 236:24 238:3 238:19 240:5 242:2,4,8,12 252:5,9,24 253:9 258:3,5 258:7,13 259:9 261:2,4,17,19 262:4 264:12 264:18,20 267:14 298:17 317:12
wellsite 251:8
went 28:18 37:6 45:13 47:5 82:25 83:7 105:24 106:19 148:18,21 173:6 184:25 185:4,4 186:23 197:3 214:8 245:14,24 246:21 275:18
weren't 108:5,6 108:9 110:6 112:4 156:7 247:19 275:2 280:18 305:15 307:6
west 3:12 37:19 37:22 44:4
West's 9:15
wet 75:2
WHEREOF 326:1
whichever 73:4 98:3
Whiting 45:10
Whitney 100:9 101:16
William 100:1
wire 66:22 308:13
wish 13:21
withdrew 198:3
withheld 202:9 205:5,6 300:16
withholding 206:17
witness 3:17 4:3 10:21 12:22,23 12:24 16:19 18:11,15,18 21:1 23:6 35:2 49:7 50:3 63:16 68:25 69:15 74:21 77:2,14 79:24 82:21 101:11 101:13 103:17 103:20 107:18 111:11,13 124:15 125:18 125:24 136:21 146:12,24 147:1 164:16 167:12 172:14 179:3,6 189:5 191:25 193:20 194:11,14 199:13,19 200:22 202:3 205:19,22 216:4 220:12 220:14,18,21 222:14 225:1 266:24 280:6 280:24 282:24 283:11 284:2,9 285:5,16 287:20 288:14 288:17,25 289:9,19 290:9 293:23 297:20 300:11 311:5 312:23 315:17 315:20,22 316:17 322:4 323:2 326:1
witness's 199:21
witness(es) 122:22
witnesses 28:21 156:23 280:2 280:21 283:17 325:11
wonder 301:4
wondering 65:23 137:4 238:8
word 90:24
worded 79:11
wording 204:18
words 17:5 57:24 59:25 76:4 142:14 243:20 284:19
work 5:24 6:6,8 9:13 19:10,20 19:25 20:11,18 20:23,25 29:6 29:24 31:13,16 32:6,7,8,10,11 32:15 33:15 34:2 35:10 36:1,6 37:14 38:25 40:15 42:15,19,25 43:15 49:6 53:4 54:2 60:8 60:13 61:22 65:6 66:2 72:25 76:23 78:1 79:3,23 81:18,23 84:3 84:5,8 92:14 98:13 109:23 109:24 110:9 110:23 112:3 117:16 119:1,3 119:14,20 121:21 133:23 133:24 134:1 134:13,16 141:12,16 155:3,4,7 163:16 168:8 171:9 181:15 195:17 201:15 202:16 203:13 237:24 240:16 242:24,25 283:20 292:8 298:15 317:7 318:20,25 319:4,6,9 320:7,9,21 321:4
worked 21:15 29:4 30:1,2 33:19 34:12,13 34:14 37:7 45:7 61:19 72:1 79:18 108:6 257:5,10
working 22:19 23:23 25:22 26:8 33:20,23 70:23 76:5 108:1 110:17 119:9 121:15 121:17 122:4
works 121:14 254:13
wouldn't 109:15 110:9 112:7 137:15 138:8 171:20 191:13 191:16 192:6 206:23 208:6 213:24 214:10 217:8 219:3 230:10 253:13 264:8 271:24 285:21 305:8 320:12
wrap 285:4
write 25:2 76:25 104:15 113:14 117:22 128:24 145:18 147:14 147:20 154:11 184:19
writing 38:10 86:11 105:7 113:18
written 21:5,8 74:5 81:1 85:25 92:23 109:8 113:24 150:21 155:13 156:8 173:6 293:20
wrong 89:10 169:19 178:20 195:19 218:25
wrote 60:10 104:19,19,22 105:1 113:15 135:5 140:10 145:21 154:13 157:16 176:22 191:10 303:24

311:9 312:9

X

X 207:1
xylene 278:15
XYZ 150:7

Y

yeah 23:2 53:14 63:19 86:8 88:14 91:21 102:24 112:12 159:12 185:18 191:22 192:11 194:5 196:7,8 196:9,15 220:20 228:14 246:10 261:3 263:15 284:9 303:24 315:3,5 315:19,21 319:20 320:11 320:15
year 11:17 31:1 31:6,22 46:6 72:9,14 114:16 116:7 121:12 129:13 181:11 181:13 189:8 189:13 221:3 223:8 250:14 250:18 321:12
years 29:6 33:18 33:23 36:19,21 37:1,17 40:16 44:22 46:1 87:24 170:4 181:18 225:2 316:6
yellow 113:11
yesterday 197:21 290:14 290:17 291:25
Yip-Kikugawa 76:6 87:22 144:12 290:22 295:16
Yip-Kikugaw... 295:9
Yorktown 45:1 45:2

Z

0

0:08 322:11,15
0:21 322:14
0:52 322:10

1

1 2:15 4:19,21 4:24 5:11,15 5:24 6:6,11,18 7:15,18 9:7,12 10:14 11:13 72:8,13 97:11 97:19,19 114:15 116:6 127:14 161:12 161:12 186:7 188:21 189:7 189:12 218:8 250:13,17 274:20 277:23 290:3,10 314:2 321:11
1-1 4:12 18:21 18:22
1-1-18 9:16
1-10 5:12 126:2 126:3 127:13
1-11 5:14 127:2 127:3
1-12 5:16 128:5 128:6
1-13 5:19 131:11 131:14,15
1-14 5:22 133:13 133:14 139:15 141:11
1-15 6:5 141:2,3
1-16 6:7 143:9 143:10 188:22 188:23,25 189:17,19 192:2
1-17 6:10 144:4 144:5 146:22 309:17,23,24
1-18 6:12 10:14 145:8,9 149:18 153:7,7 309:17 309:23,24 310:1,2,6
1-19 6:16 151:14 151:15
1-2 4:14 21:20 21:21 71:1,2 117:2
1-20 7:5 152:8,9 155:18
1-21 7:14 154:16 154:17
1-22 7:16 157:8 157:9 159:22 160:7,24 161:4
1-23 8:5 159:24 159:25
1-24 8:14 160:11 160:12 164:5 165:7 168:18 175:19
1-25 9:5 183:5,6 184:2
1-26 9:8 183:20 183:21
1-27 9:9 187:1,2
1-28 9:13 187:15 187:16 189:17 189:18,20 191:24 192:18
1-28-16 4:23
1-29 9:15 193:12 193:13 194:7
1-3 4:15 72:17 72:18 81:7
1-30 9:17 200:11
1-31 9:20 277:13 277:14
1-32 10:5 281:8 281:9
1-33 10:10 303:18,19 304:12
1-34 10:14 309:12,13
1-35 10:15 313:3 313:6
1-4 4:17 84:15 84:16
1-5 4:20 90:2,3
1-6 4:22 101:3,4
1-7 5:5 103:3,4 146:13 164:1,6 184:12 195:4 201:7 207:9 212:25 218:9 235:24 250:22
1-8 5:7 122:10 122:11
1-9 5:10 123:8,9 124:8 125:23
1,597 136:2
1.1 206:19 299:15
1.11-02-016 53:2
1.19-06-016 11:16
1:02 322:8
1:06 322:9
1:10 114:12
1:15 114:11,12
1:24 116:3,8,13 116:16 322:9
1:32 322:7
1:34 322:12
10 2:17 66:1
10-19 311:10
10:55 72:10 322:7
101 4:22
102 9:19
103 5:5
11 10:7 162:9,13 164:5,13 255:5 255:6
11-14-19 6:14 7:13 8:13,22
11-17-19 5:23
11-18-19 6:5
11-19 311:10
11-19-19 6:10
11-20-19 6:16 7:14,16
11-21-19 9:5,10
11-22-19 5:6
11-30-18 9:18
11-5-2019 4:16
11-8-19 4:20 10:10
11:13 72:15 322:8
111 161:21
112019 6:18
112119 9:11 187:13
12 128:14
12-15-15 10:18
12-21-18 9:19
12-31-1969 223:6
12-31-2009 220:4
12:15 11:3 114:17 322:8
122 5:7
123 5:10
124 226:21
126 5:12
127 5:14
128 5:16
13 4:6 131:12 232:4 234:17 242:2,12
131 5:19
132 282:1
133 5:22
14 9:16
1400 3:12
141 6:5
143 6:7
144 6:10
145 6:12
15 29:6
1509013 15:10 15:19

151 6:16
152 7:5
154 7:14
157 7:16
159 8:5
1597 135:6
16 94:15 95:13 96:10 136:8,11 136:17 137:1,6 137:9,14 138:1 138:8,12 197:23 202:4,5 206:11 222:9 232:11 234:17
16-2320-000 49:14 116:21
160 8:14
1600 5:20 131:23
17 4:16 10:23 127:23 133:21 134:7 135:5 140:9 175:18 220:21 234:17
17-09-023 10:9
17th 134:11
18 4:12 201:10 204:9,12,21,22 204:23,23 205:23 206:8 235:24
183 9:5,8
187 9:9,13
1895 32:4
18th 141:10
19 146:25 237:4 237:9
193 9:15
1969 222:22 223:6 224:22 225:16 227:9
1973 223:15
1977 46:8
1978 169:4 172:17
1980 43:7
1980s 30:1
1982 38:22
1983 33:8 40:6,7 40:13 43:7 60:11
1984 227:5
1985 37:10 39:24
1988 219:10,12 241:20 242:9
1989 273:22
1990 31:18 37:10 39:24 242:3
1990s 31:18 67:5
1993 35:5 39:12 39:18,21 40:7 40:13 41:16
1994 227:9
1995 34:7 35:6 36:24 39:21
1997 34:7 36:24 41:17
1998 31:22
19th 144:12 146:24 309:21

2

2 10:13 21:4 59:11 60:18 61:11 71:2,18 97:20 107:14 123:20,23 126:17 127:14 127:21 132:1 189:23 191:20 191:21 193:2 193:23 194:3 196:10,14,14 247:25 277:23 278:9,10 279:8
2's 194:1
2-7/8 240:21
2:30 159:15 322:9
2:47 159:18 322:10
20 10:23 41:21 41:22 154:25 157:18 168:17 237:14 242:4,8
200 9:17 181:12
200- 53:8
2000 31:7,7,19
2002 31:23
2004 31:7 41:17
2007 242:2,3,12
2009 221:1,2,8,8 232:16 233:8 233:24
2011 53:1 129:6 129:8,10
2012 128:14 169:5
2014 50:20 214:7
2015 137:3 170:5 227:5 232:10,16 233:6,7 241:23 244:16 266:2 279:11
2016 48:17 49:12 50:21 59:12 101:18
2017 50:15
2018 10:7 47:25 48:17 49:12 50:16 53:8 59:12 170:5
2019 4:17 47:25 48:3 73:4,10 73:15,20 123:22 124:4 127:19,23 133:21 134:7 135:5 140:9 142:22 146:23 146:25 151:22 154:25 157:18 304:13 322:3
2019.1118.Draft 6:8
2020 1:17 2:24 11:2,18 72:9 72:14 114:16 115:17 116:2,7 189:8,13 250:14,18 321:12 322:3 323:3 324:17
2094 13:6
20th 151:22 152:16
21 4:14 10:24 73:4,10
213 3:13,14
21st 190:12 319:24
22 5:21
22nd 11:20 136:5
23 227:5 232:10 232:15 233:6,7 241:17 266:2 279:11
244-2954 3:13
25 80:24 298:13
25-A 80:24
25-B 80:24
25A 173:16 258:6
25B 173:16 258:7
26 186:1,4
27 243:4
277 9:20
27th 319:24 321:2
28 101:18 178:16
281 10:5
29 226:22

3

3 4:14 5:9 19:6 76:23 122:19 123:18,20,23 126:9,22 127:14 146:14 195:9,11 218:7 222:4,7,16 226:23 235:25 258:17,18,18 258:19,22 259:1,5 277:23 281:25
3- 240:13
3-12-12 5:18
3-21-19 9:22
3-7/8 239:4
3-inch 240:17,22 241:3
3/4 255:6
3/4-inch 255:5
3:39 189:9 322:10
3:44 189:14 322:11
3:52 194:23 322:11
30 179:12
300 2:20 11:20
3008 9:16 193:17,19 194:8
303 10:10
309 10:14
31 227:5
3106 192:21 193:23 194:8 194:12
311652 1:25 115:25
313 10:15
3180 192:21 194:8
3181 192:21 194:8
320 195:14,20 195:21
322 4:8
3220 192:21
326 2:16
33 181:21
3315 194:8
3316.2 194:9
3320 194:8
3403.5 192:22

194:9
36 149:17
153:10
3602 5:20
37 152:17
390 280:10
391 280:10

4

4 4:13 5:13,15
9:8,23 10:18
77:24 92:1
126:16 218:7
219:7 226:22
4-17-17 5:21
4:25 195:1
322:12
400 62:12
415 3:7,8,21
42 10:12 165:6
43 286:12
44 250:22
286:12
442-1000 3:7
442-1001 3:8
45 250:23 251:6
254:6 255:3
451 98:2 161:19
171:24 172:19
191:10 201:16
202:17,24
206:19 232:18
234:19 251:10
262:16,20
263:8 288:19
299:14,19
300:11
46 182:14
47 182:14
265:15 270:8
48 267:1

5

5 1:17 2:24 11:2
73:15 115:17
116:2 218:7
322:3 323:3
5-inch 240:13
5:15 147:4
5:59 250:11
322:12
50 207:21
208:11 273:18
500 105:19
181:11
505 3:20
51 104:6 274:19
52 196:13,14
275:20 279:6
54 227:11,12
296:7
55 280:8
555 3:12
56 5:18 280:14
281:15,17
57 281:19
58 281:19
583 4:19 10:9
85:3,5
5a 77:8
5th 11:17 72:9
72:14 114:16
116:7 189:8,13
250:14,18
321:12

6

6 6:9 80:24
123:22 124:3
195:9,11 218:7
248:1
6-27-19 1:4 2:4
115:4
6:03 322:13
6:22 250:19
322:13
60 213:14,19
227:11
62 201:7
629-9620 3:14
63 226:22
633 13:14
66-D 10:9
68 154:10

7

7 10:7 73:20
127:19 213:2,2
213:3,4,5,7
222:23 226:20
255:6
7-13-18 10:6
7-inch 165:10,17
166:2,12,18
175:22 233:5
236:2,18 239:5
240:5,12
255:13,21
256:2 267:7
7:39 157:18
7:42 302:22
322:13
70 46:7
703-1973 3:21
71 6:15 7:13
72 4:15 8:13
244:8
74 8:22
76 184:14 186:4
186:5 219:15
219:16
77 184:14
79 10:24

8

8 4:17 9:14
226:17,18
270:8 304:13
8:06 302:25
322:14
8:27 315:7
322:14
8:31 315:10
322:15
8:39 2:23 116:3
321:13 322:15
80 43:8 105:16
81416 13:14
82 105:17
83 43:8,8
8300 178:14
84 4:17 219:5,6
85 38:22
851 56:18
86 5:6
8th 84:23 85:14
90:10

9

9 146:23 213:2,3
213:4,5 226:17
9-23 311:11
9:04 322:16
9:19 84:23
9:23 2:22 11:3
11:18 322:7
9:25 134:7 135:5
140:9
9:26 14:2,5
90 4:20
90013 3:13
90071-3132
11:21
90s 30:2
94102-3298 3:20
94105 3:7
95 195:13,20
201:13,22
202:14,22,23
203:12,23
204:12,20
205:23,25,25
206:8
9915 1:24 2:25
115:24 326:8

Ex. I - 11

Pressure Equipment Integrity Incident Investigation

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SoCalGas-5.0632

Contents

Page

1 Scope 1
1.1 General 1
1.2 Industry Scope 1
1.3 Flexibility in Application 1
1.4 Pressure Equipment Integrity (PEI) Focused 1
1.5 Types of Pressure Equipment Covered 2
1.6 Types of Equipment Excluded 2
1.7 Target Audience 2
1.8 Organizational Responsibilities 3

2 Normative References 3

3 Terms, Definitions, Acronyms, and Abbreviations 3
3.1 Terms and Definitions 3
3.2 Acronyms and Abbreviations 5

4 PEI Incident Tracking 6
4.1 PEI Incident Types 6
4.2 Documenting PEI Incidents 7

5 PEI Incident Causes 8
5.1 Types of Causes 8
5.2 Determining Causes 9

6 PEI Incident Investigations 10
6.1 General 10
6.2 PEI Incident Investigation Levels 10
6.3 PEI Incident Investigation Guidelines 12
6.4 Initial Response to a PEI Incident 12
6.5 Types of Evidence 13

7 Conducting PEI Incident Investigations 14
7.1 General 14
7.2 Performing Level 1 PEI Incident Investigations 14
7.3 Performing Level 2 PEI Incident Investigations 16
7.4 Level 3 PEI Incident Investigations 24
7.5 Component Failure Analysis 25

8 Training and Qualifications 27
8.1 General 27
8.2 Incident Investigation Team Leaders 27
8.3 Incident Investigation Team Members 28
8.4 Site Management Personnel 28

9 Continuous Improvement for PEI Incident Investigations 28
9.1 Information Sharing 28
9.2 Monitoring of the PEI Incident Investigation Program 29

SoCalGas-5.0633

Contents

Page

Annex A (informative) **Example Reporting Form for PEI Incidents** **30**

Annex B (informative) **Example Application of the "5-Whys" Investigation Methodology** **31**

Annex C (informative) **Example: Level 1 PEI Incident Investigation Results Form** **33**

Annex D (informative) **Example Lists of Generic Evidence to be Gathered** **34**

Annex E (informative) **Examples of Questions to Ask Eyewitnesses** **36**

Annex F (informative) **Request for Failure Analysis Form** **37**

Annex G (informative) **Example Template for Level 2 or Level 3 PEI Incident Investigation Report** **39**

Bibliography **40**

Table

1 Example PEI Incident Investigation Guidelines **13**

SoCalGas-5.0634

Pressure Equipment Integrity Incident Investigation

1 Scope

1.1 General

The purpose of this document is to provide owners/users with practices for developing, implementing, sustaining, and enhancing an investigation program for pressure equipment integrity (PEI) incidents. This recommended practice (RP) describes characteristics of how an effective investigation could be structured so organizations can learn from PEI incidents. This RP is not intended to define or supplement criteria for compliance with regulatory requirements for which companies already have defined investigation processes in place. Rather, API 585 provides a specific focus on investigating PEI failures that are precursors to potential incidents that could have significant impact on safety, health, and environment.

Significant mechanical integrity incidents are rarely the result of one isolated issue; there are almost always less severe precursors to a major failure. These precursors are frequently called near misses when they are found. Additionally, this document highlights the value in recognizing these precursor occurrences and promotes investigating them to determine the immediate, contributing, and root causes. If these precursor occurrences are uncovered, investigated, and the contributing and root causes are resolved, then major catastrophic failures of pressure equipment could be minimized or prevented.

1.2 Industry Scope

The investigation principles and concepts that are presented in this RP are specifically targeted for application to process pressure equipment in the refining and petrochemical industry but could be applied to other equipment at the discretion of the owner/user.

1.3 Flexibility in Application

Because of the broad diversity in organizations' size, culture, national, and/or local regulatory requirements, API 585 offers users the flexibility to apply the investigation methodology within the context of existing incident investigation practices and to accommodate unique local circumstances. API 585 is intended to promote the use of systematic investigations as a way to learn from unexpected leaks and equipment degradation or near misses associated with PEI.

Investigation methodologies consist of investigators collecting evidence and conducting an analysis of the evidence to determine the causes. Many types of investigation analysis methods exist and are used throughout the industry. This document is not intended to single out one specific analysis method for conducting investigations. This document highlights PEI issues for investigation and provides guidelines and work processes for PEI incident investigations.

1.4 Pressure Equipment Integrity (PEI) Focused

Investigation is a vital element for learning from unexpected discoveries or incidents (e.g. finding significantly more corrosion damage or other forms of deterioration than expected) and can be used in a continuous improvement process. Investigating and determining the causes of unexpected leaks, equipment degradation, or near misses associated with pressure equipment may be used to improve mechanical integrity programs and management systems for maintaining PEI, such as design and construction procedures, maintenance and inspection practices, and operating practices.

The Inspection, Corrosion/Materials, and Storage Tank Subcommittees of the API Committee on Refinery Equipment have produced a variety of codes and standards to guide owners/users in maintaining pressure equipment integrity and reliability, a listing is included in the Bibliography for reference.

SoCalGas-5.0635

1.5 Types of Pressure Equipment Covered

The following examples are the types of equipment considered to be within the scope of this document.

a) Pressure vessels—all pressure-containing components.

b) Piping—pipe and piping components (valves, expansion joints, sight glasses).

c) Storage tanks—atmospheric, low pressure, and pressurized.

d) Rotating equipment—pump and compressor cases and associated pressure-containing piping and pressure vessels, excluding seals.

e) Boilers and heaters—pressurized components.

f) Heat exchangers—shells, heads, channels, and pressure-containing components and tube bundles.

g) Pressure-relief devices.

h) Structural systems—integral to supporting pressure-containing systems.

i) Cooling water towers.

j) Stacks and flares.

Other types of pressure equipment can be included at the discretion of the owner/user.

1.6 Types of Equipment Excluded

The following nonpressurized equipment is not intended to be covered by this RP but could be included at the discretion of the owner/user.

a) Instrument and control systems.

b) Electrical systems.

c) Machinery components (except pump and compressor pressure-containing cases).

d) Structural equipment not associated with a pressure-containing component or system.

e) Pressure vessels or piping systems on movable structures, including piping systems on trucks, ships, barges, and other mobile equipment.

1.7 Target Audience

The primary audience for API 585 is the inspection and engineering personnel working in the PEI programs within refineries and petrochemical plants. However, investigations often require the involvement of various segments of the organization, such as engineering, maintenance, inspection, operations, and supervision. Corrective action and recommendations to address the causes may rest with more than one segment of the organization. Therefore, while the primary audience may be PEI personnel, it is suggested others within the organization who are likely to be involved become familiar with the concepts and principles embodied in this RP.

SoCalGas-5.0636

1.8 Organizational Responsibilities

Owners/users can incorporate PEI investigation into a broader incident investigation site program or develop a specific PEI incident investigation procedure that includes guidance provided in this document including roles, responsibilities, protocols, and specific activities to be carried out by site personnel in the process of implementing this RP. Management demonstrates its commitment to this RP by allocating resources and assigning responsibilities to support the PEI incident investigation system.

2 Normative References

The following referenced document is indispensable for the application of this document. The latest edition of the referenced document (including any amendments) applies.

API Recommended Practice 571, *Damage Mechanisms Affecting Fixed Equipment in the Refining Industry*

3 Terms, Definitions, Acronyms, and Abbreviations

3.1 Terms and Definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1
bias
When people or groups use their past experience or judgment to direct the evidence gathering and development of causes towards potentially incorrect conclusions or when investigators predetermine the cause of an incident and then look for confirming evidence and disregard disputing evidence.

3.1.2
chronic incidents
Frequent occurrences, especially when each occurrence alone typically has a low or minor consequence and is routine to fix.

NOTE Chronic incidents may happen routinely and may become expected and planned.

3.1.3
consequence
An undesirable outcome from an incident. There may be one or more consequences from an incident for different categories, such as safety, environmental, and/or economic. Consequences are always negative for integrity incident investigations.

3.1.4
contributing cause
A cause that increases the likelihood and/or consequence of an incident but is not the immediate or root cause. Eliminating the contributing cause will not by itself prevent reoccurrence but will likely reduce the frequency and/or consequence of any reoccurrence.

EXAMPLE An example of a contributing cause for a failure caused by corrosion under insulation (CUI) might be: the plant has poor maintenance practices for maintaining coatings, insulation, and jacketing.

3.1.5
immediate cause
The most direct or primary contributor to the incident that if eliminated or avoided would have prevented the incident. Also known as the physical cause or direct cause.

SoCalGas-5.0637

EXAMPLE For a carbon steel pipe segment that developed a hole and leaked process fluid, the immediate cause was determined to be acid that unexpectedly came in contact with the carbon steel pipe and caused the pipe to corrode at an accelerated rate.

3.1.6
integrity operating window
IOW
Established limits for process variables (parameters) that can affect the integrity of the equipment if the process operation deviates from the established limits for a predetermined amount of time. Reference API 584 (pending publication) for more information regarding IOWs.

3.1.7
investigation
The process of identifying the immediate, contributing, and root causes of incidents (failures and near misses) and developing recommendations to prevent similar occurrences.

3.1.8
investigator
The person or group that conducts the investigation by collecting the evidence, analyzing the evidence, determining the causes, and making recommendations.

3.1.9
owner/user
An owner or user of pressure equipment who exercises control over the operation, engineering, maintenance, inspection, repair, and testing of the pressure equipment.

3.1.10
pressure equipment integrity
PEI
mechanical integrity
The state of pressure equipment when it has been and continues to be designed, fabricated, installed, operated, and maintained in a way to prevent loss of containment or loss of structural stability.

3.1.11
pressure equipment integrity failure
PEI failure
The termination of the ability of a pressure equipment system, structure, or component to perform its function of containment of the process fluid (i.e. a leak or loss of containment). Loss of containment due to misoperation of equipment and not involving material damage mechanisms is not considered PEI failure for the purpose of this RP. Within this document, the term "failure" is intended to refer to a PEI failure.

3.1.12
pressure equipment integrity incident
PEI incident
A PEI failure or a PEI near miss. Within this document, the use of the term "incident" is intended to refer to a PEI incident.

3.1.13
pressure equipment integrity near miss
PEI near miss
The discovery of equipment degradation or process operating conditions outside of acceptable limits that requires immediate action to shut down the equipment and/or perform repairs to avoid a loss of containment, usually the result of some form of damage mechanism such as those covered in API 571, but did NOT result in a loss of containment or structural stability. Within this document, the term "near miss" is intended to refer to a PEI near miss.

SoCalGas-5.0638

3.1.14
pressure equipment integrity personnel
PEI personnel
Personnel in an organization assigned to maintaining, developing, improving, and implementing the organization's PEI program.

EXAMPLE Positions or job titles such as inspector, authorized inspector, inspection engineer, inspection supervisor, pressure equipment engineer, piping engineer, reliability engineer, storage tank engineer, corrosion specialist, metallurgist, etc.

3.1.15
probable cause
If, after thorough analysis of the evidence and facts, a cause cannot be fully proven but is determined to be very likely (more likely than not), then it is called a probable cause. A probable cause can be identified in any of the different causes (immediate, contributing, or root).

3.1.16
process safety incident
An incident that resulted in, or could reasonably have resulted in, a catastrophic release of highly hazardous chemicals in the workplace as defined by the Occupational Safety and Health Administration's process safety management (PSM) regulation.

3.1.17
risk
Combination of the frequency of an incident and its consequence. In some situations, risk is used to describe a deviation from the expected. When frequency and consequence are expressed numerically, risk is the product.

3.1.18
root cause
A fundamental, underlying system or culture related reason why an incident occurred or allowed the immediate or contributing cause(s) to exist. There is often more than one root cause for every incident.

EXAMPLE An example of a root cause for a failure due to CUI might be: there is a culture of only reacting to problems and not allocating resources to preventative maintenance activities.

3.1.19
sporadic incident
An infrequent or very infrequent occurrence. These incidents tend to have an unusual combination of causes and could have a high consequence.

3.2 Acronyms and Abbreviations

For the purposes of this document, the following acronyms and abbreviations apply.

CUI	corrosion under insulation
DCS	distributed control system
FA	failure analysis
IOW	integrity operating window
NDE	nondestructive examination
PEI	pressure equipment integrity
P&ID	piping and instrument diagram

SoCalGas-5.0639

QA	quality assurance
QC	quality control
PSM	process safety management
RCA	root cause analysis
SME	subject-matter expert

4 PEI Incident Tracking

4.1 PEI Incident Types

PEI incidents are unexpected discoveries or occurrences relating to pressure equipment, usually involving loss of containment or the potential for loss of containment due to some form of damage mechanism such as those covered in API 571. This document will refer to both failures and near misses as PEI incidents throughout.

The following are some examples of the two different types of PEI incidents as they relate to pressure equipment.

a) Failures:

- flange leak of process fluid (not including environmental fugitive emissions leaks);
- equipment damaged from corrosion resulting in leak of process fluid;
- through-wall crack resulting in leak of process fluid;
- equipment rupture;
- structural failure (due to structural component deterioration or physical damage to the structure) resulting in pressure equipment leak or damage requiring repairs or rerating (e.g. deterioration of external support rings);
- a process pressure and/or temperature excursion or pH excursion resulting in loss of containment and/or damage to the process equipment requiring repairs;
- heat exchanger tube bundle leak or rupture causing a loss of primary containment (e.g. air cooler tube leak or a tube bundle leak into a cooling water system with detectable emissions to atmosphere at the cooling tower). For the purpose of this RP a tube failure that does not result in a loss of containment is not considered a failure.

b) Near misses:

- discovery of corrosion or other damage/degradation that does not pass a Fitness-For-Service assessment and requires immediate repair, but did not result in a leak;
- discovery of a damaged bolt or gasket that requires immediate repair, but before any failure or leak occurred;
- structural deterioration that is found and deemed not fit for service (e.g. during potential wind loading), but before a structural failure occurred;
- process chemistry or other operating condition that is found to be outside of an acceptable process integrity operating window (IOW) for corrosion or other material degradation mechanism and requires immediate inspection or repair, but before failure or leak occurred;

SoCalGas-5.0640

— inspection or testing failure of a pressure-relieving device indicating that it would not have protected the equipment during an overpressure incident, but there was no incident that resulted in an overpressure or equipment failure;

— discovery of a compromised overpressure protection device (such as a closed block valve in the relief path or the wrong relief valve installed with a higher cold differential test pressure setting), but there was no incident that resulted in overpressure or equipment failure;

— discovery of significantly more damage than expected upon a routine inspection;

— discovery of the wrong metallurgical component installed, but before any significant damage or failure occurred;

— discovery of the wrong specification piping or fitting installed, but before any failure occurred (e.g. wrong schedule nipples installed);

— discovery of the wrong gaskets or bolting being installed, but before being put in service or before there was a leak.

Failures may be known or detected at the instant of occurrence (announced failure) or undetected at the instant of occurrence (unannounced failure). For example, a rupture of a pipe in a process plant or sudden decrease in pressure in the system is likely to be detected at the instant of occurrence and would be an announced failure. Examples of unannounced failures include a slow leak under insulation that may not be detected until a pool of fluid forms on the ground or someone notices a drip or wisp of vapor, or a slow leak from buried piping or small leak in a heat exchanger tube that may not be noticed until the next inspection.

PEI incidents differ in the typical frequency of occurrence (chronic or sporadic) and the severity or consequence of the outcome. A chronic incident typically has ongoing common cause(s) that result in recurrence of the same or similar type of outcome over time. Examples of chronic incidents include reoccurring flange leaks, continuing discovery of CUI damage throughout a plant, multiple instances of finding the wrong specification material or bolting during final inspection, and multiple cases of finding the wrong schedule piping installed as nipples. Sporadic incidents tend to have an unusual combination of causes that result in an outcome of a certain type very infrequently or possibly only once in the life cycle of the pressure equipment. Any of the items listed previously under failures could be considered a sporadic incident. Valuable lessons can be learned from investigating both chronic and sporadic incidents, regardless of the outcomes.

4.2 Documenting PEI Incidents

PEI incidents, even low-consequence incidents, provide opportunities to learn through investigation in order to identify the causes and implement improvements to prevent a potential major failure. PEI personnel should report incidents discovered in pressure equipment, including unexpected discoveries during inspections or monitoring of process operations. The tracking of PEI incident data provides opportunity to identify trends and improve PEI.

The reporting of PEI incidents should be done in a consistent manner and tracked so that the data can be more easily reviewed and analyzed. Annex A is an example of an incident reporting form that may be useful for such purpose. An incident report should be documented within a short period of time after the incident is recognized. The incident document should be reviewed to determine if an investigation is warranted. If trends are identified or suspected then that grouping of PEI incidents can be investigated further to determine underlying common systemic causes. For example, it may be appropriate to investigate a grouping of chronic incidents (e.g. several instances of the wrong gasket being installed or several instances of a minor flange leak on a feed/effluent exchanger during start-up). Reporting could be computerized to facilitate analysis for systemic causes and to improve the ability to steward follow-up items to closure.

SoCalGas-5.0641

One way to implement this work process is to select a certain frequency, such as annually, to review reported PEI incidents to look for indications of common causes or similarities. The incidents that are similar or might have common causes could then be investigated as a group. The level of investigation used should be defined in the owner's/user's investigation classification system. The consequence used for classifying a grouping of incidents might be the sum of the individual consequences for each incident.

Investigation findings and results may be recorded in a standardized format such as those shown in Annex C and Annex G. This will help in collecting relevant data and enable trending of causes to look for common risk factors or common causes that reoccur over time so that more extensive development of corrective actions or PEI work process improvements can be identified.

5 PEI Incident Causes

5.1 Types of Causes

PEI incidents are usually the result of multiple causes and may be categorized into different types. One particular way to categorize causes is into the following three different types:

1) immediate causes,

2) contributing causes,

3) root causes.

These causes are shown in the order of increasing depth of analysis:

1) identifying and correcting the immediate or physical causes of an incident will only prevent an identical incident from occurring again on the same equipment, same type of equipment, or other equipment in the same part of the process;

2) identifying and correcting the contributing causes goes further in reducing the likelihood of future similar PEI incidents on other equipment throughout the process or facility;

3) identifying and correcting the root causes will result in improved PEI management systems and work culture and should prevent or reduce the likelihood of many other PEI incidents from occurring throughout the facility or company.

An effective investigation will determine not only the immediate cause of the incident but also the contributing causes and root causes. Root causes are typically related to management systems or organizational cultural issues that need to be corrected to prevent other incidents from occurring.

Conducting investigations and utilizing a structured root cause analysis (RCA) methodology to determine the systems related causes will often reveal that there are multiple underlying causes. Most investigations can determine many of the contributing causes. Determination of the true root causes of an incident takes a thorough investigation conducted by trained and experienced personnel and is generally best accomplished with a Level 3 investigation, described in 5.2.

Any of the three types of causes (immediate, contributing, and root) can also include a probable cause. If, after thorough analysis, some causes cannot be fully proven but are determined to be the most likely causes, then these are called probable causes. The investigation team, along with the investigation sponsor, should review these probable causes to assure they are based on sound reasoning and some evidence and not personal bias. Bias can be the result of intentional or unintentional predetermination of causes.

SoCalGas-5.0642

An example to illustrate the three types of causes is as follows from this fictitious situation. A carbon steel pipe in a sulfuric acid alkylation unit failed and released alkylate. After a PEI incident investigation, it was determined the loss of containment causes were the following.

a) Immediate cause: the loss of containment occurred because sulfuric acid came in contact with the carbon steel pipe and rapidly corroded it to the point of failure.

b) Contributing causes:

— there are inadequate operating controls to prevent acid carryover in the process,

— operators did not recognize and properly react to the abnormal operating condition that caused the acid carryover.

c) Probable root causes:

— leadership did not adequately address the lack of controls on process operations,

— rigorous training of operators and retraining is not considered important to site management.

5.2 Determining Causes

Determination of causes of an incident should be based on a systematic analysis of the evidence and facts collected. During the course of the investigation, the team will determine what happened leading up to the incident and the causes. There are intermediate analysis steps to prove or disprove theories of causes. Systematic analysis of evidence and use of fact-based reasoning are usually sufficient to prove or disprove cause theories. This RP describes three levels of PEI incident investigations.

1) Level 1 is a simple one- or two-person investigation on low-consequence PEI incidents that can be done in a fairly short period of time. Level 1 uses the evidence and the judgment and experience of the investigator to determine the causes.

2) Level 2 is a more thorough investigation of medium-consequence PEI incidents that normally involves a small team and takes a bit more time to gather and analyze evidence and determine causes. The team may use casual factor or logic tree analysis techniques to determine the causes.

3) Level 3 is a more detailed investigation of high-consequence PEI incidents that involves a team typically led by a trained/experienced root cause investigator. Level 3 investigations involve the gathering of much more evidence and conducting in-depth analysis and may take several weeks to complete. Level 3 should use a structured RCA methodology to determine the three types of causes.

All three levels of investigation are designed and intended to identify the immediate and contributing causes, but Level 2 or Level 3 investigations may be required to uncover the root causes of the incident.

Each investigation, at any level, should determine the exact immediate cause of the incident, based on evidence. If the immediate cause cannot be determined, then the team or investigator should look for more evidence or consult with additional expertise or request a metallurgical failure analysis (FA). Typically, when the immediate cause cannot be determined, it means that some key evidence has been missed or is missing. If, after gathering more evidence or additional review of the evidence, the immediate cause can still not be determined, then the most probable immediate cause of the incident should be defined and clearly documented, with both the known facts and assumptions identified.

Two of the main differences between the investigation levels are in the depth of the investigation and the precision used in determining the contributing and root causes. For the Level 1 investigation, the investigator's best knowledge of the organization and systems is used to identify the probable causes. For a Level 1 investigation, the identified

SoCalGas-5.0643

causes may not be true root causes based on detailed analysis of evidence but are people's opinion based on their experiences of the cultural and systemic issues within the organization. It is important to document these causes, even if they are not precise, so that ideas can be collected and grouped with other Level 1 investigations to determine any trends in probable contributing and possible root causes. If enough Level 1 investigations are conducted and the identified probable and possible causes are grouped, this will most likely identify real systemic or cultural issues that could then be addressed to determine corrective actions.

The Level 2 investigations should be able to determine the immediate causes, contributing causes, and probable root causes of the incident based on analysis of the evidence and agreement between the team and the investigation sponsor. The Level 2 investigation may not determine all the root causes because of factors such as the experience of the investigation team and the depth of analysis. Identifying corrective actions for the causes that are identified and agreed to by the team and the investigation sponsor should help to prevent future incidents from occurring.

As discussed, because of the brevity or simplicity, Level 1 or Level 2 investigations may not be able to precisely define or prove all of the contributing and root causes. Based on the evidence and analysis, consideration should be given to making recommendations based on the probable causes to best mitigate the potential for additional incidents.

The Level 3 investigations are typically led by trained and experienced RCA personnel and are thorough enough to identify all of the causes of the incident, including the root causes. Level 3 investigations will often be driven by others outside of the PEI organization and either within or outside the site organization.

6 PEI Incident Investigations

6.1 General

It is impractical and unnecessary to investigate every PEI incident to the same level of detail. As indicated in the foregoing, there are different degrees of consequence and complexity of incidents, warranting different levels of investigations. Generally, the more serious or potentially serious an incident, the greater the scope and depth the investigation would be. Every PEI incident could be reviewed to determine if an investigation is warranted and what level of investigation is appropriate. The consequences of the incident, both actual and potential, are typically used to determine the level of the investigation. When using potential consequences as a deciding factor in determining level of investigation, care should be taken to use only the most likely scenarios that might have occurred if one or possibly two other events had happened, but not more than two. The assumptions used for determining potential consequences should be clearly documented and agreed upon with the investigation sponsor.

EXAMPLE 1 If a leak occurs and releases gasoline that forms a vapor cloud but does not cause a fire or explosion because an operator immediately saw the leak and turned on fire monitors, then it is reasonable to consider fire and explosion as a potential consequence and investigate based on that.

EXAMPLE 2 If a leak releases diesel and a small pool fire results that is contained by the emergency response, it might not be reasonable to say that the potential consequence would have been major equipment damage if the fire monitors were not working and the emergency shutdown valves had not been activated.

The three levels of investigation described in this RP differ in scope and depth of investigation and the amount and type of personnel involved. Owners/users may provide guidelines defining the different levels of investigations and the circumstances under which they are used. Table 1 is an example of defining the guidelines for PEI incident investigations. The guidelines herein will define the differences in the levels of investigation. These differences are mainly based on the personnel that are involved, including the qualifications and number of those personnel, the depth of analysis, the reporting requirements, and the follow-up.

6.2 PEI Incident Investigation Levels

For the purpose of this RP, the highest level investigation, Level 3, would be performed when a single PEI incident has a large actual or potential consequence. A Level 2 investigation would be performed on a single PEI incident that had a medium actual or potential consequence. A Level 2 investigation could also be conducted on a grouping of similar chronic PEI incidents that, when combined, have a medium actual or potential consequence. A Level 1

SoCalGas-5.0644

investigation would be performed on low-consequence PEI incidents. These Level 1 investigations are opportunities to learn and act on small incidents and proactively prevent similar chronic incidents or future larger incidents.

Typically, the level of investigation is independent of the type of incident but is determined by the consequence or potential consequence of the incident. For example, pressure equipment failures, depending on the consequence and/or specifics, might have a Level 1, Level 2, or Level 3 investigation conducted. The starting point for near misses is usually a Level 1 or Level 2 investigation.

The following are examples of some specific PEI incidents that might warrant a Level 1 investigation:

— incorrect gasket installed and leaked without causing a fire;

— short-term corrosion rate discovered to have doubled over long-term rate;

— incorrect alloy discovered in valve before it was installed;

— Schedule 40 nipple installed where Schedule 80 required in piping specification;

— small-bore piping threaded connection installed directly adjacent to a vibrating reciprocating compressor;

— inspector discovers B7 bolting installed on exchanger floating head where specification called for B7M in sour service;

— inspector discovers wrong weld rod being used by welder for Cr-Mo piping replacement;

— inspector discovers utility hose being used for process drain hose;

— thermography inspection finds 50° hot spot on radiant tube;

— small underground leak discovered in Class 2 buried piping.

The following are examples of some specific PEI incidents that might warrant a Level 2 investigation:

— high-pressure boiler tube rupture;

— storage tank bottom leak;

— inspection finds a process pipe in operation below minimum required thickness;

— a feed/effluent heat exchanger flange leaks on start-up and causes a small hydrogen flame;

— a process heater tube ruptures causing furnace fire that is blocked in and snuffed out without significant damage to the firebox;

— a relief valve opens prematurely, releasing a few hundred pounds of product before being blocked in;

— a relief valve is discovered to be plugged during servicing;

— piping vibration near a reciprocating compressor causes fatigue crack and product release requiring compressor station to be blocked in and taken off line;

— a heat exchanger tube rupture causes heat exchanger to be blocked in and taken off line for inspection and repairs;

— CUI leak causes side-stripper column to be blocked in and taken off line for repair;

SoCalGas-5.0645

— a gasket blows out on a blocked-in product line releasing a few hundred gallons of hazardous fluid;

— pinhole leak develops on a hydrocarbon process line and ignites, but an operator is able to extinguish it and block it in, before major damage.

6.3 PEI Incident Investigation Guidelines

Owners/users may develop investigation guidelines that define what consequences and what types of failures or near misses trigger what level of PEI incident investigation. The guidelines typically include the combinations of actual and potential consequences and frequency of occurrence for the different levels of investigation.

The investigation guidelines include the following:

a) examples of incident types and consequences for each;

b) team leadership, team size, and composition;

c) timing for investigation initiation;

d) management level of sponsorship.

Table 1 is an example of an investigation guideline for PEI type incidents and specifically does not define investigation characteristics, team makeup, or timing requirements for any particular regulatory requirement.

6.4 Initial Response to a PEI Incident

The owner/user may have a documented plan on how to promptly respond to PEI incidents so that the need for investigations can be quickly recognized and initiated. This may be developed at the facility level or at a company level. The level of investigation and the timing of initiating the investigation may also be prescribed by governing jurisdictions, which is outside the scope of this RP.

This RP is not intended to detail the emergency response or internal and external notifications. (For example purposes, the company should designate who should be notified immediately to determine the need to notify regulatory and insurance representatives, if necessary.)

As previously noted, the facility or company may have a written process that defines how information from PEI incidents could be reviewed to determine if an investigation is warranted and how it is initiated. When an incident occurs, it is important to begin collecting data and evidence as soon as safely possible. If collecting of data and evidence is not initiated immediately, some valuable information might be lost in repair and cleanup activities. The most serious or highest consequence PEI incidents should have evidence gathering started soon as practical after it occurs. It is important that accurate data on PEI incidents is collected so that those incidents can be properly tracked and reviewed to determine the causes and corrective action.

The facility may have a work process to assign an investigation leader and team members immediately after a high- or medium-consequence incident is recognized (the incident may still be ongoing while the investigation team is identified and assigned). For PEI incidents that require emergency response, the lead investigator might be available to begin the gathering of physical evidence as soon as the area is secured by the emergency response team and released by regulatory authorities, if they are involved. If the lead investigator is not immediately assigned or available, then PEI personnel who have been trained in proper gathering of evidence may begin the evidence gathering, or at least taking steps to preserve the evidence.

For PEI incidents that do not require emergency response, the supervisor or PEI personnel closest to the equipment could begin collecting information as soon as the issue is recognized. Annex A is an example of a form that can be used to collect the initial information. Once the information is collected, it could be reviewed by the appropriate manager or supervisor to determine if an investigation is warranted and the appropriate level of investigation.

SoCalGas-5.0646

Table 1—Example PEI Incident Investigation Guidelines

	Level 1 Investigations	Level 2 Investigations	Level 3 Investigations
Incident Characteristics	— Unexpected condition or damage found that if it had been allowed to progress would have led to loss of containment before the next scheduled outage or inspection interval. — Discovered PEI damage significantly beyond expectation but with no loss of containment or unit shutdown. — Small leaks (other than environmental fugitive emissions) from pressure equipment or joints that were easily contained. — Typically no fire, significant toxic release, injuries, or environmental damage would occur in a Level 1 incident.	— Leak from pressure equipment that resulted in or could have resulted in localized equipment damage, small to medium size release quantity, or small safety or environmental damage. — Unexpected pressure equipment failure from damage mechanisms or structural deterioration. — Unexpected pressure equipment damage or associated structural damage discovered that required equipment or unit shut down or immediate mitigation. — Repetitive Level 1 type characteristics in the same process or system.	Leak or rupture from pressure equipment that resulted in or could have resulted in significant process safety incident or environmental damage, equipment damage, large release quantity, or production loss.
Investigation Characteristics	Investigate using less structured analysis tools such as "What If" or "5-Whys." Uses evidence, judgment, and experience to identify causes.	Investigate using company or department causal factor identification or logic trees, seeking probable contributing and root causes.	Investigate using company structured root cause analysis (RCA) seeking to determine the deepest management system and cultural causes.
Team Makeup Recommended	Investigated by the PEI personnel from the affected area and trained in simple investigation techniques. Can be investigated by one person, possibly two. Involve subject-matter experts (SMEs) as needed.	Leader would be someone from the affected area trained in investigation techniques. Team members would include one to three others of different disciplines from the area; include at least one PEI person on the team. Involve SMEs as needed.	Leader would be someone trained in structured RCA and from another area of the plant or another business unit. There would be at least three team members and possibly from different disciplines or groups, such as inspection, operations, process engineering, maintenance, or process safety. Appropriate SMEs should be included on the team.
Initiation	Within a few days.	Begin investigation as soon as practical (e.g. 1 to 2 days).	Begin freezing and collecting evidence as soon as practical (e.g. within a few hours).
Sponsorship	Supervisor of investigator (First Line Supervisor).	Department Head level (Second Line Supervisor).	Management with overall responsibility for Safety Health Environment for the site.

6.5 Types of Evidence

There are three basic types of evidence that are used for investigating PEI incidents.

1) People—interviewing people involved in the incident, eyewitnesses, or those who have knowledge of the system, process, or equipment design as an example.

2) Physical—photographic documentation of as-found conditions, examination of the mechanical parts that are deficient or failed, any equipment involved in the incident, chemical samples (e.g. corrosion and fouling material), stains, damaged equipment, appearances and observations, physical sizing and orientation of

SoCalGas-5.0647

observed conditions, metallurgical analysis, secondary damage to surrounding equipment, valve positions, locations of fragments or debris, orientation of witness observations, and any other similar physical examples.

3) Records—paper and electronic records, including such items as operating logs, inspection records, prior engineering evaluations, design specifications, policies, procedures, alarm logs, test records, work orders and maintenance records, and training records. This would also include electronic format data, such as operating data recorded or correspondence (emails) pertaining to the system or equipment.

The three types of evidence listed above are in the order of what is typically the most time sensitive to be gathered before recollections or physical conditions or orientations can be changed or affected by bias. This can be used as a guide on what evidence to start collecting first (i.e. start performing eyewitness interviews as soon as possible after the incident, followed by physical evidence gathering). Note that some electronic operating records such as distributed control system (DCS) data disappear after a short specific time lapse, so data from those systems should be immediately preserved.

7 Conducting PEI Incident Investigations

7.1 General

This section provides general guidelines on how to perform the Level 1, Level 2, and Level 3 PEI incident investigations. For the purposes of these guidelines, the levels are as described in Table 1. Any PEI related incidents that are also process safety incidents may be governed by national regulations and/or jurisdictions having authority and should be handled by the appropriate group responsible for process safety incident investigations.

The main purpose of this section is to provide PEI personnel guidelines on how to conduct and support investigations. The CCPS's *Guidelines for Investigating Chemical Process Incidents*, 2003 [1] publication provides more detailed guidance on how to conduct investigations and could be used to build a comprehensive investigation program.

7.2 Performing Level 1 PEI Incident Investigations

7.2.1 General

Level 1 investigations are recommended for failures with minor actual or potential consequences, near misses, or unexpected discoveries concerning PEI. These investigations involve a review of the facts and identification of appropriate corrective action items. Level 1 investigations are less resource intensive than Level 2 and Level 3 investigations. When appropriate, Level 1 investigations identify specific corrective action items assigned to individuals with deadlines and periodic follow-up (e.g. unit inspector). The analysis is limited to localized incidents, and contributing causes and root causes are generally not evaluated in depth. The 5-Whys process is an example of an investigation method that may be used for Level 1 PEI incident investigations and is described further with an example in Annex B.

A Level 1 investigation might start with the incident report filled out with the knowledge about the incident that is known at the time of occurrence and a clear statement of the problem that is being investigated. Although no specific format for Level 1 investigations is prescribed in this RP, developing a form or guidelines for gathering and recording the information will be useful when reviewing these investigations for trends and further improvements.

7.2.2 PEI Level 1 Investigation Personnel

The Level 1 PEI incident investigation would be performed by one or two persons, typically the PEI personnel responsible for the equipment involved in the incident (e.g. inspector and/or engineer for the area where the PEI incident occurred). The following are guidelines on the type and role of personnel that could be involved in Level 1 investigations.

SoCalGas-5.0648

1) *PEI Incident Investigation Leader*—PEI personnel responsible for the equipment involved in the incident. If trained and qualified, the person could be the one who discovered the problem or the one who reported the incident.

   The investigation leader should have the training and knowledge to carry out the responsibilities for this level of investigation. This person may be the only one conducting the investigation and is responsible for collecting the evidence and analyzing the evidence in an unbiased way to determine the immediate, contributing, and possible root causes to the extent possible based on the evidence and facts. The investigation leader is then responsible for presenting the conclusions and recommendations to the sponsor for approval and endorsement. Finally the investigation leader is responsible for completing the final documentation.

2) *Team Members*—Typically, this level of investigation is performed by a single person. If another team member is needed, their training and qualifications would be dictated by the type of PEI incident that occurred and the need for assistance of the investigation leader. Others may be involved as needed to assist on an ad hoc basis by providing data/evidence, providing SME input, or being interview witnesses regarding the incident.

3) *Sponsor*—These investigations might be sponsored by the investigation leader's immediate supervisor or a supervisor/manager of the unit or department involved with the equipment where the incident occurred. The role of the sponsor is to ensure the investigator has the time and skills to complete and document the investigation and to set a date by which it needs to be complete. The sponsor would also help guide the investigator to ensure they are conducting an appropriate level of investigation and analysis. The sponsor would also have the responsibility to assure that follow-up corrective actions from the investigation were completed in a timely manner.

7.2.3 Collecting/Examining Evidence

The three forms of evidence—people, physical, and records—would be gathered or examined by the investigator(s).

The investigator would consider interviewing eyewitnesses (if there are any), people who work in the area, such as operators, process engineers, maintenance or reliability engineers, and any other PEI personnel involved with the equipment or incident. The investigator would collect and/or examine any physical evidence or parts involved or damaged in the incident. The investigator would examine any relevant documentation for the equipment or system, such as past inspection records, process operating history, design records, purchasing records, and maintenance or repair records.

If needed, the investigator could ask for expert help in the examination of some evidence or determining what additional evidence to examine.

7.2.4 Analyzing Evidence and Determining Causes

The investigator would analyze the evidence gathered and characterize what each piece of evidence is revealing about the causes of the incident.

The analysis includes looking at the evidence and determining, to the best of their ability, what the immediate, contributing, and possible root causes of the incident are. This may involve judgment and some subjective assessment. It is important to best determine the causes even if it is without 100 % certainty so that recommendations can be proposed for corrective actions to prevent a similar incident.

At times, it may be helpful if the investigator used a structured method, such as the 5-Whys, to determine the causes. In such cases, the investigator should be trained on the techniques or engage other knowledgeable experts. If the investigator cannot fully explain the immediate causes from the evidence gathered, they may need to gather more evidence or ask for additional SME expertise to help determine the immediate cause(s).

Level 1 investigations should identify the immediate causes of the incident. The investigation leader would also make a best effort at identifying contributing and possible root causes, based on the investigator's knowledge of the component failure mode or damage mechanism in conjunction with some specific information gathered about the

SoCalGas-5.0649

particular incident, and the investigator's knowledge of the facility's systems and work processes. Level 1 investigations are usually not rigorous enough to identify all of the contributing and root causes.

7.2.5 Action Items

The Level 1 investigation should include an understanding of the immediate cause to identify what actions need to be taken to address the immediate cause to prevent a similar incident. The investigator would also try to understand the contributing and possible root causes, with special emphasis on issues that represent opportunities for improvement that are within the control of the investigator or the control of the investigation sponsor. The investigator with approval from the investigation sponsor would recommend what action items are assigned and to whom.

With the focus on PEI incidents, consideration might be given to what changes may be needed to improve the PEI program to prevent similar incidents.

EXAMPLE Action items might include improvements on how inspection plans are developed or making improvements to the work process of how damage mechanisms are predicted and utilized in specifying on-stream nondestructive examination (NDE), or the investigation might reveal that additional process parameters should be monitored for IOWs.

7.2.6 Reports

Level 1 investigation results may be documented on a simple form or template such as that shown in Annex C. The report may document what happened, the immediate causes, the contributing causes, and the corrective actions. These reports are important for both the incident being investigated and to have quality information to review for trends and broader improvements.

7.2.7 Determining Effectiveness of Action Items

The identified contributing causes from many Level 1 investigations may be reviewed over time to look for common or systemic causes and to determine if they are being reduced and/or eliminated. If no improvement is shown, then this may be an indication that the follow-up actions were not effective. In such a case, a review may be conducted to determine how to more effectively address the reoccurring contributing causes or to identify additional contributing and/or root causes that should be addressed. This might involve a Level 2 investigation on a grouping of similar Level 1 incidents.

7.3 Performing Level 2 PEI Incident Investigations

7.3.1 General

Level 2 investigations are conducted on medium actual or potential consequence incidents (i.e. all that fall between Level 1 and Level 3). As previously discussed, the Level 2 processes may also be used to further analyze information from multiple, similar Level 1 investigations. Because Level 2 investigations typically involve higher risk incidents than those in Level 1, they would typically have a two- to three-person multidisciplined team to analyze the evidence and identify contributing causes and probable root causes.

7.3.2 Beginning the Level 2 PEI Incident Investigation

Similar to the Level 1 investigation, the Level 2 investigation would start with the incident report filled out with the knowledge about the incident known at the time. Developing a form or guidelines for gathering and recording the incident information will be useful when reviewing these investigations for trends and further improvements. See Annex A for a simple example form. It is important to properly define the problem that the investigation team is going to investigate. The incident might have caused multiple issues, such as loss of containment that then revealed improper fire monitor coverage or improper drainage when mitigating. These are different problems and should be investigated separately; the PEI incident investigation should address why the loss of containment occurred.

SoCalGas-5.0650

The owner-user's investigation program should define how a PEI incident investigation team leader is assigned and how a team is formed for a Level 2 investigation. The team composition should consider the type, size, consequences, and nature of the incident.

It is important to collect the available and relevant evidence as soon as safely and reasonably possible to do so. As part of establishing a PEI incident investigation program, it is helpful to have one or more trained and designated team member with the responsibility for arriving at the scene ready to collect and/or preserve evidence while the evidence still exists. For example, if an incident involves loss of containment, evidence gathering can begin outside the area even before the area is secured and safe to enter. This person(s) can begin collecting eyewitness statements, if the eyewitnesses are not involved in the emergency response, and also downloading DCS data. For Level 2 investigations that did not involve loss of containment, the program might include consideration on how to collect evidence at the scene immediately. For example, the designated team member or investigation leader responsible for initial evidence gathering should not be involved in the repair work that may be required because of the incident. This will allow the person to concentrate on evidence/data gathering and not miss an opportunity to collect data, such as while a piece of equipment is shut down, before a patch is installed over a corroded area, or before corrosion or fouling products are lost or disposed of. More details about evidence gathering are contained in 7.3.4.

7.3.3 PEI Level 2 Investigation Personnel

Defining the team composition requirements associated with a Level 2 investigation may be part of the PEI incident investigation program. The following are guidelines on the type and role of personnel that would be involved in Level 2 investigations.

a) *PEI Incident Investigation Team Leader*—The investigation leader should be trained in the specific investigation methodology used. For Level 2 investigations, the investigation team leader is responsible for leading the investigation team through the entire investigation process. The investigation team leader responsibilities include the following:

   1) conducting the investigation by the specific company methodology,

   2) defining the required resources or team members to help conduct the investigation,

   3) leading the team in collecting the evidence and analyzing the evidence in an unbiased way to determine the causes based on the evidence and facts,

   4) presenting to appropriate management the conclusions and recommendations,

   5) writing the final report.

b) *Team Members*—The size and complexity of the incident will determine the number of team members that are needed. The team may be comprised of a diverse mix of backgrounds from either the area where the incident occurred or another area within the facility in order to facilitate the thinking process from different perspectives. Either one team member or the team leader could be a PEI person; this could be an inspector, pressure equipment engineer, inspection engineer, metallurgical/corrosion engineer, or reliability engineer. The PEI team members should consist of knowledgeable but impartial people who were not directly involved in the incident. If the team leader sees indications that a person believes they have made a mistake and will be held culpable for the incident, then that person should not be selected as a team member.

   The investigation team members assist in the investigation by collecting evidence and helping to analyze the evidence to determine the causes. Team members may also be needed to assist the team leader in writing the final report.

c) *Sponsor*—The sponsor would typically be the process unit's area manager or could be the engineering manager or project manager, depending upon the type of incident.

SoCalGas-5.0651

The sponsor's role is to ensure that the team has the time, resources, and cooperation to conduct the investigation but is not to manage the activities of the investigation. The sponsor should convey to all those who will be assisting the investigation team the importance of their cooperative participation in the investigation. Additionally, the sponsor would be responsible for assuring that identified and approved corrective actions were implemented on a timely basis and that the lessons learned were communicated to affected individuals.

7.3.4 Collecting Evidence

7.3.4.1 General

The determination of immediate, contributing and root causes is based on evidence and expert knowledge of the contribution of the evidence. If not properly preserved or collected soon after the incident, some evidence can be lost, such as DCS data being overwritten, damaged components being thrown away, or fracture surfaces improperly handled. The priority for collecting data should be based on how perishable the data is. The more perishable or changeable data should be collected first. The team should begin collecting data without trying to solve why the incident occurred or determining the immediate, contributing, or root causes.

In PEI incidents that involve fires or toxic releases, once the area has been secured and it is safe for personnel to enter, evidence gathering should begin. The investigation lead will need to work with operations to control the scene until they determine that initial evidence gathering is complete. The area might be designated for no unauthorized entry. Collection of physical evidence would begin as soon as practical after securing the site and continues throughout the early part of the investigation. Collecting of other evidence not within the restricted area, such as interviewing of eyewitnesses, can begin immediately. The investigation team might begin a preliminary sequence of events timeline and sketch of the equipment or system involved to help the team understand what happened, what was involved, and the scope of the investigation.

The investigation team could survey the scene and identify people, equipment, and materials involved in the incident. The investigation leader could then prioritize the information to be gathered and assign responsibilities to the team members to conduct interviews and gather evidence. The coordination of the effort is to assure data is gathered systematically and purposefully.

One way to start determining what evidence to gather is to have a collection of generic lists for each type of evidence. These generic lists may be used by the team as a starting point and can be customized for the specific incident. An example of generic lists for each type of evidence is provided in Annex D. Depending on the type of incident being investigated, not all the evidence mentioned will be applicable or necessary to collect. If the incident did not have a defined consequence, like a loss of containment that happened suddenly, there may not be any eyewitnesses or process data at the time the incident occurred.

PEI personnel that are not on the investigation team can assist the investigation team by providing any information that they have about the equipment or system that was involved in the incident. They should be candid with any information they have, including historical information from memory, correspondence like email, and any notes in personal log books. Information should be freely provided to the team by the PEI personnel without any filtering or bias. In some cases, individuals may believe that they have made some sort of mistake or in some other way had a vital role in why the incident occurred. The investigation team should convey that they are not looking to blame any individuals but rather are just seeking the facts so that appropriate corrective actions can be applied to those management systems that are not as robust as they should be.

PEI and maintenance/repair personnel should not do anything with the equipment or system involved in the incident until the site has been released by the investigation team or team leader.

Consideration should be given to protecting the integrity of the evidence. Evidence, such as physical evidence, that cannot be replaced should be kept in a secure location such as a locked room or storage area and under the control of the investigation leader.

SoCalGas-5.0652

7.3.4.2 Collecting Evidence from People

The people evidence is one form of very perishable evidence. Immediately after an incident, people's recollection of the events begin to change, especially as they talk to others. It is important to initially interview the eyewitnesses and people directly involved in the incident as soon as possible. Ideally, they are asked not to talk to each other until they have been interviewed.

Interviewing people constitutes a major element in the initial stages of a PEI incident investigation. Some general guidelines for the interview process are as follows.

— Write questions to ask ahead of time to make the interview and note-taking go smoothly. It is good to have a template for interviewing that investigators use. An example of generic questions to ask eyewitnesses is included in Annex E, but it should be modified to suit the site-specific incident.

— Begin by interviewing the people directly involved in the incident and eyewitnesses first. People's recollection regarding details of what happened can change quickly, so timely interviews could be important.

— Interview individually to help keep the interview private and prevent individuals from influencing each other's memories. This also minimizes the intimidation factor associated with interviews.

— Interview at the scene, if practical/safe, to help the person being interviewed remember details.

— Explain that the intent of the investigation is to identify causes, not to place blame. Tell the interviewee that although their information may be used in the investigation, no names will be attached to specific statements.

— Avoid speculating, trying to solve the reason why, or identifying causes. You are just gathering information without judgment and should be careful not to influence their statements in any way. Start the interview with open-ended questions that cannot be answered with a one-word answer. For example, ask storytelling questions such as "Tell me what you saw?" and "What happened next?". Later in the interview, use closed-end questions to get more specific detail.

— Do not "lead" the interviewee; start the interview with broad questions (e.g. "Would you please tell me what you saw, heard, smelled?"). Leading questions indicate the answer as part of the question and may be useful in confirming what was said, but not in gathering overall information. For example, "You had recently inspected the piping and found xyz thickness?" is a leading question but may be useful in clarifying information after the interviewee tells you information. Leading questions are good for confirming understanding but not for pulling out the facts initially.

— Ask questions for clarification as necessary (e.g. "What do you mean when you say…?").

— Progress to more detailed questions (e.g. "Can you explain the procedure for...?").

— At the end, paraphrase what you heard to improve and confirm your understanding and provide the individual a chance to add more detail or make clarifications.

Information collected from interviewing people needs to be compared with information from other sources before stating as fact. Collaboration might include supporting interview statements with physical or records evidence or by multiple people independently making the same statements.

7.3.4.3 Collecting Physical Evidence

An initial site visit would occur as soon as the area where the incident occurred is determined to be safe for entry by investigation personnel. The investigation team or at least the investigation team leader would survey the site to look for physical evidence. They would look at the entire surrounding area and not just the point of the incident. They

SoCalGas-5.0653

would look for signs of evidence and also look for what should be there but is not. They would also look for what is correct and document that; this will be helpful later in confirming or disproving theories. The investigation team should not disturb anything at this point and should not be focused on fixing the problem or determining the cause. They should only be looking at recording, collecting, and documenting physical evidence.

The initial activities of the site survey might include the following and would typically be performed in the stated order.

— Take photographs of the scene from various angles and distances to help orient people to the incident. Consider the need and value of videotaping to add additional orientation and perspective to the scene. Take photographs of the surrounding areas and equipment. Placing a recognizable object or ruler next to the object being photographed may add perspective, particularly for close in photos of small objects. Using index cards to write what the object is and place in the photo helps with documenting the photographs.

— Write observations or make sketches for things that may not show up on a photograph (e.g. warped, discolored, cracked).

— Incidents that involved an explosion may require special mapping of the location of fragments and debris. It is important to map the exact location of any fragments and their condition. The size of the parts and the distance they are from the source are good information to determine the energy released.

— Collect any failed parts that do not require disassembly. Be very careful in handling damaged parts to preserve evidence that may be present on a macro or microscopic level. Label where the part came from and its orientation. Any equipment that requires disassembly should be done later under the direct observation of an investigation team member or FA laboratory.

— Samples of process fluids or solids that may be involved should be collected.

— Incidents that involved fires should have the damage of the material in the area recorded for determining the heat pattern. API 579 as well as NFPA 921 [4] provide guidelines for assessing fire damage.

— It is important to record what equipment was not damaged in the area or system involved.

Equipment damaged in an incident should be carefully preserved. Fracture surfaces should not be disturbed to prevent incidental damage and hinder the failure evaluation of the part. Similarly, cleaning of the part should not be done unless absolutely necessary to enable chemical analysis of the part.

When handling failed parts and fracture surfaces, care must be taken to preserve specimens in the original condition to provide as much information as possible for determination of the cause of the failure. For any failure, the following guidelines for preparation of samples for analysis should be followed, as appropriate.

— Do not mechanically clean, sandblast, wire brush, or acid clean any failed parts prior to proper analysis. Deposits on the failed part might be helpful in determining the cause(s) of the failure.

— If a part is fractured into two or more separate pieces, do not try to fit the fracture surfaces back together. Certain metallurgical features on the fracture face can help determine the cause of the failure and can be easily damaged by improper handling.

— Only apply preservatives (e.g. lubricating oil) to fracture surfaces when directed to do so. The lubricating oil can be removed prior to fractographic analysis; however, the integrity of surface deposits and corrosion products could be compromised by applying oil to fracture surfaces.

— Wrap the failed section in plastic (e.g. bubble wrap) in the "as-is condition" without removal of surface deposits beforehand.

— Do not store failed items outside.

SoCalGas-5.0654

If possible, a good practice is for the team to conduct an initial site survey and collect initial evidence, then take a break and come back later in the day or even the next day to survey the site again before cleanup or demolition begins. This provides the team the opportunity to see things that might have been missed on the first survey.

Generally, after this second site survey, the site is released from evidence gathering so that cleanup and repair activities can begin. During repair and restoration activities if any PEI personnel discover anything they think is unusual or they think might be relevant to the investigation, they should notify the investigation team leader immediately.

7.3.4.4 Collecting Record Evidence

It is important for the investigation team to concentrate on collecting the most perishable evidence as soon as practical. After that is complete, the investigation team would then brainstorm on what other evidence to collect. They could make a list of that evidence and the investigation team leader might assign responsibilities to the team members to gather the additional evidence. This additional evidence might include the following, depending on the type of PEI incident:

— Operating information showing process control data several days before the incident and at the time of the incident. (Process control information should be collected or archived as soon as possible. This should be an initial step backed up by further collection of information once the investigation is underway.)

— Related operating and maintenance procedures, including date last updated/reviewed.

— Copies of the appropriate design standards (engineering practices, design practices, etc.).

— Copies of management system documents related to the activities surrounding the incident, such as management of change documents.

— Copies of engineering drawings, piping and instrument diagrams (P&IDs), and job safety analyses.

— Operator log books and shift turnover documentation.

— Relevant maintenance and inspection records.

— Equipment design and construction records.

— Materials information.

— Applicable personnel training records.

7.3.5 Analyzing Evidence and Determining Causes for PEI Incidents

The collection of evidence and the analysis of evidence should be two distinct and separate activities. While collecting evidence, the team should not try to analyze it and determine causes too early. This can lead to bias and not exploring possible causes.

Once the investigation team leader believes that the team has collected all (or most of) the evidence, the team should begin analyzing the evidence. The investigation team should carefully review the evidence and make sure they fully understand what it is revealing. If this is a large investigation and there is a lot of evidence, it can be beneficial to divide up the different types of evidence among the team. Have one or two members of the team review each type of evidence—records, people, and physical—and summarize it. They would then present the summarized evidence to the rest of the team. Team members should draw conclusions from their reviewed evidence about the immediate, contributing, and root causes of the incident. Members would then present their conclusions to the team. The team

SoCalGas-5.0655

could then determine if each form of evidence is pointing to basically the same conclusions about causes. That would be further confirmation that the correct causes are being identified.

Once the team begins analyzing the evidence, some gaps in evidence may be revealed that will require collecting of more evidence. The team should then gather that additional evidence. Also, when the analysis of evidence begins this will reveal any expertise that is needed to help analyze data and determine causes, such as metallurgical expertise to examine failed components or process expertise to analyze process samples or process data.

Analyzing the evidence to determine the causes usually defines the issues associated with the incident such as:

1) type of failure or damage mechanism;

2) details of the components involved: material, service conditions, environment, stresses, and loadings;

3) prior service history;

4) manufacturing history;

5) design conditions.

Tests needed to analyze failed components and determine the causes would be specified by the proper expertise. Annex F is an example of a form that can be used to send physical parts off for FA and 7.5 gives guidance on FA of components.

One important part of the analysis would include determination of whether industry PEI codes and standards, such as those listed in 1.4, and company PEI-related procedures, standards, and work practices were followed or not. If they were followed, the analysis might determine why they were not effective in preventing the incident.

Use a structured analysis method to analyze the evidence and explain the failure, such as, logic tree, cause and effect diagrams, or sequence diagrams. There are many structured processes that can be found in the literature or offered by commercial vendors.

7.3.6 Developing Recommendations and Action Items

Once the investigation team has conducted a structured analysis and determined the immediate, contributing, and root causes of the PEI incident, it is important to develop recommendations and action items to address the cause(s). Once action items are satisfactorily completed and a management system created or reinforced to sustain the corrective actions, the likelihood of reoccurrence of the incident and other similar incidents should be reduced.

Recommendations resulting from the incident investigation should be developed to prevent reoccurrence of the condition or activity. The investigation team should not attempt to analyze the cost or engineering required to implement a recommendation, unless directed to do so by their sponsor. Generally, such efforts are part of the next phase to develop action items and typically involve different individuals.

For PEI incidents, consideration might be given to what changes are required to improve the PEI program in order to prevent similar incidents.

EXAMPLE The inspection plan for the equipment involved and other similar equipment should be reviewed to determine if it should be changed or modified in any way to prevent another such incident. Consideration should also be given to determination of whether any procedures, documented work practices, and other management systems need to be reviewed for improvement.

Each recommendation that the investigation team develops should be clearly written, should state which cause(s) it is designed to address, and should be clear and concise requiring no interpretation. A suitable implementation plan would then be developed to resolve the recommendations.

SoCalGas-5.0656

The investigation team will develop recommendations to address the causes identified as a result of the investigation. The investigation team may suggest action items to address their recommendations, but they do not typically define the action items and responsibility. This is more appropriately done by the management of the group or area that owns the issue or the group that has to commit resources or funding to solve the issue. It is management's responsibility to define appropriate action items to address the recommendations and assign the appropriate owner of the action item.

Action items assigned to address the investigation team's recommendations would typically be clearly written and state which recommendation it addresses. Alternative actions may be substituted by the responsible manager, or action items may be modified as corrective action work progresses, so long as the recommendation is adequately addressed and the proper approval is received. Action items are typically assigned a responsible owner with a reasonable completion date assigned; considering the risk associated with continued operation may influence the specified completion dates.

7.3.7 Final Report and Documentation

A final report is written by the investigation team that documents the PEI incident investigation effort, the findings, analyses, causes, and recommendations. The report may contain or reference the technical information used as part of the analysis.

Reports might include the following information:

— describe the incident—where and what happened;

— presentation of the findings of how and why the incident happened;

— presentation of the conclusions on what were the immediate, contributing, and root causes;

— indicate what management systems that may be related to the root causes;

— include the recommendations to prevent a repeat incident and/or lower the risk.

A standard template or consistent format for final reports assists those writing and reviewing reports and will help with documenting required information An example template for a Level 2 final report is included in Annex G.

The final report is only a portion of the overall record of the investigation. The final report and other documentation deemed necessary for recordkeeping per the company's record retention policy should be stored.

7.3.8 Tracking of Action Items

There should be a system in place to track progress and ultimate completion of action items assigned. The problems and issues discovered during a PEI incident investigation remain unchanged until the action items assigned to address them have been completed and a system is put in place to sustain the changes.

The owner/user should have a process whereby action items are periodically reviewed and progress monitored. Action items should be completed by the assigned target date. Action item target dates should not be changed without consideration of the risk associated and management review and approval. In some cases, there may also be regulatory requirements on the time allowed to implement certain actions. If an action item is changed or deleted, it should be documented as to why and how this decision was made and what alternative actions were taken. Action items should have an auditable trail.

The appropriate level of manager should be assigned to monitor the progress of action items.

SoCalGas-5.0657

7.3.9 Determining Effectiveness of Action Items

For a select number of PEI investigations, it may be important to review the effectiveness of the actions taken to resolve recommendations.

7.4 Level 3 PEI Incident Investigations

Most of the information in 7.3 for conducting a Level 2 investigation of a PEI incident also applies to Level 3 investigations of PEI incidents. It is assumed that most Level 3 PEI incident investigations would rise to the level of a process safety investigation. As such, the description herein of a Level 3 PEI incident investigation would need to be in conjunction with and in support of the site's process safety investigation procedure.

A Level 3 PEI incident investigation would likely be led and/or overseen by other parts of the organization (such as site managers, the site safety or process safety group) but would be supported by PEI personnel when loss of containment was an issue. Additional breadth and depth of investigation and root cause understanding is warranted for the PEI aspects of incidents with Level 3 actual or potential consequences. The following guidelines supplement those provided above for Level 2 PEI incident investigations.

Level 3 investigations are performed on the PEI incidents with the highest actual or potential consequence and require a multidisciplined team to fully analyze the deepest level of cause (root causes), as well as contributing causes and probable causes. Typically, only a very small percentage of PEI incidents would be investigated at this level of detail. This level of investigation is generally selected for incidents that had actual or potential to result in significant safety, health, or environmental consequences.

Typically, there is more than one cause in a Level 3 PEI incidents. Some of the causes may be latent (or hidden), or a cause cannot be verified to a high degree of certainty (referred to as a probable cause). In the refining and chemical processing industry, hazardous processes are protected by multiple layers of protection or barriers. Typically, more than one barrier or protection layer has to fail to have a catastrophic incident. For an incident that warrants a Level 3 investigation, the majority of the layers of protection would have failed or been weakened in some way. Some of the barriers might have latent or hidden weaknesses in them, but these had not been revealed or known before because the other barriers were preventing any incidents. It is important when conducting a Level 3 PEI incident investigation to determine the contributing weaknesses of the multiple layers of protection.

A structured RCA method should be used to analyze the evidence and explain the failure and the incident, including those methods such as logic trees, cause and effect diagrams, sequence diagrams, etc. Whichever method is used, the investigation results should be based on the evidence and facts and every effort made to eliminate bias. Development of these types of trees or diagrams will also reveal any additional evidence or data analysis to assure that the conclusions are thoroughly supported by the evidence.

The PEI incident investigation team leader/member should be a trained and experienced person in the specific RCA investigation methodology used. For Level 3 incidents, the PEI incident investigation leader might be someone from another area of the company or plant than where the incident occurred or even a contract principal investigator. It may also be beneficial for the team leader to have their primary area of technical expertise outside of the PEI functional discipline. This will reduce the potential for bias and overlooking some potential causes. The team leader should make sure that all evidence is gathered and considered to avoid predetermining causes and consequently the bias of gathering evidence to confirm these predetermined causes.

The team members might be a cross-functional group of individuals with knowledge and technical expertise in different functional disciplines. Team members who were not involved with or associated with the equipment being investigated are preferred to minimize introducing bias or conflicts of interest. PEI personnel from another area of the facility could serve as team members for pressure equipment failures to lend their knowledge and expertise to the investigation. If contractors are involved in the incident, then consideration should be given to including someone from the contractor's company on the team but not to someone that was directly involved in the incident.

SoCalGas-5.0658

Once a Level 3 incident is determined to be caused by a PEI failure then PEI personnel can lend their knowledge and expertise to the investigation team to improve evidence gathering and determination of causes. The following areas of expertise that PEI personnel may assist the investigation with include:

— knowledge of the PEI codes and standards (see 1.4) that apply and if any had not been followed or adhered too or were not effective;

— knowledge of the company PEI procedures and work practices;

— guidance in determining the specific damage mechanism that caused the failure and the type of FA that should be done on specific physical evidence;

— guidance in specifying NDEs to identify other damage in the remaining equipment. Help in reviewing past inspection records to determine if the damage should have been predicted and reasons it was not.

Level 3 investigations should be sponsored by site management who is responsible for safety, health, and environment. The sponsor's role is to ensure that the team has the time, resources, and cooperation to conduct the investigation.

The Level 3 investigation should identify the immediate, contributing, and root causes, with the investigation depth and scope supported by the investigation sponsor and fully utilizing the RCA methodology selected. The investigation should be extensive enough to fully understand the immediate causes (the specific equipment damage mechanisms that resulted in the failure) and also identify the contributing and root cause factors and systemic reasons (management systems and work culture) that caused or allowed the physical causes to exist and to progress to failure. Management system, work process, safety systems, and/or work culture root cause factors will be identified as defined by the specific RCA investigation methodology selected at the facility or company.

7.5 Component Failure Analysis

Laboratory FA of the component that led to the loss of containment is vital to many PEI incident investigations. Formal laboratory analysis should be completed for most failed components to determine failure mechanism. FA will typically involve some form of metallurgical FA of the failed component but could also be a FA on nonmetallurgical components and entail chemical analysis of deposits that might be helpful in identifying corrosion deposits, corrosive fluids, or fouling materials. As mentioned previously, it will be vital to protect the integrity of those components and samples to be analyzed.

Depending upon the level of investigation, an agreed upon protocol for selecting, shipping, examining, testing, and recording the failed specimens will be needed and should be agreed upon in the investigation team and with any other parties that may be involved (e.g. regulatory bodies). The protocol should cover at least five stages of handling the physical evidence that will be analyzed, namely:

1) selection of the samples;

2) packaging, handling, and shipping the samples;

3) documenting the various stages of analysis and handling;

4) examination and testing; and

5) reporting.

Annex F shows an example of a simple form for requesting a FA from an in-house company or contract FA firm.

SoCalGas-5.0659

Sometimes it will be obvious from the outset which component failed and caused the loss of containment. Other times because of the ensuing destruction and multiple equipment and piping failures due to the fire and explosion, it will not be so obvious which component failed first and which components may have failed because of the incident and consequence of the release (knock-on effects). In the latter case, multiple samples may need to be shipped from the site to the laboratory for analysis, not only to determine the physical cause of the loss of containment but also to determine which pieces of equipment may have failed as a result of the consequences that followed the original failure.

Preparing, handling, and shipping the samples needs to be sufficiently detailed with appropriate quality assurance/quality control (QA/QC) to ensure that they arrive at the laboratory in the same condition that they were found at the site. Care to avoid potential handling and shipping damage will help to avoid erroneous or lack of conclusions during the FA due to damage that was not actually incurred during the incident. Shipping and handling protocol may need to specify type of packaging, type of crating, protection from the environment, need for desiccant, etc.

But even before investigators begin to define the protocol for FA work, they must decide where to send the samples for analysis. FA for PEI incident investigations should be performed by organizations competent, qualified, and experienced in refinery and chemical plant failure mechanisms. A best practice is to identify and evaluate firms and establish a business relationship prior to an incident.

The next major step in the FA part of a PEI incident investigation is to assemble, document, and agree upon the various required steps in the laboratory FA that is needed to support the PEI incident investigation analysis. The objective of this FA protocol is to perform metallurgical/material inspection, examination, and testing of the selected physical evidence items in an effort to identify failure modes and contributing damage mechanism that caused the PEI incident (i.e. determine the immediate physical cause for the loss of containment).

The investigation team should create a FA protocol with the input of the selected FA laboratory. Decisions will need to be made about the kinds and amount of testing and examination that will be required, including such things as:

— visual examination;

— sample preservation;

— physical measurements;

— NDE;

— cleaning methods and techniques;

— sample cutting, extraction, and marking;

— macro and micro metallographic examination;

— X-ray diffraction;

— scanning electron microscope examination;

— chemical analysis;

— energy dispersive X-ray spectroscopy examination;

— macro and/or micro hardness testing;

— fracture surface examination;

— deposit/residue collection and analysis; and

— mechanical testing.

SoCalGas-5.0660

The amount and type of documentation at every step should be agreed upon and included in the FA protocol, including such things as:

— When, where, and how much photographic and/or video documentation is needed;

— how much and what laboratory documentation is needed;

— the amount and type of sample marking/tagging;

— the need for hold points and witnessing of selected steps by members of the investigation team;

— at what point and when verbal reports of FA progress are needed; and

— details of what needs to be contained in the final report.

8 Training and Qualifications

8.1 General

When an incident occurs it is important to have the right people who are already trained to immediately respond and begin the investigation. Facility management should plan for team composition requirements and have trained and qualified people ready and available. Frontline supervisors of the organization need to know who to call and when, before an incident occurs. Everyone in the organization needs to know how to recognize incidents and how to report them.

8.2 Incident Investigation Team Leaders

The organization could define a pool of potential investigation team leaders. Example of training for team leads includes the following:

— an overview of the company incident investigation management system;

— investigation concepts;

— specific investigation techniques used by the organization;

— proper interviewing techniques;

— proper gathering of evidence;

— concepts of laboratory FA;

— how to analyze evidence for immediate and contributing causes using the methodology selected by the company;

— how to determine root causes;

— how to write effective recommendations;

— how to avoid bias in investigation analysis;

— documentation and report requirements.

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PEI personnel should be trained on how to do an effective Level 1 investigation, while only select PEI and other personnel might be trained on how to lead a Level 2 investigation. Once trained, it is important that these potential team leaders practice the skills learned in the training to develop and maintain proficiency. The organization could also have a plan for periodic refresher training.

8.3 Incident Investigation Team Members

The organization may want to define a larger pool of potential investigation team members. Example of training material for team members include the following:

— an overview of the company incident investigation management system,

— investigation concepts,

— the specific investigation techniques used by the organization,

— proper interviewing techniques,

— proper gathering of evidence,

— documentation and report requirements.

8.4 Site Management Personnel

Site management should be knowledgeable in the following so they can support the process:

— incident investigation program and how it relates to the site/company PSM incident investigation management system,

— basic investigation concepts.

9 Continuous Improvement for PEI Incident Investigations

9.1 Information Sharing

Investigation reports may be made available to site personnel. Owners/users may consider sharing details of the incident within the industry to communicate learnings.

A communication bulletin summarizing key learnings may be beneficial for review within the facility at the conclusion of PEI incident investigations. It would typically contain a brief explanation of the incident and then explain the causes with particular emphasis on what others could do differently to reduce the risk of other adverse incidents. An example might be that one contributing cause of a PEI incident was adhering to IOWs for corrosion was not viewed as important as maintaining product quality process parameters, since most IOW were long-term developing issues. This is a mindset or cultural change that needs to be communicated and acted on throughout the organization.

Some example formats of PEI incident communication are:

— one-page bulletins distributed to supervisors for review with work groups,

— lessons learned documented and stored on an intracompany website,

— safety-type bulletins posted around the areas and distributed electronically.

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9.2 Monitoring of the PEI Incident Investigation Program

The effectiveness of the PEI incident investigation program should be periodically reviewed to identify areas for improvement

Annex A
(informative)

Example Reporting Form for PEI Incidents [1]

General Incident Information	
Completed by:	Company/Site:
Incident Date:	Incident Time:
Area/Unit:	Equipment Involved:
Incident Description: *Describe what happened and what you know about the incident.*	
Consequence: *Describe actual or potential.*	

Type of Incident/Equipment Involved		
Incident Classification:	Equipment Type:	Observations:
❒ Level 1—Low-consequence Incident	❒ Pressure Vessel	❒ Corrosion
❒ Level 2—Medium-consequence Incident	❒ Piping	❒ Cracking
❒ Level 3—High-consequence Incident	❒ Storage Tank	❒ Dripping
❒ Record incident data for compiling and analysis later, no investigation	❒ Rotating Equipment	❒ Hazardous Release
	❒ Boilers, Heaters	❒ Frire
	❒ Heat Exchangers	❒ Smoking
	❒ Pressure-relief Device	❒ Spray
	❒ Structural System	❒ Staining
	❒ Flange Joint	❒ Incorrect Spec
	❒ Other (describe)	❒ QA/QC Problem

[1] The following examples are merely examples for illustration purposes only. [Each company should develop its own approach.] They are not to be considered exclusive or exhaustive in nature. API makes no warranties, express or implied for reliance on or any omissions from the information contained in this document.

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Annex B
(informative)

Example Application of the "5-Whys" Investigation Methodology [2]

B.1 Description

The "5-Whys" tool is a simple process to follow to determine the causes of incidents. This method adds some structure to brainstorming on causes and does utilize a logic tree approach without actually drawing the logic tree diagram. This method is dependent on the judgment and experience of the person or group that is asking why. The method is typically best used for simple problems without multiple causal factors.

It is important to begin the process with a clear problem statement that defines the incident that is being investigated. Once the problem statement is determined, you begin asking why to the problem statement and then ask why again to that, typically after asking why five times you have reached the contributing and root cause. If you have not, then you continue to ask why until you reach the root cause. In some cases the root cause is reached in less than five whys, so five whys is just a guideline and a name for the process.

B.2 Example

This example demonstrates the basic method of the 5-Whys.

During a plant's maintenance turnaround, an exchanger bundle was pulled, cleaned, and inspected. The tubes were discovered to have corrosion damage and numerous leaks, and the number of tubes needing plugging would exceed 20 % of the tubes and therefore would be too many. It was determined the best course of action was to have a new bundle built and sent to the plant. The unit mechanical engineer pulled the heat exchanger drawings from the main records center and sent those to the fabricator. The new bundle was built and shipped to the plant only a few days before the turnaround was scheduled to end. When the maintenance crews went to install the new bundle in the existing shell, it was discovered it would not fit. The heat exchanger had been modified sometime in the past. At this point the plant had to plug the old exchanger bundle leaking tubes and put it back in service. The unit rates were reduced to accommodate the large number of plugged tubes. Block valves were also installed around this exchanger so that it could be taken out of service online and the correct tube bundle built and installed later.

The unit mechanical engineer decided to conduct a Level 1 investigation on this incident, since it did cost additional maintenance dollars to have another bundle built, install the isolation block valves, and then install the new second bundle. There were also associated production losses due to having to run at reduced rates for two weeks.

Because this unit mechanical engineer had only been assigned to this unit for about two years, he did not have knowledge of the change made to this exchanger. As part of his investigation, he talked with unit operators who had been on the unit for a long time. The operators remembered some issues with that exchanger about 10 years ago. He also talked with the unit process engineer about why the change was made. The unit mechanical engineer then reviewed the inspection records for this exchanger, and he could see that the ultrasonic thickness data showed that that the exchanger was renewed about 10 years before, but there was no explanation of why. There was also a file cabinet in his office of files that he inherited from the previous unit engineers. He looked through that file cabinet and found the correct drawings for the existing exchanger bundle.

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[2] The following examples are merely examples for illustration purposes only. [Each company should develop its own approach.] They are not to be considered exclusive or exhaustive in nature. API makes no warranties, express or implied for reliance on or any omissions from the information contained in this document.

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After looking at the data collected and also using his knowledge of the records system at the plant, he began his 5-Why analysis. The following is the 5-Why form he filled out.

NOTE A separate Level 1 investigation might need to be conducted on why the tube bundle had so many tubes needing plugging and why the bundle corrosion was so severe that it was not anticipated or planned for.

5-Whys Worksheet	
Name of Investigator: John Smith	**Date:** January, 15, 2010
Equipment Involved: E-101	**Persons Involved:**
What Happened That Should Not Have: E-101 replacement exchanger bundle was fabricated incorrectly.	
1. Why? The wrong drawings were used to fabricate the replacement bundle.	
2. Why? The drawings of the exchanger bundle were not updated in the main equipment files.	
3. Why? A previous unit engineer did not update the equipment file when the exchanger was redesigned.	
4. Why? The previous unit engineer did not trust the records room equipment files and so he kept his own files.	
5. Why? The records room does not have controlled access and documents have been lost or misplaced in the past.	
6. Why? Keeping up to date equipment files is not given a high priority by management.	
You have gotten to the end of asking why when you have identified the system related issues that can be corrected to prevent this incident from happening again.	
Identified Root Cause: The equipment files record room is not secured and there is not a defined and auditable process for updating records.	
Corrective Actions to Prevent Reoccurrence: Actions would be identified on how to improve the security of the equipment records room and to develop an auditable process for updating equipment records, with identified roles and responsibilities. This would be assigned to the plant technical manager.	

SoCalGas-5.0666

Annex C
(informative)

Example: Level 1 PEI Incident Investigation Results Form [3]

Incident: *What should be investigated?*	Date of Incident:
Investigation Method:	
Analysis Method:	Investigation Leader:
Team Members: *Name, job, and area, if any*	
Sponsor: *Name and title*	Date Investigation Initiated:
Date Investigation Completed:	Report Completed:
Investigation Results	
Evidence: *Summarize the evidence gathered.*	
Sequence of Events or Timeline: *Provide a brief timeline leading up to and including the incident.*	
Immediate Causes: *Explain the PHYSICS of the incident, define the causes that directly related to the incident.*	
Contributing Causes: *What were the causes that contributed to this incident or the severity of it?*	
Root Causes: What were the underlying system related reason the incident occurred.	
Follow-up Action Items:	

[3] The following examples are merely examples for illustration purposes only. [Each company should develop its own approach.] They are not to be considered exclusive or exhaustive in nature. API makes no warranties, express or implied for reliance on or any omissions from the information contained in this document.

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Annex D
(informative)

Example Lists of Generic Evidence to be Gathered [4]

People data:

— eyewitness reports,

— first responders/emergency responders reports,

— process operators—on shift and off shift,

— maintenance personnel associated with the equipment,

— inspection personnel associated with the equipment,

— metallurgist or corrosion engineer,

— process engineers,

— reliability or maintenance engineers,

— project/design engineers,

— manufacturer's representatives,

— chemistry and other laboratory personnel.

Physical data:

— pressure boundary equipment such as gaskets and flanges;

— damaged equipment components;

— process samples from relevant equipment;

— metallurgical samples;

— explosion fragments and pieces of process equipment;

— direction of glass pieces;

— location and position of fragments;

— process volumes and levels;

— blast and fire damage;

— location of burn and scorch marks;

— as-found position of valves, controls, and switches;

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[4] The following examples are merely examples for illustration purposes only. [Each company should develop its own approach.] They are not to be considered exclusive or exhaustive in nature. API makes no warranties, express or implied for reliance on or any omissions from the information contained in this document.

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— position of relief valves;

— location of witnesses;

— location of other personnel involved in the process;

— smoke traces;

— melting patterns;

— impact marks;

— location of chemicals in the process;

— video recordings of the area, if available.

Record data:

— process operating records and conditions—electronic and manual,

— process operating procedures,

— shift logs,

— work permits,

— maintenance records,

— inspection records,

— records of process sample analyses,

— repair records,

— P&IDs,

— equipment drawings and specification sheets,

— repair and rerating records,

— material balances,

— corrosion data,

— management of change records,

— prior incident investigation reports or near miss reports,

— training manuals and records,

— inspection plans.

SoCalGas-5.0669

Annex E
(informative)

Examples of Questions to Ask Eyewitnesses [5]

— What do you do here, and what is your job?

— How long have you been doing that job?

— How long have you been at this facility/plant?

— Where were you at the time of the incident?

— What were you doing at the time of the incident?

— Would you describe the incident?

— What did you see, hear, feel, or smell?

— What did you do in reaction to the incident?

— How did you know what to do when the incident occurred?

— Who else was around you at the time of the incident?

— What were the others doing right before the incident?

— What were you doing right before the incident happened?

— Did you have any indications before the incident that something was about the happen?

— What were the weather conditions when the incident occurred?

— Was there anything different right before the incident?

— In your opinion why do you think this incident occurred? (Note this information as opinion, not fact.)

— Was this incident unexpected, or were you expecting something like this might happen and why?

— Has this incident or a very similar event occurred previously and if so, when and what happened?

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[5] The following examples are merely examples for illustration purposes only. [Each company should develop its own approach.] They are not to be considered exclusive or exhaustive in nature. API makes no warranties, express or implied for reliance on or any omissions from the information contained in this document.

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Annex F
(informative)

Request for Failure Analysis Form [6]

From:	Date:
To:	
ANALYSIS REQUIREMENTS	
Prioritization Category: A—Urgent Request—if work requires overtime or work after hours B—Standard Request—if work will be conducted during regular business hours	
Requested Due Dates: Verbal Report: Final Report:	
How Shipped: Carrier: Expected Date of Arrival: Tracking No.:	
Shipped To:	

BACKGROUND	
Type of Component: *shell, head, nozzle, pipe, flange, valve, etc.*	Material Type:
Equipment No.:	ASTM/ASME Spec No.:
Unit:	Wall Thickness:
Operating Dept:	Year Built:

PROCESS/DESIGN CONDITIONS	
Process Design Temperature: _____ °F	Process Operating Temperature: _____ °F
Process Design Pressure: _____ psig	Process Operating Pressure: _____ psig
Internal Environment (including major/minor fluids and contaminant):	
External Environment (including major/minor fluids and contaminant):	

[6] The following examples are merely examples for illustration purposes only. [Each company should develop its own approach.] They are not to be considered exclusive or exhaustive in nature. API makes no warranties, express or implied for reliance on or any omissions from the information contained in this document.

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How Was the Problem Discovered?
Definition of Problem?
Type of Investigation Needed (please include drawings and datasheets as applicable):
Special Requests: *chemical analysis, special testing, PMI, mechanical testing, etc.*
Impact of Investigation on Business and Future Utilization of Equipment:
Contacts—Recipient of Verbal Failure Analysis Results/Conclusions by Phone:

SoCalGas-5.0672

Annex G
(informative)

Example Template for Level 2 or Level 3 PEI Incident Investigation Report [7]

The following sections are suggested as a template for an investigation final report.

Incident Description: *Provide a summary of the incident that occurred and that was investigated.*
Summary of Consequences: *Provide a summary of the consequences of the incident. This would include a summary of the injuries if there were any, environmental damage, a summary of the equipment damage, the production loss and down time, and associated costs.*
Investigation Process: *Describe in general how the incident was investigated. This would include the makeup of the team, when the investigation started after the incident, how long it took, and an overview of all that was done to investigate the incident.*
Summary Sequence of Events: *Brief summary of the major events leading up to and immediately after the incident in chronological order.*
Evidence: *An overview of what evidence was gathered and how it was.*
Evidence from People: *Provide a summary of the evidence that was gathered from people, including who was interviewed and job titles.*
Key Findings from Evidence Gathered from People: *A summary of the key findings from the evidence that was gathered from people.*
Physical Evidence: *A summary of the physical evidence that was examined and the key findings from it.*
Record Evidence: *A summary of the record evidence and the key findings from it.*
Incident Sequence: *Describe how the incident occurred and the events leading up to it.*
Immediate Causes: *Define the immediate physical causes that allowed the incident to occur based on the evidence gathered and the investigation team's analysis of that evidence.*
Contributing Causes: *Define the contributing causes of this incident based on the evidence gathered and investigation team's analysis of that evidence.*
Root Causes: *Define the root causes of this incident based on the evidence gathered and investigation team's analysis of that evidence.*
Recommendations: *Define the recommendations to mitigate the contributing and root causes in order to reduce the likelihood that they will contribute to another incident.*
Appendix: *The appendices would include more detail about the investigation team's findings. They might include further detail on key physical evidence, such as photos of failed parts and how the analysis was completed and what the analysis discovered. A more detailed timeline could be provided in the appendix, if one was developed. If a logic tree or sequence diagram is drawn for the investigation conclusions, those should be included in an appendix.*

[7] The following examples are merely examples for illustration purposes only. [Each company should develop its own approach.] They are not to be considered exclusive or exhaustive in nature. API makes no warranties, express or implied for reliance on or any omissions from the information contained in this document.

SoCalGas-5.0673

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[9] Lees, F. P., *Loss Prevention in the Process Industries*, Elsevier, 1996

[10] API 510, *Pressure Vessel Inspection Code*;

[11] API 570, *Piping Inspection Code*;

[12] API Recommended Practice 571, *Damage Mechanisms Affecting Fixed Equipment in the Refining Industry*;

[13] API Recommended Practice 572, *Inspection Practices for Pressure Vessels*;

[14] API Recommended Practice 573, *Inspection of Fired Boilers and Heaters*;

[15] API Recommended Practice 574, *Inspection Practices for Piping System Components*;

[16] API Recommended Practice 575, *Inspection of Atmospheric and Low Pressure Storage Tanks*;

[17] API Recommended Practice 576, *Inspection of Pressure-Relieving Devices*;

[18] API Recommended Practice 577, *Welding Inspection and Metallurgy*;

[19] API Recommended Practice 578, *Material Verification Program for New and Existing Alloy Piping Systems*;

[20] API Recommended Practice 579, *Fitness-For-Service*;

[21] API Recommended Practice 580, *Risk-Based Inspection*;

[22] API Recommended Practice 581, *Risk-Based Inspection Methodology*;

---

[8] American Institute of Chemical Engineers, Center for Chemical Process Safety, 3 Park Avenue, 19th Floor, New York, New York 10016, www.aiche.org/ccps.

[9] National Fire Protection Association, 1 Batterymarch Park, Quincy, Massachusetts 02169-7471, www.nfpa.org.

SoCalGas-5.0674

[23] API Recommended Practice 582, *Welding Guidelines for the Chemical, Oil and Gas Industries*;

[24] API Recommended Practice 583, *Corrosion Under Insulation and Fireproofing* (pending publication);

[25] API Recommended Practice 584, *Integrity Operating Windows* (pending publication);

[26] API Standard 653, *Tank Inspection, Repair, Alteration and Reconstruction*;

[27] API Publication 932-A, *The Study of Corrosion in Hydroprocess Reactor Effluent Air Cooler Systems*;

[28] API Publication 932-B, *Design, Materials, Fabrication, Operation, and Inspection Guidelines for Corrosion Control in Hydroprocessing Reactor Effluent Air Cooler (REAC) Systems*;

[29] API Recommended Practice 939-C, *Guidelines for Avoiding Sulfidation (Sulfidic) Corrosion Failures in Oil Refineries*;

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[31] API Recommended Practice 945, *Avoiding Environmental Cracking in Amine Units*.

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Ex. I - 12

Response to Data Request

Blade Response to SoCalGas Data Request

Prepared for:
Messrs. A. Patel and G. Healy

Purpose:
Blade response to the SoCalGas Data Request January 23, 2020.

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Date: Feb. 14, 2020

Version: 1

Project Number: N/A

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Table of Contents

1 Background 5

2 Questions and Responses 6

2.1 Question 1. 6

2.2 Question 1.a. 6

2.3 Question 1.b. 6

2.4 Question 1.c. 6

2.5 Question 1.d. 6

2.6 Question 1.e. 7

2.7 Question 1.f. 7

2.8 Question 2. 7

2.9 Question 2.a. 7

2.10 Question 2.b. 8

2.11 Question 2.c. 8

2.12 Question 2.d. 8

2.13 Question 2.e. 8

2.14 Question 2.f. 8

2.15 Question 3. 9

2.16 Question 3.a. 9

2.17 Question 3.b. 9

2.18 Question 3.c. 9

2.19 Question 3.d. 10

2.20 Question 3.e. 10

2.21 Question 3.f. 10

2.22 Question 3.g. 10

2.23 Question 4. 11

2.24 Question 4.a. 11

2.25 Question 4.b. 11

2.26 Question 4.c. 11

2.27 Question 4.d. 12

2.28 Question 4.e. 12

2.29 Question 4.f. 12

SoCalGas-5.0680

2.30 Question 5. 13
2.31 Question 5.a. 13
2.32 Question 5.b. 13
2.33 Question 5.c. 13
2.34 Question 5.d. 13
2.35 Question 5.e. 14
2.36 Question 5.f. 14
2.37 Question 6. 14
2.38 Question 6.a. 14
2.39 Question 6.b. 15
2.40 Question 6.c. 15
2.41 Question 6.d. 15
2.42 Question 6.e. 15
2.43 Question 6.f. 16
2.44 Question 7. 16
2.45 Question 7.a. 16
2.46 Question 7.b. 16
2.47 Question 7.c. 17
2.48 Question 7.d. 17
2.49 Question 7.e. 17
2.50 Question 7.f. 17
3 Nomenclature 18
3.1 Abbreviations and Acronyms 18
4 References 19

SoCalGas-5.0681

1 Background

Southern California Gas Company (SoCalGas) issued a data request to Blade Energy Partners (Blade) on January 23, 2020.

Blade reviewed the data request and prepared responses to each part of the data requests. The SoCalGas questions are included verbatim followed by the Blade responses in Section 2.

SoCalGas-5.0682

2 Questions and Responses

2.1 Question 1.

With regards to YOUR statement in the BLADE REPORT, at p. 5-6, that "the root causes for the uncontrolled release of hydrocarbons for 111 days from SS-25 were … [t]he lack of internal policy and regulation that required production casing wall thickness inspections … methodologies such as periodic wall thickness measurements were necessary," please respond to the following questions:

2.2 Question 1.a.

Identify and describe any and all INDUSTRY STANDARD(S) that YOU considered, evaluated, or assessed in connection with internal policies requiring production casing wall thickness inspections.

2.2.1 Response 1.a.

Blade did not identify any INDUSTRY STANDARD(S) "in connection with internal policies requiring production casing wall thickness inspections".

2.3 Question 1.b.

Produce any and all DOCUMENTS related to any INDUSTRY STANDARDS identified in response to Request 1(a) above.

2.3.1 Response 1.b.

No INDUSTRY STANDARD(S) were identified with "in connection with internal policies requiring production casing wall thickness inspections".

2.4 Question 1.c.

For each of the INDUSTRY STANDARD(S) identified in response to Request 1(a) above, describe the reason(s) why BLADE evaluated the INDUSTRY STANDARD(S)

2.4.1 Response 1.c.

No INDUSTRY STANDARD(S) were identified with "in connection with internal policies requiring production casing wall thickness inspections".

2.5 Question 1.d.

Identify any and all LAW(S) that YOU considered, evaluated, or assessed in connection with the above statement.

SoCalGas-5.0683

2.5.1 Response 1.d.

Blade reviewed the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1] as described in the Blade Report on pages 197 – 199—Section 4.6.1.

2.6 Question 1.e.

For each LAW(S) that YOU evaluated in preparing the BLADE REPORT identified in response to Request 1(d) above, state YOUR understanding as to whether SoCalGas complied with the LAW(S).

2.6.1 Response 1.e.

Based on Blade's technical review, no requirements were identified in the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1] requiring operators to conduct wall thickness inspections in gas storage wells. This is discussed on page 202—Section 4.7 of the Blade Report.

2.7 Question 1.f.

For each LAW(S) identified in response to Request 1(d) above, describe the reason(s) why BLADE evaluated the LAW(S).

2.7.1 Response 1.f.

An outcome of the RCA process was that the leak could have been prevented if a SoCalGas internal policy and regulations had been in place requiring periodic inspections to determine casing wall thickness as discussed on page 231—Section 5.3.1 and pages 237 – 238—Section 5.3.2 in the Blade Report. Periodic inspections would have allowed tracking wall thickness vs. time and provided data for assessing the pressure capacity of the production casing.

Therefore, Blade evaluated the regulations to determine if regulations were in place prior to the SS-25 leak that required production casing wall thickness inspections. Blade's assessment of the 2015 regulations is included in the Blade Report on pages 197 – 199—Section 4.6.

2.8 Question 2.

With regards to YOUR statement in the BLADE REPORT, at p. 5-6, that "the root causes for the uncontrolled release of hydrocarbons for 111 days from SS-25 were … [t]he lack of a real-time, continuous pressure monitoring system for well surveillance," please respond to the following questions:

2.9 Question 2.a.

Identify and describe any and all INDUSTRY STANDARD(S) that YOU considered, evaluated, or assessed related to real-time, continuous pressure monitoring systems for well surveillance.

2.9.1 Response 2.a.

Blade did not identify any INDUSTRY STANDARD(S) "related to real-time, continuous pressure monitoring systems for well surveillance."

SoCalGas-5.0684

2.10 Question 2.b.

Produce any and all DOCUMENTS related to any INDUSTRY STANDARDS identified in response to Request 2(a) above.

2.10.1 Response 2.b.

No INDUSTRY STANDARD(S) were identified "related to real-time, continuous pressure monitoring systems for well surveillance."

2.11 Question 2.c.

For each of the INDUSTRY STANDARD(S) identified in response to Request 2(a) above, describe the reason(s) why BLADE evaluated the INDUSTRY STANDARD(S)

2.11.1 Response 2.c.

No INDUSTRY STANDARD(S) were identified "related to real-time, continuous pressure monitoring systems for well surveillance."

2.12 Question 2.d.

Identify any and all LAW(S) that YOU considered, evaluated, or assessed in connection with the above statement.

2.12.1 Response 2.d.

Blade reviewed the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1] as described in the Blade Report on pages 197 – 199—Section 4.6.1.

2.13 Question 2.e.

For each LAW(S) that YOU evaluated in preparing the BLADE REPORT identified in response to Request 2(d) above, state YOUR understanding as to whether SoCalGas complied with the LAW(S).

2.13.1 Response 2.e.

Based on Blade's technical review, no requirements were identified in the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1] requiring "a real-time, continuous pressure monitoring system for well surveillance."

2.14 Question 2.f.

For each LAW(S) identified in response to Request 2(d) above, describe the reason(s) why BLADE evaluated the LAW(S).

SoCalGas-5.0685

2.14.1 Response 2.f.

An outcome of the RCA process was that the lack of a real-time, continuous pressure monitoring system for well surveillance prevented an immediate identification of the SS-25 leak and accurate estimation of the gas flow rate. The SS-25 gas injection could have been stopped earlier preventing additional cooling at the leak and may have prevented the brittle failure that caused the production casing to circumferentially part resulting in the large breach in the casing. This is discussed in the Blade Report on page 230—Section 5.2.3, page 233—Section 5.3.1, and page 239—Section 5.4.

Therefore, Blade evaluated the regulations to determine if regulations were in place prior to the SS-25 leak that required "real-time, continuous pressure monitoring system for well surveillance."

2.15 Question 3.

With regards to YOUR statement in the BLADE REPORT, at p. 5-6, that "the root causes for the uncontrolled release of hydrocarbons for 111 days from SS-25 were … "[t]he lack of systemic practices of external corrosion protection for surface casing strings," please respond to the following questions:

2.16 Question 3.a.

Identify and describe any and all INDUSTRY STANDARD(S) that YOU considered, evaluated, or assessed in connection with external corrosion protection for surface casing strings.

2.16.1 Response 3.a.

Blade considered the NACE Standard Practice SP0186-2007 titled "Application of Cathodic Protection of External Surfaces of Well Casings" [2] (formerly RP0186-2001).

The foreword from SP0186-2007 describes the standard as follows:

> This NACE International standard practice identifies procedures to determine the need for cathodic protection (CP) and the current requirements to achieve CP of well casings associated with oil and gas production and gas storage. It also outlines practices for the design and installation of CP systems and for their operation and maintenance.

2.17 Question 3.b.

Produce any and all DOCUMENTS related to any INDUSTRY STANDARDS identified in response to Request 3(a) above.

2.17.1 Response 3.b.

NACE Standard SP0186-2007 can be purchased from the NACE website.

2.18 Question 3.c.

For any INDUSTRY STANDARD(S) identified in response to Request 3(a) above, describe the reason(s) why BLADE evaluated the INDUSTRY STANDARD(S).

SoCalGas-5.0686

2.18.1 Response 3.c.

An outcome of the RCA process was that the lack of systematic practices of external corrosion protection for surface casing strings was one of the root causes for the release of hydrocarbons. This is discussed several places in the Blade Report including, page 99—Section 2.7.4; page 124—Section 2.10.2, page 193—Section 4.5, page 205—Section 4.7, page 233—Section 5.3.1, and page 239—Section 5.4.

Therefore, Blade considered the NACE Standard Practice SP0186-2007 and RP0186-2001 to determine whether the SP/RP criteria, applied to SS-25 conditions, would have identified a need for cathodic protection of the surface casing.

2.19 Question 3.d.

For any INDUSTRY STANDARD(S) identified in response to Request 3(a) above, describe how long before the October 23, 2015 leak they were published or otherwise made available.

2.19.1 Response 3.d.

The NACE standard RP0186 was published in 2001, and SP0186, which superseded RP0186, was published in 2007.

2.20 Question 3.e.

Identify any and all LAW(S) that YOU considered, evaluated, or assessed in connection with the above statement.

2.20.1 Response 3.e.

Blade reviewed the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1] as described in the Blade Report on pages 197 – 199—Section 4.6.1.

2.21 Question 3.f.

For each LAW(S) that YOU evaluated in preparing the BLADE REPORT identified in response to Request 3(e) above, state YOUR understanding as to whether SoCalGas complied with the LAW(S).

2.21.1 Response 3.f.

Based on Blade's technical review, no requirements were identified for cathodic protection of surface casings in the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1].

2.22 Question 3.g.

For each LAW(S) identified in response to Request 3(e) above, describe the reason(s) why BLADE evaluated the LAW(S).

SoCalGas-5.0687

2.22.1 Response 3.g.

An outcome of the RCA process was that the lack of systematic practices of external corrosion protection for surface casing strings was one of the root causes for the release of hydrocarbons. This is discussed several places in the Blade Report including, page 99—Section 2.7.4, page 124—Section 2.10.2, page 193—Section 4.5, page 205—Section 4.7, page 233—Section 5.3.1, and page 239—Section 5.4.

Therefore, Blade considered the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1] to determine any requirements "in connection with external corrosion protection for surface casing strings".

2.23 Question 4.

With regards to YOUR statement in the BLADE REPORT, at p. 5-6, that "the root causes for the uncontrolled release of hydrocarbons for 111 days from SS-25 were … "[t]here was no quantitative understanding of well deliverability, although data were available, and well-established industry practices existed for such analysis," please respond to the following questions:

2.24 Question 4.a.

Identify and describe any and all INDUSTRY STANDARD(S) that YOU considered, evaluated, or assessed in connection with the above statement.

2.24.1 Response 4.a.

Well deliverability analysis is a long-established and widely used practice by the petroleum industry.

Blade used the following handbooks and textbooks in conducting well deliverability analysis:

- *Production Optimization Using Nodal Analysis*, H. Dale Beggs, OGCI Publications, 1991
- *Petroleum Production Systems*, First Edition, M.J. Economides, A.D. Hill, C. Ehlig-Economides, Prentice Hall, 1994
- *Petroleum Production Systems*, Second Edition, M.J. Economides, A.D. Hill, C. Ehlig-Economides, D. Zhu, Prentice Hall, 2013

Blade used PROSPER, a commercially available software, which is widely used in the petroleum industry.

2.25 Question 4.b.

Produce any and all DOCUMENTS related to any INDUSTRY STANDARDS identified in response to Request 4(a) above.

2.25.1 Response 4.b.

These documents are available for purchase online.

2.26 Question 4.c.

For each of the INDUSTRY STANDARD(S) identified in response to Request 4(a) above, describe the reason(s) why BLADE evaluated the INDUSTRY STANDARD(S)

SoCalGas-5.0688

2.26.1 Response 4.c.

An outcome of the RCA process was that the lack of understanding of the well deliverability was a root cause and affected the well-control planning as discussed in the Blade Report on pages 132 – 133—Section 3.2.1. Well gas flow rate is a key parameter used in dynamic kill modeling and in estimating the total gas leak volume.

Therefore, Blade used industry practices to establish well deliverability following the leak event.

2.27 Question 4.d.

Identify any and all LAW(S) that YOU considered, evaluated, or assessed in connection with the above statement.

2.27.1 Response 4.d.

Blade reviewed the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1] as described in the Blade Report on pages 197 – 199—Section 4.6.1.

2.28 Question 4.e.

For each LAW(S) that YOU evaluated in preparing the BLADE REPORT identified in response to Request 4(d) above, state YOUR understanding as to whether SoCalGas complied with the LAW(S).

2.28.1 Response 4.e.

Based on Blade's technical review, no requirements were identified for well deliverability estimation in the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1].

2.29 Question 4.f.

For each LAW(S) identified in response to Request 4(d) above, describe the reason(s) why BLADE evaluated the LAW(S).

2.29.1 Response 4.f.

An outcome of the RCA process was that the lack of understanding of the well delivery was a root cause and affected the well-control planning as discussed in the Blade Report on pages 132 – 133—Section 3.2.1. Well gas flow rate is a key parameter used in dynamic kill modeling and in estimating the total gas leak volume.

Therefore, Blade reviewed the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1] to identify any requirements for estimating well deliverability.

SoCalGas-5.0689

2.30 Question 5.

With regards to YOUR statement in the BLADE REPORT, at p. 217, that "no failure analysis or subsequent risk assessment was done that may have led to an awareness that corrosion was a potential problem," please respond to the following questions:

2.31 Question 5.a.

Identify and describe any and all INDUSTRY STANDARD(S) that YOU considered, evaluated, or assessed related to "failure analysis or subsequent risk assessment" related to gas storage well casings.

2.31.1 Response 5.a.

There are no specific standards or practices related to "failure analysis or subsequent risk assessment" related to gas storage well casings. However, Blade considered and evaluated API RP 585, *Pressure Equipment Integrity Incident Investigation* [3].

Blade considered API RP 1171 *Functional Integrity of Natural Gas Storage in Depleted Hydrocarbon Reservoirs and Aquifer Reservoirs* [4] published in September 2015 that does address risk assessments for gas storage wells.

2.32 Question 5.b.

Produce any and all DOCUMENTS related to any INDUSTRY STANDARDS identified in response to Request 5(a) above.

2.32.1 Response 5.b.

API RP 585 and API RP 1171 can be obtained from the API website.

2.33 Question 5.c.

For each of the INDUSTRY STANDARD(S) identified in response to Request 5(a) above, describe the reason(s) why BLADE evaluated the INDUSTRY STANDARD(S)

2.33.1 Response 5.c.

An outcome of the RCA process was that a direct cause of the release of hydrocarbons was an axial rupture due to external microbial corrosion on the 7 in. casing outside diameter caused by ground water. A root cause was the lack of a detailed follow-up investigation failure analyses, or RCA of casing leaks, parted casings, or other failure events as discussed in the Blade Report on page 237—Section 5.3.2. The lack of failure analyses and risk assessments related to corrosion are discussed on page 232—Section 5.3.1.

Therefore, Blade reviewed industry standards to establish industry practices regarding failure analysis and subsequent risk assessments.

2.34 Question 5.d.

Identify any and all LAW(S) that YOU considered, evaluated, or assessed in connection with the above statement.

SoCalGas-5.0690

2.34.1 Response 5.d.

Blade reviewed the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1] as described in the Blade Report on pages 197 – 199—Section 4.6.1.

2.35 Question 5.e.

For each LAW(S) that YOU evaluated in preparing the BLADE REPORT identified in response to Request 5(d) above, state YOUR understanding as to whether SoCalGas complied with the LAW(S).

2.35.1 Response 5.e.

Based on Blade's technical review, no requirements were identified for failure analysis or subsequent risk assessments in the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1].

2.36 Question 5.f.

For each LAW(S) identified in response to Request 5(d) above, describe the reason(s) why BLADE evaluated the LAW(S).

2.36.1 Response 5.f.

An outcome of the RCA process was that a direct cause of the release of hydrocarbons was an axial rupture due to external microbial corrosion on the 7 in. casing outside diameter caused by ground water. A root cause was the lack of a detailed follow-up investigation failure analyses, or RCA of casing leaks, parted casings, or other failure events as discussed in the Blade Report on page 237—Section 5.3.2. The lack of failure analyses and risk assessments related to corrosion are discussed on page 232—Section 5.3.1.

Therefore, Blade reviewed the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1] to identify requirements regarding failure analysis and subsequent risk assessments.

2.37 Question 6.

With regards to YOUR statement in the BLADE REPORT, at p. 237, that "[t]he root causes for the uncontrolled release of hydrocarbons for 111 days from SS-25 were . . . The lack of a dual mechanical barrier system in the wellbore," please respond to the following questions:

2.38 Question 6.a.

Identify and describe any and all INDUSTRY STANDARD(S) that YOU considered, evaluated, or assessed regarding use of dual mechanical barrier systems in gas storage wells.

SoCalGas-5.0691

2.38.1 Response 6.a.

Blade considered API RP 1171 titled "*Functional Integrity of Natural Gas Storage in Depleted Hydrocarbon Reservoirs and Aquifer Reservoirs*" [4] that was published in September 2015. However, API RP 1171 does not require dual mechanical barrier in gas storage wells.

Blade also considered ISO Technical Specification 16530-1, *Petroleum and Natural Gas Industries-Well Integrity Life Cycle Governance* [5] that does discuss the need for multiple barriers and redundancy to achieve a high level of reliability. However, ISO 16530-1 was published in 2017.

2.39 Question 6.b.

Produce any and all DOCUMENTS related to any INDUSTRY STANDARDS identified in response to Request 6(a) above.

2.39.1 Response 6.b.

API RP 1171 is available on the API website. ISO 16530-1 is available on the ISO website.

2.40 Question 6.c.

For each of the INDUSTRY STANDARD(S) identified in response to Request 6(a) above, describe the reason(s) why BLADE evaluated the INDUSTRY STANDARD(S)

2.40.1 Response 6.c.

An outcome of the RCA process was that a root cause of the release of hydrocarbons was the lack of a dual mechanical barrier system, as discussed in the Blade Report on page 233—Section 5.3.1.

Therefore, Blade considered and assessed API RP 1171 and ISO 16530-1 to determine industry practices for dual barrier requirements.

2.41 Question 6.d.

Identify any and all LAW(S) that YOU considered, evaluated, or assessed in connection with the above statement.

2.41.1 Response 6.d.

Blade reviewed the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1] as described in the Blade Report on pages 197 – 199—Section 4.6.1.

2.42 Question 6.e.

For each LAW(S) that YOU evaluated in preparing the BLADE REPORT identified in response to Request 6(d) above, state YOUR understanding as to whether SoCalGas complied with the LAW(S).

SoCalGas-5.0692

2.42.1 Response 6.e.

Based on Blade's technical review, no requirements were identified for dual mechanical barriers for gas storage wells in the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1].

2.43 Question 6.f.

For each LAW(S) identified in response to Request 6(d) above, describe the reason(s) why BLADE evaluated the LAW(S).

2.43.1 Response 6.f.

An outcome of the RCA process was that a root cause of the release of hydrocarbons was the lack of a dual mechanical barrier system in the wellbore, as discussed in the Blade Report on page 233—Section 5.3.1.

Therefore, Blade evaluated the regulations to determine if regulations were in place prior to the SS-25 leak that required a dual mechanical barrier system for gas storage wells.

2.44 Question 7.

With regards to YOUR statement in the BLADE REPORT, at p. 238, that "[t]he root causes for the uncontrolled release of hydrocarbons for 111 days from SS-25 were . . . The lack of a well-specific well-control plan that considered transient kill modeling or well deliverability," please respond to the following questions:

2.45 Question 7.a.

Identify and describe any and all INDUSTRY STANDARD(S) that YOU considered, evaluated, or assessed related to well-specific well-control plans that consider transient kill modeling or well deliverability.

2.45.1 Response 7.a.

Although there are many references in the open literature, Blade considered the following as part of the RCA:

- API RP 1171, *Functional Integrity of Natural Gas Storage in Depleted Hydrocarbon Reservoirs and Aquifer Reservoirs* [4] (published in September 2015)
- *Advanced Blowout and Well Control* [6] reference book
- *NORSOK Standard D-010 Rev 4, June 2013, Well Integrity in Drilling and Well Operations* [7]

2.46 Question 7.b.

Produce any and all DOCUMENTS related to any INDUSTRY STANDARDS identified in response to Request 7(a) above.

2.46.1 Response 7.b.

These documents are available for purchase online.

SoCalGas-5.0693

2.47 Question 7.c.

For any INDUSTRY STANDARD(S) identified in response to Request 7(a) above, describe the reason(s) why BLADE evaluated the INDUSTRY STANDARD(S).

2.47.1 Response 7.c.

An outcome of the RCA process was that a root cause of the release of hydrocarbons was the lack of a well-specific well-control plan that considered transient kill modeling or well deliverability, as discussed in the Blade Report on page 233—Section 5.3.1.

Therefore, Blade considered API 1171, NORSOK Standard D010 and *Advanced Blowout and Well Control* book. API RP 1171 discusses industry practices for a blowout contingency plan. NORSOK Standard D010 discusses kill rate simulation. The *Advanced Blowout and Well Control* book includes a discussion on dynamic kill operations and using friction to control the bottom hole pressure to kill the well.

2.48 Question 7.d.

For any INDUSTRY STANDARD(S) identified in response to Request 7(a) above, describe how long before the October 23, 2015 leak they were published or otherwise made available.

2.48.1 Response 7.d.

API RP 1171 was issued in September 2015.

The book *Advanced Blowout and Well Control* was published in 1994.

NORSOK Standard D-010 Rev 4 was updated in June 2013.

2.49 Question 7.e.

Identify any and all LAW(S) that YOU considered, evaluated, or assessed in connection with the above statement.

2.49.1 Response 7.e.

Blade reviewed the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1] as described in the Blade Report on pages 197 – 199—Section 4.6.1.

2.50 Question 7.f.

For each LAW(S) that YOU evaluated in preparing the BLADE REPORT identified in response to Request 7(e) above, state YOUR understanding as to whether SoCalGas complied with the LAW(S).

2.50.1 Response 7.f.

Based on Blade's technical review, no requirements were identified for well-specific well-control plans that considered transient kill modeling or well deliverability in the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1].

SoCalGas-5.0694

3 Nomenclature

3.1 Abbreviations and Acronyms

Term	Definition
API	American Petroleum Institute
Blade	Blade Energy Partners
ISO	International Standards Organization
NACE	National Association of Corrosion Engineers
NORSOK	Norsk Sokkels Konkurranseposisjon (a Norwegian Standards Organization)
RCA	Root Cause Analysis
SoCalGas	Southern California Gas Company

SoCalGas-5.0695

4 References

[1] State of California, "California Statutes and Regulations for Conservation of Oil, Gas, & Geothermal Resources," 2015.

[2] NACE International, "Application of Cathodic Protection for External Surfaces of Steel Well Casings (NACE SP0186-007)," 2007.

[3] American Petroleum Institute, "API RP 585 Pressure Equipment Integrity Incident Investigation," Washington, DC, April 2014.

[4] American Petroleum Institute, "API RP 1171, Functional Integrity of Natural Gas Storage in Depleted Hydrocarbon Reservoirs and Aquifer Reservoirs," Washington, DC, September 2015.

[5] ISO, "Petroleum and natural gas industries-Well integrity-Part 1: Life cycle governance," 2017-03.

[6] R. D. Grace, Advanced Blowout and Well Control, Houston: Gulf Publishing Company, 1994.

[7] Standards Norway, "NORSOK Standard D-010, Well Integrity in Drilling and Well Operations, Rev 4," June 2013.

SoCalGas-5.0696

Ex. I - 13

Response to Data Request

Blade Response to SED Data Request

Prepared for:
Mr. Darryl Gruen

Purpose:
Blade response to the SED Data Request SED DR-49.

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Version Record

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SoCalGas-5.0699

Table of Contents

1 **Background** **4**
2 **Questions and Responses** **5**
2.1 Question 1 5
2.2 Question 2 5
2.3 Question 3 12
2.4 Question 4 12
2.5 Question 5 13
2.6 Question 6 13
2.7 Question 7 15
2.8 Question 8 15
2.9 Question 9 15
3 **References** **16**
4 **Appendix A—Data Request February 18, 2018, SS-44A SoCalGas Response** **17**
5 **Appendix B—Data Request March 23, 2018, SS-44A SoCalGas Response** **25**

List of Figures

Figure 1: February 18, 2018, Data Request and Response 7
Figure 2: March 23, 2018, Data Request and Response 8
Figure 3: April 19, 2018, Supplemental Response 9
Figure 4: August 24, 2018, Meeting, Slide 23 9
Figure 5: August 24, 2018, Meeting, Slide 24 10
Figure 6: August 29, 2018, Data Request and Response 11
Figure 7: December 18, 2018, Data Request and Response 12
Figure 8: API 585 Inspection Levels 14

SoCalGas-5.0700

1 Background

The California Public Utilities Commission Legal Division issued Data Request No. SED DR-49 to Blade Energy Partners (Blade) on December 5, 2019.

The data request is related to the Prepared Testimony of Amy Kitson on Behalf of Southern California Gas Company, dated November 22, 2019, at page 3, lines 1 through 14, and is replicated here verbatim for reference:

> **Solution 6: Conduct a Casing Failure Analysis**
>
> This mitigation/solution has already been implemented. The Blade Report incorrectly asserts that SoCalGas did not investigate the causes of previous casing failures. In order to remediate a leak discovered in any gas storage well, SoCalGas necessarily had to analyze and diagnose the issue first, before repairing it. In describing Solution 6, the Blade Report states that "casing failures need to be formally investigated." [Footnote 3, referencing Blade Report at p. 232] The Blade Report fails to recognize, however, that a "formal investigation" of the type Blade appears to envision would likely entail a level of examination that would not be feasible for an active well, nor necessary. While Blade was able to cut, extract, and thoroughly examine the casing at well SS-25 because there were plans to abandon the well, it is not feasible for SoCalGas to perform the same level of failure analysis on active gas storage wells. Further, although the SS-25 failure occurred at a relatively shallow depth, even Blade experienced difficulty cutting and extracting the casing. For casing failures thousands of feet belowground, operational issues may inhibit the cutting and extracting of casing.

The SED questions related to the Prepared Testimony are included verbatim followed by the Blade responses.

SoCalGas-5.0701

2 Questions and Responses

2.1 Question 1

Does Blade agree with, or disagree with any portion or all of the statement that, "The Blade Report incorrectly asserts that SoCalGas did not investigate the causes of previous casing failures."?

2.1.1 Response 1

Blade disagrees with the statement.

2.2 Question 2

Please provide an explanation in support of Blade's answer.

2.2.1 Response 2

Data gathering and a review of the data for the RCA that Blade conducted for the SS-25 casing failure determined that numerous casing failures [1] had occurred throughout the life of the Aliso Canyon field. SoCalGas communicated to Blade that any documents, reports and analysis related to failures would be contained in the well files. Blade reviewed numerous well files for wells with casing failures and did not find documentation of failure analysis.

The following are types of questions and analysis that should be considered as part of a failure investigation (whether the casing can be recovered or not):

- Is the corrosion on the ID or OD based on inspection log data?
- What is possibly causing corrosion? Modeling and assessment of water sources may be adequate to understand the problem.
- Was the failure in the casing body or is it in the connection? A camera run may reveal the nature of the failure. This may enabled an interpretation of the failure.
- Is the failure an isolated event or potentially a systemic issue? Are mitigating steps required?

However, if the casing can be recovered because it is parted shallow or the failure is shallow, then additional laboratory work can be conducted to develop a hypothesis on the causes of failure. There were cases where casing (failed or otherwise) were recovered, however no analysis reports were found in the well files.

There was no indication that failure analysis had been completed for any of the failures. Blade did not locate any such information in any of the well files that it examined in some detail.

Two of the wells (Frew 3 and FF-34A) had underground blowouts that were successfully controlled and repaired without difficulty. The Blade RCA Team was interested in understanding details regarding these two casing failures to determine if the failures were one-off or if there were systemic problems that may affect other wells in the field, and if any failures were similar to SS-25. No documentation of any failure analysis was available in the Frew 3 and FF-34A well files.

SoCalGas-5.0702

Blade wanted to confirm that failure studies or failure analyses reports were not overlooked. During the multi-year RCA process, Blade made several requests for information that provided evidence that a study or investigation was done by SoCalGas to understand the cause of casing failures.

The following are examples of the Blade information requests and SoCalGas responses:

1. Data Request February 18, 2018. This request was related to information collected as part of the storage integrity management program (SIMP) casing/integrity program. The request specifically asked for ". . . all daily reports, failure reports and documentation related to the failure analysis".

   SoCalGas responded with a list of wells, daily operational reports, and a Schlumberger casing integrity evaluation report (Figure 1). No documentation that shows failures were analyzed or studied was found in the well files.

   Blade was interested in the SS-44A well that reported defects in the surface casing and a longitudinal split in the production casing. The documents provided in the response from SoCalGas are included in Appendix A—Data Request February 18, 2018, SS-44A SoCalGas Response.

SoCalGas-5.0703

Question 2:

Have there been instances of casing with longitudinal or circumferential through wall defects identified by logs or visual inspection? If so, please provide the well name, the description of the failure, casing size, casing weight, casing grade, casing connection, etc. Also provide all daily reports, failure reports and documentation related to the failure analysis.

Response 2:

Well Name	Casing Size, Weight, and Grade	Casing Connection Type	% Wall Loss	Description
Standard Sesnon 44A	8 5/8", 36#, K55/N80	BT&C	N/A	Caliper log indicates potential surface casing through-wall defects at 90° and 225°
Standard Sesnon 44A	8 5/8", 36#, K55/N80	BT&C/LT&C	~100%	Visually identified a longitudinal split in the production casing
Mission Adrian 1B	8 5/8", 36/40#, N80	BT&C	~100% at 1590'	Longitudinal through-wall defect in production casing at 1590'
Porter 32	7", 23-29#, J55/N80	Speedfite	~100% at 5417'	Through-wall defect in production casing at 5417'.
Porter 44	7", 23-26#, N80/J55/S95	T&C	~100% at 4004'	Through-wall defect in production casing at 4004'
Porter 69A	9 5/8", 43.5-53.5#, N80	BT&C + LT&C	~100% at 7414'	Through-wall defect in production casing at 7414'.

For reports and documentation related to the failure analysis, see the following electronic documents:

Well Name	Bates Range
Standard Sesnon 44A	AC_BLD_0067777 – AC_BLD_0067784
Mission Adrian 1B	AC_BLD_0067591 – AC_BLD_0067625
Porter 32	AC_BLD_0067626 – AC_BLD_0067674
Porter 44	AC_BLD_0067675 – AC_BLD_0067719
Porter 69A	AC_BLD_0067720 – AC_BLD_0067776

2

Blade-29 Response Letter.pdf

Figure 1: February 18, 2018, Data Request and Response

2. Data Request March 23, 2018, was a follow up to the data request on February 18, 2018, specific to the longitudinal split that was visually identified in the SS-44A production casing. Photographs and reports specific to the split, other than the daily reports already provided were requested. The information provided is included in Appendix B—Data Request March 23, 2018, SS-44A SoCalGas Response.

   SoCalGas responded that they were not aware of any photographs of the longitudinal split (Figure 2). SoCalGas sent daily operational reports. No failure analysis reports related to the cause to the failed casing were provided. The failed casing was made available to Blade for examination.

Question 1:

A response was provided, and it identified that in Standard Sesnon 44A a longitudinal split was visually identified in the production casing.

a. Are there any photographs of the split, that was visually identified, in SS 44A? Could you please provide them? Please provide any reports specific to the split, other than the daily reports already provided.
b. Is this longitudinal split from SS44A still available for examination? Could we have access to the split in SS44A?
c. Are the rest of the casing joints extracted from this well available for visual examination? Could you provide access to these joints?

Response 1:

SoCalGas provides the following response with respect to the SIMP casing integrity program.

a. SoCalGas is not aware of any photographs of the longitudinal split visually identified in the production casing of SS44A. Please see enclosed electronic documents with Bates range: AC_BLD_0067849 – AC_BLD_0067850 for additional reports related to the split in SS44A.

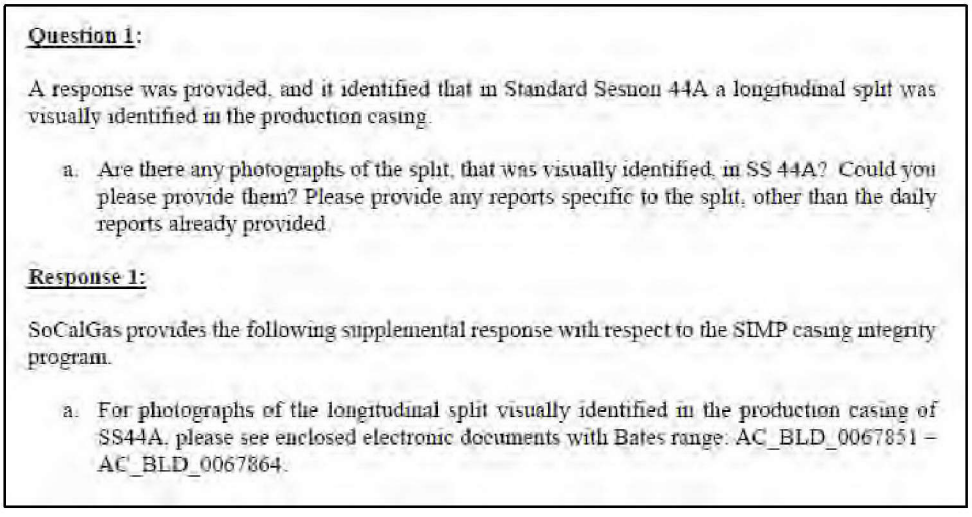
b. After extraction, the tubulars (tubing and casing) were transported to SoCalGas' vendor National Oilwell Varco (NOV) for storage. SoCalGas understands that the split in SS44A is located at NOV's facility in Bakersfield, California, and is available for examination.

c. See Response 1b.

Figure 2: March 23, 2018, Data Request and Response

SoCalGas-5.0705

Eleven months later on April 19, 2019, SoCalGas provided a Supplemental Response with photographs of the longitudinal split (Figure 3).



Question 1:

A response was provided, and it identified that in Standard Section 44A a longitudinal split was visually identified in the production casing.

a. Are there any photographs of the split, that was visually identified, in SS 44A? Could you please provide them? Please provide any reports specific to the split, other than the daily reports already provided.

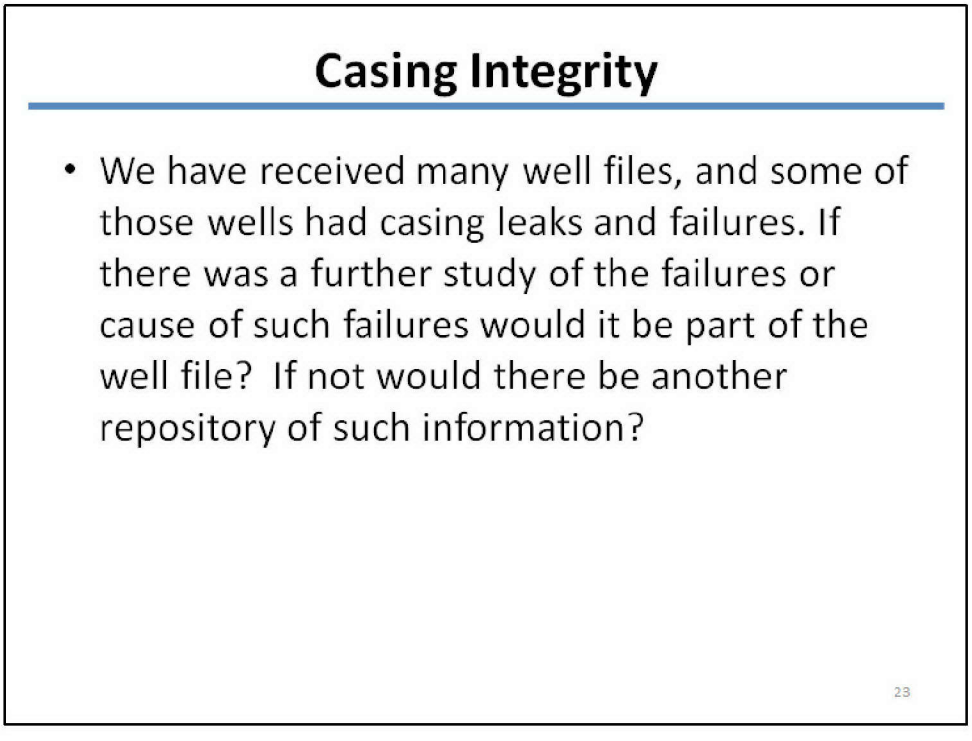
Response 1:

SoCalGas provides the following supplemental response with respect to the SIMP casing integrity program.

a. For photographs of the longitudinal split visually identified in the production casing of SS44A, please see enclosed electronic documents with Bates range: AC_BLD_0067851 – AC_BLD_0067864.

Figure 3: April 19, 2018, Supplemental Response

3. August 24, 2018. Data Clarifications Meeting attended by CPUC, DOGGR-IT (DOGGR Investigation Team), SoCalGas, and Blade. Blade presented slides for discussion at the meeting. Figure 4 is an image of Slide 23.



Casing Integrity

- We have received many well files, and some of those wells had casing leaks and failures. If there was a further study of the failures or cause of such failures would it be part of the well file? If not would there be another repository of such information?

23

Figure 4: August 24, 2018, Meeting, Slide 23

The verbal response from SoCalGas regarding Slide 23 during the meeting is summarized in the notes taken by Blade at the time. The Blade notes for this slide stated:

SoCalGas-5.0706

There is a excel file that Dan has collated around all the casing leaks/ruptures over the years since inception of the field for a SED data request. All leaks were included in Dan's excel. This will be shared with us. There appears to be no record of any failure analyses or reasons for the failures. The well file is a repository for the records.

Studies of casing leaks or problems were brought up again on the next slide (Figure 5).

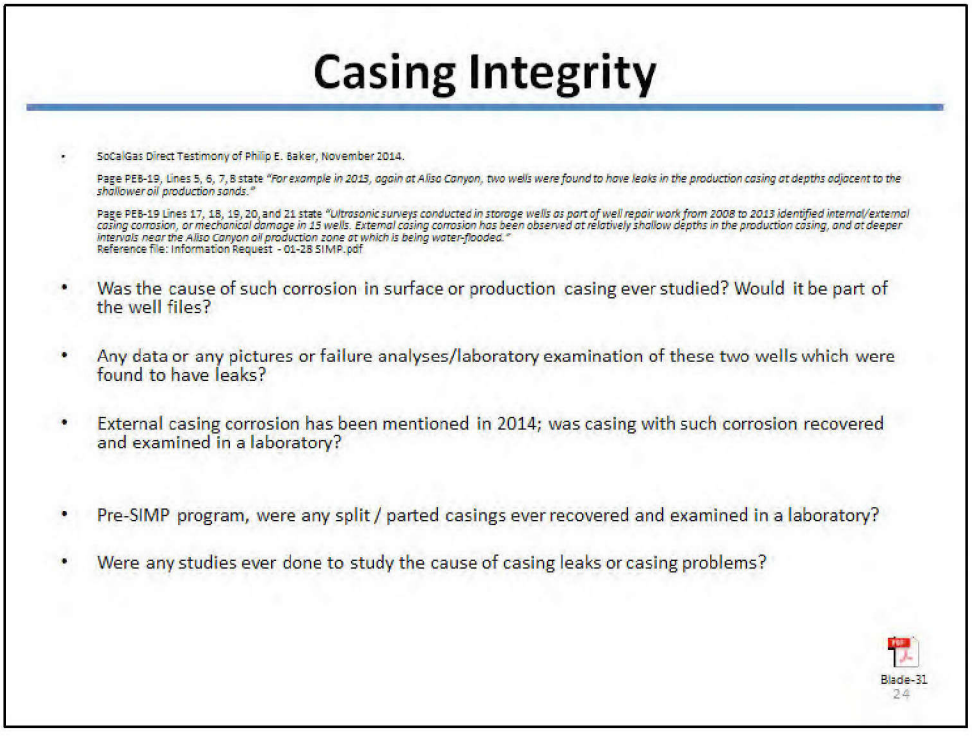


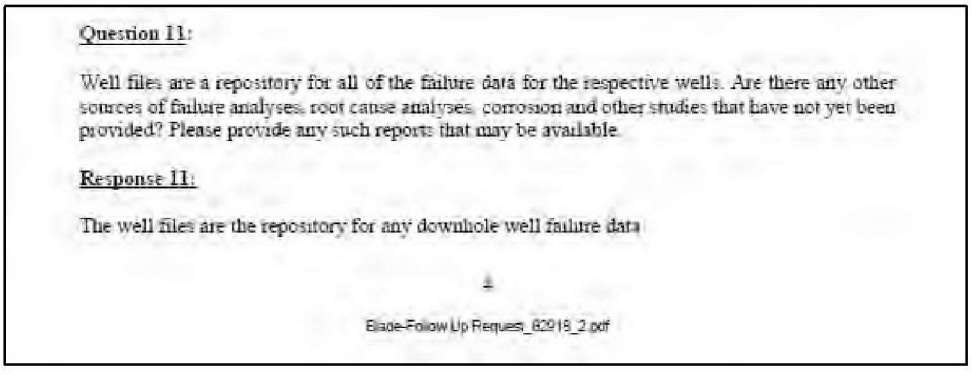
Figure 5: August 24, 2018, Meeting, Slide 24

The verbal response from SoCalGas during the meeting for Slide 24 is summarized in the notes taken by Blade at the time. The Blade notes for this slide stated:

No knowledge on this topic. No shallow casing was ever recovered. Shallow casing problems have been few in the recent past.

4. Data Request August 29, 2018. This data request was a follow-up to the Data Clarification Meeting discussion held on August 24, 2018. The specific request was for any sources of failure analyses, root cause analyses, corrosion and other studies that have not yet been provided, and to provide any such reports that may be available. No failure analysis related information was found in the well files.

   On September 17, SoCalGas responded. No reports were provided as requested (Figure 6).



Question 11:

Well files are a repository for all of the failure data for the respective wells. Are there any other sources of failure analyses, root cause analyses, corrosion and other studies that have not yet been provided? Please provide any such reports that may be available.

Response 11:

The well files are the repository for any downhole well failure data

Blade-Follow Up Request_82918_2.pdf

Figure 6: August 29, 2018, Data Request and Response

5. Data Request December 18, 2018. This data request was related to a proposed study in the Frew 3 well file to determine if corrosion from fresh water could also affect other wells.

   On January 11, 2019, SoCalGas responded that the review program was not warranted because the leak was found to be deeper than earlier indications. Figure 7 shows an image of Question 3 and Response 3.

SoCalGas-5.0708

Question 3:

Refer to Frew-3 documents AC_BLD_0032691 through AC_BLD_0032692, Page 2, next to the last paragraph that states the following.

"If the cause of the leak is determined to be corrosion from the fresh water, a review program should be established to determine the number of wells that are also exposed to this action. Alternatives should then be considered as to the most effective solution to remedy the corrosion problem."

a. Was the work completed to determine if the cause of the Frew-3 leak was due to fresh water corrosion? Is so, please provide any study results or reports related to corrosion and the cause of corrosion.

Response 3:

Based on the cooling anomaly at +/- 1100', there was a concern that the leak was across the shallow sand and possibly caused by fresh water in the shallow sand. However, at the time of the workover recommendation, the exact type and location of the leak was unknown. It was recommended to run a casing caliper log to determine this information.

In January 1986, SoCalGas performed a workover of Frew 3 to repair the casing leak and ran both a Pengo Multi-Arm Casing Caliper Log and a Welex Casing Inspection Log to determine the type and depth of the leak. Both casing inspection logs identified that the hole in the production casing was at 3240', a depth considerably deeper than the shallow sand location. For the casing inspection logs, please see electronic documents with Bates range AC_BLD_0103355 through AC_BLD_0103367. For the workover history and daily well report, please see electronic documents with Bates range AC_BLD_0103348 through AC_BLD_0103354. Since the leak was not found at the shallow sand location, a review program of other wells was not warranted.

Following the two casing inspection logs, the production casing was squeeze cemented and pressure tested to 1000 psi, and the 2-7/8" tubing was replaced with a 5-1/2" inner string and 2-3/8" tubing.

Figure 7: December 18, 2018, Data Request and Response

2.3 Question 3

Does Blade agree with the statement that, "The Blade Report fails to recognize, however, that a 'formal investigation' of the type Blade appears to envision would likely entail a level of examination that would not be feasible for an active well, nor necessary. While Blade was able to cut, extract, and thoroughly examine the casing at well SS-25 because there were plans to abandon the well, it is not feasible for SoCalGas to perform the same level of failure analysis on active gas storage wells."

2.3.1 Response 3

Blade disagrees with the statement.

2.4 Question 4

If Blade agrees with the statement in question 3, please explain why.

2.4.1 Response 4

See Response 5.

2.5 Question 5

If Blade disagrees with any portion or all of the statement in question 3, please explain why it disagrees.

2.5.1 Response 5

Solution 6: Conduct a Casing Failure Analysis from the Blade Main Report, Section 5.3.1, Page 232, is replicated here for reference.

> **Solution 6: Conduct a Casing Failure Analysis**
>
> Despite numerous casing failures, no data were provided to indicate that failure causes were investigated. Casing failures need to be formally investigated so that their causes are identified and their implications are understood. Understanding and interpreting failures are critical to defining the propensity or risk of such failures field wide. Such analysis is an important part of any risk assessment. The cause may be straightforward, well specific, and easily mitigated. However, if the cause appears to systemic, or the potential consequences are serious, then a more comprehensive investigation is needed to evaluate the potential risks to other wells in the field so that the appropriate mitigation steps are taken. For example, failure investigation of casing OD corrosion in another well might have directed attention to SS-25 and other similar wells. Running an inner string or plugging a well are valid mitigations, but prior to such actions, the cause of the casing leak or failure should be understood. **The type of investigation should be commensurate with the risk and consequence of the failure, and should be part of the well integrity management system.**

As stated in Solution 6, the last sentence; "The type of investigation should be commensurate with the risk and consequence of the failure, and should be part of the well integrity management system." It is understood that all failures cannot be treated like SS-25, nor should they. The level of investigation depends on many things including the depth of the failure. It may not be feasible, practical, or necessary, to recover production casing from a deep leak. However, inspection and diagnostic tools are available to determine the nature of the failure, such as, a hole, corrosion—internal or external over a large or small area, location of a failure—pipe body or connection, etc. Such data should be integrated and analyzed to assess the possible causes and develop some hypothesis that can be used to evaluate other wells with failures. Once the failure has been evaluated and understood, the appropriate steps can be taken to determine the disposition of the well. The well can be repaired (inner strings, etc.) or plugged and abandoned if not repairable or if the well is no longer needed. SoCalGas did repair wells or plugged and abandoned wells after the failures were identified.

2.6 Question 6

With regards to the statement, that, "a 'formal investigation' of the type Blade appears to envision would likely entail a level of examination that would not be feasible for an active well. . .", what levels of examination are feasible for an active well that SoCalGas could have performed in Blade's opinion?

2.6.1 Response 6

This is addressed by Solution 7: Regulations Should Require a Level 1 (Per API RP 585) Analysis of All Failures in the Blade Main Report, Section 5.3.1, Page 232, replicated here for reference.

> **Solution 7: Regulations Should Require a Level 1 (Per API RP 585) Analysis of All Failures**
>
> API RP 585 *Pressure Equipment Integrity Incident Investigation,* discusses failure investigation of pressure equipment [2]. The Aliso Canyon wells are a form of complex pressure vessels. A Level 1 type analysis of

SoCalGas-5.0710

failures, as a minimum requirement, will identify the immediate causes of the failures or near misses and allow operators to understand the implications, if any.

Figure 8 shows the different levels of investigation as discussed in RP 585. A Level 1 investigation may be appropriate for most casing failures and can be done quickly with no disruption to field operations. API RP 585 was developed for Pressure Equipment Integrity Incident Investigation; however, Blade presents this as an option that could be applied to Gas Storage Well Integrity Management.

	Level 1 Investigations	Level 2 Investigations	Level 3 Investigations
Incident Characteristics	— Unexpected condition or damage found that if it had been allowed to progress would have led to loss of containment before the next scheduled outage or inspection interval. — Discovered PEI damage significantly beyond expectation but with no loss of containment or unit shutdown. — Small leaks (other than environmental fugitive emissions) from pressure equipment or joints that were easily contained. — Typically no fire, significant toxic release, injuries, or environmental damage would occur in a Level 1 incident.	— Leak from pressure equipment that resulted in or could have resulted in localized equipment damage, small to medium size release quantity, or small safety or environmental damage. — Unexpected pressure equipment failure from damage mechanisms or structural deterioration. — Unexpected pressure equipment damage or associated structural damage discovered that required equipment or unit shut down or immediate mitigation. — Repetitive Level 1 type characteristics in the same process or system.	Leak or rupture from pressure equipment that resulted in or could have resulted in significant process safety incident or environmental damage, equipment damage, large release quantity, or production loss.
Investigation Characteristics	Investigate using less structured analysis tools such as "What If" or "5-Whys." Uses evidence, judgment, and experience to identify causes.	Investigate using company or department causal factor identification or logic trees, seeking probable contributing and root causes.	Investigate using company structured root cause analysis (RCA) seeking to determine the deepest management system and cultural causes.
Team Makeup Recommended	Investigated by the PEI personnel from the affected area and trained in simple investigation techniques. Can be investigated by one person, possibly two, involve subject-matter experts (SMEs) as needed.	Leader would be someone from the affected area trained in investigation techniques. Team members would include one to three others of different disciplines from the area; include at least one PEI person on the team. Involve SMEs as needed.	Leader would be someone trained in structured RCA and from another area of the plant or another business unit. There would be at least three team members and possibly from different disciplines or groups, such as inspection, operations, process engineering, maintenance, or process safety. Appropriate SMEs should be included on the team.
Initiation	Within a few days.	Begin investigation as soon as practical (e.g., 1 to 2 days).	Begin freezing and collecting evidence as soon as practical (e.g. within a few hours).
Sponsorship	Supervisor of investigator (First Line Supervisor).	Department Head level (Second Line Supervisor).	Management with overall responsibility for Safety, Health, Environment for the site.

Figure 8: API 585 Inspection Levels

Failed casing in an active well can be analyzed using casing wall thickness inspection, downhole camera, and other diagnostic tools as discussed in Section 2.2.1 Response 2. This may provide data that can be used to interpret causes for the casing failure.

2.7 Question 7

Please provide an explanation for the answer in support of question 6.

2.7.1 Response 7

The discussion from Section 2.2.1 Response 2 is repeated here for reference.

The following are types of questions and analysis that should be considered as part of a failure investigation (whether the casing can be recovered or not):

- Is the corrosion on the ID or OD based on inspection log data?
- What is possibly causing corrosion? Modeling and assessment of water sources may be adequate to understand the problem.
- Was the failure in the casing body or is it in the connection? A camera run may reveal the nature of the failure. This may enabled an interpretation of the failure.
- Is the failure an isolated event or potentially a systemic issue? Are mitigating steps required?

However, if the casing can be recovered because it is parted shallow or the failure is shallow, then additional laboratory work can be conducted to develop a hypothesis on the causes of failure. There were cases where casing (failed or otherwise) were recovered, however no analysis reports were found in the well files.

2.8 Question 8

Does Blade have an opinion or opinions with regards to any other statement or statements in the passage?

2.8.1 Response 8

Yes

2.9 Question 9

If so, please provide such opinions, and the basis for them.

2.9.1 Response 9

Blade exhibited caution and took the time and care during the RCA casing extraction process to ensure that the evidence was unaffected by the extraction process itself.

A general statement regarding the RCA is that Blade completed the RCA based on data and information that was collected by Blade and data that was provided by SoCalGas. The RCA data was evaluated and analyzed independently by Blade. The RCA results were documented in the RCA Main Report and Supplementary Reports. Blade stands by the RCA reports that were provided to CPUC, DOGGR, and SoCalGas.

SoCalGas-5.0712

3 References

[1] Blade, "Analysis of Aliso Canyon Gas Storage Wells with Casing Failures," 2019.

[2] American Petroleum Institute, "API RP 585 Pressure Equipment Integrity Incident Investigation," 2014.

SoCalGas-5.0713

4 Appendix A—Data Request February 18, 2018, SS-44A SoCalGas Response

The following pages are images of the SoCalGas Response 2: referenced in Figure 1.

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County Los Angeles
Well Standard Sesnon 44 A Sec. 28, T03N, R15W, S.B.B.&M.
A.P.I. No. 0403721455 Name Tom McMahon Title SIMP Project Manager
Date 3/14/2018
Signature
Address PO Box 2300, SC9365, Chatsworth, CA 91313-2300 Telephone Number 714-398-5020

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, fishing tests, and initial production data.

Start Date	Ops this Report (DOGGR)
3/22/2017	HSM; It was determined to move here via Engineering. Rig is on SS-44B and will turn Rig around & equipment to rig up on SS-44A to abandon. Wait on SCG to remove sensor lines on SS-44 & SS-44B in order to install plates, for spotting in Rig. Continue to MIRU. Check psi on well - 0 . install BPV & remove tree. NU-BOPE and torque down. Test BOPE's 300 psi low/5000 high. GOOD. DOGGR; BOPE Inspection by- Mark Davis. Good Note; Utilized BOI spotter for Traffic control
3/23/2017	HSM; 0 psi on well. R/U Donut puller F/Weatherford and back out dogs/Pull Hanger. Circulate sand off. TOOH w/Tbg. RIH wretreving tool and engage Pkr @ 2650' & TOOH and lay down. P/U Baker dummy seals and RIH w/kill string. Secure well.
3/24/2017	HSM; 0 psi on well. Continue to RIH w/dummy seal to engage straddle Pkr & wireline cut 3.5" Tbg. R/U wireline & RIH T/3933' and Cut W/RTC tool. Note; First attempt failed due to short in insulator. TOOH and repaired. Second attempt -Good. TOOH w/baker seal tool & L/D. P/U SC Retrieving tool and RIH w/123 jnts. Close in well same. Secure location.
3/27/2017	HSM; 0 psi on well. Latch into the Baker upper straddle Pkr @ 3933', and pull 42 K (21k over) and release Pkr. TOOH and lay down the 85 joints that were in wel. Stand back the rest. P/U Baker Overshot (5 3/4") and RIH w/new kill string. Remove trailer & install Ensign pipe wrangler (tight location)-utilize traffic control flag man. Continue to RIH w/70 jnts and close in same. Secure location
3/28/2017	HSM; 0 psi on well. P/U 4 jnts and engage fish w/grapple @ 3933' and rotate on it. Pull up good. TOOH and lay down Fish (Baker Packer) with 1 and a half jnt of 3.5" Tbg. M/U a Baker/Bowen 1 1/2" Grapple & RIH by picking up 4700' of Tbg W/pipe wrangler. Stay above the 43" prong/plug fish @ 8700'. Close in same.
3/29/2017	HSM; 0 psi on well. Rotate over Fish (prong/plug of 43") w/ 6 K down on it, torqued up. TOOH easy. Pull T/BHA-No Fish. Make forward plan to use same BHA and reverse circulate while going over fish. (look for psi spike). RIH w/281 jnts of Tbg. Close in well same
3/30/2017	HSM; 0 psi on well. 4 stands above fish & will reverse circulate. RIH T/Fish and rotate while pumping over 43" plug/prong-fish. Pressured up to 550 psi. Stop pumping and TOOH of 281 jnts. Pull to Rig floor. NO FISH. NOTE: Get a hold of Curtis (Western Wire line) and he informed us that the PXN body is ALONG SIDE OF PRONG (2 separate runs when placed there) on top of sand for the Lok-Set RBP. Re-assessed the Fishing BHA, and recommended we run a 7.125" junk basket tomorrow with NO pumping to hopefully swallow both PXN/Prong. RIH w/ kill string and close in same
3/31/2017	HSM; 0 psi on well. Breakdown Baker fishing BHA to install 7.125" grapple. Wait on Baker to deliver grapple. Slip and Cut drilling line of 41'. P/U BHA and RIH w/10 stands of Tbg. HIGH Winds in Derrick- 2 hours. Continue T/TOOH w/239 jnts of Tbg. Shut in well. Secure location
4/3/2017	HSM; 0 psi on well. Cored over top of fish with no pump. Made 4.5' down. TOOH. No Fish. Ran kill string & close in same. NOTE: Baker is fabricating (in Shafter) extension for Junk basket to reverse circulate up fish tomorrow.
4/4/2017	HSM; 0 psi on well. TOOH w/kill string & 4th Run-P/U Baker 7 3/8" Junk basket with 5' 6" extension. RIH and tag @ 8713' work down with NO pump using Ensign power swivel @ 85 rpm/1100 ft/lbs of torque. Rotated easy & got hard tag @ 8725', continue to rotate down to 8732' & stopped, rotate upward. TOOH & lay down extended junk basket. NO FISH. Discuss forward Ops; RIH w/same junk basket and pump this time. RIH W/140 stands and shut in well same.
4/5/2017	HSM; 0 psi on well. Continue to RIH w/30 stands of Tbg above fish. M/U power swivel & drop ball for basket catcher. Establish 1500 psi / 4 bbls/min. Work over fish @ 85 rpm F/8713' T/8743' with 110 ft/lbs of torque. Torqued up at the last foot. Circulate hole volume (500 bbls) & TOOH. Lay Down basket. NO FISH. Discuss forward Ops. Run extended basket again. RIH W/150 jnts of Tbg and shut in same.
4/6/2017	HSM; 6th Run; Continue to RIH w/extended junk basket. Get over fish and R/U power swivel. Rotate over fish @ 85 rpm/ 2000 ft/lbs of torque/ 4.5 bbls/min. Got down to 8743' Note; Higher torque for sure. TOOH w/280 jnts of Tbg and lay down basket to check. NO FISH M/U 5 3/4" Overshot/bumper sub/1 jnt of Tbg/8. Tbg Jars & RIH. to above fish w/270 jnts. Close in same
4/7/2017	HSM; 0 psi on Open well (unloader open). 150 bbls to fill. Continue T/RIH w/overshot. Get above Fish and added 50 bbls more of fluid and got returns. Get over Fish @ 8742' and work over top of retrieving head of RBP, 6" down. Unset RBP w/Weatherford/3 attempts. GOOD. Circulated out gas out of well-clean. Pull up on Fish @ 52 K up (48 k up weight normally). Pull 40 stands very slowly with Fish on the hook. Shut in well same

OG103 (6/97/GS/R/SM) SUBMIT IN DUPLICATE

AC_BLD_0067777

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator: Southern California Gas Company Field: Aliso Canyon County: Los Angeles
Well: Standard Sesnon 44 A Sec. 28, T03N, R16W, S.B.B.&M.
A.P.I. No.: 0403721456 Name: Tom McMahon Title: SIMP Project Manager
Date: 3/14/2018 Signature:
Address: PO Box 2300, SC9365, Chatsworth, CA 91313-2300 Telephone Number: 714-398-5020

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, baling tests, and initial production data.

Start Date	Ops this Report (DOGGR)
4/10/2017	HSM; 0 psi on well. Pumped 100 bbls down annulus, no returns. Continue T/TOOH & @ 1388' BHA increased in drag. Pulled slowly as Rig was jumping. Installed 8 5/8" stub in BOP and pulled FISH TO RIG FLOOR. Lay Down the PXN plug (2 pieces) and the Prong that was on top of Weatherford Arrow set Pkr. (all elements in tact). M/U 6 5/8" all weight scraper and RIH T/8749' (just above PW Pkr.). TOOH w/60 jnts of Tbg and shut in well same.
4/11/2017	POOH w/ scraper. Engaged & jarred packer loose f/ 8,734'. POOH w/ 120 jts. C.W.I.
4/12/2017	HSM; 0 psi on well. Added 75 bbls of polymer in well. Continue T/TOOH & only retrieving tool. NO FISH (permatrieve Pkr). M/U 4" Baker-grapple spear and RIH, T/8756' & spear into Pkr. Pull 45 k over and jars sheared lugs. Wait for an hour. TOOH slowly. Have FISH & laydown. RIH w/kill string.
4/13/2017	HSM; 0 psi on well. Added 50 bbls of fluid to well. TOOH w/kill string. M/U Baker 3.25" spear & (2) 4 1/8" collars & RIH T/9075' and engage Obs PW Pkr. Work up 3 times w/jars and sheared out @ 72 k, 20 k over. Let relax and TOOH. Laydown Pkr. M/U 6 5/8" Scraper and bumper sub & RIH T/kill string and shut in same.
4/14/2017	HSM; 0 psi on well. Continue to RIH to bottom T/9376' (48') of FILL. DOGGR Notified. Attempt to reverse circulate-NO RETURNS. Pull up to 8622'. Close in same DOGGR Witness; Chris Gustafson
4/17/2017	HSM; 0 psi on well. Continue to TOOH & laydown scraper and removed 40' of fill in Tbg. M/U 6 5/8" Bit / bit sub / (2) 4-1/8" collars & RIH T/9376'. Turn on pump and work down through 3 bridged off areas. Worked down to 9424' & got partial returns @ 5 bbls/min @ 500 psi. Pulled up above liner top and Shut in same
4/18/2017	HSM; 0 psi on well. Add 50 bbls of fluid in well. RIH & tag bottom with No issues.TOOH and laydown BHA. On load with crane all Baker Fishing tools/Collars. RIH w/kill string & shut in well same. DOGGR; Mark Davis to witness and sign permit.
4/19/2017	HSM; 0 psi on well. Added 20 bbls of fluid & level @ 1210'. Pull kill string. R/U SLB loggers w/lubricator. Log 6 5/8" CBL/Nuetron log F/8822' (TOL) T/400'-fluid lvl. TOOH and make 2nd run F/9424' T/8822'. TOOH and R/D. Run kill string and secure well & location.
4/20/2017	HSM; 0 psi on well. Added 38 bbls of fluid and is Full. R/U DI-Drill Gyro service. Log F/9424' T/Surface with no issues. R/D Wireline. RIH w/279 jnts and close in same.
4/21/2017	HSM; 0 psi on well. HIGH WINDS clocked @ 38 mph at ground lvl. Stand by. Off load cement bin. Halliburton on stand by also.
4/24/2017	HSM; 0 psi on well added 80 bbls of fluid. Continue to RIH & tagged a bridge @ 9324'. Worked through and tagged bottom @ 9424' R/U Halliburton cementers & spot a 10 bbl cement plug @ 9422' & pull up 300' & repeat w/20 bbls cement plug. Pull up to 8613' & reverse out clean. Pull 3 stands & Shut in well same. Clean location. Slip & Cut 91' of Drilling line. CEMENT BLEND AS FOLLOWS: Mitsubishi Premium Cement/14.8 ppg/1.81 yeild/.05%-SA-10 /.25% SUPER CBL/.06Gal-SCR-100L/.30% HALAD (R)344/5%MICROLITE/.30%HALAD(R)-322/35% SS-200
4/25/2017	HSM; 0 psi on well. Added 6 bbls of fluid. DOGGR (Emie Blevins) here Witness tag @ 8613'. RIH T/9003' & tag solid (390') lower. R/U Cementers & pump a 20 bbls cement plug and polish off @ 8600'. Pull up and shut in wel. CEMENT BLEND AS FOLLOWS: Mitsubishi Premium Cement/14.8 ppg/1.81 yeild/.05%-SA-10 /.25% SUPER CBL/.06Gal-SCR-100L/.30% HALAD (R)344/5%MICROLITE/.30%HALAD(R)-322/35% SS-200
4/26/2017	HSM; 0 psi on well. RIH & tag cement @ 8600'. Witnessed by Doggr, Emie Blevins. 6 bbls to top off well. R/U Western Wire Line and shoot perf holes @ 8590'-8585' (4 spf) & TOOH, R/D. Establish a pump injection rate of 2 bbls/min @ 2000 psi of a total of 7 bbls. R/U Halliburton cementers/HSM & pump 21 bbls of Mitsubishi premium 14.8 ppg cement w/tail @ 8500'. @ 14.8 ppg/ 65 SXS 116 CU/FT, pump 1 bbl of water spacer, pump 45 bbl tdisplace.TOOH w/ 12 jnts setting tail @ 8210', pump 3 bbl to fill casing. Squeezed 4.5 bbl at 197 psi, shut down & wait 25 minutes & pump again @ 38 psi, squeezed 3 bbl at 167 psi. R/O Halliburton equipment. Pull 3 stands and shut in same w/No downward psi. CEMENT BLEND AS FOLLOWS: Mitsubishi Premium Cement/14.8 ppg/1.81 yeild/.05%-SA-10 /.25% SUPER CBL/.06Gal-SCR-100L/.30% HALAD (R)344/5%MICROLITE/.30%HALAD(R)-322/35% SS-200

OG103 (6/97/GS/R/SM) SUBMIT IN DUPLICATE

AC_BLD_0067778

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County Los Angeles
Well Standard Sesnon 44 A Sec. 28, T03N, R15W, S.B.B.&M.
A.P.I. No. 0403721456 Name Tom McMahon Title SIMP Project Manager
Date 3/14/2018
Signature
Address PO Box 2300, SC9365, Chatsworth, CA 91313-2300 Telephone Number 714-398-5020

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, casing tests, and initial production data.

Start Date	Ops this Report (DOGGR)
4/27/2017	HSM; 0 psi on well. RIH w/3 stands and Tag @ 8310'. Doggr, Ernie Blevins here to confirm. Discuss Ops forward based off Cement Lyl. R/U Halliburton & pumped 24 obls of Deep blend/Premium Mitsubishi cement & displace 42 bbls w/polymer. Pulled up 7 jnts. & reverse out clean & shut in well. Secure location DEEP BLEND CEMENT BLEND AS FOLLOWS; Mitsubishi Premium Cement/14.8 ppg/1.81 yeild/.05%-SA-10 /.25% SUPER CBL/.06Gal-SCR-100L/.30%HALAD (R)344/5%MICROLITE/.30%HALAD(R)-322/35% SS-200
4/28/2017	HSM; 0 psi on well. RIH & tagged @ 7900' & witnessed by DOGGR-Mark Davis. R/U Halliburton cementers & test lines. Mix & pump 15 bbls of Premium Deep Mt. blend T/7650', and displace w/42 obls of polymer. Pull up to 7650' & reverse out clean. Close in well. CHECK LOCATION/Valves. CEMENT DEEP BLEND AS FOLLOWS; Mitsubishi Premium Cement/14.8 ppg/1.81 yeild/.05%-SA-10 /.25% SUPER CBL/.06Gal-SCR-100L/.30%HALAD (R)344/5%MICROLITE/.30%HALAD(R)-322/35% SS-200
5/1/2017	HSM; 0 psi on well. Have meeting w/SOG & discuss fluid management at Rig site. TIH w/6 Jnts of 2-7/8" N-80 off of derrick tag @ 7650' Kristopher Gustafson w/DOGGR on location to witness tag. Waited on Halliburton Cementers. R/U Cementers & pump (2) plugs of 28 bbls each of Deep blend cement F/7650' T/6690' with no issues. Pulled up and reversed out. Then pulled high & shut in well. R/D Cementers & secure location. DEEP BLEND CEMENT BLEND AS FOLLOWS; Mitsubishi Premium Cement/14.8 ppg/1.81 yeild/.05%-SA-10 /.25% SUPER CBL/.06Gal-SCR-100L/.30%HALAD (R)344/5%MICROLITE/.30%HALAD(R)-322/35% SS-200
5/2/2017	HSM; 0 psi on well. DOGGR, Christopher Gustafson here to witness tag. Tagged lower @ 6751' (61' lower). R/U swivel and reverse circulate down T/6755', solid. R/O. General maintenance on Rig. R/U Halliburton Cementers & Pump (2) stages of plug. First with 27 bbls and pull up. Pump 2nd one of 29 bbls of Deep blend. Pull just above 5840' & reverse clean. Shut in same-secure location. DEEP BLEND CEMENT BLEND AS FOLLOWS; Mitsubishi Premium Cement/14.8 ppg/1.81 yeild/.05%-SA-10 /.25% SUPER CBL/.06Gal-SCR-100L/.30%HALAD (R)344/5%MICROLITE/.30%HALAD(R)-322/35% SS-200
5/3/2017	HSM; 0 psi on well. DOGGR: Chris Gustafson here to witness tag @ 5901' (51' lower), cement sample good. Perform Rig Maintenance. Wait on Halliburton cementers from SS-2 well for (4) hrs. R/U Halliburton & Tubing pressured up. Unable to clear. TOOH & laydown joint that was plugged. RIH w/4stsring. Secure well and location.
5/4/2017	HSM; 0 psi on well. Laydown plugged Tbg. RIH T/top of cement plug & tagged @ 5688', Reversed out to hard tag @ 5900' & circulate clean. ***HSM F/SS-25A with all personel on pipe handling protocal. R/U Halliburton cementers & pumped 30 bbls of Premium Mitsibishi Cement. Displaced w/27 bbls & pulled up T/5390' & reversed out clean. TOOH sideways w/40 jnts of tubing. (prep to move T/SS-25A). Shut in well same & secure location. DEEP BLEND CEMENT BLEND AS FOLLOWS; Mitsubishi Premium Cement/14.8 ppg/1.81 yeild/.05%-SA-10 /.25% SUPER CBL/.06Gal-SCR-100L/.30%HALAD (R)344/5%MICROLITE/.30%HALAD(R)-322/35% SS-200
5/5/2017	HSM; 0 psi on well. Continue to TOOH sideways w/30 jnts of Tbg. RIH w/Tbg in Derrick & do tag F/Doggr, Chris Gustafson Okd tag @ 5432', after a soft tag @ 5396' (reverse circulated out 36'). Pulled up and reversed out clean. Left 174 jnts in hole & landed Hanger. Ran in dogs. ATTENDED SS-25A Meeting: On pipe extraction process. Rig Rig down floor/all support equipment. Load out Tbg. LEAVE ON BOPE: Double gate & Annular w/blind flange on DG and valve on the other. Rig out and load Accumulator/anaconda/Choke manifold. Pull out Rig and place alongside pad. (to be worked on over the weekend) Leave all plates & set up handrails around SS-44A well. Roper out Pump & shaker bin NOTE: Both tanks staying on location. Moving T/SS-25A Monday AM.
5/8/2017	HMS; MIRU, Tie rig down. Spot circulating pump. Rig up work floor, circulating pump. Accumulator hoses. Ready work floor.
5/9/2017	HMS; Open well. Completed safety check of rig and location. Pulled and laid down tubing hanger.RIH tag TOC @5432'. R/U Cementers. Pumped 2 x 32 bbl cement plugs. from 5432' - 4350'. Typ II cement. Pulled up circulated excess out. Pulled 4 stands. Secured well. EOT

OG103 (6/97/GSR/SM) SUBMIT IN DUPLICATE

AC_BLD_0067779

RESOURCES AGENCY OF CALIFORNIA
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HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County Los Angeles
Well Standard Sesnon 44 A Sec. 28, T03N, R16W, S.B.B.&M.
A.P.I. No. 0403721455 Name Tom McMahon Title SIMP Project Manager
Date 3/14/2018
Signature
Address PO Box 2300, SC8365 Chatsworth, CA 91313-2300 Telephone Number 714-396-5020

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Start Date	Ops this Report (DOGGR)
5/10/2017	HMS: Open well. RIH tagged TOC at 4389'. Witnessed by Mr.Cliff Knight W/DOGGR. Pumped 2x 35 bbls balance plug f/4350' t/3801'. Secure well.
5/11/2017	Begin cement job as follows: Pump ahead w/9 bbls fresh water @ .70 bpm w-6 psi, 37 bbls 14.8# type 3 cement @ 1.6 bpm w/29 psi, Displace w/1 bbl fresh water @ 1.2 bpm w/-10 psi, 13 bbls Polymer @ 2.8 bpm w/-10 psi T.O.C @ 2,642', POH w/21 jts 2-7/8" N-80. Pump 2 bbls fresh water @ 1.7 bpm w/36 psi, 37 bbls 14.8# type 3 cement @ 2.40 bpm w/40 psi. Displace w/1 bbl fresh water @ 1.0 bpm w/9 psi, 9 bbls Polymer @ 2.5 bpm w/-4 psi T.O.C @ 2,022' POH w/20 jts 2-7/8" N-80. Pump 2 bbls fresh water @ 1.5 bpm w/0 psi, 35 bbls 14.8# type 3 cement @ 2.0 bpm w/10 psi, Displace w/1 bbl fresh water @ 2.6 bpm w/-3 psi, 5 bbls Polymer @ 2.8 bpm w/-9 psi T.O.C @ 1,402' POH w/25 jts 2-7/8" N-80.
5/12/2017	RIH Tagged TOC at 1468' witnesewd by Mr Cliff Knight W/DOGGR. Placed 36 bbl balanced cement plug f/ 1468' t/ 860' Pulled high Circulated well bore clean.
5/13/2017	RIH, Tagged cement plug high. Pulled high. Secure well. EOT
5/15/2017	HMS; POH, P/U DC's, Bit, Bit sub, Crossover. RIH tag cement. R/U power swivel. Drill out sement plug. Hang back power swivel. POH Stand back DC's. R/U W/L. Shot holes, Establish injection rate. RIH Set CICR.
5/16/2017	HMS; POH, RIH W/ Csg cutter. Cut csg at 930' POH. N/D BOP , cut bolts on tbg head, Remove bolts. Replace bolts. Secure well EOT
5/17/2017	HSM. Remove well head. N/U WFD 5-3/4" spear w/7.662 grapple and engage into 8-5/8" casing and work up to 165K, could not get slips to unland Orginize location to make room for Baker Casing jacks, using TNT Trucking.Stand by for Baker Casing jacks. R/U Baker Casing jacks and pull on 8-5/8" casing and Could not get any movement. R/O casing jacks.Install well head to close in and secure well and location E.O.T.
5/18/2017	Run CBL log f/846 t/surface. Cut 8-5/8" csg at 200'. Attempt to pull with rig. Max 160k. No movement. R/U Csg jacks jack at 400k, moved csg 3.5'. R/D csg jacks Installed spool,BOP. Secure well. EOT
5/19/2017	Attempt to Jack top 200' of csg out of hole, max force with csg jacks 450k. Cut csg 17' down. pulled free. removed csg slips. L/D cut off joint, measured 17'. N/U riser and BOP. Secured well. EOT.
5/22/2017	Rih w/Spear and pack off. Attempt to circulate well while pulling with rig. Pulled 160k. No circulation or movement. R/U Csg jacks attempt to pull 8-5/8" csg. pulled 400k with 12" of movement. R/D csg jacks. Secure well.
5/23/2017	N/D BOP. R/U Baker casing jacks. RIH W/ wfd Spear set at 16'. Attempt to jack 183' of 8-5/8" csg out. Jacks stopped working. R/D Csg jacks. N/U BOP. Secure well. EOT.
5/24/2017	Cut 8-5/8" csg @ 100'. Pulled Csg to surface. Secured well EOT.
5/25/2017	L/D 8-5/8" csg. RIH W/ 7-5/8" bit ,cleaned out fill to 85'. POH, R/U and pumped 65 bbls of" class 3 cement. Secured well. EOT
5/26/2017	Waiting on cement to harden.
5/30/2017	Cleaning out 8-5/8" csg.
5/31/2017	Clean out top of 8-5/8" cut off at 85' with 2-7/8" tbg and sawtooth collar. Cleaned out to 234' with 6-1/8" drill bit.RIH cleanned out to 118' with two string mills 5' apart.
6/1/2017	Cdleaned top of 8-5/8 csg at 85'. POH Left mule shoe in hole. RIH W/ 6-1/8" bit Would not enter 8-5/8" csg. RIH W/2-7/8" sawtooth collar Would not enter top of 8-5/8" csg. RIH W/ Overshot 7-3/4" OD 5-1/2" Grapple stacked out at 123', M/U Pilot mill RIH. Secure Well. EOT
6/2/2017	Milled top of 8-5/8 csg from 80.46' to 82.46'. RIHH W/ 7-3/4" Clean out bit, Cleaned out to 314'. Pulled high secured well.
6/5/2017	Attempt to pull 8-5/8" Csg with rig. No movement. R/U csg jacks attempt to jack out csg out with 550 k. No movement. RIH made cut at 148'. EOT.
6/6/2017	POH W/ Csg cutter. R/u Csg Jacks. pull cut csg from 56' to 138' POH L/D csg. RIH W 12" bit clean out to 136'.RIH W/ 7 3/4" bit. Clean out to 310' Pull above 8-5/8". EOT
6/7/2017	R/U Csg jacks. RIH Spear 8-5/8" @ 138'.
6/8/2017	Established circulation & cleaned out cement & formation f/ 164'-175' w/ 8.5# 60 vis. polymer. POOH. Laid down collars, bit sub & 10-5/8" pt. C.W.I.

OG103 (5/97/GS/USM) SUBMIT IN DUPLICATE

AC_BLD_0067780

RESOURCES AGENCY OF CALIFORNIA
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HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County Los Angeles
Well Standard Sesnon 44 A Sec. 28, T03N, R16W, S.B.B.&M.
A.P.I. No. 04003721455 Name Tom McMahon Title SIMP Project Manager
Date 3/14/2018
Signature
Address PO Box 2300, SC8365, Chatsworth, CA 91313-2300 Telephone Number 714-389-6020

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Start Date	Ops this Report (DOGGR)
6/9/2017	RIH w/ 2-7/8" open ended to 172 ' & broke circulation w/ 14 bbls. polymer. Rigged up cementers & broke circulation w/ 8 bbls. fresh water. Pumped 30 bbls of 14.8 cement. Lost returns, (Saw grey Wtr.) POOH. Closed blinds & squeezed 172 bbls of 14.8 ppg cement. Washed pumps & lines . Displaced 1 bbl. fresh water. C.W.I. 1st plug: 30 bbls. / 168 cf3/ 126 sks/ 794 gals water/ 19 bbls water to mix. Squeeze : 172 bbls/ 966 cf3 / 726 sks/ 4451 gals w/tr / 105 bbls mix water Cement pumped : 14.8 ppg. Type 111 cement/ .3% bwoc EC-1/.8% bwoc FL-63/.4% bwoc CD-32 / 1 gal/ 100 sack FP-6L / 55.5% Fresh water. Final rate and pressure of 1BPM at 80 p.s.i. Final shut in pressure of 0 p.s.i.
6/12/2017	RIH Tag TOC at 14', M/U clean out assembly, RIH attempt to reverse circulate, loss 24 bbls to formation. POH. Secured well. EOT
6/13/2017	RIH w/ 2-7/8" open ended to 172 .. Rigged up cementers & broke circulation w/ 5 bbls. fresh water. Pumped 4 bbls of 14.8 cement. POOH. Closed blinds & squeezed 1bbls of 14.8 ppg cement W/ fresh water. C.W.I. Cement pumped : 14.8 ppg. Type 111 cement/ .3% bwoc EC-1/.8% bwoc FL-63/.4% bwoc CD-32 / 1 gal/ 17 sacks 22 cu/ft FP-6L / 55.5% Fresh water. Final rate and pressure of 1BPM at 0 p.s.i. Final shut in pressure of 200 p.s.i.
6/14/2017	RIH Tagged TOC at 5'. M/U Clean out assy. Cleaned out to 32'. RIH W/2-7/8" tbg reversed well clean. EOT.
6/15/2017	Continue cleaning out cement from 32' to 89'. Reversed well clean. EOT
6/16/2017	Continue cleaning out cement from 89' to 119', Reversed well clean.
6/19/2017	Spotted 15 bbls 14.2 ppg Type III cement 4 opm at 50 psi.. W/Csg valve open. Closed Csg valve pumped 2.5 bbls Type III cement .5 bpm at 50 psi. .Pressured up to 100 psi. CIP at 07:25. Type III Cement 76 sacks, A-10 293 lbs FP-6L 1 gal. Cello Flake 20 lbs
6/20/2017	M/U Bit/Bitsub/drill collar/Power swivel. Tag TOC at 5' clean out cement to 43'. Circulate well clean. Secure well EOT
6/21/2017	Clean out cement from 43' to 179'. Secure well. EOT
6/22/2017	Cleaned out to top of 8-5/8 csg at 179'. RIH W/ 7-3/4" clean out assembly. Attempted to enter top of 8-5/8" csg. POH changer to Pilot mill, RIH cleaned out top of 8-5/8" csg. RIH W/ 7-3/4" old cleaned out to 336'. POH. EOT.
6/23/2017	RIH W/ 5-1/2" Grapple. Not able to catch Mule shoe. Made two attempts. changed out grapples to 5-5/8". Made 3rd attempt. Not able to engauge fish. EOT.
6/24/2017	N/D BOP. Install CSG. Jacks. Attempt to pull 8-5/8" csg. 475k. No movement. N/D Csg. Jacks. Install BOP. EOT
6/26/2017	Attempt to realse spear, POH installed 4-3/4" bumper sub. Continue to bump down. No movement. EOT
6/27/2017	Attempt to back of 4-3/4" DCs at bumper sub, back off at first Dc. R/U Wire line, RIH with back off shot. Backed off DCs. POH. Backed off at service break on bumper sub. Installed Annular preventer. Rigged up work floor. R/U WFD tongs. EOT
6/28/2017	M/U Overshot W/5-3/4" grapple, Bumper sub, 5 x 6-1/2" drill collars, RIH Engauge grapple, Bump down released spear. POH. L/D Spear,bumper sub, overshot assembly.
6/29/2017	P/U RIH w/ WFD 7-5/8" Mill Shoe, 1 5" 7-5/8" Wash pipe extention, 6 4-3/4" D.C's, 5 jts 2-7/8" N-80 8rd tbg. tagged fish @ 335'. Strip on 11" x 7-1/16"5M P.G.S.R head. Rig up WFD 2.5" Powerswivel, and W/O cement @ 335'-428'. R/O Powerswivel. Circulate well clean.
6/30/2017	Continue cleaning out from 428' to 812' with wash over assembly Inside 8-5/8" csg. Pulled high circulated clean. Secure well and location.
7/5/2017	RIH tag at 812'. POH L/D Washover assembly, Found mule shoe stuck inside. (Fish out of hole). RIH cut 8-5/8" 36# csg at 393'. POH. N/D BOP, Installed Csg jacks, Not able to break cross over sub needed to run spear. R/D Csg jacks, N/U BOP. Secure well. EOT
7/6/2017	N/D BOP, Install Csg jacks. RIH W/Spear, engauge spear @ 190' attempt to pull 8-5/8" 36# csg, Pulled 600k. No movement. RIH cut 8-5/8" csg at 350'. RIH W/ Spear engauge spear at 190'. attempt to jack 8-5/8" csg, pulled 600k No movement. POH. R/D Csg jacks. N/U BOP. Secure well and location.
7/7/2017	N/D BOP. Install csg jacks. RIH Cut 8-5/8" 36# csg at 270 + -. RIH W/ 5-3/4" spear W/7 882" grapple. Engage spear at 180', R/U csg jacks, Csg started moving at 550K. Continue to work pipe out of hole. L/D 8-5/8" csg. Rig out csg jacks. Install BOP. EOT

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HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County Los Angeles
Well Standard Sesnon 44 A Sec. 28, T03N, R16W, S.B.B.&M.
A.P.I. No. 0403721455 Name Tom McMahon Title SIMP Project Manager
Date 3/14/2018 Signature
Address PO Box 2300, SC9365, Chatsworth, CA 91313-2300 Telephone Number 714-399-6020

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Start Date	Ops this Report (DOGGR)
7/9/2017	RIH w/10 4-3/4" Drill collars. Begin to on 8-5/8" 36# casing @ 110K-660K, could not pull free. Attempt to release WFD Spear w/7.882" Grapple. Had problems releasing Spear, backed off collars. POH w 7 x 4-3/4" Drill collars . Remove Pacific Petroleum hydraulic jacks. Install 11"5M Double Gate BOP.
7/10/2017	RIH W/6-1/8" DCs, Screw in sub, Screw into spear, Work spear free, POH. M/U 6-1/8" Bit ,Bit sub, DCs. Clean out cement skin from surface to 211', POH M/U 10-3/4" Pilot mill, RIH, Secure well.
7/11/2017	Remove Workfloor and handrails.Strip on 11" x 13-5/8"5M P/G.S.R.Rig up Workfloor and WFD casing tongs and equipment.Fill hole, Mill out 8-5/8" 36# casing w/WFD Pilot Mill from 211'-216', Circulate well clean.Rig out and Hang back WFD 2.5" Powerswivel. Rig out WFD casing tongs, Workfloor, P/G.S.R.POH w/1 jt 2-7/8" N-80 8rd tbg. 6 4-3/4" Drill collars, WFD Pilot Mill.
7/12/2017	RIH w/WFD Pilot Mill, 6 4-3/4" Drill collars, 1 jt 2-7/8" N-80 8rd tbg to 211'. Strip on P.G.S.R. Rig up WFD 2.5" Powerswivel.Begin to Mill on 8-5/8" 36# casing @ 211'-216'. Circulate well clean, R/O Swivel.POH w/1 jt 2-7/8" N-80 8rd tbg, 6 4-3/4" D.C's, WFD Pilot Mill. Performed a BOP Drill w/ crew members @ 56 seconds, Discuss w/ crew. P/U RIH w/WFD Spear w/7.882" Grapple, 8 4-3/4" Drill collars and Engage into 8-5/8" 36# casing @ 216' and Attempt to pull free. Could not get casing to move. POH w/ 8 4-3/4" D.C's, Spear. RIH w/6 jts 2-7/8" N-80 8rd tbg to 211'. Rotate into 8-5/8" 36# casing. Rig up Poor Boy and Kelly hose, attempt to circulate and work tbg down, not make any hole.
7/13/2017	POH w/6 jts 2-7/8" N-80 8rd tbg. M/U RIH w/7-5/8" Bit, 6 4-3/4" Drill collars, 1 jts 2-7/8" N-80.R/U WFD 2.5" Powerswivel, M/U connection and Break circulation. C/O cement and fill from 211'-800'. Circulate well clean, R/O powerswivel.POH w/20 jts 2-7/8" N-80 8rd tbg, 6 4-3/4" Drill collars, L/D 7-5/8" Bit.RIH w/6 6" Drill collars. Laydown 6 6" Drill collars.
7/14/2017	RIH w/WFD Cutting Tool, 2 4-3/4" Drill collars, 6 jts 2-7/8" N-80 8rd tbg. R/U WFD 2.5" powerswivel and Perform 8-5/8" 36# casing cut @ 236' w/700 psi on mud pump.R/O WFD 2.5" Powerswivel. OH w/6 jts 2-7/8 N-80 8rd, 2 4-3/4" D.C's, Cutting Tool. P/U RIH w/WFD Spear w/7.882" Grapple, 2 4-3/4" Drill collars, 6 jts 2-7/8" N-80 8rd tbg and Engage " 36# casing @ 216'. Attempt to pull casing free, did not move casing.POH w/ WFD Spear and BHA. RIH w/ 12-1/4" Bit, 2 4-3/4" D.C's, 5 jts 2-7/8" N-80 8rd tbg and tag 8-5/8" 36# casing @ 211'. Rotate to verify casing. POH w/ tbg / Bit. Meet/Greet Western w/reline. RSM and R/U equipment. RIH w/ 60 Arm Caliper Tool and log well @ 780'-Surface. R/O equipment.
7/17/2017	Remove tubing equipment and workfloor, Strip on P/G.S.R. R/U Workfloor and tbg equipment.P/U RIH w/WFD Pilot Mill, 6 4-3/4" Drill collars, 2 jts 2-7/8" N-80 8rd tbg @ 211'.R/U WFD 2.5" Powerswivel and Mill out 8-5/8" 36# casing @ 216'-216'. Circulate well clean. R/O WFD 2.5" Powerswivel, Strip off P.G.S.R Head. POH w/2 jts 2-7/8" N-80 8rd tbg, 6 4-3/4" Drill collars, WFD Pilot Mill.RIH w/2 4 3/4" Drill collars and POH L/D 2 4 3/4" Drill collars.
7/18/2017	RIH w/WFD Pilot Mill, 6 4-3/4" Drill collars to 216'. Spot in WFD 3.5 Powerswivel w/Pacific Petroleum Crane, Change out tbg elevators 2-7/8" to 3-1/2". R/U 3.5 Powerswivel and M/U connection. Mill out 8-5/8" 36# Casing F/216' T/248'. Circulate well clean, pull Powerswivel high.
7/19/2017	Continue to Mill out 8-5/8" 36# casing @ 248'-250'. Change out Powerswivel Safety valve.M/U Connection and Continue to Mill out 8-5/8" 36# casing @ 250'-278'. Circulate well clean, pull WFD 3.5 Powerswivel up high.
7/20/2017	Mill on 8-5/8" 36# casing @ 278'-285' Fell threw. Circulate well clean.Rig out WFD 3.5" Powerswivel. POH and L/D 2 4-3/4" Stick Drill collars. RIH w/2 4-3/4" Drill collars from derrick. "Performed a BOP Drill w/56 seconds, discuss drill w/ crew".P/U 2 4-3/4" Drill collars, tagged 8-5/8" 36# casing @ 292'. Change out elevators and R/U WFD 3.5" Powerswivel. Begin Reaming / Milling @ 292'-375', Circulate well clean. R/O Powerswivel,POH L/D 2 4-3/4" Drill collars, S/B 6 4-3/4" Drill collars, WFD Pilot Mill. Rig out WFD casing tongs, tbg equipment, workfloor.
7/21/2017	Rig up Workfloor and WFd casing tongs, P/U M/U 12-1/4" Tandem String Mill Assembly, 2 4-3/4" Drill collars. Strip on P.G.S.R head. Continue to RIH w/ 10 4-3/4" Drill collars, tagged @ 360'.Rig up WFD 3.5" Powerswivel, M/U connection and Attempt to Mill out cement / fill @ 360'. Could not make any hole, Circulate well clean and Rig out WFD 3.5" Powerswivel.POH w/12 4-3/4" Drill collars, Rig out workfloor and equipment, Strip off P.G.S.R head. POH and L/D WFD 12-1/4" Tandem String Mill Assembly.Install P.G.S.R head, Rig up workfloor and tbg equipment. P/U RIH w/7-5/8" Bit, 4-3/4" Bit sub, 2 4-3/4" Drill collars, 10 jts 2-7/8" N-80 8rd tbg. Roll up Doby Containment.
7/24/2017	Rig up WFD 3.5" Powerswivel and M/U connection, Break circulation. C/O Cement / Fill @ 360'-785'While making a connection, tubing became stuck. Work tubing @ 785'. Could not work free. Lost circulation.
7/25/2017	Rig out WFD 3.5" Powerswivel, Spool up and organize hydraulic hoses.Meet/Greet Western Wireline. Rig up top sheave and hold safety meeting.RIH w/Western Wireline 1-7/16" Free point tool to 724'. RIH w/1-7/16" String Shot Tool and locate free point and Release from tbg @ 584'. R/O Western Wireline.POH w/23 jts 2-7/8" N-80 8rd tbg. Performed a Bop drill w/58 seconds, discuss drill w/ crew.Change over to 4-1/2" equipment. P/U RIH w/WFD Spear w/ 7.882" Grapple, 12 4-3/4" Drill collars. Change over elevators, R/U WFD casing tongs and M/U 4" Drill pipe pup jt. Engage and pull 8-5/8" 36# casing free @ 375'. POH w/ 12 4-3/4" Drill collars, WFD Spear, L/D 11' 8-5/8" CSG jt.P/U & RIH w/WFD 7-5/8" Mill Shoe, 2 7-5/8" Wash Pipe jts, X-over, 2 4-3/4" D.C's, 6 jts 2-7/8" tbg.

OG103 (6/97/GS/R/SM) SUBMIT IN DUPLICATE

AC_BLD_0067782

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator: Southern California Gas Company Field: Aliso Canyon County: Los Angeles
Well: Standard Sesnon 44 A Sec. 28, T03N, R15W, S.B.B.&M.
A.P.I. No.: 0403721455 Name: Tom McMahon Title: SIMP Project Manager
Date: 3/14/2018 Signature:
Address: PO Box 2300, SC9365, Chatsworth, CA 91313-2300 Telephone Number: 714-398-5020

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, and initial production data.

Start Date:	Ops this Report (DOGGR)
7/26/2017	R/U pumping equipment and break circulation. RIH w/16 jts 2-7/8" N-80 tbg, tagged tight spot @ 603'. POH w/4 jts, NOTE: Dragged out from 580'-530'.R/U WFD 3.5 Powerswivel & Attempt to break circulation, but lost 45 bbls to formation.R/O 3.5 Powerswivel & POH w/10 jts 2-7/8" N-80 8rd tbg. Strip off P.G.S.R head. Continue to POH w/2 jts 2-7/8 tbg, X-over, 2 jts 7-5/8" Wash pipe, 7-5/8" Mill Shoe.RIH w/ 23 jts 2-7/8" N-80 8rd tbg and tagged @ 694'.Dump 20 sacks of sand in 5 sack stages. POH w/8 jts 2-7/8" N-80 8rd tbg.
7/27/2017	RIH w/6 jts 2-7/8" N-80 8rd tbg, tagged @ 675'. POH w/22 jts 2-7/8" N-80 tbg, S.T.C.RIH w/WFD Cutting Tool, 2 4-3/4" D.C's. Change over 4-1/2" to 2-7/8" equipment. Continue to RIH w/16 jts 2-7/8" N-80 tbg.Rig up WFd 3.5" Powerswivel, Locate casing collars and Perform casing cuts in 8-5/8"36# casing @ 523', 480', 439' w/200 psi on mud pump." Performed a total of (3) 8-5/8"36# casing cuts". POH w/14 jts 2-7/8" N-80 tbg. Change over tbg equipment. Continue out w/2 4-3/4" D.C's, L/D WFD Cutting Tool.P/U & RIH w/WFD Spear w/7.882" Grapple, 12 4-3/4" D.C's, 14' Drill pipe pup jts and Engage into 8-5/8" 36# casing @ 393'. Start to Jar on 8-5/8"36# casing @ 393'. Could not pull free.POH w/12 4-3/4" D.C's, L/D WFD Spear.Rig out WFD Casing tongs, tbg tongs, X-over, workfloor.
7/28/2017	Remove 13-5/8" Double Gate BOP. Install Pacific Petroleum Hydraulic casing jacks.RIH w/ WFD Spear w/7.882" Grapple, 14 4-3/4" Drill collars & Engage into 8-5/8"36# casing @ 393'. Begin to pull on casing @ 100K-600K." WFD Spear Released.POH w/14 4-3/4" Drill collars, and Inspect WFD 7.882" Grapple, RIH w/WFD Spear w/7.882" Grapple, 14 4-3/4" Drill collars and Engage/Pull on 8-5/8"36# casing @ ±13' @ 100K -600K. No movement.POH w/14 4-3/4" Drill collars, L/D Spear, RIH w/WFD Cutting Tool, 2 4-3/4" D.C's, Change over 4-1/2" to 2-7/8" eulpment. Continue to RIH w/16 jts 2-7/8" N-80 tbg.Rig up WFd 3.5" Powerswivel, Locate casing collars and Perform casing cuts in 8-5/8"36# casing @ 523' w/200 psi on mud pump.R/O WFD 3.5" Powerswivel. POH w/ 16 jts 2-7/8" N-80 8rd tbg, 2 4-3/4" D.C's, Cutting Tool.Remove Pacific Petroleum Hydraulic casing jacks. Install 13-5/8" Double Gate BOP.
7/31/2017	Remove 13-5/8" Double Gate BOP. Install Pacific Petroleum Hydraulic casing jacks.RIH w/ WFD Spear w/7.882" Grapple, 14 4-3/4" Drill collars & Engage into 8-5/8"36# casing @ 393'. Begin to pull on casing @ 100K-450K." WFD Spear Released .POH w/14 4-3/4" Drill collars, and Inspect WFD 7.882" Grapple, RIH w/WFD Cutting Tool, 2 4-3/4" D.C's, 16 jts 2-7/8" N-80 to 393'. R/U WFD 3.5" Powerswivel and Perform 8-5/8"36# casing cut @ 523',480',439' w/200 psi on mud pump. R/O WFD Powerswivel.POH w/2 4-3/4" Drill collars, 16 jts 2-7/8" N-80 8rd tbg, L/D WFD Cutting Tool. RIH w/WFD Spear w/ 7.882" Grapple." WFD showed signs of failure, stand back collar and start in the AM.Remove Pacific Petroleum Hydraulic casing jacks. Install 13-5/8" Double Gate BOP. R/U Workfloor.
8/1/2017	Detail WFD Mill Shoe & Washpipe. Pick up and land 13-3/8" Bowl, Slips. Rig up Workfloor tbg equipment. WFD tbg tongs.Pick up RIH w/WFD 12-1/4" Mill Shoe, Washpipe, X-over, 4-3/4" Jar. R/O Workfloor, tbg equipment, WFD Tongs. Remove 13-3/8" Bowl, Slips & Strip on M/U 13-5/8" x 11"5M X-over/P.G.S.R head. Rig up Workfloor, RIH w/3 4-3/4" D.C's & L/D 3 4-3/4" Drill collars.Continue to RIH w/10 4-3/4" Drill collars and tagged @ 370'. Held a BOP drill W/59 seconds, discuss drill w/ crew members.Rig Up WFD 3.5" Powerswivel & C/O Cement @ 370'-400', Circulate well clean.Rig out WFD 3.5" Powerswivel & POH w/5 4-3/4" Drill collars.
8/2/2017	RIH w/6 4-3/4" Drill collars. Rig up WFD 3.5" Powerswivel.Empty Cement cutting bin, Relocate cooling station, Fill kill tank w/ 8.5 Polymer.Break circulation (reverse) w/15 bbls 9.5 Polymer 120 Vis.Begin to Mill on 8-5/8"36# Casing @ 400. WFD 3.5" Powerswivel started to leak. Stand by for WFD to change out swivels. R/O Powerswivel. Change out & Rig up WFD 3.5" Powerswivel, Break circulation and Begin to Mill on 8-5/8"36# Casing @ 400'-405'." NOTE: Noticed that a fissure opended with polymer circulating fluid flowing from it. Amount flowed on ground less then 1/4 of a bbl. Rig out WFD 3.5" Powerswivel. POH w/12 4-3/4" D.C's, Rig out Workfloor & Strip off 13-5/8"x 11"5M X-Over / P.G.S.R head. R/U Workfloor & POH w/X-Over, Jars, 12-1/4" Washpipe, Mill Shoe.
8/3/2017	Meet/Greet Schlumberger wireline, Rig up top/bottom sheaves. RIH w/ CCL Logg Tool and Log well from 393'-Surface. Rig out wireline.Move out Pacific Petroleum cement bins, Load out,move off WFD 3.5" Powerswivel.P/U RIH w/WFD 12-1/4" RBP, 14 4-3/4" Drill collars. Set WFD 12-1/4" RBP @ 350' L/D 2 4-3/4" D.C's, Dump 25 sacks of sand for 10'. Flush tbg w/ fresh water. Continue to POH & L/D 12 4-3/4" D.C's, RIH & L/D WFD 4-3/4" Jars, 12-1/4" Washpipe, Mill Shoe.Breakout & Load up pumping hoses, 4" nose's, Rig out mud pump and Load out WFD baskets.
8/4/2017	RIH w/12 jts 2-7/8" N-80 8rd tbg, tagged @ 340'. POH & L/D 22 jts 2-7/8" N-80 8rd tbg.Rig out tbg equipment, Workfloor. Remove 13-5/8" 5M BOP. Install 13-5/8" x 2-7/8" Flange.Load out rig elpment w/ Pacific Petroleum Crane.Wash out Rig Mud Pump and Move to bottom location, Clean location.

OG103 (6/97/GSR/5M) SUBMIT IN DUPLICATE

AC_BLD_0067783

5 Appendix B—Data Request March 23, 2018, SS-44A SoCalGas Response

The following pages are images of the SoCalGas data Response 1: referenced in Figure 2.

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County Los Angeles
Well Standard Sesnon 44 A Sec. 28, T03N, R16W, S.B.B.&M.
API No 0403721455 Name Todd Van de Putte Title Senior Storage Field Engineer
Date 3/27/2018
Signature
Address PO Box 2300, SC9365, Chatsworth, CA 91313-2300 Telephone Number 818-701-3339

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during reworking or altering the casing, plugging, or abandonment, with the dates thereof, include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, casing tests, and initial production data.

Start Date	Ops this Report (DOGGR)
7/1/2014	Held safety meeting with crews. Unload BOP equipment. Rigged up PPE wire line unit ran in well to 8722 pulled prong. Ran in well to 8722 pulled plug body. Open well 0 psi tubing and casing rigged up and pumped 250 bbls with no fluid returns to surface secured well.
7/2/2014	Held safety meeting with crews open well 0 psi tubing 50 psi casing. Bleed down casing and pumped 75 bbls. tubing and casing 0 psi. Installed BPV nipple down production tree. Nipple up Class III BOP changed pipe rams to 2-7/8" and function test BOP. Rigged up working floor and tubing equipment secured well.
7/3/2014	Held safety meeting with crews. Rigged up WEA test unit test blind rams to 300 low and 5000 high for twenty minutes. (good) Tested pipe rams to 300 low and 5000 high for twenty minutes. (good) Tested Hydri to 300 low and 5000 high for twenty minutes. (good) Tested all control valves and choke manifold to 300 low and 5000 high for twenty minutes. (All test good). Rigged out test unit backed out hold down studs . Unlanded tubing attempt to release for packer at 8756' secured well.
7/7/2014	Held safety meeting with crews open well 0 psi tubing and casing pumped 50 bbls. Rigged up Tiger wire line made up free point tools. Ran in well to 8740' (free) ran in well to 8766' (no movement) Made up 2-7/8 cutter ran in well to 8734' correated and cut 2-7/8" tubing. Rigged out wire line pulled out of well layed down 2-7/8" tubing to 3600' secured well.
7/8/2014	Held safety meeting with crews open well 0 psi tubing and casing pumped 50 bbls. Pulled out of well laying down 2-7/8" tubing layed sdown production equipment. Changed pipe rams to 3-1/2" made up 6.5 spear, bumper sub, jars, (2) 4-3/4" drill collars and instenifer. Measured and picked up 3-1/2" tubing to kill string at 2500' secured well.
7/9/2014	Held safety meeting with crews open well 0 psi tubing and casing pumped 50 bbls. Measured and picked up 3-1/2" tubing to top pf patch at 3963'. Attempted to engag fish. Pulled out of well changed out grapple to 6.795". Ran in well to 3963 engaged fish jarred free. Pulled out of wel layed down fish (recovered top cone) Made up spear with 12' extension and stop, bumper sub ,jars ,(2) 4-3/4' drill collars and instenifer. Ran in well to 3910' secured well.
7/10/2014	Held safety meeting with crews open well 0 psi pumped 50 bbls. Ran in well too 3952' engaged fish jarred on patch moved up hole 10' came free. Pulled out of well layed down fish (recovered 20' patch left bottom cone in well.) Made up spear with 6.967 grapple, bumper sub , jars (2) 4-3/4" collars and instenifer Ran in well to 2995' measured and picked up 3-1/2" tubing to 6570' secured well.
7/11/2014	Held safety meeting with crews open well 0 psi tubing and casing pumped 50 bbls. KCL. Measured and picked up 3-1/2" tubing to 8737' (top of cut off) Pulled out of well layed down fishing tools (no recovery). Made up 8-5/8" casing scraper and bumper sub ran in wel 2650' secured well.
7/14/2014	Held safety meeting with crews open well 0 psi tubing and casing pumped 50 bbls. Ran in well with scraper to 8726' pulled out of well layed down scraper. Made up 6.75" die tap on 7-3/8" wash pipe ran in well to 5200' secured well.
7/15/2014	Held safety meeting with crews open well 0 psi tubing and casing pumped 50 bbls KCL. Rna in well with wash pipe to top of fish. Worked over fish pumped down annulus at 84 bpm work down to packer ay 674 6'. Pulled out of well layed down wqash pipe (recovered bottom cone of patch) Made up 5-3/4" over shot with 2.875 grapple, bumper sub and jars. Ran in well to 3200' secured well.
7/16/2014	Held safety meeting with crews open well 0 psi tubing and casing pumped 50 bbls. Ran in well with fishing tools to top of fish at 8726'. Engaged fish worked free from packers. Pulled out of well layed down tools layed down cut off, top packer (10) joints 2-3/8" tubing ,sliding sleeve ,no/go nipple and bottom seals. Made up 6-5/8" casing scraper and bumper sub ran in well to kill string at 2600' secured well.
7/17/2014	Held safety meeting with crews open well 0 psi tubing and casing pumped 50 bbls. Ran in well with casing scraper to packer at 8740. Pulled out of well layed down scraper made up WEA 8-5/8" bridge plug. Ran in well to 8741 secured well.
7/18/2014	Held safety meeting with crews open well 0 psi tubing and casing pumped 50 bbls. Ran in well with RBP to 7734". Set and released from RPE tested annulus to 500 psi for ten minutes (good) Dumped 8 sx sand pulled out of well layed down running tool. Rigged out tubing equipment and working floor serviced well head bolts secured well.
7/21/2014	Held safety meeting with crews open well 0 psi tubing and casing well standing full. Nipped down BOP nipple down tubing head and send in for repairs. Attempted to remove pack off unit (drawing shows automatic unit) Nipple up BOP and working floor secured well.
7/22/2014	Held safety meeting with crews open well 0 psi tubing and casing 0 bbls to fill. Rigged up Schlumberger wire line made up USIT/CBL tools. Ran in well to 8724' ran USIT/CBL to surface. Rigged out loggers secured well.
7/23/2014	Held safety meeting with crews work as directed labor only.
7/24/2014	Held safety meeting with crews open well 0 psi tubing and casing 0 bbls. to fill. Nipped down BOP nipple up and tested tubing head and primary seals. Nipped up BOP and working floor ran in well with kill string to 2400' secured well.
7/26/2014	Held safety meeting with crews open well 0 psi tubing and casing 0 bbls. to fill. Pulled out of well with kill string made up WEA test packer. Ran in well to 7026' set packer tested casing below packer at 700 psi for twenty minutes on test chart. (good) Filled annulus tested to 700 psi for twenty minutes (Bleed down to 100 psi in twenty minutes. Released packer pulled to 5037' set packer tested below packer to 700 psi for 5 minutes (good). Tii annulus tested to 1100 psi for twenty minutes. (Lost 700 psi in twenty minutes) Released packer and pulled to 4800' secured well.

OG103 (6/97/GSR/5M) SUBMIT IN DUPLICATE

AC_BLD_0067849

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator: Southern California Gas Company Field: Aliso Canyon County: Los Angeles
Well: Standard Sesnon 44 A Sec. 28, T03N, R16W, S.B.B.&M.
A.P.I. No: 0403721455 Name: Todd Van de Putte (Person submitting report) Title: Senior Storage Field Engineer (Operator, engineer, or agent)
Date: 3/27/2018 (Month, Day, Year)
Signature:
Address: PO Box 2300, SC9385, Chatsworth, CA 91313-2300 Telephone Number: 818-701-3339

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, and initial production data.

Start Date	Ops this Report (DOGGR)
7/29/2014	Held safety meeting with crews open well 0 psi tubing and casing 0 bbls. to fill. Pulled out of well to 3985' set packer and tested below packer to 700 psi (lost 40 psi in twenty minutes) tested annulus to 2000 psi (bled down to 0 psi in 5 minutes). Released packer and pulled to 3961' set packer and tested below packer to 700 psi. (lost 40 psi in twenty minutes) Tested annulus to 2000 psi (lost 1500 psi in six minutes) Pulled to 3925' tested below packer to 700 psi (good) Tested annulus to 2000 psi (Bled down to 16600 in six minutes found pressure on surface casing circulating at 1500 psi) open) Pulled to 1500 set packer pressured annulus with returns to surface pipe) Pulled to 1000' set packer pressured annulus with returns to surface pipe. pulled to 696' set packer pressured annulus with returns to surface pipe. Pulled to 500' set packer pressured annulus with returns to surface pipe. pulled to tested below to 700 psi (good) pressured annulus with returns to surface pipe. Pulled to 300' set packer pressured annulus with returns to surface pipe. Pulled to 125, attempted to set packer lug sheared on packer. Pulled out of well layed down packer made up 8-5/8" bridge plug ran in well to 2500' secured well.
7/30/2014	Held safety meeting with crews open well 0 psi tubing and casing 0 bbls. to fill. Ran in well with RBP to 4012' set RBP and dump 5 cu. ft. sand Pulled out wel layed down retrieving tool made up 8-5/8" test packer. Ran in well to 3984' tested below packer to 2000 psi for twenty minute. (good) Released packer pull to 3658' set packer and tested to 2000 psi for twenty minutes. (lost 100 psi in twenty minutes at port collar) Released packer pulled out of well to 326' set packer tested below packer to 2000 psi for twenty minutes (good) Pumped into annulus with returns to surface pipe. Released packer and pull to 258' set packer pumped into annulus with returns to surface. Pulled to 197 set packer pumped into annulus with returns to surface. Pulled to 133' set packer pumped into annulus with returns to surface. Same results at 72', 24', 14', and 6'. At 5' tested below packer to 1000 psi for twenty minutes.(good) Released and layed down packer secured well.
7/31/2014	Held safety meeting with crews open well 0 psi tubing and casing 0 bbls. to fill. Rigged up Cameron and tested well head seals to 3600 psi for twenty minutes . Pumped in 8-5/8" casing with returns to surface pipe. Work as directed secured well.
8/1/2014	Work as directed labor only.
8/4/2014	Wait on orders work as directed labor only.
8/5/2014	Held safety meeting with crews open well 0 psi tubing and casing 0 bbls to fill made up retrieving tool ran in well to 4000' secured well.
8/6/2014	Held safety meeting with crews open well 0 psi tubing and casing 0 bbls. to fill. Nippled up PGSR rigged up and reversed sand off RBP. Released bridge plug. Pulled out of well laying down 3-1/2" tubing layed down and loaded out bridge plug. Ran in well with 3-1/2" tubing to 4700' secured well.
8/7/2014	Held safety meeting with crews open well 0 psi tubing and casing 0 bbls. to fill. Layed down and loaded out 3-1/2" tubing. Layed down 4-3/4" drill collars changed pipe rams to 2-7/8". Measured and piped up 2-7/8" tubing to 2500' secured well. Moved Baker tanks to Frew 3 and transfered fluids.
8/8/2014	Held safety meeting with crews open well 0 psi tubing and casing 0 bbls. to fill.Measured and picked up 133 joints. 2-7/8" tubing landed in tubing hanger. Nippled down BOP nippled up production tree secured well.

OG103 (6/97/GSR/5M) SUBMIT IN DUPLICATE

Blade-32 Response AC_BLD_0067849.pdf

AC_BLD_0067850

Ex. I - 14

WELL ACTIVITY REPORTS FOR FREW 3

DATE	ACTIVITY/REMARKS
6/14/84	(Continued) NOTE: When talking to the Shift Supervisor who worked the Sunday afternoon (6/10) the high annulus pressure was discovered on F-3, he said the well was taking far more gas than normal while on injection. He noted it sounded as if twice the volume of gas was being taken by the well. Flo-Log ran a temperature survey and noise log. Temperature ran at 100'/min from 500'-1500'. A 3 cooling anomaly was noted at 1160' and a smaller anomaly noted at 1100'. The noise log showed a large separation between the 200 Hz and the other three frequencies with all frequencies exited. The word used to describe the sound would be "crackling" or "popping". No disconcernable shifts in the frequencies were noted with the log being taken down to 3500'. Three different noise tools were used and all three were the same noise level. NOTE: The only hypothesis on the condition of the well would be the casing has a hole, split or is ported around 1100'. The subsequent feeding of the leak caused hydrates to form and back up all the way to the SSSV ports. This is supported by the "crackling" of the noise log which sounds like a very small amount of gas slowly moving and the inability of the temperature bombs to get below the ports at the SSSV thus showing some "plug" located there. Halliburton killed the well with 67# polymer. The first 100 Bbls was a 100+ cp viscosity pill followed by regular mix polymer using the constant tubing pressure method. The tubing pressure declined as normal to less than 100# with no casing pressure buildup. After approximately 100 Bbls had been pumped, the casing pressure began to decline from 1220#. This continued until 200 Bbls had been pumped when the tubing pressure finally kicked and the casing pressure was 800#. The remainder of the gas was vented as the kill proceeded. Once the casing pressure was zero (at approximately 350 Bbls, hole volume, 300 Bbls), returns were waited upon but never received. Eventually pumped a total of 580 Bbls of fluid into hole at 5 BPM with no returns. The tubing pressure did begin to rise slightly before we ran out of the fluid. Well was then shut-in. Both casing and tubing pressure was zero.

WELL ACTIVITY REPORTS FOR FREW 3

DATE	ACTIVITY/REMARKS
8/18/81	Pruett pulled SSSV, cost $515.00
8/19/81	Pruett pulled choke, cost $265.34
8/20/81	Ran temperature survey
8/31/81	Triangle ran sound log, cost $3,172.04
9/15/81	Otis ran SSSV, test OK, cost $1,235.00
10/27/81	Otis rigged up to pull SSSV, no complete
12/3/81	Otis set SSSV & BHC, will test on 12/4
12/4/81	Otis set SSSV & BHC, test OK
1/11/82	Pruett pulled SSSV
1/16/82	Pruett pulled BHC, blew-out and re-ran BHC
1/17/82	Pruett pulled BHC, blew-out second time
1/18/82	Sand testing
3/30/82	Ran temperature survey
10/20/82	Ran temperature survey, anomaly @ 7650'. Run A/A
12/16/82	Noise log run, no noise
6/8/83	Ran temperature survey, no anomaly
12/12/83	Ran temperature survey, no anomaly
4/2/84	Ran temperature survey, cooling anomaly at shoe
4/10/84	Ran detail temperature survey, confirms cooling from 6750'-7791' at shoe. A noise log will be run at high inventory due to low structural position of well.
6/10/84	Operations noted sudden jump in surface annulus pressure to 550#; repeated attempts to blowdown annulus were unsuccessful
6/11/84	Ran temperature survey which looked very abnormal; hottest temperature noted was around 80 F so assumed temperature bomb had malfunctioned.
6/13/84	MacCarlisle checked seals on wellhead, neither seal was leaking. Ran temperature survey which showed extreme cooling. Surface temperature was 38 and temperature @ 7750' was only 82. It should be noted both surveys (11th & 13th) could not be run through the tubing, but the survey run on 4/2/84 could go through; possible hydrates (?) all the way to SSSV ports. Continued trying to blowdown annulus, but it will rise back to 460# from 250# in minutes.
6/14/84	Baker set 500 Bbl tank on site for well kill. Test center came out and took sample of gas coming from annulus. Helium content on annulus was 560 ppm thus showing it was definitely Aliso gas and it was coming from a leak somewhere. Checked DA-2 (Del Aliso 2) which is in close proximity but only showed 24 ppm. No movement in that direction. Annulus pressure on F-4 increased abruptly from 30# to 180#. Looks like definite migration to F-4.

WELL ACTIVITY REPORTS FOR Frew 3

DATE	ACTIVITY/REMARKS
3/1/79	Pipe construction completed. Opened SSSV and put well on csg. W/D SIWHP 2560
3/30/79	Ran temperature survey
4/3/79	Archer-Reed rigged up and pulled separation tool. Latched onto SSSV but could not pull
4/9/79	Jarred on SSSV all day but could not pull. Ordered out braided wire unit for Monday
4/10/79	Archer-Reed removed SSSV
7/26/79	Ran temperature survey to BHC. Will have choke pulled and complete survey to bottom
7/27/79	Hanson Wireline pulled .770 BHC to complete temperature survey to bottom of well
7/31/79	Ran temperature survey to bottom of well.
10/24/79	Pruett ran BHP survey
11/2/79	Archer-Reed set BHC. Empty choke holder, ID 1.0
11/7/79	Ran BHP survey
11/20/79	Gurevich ran BHP survey
11/28/79	Pruett ran BHP survey
1/8/80	Ran 8 hr sand test. 1.0 BHC, SIWHP 2560, Pup 520; Pdn 520, Tup 69, Q 45
1/10/80	Archer-Reed pulled 1.0 BHC
1/14/80	Gurevich ran temperature & BHP survey. Archer-Reed ran scratcher
1/15/80	Archer-Reed ran XL sleeve shifter. Ran SSSV and separation tool tested valve as follows: S/I T 2560, S/I C 2590 1. Bled tubing to 1470, held good 2. Bled tubing to atmosphere 3. Bled casing to 1950, valve was closed 4. Pressure casing to 2400 5. Pressure tubing slowly to 2200, valve opened at about 1300. Test OK.
1/16/80	Ran sand test. 24-hours, 1.125 SSSV, SIWHP 2580; Pup 585; Pdn 585; Tup 67; Q 30
6/9/80	Archer-Reed pulled separation tool & SSSV. Cost $296.50
6/10/80	Gurevich ran temperature survey
6/20/80	Triangle ran noise survey. Survey shows some noise in WSO area of well. Will run R/A survey to verify. Cost #2185.00
6/24/80	Triangle attempted R/A survey. Panel problems in truck. Took to shop. Be back on Monday
7/7/80	Triangle ran R/A survey in shoe - WSO area of well. Cost $1700.10
10/20/80	Shut-in BHP survey
10/27/80	Pruett BHP survey
10/31/80	Archer Reed set 1.0 BHC. Cost $220.00
11/3/80	Pruett BHP survey
12/23/80	Archer-Reed set SSSV. Cost $370.50
3/20/81	Harry ran BHP
3/27/81	Harry ran BHP
6/4/81	Fred ran temperature survey
6/10/81	Fred ran temperature survey

Ex. I - 15

SOUTHERN CALIFORNIA gas COMPANY

INTEROFFICE CORRESPONDENCE

TO M. E. Melton FROM D. J. Anderson DATE Oct. 24, 1990

SUBJECT Radial Model of FF-34A Incident

BACKGROUND

On Monday evening, September 10, a downhole flowing condition was discovered in well Fernando Fee-34A. A pressure drawdown of 140 psig was recorded on the tubing/casing annulus, indicating the presence of a leak in the 8-5/8 inch casing. The leak was stopped when the well was killed at 10:20 a.m. the next morning. I developed a radial reservoir model to simulate gas migration updip from well FF-34A. The model was developed to determine the volume of gas lost at FF-34A, the gas distribution over time, and the time for gas to reach surface outcrops.

RESULTS

1. Based on the pressures recorded at well MA-5A, approximately 123 MMCF of gas was lost to a shallow zone in FF-34A. The zone of interest is a sequence of interbedded sandstones and shales over the interval 1500'-2000'. The shut-in pressures observed at MA-5A on September 11th and 13th compare closely with array pressures calculated in the model.

2. Gas breakthrough occurred in layer two on day six of the simulation (September 12). At six days, gas was detected in each radial segment in sector two of the model. Moving updip from FF-34A, the gas percentages found in sector two were 22.4%, 3.98%, 0.92%, 0.13%, and 0.04%. The gas saturation of 0.04% was found at a radius of 1570' from FF-34A. Assuming the shallow zone outcrops at a radius of 1500' or greater, six days is a good estimate of when gas might show up as seepage at the surface. However, the relative permeability at .04% is very low; in fact, it is probably below the critical gas saturation. Unless there are fractures or high permeability streaks, gas would not flow at high rates to the surface.

3. Figures 1 through 7 show the updip expansion of gas in layer two over forty-five days. Layer two is the most permeable layer in the model. The gas saturations remain low (0.1%) as gas percolates updip toward the surface. The highest gas saturations remain within two hundred feet of FF-34A. After forty-five days, the gas bubble expanded to a radius of 1200 feet, where saturations of 0.1% were detected.

64-F

AC_BLD_0033633

SoCalGas-5.0730

DISCUSSION

Flowrate from NAPS

An estimate of the downhole flowrate for FF-34A was made using nodal analysis. The well mechanical showing wellhead pressures prior to and during the leak is shown in Figure 9. A flowrate of 35 MMCF/D was calculated using a flowing pressure of 2500 psig and a reservoir pressure of 3153 psig. A flowing wellhead pressure of 2460 psig was recorded in the field; however, 40 psig was added to the field pressure as a correction for depth. In the analysis, a backpressure exponent of 0.75 and a flow coefficient of 0.91 $MCFD/PSI^2$ were used. (Please see Table I.)

Initialization

A four-layer radial model was used to represent the zone of gas migration. Moving outward from the center of the model, it was divided into radii of 160', 420', 800', 1200' and 2100'. The model was designed with a 45° dip to the north. The shallow zone rock properties are as follows:

TABLE OF PROPERTIES

Property	Layer 1	Layer 2	Layer 3	Layer 4
Permeability	50 md.	75 md.	15 md.	15 md.
Thickness	55 ft.	20 ft.	50 ft.	100 ft.
Porosity	20%	24%	18%	18%

A total zone thickness of 225' was used based on the gas saturations discovered over the interval 1500'-2000' in well FF-34B. The model was initialized with an initial average pressure of 565 psia and 572 MMSTB of water in place. All layers were initialized with a gas/water contact depth of 400 feet. The date of initialization was September 6, 1990.

Simulation

The pressure history match was based on shut-in pressures observed on the number one annulus of MA-5A. To simulate the shallow well leak, gas was injected into FF-34A at a rate of 35 MMCF/D. Injection continued at this rate for three days (September 7-9). On the fourth day, the injection rate was reduced to 18 MMCF/D. By September 11, a total volume of 123 MMCF of gas had been injected. On this date, the maximum surface pressure recorded on MA-5A's

number one annulus was 760 psig. Assuming the annulus was filled with water, the surface pressure calculates to a zone pressure of 1309 psig. This compares closely with a grid block pressure of 1242 psig calculated by the model. On September 13, the shut-in surface pressure on the #1 annulus was 325 psig. The calculated zone pressure at this time was 835 psig. The model calculates a grid block pressure of 879 psig on this date.

The calculated pressures did not match the observed pressures on other surrounding wells (i.e., FF-34, FF-34B). I attribute this to the combined influence of variable fluid saturations and inter-bedded sands and shales that have irregular permeability patterns.

Wells FF-34, FF-34B, MA-3, MA-4, and MA-5A were produced at low gas rates (50-100 MCFD) to simulate the effect of surface blowdown and venting through fractures. The well locations are shown on Figure 8. A water producing well was completed updip at a radius of 1570' from the gas injection well. The water well was produced at a rate of 50 STB/D to simulate the surface outcrop.

DJA:ll
Attachment (see attached envelope)

cc: N. W. Buss
File AC1103

Ex. I - 16

History of Oil or Gas W.

Operator GETTY OIL COMPANY Field ALEGRIA CANYON FIELD

Well No. SFZU P-12, Sec. 27, T. 3N, R. 16W, S.B. B. & M.

Date July 16, 1970 Signed Carl G Nelson

P.O. Box 811, Ventura, Calif. 643-2154 Title Agent

(Address) (Telephone Number) (President, Secretary or Agent)

It is of the greatest importance to have a complete history of the well. Use this form to report a full account of all important operations during the drilling and testing of the well or during re-drilling, altering of casing, plugging, or abandonment with the dates thereof. Be sure to include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, shooting and initial production data.

1/21/70	California Production Service moved in and rigged up to locate and repair a suspected hole in the casing.
1/22	Circulated down 6 5/8" casing and out 9" casing to sump. Recovered 20 barrels of oil. Squeezed 30 barrels salt water down tubing. Pulled choke from 6488' and circulated bottoms up. Removed tree and installed B.O.P.E. Pulled tubing and packer. Ran 6 5/8" fullbore and tested for leaks from 1041' to surface; 2305' to surface; 3377' to surface and 4543' to surface. Found leak between 3376' and 4553'.
1/23	With fullbore set at 4553' squeezed 30 barrels salt water into formation. Circulated hole free of gas. Located hole in 6 5/8" casing at 3634'. Pulled out with fullbore. Made up 4 3/4" retrievable bridge plug. Set plug at 6014'. Pulled tubing. Ran 6 5/8" fullbore to 4543'. Tested 4 3/4" bridge plug to 1500 psi, held O.K. Spotted 2 sax sand on top of bridge plug. Rechecked hole in casing - hole between 3634' and 3636'. Set fullbore at 3503' and pumped through hole in casing at 3 bbls/min. rate, 1000 psi. Mixed 40 sax Class G cement preceded with 5 cu.ft. water. Displaced with 5 cu.ft. water and 76 cu.ft. salt water. Stopped going and pressure went to 1500 psi. Could not move cement at 1500 psi. Backscuttled cement at 11:40 P.M. Pulled 15 doubles and shut job down for night.
1/24-26	Finished pulling fullbore. Ran 6 5/8" scraper and 5 5/8" bit. Tagged cement at 3504' with stringers to 3584'. Had hard cement from 3584' to 3600'. Had stringers from 3600' to 3634'. Ran down to swedge at 4622'. Closed rams and tested 6 5/8" casing to 1750 psi, held O.K. Pressure tested 9" casing to 1000 psi, held O.K. Pulled bit and scraper. Ran retrieving tool, tagged sand at 5985' and cleaned out to 6014'. Latched on to bridge plug. Backscuttled hole free of gas. Circulated corrosion inhibitor in salt water. Pulled tubing. Lost bridge plug coming out of hole. Reran tubing and latched on to bridge plug at 4800'. Pulled and recovered same. Hydrotested tubing in the hole. Set packer at 6564'. Removed B.O.P. and installed tree. Swabbed fluid to 3000'.
1/27	Swabbed fluid to 3500'.
1/28	Swabbed well from 4000'. Sand and mud cut becoming lower - mostly salt water with small showing of gas.
1/29	Tubing pressure 800#. Fluid level 2500'. Swabbed fluid level to 4500'.
2/6	Swabbed fluid from 2000' to 4500'. Well would not flow.
2/12	California Production Service moving in to swab well.
2/13	Moved in, could not swab well due to welding in vicinity of the well.
2/25	California Production Service moved in and rigged up. Found fluid level at 1700'. Swabbed to 4500'. Found fluid at 3500' between runs.
2/27	Found fluid level at 2200'. Swabbed fluid to 4000'. Last two runs had gas follow-up.

AC_CPUC_0073369
SCAN00024753
SoCalGas-5.0734

2/28-3/2/70	Ran swab, hit fluid at 1500'. Swabbed to 3500'. Ran swab, hit fluid at 1500' and swabbed to 4500'. Fluid level staying at 2000'. Prep. to swab - well had 400# tubing pressure. Flowed well to cellar with 400 psi through 14/64" surface choke. Put well in flowline. Well flowed all night at 400 psi through 13/64" choke.
3/3	Rigged down and moved out. Well flowing with 500 psi tubing pressure through 13/64" surface choke.
3/6	Flowed 12 BFPD; 33%; 8 BOPD.
3/17	Flowed 16 BFPD; 25%; 12 BOPD.
3/24	Flowed 8 BFPD; 8 BOPD.

FINAL REPORT

Casing Record:

16" 75# c 512'
11 3/4" 61# F&C 2310'
9" 45# c 4721'
WSO shoe 4721'*
4 3/4" 16# & 6 5/8" 26 & 28# c 6910'
WSO shoe 6910'
Cmtd. hole 3634-3636'
684'-3 1/2" 13.3# L 7548'
Pf: 6908-7548'
(2" x 60 M x 6 R x 6" C)
T.L.H. 6864'

*Witnessed and approved by D.O.G.

Tubing Record: 6487' - 2 7/8", 8 RT, J-55 EU Tbg. (206 Jts)
1' - 2 7/8" Otis Type X port collar at 6488'
61' - 2 7/8", 8 RT, EU Tbg. (2 Jts)
1' - 2 7/8" x 2 3/8" 8 RT Xover
6' - 2 3/8" 8 RT N-80 pup jt.
7' - 2 3/8" x 4 3/4" 16# KV-30 packer
1' - 2 3/8" belled collar
6564' - Overall

AC_CPUC_0073370
SCAN00024753
SoCalGas-5.0735

Ex. I - 17

FORM 103

SUBMIT IN DUPLICATE

STATE OF CALIFORNIA

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF OIL AND GAS

area

History of Oil or Gas Well

OPERATOR GETTY OIL COMPANY FIELD ALISO CANYON

Well No. SFZU SS-14, Sec. 28, T. 3N, R. 16W, S.B. B. & M.

Date December 4, 1969 Signed Carl G. Nelson

P. O. Box 811, Ventura, Calif. (Address) 643-2154 (Telephone Number) Title Agent (President, Secretary or Agent)

It is of the greatest importance to have a complete history of the well. Use this form to report a full account of all important operations during the drilling and testing of the well or during re-drilling, altering of casing, plugging, or abandonment with the dates thereof. Be sure to include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, shooting and initial production data.

HISTORY

6/16/69 Killed well with 320 barrels salt water. Prep. to throw the derrick.

6/17 Threw the derrick.

6/18 California Production Service moved in and rigged up. Circulated well free of gas. Removed tree. Installed B.O.P. Measured out with tubing. Ran 6" bit and 7" scraper to T.L.H. Landed in tubing head. Shut down for the night. (Suspected leak in packing between 7" and 13 3/8" surface string.)

6/19 Circulated bottoms up. Mixed corrosion inhibitor and circulated around. Tagged top of liner hanger at 8062'. Pulled out. Removed B.O.P. and tubing head. Found hole in casing bowl and split in top of 7" casing. Repacked the casing bowl. Hydrotested in hole with 4500 lbs./inch. Total overall tubing in hole 9000' with Guiberson packer at 7998' and MM mandrel with dummy valve one joint above packer. Circulating bottoms up.

6/20 Circulated bottoms up. Pulled tubing. Ran and set Halliburton bridge plug at 7971'. Pulled up to 7260'. Installed KV-30 packer in string. Ran back down to 7400' (KV-30 at 240'). Set packer and tested bridge plug to 600 psi, held O.K. Pulled packer, tubing, and retrieving tool. Shut the well in.

6/23 Ran Dialog casing log. Logged 7" casing from 810' to surface. Cut 7" casing at 105' and recovered. Cut off 13 3/8" casing landing bowl. Welded on new Shaffer 13 3/8" casing landing bowl. Ran 7" casing with Bowen packer type casing patch. Latched on and set with 40,000 lbs. tension. Set slips, cut off and packed 7". Installed tubing head and B.O.P. Tested casing patch to 1000 psi. Held O.K. Ran tubing with Howco retrieving tool. Unset bridge plug. Circulated corrosion inhibited salt water. Pulled out. Ran and set packer at 7978'. Swabbed well to 5000'. Shut down for the night.

6/24 Swabbed well in. Well flowing, 8/64" surface choke, 750 psi tubing pressure.

6/25 Rigged down and moved out.

6/27 Flowed 24 BFPD; 20 BOPD.

7/3 Flowed 76 BFPD; 13%; 66 BOPD; 555 MCF.

7/7 Flowed 70 BFPD; 11%; 62 BOPD; 744 MCF.

7/30 Flowed 24 BFPD; 8%; 22 BOPD; 1329 MCF.

8/2 Flowed 28 BFPD; 7%; 26 BOPD; 708 MCF.

FINAL REPORT

CONFIDENTIAL

Casing Record

20" c 33'
13 3/8" 54.5# c 817'
7" 29, 26, 23# effec. to 8150'
(Window 8165'-8195')
Casing Bowl at 105'
1109' -5" 18# c 9171'
(Cmt. in liner at 9167')
WSO splice* and 4 h's 8889'*
Seg. 4 h's 9010'
G.P. 4 h/ft 8895-8947'; 8961-9000'; 9020-9118'; 9132-9165'
T.L.H. 8062'

*Witnessed and approved by D.O.G.

Junk Record

1. 716' - 7" ST'd (Rd. 1) 8150-8165'; Window 8165-8195'
ST'd (Rd. 1) 8195-8896'

2. 153' - 5" ST'd. (Rd. 1) 8863-9016'

Ex. I - 18

FORM 103
CALIFORNIA STATE PRINTING OFFICE

SUBMIT IN DUPLICATE

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCES

DIVISION OF OIL AND GAS

History of Oil or Gas Well

OPERATOR TIDE WATER ASSOCIATED OIL COMPANY FIELD ALISO CANYON

Well No. Standard-Seamon 2-17, Sec. 26, T. 3 N, R. 16 W, S.B. B. & M.

Signed F. C. Foster

Date October 13, 1952 Title Agent

(President, Secretary or Agent)

It is of the greatest importance to have a complete history of the well. Use this form in reporting the history of all important operations at the well, together with the dates thereof, prior to the first production. Include in your report such information as size of hole drilled to cementing or landing depth of casings, number of sacks of cement used in the plugging, number of sacks or number of feet of cement drilled out of casing, depth at which cement plugs started, and depth at which hard cement encountered. If the well was dynamited, give date, size, position and number of shots. If plugs or bridges were put in to test for water, state kind of material used, position and results of pumping or bailing.

Date 1952

7/20 Swabbed 175 barrels of muddy water. Salinity at 4:00 PM, 492 grains per gallon. Fluid level 2000'. Pulled tester loose at 11:00 PM and found fluid level at 1500'. Water sample above tester, 554 grains per gallon.

7/21 Ran bit and cleaned out to 11,000'. Found sand bridge from 10,430' to 10,435'. Had good gas showing on ditch while circulating returns from 10,430'. Ran McCullough Neutron Log.

7/22 Hung 3-1/2" drill pipe at 9548' and plugged with 100 sacks Colton Hi-Temperature Cement. Final pressure 800#. Time 11:30 AM. B.J. Service. Located top of plug at 9234' after standing 6 hours. Ran McCullough magnatector and checked aluminum section at 8433' to 8523'. Started milling aluminum section at 8490'.

7/23 Milled aluminum section from 8490' to 8516'.

7/24 Found bottom of aluminum section at 8516'. Pulled up and started milling aluminum section at 8476' and milled to 8490'.

7/25 Ran 10-5/8" Baker scraper and scraped from 8475' to 8516'.

7/26 Ran Booth Ross whipstock on 3-1/2" drill pipe and set on stub of 7" casing at 8516' with tailpipe to 8531'. Cemented in place with 50 sacks of Colton Hi-Temperature Cement. Time 5:45 AM. B.J. Service.

7/27 Standing cemented. Located top of cement at 8458'.

7/28 Cleaned out cement from 8433' to 8507' and redrilled to 8535' with 6" bit.

7/29 Redrilled 6" hole from 8535' to 8669'. Ran Schlumberger electric log at 8669'. Hole following alongside 7" casing.

7/30 Hung 2-1/2" tubing at 8656' and plugged well with 100 sacks Colton Hi-Temperature cement. Final pressure 700#. Time 6:00 AM. B.J. Service. At 4:00 PM located top of cement at 8250'. Cleaned out to 8273' and lost circulation. Ran Halliburton squeeze tool and located hole in 7" casing at 5238'.

7/31 Set Halliburton squeeze tool at 4985' and pumped in 100 sacks Victor Hi-Temperature cement through hole at 5238'. Final pressure 400#. Time 8:30 AM. Halliburton Bulk Method. At 1:30 PM applied 1100# pressure without loss. Located top of cement at 4996' and cleaned out hard cement to 5286', then found stringers of cement to 5286'.

8/1 Cleaned out cement from 8278' to 8359'. Closed rams and applied 1250# pressure for 15 minutes without loss. Cleaned out cement from 8359' to 8330' and lost circulation. Ran Halliburton shoe squeeze tool on 3-1/2" drill pipe and set at 4955'. Displaced fluid easily with 800# pressure. Mixed 150 sacks of Colton Slow Cement and displaced with 227 cu. ft. mud. Final pressure 500# which bled to 0#. Time 6:00 PM. Halliburton Bulk Method.

8/2 Standing cemented. Located top of cement at 4355'.

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SoCalGas-5.0740

Ex. I - 19

PORTER 47

DAILY DRILLING REPORT

3-29 Continued running tubing and 1" control line. Tested safety valve and control line through donut with 5000 psi for 45 minutes, OK. Landed tubing. Tore out BOPE and installed production head. Tested through test port with 4500 psi for 15 minutes, OK. Tested through unibolt against Shaffer donut plug with 4650 psi for 15 minutes, OK. Rigged up Otis wireline. Closed sliding sleeve at 6782'. Set No-Go plug at 8254'. Pressured tubing and set Otis hydraulic packers. Pulled No-Go plug. Tested top packer by pressuring annulus with 1140 psi for 15 minutes, OK. Opened sleeve at 6782'. Control line at 5000 psi for overnight test.

SEE SUPPLEMENT DATED 4-20-73

SEE SUPPLEMENT DATED 5-4-73

PORTER 47

DAILY DRILLING REPORT

3-23 No morning tour. Waiting on cement, continued running 4-1/8" bit and scraper, tagged cement at 7888' (60' high) drilled and cleaned hard cement 7888-8058' circulated from 8104' for one hour. Pressure tested from surface to 8126' with 1625 psi for 30 minutes, OK. Started out of hole with bit and scraper.

3-24 Continued pulling bit and scraper, ran retrieving tool and released bridge plug at 8126'. Ran in from 8126' to set bridge plug onbottom. Stopped at 8138'. Believe cement from squeeze at 8056' was pumped into liner below bridge plug through unsqueezed WSO holes at 8138'. Pulled bridge plug, ran 4-1/8" bit and 5" casing scraper. Tagged cement at 8138'. Drilled and cleaned out soft cement 8138-8200' and hard cement at 8283'. Drilled and cleaned out hard cement at 8297' to 8352'. All perforations cemented, circulated on bottom one hour. Started out of hole with bit and scraper.

3-26 Continued pulling bit and scraper. Rigged up Dresser-Atlas. Ran cement bond log 7900-8355', cement bond at top of S-4 questionable. Jet perforated four 1/2" holes at 8135'. Made up and ran Johnston tester and bridge plug in tandem, set bridge plug at 8158'. Pulled up and set test tool at 8062', tail to 8080'. Opened tool at 6:50 pm. Dead throughout one hour test. Pulled bridge plug and tester. Recovered 5' rise oily workover fluid, charts OK. WSO. Witnessed and approved by P. R. Wygle of the D.O.G.

3-27 Rigged up Dresser-Atlas jet perforated four 1/2" holes 8159-8189', 8200-8223', 8270-8276', 8330-8343'. Used 3-1/2" carriers and 11.0 gram charges. Made up and ran Baker Model "C" bridge plug and fullbore packer. Set bridge plug at 8242'. Pulled up and set fullbore packer at 8140'. Pumped into formation at rate of 0.8 barrels per minute at 2200 psi. Too tight for Halliburton Clay-Lok. Pulled bridge plug and fullbore.

3-28 Rigged up to run Otis packer, Page safety valve and 1" GST control line. Tested safety valve and control line connections with 4850 psi for 20 minutes, OK. Ran into 5623'. Tested control line and safety valve with 4975 psi for 30 minutes, OK.

PORTER 47

DAILY DRILLING REPORT

3-21 Installed BOPE on new tubing head. Used rig pump. Tested pipe rams and casing from surface to 6911' with 1650 psi for 15 minutes, OK. Made up Baker 5" fullbore packer and retrieved tool. Ran in and recovered bridge plug at 6911'. Reset bridge plug at 8126'. Pulled up and set fullbore at 8056'. Tested bridge plug and 5" casing at 8056-8126' with 1625 psi for 15 minutes, OK. Pulled up and set fullbore at 7486'. Tested 7486-8126', no good. Tested from surface to 7486' - inconclusive. Picked up 14' of pup joints to space out properly between collars. Set fullbore at 7816'. Tested 7816-8126', no good. Tested from surface to 7816' with 1700 psi for 15 minutes, OK. Set fullbore at 7943' and tested 7943'-8126', no good. Set full bore at 8007' and tested at 7008'-8126', no good. Set fullbore at 8038' and tested 8038-8126', no good. Tested from surface to 8038' with 1750 psi for 15 minutes, OK. Leak isolated between 8038-8056'; collar at 8052' with fullbore set at 8038'. Could not break down formation with 3100 psi surface pressure (approximately 6650 psi at hole). Collar leak indicated, with fullbore hanging at 8056'. Pumped in two sacks of sand. Pulled up and hung fullbore at 7864'. Rigged up Go-International Jet, perforated four 3/8" holes at 8056' using 1-11/16" bore tubing perforator. Set fullbore at 7864'. Could not break down formation with 3100 psi surface pressure.

NOTE: All measurements are to center of packing element. Add 5' to all figures for correlation with CBL/CCL.

3-22 With fullbore hanging at 8093' pumped in 500 gallons of 15% HCL. Pulled up and set fullbore at 7555'. Pressure tubing to 3000 psi and shut well in for 2-1/2 hours. Broke down holes at 8056' with 4000 psi. Took fluid at a rate of 8 cf/minute at 3500 psi. Hung fullbore at 8093' and backscuttled out acid. Pulled up and hung fullbore at 7864'. With 20 cf fresh water ahead, mixed and pumped 50 sacks Class "G" cement with 0.75% CFR-2. Displaced with 5 cf fresh water and 161 cf workover fluid. Closed tool and squeezed 49 cf cement to formation. Final pressure 3300 psi. Released pressure and had 2 cf bleed-back. Used Halliburton equipment. Pulled fullbore packer. Started in hole with 4-1/8" bit and 5" casing scraper.

PORTER 47

DAILY DRILLING REPORT

3-13-73 Filled hole. Took one barrel. Circulated out fill from 8345' to 8357'. Turn on junk at 8357'. Circulated on bottom for 1-1/2 hours. Started out of hole. Rig broke down with bit and scraper at 7633'. Circulated 2 hours from 7633' waiting on engine.

3-14 Replaced rig engine.

3-15 Filled hole; took one barrel. Circulated one hour from 7633'. Pulled bit and scraper. Rigged up Dresser-Atlas. Ran cement bond log 6700-8354', Neutron Lifetime gama ray log 7780-8352' and Densi-Log 7800-8351'. Start in hole with 7" casing scraper.

3-16 Filled hole. Took one barrel. Continued running 7" casing scraper. Tagged top of liner at 6887'. Started out of hole. Discovered cracked brake flange on rig. Shut down for repairs with scraper at 1532'.

3-17 Pulled 7" scraper from 1532'. Made one 5" Baker Model "C" bridge plug at 1233'. 2-3/8" tubing below 7" Baker fullbore packer. Ran in and set in bridge plug at 8122' with fullbore hanging 6833', tail to 8075'. Tested from surface to 2811' with 1500 psi. No good. Set full bore at 6833' to 8122' with 1500 psi. No good. Tested on surface to 6833' with 1700 psi for 15 minutes. OK. Dropped down to retrieve bridge plug. Discovered that bridge plug as not set properly. Reset same at 8122'. Reset fullbore at 6833', tail to 8075'. Tested 6833' to 8122' with 1700 psi. No good. Retrieved bridge plug and set same at 6911'. Set fullbore at 5609', tail to 6851' and tested 5609-6911' with 1700 psi for 15 minutes, OK. Splice OK. Pulled bore and set same at 3525', tail to 4767'. Tested from surface to 3525' with 2150 psi for 15 minutes, OK. Pulled fullbore and set same at 2505' tail to 3747'. Tested from surface to 2505' with 3200 psi for 15 minutes, OK. Pulled full bore packer. Test summary 7" casing, OK. 5"x7", splice OK. Pulled Leaking 5" liner between 6911-8122'.

3-19 Filled 7"x 13-3/8" annulus. Took 45 barrels. Tore out BOPE and tubing heads. Rigged up spear in casing jacks. Could not unland 7" casing. Cut off casing head. Found 184,000# on casing. Welded extension on 7" casing.

3-20 X-rayed 7" weld, OK. Cut off base plug and welded on new casing head. X-rayed casing head weld, OK. Relanded 7" casing with 185,000#. Installed new tubing head. Tested primary fill with 3275 psi for 15 minutes, OK. Tested secondary fill with 3300 psi for 15 minutes, OK.

Ex. I - 20

Due to the large file size, this exhibit is an excerpt. The native file of this document is available upon request.

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS
RECEIVED
APR 4-1 1977
SANTA PAULA, CALIFORNIA

DIVISION OF OIL AND GAS

Notice of Intention to Rework Well

This notice and indemnity or cash bond shall be filed, and approval given, before rework begins. If operations have not commenced within one year of receipt of the notice, this notice will be considered cancelled.

FOR DIVISION USE ONLY		
BOND	OGD114	OGD121
7373	✓	✓

DIVISION OF OIL AND GAS

In compliance with Section 3203, Division 3. Public Resources Code, notice is hereby given that it is our intention to rework well No. PORTER (#25, API No. -,
Sec. 28, T. 3N, R. 16W, S.B. B. & M., Aliso Canyon Field, Los Angeles County.

The present condition of the well is as follows:

1. Total depth. 8625'

2. Complete casing record, including plugs and perforations:

13 3/8" cemented 808'

7" cemented 5770', WNSO 5755', squeezed - WSO 5751'

5" cemented 8600', WSO 8211'
Perforated 8218'-8494'

3. Present producing zone name SESNON Zone in which well is to be recompleted -

4. Present zone pressure 2500 psi New zone pressure -

5. Last produced ____ (Date) Gas Storage Well (Oil, B/D) ____ (Water, B/D) ____ (Gas, Mcf/D)

or

6. Last injected ____ (Date) ____ (Water, B/D) ____ (Gas, Mcf) ____ (Surface pressure, psig.)

The proposed work is as follows:

1. Move in, kill well and install B.O.P.E.
2. Recover Otis hydraulic packers.
3. Pressure test casing and perfrom remedial work, as indicated.
4. Set Baker Retrieva-"D" packer at 7850'.
5. Run tubing and safety system. Return to Gas Storage.

It is understood that if changes in this plan become necessary we are to notify you immediately.

Address P.O. Box 3249, Terminal Annex (Street)
Los Angeles, California 90051 (City) (State) (Zip)
Telephone Number (213) 689-3561

SOUTHERN CALIFORNIA GAS COMPANY (Name of Operator)
By P.S Magruder Jr. by Greg C. Abrahamson (Name) P.S. Magruder, Jr. (Date)
Type of Organization Corporation (Corporation, Partnership, Individual, etc.)

OG107 (8-75—GSRI—15M)

SoCalGas-5.0748

FORM 103 SUBMIT IN DUPLICATE △ OSP

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS

History of Oil or Gas Well

OPERATOR Pacific Lighting Service Company FIELD Aliso Canyon

Well No. "SFZU" P-25 Porter 25, Sec. 28, T. 3N, R. 16W, S.B. B. & M.

Date October 24, 1973 Signed R. S. Magruder Jr.

P. O. Box 54790, Terminal Annex
Los Angeles, California 90054 (213) 689-3561 Title
(Address) (Telephone Number) (President, Secretary or Agent)

It is of the greatest importance to have a complete history of the well. Use this form to report a full account of all important operations during the drilling and testing of the well or during re-drilling, altering of casing, plugging, or abandonment with the dates thereof. Be sure to include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, shooting and initial production data.

Date	
1973	
1-19	Moved in C.P.S. production rig. Sucker rods had been pulled but rod pump was stuck and remained in well. Blew down gas pressure on tubing and casing, unlanded tubing and opened Page tubing drain. Re-landed tubing and filled casing with 110 bbls. brine-polymer work over fluid and attempted to backscuttle through pump and drain at 1500 psi without success. Attempted to circulate through tubing at 1350 psi without success. Installed class III B.O.P.E.
1-20	Tested B.O.P.E. to 2000 psi. Shot one 3/8" hole in tubing at 8380'. Circulated through tubing, separating kill fluid and oil returning through casing, losing approximately 100 bbls. to formation, in skimmings from circulating tank and mixed with oil to flow line. Pulled tubing. Coming out, Page double tubing anchor stuck at 6042' but worked free in one hour. Lost in hole one 5" x 1-3/4" slip segment and button from Page 5" tubing anchor.
1-21	Idle
1-22	Filled hole, took 9 bbls. Ran 7" scraper and 6-1/8" bit to top of 5" liner at 5678'. Ran 5" scraper and 4-1/8" bit which stopped at tight place at 6042'. Ran 4-1/8" swage and worked through partially collapsed 5" casing at 6042' to 6043'.
1-23	Continued working 4-1/8" swage through tight pipe at 6042' until swage worked through freely. Pulled out but lost swage tool in hole. Ran in, found swage tool at 7618'.
1-24	Recovered 4-1/8" swage. Ran 4-1/8" bit and 5" scraper drifted at 4-1/8" and worked through tight spot at 7618' but stopped and could not be worked through tight spot at 8455'
1-25	Ran 3-7/8" bit and 5" scraper set at 3-7/8" O.D. which could not be worked below 8455'. Ran Dresser-Atlas Neutron Lifetime, Density and Cement bond logs.
1-26	Attempted to run 5" Baker Lok-Set bridge plug but plug would not go through tight pipe at 6042'. Ran 4-1/8" swage and worked through tight places at 6042' & 7618'.

SoCalGas-5.0749

1973

1-27 Checked tight 5" casing at 7618' and 6042' with 4-1/8" swage OK after setting overnight. Ran 126' of 2-3/8" O.D. plain end flush joint tubing stinger, went through tight 5" casing at 8455' and backscuttled out sand fill from 8513' to 8550'.

1-28 Idle.

1-29 Set 5" bridge plug at 8160' to plug well to change wellhead. Tested plug and casing with rig pump to 1500 psi but pressure bled off to 1150 psi in 5 minutes. Set plug at 7575' and tested but bled off from 1600 psi to 1250 psi in 75 minutes. Set plug at 6010' and tested at 1825 psi OK. Above tests indicate leaks in 5" casing between 6010' and 8160'. Pulled and re-dressed bridge plug. Reran 5" bridge plug with squeeze packer and pressure tested tubing at 5000 psi to 8160'.

1-30 Set bridge plug at 8160' and packer at 8120' and tested between at 3000 psi OK using B-J pump truck. Set packer at 7663' and tested 5" casing from 7663' to 8160' at 3000 psi OK. Set packer at 7600' and tested 7600' to 8160' and pumped away 5 cu. ft. per minute at 2000 psi. Tested 7" casing and 5" casing from surface to 7600' at 2000 psi which leaked 200 psi in 7 minutes. The tests indicated hole in 5" at 7618', the depth at which the 5" was partially collapsed and a smaller leak between 7600' and surface. Set squeeze packer at 7427' to cement hole at 7618'. Pumped in 20 cu. ft. water, 40 sacks Class "G" cement with 0.2% B-J, Inc. D-19 fluid loss additive and 0.2% D-31 dispersant and 4 cu. ft. water and squeezed out 36 cu. ft. cement through holes at 7618' in stages to a final pressure of 2450 psi. Cement in place 2:40 PM. Calculated top of cement 7518'. Held pressure on cement until 5:00 PM. Set packer at 6060' and tested 5" to calculate top of cement at 7518' at 2200 psi which leaked off 300 psi in 7 minutes. Tested 5" and 7" casing from 6060' to surface which held 2000 psi for 4 minutes, increased pressure to 2200 psi which held 3 minutes then broke down and leaked off 100 psi in 40 minutes. Set packer at 6806', 6494', 6682', 6620', 6557' and 6588' and tested from packer to calculate top of cement at 7518' and determined existence of small leaks in the 5" casing at or near a collar at 6588' and between 6806' and calculated top of cement at 7518'.

1-31 Pulled squeeze packer to 6342' and ran Dresser-Atlas through tubing perforator and shot four 3/8" jet holes at 6593'. Set packer at 6342' and broke down holes at 6593' with 7 cu. ft. per minute at 2000 psi. Pumped in 20 cu. ft. water, 60 sacks class G cement with 0.2% D-19 and 0.2% D-31 and 4 cu. ft. water and squeezed out 60 cu. ft. cement through holes at 6593' at a final pumping pressure of 2200 psi, but leaked off to 1800 psi in 40 minutes. Cement in place 9:40 AM. Calculate top of cement 6513'. Released pressure at 12:00 Noon. Retested 6342' to calculate top of cement at 6513' at 2200 psi which leaked off 100 psi in 10 minutes, indicating an additional leak between 6342' and calculate top of cement at 6513'. Pulled squeeze packer and ran in with 4-1/8" bit and 5" scraper drifted to 4-1/8". Drilled out cement stringers from 6475' to 6489', leaving cement plug from 6489' to squeezed holes at 6593'.

2-1 Pulled bit and scraper. Ran 5" squeeze packer and set successively at 6434', 6310', 6376', 6366', 6355' and at 6310' and 6376' again and tested from packer to top of cement plug at 6489' proving existence of leaks in the 5" casing from above 6310' to 6434'. Pulled packer. Ran 4-1/8" bit and scraper and drilled out cement from 6489' to 6551'.

1973

2-2 Continued drilling out cement from 6551' to 6599'. Ran on in with 4-1/8" bit and scraper, hit cement stringers at 7470', firm cement from 7590' to 7624'. Ran on in and circulated hole clean from top of sand plug at 8144'.

2-3 Ran Dia-log Caliper survey in 5" casing from 8141' to 5678', indicating no appreciable loss of inside wall metal.

2-4 Idle.

2-5 Made four attempts to run Schlumberger electronic casing inspection log on 5" casing without success. Tool malfunctioned.

2-6 Ran Schlumberger electronic casing inspection log in 5" casing from 7730' to shoe of 7" casing at 5770', indicating more than 90% wall thickness remaining throughout. The log indicated 5" joints to be flush joint, such as Hydril "EU".

2-7 Ran and set 5" bridge plug at 7668' and 5" packer at 7602' and tested 7602' to 7668', including cemented holes at 7618', to 2100 psi for 35 minutes OK. Moved bridge plug to 7602' and set packer at 6806' and tested 6806' to 7602' at 1700 psi which leaked off 100 psi in 50 minutes confirming existence of small hole in 5" casing between 6806' and 7602'. Set packer at 6438' and tested 6438' to 7602', including cemented holes at 6593', to 1700 psi which leaked off at rate of 1-1/2 psi per minute, indicating cemented holes were holding OK and that leak off was at the small hole between 6806' and 7602'. Pulled bridge plug to 6475' and set packer as outlined below to re-confirm leaks in the 5" casing between 6342' and 6513' as reported on 1/31/73 and leaks in the area of 6310' to 6434' as reported on 2/1/73. Set packer and tested 5" casing (1) 6376' to 6475' at 2200 psi for 15 minutes OK; (2) tested 6314' to 6475' at 2000 psi which leaked off to 1900 psi in 5 minutes; (3) tested 6345' to 6475' at 2000 psi which leaked off 40 psi per minute. Also when packer was set at 6314', tested 5" and 7" casing from 6314' to surface at 1500 psi for 25 minutes OK. The above tests showed the tests conducted on 2/1/73, which indicated leaks "from above 6310' to 6434'", to be in error due to a fault in the packer unknown at that time and that the only leak in the 5" between 6342' and 6513' is between 6345' and 6376', probably at a joint at 6363'.

2-8 Moved bridge plug to 7603' to pinpoint leak in 5" casing between 6806' and 7602' as previously determined. Set packer at 7309', 7063', 6938', 6876' and 6907' and tested to 7603' at 2100 psi which showed hole to be in 5" casing between 6907' and 6938', probably at joint at 6923', which leaked off at 10 psi per minute. Pulled packer to 6691'. Ran Dresser-Atlas through tubing gun and shot four 3/8" holes at 6927' to 6928'. Set packer at 6691'. Holes at 6927' to 6928' would not take fluid at 2600 psi, only leaking off from 2600 psi to 1700 psi in 5 minutes. Spotted 200 gallons 15% inhibited HCL in 5" casing from 6968' to 6708'.

2-9 Set packer at 6691' and broke down holes at 6927' with 5 cu. ft. per minute at 2500 psi. Backscuttled from 6998' to circulate out HCL acid. Re-set packer at 6691' and cemented holes at 6927' as follows: Pumped in 20 cu. ft. water, 40 sacks Class "G" cement, 4 cu. ft. water and displaced with 252 cu. ft. mud staging 36 cu. ft. cement out holes at 6927' at a final pump pressure of 2000 psi. Cement in place 9:10 AM. Calculate top of cement at 6827'. Held 2000 psi 30 minutes then tested against cement at 2200 psi OK. Pulled packer. Ran 3-1/2" gun

1973

2-9 (cont'd) and shot four 0.38" holes at 6368'. Set packer at 6130' and broke down holes at 6368' with 6 cu. ft. per minute at 1700 psi. Cemented holes at 6368 as follows: pumped in, through 3248' 2-3/8" tubing and 2882' 3-1/2" tubing, 20 cu. ft. water 70 sacks Class "G" cement with 0.20% D-19 and 0.20% D-31, 4 cu. ft. water and displaced with 225 cu. ft. mud squeezing out 70 cu. ft. cement through holes at 6368' at a final pump pressure of 1900 psi and a final static pressure of 1600 psi. Calculated top of cement 6268'. Cement in place 4:50 PM. Released pressure at 6:30 PM. Pulled packer.

2-10 Removed B.O.P.E. and tubing head in order to remove existing casing head and weld on new casing head, but shut down at 11:00 AM. Unable to make weld in rain.

2-11 Idle.

2-12 Unlanded 7" casing with 160,000 pounds. Removed existing casing head and welded on new 5000 psi API 13-3/8" casing head by making butt weld in 13-3/8" casing 3" above cellar floor. X-rayed weld OK.

2-13 Relanded original 7" casing with 160,000 pounds. Installed 5000 psi API seal flange and tubing head and tested seals to 3400 psi OK. Ran 4-1/8" bit and scraper, hit cement stringers at 6193', firm cement at 6258' and drilled out cement to 6334'.

2-14 Continued drilling out cement 6334' to 6375', 7' below holes at 6368'. Pressure tested holes at 6368' with rig pump at 1500 psi which bled off to 1210 psi in 50 minutes. Ran on in with 4-1/8" bit and scraper and hit cement at 6720' and drilled out cement to holes at 6927'. Pressure tested complete interval from top of sand at 7583' to surface including the two sets of squeezed holes at 6368' and 6927' at 1500 psi with rig pump which bled off to 1170 psi in 28 minutes. Ran in, tagged top of sand at 7583' and pulled bit.

2-15 Ran 5" packer to test cement jobs at 6927', 6593' and 6363'. Set packer at 5704' and tested 5704' to surface at 1590 psi 20 minutes OK. Set packer at 6425' and tested 6425' to surface at 1520 psi which leaked off to 1250 psi in 5 minutes, indicating holes at 6368' were leaking. Set packer at 6441' and tested 6441' to sand at 7583' at 1500 psi which leaked off to 1395' in 30 minutes, which indicated holes at 6927' and/or 6593' were leaking. Set packer at 6900' and tested holes at 6927' which leaked off from 1975 psi to 1875 psi in 25 minutes. Using Dresser-Atlas 1-11/16" through tubing perforator and Di-Kone link jet, shot 2 holes at 6930'. Set packer at 6683' and broke down holes at 6930' with 3 cu. ft. per minute at 3200 psi. Squeezed holes at 6930' with 25 sacks Class "G" cement at pumping pressure of 3000 psi, which bled off to 1800 psi in 5 minutes, except final stage built up to and held 2000 psi. Calculated top of cement at 6770'.

2-16 Pulled packer from 6683' to 6430' and found tubing plugged. Pulled out and found cement in bottom 90' of 2-3/8" tubing. Ran 7" packer to test 7" casing. The 7" packer (6.200" O.D.) stopped going at 5093', 585' above top of 5" liner. Set packer at 5063' and tested 7" casing to surface at 2200 psi 20 minutes OK. Set packer at 3000' and tested 7" casing to surface at 2550 psi for 20 minutes OK.

1973

2-16 (cont'd) Set packer at 2002' and tested 7" casing to surface at 3100 psi for 20 minutes OK. Ran 5" packer and tubing plug catcher and checked displacement of 3248' of 2-3/8" tubing and 3435' of 3-1/2" tubing finding displacement to be 16 cu. ft. more than standard due to rod wear. Set packer at 6437' and tested cemented holes at 6593' which leaked off from 1700 psi to 1630 psi in 20 minutes.

2-17 Pulled tubing. Using Dresser-Atlas 3-1/2" Gun and Golden Jets, shot two 1/2" holes at 6595'. Set packer at 6463' and broke down formation at 14 cu. ft. per minute at 3200 psi. Squeezed holes with 100 sacks Class "G" (114 cu.ft. cement), staging to a final pressure of 3000 psi, putting 101 cu. ft. out holes. Calculated top of cement 6523'. Set packer at 6122' and broke down holes at 6368' with 8 cu. ft. per minute at 3200 psi. Squeezed holes at 6368' with 70 sacks Class "G" (80 cu.ft. cement), staging to a final pressure of 3500 psi, putting 60 cu. ft. cement out holes. Calculated top of cement 6168'. Pulled packer and ran 4-1/8" bit to 3300'.

2-18 Idle.

2-19 Ran on in with 4-1/8" bit and 4-1/8" scraper, found top soft cement at 6196' and drilled out cement to 6326'. No cement between 6326' and supposed leak at 6368'. Evidently original squeeze on holes at 6368' on 2-9-73 was OK but break down on 2-17-73 with packer at 6122' was out new holes 6326'. Ran on in and hung bit at 6551' and tested 7" and 5" casing from surface to below 6551' with rig pump at 1520 psi for 20 minutes, OK. Rotated bit and scraper finding cement stringers from 6496' to 6582' and solid cement from 6582' to 6601'. This cement was left in place when squeezing holes at 6595' on 2-17-73. Ran on in and hit top of cement at 6684' from squeeze on holes at 6930' on 2-15-73. Hung bit at 6684' and pressure tested from 6684' to surface at 1360 psi for 20 minutes OK. Drilled out hard cement from 6684' to 6801'.

2-20 Continued drilling out cement 6801' to 6931'. Ran on in to 6962' and pressure tested holes at 6930' from surface at 1300 psi which bled off to 930 psi in 20 minutes. Retrieved bridge plug from 7602'.

2-21 Using Dresser-Atlas 3-1/2" hollow carrier and NCF III 11 gram Golden Jet, shot 4 0.31" holes per foot from 8088'-8086', 8080'-8074', 8070'-8056', 8026'-8001', and 7998'-7982'. Ran Johnston formation test tool on 3248' 2-3/8" and 4619' 3-1/2" tubing. Set packer at 7894' (27' of tools above packer) with tail to 7912', with 1/2" flow bean in tester. Flowed well for clean up period from 2:45 PM to 6:10 PM then shut in at tester. Final rate 2.8 MMCF/day approximately at 578 psi surface flowing pressure on 48/64" surface bean. Produced 3.3 bbls. oil last hour.

2-22 Flow tested S-8 zone from 6 AM to 6 PM with perforations open and test tool set as outlined on 2-21-73. Final flow rate 3252 MCF/day on 3/4" surface bean and 604 psig surface flowing pressure. Produced 9.0 bbls. oil and 15.4 bbls. water in the 12 hour test.

1973

2-23 Pulled test tools. Using Dresser-Atlas 3-1/2" hollow carrier and NCF III 11 gram Golden Jets, perforated four 0.31" holes per foot at 7888'-7894', 7914'-7926' and 7950'-7956'. Ran Johnston tester and bridge plug. Set plug at 7970' and test packer at 7821' with tail to 7846'. Opened tester from 4:18 PM to 6:00 PM for clean up flow period. At 6:00 PM flowing through 1" bean at surface rate was approximately 2300 MCF/day at 635 psi surface pressure.

2-24 Flow tested S-4 zone from 6:05 AM to 6:05 PM with tester set as outlined on 2-23-73. Flow rate at 6:05 PM 2897 MCF/day at 511 psi surface pressure. Fluid produced for the 12 hours was 21.3 bbls. gross, 10.4 bbls. net.

2-25 Idle.

2-26 Pulled tester tool. Moved bridge plug from 7970' to 7872'. Shot four 0.31" holes at 7853'. Ran Johnston tester on 3248' 2-3/8" and 4569' 3-1/2" dry tubing. Set packer at 7817' with tail to 7833'. Tester open at 5:25 PM for one hour for WSO test on holes at 7853'. Had weak diminishing blow for 40 minutes, dead last 20 minutes. Had 10' rise drilling fluid. Charts OK. I.H.P. 3460 psi, I.F.P. 30 psi, F.F.P. 0 psi, F.H.P. 3456 psi witnessed and approved by Peter Wygle of Division of Oil & Gas.

2-27 Ran squeeze packer and moved bridge plug from 7872' to 7061'. Set packer at 6688' and tested cemented holes at 6930' at 2500 psi for 20 minutes, OK. Tested from 6688' to surface at 1300 psi which bled off to 1075 psi in 15 minutes. This test indicated that holes at 6595' or 6368' had broken down since good tests were made on 2-19-73 and that holes at 6930' were OK. (Tests conducted on 2-20-73 indicated holes at 6930' were bad). Set packer at 6564' and tested 6564' to 7061' at 1300 psi 10 minutes OK, showing holes at 6593' were OK. Set packer at 6315' and tested 6315' to 7061' at 1300 psi which leaked to 900 psi in 5 minutes, indicating holes at 6368' and/or 6326' were bad. Tested from 6315' to surface at 1300 psi 20 minutes OK. Packer failed. Pulled packer and retrieved plug from 7061'.

2-28 Ran squeeze packer and bridge plug. Set bridge plug at 6579' and packer at 6564' and tested between at 2500 psi 5 minutes OK. Set packer at 6346' and tested to 6579' at 1300 psi which bled off to 800 psi in 4 minutes, indicating holes at 6368' were leaking. Tested from 6346' to surface at 1300 psi 10 minutes OK. Broke down holes at 6368' with 8 cu. ft. per minute at 2500 psi. Cemented holes at 6368' with 57 cu. ft. Class "G" cement to a final pressure of 3000 psi. Cement in place 2:06 PM. Held 3000 psi 5 minutes, released squeeze tool and backscuttled 37 cu. ft. cement. Calculate 18 cu. ft. out holes at 6368', 2 cu. ft. in 5" casing. Pulled packer.

3-1 Ran 4-1/8" bit and scraper. Drilled out firm cement from 6346' to 6371'. Pressure tested casing from 6579' to surface at 1000 psi 20 minutes OK. Pulled bit.

1973

3-2 Retrieved bridge plugs from 6579' and 8160'. Hole took 120 bbls. after pulling bridge plug at 8160'. Ran Baker Model D production packer on Dresser-Atlas wireline. Could not get below tight spot in 5" liner at 7618'. Pulled out.

3-3 Ran 4-1/8" tapered mill. Milled tight spots in 5" liner at 6047' and 7618'. Mixed 460 bbls. mud. Checked liner to 8163' with mill.

3-4 Idle.

3-5 Ran Johnston squeeze packer and bridge plug in tandem to test milled spots. Set bridge plug at 7720'. Set packer at 7710' and tested bridge plug with 1075 psi for 15 minutes OK. Pulled up and set packer at 7578'. Tested 7578'-7710' with 1035 psi for 25 minutes OK. Retrieved bridge plug and reset same at 6167'. Set packer at 6151' and tested bridge plug with 1350 psi for 15 minutes OK. Pulled up and set packer at 6023'. Tested 6023' to 6167' with 1150 psi for 25 minutes OK. Ran Baker Model "D" on Dresser Atlas wireline. Could not get below tight spot at 7618'. Maximum O.D. Baker packer 3.968", maximum O.D. Johnston packer 3.968", maximum O.D. tapered mill 4.125". Suspect dogleg at 7618'.

3-6 Made up Baker Model "D" on tubing. Measured in and set Model "D" at 8100'. No trouble getting past 7618'. Made up completion string (see tubing detail). Tested 6060' of 1/4" control line and 2-3/8" Page safety valve with 5000+ psi for 15 minutes OK. Started Hydrotesting in hole with tubing.

3-7 Continued in hole with tubing. Made splice at end of spool and tested same with 5000+ psi for 15 minutes OK. Spaced out to land tubing. Tested control line and safety valve through donut with 5000+ psi for 30 minutes OK. Landed tubing with 13,000 lbs. on Model "D" packer. Tore out B.O.P.E. Installed production head. Tested control system and safety valve through head with 5000+ psi for 30 minutes OK. Tested production head through test port with 4575 psi for 15 minutes OK. Tested production head through unibolt with 4500 psi for 15 minutes OK. Rigged up Otis wireline and closed all three sleeves (7792', 7958', 8090'). Set No Go plug in Otis X nipple at 8099'. Pressured tubing to 2300 psi and held for 5 minutes to set 2 Otis Model RH hydraulic packers (packers at 7833' and 7963'). Tested setting of top packer by pressuring up on annulus. Held 750 psi for 10 minutes OK.

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1973

TUBING DETAIL

No.Jts.	Item	Length	Depth
	Below K.B.	6.92	
	Donut & 2-7/8" x 3-1/2" EU 8 Thd X-Over	1.00	
	3-1/2" EU 8 Thd pup jt.	2.15	
	3-1/2" EU 8 Thd pup jt.	4.20	
	3-1/2" EU 8 Thd pup jt.	10.00	
	3-1/2" EU 8 Thd pup jt.	10.00	
178	3-1/2" EU 8 Thd J-55 tubing	5538.94	5573.21
	3-1/2" x 2-7/8" EU 8 Thd crossover	1.10	5574.31
1	2-7/8" EU 8 Thd J-55 tubing	31.62	5605.93
	2-7/8" EU 8 Thd Otis X nipple 2-5/16 I.D.	1.00	5606.93
1	2-7/8" EU 8 Thd J-55 tubing	30.35	5637.28
	2-7/8" x 2-3/8" EU 8 Thd crossover	1.10	5638.38
69	2-3/8" EU 8 Thd J-55 tubing	2154.35	7792.73
	2-3/8" EU 8 Thd Otis Sliding Sleeve (closed)	2.80	7795.53
1	2-3/8" EU 8 Thd J-55 tubing	31.12	7826.65
	2-3/8" EU 8 Thd Page Safety Valve (will not close)	3.10	7829.75
	2-3/8" x 5" 18# Otis Hydrostatic set packer w/15,000# shear out	4.05	7833.80
4	2-3/8" EU 8 Thd J-55 tubing	124.40	7958.20
	2-3/8" EU 8 Thd Otis Sliding Sleeve (open)	2.80	7961.00
	2-3/8" EU 8 Thd N-80 tubing pup jt.	2.25	7963.25
	2-3/8" x 5" 18# Otis Hydrostatic set packer w/15,000# shear out	4.05	7967.30
4	2-3/8" EU 8 Thd J-55 tubing	123.07	8090.37
	2-3/8" EU 8 Thd Otis Sliding Sleeve (closed)	2.80	8093.17
	2-3/8" EU 8 Thd N-80 tubing pup jt.	6.00	8099.17
	2-3/8" Otis X nipple 1.875 I.D. & 1.791 No. Go. (plug in place)	1.10	8100.27
	2-3/8" EU 8 Thd Baker Locator Sub. Landed in Model D pkr. @ 8100' w/13,000#	.45	8100.72
	5 sets Baker Seals	4.50	

3-8 Opened sliding sleeves at 7792' and 7958' with Otis wireline unit. Closed safety valve. Unloaded 240 bbls. workover fluid with nitrogen. Closed sleeve at 7792'. Blew down tubing until fluid hit and well came in. Shut well in. Tubing pressure built up to 1176 psi. 2200 psi nitrogen pressure on annulus. Defective safety valve indicated. Made flow line connection. Pressured up on control line. Flowed well. Bled off control line and attempted to bleed off tubing above safety valve. No good. Well continued to flow. Repeated procedure. No good.

3-9 Cycled valve two more times as above with no results 2200 psi still on annulus. Top of Otis packer, sliding sleeve, and squeeze jobs above Otis packer all good. Malfunction definitely in safety valve. Pressured control line and closed sleeve at 7958' with Archer Reed wireline. Bled off control line and checked safety valve with 1-3/4" impression block. Valve wide open. Pressured up tubing to

SoCalGas-5.0756

1973

3-9 (cont'd) 3000 psi with nitrogen in attempt to hydraulic the valve closed. Impression block again showed valve to be wide open. Pressured control line to 4500 psi and opened sleeves at 7792' and 7958'. Closed sleeve at 7792'. Do not believe valve to be locked open as sleeve shifting tool did not see safety valve. Possible that valve equalizing bypass is clogged with well trash and that prolonged flow periods will clean up valve and thus allow it to operate properly. Tore out C.P.S. and moved out.

Final status of downhole equipment:

2-7/8" x 2-5/16" I.D. Otis "X" nipple to seat Udall valve @ 5606'
2-3/8" Otis sliding sleeve (circulating) closed @ 7792'
2-3/8" Page Safety Valve open @ 7827'
2-3/8" Otis sliding sleeve (S-4 production) open @ 7958'
2-3/8" Otis sliding sleeve (S-8 production) closed @ 8090'
2-3/8" x 1.875" I.D. Otis X nipple with No Go plug in place @ 8099'

Approximately 140' workover fluid (1.7 bbl.) left in annulus.

SoCalGas-5.0757

FORM 109

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS

Report on Operations

No. T 273-158

Mr. P. S. Magruder, Jr., Agent
Pacific Lighting Service Company
P O Box 54790, Terminal Annex
Los Angeles, California 90054

Santa Paula Calif.
March 20, 1973

DEAR SIR:

Operations at well No. "SFZU" P-25, API No. (037) 00712, Sec. 28, T. 3N, R. 16W S.B., B & M. Aliso Canyon Field, in Los Angeles County, were witnessed on Feb. 26, 1973. Mr. P R Wygle, engineer, representative of the supervisor was present from 1900 to 2100. There were also present J. Melton, foreman

Present condition of well: 13 3/8" cem. 808'; 7" cem. 5770', c.p. 5755', perf. 5751' WSO; 5" cem. 5678-8600', perf. 7853' WSO, perf. 8211' WSO, perf (ints) 8225-8494'. T.D. 8625'. Plugged with cem. 8600-8560'.

The operations were performed for the purpose of testing the 5" shut-off by means of a formation tester.

DECISION:

THE 5" SHUT-OFF AT 7853' IS APPROVED.

a
cc: Operator

JOHN F. MATTHEWS, JR.
State Oil and Gas Supervisor

By _____ Deputy

SoCalGas-5.0758

FORM 111

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS

REPORT ON PROPOSED OPERATIONS No. P 273-44

GAS STORAGE

Mr. P. S. Magruder, Jr., Agent
Pacific Lighting Service Company
P O Box 54790, Terminal Annex
Los Angeles, California 90054

Santa Paula, Calif.
January 29, 1973

DEAR SIR:

Your (037-00712) proposal to convert to gas storage Well No. "SFZU" P-25, Section 28, T. 3N, R. 16W S.B B. & M., Aliso Canyon Field, Los Angeles County, dated 1/15/73, received 1/26/73, has been examined in conjunction with records filed in this office.

THE PROPOSAL IS APPROVED PROVIDED THAT:

1. Blowout prevention equipment, at least of the Division of Oil and Gas Class III rating, shall be installed and maintained in operating condition at all times.
2. Drilling fluid of proper weight and consistency shall be used to keep the well under control at all times; and a reserve supply of this material shall be kept on hand to meet any emergency. NO CONTAMINATES OR TOXIC MATERIAL SHALL BE USED IN ANY DRILLING FLUID THAT IS TO BE PLACED IN AN UNLINED SUMP.
3. THIS DIVISION SHALL BE NOTIFIED TO WITNESS the test of the 5" water shut-off at 7850'.

Blanket Bond
ALL:a
cc: Operator

JOHN F. MATTHEWS, JR., State Oil and Gas Supervisor

By [signature], Deputy

87628-708 11-71 35M ⓢ OSP

SoCalGas-5.0759

FORM 107

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS

Notice of Intention to Deepen, Redrill, Plug or Alter Casing in Well

This notice must be given before work begins; one copy only

Los Angeles, Calif. January 15, 19 73

DIVISION OF OIL AND GAS

In compliance with Section 3203, Chapter 93, Statutes of 1939, notice is hereby given that it is our intention to commence the work of deepening, redrilling, plugging or altering casing at Well No. "SFZU" P-25
(Cross out unnecessary words)
, Sec. 28, T. 3N, R. 16W, SB B. & M.

Aliso Canyon Field, Los Angeles County.

The present condition of the well is as follows:

1. Total depth. 8625', Plug 8560'.

2. Complete casing record, including plugs:

13-3/8" cemented 808'
7" cemented 5770'
4 holes 5755' cemented
4 holes 5751' WSOK
5" liner 5678' to 8600', ineffective below 8560'
5" x 7" Lap WSOK
8211' 4 holes WSOK
Jet perforations 2 holes per/foot and bullet perforations 2 holes per foot 8225'-8281', 8309'-8327', 8335-8356', 8367'-8385', 8387'-8397', 8416'-8446' and 8452'-8494'. Re-perforated 2 jet holes per foot 8218'-8274', 8280'-8321', 8331'-8352', 8363'-8371', 8383'-8393' and 8412'-8442'.

3. Last produced. (Date) (Oil, B/D) (Water, B/D) (Gas, Mcf/D)

The proposed work is as follows:

1. Demonstrate WSO at 7850'.

2. Perforate and/or re-perforate in the Sesnon and Frew zones between 7876' and 8560' as required to convert well to a gas storage well.

MAP | MAP | | | FORMS

P. O. Box 54790, Terminal Annex
Los Angeles, Ca. 90054
(Address)

(213) 689-3561
(Telephone No.)

Pacific Lighting Service Company
(Name of Operator)

By R. S. Maguder Jr.

46086-705 11-70 15M OSP

SoCalGas-5.0760

FORM 156

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL AND GAS

REPORT OF PROPERTY AND WELL TRANSFER

Field or County: Los Angeles — District: 1

Former Owner: Getty Oil Company — Date: Sept. 26, 1968

Description of Property: Sec. 27,28,34, T. 3 N., R. 16 W., S. B. B. & M.

Sec. 27:
*"Fernando Fee" 32 (037-00686)
"Porter" 12 (037-00701)
" 30 (037-00717)
" 31 (037-00718)
" 32 (037-00719)

List of Wells
"Porter" 36 (037-00723)
" 37 (037-00724)
" 45 (037-00732)

Sec. 28:
"Porter" 4 (037-00699)
" 25 (037-00712)
" 26 (037-00713)
" 34 (037-00721)
" 35 (037-00722)
" 38 (037-00725)
" 39 (037-00726)

Sec. 28:
"Porter" 40 (037-00727)
" 41 (037-00728)
" 42 (037-00729)
" 43 (037-00730)
" 44 (037-00731)
" 46 (037-00733)
" 47 (037-00734)
"Porter-Sesnon" 42 (037-00753)

Sec. 34:
"Fernando Fee" 31 (037-00685)
" 33 (037-00687)
" 34 (037-00688)
" 35 (037-00689)
"Mission-Adrian Fee" 3 (037-00693)
" 4 (037-00694)
" 5 (037-00695)

Date of Transfer: August 1, 1968
New Owner: GETTY OIL COMPANY, OPERATOR
Address: 3450 Wilshire Boulevard, Room 720
Los Angeles, California 90005
Telephone No. 381-7151

Type of Organization: Corporation
Reported by: C. G. Nelson for Getty Oil Co. & Getty Oil Co., Operator (letter of 8-7-68) *
Confirmed by:
New Operator New Status PA , Old Operator New Status PA
Request Designation of Agent No

Remarks:

ag
cc: F. E. Kasline
Production Dept.
Conservation Committee

Wm. C. Bailey
Deputy Supervisor

	INITIALS	DATE
Form 121		
New Well Cards		
Well Records		
Electric Logs		
Production Reports		
Map and Book		
Form 148		
Notice to be cancelled		
Bond status		

LEGEND
PA—Producing Active
NPA—Non Potential Active
PI—Potential Inactive
NPI—Non Potential Inactive
Ab—Abandoned or No More Wells

71869-705 5-66 3M ② OSP

SoCalGas-5.0761

Ex. I - 21

FORM 103 SUBMIT IN DUPLICATE △ OSP

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS

History of Oil or Gas Well

OPERATOR Pacific Lighting Service Company FIELD Aliso Canyon

Well No. IW 63, Sec. 34, T. 3N, R. 16W, SB B. & M.

Date June 8, 19 73 Signed R. B. Magruder Jr.

P. O. Box 54790, Terminal Annex
Los Angeles, Calif. 90054 (213) 689-3561 Title Agent
(Address) (Telephone Number) (President, Secretary or Agent)

It is of the greatest importance to have a complete history of the well. Use this form to report a full account of all important operations during the drilling and testing of the well or during re-drilling, altering of casing, plugging, or abandonment with the dates thereof. Be sure to include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, shooting and initial production data.

1972 Date	
8-6	Well drilled by Camay Drilling Company, Contractor, rig #8. All measurements taken from top of kelly bushing which was 15' above mat. Spudded well at 12:01 PM, 8-6-72, and drilled 11" hole to 922'.
8-7	Opened 11" hole to 17-1/2" from 40' to 705'.
8-8	TO CEMENT 13-3/8" SURFACE CASING: Ran 17 joints or 704.11 feet of 13-3/8", 48#, H-40, 8rd., ST&C, R-3, new seamless blank casing and cemented same at 699' with 534 sacks of Class "G" cement treated with 2% calcium chloride. Cement in place 12:30 AM. CASING DETAIL: All 17 joints or 699 feet, 13-3/8" fitted on bottom with Baker stab in shoe. Cut and recovered 13-3/8" casing, welded on Shaffer casing head and tested same to 3000# OK. Installed BOP.
8-9	Tested BOP to 1000# OK. Test witnessed and APPROVED BY ENGINEER FOR DIVISION OF OIL AND GAS.
8-10	Drilled 11" hole to 1270'. Pow-R-Drill #1 11" hole to 1288'.
8-11	Pow-R-Drill #1 11" hole to 1600'. Reamed 1482' to 1600' and directionally drilled 11" hole to 1778'.
8-12	Directionally drilled 11" hole to 2542'.
8-13	Directionally drilled 11" hole to 3153'.
8-14	Directionally drilled 11" hole to 3830'.
8-15	Directionally drilled 11" hole to 4405'.

Aliso_Canyon_DOGGR_0002349
SoCalGas-5.0763

1972

8-16 Directionally drilled 11" hole to 4540'.
Pow-R-Drill #2 11" hole to 4617'.

8-17 Reamed 4540' to 4617' and directionally drilled 11" hole to 5000'.

8-18 Directionally drilled 11" hole to 5192'.
Pow-R-Drill #3 11" hole to 5310'.

8-19 Pow-R-Drill #3 11" hole to 5351'.
Ream 5191' to 5351' and directionally drilled 11" hole to 5722'.

8-20 Directionally drilled 11" hole to 6100'.

8-21 Reamed 6060' to 6100' and directionally drilled 11" hole to 6447'.

8-22 Directionally drilled 11" hole to 6798'.

8-23 Ream 6123' to 6163' and directionally drilled 11" hole to 6950'.
Ran Dresser Atlas Induction Electrolog and recorded from 6937' to 699'.

8-24 Directionally drilled 11" hole to 7100'. Circulate and condition gas cut mud.
Ran Dresser Atlas Induction Electrolog and recorded from 7092' to 5600'.
Directionally drilled 11" hole to 7106'.

8-25 Directionally drilled 11" hole to 7190'.
TO CEMENT 8-5/8" CASING: Ran 172 joints or 7195' of 8-5/8", 36#, K-55 and N-80, Buttress thread, R-3, new seamless blank casing and cemented same at 7190' with 600 sacks Class "G" cement. Displaced with 2390 cu. ft. of mud to bump plug to place at 9:22 PM under 750# final pressure. Dropped plug and opened stage collar at 1919'. Pumped in 100 sacks Class "G" cement. Displaced with 690 cu. ft. mud. Did not bump plug; cement in place at 10:30 PM. Used Dowell bulk cement and power.

CASING DETAIL

Bottom 33 joints or 1386'	(7190' to 5804')	N-80 fitted on bottom with Davis fill-up float shoe and at 7146' with Davis fill-up float collar.
Next 139 joints or 5804'	(5804' to Sfc.)	K-55 Stage collar at 1919'.
Total 172 joints or 7190 feet.		

8-26 Removed BOP, cut and recovered 8-5/8" casing, installed secondary 8-5/8" packing and tested same OK with 5000# psig.
Reinstalled BOP, ran 7-5/8" bit to stage collar plug at 1913'.

8-27 Drilled out stage collar at 1919' and same took fluid under 1000# pressure.
Set Baker full bore cement tool at 2000' and tested casing OK under 1500#.
Reset tool at 1800' and pumped away. Stage collar not holding.
TO SQUEEZE STAGE COLLAR AT 1919' WITH CEMENT: Set Baker cement tool above collar at 1919' and stage cemented with 100 sacks of Class "G" cement. Final pressure 1500# psig; cement in place at 1:00 PM.

1972

8-28 Drilled out cement with 7-5/8" bit from 1859' to 1919'; tested casing with 1500# psig for 15 minutes OK, and cleaned out to 7080'.

TO TEST WATER SHUT-OFF ON HOLES IN 8-5/8" CASING AT 7060': Ran combination gun and tester on 5" drill pipe and shot 4-1/2" jet holes at 7060'. Set packer at 7000'. Opened tool at 11:10 AM for 1 hour test. Strong blow 15 minutes and dead in 25 minutes. Recovered 1000' rise of drilling fluid. Water shut-off not approved.

8-29 TO SQUEEZE HOLES IN 8-5/8" CASING AT 7060' WITH CEMENT: Ran squeeze tool and set same at 6951'. Squeezed holes with 100 sacks Class "G" cement mixed to 118#/cu. ft. slurry. Cement in place at 4:35 AM under 2500# psig.

Ran 7-5/8" bit with scraper above and drilled out cement from 7009' to 7060'. Tested casing OK with 1650# psig cement.

8-30 TO TEST WATER SHUT-OFF ON HOLES IN 8-5/8" CASING AT 7059': Ran Johnston combination gun and tester and shot four 1/2" jet holes at 7059'. Set packer at 7014' with tail to 7039'. Opened tool at 1:17 AM for one hour test. Medium blow for 5 minutes, dead balance of test. Recovered 300' drilling fluid rise in 5" drill pipe. Charts OK. Water shut-off approved by ENGINEER FOR DIVISION OF OIL & GAS.

TO TEST HOLES IN 8-5/8" CASING AT 7059': Ran squeeze tool on 5" drill pipe and set same at 6952'. Pumped 30 cu. ft. of fluid to obtain 2500# psig on holes. Held OK. Holes not taking fluid.

Drilled out cement 7111' to 7190'. Drilled out shoe and drilled 7-5/8" hole to 7623'.

8-31 Drilled 7-5/8" hole to 7331'. Left 3 bit cones in hole.
Ran Globe junk basket and recovered all cones.
Reamed 7-5/8" hole 7300' to 7331'.

9-1 Drilled 7-5/8" hole to 7390'.
Ran Dresser Atlas suite of logs.

9-2 TO CEMENT 6-5/8" BLANK LINER: Ran 301' of 6-5/8", 27.65#, K-55, R-3, Security flush joint, new seamless blank casing on 5" drill pipe and liner cementing tool and hung liner at 7072'. Cemented same at 7373' with 75 sacks of Class "G" cement, with .2 of 1% D13, mixed to 118#/cu. ft. slurry. Preceded cement with 30 cu. ft. of water and displaced with 722 cu. ft. of mud to bump plug under 3000# final pressure. Cement to place at 5:20 PM. Used Dowell cementing equipment and bulk cement.

9-3 Ran in to 7082' where bit stopped. Displaced mud in hole with salt water. Layed down drill pipe.

9-4 Finish laying down drill pipe, removed BOP and installed Christmas tree.

1972

9-5 Removed tree, reinstalled BOP and picked up drill pipe.

9-6 Ran spear on 3-1/2" and 5" drill pipe and attempted to stab into liner cementing tool. Lost spear in hole.
Ran socket and recovered spear.
Ran mill and milled up and pushed liner cementing tool with swab cups down hole to 7367'.

9-7 Ran Dresser Atlas cement Bond Log and Density Log.
Ran 5-5/8" bit with scraper above and cleaned out to 7367' EFFECTIVE DEPTH.

9-8 Lay down drill pipe and run Dresser Atlas Neutron Lifetime Log.
Removed BOP and installed Shaffer Tree.
RIG RELEASED 9:30 PM.

11-2 Moved in CPS and rigged up. Installed BOPE. Tested pipe rams with 3500 psi for 10 minutes, OK. Tested Hydril bag with 3400 psi for 10 minutes, OK.

11-3 Picked up 2-7/8" Seal-Lock tubing and ran 5-5/8" bit and 6-5/8" casing scrapper. Tagged bottom at 7368'. Ran 8-5/8" Baker fullbore packer to 4427'.

11-4 Set fullbore packer at 4427' and tested from surface to 4427' with 3700 psi. Pressure fell off at a rate of 150 psi/hr. Made nine additional pressure tests as follows:

Test Interval	Results
Surface to 4488'	No good
" " 1848'	Held 3700 psi for 20 minutes, OK
" " 1943'	Held 3700 psi for 20 minutes, OK
" " 3192'	No good
" " 2567'	No good
" " 2261'	Held 3700 psi for 20 minutes, OK
" " 2440'	No good
" " 2347	Held 3625 psi for 20 minutes, OK
Surface to 2409'	No good

Leak isolated between 2347' and 2409'.

11-5 Crew off

1972

11-6 Rigged up Welex. Ran Cement Bond and collar logs 1200-3000'. Ran 8-5/8" Baker Model "C" bridge plug on fullbore packer. Set bridge plug at 2460'. Set fullbore at 2440' and tested bridge plug with 3700 psi for 15 minutes, OK. Pulled up and set fullbore at 2410'. Tested 2410'-2460' with 3800 psi for 20 minutes, OK. Pulled up and set fullbore at 2378'. Tested 2378'- 2460' with 3800 psi for 20 minutes, OK. Pulled up and set packer at 2318'. Tested 2318' - 2460', no good. Leak in collar at 2344' (CBL/CCL measurement). Broke down at 3200 psi and took fluid at a rate of 10 ft^3/minute at 1750 psi. Ran in to 2440' and dumped five sacks sand. Pulled up and set fullbore packer at 2194'. With 50 ft^3 fresh water ahead mixed and pumped 100 sacks Class "G" cement with 2% calcium chloride and 0.5% CFR-2. Displaced with 115 ft^3 salt water. Final pressure 1350 psi. Cement in place at 10:00 pm. Used Halliburton equipment.

11-7 Ran 7-5/8" bit and 8-5/8" casing scraper. Tagged cement at 2250'. Drilled and cleaned out cement stringers 2250'-2285' and hard cement 2285'-2337'.

11-8 Tested from surface to 2460' with 2750 psi, no good. Measured in and set fullbore at 2360'. Tested 2360'-2460' with 2700 psi for 15 minutes, OK. Pulled up and set fullbore at 2320'. Tested from surface to 2320' with 2525 psi for 15 minutes, OK. Tested 2320'-2460', no good. Broke down at 4550 psi and took fluid at a rate of 12 cu ft per minute at 1800 psi. Pulled up and set fullbore at 2164'. With 50 ft^3 fresh water ahead mixed and pumped 100 sacks Class "G" cement with 2% calcium chloride and 0.5% CFR-2. Displaced with 107 ft^3 salt water. Final pressure 3250 psi. Cement in place 11:20 pm. Used Halliburton equipment.

11-9 Ran 7-5/8" bit and 8-5/8" casing scraper. Tagged cement at 2238'. Drilled and cleaned out hard cement 2238'-2344'.

11-10 Tested from surface to 2460' with 2600 psi for 20 minutes, OK. Ran in with bridge plug retrieving tool. Backscuttled cement and sand, and pulled bridge plug. Rigged up Dresser Atlas. Jet perforated four 1/2" holes per foot 7198'-7210' (NLL/CCL measurement). Used 4" carrier and 17 gram charges. During perforating operations discovered junk in hole. Ran 7-5/8" bit and 8-5/8" casing scraper. Tagged top of liner at 7072'.

11-11 Ran 5-1/2" junk basket on Dresser Atlas Electric line. Could not work basket into liner. As basket was being pulled through BOPE rope socket parted. Made feeler run with electric line and tagged junk basket fish at 7056'. Ran overshot and guide shoe on tubing and recovered fish. No significant recovery in junk basket.

11-12 Crew off

1972

11-13 Ran 6-5/8" casing scraper to 7355'. Backscuttled 2-1/2 hours. Recovered 100-150 bbls drilling mud. Pulled up to 7045' and backscuttled 30 minutes. Ran Baker Model "D" production packer on Dresser Atlas Electric line and set same at 7044' (NLL/CCL measurement).

11-14 Rigged up to run safety valve and control line. Tested safety valve and 6800' of 1/4" control line with 5000 psi for 30 minutes, OK.

11-15 Ran safety valve and control line on tubing to 6750'. Tested safety valve and control line with 5000 psi for 15 minutes, OK. Made control line splice and continued in hole. Tested safety valve and control line through donut with 5000 psi for 15 minutes, OK. Landed tubing with 13000# on Model "D" packer. Tore out BOPE and installed production head. Tested safety valve and control line through head with 5000 psi for 30 minutes, OK. Tested donut seals through test port with 4500 psi for 10 minutes, OK. Set Shaffer back pressure valve in donut and tested through unibolt cap with 4500 psi for 10 minutes, OK.

TUBING DETAIL

2-7/8"N-80 Seal-Lock fatigue nipple	.60'
2-7/8" N-80 Seal-Lock pup joint	8.00'
2-7/8" N-80 Seal-Lock pup joint	12.00'
225 joints 2-7/8" J-55 Seal-lock tubing	7025.37'
2-7/8" Seal-Lock x 2-7/8" 8 rd N-80 X-over	1.20'
Page 3-1/2" type RTL safety valve with ported nipple	5.62'
3-1/2" 8 rd x 2-7/8" 8 rd J-55 X-over	1.20'
Baker Seal Assembly	7.70'
	7061.69'

Ex. I - 22

Due to the large file size, this exhibit is an excerpt. The native file of this document is available upon request.

California
Department of Conservation
Division of Oil, Gas, and Geothermal Resources

Gavin Newsom, Governor
David Bunn, Director

September 19, 2019

Mr. Robert Dentici
Southern California Gas company
555 West 5th St. ML 17G4
Los Angeles, CA 90013

Dear Mr. Dentici:

REPORT OF ABANDONMENTS

On August 5, 2019, this office received well summaries for the plugging and abandonment of the following wells located in the Aliso Canyon field:

Fernando Fee 32E (037-21321)
Porter 30 (037-00717)
Porter 32A (037-21277)
Porter 32E (037-21363)
Porter 35 (037-00722)
Porter 40 (037-00727)
Porter 42C (037-21878)
Porter 45 (037-00732)
Sesnon Fee 2 (037-00648)
Sesnon Fee 4 (037-00650)
Sesnon Fee 5 (037-00651)
Sesnon Fee 6 (037-00652)
Sesnon Fee 7 (037-00653)
Sesnon Fee 8 (037-00654)
Standard Sesnon 11 (037-00763)
Standard Sesnon 12 (037-00764)
Standard Sesnon 14 (037-00766)
Standard Sesnon 16 (037-00768)
Standard Sesnon 25B (037-21323)
Standard Sesnon 3H (037-00756)
Standard Sesnon 44A (037-21455)

In accordance with California Code of Regulations (CCR) §3232 "The supervisor or the district deputy shall, within 10 days after the receipt of a written report of abandonment, furnish the owner or operator with a written final approval of abandonment, or a written disapproval of abandonment, setting forth the conditions upon which the disapproval is based." Due to the number of submissions and extensive operations detailed in these summaries, a determination cannot be made within the time prescribed by law.

If you have any questions or need additional information, please contact Mr. Eric Heaton, Engineering Geologist at (805) 937-7246.

Sincerely,

Patricia A. Abel
Coastal District Deputy

cc: Chrono/Well files/ Follow up

I RAL RESOURCES AGENCY OF CALIFORN
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS & GEOTHERMAL RESOURCES
1000 S. Hill Rd, Suite 116 Ventura, CA 93003-4458
Phone:(805) 654-4761 Fax:(805) 654-4765

No. T **217-0614**

REPORT ON OPERATIONS

GAS STORAGE PROJECT
"Sesnon-Frew" - Modelo (Miocene-Eocene) Formation

Roberto (Bob) Dentici
Southern California Gas Company (S4700)
555 West 5th Street, ML 17G4
Los Angeles, CA 90013

Ventura, California
October 26, 2017

Your operations at well **"Sesnon Fee" 2**, A.P.I. No. **037-00648**, Sec. **33**, T. **03N**, R. **16W**, **SB** B.&M., **Aliso Canyon** field, in **Los Angeles** County, were witnessed on **10/24/2017**, by **Blake Foreshee**, a representative of the supervisor.

The operations were performed for the purpose of **inspecting the blowout prevention equipment and installation**.

DECISION: **APPROVED**

BF2/ap

Kenneth A. Harris Jr.
State Oil and Gas Supervisor

By _____
Patricia A. Abel, *District Deputy*

OG109 (Rev. 10/2011)

7-20-76 Ran 6.15" O.D. Servco mill to 3031' and milled to 3301'. Stopped rotation and ran to 3406' and hit Baker rubber packing element lost in hole from Retrieva-"D" packer. Pushed rubber to 8380' when tools stopped. (Took 50,000# over tubing weight with hydraulic jars barely working.) Circulated hole and started out.

7-21-76 Pulled out of hole. Ran 6" O.D. wireline junk basket while waiting on new mill. (Stopped at 8366'.) Made up Servco 6" O.D. flat-bottomed junk mill. Ran to 9237' and milled up rubber to 9237'. Circulated hole and started out.

7-22-76 Ran Baker 7" Retrieva-"D" packer on "GO" electric line to 9140' and set it. Ran "GO" casing patch on tubing and set across interval from 3226' to 3258'. Pulled 30 stands of tubing and shut down.

7-23-76 Finished pulling tubing and "GO" tools out of hole. Started in hole with Baker 80-32 anchor seal assembly; 10' blast joint; 2 7/8" O.D. x 1.81 "No-Go" nipple; 20' blast joint, Camco 2 7/8" KP.5 safety valve housing with "EH" valve closed, and 8 Camco 2 7/8" KBM mandrels; breaking off 2 7/8" tubing collars and replacing them with inspected ones, and testing the tubing string to 5000 psi for one minute.

7-24-76 Continued running tubing, changing collars and hydrotesting tubing. Landed Baker Seal Assembly in packer. Pulled 20,000# over tubing weight on seal assembly latch. Landed tubing with 5000# on packer. Shut well down.

7-25-76 Idle.

7-26-76 Removed B.O.P.E. Installed Christmas tree and tested to 5000 psi. Displaced polymer mud with waste lease salt water. Installed blanking plug in "No-Go" nipple and tested packer and seals to 2000 psi. Retrieved blanking plug. Rigged down and released rig.

SoCalGas-5.0773

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS

REPORT ON PROPOSED OPERATIONS No. P 276-154

Mr. P. S. Magruder, Jr., Agent
Southern California Gas Co.
P.O. Box 54790 Terminal Annex
Los Angeles, California 90054

Santa Paula, Calif.
May 20, 1976

DEAR SIR:

Your proposal to alter casing Well No. "SFZU" SF-2 (037-00648),
Section 33, T. 3N, R. 16W, S.B.B. & M., Aliso Canyon Field, Los Angeles County,
dated 5/13/76, received 5/17/76, has been examined in conjunction with records filed in this office.

THE PROPOSAL IS APPROVED PROVIDED THAT:

1. The drilling fluid used shall be of a quality and in sufficient quantity to control all subsurface conditions in order to prevent blowouts; and a reserve supply of this material shall be kept on hand to meet any emergency.
2. Blowout prevention equipment, at least of the Division of Oil and Gas Class III rating, shall be installed and maintained in operating condition at all times.
3. THIS DIVISION SHALL BE NOTIFIED TO WITNESS A PRESSURE TEST OF THE BLOWOUT PREVENTION EQUIPMENT BEFORE COMMENCING DOWNHOLE OPERATIONS.

NOTE: A COPY OF THIS APPROVAL SHALL BE POSTED AT THE WELL SITE PRIOR TO COMMENCING OPERATIONS.

Blanket Bond
MD:b

HAROLD W. BERTHOLF
~~JOHN F. MATTHEWS, JR.~~, State Oil and Gas Supervisor

By _____, Deputy

25476-705 7-74 50M ⓘD OSP
OG 111

SoCalGas-5.0774

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS
RECEIVED
MAY 17 1976
SANTA PAULA, CALIFORNIA

DIVISION OF OIL AND GAS

Notice of Intention to Rework Well

This notice and indemnity or cash bond shall be filed, and approval given, before rework begins. If operations have not commenced within one year of receipt of the notice, this notice will be considered cancelled.

FOR DIVISION USE ONLY		
BOND	FORMS	
	114	121
BB	✓	✓

DIVISION OF OIL AND GAS

In compliance with Section 3203, Division 3. Public Resources Code, notice is hereby given that it is our intention to rework well No. SESNON FEE #2, API No. _____,

Sec. 33, T. 3N, R. 16W, S.B. B. & M., Aliso Canyon Field, Los Angeles County.

The present condition of the well is as follows:

1. Total depth. 9471'

2. Complete casing record, including plugs and perforations:

13 3/8" cemented 1594'
7" cemented 9245', WNSO 9153', squeezed and pressure tested to 1000 psi. Perforated 9208'-9190', 9180'-9172'
5" cemented 9467', cement plug 9429', top of liner 9237' squeezed lap at 9237' - pressure tested O.K. Perforated 9330'-9322', 9316'-9308'.

3. Present producing zone name SESNON Zone in which well is to be recompleted -

4. Present zone pressure 2600 psi New zone pressure -

5. Last produced S.I. Gas Storage Well _____ _____ _____
(Date) (Oil, B/D) (Water, B/D) (Gas, Mcf/D)

or

6. Last injected _____ _____ _____ _____
(Date) (Water, B/D) (Gas, Mcf) (Surface pressure, psig.)

The proposed work is as follows:

1. Move in rig, kill well, install B.O.P.E. and pressure test.
2. Pull tubing. Clean out to 9429'. Run Neutron lifetime and cement bond logs.
3. Perform any indicated remedial work. Install new wellheads.
4. Pressure test 7" casing. Perform any indicated remedial work.
5. Perforate Sesnon Zone sands as indicated by logs.
6. Run packer, tubing, safety valve and gas lift valves.

It is understood that if changes in this plan become necessary we are to notify you immediately.

Address P. O. Box 3249, Terminal Annex
(Street)
Los Angeles California 90051
(City) (State) (Zip)
Telephone Number (213) 689-3561

SOUTHERN CALIFORNIA GAS COMPANY
(Name of Operator)
By P. S. Magruder, Jr. 5/13/76
(Name) P. S. Magruder, Jr. (Date)
Type of Organization Corporation
(Corporation, Partnership, Individual, etc.)

OG107 (12-73-GSR1-15M)

SoCalGas-5.0775

FORM 157

NI/

STATE OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL AND GAS

REPORT ON PROPOSED CHANGE OF WELL DESIGNATION

830 North La Brea Avenue
Inglewood, California

September 25, 1968

Mr. Mr. C. G. Nelson, Agent
Getty Oil Co., Operator
P. O. Box 811
~~Agent for~~ Ventura, California 93001

DEAR SIR:

Your ~~request dated~~ letter dated August 26, 1968, relative to change in designation of 32,33,34 well(s) in Sec. ____, T. 3 N., R. 16 W., S.B. B. & M., Aliso Canyon field, Los Angeles County, District No. 1, has been received;

and in accordance with Section 3203, Public Resources Code, reading in part as follows:

> "* * * The number or designation by which any well heretofore drilled has been known, and the number or designation specified for any well in a notice filed as required by Section 3203, shall not be changed without first obtaining a written consent of the Supervisor."

the proposed change in designation is hereby authorized as follows: (Formerly owned by Porter Sesnon, Et Al)

Old Designation		New Designation	
Sec. 32: "Sesnon Fee" 4		Sec. 32: "SFZU" SF-4	(037-00650)
" 6		" SF-6	(037-00652)
Sec. 33: " 1		Sec. 33: " SF-1	(037-00647)
" 2		" SF-2	(037-00648)
" 3		" SF-3	(037-00649)
" 5		" SF-5	(037-00651)
" 7		" SF-7	(037-00653)
" 8		" SF-8	(037-00654)
Sec. 34: "Porter Fee" 1		Sec. 34: " PF-1	(037-00644)
" 2		" PF-2	(037-00645)
" 3		" PF-3	(037-00646)

ag
cc: F. E. Kasline
Production Dept.
Conservation Committee

F. E. KASLINE
~~E. R. MURRAY-AARON~~
State Oil and Gas Supervisor

By Wm. C. Bailey
Deputy Supervisor

△ SPO

SoCalGas-5.0776

Ex. I - 23

FORM 103
CALIFORNIA STATE PRINTING OFFICE

SUBMIT IN DUPLICATE

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCES

DIVISION OF OIL AND GAS

History of Oil or Gas Well

OPERATOR TIDE WATER ASSOCIATED OIL COMPANY FIELD ALISO CANYON

Well No. Standard-Seamon 2-17, Sec. 26, T. 3 N, R. 16 W, S.B. B. & M.

Signed F. C. Foster

Date October 13, 1952 Title Agent

(President, Secretary or Agent)

It is of the greatest importance to have a complete history of the well. Use this form in reporting the history of all important operations at the well, together with the dates thereof, prior to the first production. Include in your report such information as size of hole drilled to cementing or landing depth of casings, number of sacks of cement used in the plugging, number of sacks or number of feet of cement drilled out of casing, depth at which cement plugs started, and depth at which hard cement encountered. If the well was dynamited, give date, size, position and number of shots. If plugs or bridges were put in to test for water, state kind of material used, position and results of pumping or bailing.

Date 1952

7/20 Swabbed 175 barrels of muddy water. Salinity at 4:00 PM, 492 grains per gallon. Fluid level 2000'. Pulled tester loose at 11:00 PM and found fluid level at 1500'. Water sample above tester, 554 grains per gallon.

7/21 Ran bit and cleaned out to 11,000'. Found sand bridge from 10,430' to 10,435'. Had good gas showing on ditch while circulating returns from 10,430'. Ran McCullough Neutron Log.

7/22 Hung 3-1/2" drill pipe at 9548' and plugged with 100 sacks Colton Hi-Temperature Cement. Final pressure 800#. Time 11:30 AM. B.J. Service. Located top of plug at 9234' after standing 6 hours. Ran McCullough magnatector and checked aluminum section at 8433' to 8523'. Started milling aluminum section at 8490'.

7/23 Milled aluminum section from 8490' to 8516'.

7/24 Found bottom of aluminum section at 8516'. Pulled up and started milling aluminum section at 8476' and milled to 8490'.

7/25 Ran 10-5/8" Baker scraper and scraped from 8475' to 8516'.

7/26 Ran Booth Ross whipstock on 3-1/2" drill pipe and set on stub of 7" casing at 8516' with tailpipe to 8531'. Cemented in place with 50 sacks of Colton Hi-Temperature Cement. Time 5:45 AM. B.J. Service.

7/27 Standing cemented. Located top of cement at 8458'.

7/28 Cleaned out cement from 8433' to 8507' and redrilled to 8535' with 6" bit.

7/29 Redrilled 6" hole from 8535' to 8669'. Ran Schlumberger electric log at 8669'. Hole following alongside 7" casing.

7/30 Hung 2-1/2" tubing at 8656' and plugged well with 100 sacks Colton Hi-Temperature cement. Final pressure 700#. Time 6:00 AM. B.J. Service. At 4:00 PM located top of cement at 8250'. Cleaned out to 8273' and lost circulation. Ran Halliburton squeeze tool and located hole in 7" casing at 5238'.

7/31 Set Halliburton squeeze tool at 4985' and pumped in 100 sacks Victor Hi-Temperature cement through hole at 5238'. Final pressure 400#. Time 8:30 AM. Halliburton Bulk Method. At 1:30 PM applied 1100# pressure without loss. Located top of cement at 4996' and cleaned out hard cement to 5286', then found stringers of cement to 5286'.

8/1 Cleaned out cement from 8278' to 8359'. Closed rams and applied 1250# pressure for 15 minutes without loss. Cleaned out cement from 8359' to 8330' and lost circulation. Ran Halliburton shoe squeeze tool on 3-1/2" drill pipe and set at 4955'. Displaced fluid easily with 800# pressure. Mixed 150 sacks of Colton Slow Cement and displaced with 227 cu. ft. mud. Final pressure 500# which bled to 0#. Time 6:00 PM. Halliburton Bulk Method.

8/2 Standing cemented. Located top of cement at 4355'.

AC_CPUC_0116440

SoCalGas-5.0778

Ex. I - 24

History - Mission Adrian #1-B, Aliso Canyon

19

10-08 Set Baker retrieva-D packer at 7190'. Attempted to pressure test seals and packer - leak -

10-10 Set Baker "C" bridge plug at 7150' and capped with sand 7132'.

10-11 Baker fullbore - found leak 1594'-1596'. Ran casing inspection log 7100' - surface, leak showed 1594'-1596'.

10-12 Set Model "C" B. plug 1721' - sand to 1709'. Equalized 67 cu. ft. "G" Neat - B. Head squeezed 62 cu. ft. - F.P. 800 psi

10-13 DOC 1585'-1600' - Leaked 400 psi - Equalized 100 cu. ft. "G" Neat - 92 cu. ft. away DOC 1580'-1601' - 1000 psi B. down

10-14 Equalized 100 cu. ft. "G" + 3% Cacl2 Squeeze away 80 cu. ft. DOC 1500'-1608' Broke at 1200 psi - Equalized 100 cu. ft. "G" + 3% Cacl2 - squeezed away 85 cu. ft.

10-15 DOC 1604'-1608' - Leaked 1250 psi. Equalized 108 cu. ft. "G" + 3% Cacl2 F.P. 2600 psi - DOC 1296'-1620' B. down 1150 psi - Equalized 58 cu. ft. "G" Neat - squeezed 47 cu. ft. F.P. 1200 psi

10-16 DOC 1578'-1630' - leaked 1250 psi. Set drillable retainer 1546' - squeezed away 38 cu. ft. Cal seal F.P. 2600 psi

10-17 Drilled out cement and retainer.

10-18 Leaked 1250 psi - set drillable retainer 1548' - squeezed 53 cu. ft. "G" + 10% Cal seal F.P. 2600 psi, Rig released.

1980

6-18 Unlanded 8-5/8" casing

6-21 Backed off 8-5/8" at 180' (138' casing) Ran 4 new joints 8-5/8" casing, Top 40# N-80, 3 - 36# N-80 screwed in - P. tested 4000 psi - cut off casing

6-24 Drilled out cement and continued.

6-27 Ran full bore set 1486' - B. down 16 cu. ft. at 1800 psi - 100 sacks "G" + 10% Cal seal - circulation 8-5/8" x 13-3/8" annulus stopped pumping

6-28 DOC 1547'-1599' - 1300 psi bled off to 1100 psi in 10 minutes - set full bore 1486' - B. down 2000 psi - 20 cu. ft./minute 100 sacks "G" + 10% Cal seal - Displaced 2000 psi dropped to 1200 psi in 1 minute.

6-0 DOC 1549'-1620' - 1300 psi lost 200 psi in 20 minutes - Ran full bore set 1486' - 12 cu. ft./minute at 1900 psi 100 sacks "G" + Cal seal - left 10 cu. ft. inside casing 2000 psi dropped to 1200 psi when stopped pumping

7-01 DOC 1466'-1576' tested - no entry

7-09 Ran 42' Pengo casing patch - set while running in well - left lower pack-off in well - pushed to 7180'

7-10 Set casing patch 1578'-1620'

8-17 Recovered top seal from casing patch - recovered balance of casing patch

8-18 Left bottom seal in well

8-19 Pushed bottom seal to 7190'

8-20 Ran casing patch which stopped at 30'

8-21 Ran 7.7" tapered mill - 24' - 205' and 1513'-1669'

8-22 Set casing patch 1540'-1622'

Well again leaking at 1596' 500 Mcf/Day
Likely both seals are leaking

7347'-5323'	40#	N-80	D.D. 7.6"
5323'-Surface	36#	N-80	D.D. 7.7"
Top joint	40#		D.D. 7.6"

6-5/8" 24# K-55 LT&C O.D. collars 7.39"

Major Costs

Rig	$ 80,000	
Wellheads	10,000	
Inner string	180,000	
Tubing	35,000	
Fittings for tubing	5,000	
BOPE	25,000	
Cementing	10,000	
Fishing	5,000	
V. Trucks	5,000	
Trucking	10,000	
Wellhead	2,500	
Supervision & Ad	15,000	
Contingency & Miscellaneous	32,500	
Total	$ 420,000	For cementing leak and running inner string
Completion fluid	20,000	
Grand Total	$ 440,000	

Set 3rd casing patch

Rig	$ 60,000	
BOPE	15,000	
Completion fluid	20,000	
Cementing	10,000	
Fishing	5,000	
V. Trucks	5,000	
Wellhead	500	
Supervision & Ad	9,000	
Casing patch	20,000	Set same 1606'-1554'
Contingency & Miscellaneous	15,500	
	$ 160,000	

Ex. I - 25

SOUTHERN CALIFORNIA gas COMPANY

INTEROFFICE CORRESPONDENCE

B. F. Jones
P. S. Magruder Jr.
TO D. S. Smiley FROM A. L. Colbert DATE June 26, 1979

SUBJECT Daily Well Report for Mission Adrian #1-B, Aliso Canyon

6-25-79

-0- Day. Moving Camrich rig from Porter #42-C to Mission Adrian #1-B.

6-26-79

-0- Day. Continued moving Kenai-Camrich rig to Mission Adrian #1-B wellsite and rigging up.

6-27-79

-0- Day. Rigging up.

6-28-79

-0- Day. Rigging up.

6-29-79

-0- Day. Rigging up.

6-30-79

-0- Day. Rigged up. Spudded in at 1:00 p.m., June 30, 1979. Drilled 17 1/2" hole from 57' to 210' with bit #1. Pulled out and picked up shock sub. Drilled 17 1/2" hole to 238' with bit #1.

Survey at 175' 1° N 89 W

Mud wt. 66#, Vis 38 sec., W.L. 11.4cc., sand 1/2%, solids 5%

6:00 a.m. Drilling ahead at 342'.

7-1-79

1st Day. Drilled 17 1/2" hole from 238' to 591' with bit #1.

Survey at 536' 1° S 89 W, V.D. 596.80', S 2.71, W 11.99

Mud wt. 68#, Vis 60 sec., W.L. 11.2cc., sand 1%, solids 6%

6:00 a.m. 645'. Drilling ahead with bit #2

Daily Well Report for Mission Adrian #1-B, Aliso Canyon

7-2-79

2nd Day. Drilled 17 1/2" hole from 591' to 859' with bit #2

Survey at 779' 1° 15' S 72 W, V.D. 778.75, S 6.16, W 18.88

Mud wt. 71#, Vis 50 sec., W.L. 11.4cc., sand 1%, solids 8%

6:00 a.m. Drilling ahead at 931' with bit #2.

7-3-79

3rd Day. Drilled 17 1/2" hole from 859' to 1,014' with bit #2. Ran 26 joints of K-55, 54.5# Buttress casing with Baker shoe at 1,014' stop ring at 972' and cemented with 800 cu.ft. of class "G" cement mixed with 8% gel and 3% calcium chloride , followed by 200 sacks of class "G" cement mixed with 3% calcium chloride. Cement in place at 11:45 p.m., 7-3-79. Bumped plug with 400 psi.

Survey 967' 3° 30' S 71 W, V.D. 966.59, S 8.82, W 22.90

Mud wt. 70#, Vis. 60 sec.

6:00 a.m. Welding on 13 5/8", 5,000 psi well head

7-4-79

4th Day. Cut off conductor and 13 3/8" casing. Welded on 13 5/8", 5,000 psi casing head. Pressure tested to 1,500 psi. Inspected with gamma ray device (O.K.). Installed class III 12", 5,000 psi BOPE. Set Johnston bridge plug at 60'. Tested 4 1/2" pipe rams.

6:00 a.m. Testing BOPE

7-5-79

5th Day. Tested complete shut off rams, 4 1/2" pipe rams, choke and kill manifold to 2,700 psi with water for 20 minute test. Tested Hydril to 2,000 psi with water, witnessed by D.O.G. Attempted to test complete shut off rams with nitrogen. Found leak in 13 3/8" casing. Removed BOPE and tightened 13 3/8" 2 turns at 10,000 ft. lbs. torque. Reinstalled BOPE and retested with nitrogen and casing leaked at 1,400 psi.

6:00 a.m. Removing BOPE

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SoCalGas-5.0785

7-6-79

6th Day. Pressure tested blind rams and choke manifold with 2000 psi for 20 minutes with water.
Tested with nitrogen and found leak in 13 3/8" casing. Removed Bridge Plug and cut off 13 5/8" casing head. Backed off and recovered casing at first collar and found bad pin casing. Installed new 13 3/8" joint and torqued to 6000 Ft. lbs. Butt welded 13 5/8" well head and x-rayed weld.

6:00 a.m. Pressure testing with nitrogen.

7-7-79

7th Day. X-rayed well head. Nippled up B.O.P.E. and tested blank rams 4 1/2" pipe rams and Hydril to 2000 psi. Made up drilling assembly. Ran in and drilled out cement to 1,012'.

7-8-79

8th Day. Rig down for repairs.

7-9-79

9th Day. Finished Master Clutch Repair. Changed Hydril rubber. Drilled out shoe at 1,014' and drilled 12 1/4" hole to 1,173' with Bit #3.

Surveys: 1,082', 4°, S83W
1,210', 5°45, S74W, T.V.D. 1208.88 S-12.69',W-40.90

Mud: 66#, 45 sec., 10.2cc.,sand 1/4%, solids 5%

6:00 a.m. 7-10-79 Drilling ahead at 1,256' with Bit #3.

7-10-79

10th Day. Drilled 12 1/4" hole 1,173' to 1,296' with Bit #3. Made up and ran Dyna-Drill on 2 1/2° kick sub. Run #1 Dyna-Drilled 1,296' to 1,401' with Bit # Bit #4. Dyna-Drill stopped working after 3 1/2 hours of operation.

Surveys: 1,272', 6°15', S80W
1,316', 5°30', S71W
1,347', 4°30, S58W
1,377, 3°15, S56W, T.V.D. 1375.12, S-17.55,W-55.71

Mud: 68#, 48sec., 8.2cc., sand 1/4%, solids 6%

6:00 a.m. 7-11-79 Dyna-Drilling (Run #2) at 1,447' with Bit #5.

Daily Well Report for Mission Adrian #[illegible], Aliso Canyon

7-11-79

11thDay. Made up and ran Dyna-drill #2 and Bit #5. Dyna-Drilled 12 1/4" hole 1,401' to 1,667'. Running in hole with Bit #6 on drilling assembly.

Surveys: 1,407' 3°, S31W
1,439' 3°, So4E
1,470' 4°, S12E
1,502' 2°45',S18E
1,534' 1°45',S03W
1,564' 1°30',S41E
1,596' 2°15',S64E
1,627' 3°45',S65E, T.V.D. 1624.83, S-27.44, W-53.71

Mud: 68#, 43sec., 7.4cc., sand 1/4%, solids 6%.

6:00 a.m. 7-12-79. Drilling ahead at 1,747' with Bit #6.

7-12-79

12th Day. Directionally drilled 12 1/4" hole 1,667' to 2,118' with Bit #6. Running in with Bit #7.

Surveys: 1,723' 6° ,S59E
1,816' 6°15,S56E
1,909' 6°15,S54E
1,999' 6°30,S54E
2,093' 6°30,S55E
2,183' 6°15,S55E, T.V.D. 2177.88, S-60.37, W-5.01

Mud: 71#, 50sec, 6.4cc., sand 1%, solids 9%

6:00 a.m. 7-13-79. Drilling ahead at 2,300' with Bit #7.

7-13-79

13th Day. Directionally drilled 12 1/4" hole from 2,118' to 2,391' with bit #7. Dyna-drilled 12 1/4" hole from 2,391' to 2,456' with dyna-drill #3 and bit #8. Pulling out to change kick sub from 2 1/2° to 1 1/2°.

Surveys: 2,275' 6° 30', S 55 E
2,366' 5° , S 53 E
2,416' 4° 45', S 81 E
2,447' 6° , N 88 E, TVD 2,440.57', S-73.32', W- 17.14'

Mud wt. 72#, Vis. 48 sec., W.L. 6cc., sand 1%, solids 9%

6:00 a.m. Dyna- drilling 12 1/4" hole at 2,518'.

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SoCalGas-5.0787

7-14-79

14th Day. Dyna-drilled 12 1/4" hole from 2,456' to 2,610' with bit #8 RR, Run #4, Dyna-drill #2. Pulled out, changed bits and kick sub from 1 1/2° to 2°. Dyna-drilled 12 1/4" hole from 2,610' to 2,733' with bit #9, run 5, Dyna-drill #2.

Surveys:				
	2,447'	6° ,	N 88 E	
	2,478'	6° 30',	N 77 E	
	2,510'	6° 15',	N 69 E	
	2,538'	6° 15',	N 61 E	
	2,570'	6° ,	N 53 E	
	2,601'	6° 15',	N 44 E	
	2,631'	7° 30',	N 34 E	
	2,662'	7° 45',	N 26 E	
	2,693'	7° 45',	N 14 E	
	2,726'	9° ,	N 04 E	TVD 2717.54, S-51.17, E- 38.50

Mud wt. 71#, Vis 44 sec., W.L. 6.2cc., sand 1/2%, solids 9%

6:00 a.m. T. D. 2,766' Pulling dyna-drill.

7-15-79

15th Day. Dyna-drilled 12 1/4" hole from 2,733' to 2,766' with bit #9 run #5, Dyna-drill #2. Ran drilling assembly, reamed from 2,394' to 2,766', directionally drilled 12 1/4" hole from 2,766' to 2,868' with bit #10. Pulling out for Dyna-drill.

Surveys:				
	2,813'	9° 45',	N 20 E	
	2,843'	9° 15'	N 21 E	TVD 2,832.97, sec. 32' S- 32.66, E- 43.18

Mud wt. 71#, Vis 42 sec., W.L. 7.2cc., sand 1/4%, solids 8%

6:00 a.m. Dyna-drilling 12 1/4" hole at 2,868' with bit #11, run #6, Dyna-drill #2.

7-16-79

16th Day. Dyna-drilled 12 1/4" hole from 2,868' to 2,998' with bit #11.

Surveys:				
	2,896'	9°	N 11 E	
	2,926'	8° 45'	N	
	2,958'	10°	N	
	2,978'	11°	N 11 W	TVD 2,966.18, Sec. 11, E 46.26, S 11.12

Mud wt. 70#, Vis. 40 sec., W.L. 7 cc., Sand nil, solids 6%

6:00 a.m. Running in hole with Eastman D.O.T. guide tool.

7-17-79

17th Day. Dyna-drilled 12 1/4" hole using Eastman "D.O.T." guidance tool from 2,998' to 3,126' with bit #12.

Survey: 3,182' 13° 25' N 4 E, Vert. 3,165.63', N 31.74' E 45.51', Sec 31

Mud wt. 70.5#, Vis. 44 sec., W.L. 6.8cc., solids 6 1/4%, sand trace

6:00 a.m. Drilling at 3,230'.

7-18-79

18th Day. Directionally drilled 12 1/4" hole from 3,126' to 3,549' with bit #13.

Surveys:	3,182'	13° 15'	N 4 E	
	3,272'	14° 45'	N 5 E	
	3,396'	16° 45'	N 4 E	
	3,524'	18° 45'	N 2 E	TVD 3,494.28, N 126.07, E 53.40, Sec 126

Mud wt. 71#, Vis 48 sec., W.L. 7.0cc., sand 1/4%, solids 7%

6:00 a.m. Surveying at 3,674'.

7-19-79

19th Day. Directionally drilled 12 1/4" hole from 3,549' to 3,797' with bit #14, and to 3,987' with bit #15.

Surveys:	3,649'	20° 45'	N 01 E	
	3,772'	23°	N 01 E	
	3,871	22° 15'	N 02 E	
	3,962'	21° 30'	N 04 E	TVD 3,901.48, N 287.79', E 52.39' Sec 288.38

Mud wt 70#, Vis 42 sec., W.L. 7.0cc., solids 7%, sand trace

6:00 a.m. Surveying at 4,112'

Daily Well Report for Mission Adrian #1-B, Aliso Canyon

7-20-79

20th Day. Directionally Drilled 12 1/4" hole from 3,797' to 4,237' with bit #15 and to 4,415' with bit #16.

Surveys: 4,087' 21° 15' N 4 E
4,212' 20° 45' N 6 E
4,303' 22° N 8 E
4,395' 24° 30' N 8 E TVD 4,303.75', N 447.01, E 68.52, sec. 447.19

Mud wt. 70#, Vis 42 sec., W.L. 6.8cc., solids 7%, sand 1/4%

6:00 a.m. Tripping at 4,423'.

7-21-79

21st Day. Directionally drilled 12 1/4" hole from 4,415' to 4,423' with bit # 16 and to 4,575' with bit #17.

Surveys: 4,520' 25° 30' N 8 E
4,549' 26° N 7 E TVD 4,443.16', N 511.81, E 77.51, Sec 512.11

Mud wt. 70#, Vis 40 sec., W.L. 6.8cc., sand trace, solids 8%, oil 7%

6:00 a.m. Running in hole with Dyna-drill.

7-22-79

22nd Day. Dyna-drilled 12 1/4" hole using Eastman "D.O.T." guidance tool from 4,574' to 4,604' with bit #18. Stuck pipe at 4,604' at 8:00 a.m.. Pipe free at 10:00 a.m. Pulled out of hole. Rig had 2 hours down time changing out Rotary table. Ran drilling set up.

Mud wt. 70#, Vis. 43 sec., W.L. 6.4cc., sand trace, solids 8%, oil 7%.

6:00 a.m. Drilling at 4,640'.

7-23-79

23rd Day. Directionally drilled 12 1/4" hole from 4,604' to 4,668' with bit #18. Pulled out and repaired rig 8 hours (installed #3 engine and changed rotary table). Ran in with bit #19.

Mud wt. 70#, Vis. 45 sec., W.L. 6.1cc., Sand trace, solids 8%, Oil 6%

Survey at 4,643' 25° 45' N 4 E, TVD 4,612.40', N 593.36, E 84.64, Sec. 593.75

6:00 a.m. Circulating for survey at 4,840', bit #19.

Daily Well Report for Mission Adrian #1-B, Aliso Canyon

7-24-79

24th Day. Directionally drilled 12 1/4" hole from 4,663' to 4,949' with Bit #19. Ran in with Dyna Drill and Bit #19 to 1,000' repairing engine. (3 hours lost time.)

Mud weight: 70#, vis. 45 sec., W.L. 6.4, sand trace, solids 8%, oil 5 %.

Survey: 4,924' 25 3/4° N 6°E, VD 4,780.64 , Section 675.40 , N 674.64 , E 92.11

6:00 a.m. Dyna Drilling at 4,972'with Bit #19.

7-25-79

25th Day. Dyna-drilled 12 1/4" hole with guidance tool from 4,949' to 5,006' with bit #20 and to 5,082' with bit #21.

Mud wt. 70#, Vis. 43 sec., W.L. 5.0cc., Sand trace, Solids 6%, Oil 5%

Survey 5,039' 23° 30', N 1 3/4 W, VD 4,885.24', Sec 722.79, N 722.31, E 94.03

6:00 a.m. 5,082' Running in with bit #22.

7-26-79

26th Day. Directionally drilled 12 1/4" hole from 5,082' to 5,573' with bit #22.

Mud wt. 70#, Vis. 45 sec., W.L. 5.5cc., Sand trace, Solids 7%, Oil 5%

Survey 5,644' 22° 45', N 5 1/2 W, VD 5,441.99', Sec 958.12, N 958.08, E 71.10

6:00 a.m. Surveying at 5,730'.

7-27-79

27th Day. Directionally drilled 12 1/4" hole from 5,573' to 5,699' with bit #22 and to 5,880' with bit #23.

Mud wt. 70#, Vis. 46 sec., W.L. 5.6cc., Sand 1%, Solids 7%, Oil 5%

Survey: 5,953' 23° N 5 W, VD 5,726.31, Sec. 1078.47, N 1078.47, E 60.87

6:00 a.m. Depth 6,000', drilling ahead

7-28-79

28th Day. Directionally drilled 12 1/4" hole from 5,880' to 6,109' with bit #23, and to 6,240' with bit #24

Mud wt. 73#, Vis 43 sec., W.L. 5.8cc., Sand 1%, Solids 8%, Oil 4%

Survey: 6,205' 23° 15' N 5 1/2 W VD 5,957.95, Sec. 1,177.30, N 1177.34, E 52.44

6:00 a.m. 6.260', tripping for bit #25

Daily Well Report for Mission Adrian #1-B, Aliso Canyon

7-29-79

29th Day. Directionally drilled 12 1/4" hole from 6,240' to 6,260' with bit #24 and to 6,477' with bit #25.

Mud wt. 71#, Vis 42 sec., W.L. 5.6cc., Sand 1%, Solids 7%, Oil 4%

Survey: 6,452' 24° N 4 1/2 W, VD 6,184.35, Sec. 1,175.63, N 1,275.38, E 44.70

6:00 a.m. 6,477', reaming to bottom with bit #26.

7-30-79

30th Day. Directionally drilled 12 1/4" hole from 6,477' to 6,575' with bit #26. Reamed from 5,257' to 6,477'.

Surveys: 6,515' 24° 15' N 4 W
6,550' 24° 15' N 4 W, TVD 6,273', Sec. 1,316.66', N 1,315.80', E 41.79'

Mud wt. 72#, Vis 42 sec., W.L. 4.4cc., Sand 1/2%, Solids 8%

6:00 a.m. Drilling 12 1/4" hole at 6,603' with bit #27.

7-31-79

31st Day. Directionally drilled 12 1/4" hole from 6,575' to 6,790' with bit #27.

Surveys: 6,643', 22° 45', N 4 W
6,706', 22° , N 4 W
6,765', 21° 15', N 4 W, TVD 6,472.15', Sec. 1,399.19', N 1,398.42'. E 36.01'

Mud wt. 74#, Vis 46 sec., W.L. 4.1cc., Sand 1/2%, Solids 9%, Oil 4%

6:00 a.m. Drilling ahead at 6,835' with bit #28.

8-1-79

32nd Day. Directionally drilled 12 1/4" hole from 6,790' to 6,950' with bit #28. Tripped for bit. Reamed 6,920' to 6,950'.

Surveys: 6,828' 21°, N 4 W
6,925' 21° 15' N 4 W, TVD 6,621.40', Sec. 1,456.67', N 1,455.95' E 31.99'

Mud wt. 77#, Vis 45 sec., W.L. 4.2cc., Sand 1/2%, Solids 11.5%, Oil 3.5%

6:00 a.m. Drilling ahead at 7,042' with bit #29.

8-2-79

33rd Day. Directionally drilled 12 1/4" hole from 6,950' to 7,100' with bit #29 and to 7,130' with bit #30.

Surveys: 7,017', 20° 45' N 3° 30' W
7,109', 20° 30', N 4 W, TVD 6,793.38, Sec. 1,522.05, N 1,521.20', E 27.71'

Mud wt. 77#, Vis 48 sec., W.L. 4.4cc., Sand 1/2%, Solids 12%, Oil 3%

6:00 a.m. Drilling ahead at 7,257' with bit #30.

8-3-79

34th Day. Directionally drilled 12 1/4" hole from 7,130' to 7,347' with bit #30. Circulated and conditioned hole for logs.

Surveys: 7,232', 20° 30', N 1 W
7,322', 21° , N 1 W TVD 6,992.75', sec. 1,596.92', N 1,596.41', E 25.27'
7,347', 21° , N 1 W (extrapolated) TVD 7,016.09', Sec 1,605.88', N 1,605.37', E 25.11'.

Mud wt. 77#, Vis 47 sec., W.L. 4.5cc., Sand 1/2%, Solids 12%, Oil 3%

6:00 a.m. Pulling out of hole for logs.

8-4-79

35th Day. Circulated for logs. Pulled out of hole. Ran Schlumberger Dual Induction Sonic and FDC which stopped at 7,162'. Ran Dual Induction SFL log and recorded from 7,327' to 1,014'. Ran in with drilling assembly and cleaned out to 7,347'. Circulated for logs. Pulling out.

Mud wt. 77#, Vis 46 sec., W.L. 4.5cc., Sand 1/2%, Solids 12%, Oil 3%

6:00 a.m. Schlumberger logging from 7,339' to 1,014' with FDC, CNL and GR.

8-5-79

36th Day. Continued pulling out of hole. Schlumberger ran Gamma Ray, CNL, FDC logs and recorded from 7,339' to 1,012', dipmeter from 7,332' to 1,012', Sonic and Gamma Ray from 7,332' to 1,012'. Rigging down loggers.

Mud wt. 77#, Vis 47 sec., W.L. 4.6cc., Sand 1/2%, Solids 12%, Oil 3%

6:00 a.m. Circulating at 7,347' for casing.

Daily Well Report for Mission Adrian #1-B, Aliso Canyon

8-6-79

37th Day. Laid down non-magnetic drill collar, Ran in with drilling assembly and bit #30RR. Cleaned out fill from 7,339' to 7,347'. Circulated and conditioned for casing. Worked pipe through tight hole from 3,266' to 2,723' where drilling assembly became stuck. Jarred up and down. Rigged Dia-Log Freepoint and string shot. Backed off at 2,366'. Length of fish 357'. Rigged down Dia-Log. Pulled out, picking up fishing tools.

6:00 a.m. Fishing

8-7-79

38th Day. Attempted to screw into fish at 2,366' without success. Ran back to 2,366' for second attempt. Ran in to 2,410' where drill string stopped. Pulled out, made up and ran Midway 11" skirted sub. Screwed into fish at 2,426'. Jarred fish loose, chaining out of hole.

6:00 a.m. Running in hole with bit, near bit, stab, 1-DC, stab, to condition mud for casing.

8-8-79

39th Day. Finished chaining out with fish. Laid down and loaded out fishing tools. Laid down 7" drill collars and stabilizers. Ran 12 1/4" bit, 2 stabilizers and one drill collar to 7,347'. Circulated and conditioned mud. Pulled out and laid down tools. Rigging up to run casing.

Mud wt. 77#, Vis. 46 sec., W.L. 4.2cc., Sand 1/2%, Solids 12%, Oil 2 1/2%

6:00 a.m. Pulling bit guide.

8-9-79

40th Day. Strung 10 lines. Pulled bit guide from 13 3/8" head. Running 8 5/8" casing.

6:00 a.m. Cementing 8 5/8" casing.

Daily Well Report for Mission Adrian #1-B, Aliso Canyon

8-10-79

41st Day. Ran 49 Jts. of 8 5/8" 40# N-80 and 130 Jts. of 8 5/8" 36# N-80 all with buttress thread. Total of 7,353.82' on hook. B&W float shoe landed at 7,347', B&W float collar at 7,220'. Shoe, bottom three jts. and float collar had thread-lock applied. Two centralizers and three clusters of scratchers installed on bottom three joints. Centralizers installed on every other collar up to 1,000'. Circulated casing. Dowell pumped 500 cu.ft. "CW7" ahead of 1,200 cu.ft. of 1-1 lite-poz 7, blended with 1% "D-65" and 0.5% "D-60", followed by 350 sacks of class "G" cement with 0.75% "D-65" and 0.5% "D-60", followed by 250 cu.ft. of self-stress cement with 0.5% "D-65" and 0.2% "D-108". Used top and bottom plugs. Displaced with 2,472 cu.ft. of mud. Did not bump plug. Approximately 200 lineal feet left in pipe. Good circulation through out job. Cement in Place at 7:15 a.m., 8/10/79. Removed BOPE. Landed 8 5/8" casing in slips with 265,000#. Cut off 8 5/8" casing. Installed tubing head and tested all seals to 5,000 psi for 1 hour, O.K.

6:00 a.m. Testing CSO.

8-11-79

42nd Day. Finished installing BOPE. Made up drilling assembly (with scraper) and bit #31. Ran in to 3,900'± . Tested pipe rams to 3,000 psi, Hydril to 2,000 psi with water and nitrogen for 20 minutes each. All tests O.K.. Running in hole to clean out.

6:00 a.m. Cleaned out to 7,330'. Pulling out to run CBL.

8-12-79

43rd Day. Ran in hole to 7,220'. Drilled out plugs, float collar and cement to 7,330' with bit #31. Circulated for logs. Pulled out, rigged and ran Welex Cement Bond log from 7,308' to 3,350' (Welex measure). Ran in hole rubbering drill pipe every other joint. Changed over to brine-polymer fluid. Pulling out of hole.

Mud wt. 78#, Vis. 47 sec.

6:00 a.m. W.S.O. holes at 7,204' (Welex measure). 7,217' (Schlumberger measure). Holes broke down at 2,200 psi.

8-13-79

44th Day. Finished pulling out of hole. Welex shot four 1/2" holes at 7,204' - 7,205'. Dowell pressured to 2,200 psi. Holes broke down immediately. Ran in with Baker model "K" cement retainer to 7,239'. Spotted 40 cu.ft. of water in annulus and 60 cu.ft. in drill pipe. Closed pipe rams. Obtained breakdown of 3 cu.ft. per minute at 2,450 psi. Backscuttled out water. Pulled up to 7,209'. Dowell pumped 30 cu.ft. of water ahead of 56 cu.ft. of acid and 30 cu.ft. of water. Spotted 30 cu.ft. of water and 20 cu.ft. of acid in annulus. Pulled up to 7,137' and set retainer. Obtained breakdown of 30 cu.ft. per minute at 1,800 psi. Dowell pumped 50 cu.ft. of water ahead of 115 cu.ft. of class "G" cement with 0.75% "D-65", followed by 50 cu.ft. of water. Displaced with 335 cu.ft. of drilling fluid and stabbed into tool. Squeezed away cement and cleared holes with 20 cu.ft. of water. Cement in Place at 9:30 p.m. Pulling out of hole.

Mud 78#, Vis 46 sec.

6:00 a.m. Pulling out of hole.

8-14-79

45th Day. Finished pulling out of hole. Laid down 24 joints of 4 1/2" 16.60#, and 18 joints of 4 1/2" heavy weight cemented up drill pipe and loaded out same. Unloaded, tallied and picked up 23 joints of 4 1/2" 16.60# drill pipe. Measured in hole with bit #31RR. Tagged cement at 7,129'. Bit plugged. Pulling out wet.

Mud wt. 78#, Vis 48 sec..

6:00 a.m. Going in with bit #31RR to drill out cement and retainer at 7,137'.

8-15-79

46th Day. Finished pulling out of hole with plugged bit. Ran back in cleaned out from 7,080' to 7,113'. Drilled hard cement from 7,113' to 7,137'. Drilled out retainer and hard cement to 7,159'. Circulated clean. With bit at 7,250', Dowell spotted 60 cu.ft. of water, (30 cu.ft. in annulus) Closed rams and got breakdown of 10 cu.ft. per minute at 2,200 psi. Pulled out of hole. Ran Baker model "K" cement retainer on 4 1/2" 16.60# drill pipe to 7,202'. Dowell pumped 56 cu.ft. of acid (12% HCL and 3% HF) and displaced with 540 cu.ft. of drilling fluid. Pulled up to 7,137', closed rams, squeezed away 20 cu.ft. of acid at 8 cu.ft. per minute at 2,000 psi. Set cement retainer and squeezed away 20 cu.ft. at 35 cu.ft. per minute at 2,000 psi. Dowell pumped 50 cu.ft. of water ahead of 115 cu.ft. of class "G" cement blended with 0.75% "D-65" followed by 50 cu.ft. of water, followed by 355 cu.ft. of drilling fluid. Stabbed into model "K" retainer (7,137'). Squeezed away 100 cu.ft. of cement at 10 cu.ft. per minute at 1,000 psi. Locked up at end with 2,500 psi.

Mud 77#, Vis 46 sec.

6:00 a.m. Cement in Place at 12:45 a.m. Going in hole with bit to clean out retainer and cement

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Daily Well Report for Mission Adrian #1-B, Aliso Canyon

8-16-79

47th Day. Finished squeeze at 12:45 a.m., reverse circulated 600 cu.ft. of drilling fluid from 7,135'. Chained out of hole. Made up 7 5/8" bit #32 on drilling assembly. Ran in hole to 7,137'. Drilled out retainer, cleaned out cement from 7,157' to 7,204'. Cleaned out to 7,330'. Circulated clean. Pulled up to 7,230'. Dowell pumped 100 cu.ft. of calcium chloride 78# water. Followed by 513 cu.ft. of mud. Closed rams and pressure tested holes at 7,204' - 7,205' with 2,200 psi for 20 minutes, o.k.. Pulled out of hole. Welex shot four 1/2" holes at 7,205' - 7,206'. Dowell pressure tested holes and got a breakdown of 8 cu.ft. per minute at 2,100 psi. Running in hole with Johnston "Hornet" cement retainer.

Mud 76#, Vis 41 sec..

6:00 a.m. Chaining out of hole with Johnston Stabin tool.

8-17-79

48th Day. Finished running in hole with Johnston "Hornet" cement retainer. Set retainer at 7,098'. Dowell pumped 50 cu.ft. of water followed by 57 cu.ft. of class "G" cement blended with 0.75% "D-65 and followed by 50 cu.ft. of water and 409 cu.ft. of drilling fluid. Closed tool. Displaced with 91 cu.ft. of drilling fluid. Starting breakdown 8 cu.ft. per minute at 2,100 psi. Final pressure 2,500 psi and locked. Cement in Place at 2:49 a.m. , 8-17-79. Reverse circulated with 600 cu.ft. of drilling fluid. Ran in with drilling assembly and bit #33. Located cement at 7,082'. Drilled out cement to 7,098' and retainer at 7,098'. Drilled out cement to 7,204'. Ran in to 7,330' and circulated clean. Pulled up to 7,207'. Dowell pumped 60 cu.ft. of calcium chloride water ahead of 509 cu.ft. of drilling fluid. Closed rams and pressure tested holes at 7,205' - 7,206' with 2,200 psi for 20 minutes. Pulled out of hole. Rigging up Welex.

Mud wt. 78.5#, Vis. 47 sec.,

6:00 a.m. New set of four 1/2" holes at 7,206' - 7,207'. Going in hole with Howco "E-Z Drill" retainer.

8-18-79

49th Day. Welex shot four 1/2" holes from 7,206' to 7,207'. Closed blind rams. Dowell obtained breakdown of 3 cu.ft. per minute at 2,100 psi. Ran in with Howco "E-Z Drill" cement retainer to 7,210'. Dowell pumped 50 cu.ft. of water and 550 cu.ft. of drilling fluid. Closed pipe rams and obtained a breakdown of 4 cu.ft. per minute at 2,300 psi. Pulled up to 7,180' and set retainer. Dowell pumped 50 cu.ft. of water ahead of 50 sacks (57 cu.ft.) of class "G" neat cement, followed by 50 cu.ft. of water. Displaced with 442 cu.ft. of drilling fluid, stabbed in and displaced with additional 75 cu. ft. (517 cu.ft. total). Starting rate - 4 cu.ft. per minute at 2,300 psi, final pressure 2,400 psi, locked up. Cement in Place at 12:50 p.m., 8-18-79. Reversed with 600 cu.ft. of drilling fluid. Pulled

Daily Well Report for Mission Adrian #1-B, Aliso Canyon

8-18-79 continued

out of hole. Ran in with 7 5/8" OMT mill. Milling out Howco "E-Z Drill".

Mud wt. 78#, Vis. 43 sec.

6:00 a.m. Going in hole with bit #34. Mill was not drilling.

8-19-79

50th Day. Milled on retainer. Pulled out and ran with bit #34. Drilled out retainer at 7,180'. Drilled out cement to 7,207'. Ran in to 7,330'. Circulated clean. Pulled up to 7,237'. Dowell displaced 100 cu.ft. of calcium chloride water and 513 cu.ft. of drilling fluid. Closed rams and pressured up to 2,200 psi. Rams leaked. Closed Hydril , pressure tested to 2,200 psi for 20 minutes, ok. Pulled out of hole. Changed 4 1/2" ram rubbers. Welex shot four 1/2" holes from 7,207' - 7,208'. Pressure tested. Holes started taking fluid at 1,800 psi. Final breakdown 10 cu.ft. per minute at 2,000 psi.

Mud wt. 78#, Vis 47 sec.

6:00 a.m. Howco "E-Z Drill" set at 7,180', and preparing to squeeze.

8-20-79

51st Day. Ran in well with Howco "E-Z Drill" retainer and set at 7,184'. Mixed 50 sacks of class "G" cement mixed with latex. Squeezed away 38 cu.ft. at final pressure of 2,300 psi. Reverse circulated well clean. Pulled out of well. Ran in with bit #35 and located top of retainer at 7,184'. Drilled on retainer for 6 hours from 7,184' to 7,185'. Pulled out of well. Ran in with bit #36 to 5,500'.

Mud wt. 78#, Vis. 43 sec..

6:00 a.m. Pulling out of well with bit #36.

8-21-79

52nd Day. Continued running in well with bit #36. Drilled 5 hours on retainer from 7,185' to 7,186'. Pulled out and ran in well with 7 5/8" flat bottom mill. Milled up retainer and cleaned out to 7,330'. Circulated well one hour. Pulled up to 7,207' and equalized 100 cu.ft. of calcium chloride water. Closed pipe rams and pressured up to 2,000 psi which held for 20 minutes.

Mud wt. 78#, Vis. 45 sec..

6:00 a.m. Running in well with Lynes Test Tools for WSO.

Daily Well Report for Miss on Adrian #1-B, Aliso Canyon

8-22-79

53rd Day. Using Welex wireline and jet gun, shot four 1/2" holes from 7,203' to 7,204'. Pressure tested holes to 2,000 psi for 20 minutes. Ran in well with Lynes test tools and set packer at 7,140'. Opened tool at 9:50 a.m., faint blow for 3 minutes and dead balance of one hour test. Pulled and recovered 25' rise of polymer drilling fluid. Test witnessed and approved by DOG. Ran in with bit #37 and drilled out cement from 7,330' to shoe at 7,347'. Drilled to 7,353' and circulated well clean.

Test Pressures:

I.H.	3,705 psi
I.F.	10 psi
F.F.	10 psi
F.H.	3,700 psi

Mud wt. 78#, Vis. 43 sec..

6:00 a.m. Running in with 7 5/8" Diamond core bbl.

8-23-79

54th Day. Ran in well with 7 5/8" Diamond core head and cored from 7,353' to 7,379'. Pulled out and recovered 22'.

Mud wt. 78#, Vis 47 sec..

6:00 a.m. In well with core run #2, circulating preparing to core.

8-24-79

55th Day. Diamond cored 7 5/8" hole from 7,379' to 7,403' for core #2. Recovered 23' of core.

Mud wt. 78#, Vis 49 sec..

6:00 a.m. Coring at 7,412'.

8-25-79

56th Day. Diamond cored 7 5/8" hole from 7,403' to 7,428'. Recovered 23' of core. Diamond cored 7 5/8" hole from 7,428' to 7,439'.

Mud wt. 79#, Vis. 51 sec..

6:00 a.m. Coring at 7,449'.

Daily Well Report for Mission Adrian #1-B, Aliso Canyon

8-26-79

57th Day. Diamond cored 7 5/8" hole from 7,439' to 7,450' with run #4, and to 7,464' with run #5. Recovered 26' of 3" core.

Mud wt. 79#, Vis 50 sec..

6:00 a.m. 7,469'

8-27-79

58th Day. Diamond cored 7 5/8" hole from 7,464' to 7,475' for core #5 and to 7,485' with run #6

Mud wt. 78#, Vis 50 sec., Solids 2%

6:00 a.m. Pulling out of hole with core #6.

8-28-79

59th Day. Diamond cored 7 5/8" hole from 7,484' to 7,485'. (Recovered 2.5 feet of 3" core). Diamond cored 7 5/8" hole from 7,485' to 7,496'.

Mud wt 79.5#, Vis 51 sec., solids 1 1/2%.

6:00 a.m. Running in hole with core #8. Recovered 10' of core #7.

8-29-79

60th Day. Diamond cored 7 5/8" hole from 7,496' to 7,510'. (Recovered 12 1/2 feet of 3" core).

Mud wt. 78#, Vis 50 sec., solids 2%.

6:00 a.m. Drilling with 7 5/8" bit at 7,545'.

8-30-79

61st Day. Drilled 7 5/8" hole from 7,510' to 7,587' with bit #37.

Mud wt. 79#, Vis. 48 sec., Solids 1 1/2%.

6:00 a.m. Diamond coring with 7 5/8" core head at 7,592'.

8-31-79

62nd Day. Diamond cored 7 5/8" hole from 7,587' to 7,604'. (Recovered 13 1/2 feet of 3" core #9). Down 1 hour repairing rotary clutch.

Mud wt. 79#, Vis 47 sec., solids 1%.

6:00 a.m. Diamond coring core #10 with 7 5/8" core head at 7,608'.

9-1-79

63rd Day. Diamond cored 7 5/8 hole from 7,604' to 7,626'. (Recovered 19 1/2 feet of 3" core).

Mud wt. 80#, Vis 48 sec., solids 2%.

6:00 a.m. 7,300' with new diamond core head changing 6" liners to 5 1/2".

9-2-79

64th Day. Diamond cored 7 5/8" hole from 7,626' to 7,656'. (Recovered thirty feet of 3" core). Drilled 7 5/8" hole from 7,656' to 7,684'.

Mud wt. 79#, Vis. 46 sec.

6:00 a.m. Circulating hole clean for logging. T.D. 7,716'.

9 -79

65th Day. Drilled 7 5/8" hole from 7,684' to 7,716' with bit #37. Circulated. Pulled up to 8 5/8" casing shoe at 7,347'. Circulated. Ran in to 7,716'. Circulated for logs. Pulled out. Schlumberger ran Dual Induction - SFL, Compensated Neutron - Formation Density logs and recorded from 7,716' to 7,347'. Ran Bore Hole Compensated Sonic log and recorded from 7,716' to 7,000'. Ran Continuous Dipmeter log and recorded from 7,716' to 7,347'. Logging.

Mud wt. 79#, Vis 46 sec., sand Trace, solids 1%

6:00 a.m. Pulling out of hole.

9-4-79

66th Day. Rigged down Schlumberger. Ran in hole with bit #37RR. Tagged bottom (7,716'), no fill. Circulated and pulled out of hole. Laid down 4 1/2" drill collars. Measured and picked up 11 joints of 2 7/8" tubing tail. Ran in to 7,673'. Dowell pumped 70 cu.ft. of water ahead of 100 sacks of class "G" cement with .05% water loss agent. Equalized with 570 cu.ft. of drilling fluid. Cement in Place at 4:53 p.m., 9-4-79. Pulled out of hole. Laid down 2 7/8" tubing. Measured and picked up six 4 1/2" drill collars. Two hours downtime repacking swivel.

Mud wt. 79#, Vis 46 sec.

6:00 a.m. Tagged cement at 7,286'. Cleaning out cement at 7,316'.

9-5-79

67th Day. One hour down time repacking swivel. Ran in hole with 7 5/8" bit # 37RR. Tagged cement at 7,287'. Cleaned out cement to 7,500'. Circulated clean. Pulled out. Laid down and loaded out 4 1/2" drill collars. Made up Tri-State 7 1/2" x 15" under-reamer. Under-reamer would not go through bit guide. Ran bit guide retrieving tool, could not engage guide. Ran Midway 7 1/2" x 7 3/4" spear. Took hold of guide. Pulled 30,000#, would not pull loose.

Mud wt 80#, Vis 46 sec.

6:00 a.m. Waiting on tools.

9-6-79

68th Day. Laid down spear. Hole opener stopped in protector. Attempted to run Baker bridge plug. Ran in with open ended 4 1/2" drill pipe to 6,002' and circulated. Dowell pumped 50 cu.ft. of water ahead of 57 cu.ft. of class "G" cement followed by 6 cu.ft. of water and displaced with 455 cu.ft. of drilling fluid. Cement in Place at 11:45 a.m., 9-6-79. Pulled out of hole. Bit guide came out on last drill pipe rubber. Made up 7 5/8" bit #37RR on casing scraper and three 6" drill collars. Ran in hole and located cement at 5,828'. Drilled out cement to 6,011'. Pulled out of hole. Made up Tri-State 7 1/2" x 15" hole opener. Measuring and picking up heavy weight drill pipe.

Mud wt. 79#, Vis. 45 sec..

6:00 a.m. Opening 7 5/8" hole to 15" at 7,350'. (8 5/8" casing shoe at 7,347').

Daily Well Report for Mission Adrian #1-B, Arroso Canyon

9-7-79

69th Day. Ran in hole with Tri-State hole opener. Opened 7 5/8" hole to 15" from 7,347' to 7,399' with hole opener #1, and to 7,433' with hole opener #2.

Mud wt 79#, Vis 51 sec., solids 2%

6:00 a.m. 7 5/8" hole opened to 15" to 7,436'. Going in hole with #3 hole opener.

9-8-79

70th Day. Opened 7 5/8" hole to 15" from 7,433' to 7,436' with hole opener #2 and to 7,470' with hole opener #3. Ran in with 7 5/8" bit #37RR. Cleaned out fill from 7,470' to 7,500', and drilled out cement to 7,512'. Circulated. Pulling out of hole.

Mud wt 80#, Vis 46 sec.

6:00 a.m. Opening 7 5/8" hole to 15" at 7,476' with hole opener #4.

9-9-79

71st Day. Continued out of hole with 7 5/8" bit. Ran 7 5/8" x 15" hole opener #4. Opened 7 5/8" hole to 15" from 7,470' to 7,477'. Pulled out of hole and ran 7 5/8" x 15" hole opener #5. Reamed 15" hole from 7,475' to 7,477'. Well blew out at 3:25 p.m.. Rigging up to kill well.

6:00 a.m. , 9-10-79. Preparing to kill well.

9-10-79

72nd Day. Rigged up choke manifold and withdrawal line. Dowell commenced pumping 80# mud at 6:40 a.m., at a rate of 3 bbls per min. Starting pressure on drill pipe was 1,200 psi with annulus pressure of 2,780 psi. Drill pipe pressure declined to zero at 570 cu.ft. (102 bbls). Well was dead and BOPE was opened at 11:30 a.m.. Circulated and jarred on stuck pipe. Ran Dia-Log free-point indicator, free point at 7,390'. Ran string shot and backed off at 7,288'. Rigging down Dia-Log.

Mud wt. 80#, Vis 43 sec.. 7347

6:00 a.m. Going in hole with Baker bridge plug.

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SoCalGas-5.0803

9-11-79

73rd Day. Chained out of hole. Ran in hole with Baker model "C" bridge plug and set same at 6,990'. Pulled out of hole. Replaced Hydril, pipe and blind ram rubbers. Made up and ran in hole with Baker fullbore test packer which was set at 477'. Pressure tested pipe rams with water to 4,000 psi for 20 minutes, o.k.. Pressure testing Hydril.

Mud wt 80#, Vis 46 sec..

6:00 a.m. Hydril test o.k. with water and nitrogen to 3,000 psi for 20 minutes. Testing BOPE.

9-12-79

74th Day. Tested Hydril with water and nitrogen to 3,000 psi for 20 minutes each test, o.k.. Tested pipe rams with nitrogen and would not hold. Welded up washouts in pipe ram seal in body of gate. Tested pipe rams with water to 4,000 psi for 20 minutes, o.k.. Testing with nitrogen.

Mud wt 81#, Vis 47 sec..

6:00 a.m. Pipe rams tested with 4,000 psi of nitrogen for 20 minutes, o.k.. Out of hole slipping and cutting drilling line.

9-13-79

75th Day. Tested pipe rams with nitrogen to 4,000 psi for 20 minutes, o.k.. Pulled out Full-Bore packer from 477'. Attempted test on blind rams with tubing doughnut in head. No Go. Ran in the hole with Baker retrieving tool on 4 1/2" drill pipe. Found and latched on to bridge plug at 5,900'. Ran in to 7,173'. Circulated. Pulled out with Baker model "C" plug. Made up and ran Johnston retrievable bridge plug and set at 60'. Tested blind rams with water and nitrogen to 4,000 psi for 20 minutes both tests, o.k. Retrieved Johnston bridge plug. Made up Midway fishing tools, six 6" drill collars and picking up additional drill collars.

Mud wt. 80#, Vis. 43 sec..

6:00 a.m. Screwed into fish and jarring.

Daily Well Report for Mission Adrian #1-B, Aliso Canyon

9-14-79

76th Day. Finished picking up 6" drill collars. Ran in hole. Circulated. Screwed into fish at 7,288'. Jarred on fish. Unable to pump through fish with rig pump. Rigged up Dowell to establish better, or full circulation. Continued jarring on fish. Dowell pumped 50 bbls (280 cu.ft.) of #2 diesel fuel. Followed by 386 cu.ft. of mud when circulation was lost with 16 bbls of diesel in 7 5/8" x 15" annulus.

Mud wt. 80#, Vis 48 sec.

6:00 a.m. Jarring on fish

9-15-79

77th Day. Displaced diesel fuel with additional 200 cu.ft. of drilling fluid. Let diesel set for one hour. Jarred on fish with 280,000# for 17 hours. Slipped drilling line 40'. Ran free point indicator and string shot. Made one unsuccessful backoff at 7,419'. Pipe backed off up hole. Depth unknown. Screwed back in. Pulling wireline.

Mud wt. 80#, Vis 50 sec.

6:00 a.m. Backed off at 7,385'. Circulating.

9-16-79

78th Day. Dia-Log ran shot #2 which misfired. Ran shot #3 and backed off at 7,385', drill pipe measure, 7,392' wireline measure. Chained and measured out of hole. Laid down fishing tools and fish. Recovered one joint of heavy wall drill pipe, jars, crossover sub, and one 6" drill collar. Made up one 40' joint of 7" washpipe on four 5 3/4" drill collars. Ran in hole slowly. Serviced all tool joints on heavy wall drill pipe going in hole.

Mud wt. 80#, Vis 46 sec.

6:00 a.m. Washing over fish.

9-17-79

79th Day. Continued running in hole with 7" washpipe to shoe of 8 5/8" casing at 7,347'. Circulated for one hour. Washed over fish from 7,385' to 7,439'. Pulled out and laid down washpipe. Made up and ran screw in fishing assembly. Stopped at shoe and circulated for one hour. Screwed into fish at 7,385'. Jarred on fish. Ran Dia-Log free point indicator and string shot. Backed off at 7,422'. Pulled up to 7,217'. Circulating .

Mud wt. 81#, Vis 45 sec.

6:00 a.m. Pulling out of hole.

Daily Well Report for Mission Adrian #1-B, Aliso Canyon

9-18-79

80th Day. Pulled out of hole. Recovered one 6" drill collar. Top of fish now at 7,422'. Ran in with 45' of 7" washpipe. Washed over fish from 7,422' to 7,455'. Pulled out of hole with washpipe. Running in with screw in sub.

Mud wt. 80.5#, Vis. 46 sec..

6:00 a.m. Dia-Log making up Free-point indicator and string shot.

9-19-79

81st Day. Finished running in hole to shoe of 8 5/8" casing shoe and circulated bottoms up. Ran in and screwed into fish at 7,422'. Jarred on fish. Dia-Log ran Free-point and string shot. Attempted to back off at 7,478' with no success. Shot and backed off at 7,449' leaving fish in hole 7,449' - 7,487'. Pulled out of hole. Left one drill collar of fish, screw in sub, bumper sub, jars and two 5 3/4" drill collars of fishing tools. Making up tools to recover lost tools.

Mud wt 80#, Vis. 47 sec..

6:00 a.m. Screwed into lost tools. Running Dia-Log locator to check same.

9-20-79

82nd Day. Ran in hole with screw in sub to shoe of 8 5/8" casing. Circulated bottoms up. Screwed into fish at 7,354'. Pulled out of hole. Laid down one badly damaged 6" drill collar fish. Ran 43' of 3 1/2" drill pipe probe below 4 1/2" drill pipe which stopped at 7,347'. Circulated bottoms up. Attempted to work on down. Wouldn't go. Pulling out of hole.

Mud wt. 80#, Vis 47 sec..

6:00 a.m. Going in hole with new 3 1/2" drill pipe stinger.

9-21-79

83rd Day. Pulled out of hole. Modified 3 1/2" drill pipe stinger. Ran in hole to 7,347'. Circulated bottoms up. Ran in to 7,449' and washed along side of fish to 7,455'. Pulled out of hole. Modifying 3 1/2" 43' stinger.

Mud wt. 80#, Vis 46 sec..

6:00 a.m. Washing along side of fish at 7,460'.

9-22-79

84th Day. Ran in with 40' of 3 1/2" drill pipe stinger. Washed down beside fish from 7,455' to 7,472'. Pulled out. Made up 62' of 3 1/2" drill pipe stinger and ran in hole to 7,345'. Circulating bottoms up.

Mud wt. 80#, Vis 55 sec..

6:00 a.m. Washing down beside fish at 7,480'.

9-23-79

85th Day. Washed down beside fish from 7,472' to 7,484' with 62' of 3 1/2" drill pipe stinger. Pumped down 50 bbls of high viscosity pill. Pulled up to 8 5/8" casing shoe. Set for one half hour. Ran in and tagged bottom at 7,484'. No fill. Pulled out. Ran in well with screw in sub and 10' head collar.

Mud wt 78#, Vis 45 sec..

6:00 a.m. Screwed into fish and jarring

9-24-79

86th Day. Made up screw in sub. Ran in hole. Screwed into fish at 7,449'. Unable to circulate. 7 hours jarring on fish. Ran Dia-Log collar locator. Found fill inside of fish at 7,453'. Cleaned out fill from 7,453' to 7,480'. Ran Dia-Log back off string shot which did not fire.

9-25-79

Jarred on fish 4 hr. Rigged up dialog. Ran a nitro gel shot which was fired at 7479'. Circulated and jarred on fish. Jarred pin of screwin sub out of damaged drill collar box at 7449'. Pulled out of well. Layed down fishing tools. Ran in well with 62' of 2 7/8 tubing stinger on bottom. Equalized cement plug from 7449' up to 7400. Cip at 11:40 P.M.

6:00 A.M. Running in well with 7 1/2" mill

9-26-79

88th Day. Ran in well with 4 1/2" drill pipe and 7 1/2" junk mill. Found top of cement at 7,400'. Loaded out drill collars and fishing tools. Pulled out of well. Made up 5" bent housing Dyna-drill.

6:00 a.m. Running Dyna-drill.

N.M.G.&O. 10/4/79

9-27-79

89th Day. Dyna-drilled 7 5/8" hole from 7,400' to 7,437' with bit #38 and to 7,453' with bit #39.

Mud wt. 80#, Vis. 53 sec., solids 1%

6:00 a.m. Running in hole with drilling assembly.

9-28-79

90th Day. Drilled 7 5/8" hole from 7,453' to 7,478' with bit #39, and to 7,490' with bit #40.

6:00 a.m. 7,509'. Pulling out to log.

9-29-79

91st Day. Circulated well clean and pulled out. Ran Schlumberger Dual Induction SFL log and recorded from 7,509' to 7,342'. Ran drilling assembly. Drilled 7 5/8" hole from 7,509' to 7,512' with bit #41.

6:00 a.m. Running in well with Tri-State 7 1/4" x 15" hole opener.

9-30-79

92nd Day. Ran 7 1/4" x 15" hole opener #6 and opened 7 5/8" hole to 15" from 7,400' to 7,452'. Pulled out.

Mud wt 80#, Vis. 48 sec., solids 1%

6:00 a.m. 15" hole opened to 7,469'. Pulling out with opener #7.

10-1-79

93rd Day. Opened 7 5/8" hole to 15" from 7,452' to 7,469' with hole opener #7 and to 7,476' with hole opener #8.

Mud wt. 80#, Vis 47 sec.

6:00 a.m. Hole opened to 15" to 7,478'. Going in hole with opener #10.

10-2-79

94th Day. Opened 7 5/8" hole to 15" from 7,476' to 7,478' with hole opener #9, to 7,486' with hole opener #10, and to 7,507' with hole opener #11. Pulling out of hole.

Mud wt. 80#, Vis. 48 sec.

6:00 a.m. At shoe with bit and circulating.

10-3-79

95th Day. Finished pulling out of hole. Made up 7 5/8" bit. Circulated for one hour at 8 5/8" casing shoe. Ran in and found fill at 7,483'. Cleaned out to 7,512'. Circulated clean. Pulled out of hole. Ran in with Tri-State hole opener #12. Gauge reamed 15" hole from 7,347' to 7,510'. Circulated clean. Pulled out. Rigged and running Dresser Atlas Caliper log.

Mud wt 81#, Vis. 47 sec..

6:00 a.m. Cleaning pits for gravel pack fluid.

10-4-79

96th Day. Ran Dresser Atlas Caliper log with bore hole volume integrator and recorded from 7,510' to 7,346'. Ran in hole with bit #42 RR to 8 5/8" casing shoe. Circulated. Cleaned out from 7,510' to 7,512'. Pulled back up to shoe. Cleaned mud pits and changed over to 86# gravel pack fluid. Pulled out. Making up 5 1/2" wire wrap liner.

Mud wt 86#, Vis. 53 sec..

6:00 a.m. Running in hole with 5 1/2" liner.

10-5-79

97th Day. Made up and ran 6 joints and 2 pups of 5 1/2" 20# K-55 ST&C 8rd liner. Total length 278.16' including Baker lead seal hanger and port collar. Shoe landed at 7,511'. 10 mesh wire wrap from 7,510' to 7,343'. Blank from 7,343' to 7,280'. Wire wrap from 7,280' to 7,240'. Port collar from 7,240 to 7,233'. Ports at 7,238.55'. Three B&W centralizers installed on bottom, three collars in open hole. 239' of 2 3/8" tubing stinger. B&W flow packing with 20 - 40 gravel

Mud wt. 86#, Vis. 52 sec.

6:00 a.m. Pulling out of hole with gravel packing tool to pick up perforated washer.

10-6-79

98th Day. B&W gravel packed with 228 sacks of 20 - 40 gravel. Back-scuttled and pulled out of hole. Made up and ran washer. (2.60' between cups). Washed liner. Pulled out. Ran in with gravel packing tool. Opened port collar and circulating.

Mud wt. 86#, Vis 52 sec..

6:00 a.m. Rigging up to run Dresser Atlas Photon Log.

Daily Well Report for Mission Adrian #1-B, Aliso Canyon

10-7-79

99th Day. Repacked 5 1/2" liner with 8 cu.ft. of 20 - 40 gravel. Packed off. Backscuttled out 6 cu.ft. for 230 cu.ft. in place. Closed port collar. Tested same with 1,000 psi, o.k. Pulled out. Ran Dresser Atlas Photon log. Log shows 8 lineal foot void immediately below 8 5/8" casing shoe. Ran in with Baker washer and two B&W vibrators. Rewashed and vibrated all of liner. Pulling out.

Mud wt. 86#, Vis 52 sec.

6:00 a.m. Making up gravel packing tools.

10-8-79

100th Day. Finished pulling out. Ran in with gravel packing tools and opened port collar. B&W packed 5 1/2" liner with 34 cu.ft. of 20 - 40 gravel. Backscuttled out 20 cu.ft., 14 cu.ft. in, 243 cu.ft. total in place. Closed and tested port collar with 1,000 psi, o.k. Pulled out of hole. Rigged and ran Dresser Atlas Photon log. Dresser Atlas set Baker 8 5/8" "Retrieva-D" packer at 7,190'.

Mud wt 86#, Vis. 52 sec.

6:00 a.m. Preparing to test packer and seals to 1,500 psi.

10-9-79

101st Day. Ran in hole with Baker two seal and locator sub. Attempted pressure test on packer. Would not test. Built up mud volume. Pulled out of hole. Made up and ran Johnston bridge plug.

Mud wt. 86#, Vis. 62 sec..

6:00 a.m. Attempting to set bridge plug.

10-10-79

102nd Day. Ran in hole with Johnston bridge plug. Unable to set at 7,150'. Pulled out of hole. Ran Baker model "C" bridge plug. Set bridge plug at 7,150'. Howco spotted 8 sacks of sand. Pulled up 3 stands. Waited 2 hours. Ran 3 stands to find top of sand. Bridge plug not set. Reset bridge plug at 7,152'. Howco spotted 8 sacks of sand on bridge plug.

Mud wt. 86#, Vis. 60 sec..

6:00 a.m. Top of sand on bridge plug at 7,132'. Going in hole with Baker fullbore packer.

Daily Well Report for Mission Adrian #1-B, Aliso Canyon

10-11-79

103rd Day. Waited for sand to fall. Ran in and touched sand at 7,132'. Pulled out of hole. Ran in with Baker fullbore packer. Made 16 pressure tests of 8 5/8" casing. Found leak from 1,597' to 1,605'. Pulled out. Rigged and running McCullough Casing Inspection log.

Mud wt. 86#, Vis. 60 sec..

6:00 a.m. McCullough found leak from 1,594' to 1,596'. Preparing to set bridge plug at 1,700'±

10-12-79

104th Day. Finished running McCullough Casing Inspection log from 7,100' to surface. Found leak from 1,594' to 1,596'. Ran in and set Baker model "C" bridge plug at 1,721'. Howco pumped 8 sacks of silica sand on top of bridge plug. Pulled out of hole. Broke and laid down setting tool. Ran in with open end 4 1/2" drill pipe. Tagged sand at 1,709'. Pulled up to 1,600'. Howco equalized 67 cu.ft of class "G" neat cement, Pulled out of hole. Closed blind rams and squeezed away 62 cu.ft.. Cement in Place at 4:00 p.m., 10-12-79. Final pressure 800 psi. Waiting on cement.

Mud: water

6:00 a.m. Cement cleaned out 1,585' to 1,600'. Pressure test no good Broke at 400 psi. Pulling out with bit and scraper.

10-13-79

105th Day. Ran in hole with 7 5/8" bit #43RR and casing scraper to 1,400'. Changed calcium chloride polymer to water. Drilled cement from 1,585' to 1,600'. Circulated clean. Pressure tested casing. Pumped away at 800 psi. Pulled out. Ran back with open end 4 1/2" drill pipe to 1,601'. Howco equalized 100 cu.ft. of class "G" cement. Pulled out. Closed blind rams. Squeezed away 92 cu.ft. Cement in Place at 8:30 a.m. Waited on cement 12 hours. Ran in with 7 5/8" bit #43RR and 8 5/8" casing scraper. Cleaned out cement frpm 1,580' to 1,601'. Circulated and tested casing. Pumped away at 1,000 psi. Pulled out. Running in with 4 1/2" open end drill pipe.

Mud: water

6:00 a.m. Waiting on cement.

10-14-79

106th Day. Finished running in hole with open end 4 1/2" drill pipe to 1,601'. Howco equalized 100 cu.ft. of class "G" cement blended with 3% calcium chloride. Pulled out. Closed blind rams and squeezed away 80 cu.ft. Cement in Place at 2:30 a.m., 10-14-79. Waited on cement 8 hours. Ran in with 7 5/8" bit and

10-14-79 continued

and casing scraper. Cleaned out cement from 1,500' to 1,608'. Pressure test broke down at 1,200 psi. Pulled out. Ran in with 4 1/2" open ended drill pipe to 1,600'. Howco equalized 100 cu.ft. of class "G" cement blended with 3% calcium chloride. Pulled out. Closed blind rams and squeezed away 85 cu.ft.. Cement in Place at 3:15 p.m., 10-14-79. Waited on cement 8 hours. Running in hole with bit and casing scraper.

Mud: water

6:00 a.m. Waiting on cement.

10-15-79

107th Day. Finished running in hole with 7 5/8" bit and scraper. Cleaned out cement from 1,604' to 1,608'. Stringers to 1,633'. Pulled out of hole. Closed blind rams, pressured up, leak broke down at 1,250 psi. Ran in to 1,619' with 4 1/2" open ended drill pipe. Howco equalized 108 cu.ft. of class "G" cement blended with 3% calcium chloride. Pulled out. Closed blind rams. Attempted to squeeze. Cement in Place at 4:00 a.m.. Final pressure 2,600 psi. Waited on cement for 8 hours. Ran in with bit and scraper. Cleaned out cement from 1,296' to 1,620'. Ran in to 1,683'. Circulated clean. Closed pipe rams. Leak broke down at 1,150 psi. Pulled out of hole. Ran in to 1,619' with 4 1/2" drill pipe. Howco equalized 58 cu.ft. of class "G" neat cement. Pulled out. Closed blind rams. Howco squeezed away 47 cu.ft.. Final pressure 1,200 psi. Cement in Place at 11:00 p.m. Waiting on cement.

Mud: water

6:00 a.m. Waiting on cement.

10-17-79

108th Day. Waited on cement for 11 hours. Ran in hole with 7 5/8" bit #43RR. Cleaned out cement from 1,578' to 1,630'. Circulated clean. Pulled out. Tested casing to 1,250 psi. Would not hold. Ran in and set Howco "E-Z drill" retainer at 1,546'. Howco pumped 62 cu.ft. of Cal seal. Squeezed away 38 cu.ft.. Final pressure 2,600 psi. Cement in Place at 7:45 p.m., 10-16-79. Pulled out. Waited on cement for 2 hours. Running in hole with 7 5/8" bit #44 and scraper.

Mud: water

6:00 a.m. Drilling on retainer at 1,547'.

Daily Well Report for Mission Adrian #1-B, Aliso Canyon

10-17-79

109th Day. Drilled on "E-Z" drill retainer from 1,551' to 1,553' with 7 5/8" bit #44. Pulled out of hole. Ran in with OMT 7 5/8" junk mill but unable to mill. Pulled out. Ran in with 7 5/8" bit #45. Drilled out cement retainer to 1,554'. Drilled out cement to 1,568'.

Mud: water

6:00 a.m. Drilling out cement at 1,600'.

10-18-79

110th Day. Tripped for bit. Drilled out cement from 1,568' to 1,674' with bit #46. Circulated clean. Tested casing. Pumped away at 1,250 psi at 7 cu.ft. per minute. Pulled out of hole. Ran in and set Howco "E-Z" drill cement retainer at 1,548'. Howco squeezed away 53 cu.ft. of class "G" cement mixed with 10% Cal seal. Final pressure 2,600 psi. Cement in Place at 7:00 p.m., 10-18-79. Pulled out. Ran in with bit and located cement at 1,548'. Rigging up to lay down drill pipe.

Mud: water

6:00 a.m. Laying down drill pipe.

10-19-79

111th Day. Laid down drill pipe. Broke Kelly and swivel. Laid down mouse hole and rat hole pipe. Removed BOPE.

6:00 a.m. Installing tree.

10-20-79

112th Day. Installed xmas tree. Cleaned pits. Released rig at 11:00 a.m., 10-20-79.

6:00 a.m. Tearing out rig.

Ex. I - 26

Due to the large file size, this exhibit is an excerpt. The native file of this document is available upon request.

DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

CHECK LIST-RECORDS RECEIVED AND WELL STATUS

Operator: So Cal Gas WELL DESIGNATION "Fernando Fee" 32F

API No. 037-2133 SE 27 T: 3N R.: 16W , SB B. and M.

County: Los Angeles FIELD: Aliso Canyon

Type of Notice: _____ **Date** _____ **Report Number:** _____

RECORDS RECEIVED (ATTACH PAGES IF REQUIRED)

	Date	OK	NEED	Remarks
Well Summary (OG100)				
History (OG103)				
E-Log				
Mud Log				
Dipmeter				
Directional				
Core and/or SWS				
MIT (Noise Temp)	3/14/16	C		EB, Approved Deferred to Senior

NEW STATUS

DATE: _____

NOTICE OF RECORDS DUE

DATE: _____

DATE: _____

DATE: _____

DATE: _____

WELL STATUS INQUIRY

DATE: _____

DATE: _____

Well Stat

Change Required: _____

Change Done: _____

ABANDONMENTS/REABANDONMENTS/DRILLS/REDRILLS

CalWims Abandonment Form: _____ SURFACE INSPECTION NEEDED _____ COMPLETED _____
Date and Inspector

FINAL LETTER NEEDED _____ COMPLETED _____ Calwims DRILL/REDRILL Form _____
(Date)

ENGINEER'S CHECK LIST

T-REPORT(S) C OPERATOR'S NAME C WELL DESIGNATION _____ SIGNATURE C

Calwims Location _____ Calwims ELEVATION: _____ CONFIDENTIAL RELEASE DATE: _____ PERMIT REQUIREMENTS MET _____

CLERICAL CHECK LIST

LOCATION CHANGE (OG165) _____ ELEVATION CHANGE (OG165) _____ RELEASE OF BOND (OG150) _____

REMARKS

RECORDS SCANNED: _____
(Date)

RECORDS APPROVED: D. O.
(Date and Engineer)

Modified OGD2

AOR Datbase _____

PARTMENT OF CONSERVA)N
DIVISION OF OIL, GAS & GEOTHERMAL RESOURCES
1000 S. Hill Rd, Suite 116 Ventura, CA 93003-4458
Phone:(805) 654-4761 Fax:(805) 654-4765

No. T216-0093

REPORT ON OPERATIONS

GAS STORAGE PROJECT
"Sesnon-Frew" - Modelo (Miocene-Eocene)

Amy Kitson
Southern California Gas Company (S4700)
12801 Tampa Ave., SC9382
Northridge, CA 91326

Ventura, California
April 13, 2016

Your operations at well **"Fernando Fee" 32F**, A.P.I. No. **037-21313**, Sec. **27**, T. **03N**, R. **16W**, **SB** B. & M., **Aliso Canyon** field, in **Los Angeles** County, were witnessed on **3/10/2016**, by **Ernest Blevins**, a representative of the supervisor.

The operations were performed for the purpose of **demonstrating that all of the injection fluid is confined to the approved zone.**

DECISION:

DEFERRED PENDING REVIEW BY THE DIVISION'S SAFETY TEAM.

Kenneth A. Harris Jr.
State Oil and Gas Supervisor

By _____
Patricia A. Abel
District Deputy

EB/tkc
OG109

DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS & GEOTHERMAL RESOURCES
1000 S. Hill Rd, Suite 116 Ventura, CA 93003-4458
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No. T216-0092

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GAS STORAGE PROJECT
"Sesnon-Frew" - Modelo (Miocene-Eocene)

Amy Kitson
Southern California Gas Company (S4700)
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Northridge, CA 91326

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Kenneth A. Harris Jr.
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By _____ for
Patricia A. Abel
District Deputy

EB/tkc
OG109

STATE OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL AND GAS

REPORT ON PROPOSED CHANGE OF WELL DESIGNATION

R.D. Phillips, Agent
Southern Calif. Gas Company
810 S. Flower St.
Los Angeles, CA. 90017

Ventura, California
February 23, 1990

Your request, dated February 13, 1990, proposing to change the designation of wells in Sec. 27, T. 3N, R. 16W, SB B.&M., Aliso Canyon field Los Angeles County, District No. 2, has been received.

The proposed change in designation, in accordance with Section 3203, Public Resources Code, is authorized as follows:

From:		To:
IW 56	(037-21354)	"Porter" 32F (037-21354)
IW 57	(037-21355)	"Porter" 32D (037-21355)
IW 58	(037-21321)	"Fernando Fee" 32E (037-21321)
IW 60	(037-21276)	"Porter" 32B (037-21276)
IW 61	(037-21277)	"Porter" 32A (037-21277)
IW 62	(037-21313)	"Fernando Fee" 32F (037-21313)
IW 73	(037-21358)	"Fernando Fee" 32B (037-21358)
IW 75	(037-21356)	"Fernando Fee" 32D (037-21356)
IW 76	(037-21359)	"Fernando Fee" 32C (037-21359)
IW 77	(037-21323)	"Standard Sesnon" 25B (037-21323)
IW 78	(037-21360)	"Porter" 32C (037-21360)
IW 81	(037-21363)	"Porter" 32E (037-21363)

bb

M.G. MEFFERD, State Oil and Gas Supervisor

By Patrick J. Kinneat
Patrick J. Kinneat, Deputy Supervisor

OGD157

SoCalGas-5.0819

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL AND GAS

No. P 277-191

REPORT ON PROPOSED OPERATIONS

Santa Paula, California

June 7, 1977

Mr. P. S. Magruder, Jr., Agent
Southern California Gas Co.
P.O. Box 54790 Terminal Annex
Los Angeles, Calif. 90054

Your proposal to rework well IW 62 (Name and number)
, A.P.I. No. 037-21313, Section 22, T. 3N, R. 16W,
S.B. B. & M., Aliso Canyon field, Los Angeles County,
dated 6-2-77, received 6-6-77, has been examined in conjunction with records filed in this office.

THE PROPOSAL IS APPROVED PROVIDED THAT:

1. Mud fluid of sufficient density shall be used in sufficient quantity to control any subsurface pressures, and a reserve supply of at least one hole volume of this fluid shall be kept on hand at the well site.
2. Blowout prevention equipment, at least of the Division of Oil and Gas Class III rating, shall be installed and maintained in operating condition at all times.
3. Blowout-prevention practice drills shall be conducted at least weekly for each crew, and recorded in the log book.
4. THIS DIVISION SHALL BE NOTIFIED TO WITNESS A PRESSURE TEST OF THE BLOWOUT PREVENTION EQUIPMENT BEFORE COMMENCING DOWNHOLE OPERATIONS.

NOTE: A COPY OF THIS APPROVAL SHALL BE POSTED AT THE WELL SITE PRIOR TO COMMENCING OPERATIONS.

Blanket Bond
PW:h

K. S. MEIFERD (acting)
State Oil and Gas Supervisor

By
Deputy Supervisor

OG111 (11-76—GSR1—30M)

SoCalGas-5.0820

SUBMIT IN DUPLICATE

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS

DIVISION OF OIL AND GAS
RECEIVED
JUL 3 1986
VENTURA, CALIFORNIA

History of Oil or Gas Well

Operator Southern California Gas Co. Field Aliso Canyon County Los Angeles
Well IW #62, Sec. 27, T 3N, R 16W, SB B. & M.
A.P.I. No. 037-21313 Name J. W. Gourley (Person submitting report) Title Agent (President, Secretary or Agent)
Date June 27, 1986

Signature N.W. Buss for J.W. Gourley 6/27/86

Box 3249, Terminal Annex, Los Angeles, CA 90051 (Address) (213) 689-3925 (Telephone Number)

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests and initial production data.

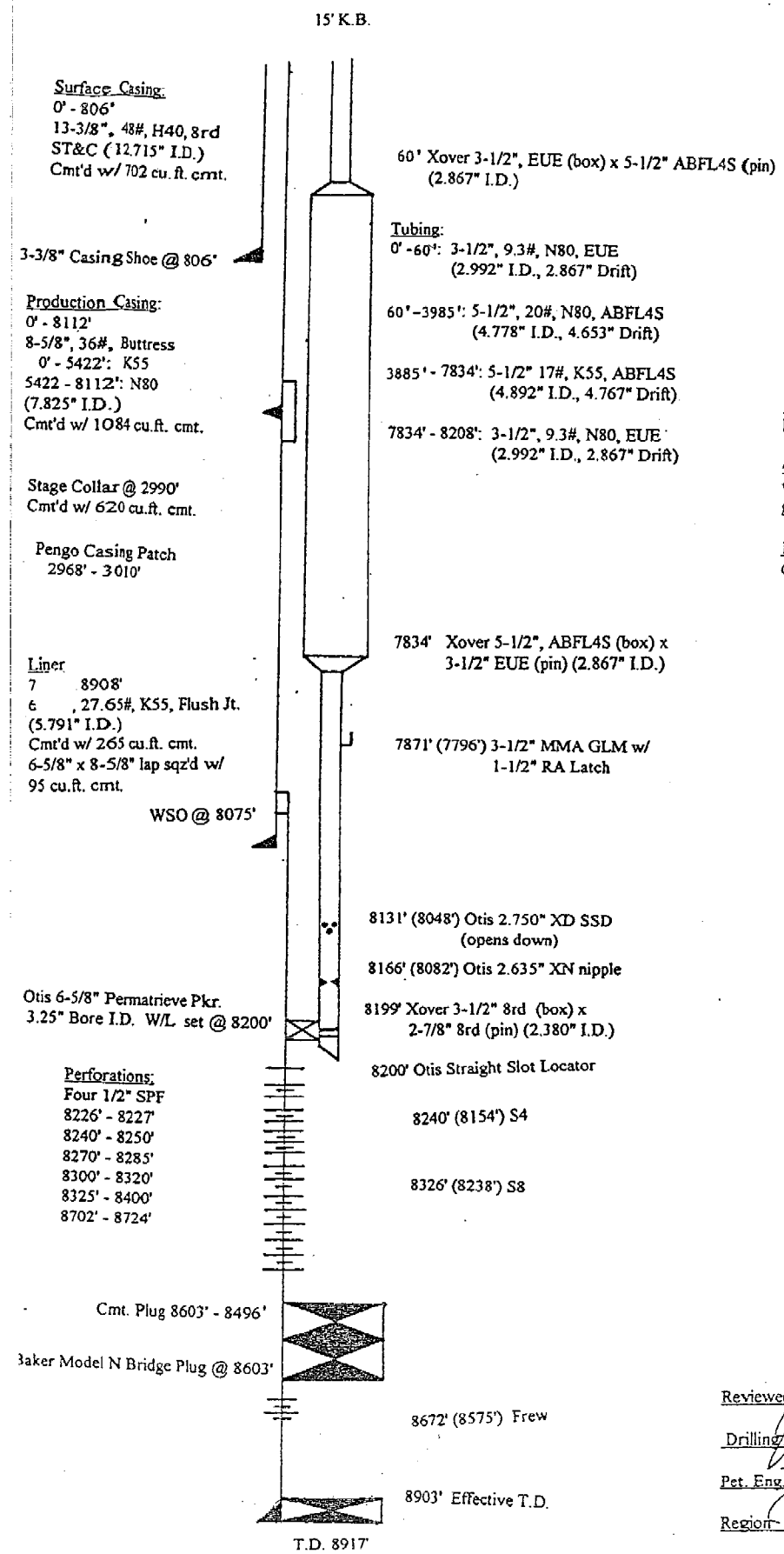
Date	
	MWO No.: 99586 was issued to recover junk and set casing patch
1986	
1-20	Moved CPS Rig M-72 from Well IW #73 to IW #62. Filled well with 142 bbls. of 63#/cu.ft. polymer completion fluid and displaced additional 125 bbls. of fluid from well. Installed back pressure valve in doughnut. Removed xmas tree and installed 9" x 3000 psi Class III BOPE. Pressure tested as follows with water: blind rams 3000 psi for 20 minutes; pipe rams 3000 psi for 20 minutes; Hydril 2300 psi for 20 minutes; choke manifold 3000 psi for 20 minutes. Witnessing of test declined by Mr. Bill Winkle of the D.O.G.
1-21	Using free point and rotational torque indicator, worked Baker seal assembly loose from packer at 7072'. Circulated well. Pulled out of well, laying down production equipment (one 2-7/8" Camco gas lift mandrel, one 2-7/8" Camco annular flow safety system, one 2-7/8" Camco heavy wall tube, one Baker anchor seal assembly with 4 seals and one 5' production tube). Made up 8-5/8" bit and casing scraper on 2-7/8" tubing and ran in well to packer.
1-22	Pulled out of well with bit and scraper. Made up Baker locator seals on 2-7/8" tubing. Ran seals to packer at 7072'. Pressure tested packer at 1500 psi for 15 minutes. Pulled out of well, changing 2-7/8" tubing collars on bottom 5208' of tubing. Baker sealed the threads.
1-23	Made up Baker 8-5/8" x 5-1/2" 17# casing patch on 2-7/8" tubing. Using wireline, oriented Baker patch from 1978'-2023', across stage collar at 2001'. Set Baker casing patch. Pulled out of well, laying down setting tools. Secured well.

SoCalGas-5.0821

1986

1-24 Made up one 2-7/8" x 5' Baker production tube on one 2-7/8" Baker anchor seal assembly with 2 seal units, one joint of 2-7/8" tubing, one BST PSI "DU" 2-7/8" x 1.0" gas lift mandrel; hydrotested tubing in well to 7073'. Spaced out and attached to Retrieva-D packer and landed with 10,000# on latch when doughnut was in place. Installed back pressure valve in doughnut. Removed BOPE and installed tree. Pressure tested tree and doughnut at 5000 psi. Displaced polymer completion fluid from well with 430 bbls. of 3% KCl water. Released rig at 10:00 p.m. on 1-24-86.

Ex. I - 27



Well Name: Standard Sesnon 25A

Field: Aliso Canyon

Status: Injection/Withdrawal

Flow Regime: Large Tubing Flow

Elevation: 2927' G.L.
15' K.B.

Surf. Loc.: 814' South and 5373' West of Station 84, Sec. 28, T3N, R16W.

Btm.Hole Loc: 965' North & 6.32' East of surface @ 8805' TVD.

11/2/72-12/7/72: Well spudded and completed.

7/9/76-7/22/76: Cleaned out to 8603', permanent bridge plug moved up hole, plugged back to 8496' and reperfed with jets, tbg. w/ SSSV.

10/19/81-10/29/81: Installed casing patch across leaking collar from 2968'-3010'.

4/20/83-4/27/83: Installed 5-1/2" large tubing with annulus inhibited with fluid to prevent gas leakage through casing patch.

12/4/93-12/22/93: Replace 5-1/2" large tubing due to externally aligned pitting.

Volumes	Bbls	Cu.Ft.
Tubing	177	991
Annulus	247	1386
Csg./Liner	4	20
Total	424	2397

Reviewed	By	Date
Drilling		2/3/94
Pet. Eng.		2/3/94
Region		2/2/94

Ex. I - 28

Due to the large file size, this exhibit is an excerpt. The native file of this document is available upon request.

State of California • Natural Resources Agency
Department of Conservation
Division of Oil, Gas, and Geothermal Resources
801 K Street • MS 18-05
Sacramento, CA 95814
(916) 445-9686 • FAX (916) 319-9533

Edmund G. Brown Jr., *Governor*
Kenneth A. Harris Jr., *State Oil and Gas Supervisor*

January 3, 2017

SENT VIA EMAIL

Mr. Rodger Schwecke
Vice President
Transmission and Storage
Southern California Gas Company
RSchwecke@semprautilities.com

FINDING THAT WELL STANDARD SESNON 25A (API NO. 03721322) HAS PASSED THE FIRST BATTERY OF TESTS AND WAS TAKEN OUT OF SERVICE AND ISOLATED FROM THE UNDERGROUND GAS STORAGE RESERVOIR

Dear Mr. Schwecke:

I am writing regarding the safety review results of one of the 114 wells at the Aliso Canyon gas storage facility (Facility). Each of the wells are subject to the comprehensive safety review that State Oil and Gas Supervisor Order 1109 and SB 380[1] require to be completed before the Division of Oil, Gas, and Geothermal Resources (Division) may authorize resumption of injection operations at the Facility. Order 1109 describes two batteries of well tests. To complete the review, each well must (1) pass both batteries of tests, (2) pass the first battery of tests and be taken out of service and isolated from the underground gas storage reservoir, or (3) be properly plugged and abandoned.

The first battery of tests assesses the casing using temperature and noise logs to ensure that there is no migration of fluids near the wellbore. If a well passes those tests, it may (1) undergo the second battery of tests for potential approval to use for injection if and when injections may resume, or (2) be taken out of service and isolated from the underground gas storage reservoir as specified in Steps 4b through 7b of the Safety Review Testing Regime of Order 1109 (Testing Regime). The Division posts the current status and testing results for each of the 114 wells on its website at http://www.conservation.ca.gov/dog/AlisoCanyon/Pages/Well-Detail.aspx.

After receiving and evaluating all test results and other data concerning the well, I find for purposes of Order 1109 and SB 380, that well Standard Sesnon 25A (API No. 03721322) has completed the first battery of the Testing Regime and was taken out of service and, on September 29, 2016, the well was isolated from the underground gas storage reservoir as specified in Step 6b of the Testing Regime. Monitoring and testing of the well must continue as required by Order 1109 and any applicable law. If the well does not pass the second battery of tests within one year of being isolated from the reservoir, then the well must be plugged and abandoned in accordance with Public Resources Code section 3208.

Sincerely,

Kenneth A. Harris Jr.,
State Oil and Gas Supervisor

[1] Senate Bill 380 (Pavley, Chapter 14, Statutes of 2016) codified in part at Public Resources Code section 3217.

88

NATURAL RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

Rec'd 07-28-16 DOGGR Ventura.

FOR DIVISION USE ONLY		
Bond	Forms ~~OGD114~~	OGD121
	CAL WIMS	115

P216-0156

NOTICE OF INTENTION TO REWORK / REDRILL WELL

Detailed instructions can be found at: www.conservation.ca.gov/dog/

In compliance with Section 3203, Division 3, Public Resources Code, notice is hereby given that it is our intention to rework ☒ / redrill ☐ (Check one) well Standard Sesnon 25A , API No. 037-21322

Sec. 28 , T. 3N , R. 16W , SB B.&M., Aliso Canyon Field, Los Angeles County.

The complete casing record of the well (present hole), including plugs and perforations, is as follows: (Attach wellbore schematics diagram also.)

See attached wellbore schematic and completed work summary

The total depth is: 8917 feet. The effective depth is: 8903 feet.

Present completion zone(s): Sesnon (Name). Anticipated completion zone(s): Same (Name)

Present zone pressure: storage psi. Anticipated/existing new zone pressure: storage psi.

Is this a critical well as defined in the California Code of Regulations, Title 14, Section 1720(a) (see next page)? Yes☐ No☒

For redrilling or deepening only, is a California Environmental Quality Act (CEQA) document required by a local agency? Yes☐ No☐ If yes, see next page.

The proposed work is as follows: (A complete program is preferred and may be attached.)

7b - MIRU pump, with casing valve open, pressure-up on tubing to 1000 psi for 1 hour.
Switch pump to casing and, with tubing valve open, pressure-up on casing to 500 psi for 1 hour.
Note: Casing test pressure reduced to 500 psi due to casing patch installed across stage collar at 2990' in 8-5/8" casing.

If well is to be redrilled or deepened, show proposed coordinates (from surface location) and true vertical depth at total depth: feet (Direction) and feet (Direction) Estimated true vertical depth:

Will the Field and/or Area change? Yes☐ No☒ If yes, specify New Field: New Area:

The Division must be notified immediately of changes to the proposed operations. Failure to provide a true and accurate representation of the well and proposed operations may cause rescission of the permit.

Name of Operator			
Southern California Gas Company			
Address: P.O. Box 2300		City/State: Chatsworth, CA	Zip Code: 91313-2300
Name of Person Filing Notice: A.J. Alshammasi	Telephone Number: (818) 700-3887	Signature	Date: 07/27/2016
Individual to contact for technical questions: Jacob Zachry	Telephone Number: (805) 256-5401	E-Mail Address: jzachry@semprautilties.com	

This notice and an indemnity or cash bond must be filed, and approval given, before the workover begins. (See the reverse side for bonding information.) If operations have not commenced within one year of the Division's receipt of the notice, this notice will be considered cancelled.

OG107 (1/09)

60

Rec'd 07-28-16 DOGGR Ventura.

Completed Work Summary -SS25A		
Step	Work Completed	Date
4b	Good bond across MP per Acoustic Cement Bond Log dated 12/14/1972	12/14/1972
5b	6-5/8" hydraulic packer set in good cement at 8181'	10/27/2010
5b	Tubing plug set in No-Go nipple at 8144'	11/23/2015
6b	Tubing and casing filled with 3% KCl independently (sliding sleeve will not open)	5/22/2016

SoCalGas-5.0829

Rec'd 07-28-16 DOGGR Ventura.

Well
Standard Sesnon 25A

API #: 04-037-21322-00
Sec 28, T03N, R16W

Operator: So. California Gas Co.

Lease: Standard Sesnon
Field: Aliso Canyon
Status: Active Gas Storage
BFW:
USDW:

Ground Elevation: 2927' asl
Datum to Ground: 15' KB

Spud Date: 11/2/1972
Completion Date: 12/23/1972

Junk: Lost Cones off bit & one blade off stabilizer @ 8917'

Notes
*No circulation while CMT'ing 13-3/8" CSG

13-3/8" TOC Surface
8-5/8" TOC (2nd Stage) Surface

17-1/2" Hole (to 808')

Surface Casing
13-3/8", 48#, H-40
0' - 806'

CMT'D w/ 352 CF*
+ CMT'D 5X's w/ a total of 225 SKS CMT + 10 SKS LCM thru 1" pipe @ 80' BGL Top Job, Good CMT Returns to Surface

806'

11" Hole (808' - 8116')

8-5/8" ETOC (1st Stage) 3455'

Production Casing
8-5/8"
0' - 5422' 36#, K-55
5422' - 8112' 36#, N-80

CMT'D w/ 1084 CF + 100 SKS (1st Stage) + 909 CF thru Stage Collar @ 2990' (2nd Stage), Good CMT Returns to Surface (2nd Stage)

6-5/8" TOL & TOC 7926'

8112'

7-5/8" Hole (8116' - 8917')

Four (4) 1/2" Holes (12/14/1972) Co. WSO 8226'

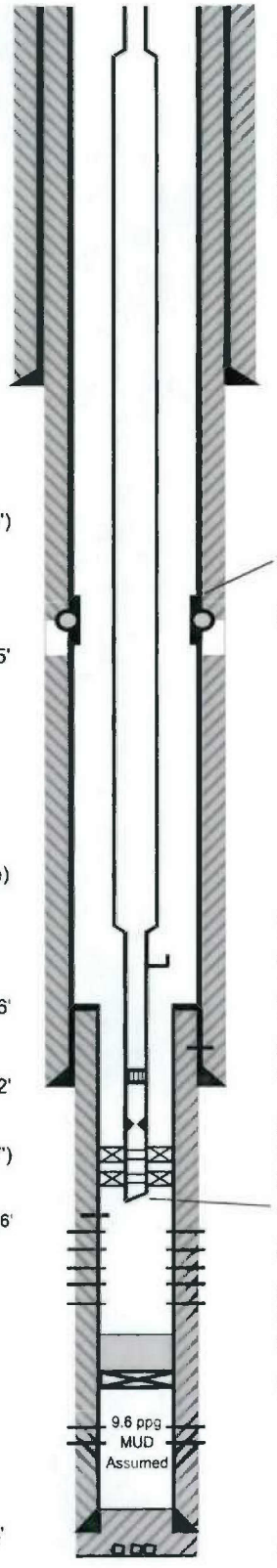
Liner
6-5/8", 27.65#, K-55
7926' - 8908'

CMT'D w/ 265 CF + 95 SKS CMT SQZ'D Away thru TOL

PBTD 8903'

8908'

TD 8917'
TVD (8816')
Directionally Drilled: Yes (TD is 4' W, 963' N of Surf)



3-1/2" x 5-1/2" X-Over

Tubing

3-1/2"	0' - 50'	9.3#, N-80
5-1/2"	50' - 7845'	20#, N-80
3-1/2"	7845' - 8184'	9.3#, N-80
2-7/8"	8184' - ~8204'	6.4#, N-80

2970' - 3110' Homco CSG Patch (9/8/2010, patch did not pressure test)
2990' Stage Collar

Top of Zone Markers	md	(tvd)
MPupth	4163'	(4159')
A1	4521'	(4517')
UP	5768'	(5742')
LP	6188'	(6151')
UDA1	6506'	(6461')
MDA	7183'	(7122')
LDA	7410'	(7344')
MP	7945'	(7868')
S1	8134'	(8053')
S4	8240'	(8156')
S8	8326'	(8240')
FREW	8674'	(8579')

7845' 5-1/2" x 3-1/2" X-Over

7880' GLMA w/ 1.5"

7926' 6-5/8" x 8-5/8" Lap WSO (12/13/1972)

8075' Four (4) 1/2" Holes (11/29/1972) WSO
8109' Sliding Sleeve

8144' XN' No-Go Nipple
8181' HES G-77 PCKR
8200' - 8204' Otis Permatrieve PCKR
~8204' Mule Shoe

6-5/8" Perfs: 8240' - 8250', 8270' - 8280', 8282' - 8285', 8300' - 8308', 8312' - 8320', 8325' - 8355', 8364' - 8400' Four (4) 1/2" HPF (7/15/1976)
8280' - 8282', 8308' - 8312', 8355' - 8364', 8702' - 8724' Four (4) 1/2" HPF (12/1972)
8240' - 8250', 8270' - 8285', 8300' - 8320', 8325' - 8400' Two (2) ~0.28" SPF (2/1/2006)

8496' - 8603' CMT Plug (30 SKS, 7/14/1976))

8603' Baker Model N Bridge Plug (orig. set @ 8686' on 12/19/1972, Found @ current location on 7/13/1976)

8917' Top of Junk

Prepared by: CAM (7/25/2016)

InterAct

58

Rec'd 07-28-16 DOGGR Ventura.

Casing Pressure Test Safety Check (500 psi)

Well	Packer Depth MD/TVD	Casing Size/Grade/Weight	Depth MD	Burst PSI	85% of Burst PSI	Pressure at Depth w/500 psi Surface Pressure	Press < 85% of Burst
Standard Sesnon 25A	8181	8-5/8", 36#, K-55	5422	4460	3791	2897	Yes
		8-5/8", 36#, N-80	7926	6490	5517	4003	Yes
		6-5/8", 28#, K-55	8181	6170	5245	4116	Yes

SoCalGas-5.0831

GO INTERNATIONAL

Cement Bond Log with Sonic Spectrum

FILING NO.

COMPANY PACIFIC LIGHTING SERVICES COMPANY

WELL IW #69 SS25A

FIELD ALISO CANYON

STATE CALIFORNIA COUNTY LOS ANGELES

LOCATION: FROM STATION 84, 814' SOUTH AND 5373' WEST

SEC 28 TWP 3N RGE 16W

OTHER SERVICES: N/L J/P

PERMANENT DATUM: MAT ELEV. 2927

LOG MEASURED FROM K.B. 15 FT. ABOVE PERM. DATUM

DRILLING MEASURED FROM K.B.

ELEV.: K.B. 2942 D.F. G.L. 2927

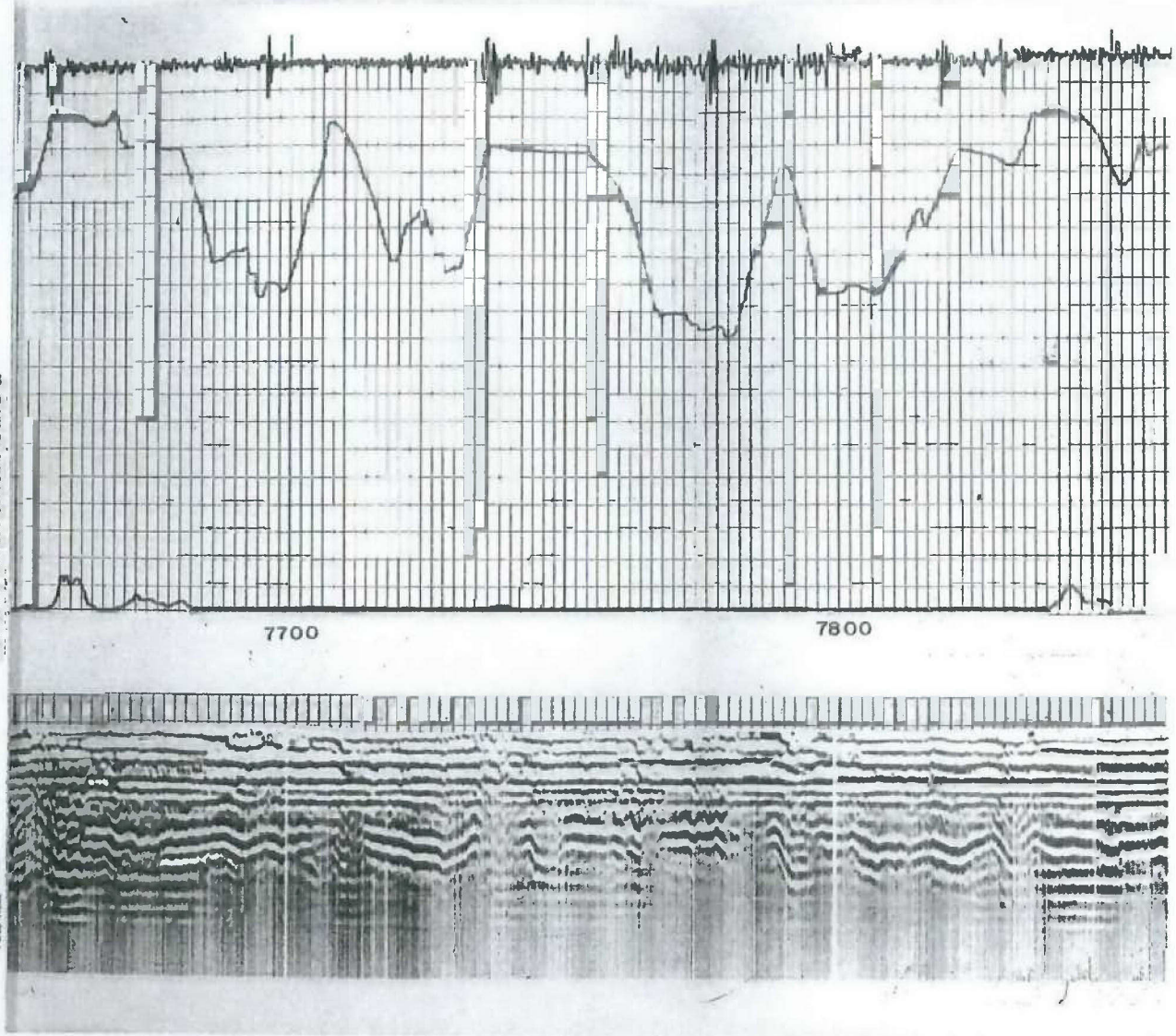
DATE	12-14-72
RUN NO.	ONE
TYPE LOG	CBL/SS
DEPTH—DRILLER	8903
DEPTH—LOGGER	8902
BOTTOM LOGGED INTERVAL	8901
TOP LOGGED INTERVAL	SURF.
TYPE FLUID IN HOLE	MUD
SALINITY, PPM Cl	
DENSITY	
LEVEL	FULL
MAX. REC. TEMP. DEG. F	N.R.
OPERATING RIG TIME	6 HRS.
RECORDED BY	FOSTER
WITNESSED BY	MR. GEDDES MR. OLSON

Rec'd 07-28-16 DOGGR Ventura.

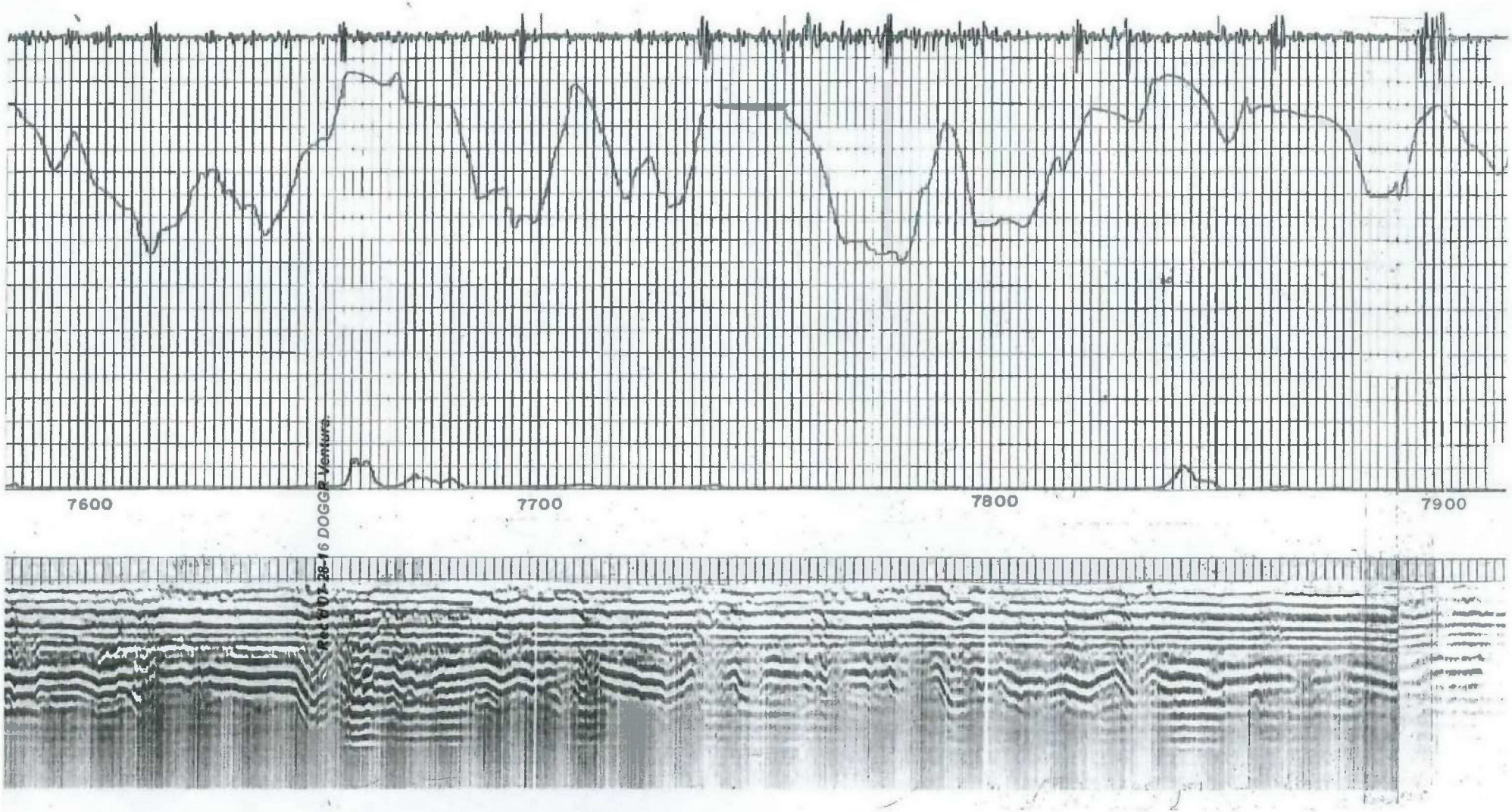
THIS HEADING AND LOG CONFORMS TO API RP 33

RUN NO.	BORE-HOLE RECORD BIT	FROM	TO	CASING RECORD SIZE	WGT.	FROM	TO
1				13-3/8		SURF.	806
2	11	806	8116	8-5/8	36	SURF.	8112
3	7-5/8	8116	8910	6-5/8	28	7926	8908

FOLD HERE



SoCalGas-5.0832



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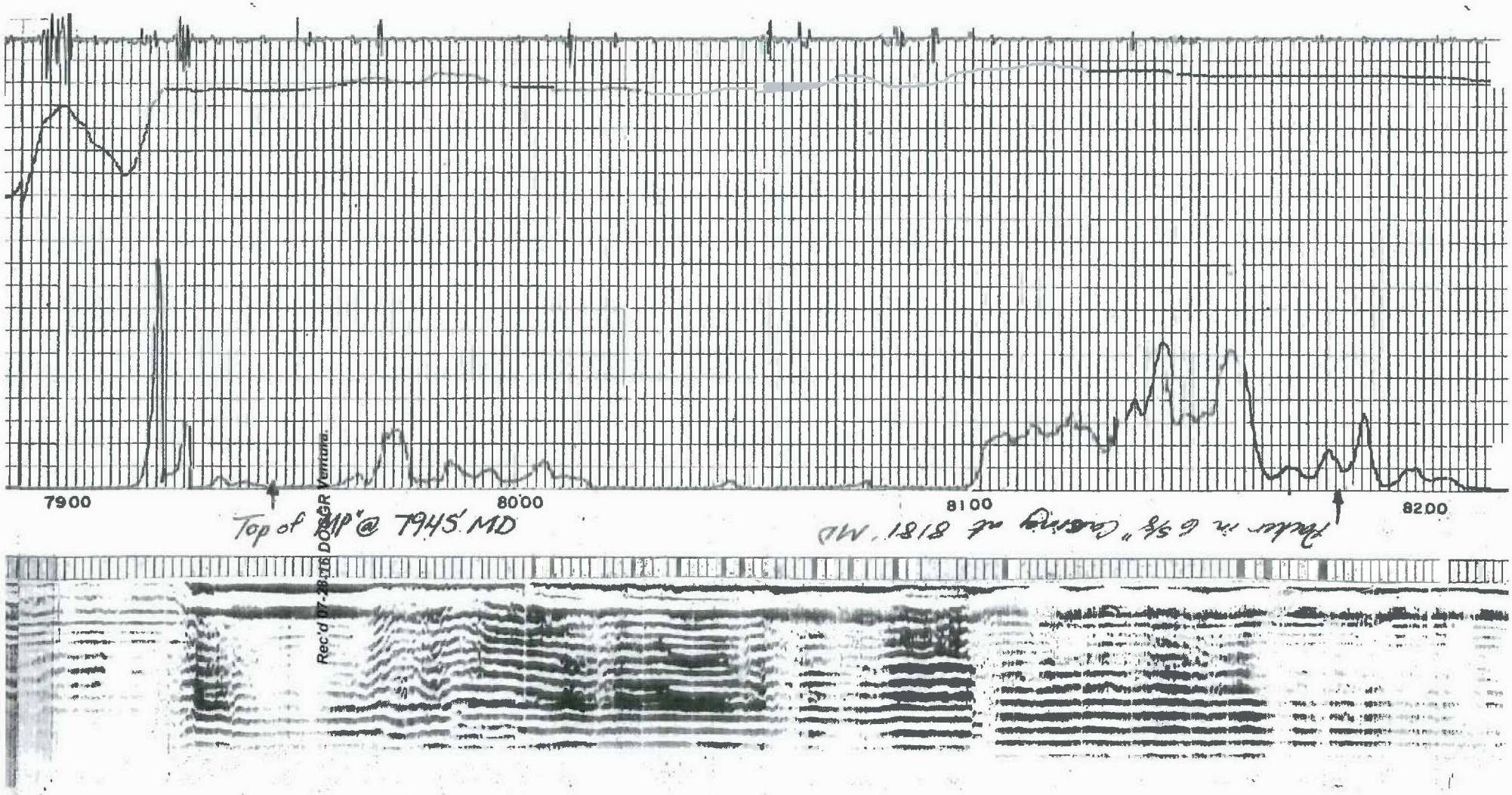


SoCalGas-5.0834

DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

CHECK LIST-RECORDS RECEIVED AND WELL STATUS

OPERATOR Southern Calif. Gas Co. WELL DESIGNATION: "Standard Sesnon" 25A

API No. 03721322 SEC 28 , T. 3N , R. 16W , SB B. and M.

COUNTY: Los Angeles FIELD Aliso Canyon

Type of Notice: Rework Date: 7/2/2010 Report Number: P210-154

RECORDS RECEIVED (ATTACH PAGES IF REQUIRED)

	Date	OK	NEED	Remarks
Well Summary (OG100)	12/27/10			
History (OG103)				
E-Log				
Mud Log				
Dipmeter				
Directional				
Core and/or SWS				

NEW STATUS

DATE: 8/10

NOTICE OF RECORDS DUE

DATE: 11/5/10

DATE:

DATE:

DATE:

WELL STATUS INQUIRY

DATE:

DATE:

Well Stat

Change Required: NO

Change Done:

ABANDONMENTS/REABANDONMENTS/DRILLS/REDRILLS

ABANDONMENT DATABASE : SURFACE INSPECTION NEEDED COMPLETED
Date and Inspector

FINAL LETTER NEEDED COMPLETED DRILL/REDRILL DATABASE
(Date)

ENGINEER'S CHECK LIST

T-REPORT(S) ✓ OPERATOR'S NAME ✓ WELL DESIGNATION ✓ SIGNATURE ✓

LOCATION ELEVATION: CONFIDENTIAL RELEASE DATE: PERMIT REQUIREMENTS MET ✓

CLERICAL CHECK LIST

LOCATION CHANGE (OG165) ELEVATION CHANGE (OG165) RELEASE OF BOND (OG150)

REMARKS

RECORDS SCANNED: 12/27/10 (Date)

RECORDS APPROVED: 12/27/10 (Date and Engineer)

Modified OGD2

53

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator: Southern California Gas Company
Well: Standard Sesnon 25 A
A.P.I. No. 03721322

Field: Aliso Canyon County: Los Angeles
Surface Location: Sec 28 3N 16W S.B.B.M.
Title: Senior Storage Field...

Dan Neville
(President, Secretary, or Agent)

Date: 12/27/2010 DEC 27 2010

Signature: [signature]
(Person Submitting Report)

Address: PO Box 2300, SC9365, Chatsworth, CA, 91313-2300

Telephone Number: 818-700-3810

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, and initial production data.

Start Date	Ops. DOGGR Rpt
8/3/2010	Opened well (2300 psi on tubing). Rigged up wire line. Pulled PXN plug at 8168'. Rigged down wire line. Rigged up for well kill. Pumped 50 bbls hi-vis polymer pill and displaced with 179 bbls 9.5 ppg KCL. Killed well per schedule with 430 bbl KCL water. Installed back pressure plug. Nippled up Class III BOP. Nippled up choke manifold. Rigged up accumulater and function tested BOP.
8/4/2010	Opened well (0 psi tubing and casing.) Filled well with 22 bbls. Rigged up testers. Tested blind rams to 5000 psi for twenty minutes (3" control valves leaking). Continued testing BOP. Tested pipe rams to 5000 psi and Hydril to 3500 psi for twenty minutes. Repaired control vavles. Tested to 5000 psi (pipe ram shaft seals leaking.) Shut down for repairs.
8/5/2010	Repaired pipe ram shaft packing. Tested to 500 psi (ram packing leaking would not test). Waited on equipment. Replaced pipe ram door. Replaced 3-1/8" control valve. Tested pipe rams to 300 psi low and 5000 psi high for twenty minutes. Tested 3 -1/8" control to 300 psi low and 5000 psi high.
8/6/2010	Tested pipe rams and 3" control valve to 5000 psi for twenty minutes (W. Beil DOGGR witnessed and approved BOP test). Filled well with 10 bbls. Backed out hold down studs. Unlanded tubing at 170,000#. Worked stuck tubing to 190,000#. Worked up 4.5' (Clutches out of adjustment, shut down for repairs).
8/9/2010	Filled well with 31 bbls. Rigged up Tiger wire line, made up free point tools and ran in well. Free at 2800', free at 3400', free at 7800', and free at 8150'. Pulled out of well and made up chemical cutter. Ran in well to 8150' and cut 3-1/2" tubing. Rigged out wire line unit. Rigged up casing tongs. Pulled out of well laying down 5-1/2" tubing to kill sting at 4000'.
8/10/2010	Filled well with 4 bbls. Pulled out of well and layed down 5-1/2" and 3-1/2 " tubing. Rigged out casing tongs. Changed pipe rams. Rigged up tubing equipment. Measured and picked up 3-1/2" work string to kill string at 3202'.
8/11/2010	Filled well with 7 bbls. Measured and picked up 3-1/2" tubing to 8150'. Engaged fish and pulled seals loose. Pulled out of well to 6000'.
8/12/2010	Filled well with 5 bbls. Pulled out of well laying down fish tools (recovered seals , no/go, one joint and 13' cut off of 3-1/2" tubing). Made up 7" spear, bumper sub, jars,(2) 4-3/4" drill collars and intensifer. Ran in well to 2968', engaged top cone of patch and jarred loose. Pulled out of well and layed down fish (recovered top cone). Made up fish tools and ran in well to 2969'. Engaged fish and jarred loose. Pulled to 2800'.
8/13/2010	Filled well with 9 bbls. Pulled out of well with casing patch. Layed down casing patch (recovered 41' casing patch, left 1' and bottom cone in well). Ran in well with kill string to 3000'.
8/16/2010	Filled well with 19 bbls. Pulled out of well with kill string. Made up 7" spear assembly ,bumper sub, jars, (2) 4-3/4" drill collars. Ran in well to fish at 3010'. Engaged fish and jarred loose. Pulled out of well (recovered 1' and bottom cone.) Layed down fishing tools. Made up 8-5/8" casing scraper with bumper sub and ran in well to 7640'.
8/17/2010	Filled well with 7 bbls. Ran in well to liner top at 7926'. Pulled out of well and layed down 8-5/8" scraper. Made up 6-5/8" casing scraper and ran in well to packer at 8200'. Pulled out of well to kill string at 3400'.
8/18/2010	Filled well with 9 bbls. Pulled out of well with kill string and laid down casing scraper. Nippled up shooting flange. Rigged up Schlumberger wireline and ran USIT log from 8200' to surface. Rigged down loggers and nippled down shooting flange. Ran in well with kill string to 3300'.
8/19/2010	Filled well with 5 bbls. Pulled out of well with kill string. Made up mill and (2) 4-3/4" drill collars and ran in well to 2980'. Attempted to work with tongs. (Shut down and wait for power swivel).
8/20/2010	Filled well with 9 bbls. Picked up power swivel and ran in well to 2990'. Cleaned up stage collar with 7-5/8" string mill. Pulled out of well and laid down mill and drill collars. Made up 6-5/8" bridge plug and ran in well to 7700'.
8/23/2010	Filled well with 13 bbls. Ran in well with bridge plug to 8127'. Set BP and tested to 500 psi for twenty minutes. Dumped 2 cu ft sand on BP. Pulled out of well (down 2 hours for rig repairs). Made up 8-5/8" lok-set bridge plug and ran in well to 2812'. Set BP and tested annulus to 1700 psi for twenty minutes (good). Ran in well to 3188' and set BP. Tested annulus to 1600 psi (bled to 0 psi in 13 minutes). Tested below packer to 500 psi for twenty minutes (good). Released BP.

52

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator: Southern California Gas Company
Field: Aliso Canyon
County: Los Angeles
Well: Standard Sesnon 25 A
Surface Location: Sec 28 3N 16W S.B.B.M.
A.P.I. No. 03721322
Dan Neville
Title: Senior Storage Field...
(President, Secretary, or Agent)

Date: 12/27/2010
Signature: [signature]
(Person Submitting Report)

Address: PO Box 2300, SC9365, Chatsworth, CA, 91313-2300
Telephone Number: 818-700-3810

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, and initial production data.

Start Date	Ops. DOGGR Rpt
8/24/2010	Fill well with 2 bbls. Set packer at 3218' and tested below packer to 500 psi for twenty minutes (good). Released packer and ran in well to 5410'. Set packer and tested below packer to 500 psi for twenty minutes (good). Released packer ran in well to 7900'. Set packer and tested to 500 psi for twenty minutes (all tests good). Released packer and pulled to 3200' kill string.
8/26/2010	Filled well with 7 bbls. Ran in well to 3000' and set packer. Tested annulus to 1600' psi (bled down to 0 in 14 minutes). Released packer and moved to 2980'. Tested annulus to 1600 psi for twenty minutes (good). Pulled out of well and laid down packer. Ran in well with 3100' kill string.
8/27/2010	Filled well with 2 bbls. Pulled out of well with kill string. Made up 8-5/8" bridge plug and packer assembly. Ran in well. (change in orders.) Pulled out of well and laid down packer and BP. Made up retrieving tool and ran in well to 8110'. Nippled up PGSR and circulated out sand. Released 6-5/8" bridge plug. Nippled down PGSR and pulled out of well to 6000'.
8/30/2010	Filled well with 40 bbls. Casing started flowing. Circulated well with 80 bbls. Pulled out of well and laid down 6-5/8" bridge plug. Made up 8-5/8" bridge plug and packer. Ran in well to 6000' and set and released from BP. Pulled to 5000' and set packer. Tested from 5000' to 6000' at 1000 psi for twenty minutes (good). Released packer and ran in well to 6000'. Released BP, pulled to 5000' and set BP. Pulled to 4000' and set packer. Tested from 5000' to 4000' to 1430 psi for twenty minutes (good). Released packer and ran in and released BP.
8/31/2010	Filled well with 7 bbls. Pulled to 4000' and set BP. Pulled to 3000' and set packer. Tested to 1870 psi for twenty minutes (good). Pulled to 2980' and set packer. Tested to 2230' (would not test - packer leaking due to not enough weight). Pulled out of well and laid down BP and packer. Picke up 8-5/8" full bore tension set packer. Ran in well to 2980' and set packer. Tested to 2230 for twenty minutes (good). Pulled to 2500' and set packer. Tested to 2450 for twenty minutes. Pulled to 2000' and set packer. Tested to 2670 for twenty minutes. (packer unloader not opening.) Pulled out of well and laid down packer. Ran in well with kill string.
9/1/2010	Filled well with 9 bbls. Pulled out of well with kill string. Made up 8-5/8" full bore packer and ran in well to 1500'. Tested to surface with 2890' for twenty minutes (good). Pulled to 1000' and tested to surface with 3110 psi for twenty minutes (good). Pulled to 500' and tested to surface with 3300 psi for twenty minutes (good) Pulled out of well and laid down packer. Made up 7.750 string mill (2) 4-3/4" drill collars and ran in well to 3180'. Pulled to 2800'. Nippled up PGSR.
9/2/2010	Filled well with 2 bbls. Rigged up power swivel and milled from 2950' to 3130'. Criculated clean. Pulled out of well and laid down mill. Made up casing patch and running tools. Applied expoy on casing patch and ran in well (stopped at 2117' top at 2077'). Attempted to work thru. Pulled out of well and laid down casing patch (while laying down patch crew member shut blind rams on patch). Ran in well with kill string to 3200'.
9/7/2010	Filled well with 27 bbls. Pulled out of well with kill string. Made up 7.75 string mill, 4-3/4" drill collar, 7-3/8" stabilizer, and 4-3/4" drill collar. Ran in well to 2077'. Picked up power swivel and reamed to 2150'. Ran in well to 3127'. Pulled out of well and laid down tools. Measured and picked up (2) jts of 7-3/8" wash pipe ran and in well to 3200' with no obstructions.
9/8/2010	Filled well with 4 bbls. Pulled out of well with kill string and laid down wash pipe. Made up WEA casing patch and ran to 2119'. Worked thru tight spot and ran to 2157'. Worked thru tight spot and ran to 2970' (top) and bottom at 3110'. Rigged up and set patch with pump at 4000 psi. Pulled thru with rig at 60,000#.
9/9/2010	Filled well with 5 bbls. Pulled out of well and laid down setting tools and 4-3/4" drill collars. Made up Baker 6.25" inflatable packer and ran in well to 3122'. Dropped ball and set packer with 1500 psi. Tested annulus to surface with 1870 psi for twenty minutes (100 psi loss in twenty minutes). Blew ball with 2000 psi and waited 30 minutes for element to relax. Pulled to 2935'.
9/10/2010	Filled well with 4 bbls. Pulled out of well and laid down packer. Made up 6-5/8" bridge plug and ran in well to 7978'. Set bridge plug and tested to 500 psi. Released from BP and pulled to 7920'. Landed in tubing hanger. Installed BPV and nippled down Class III BOP. Nippled up production tree.
9/13/2010	Rigged down hoist and loaded out equipment .
10/15/2010	Spotted tanks mud pump. Moved in and rigged up.

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator: Southern California Gas Company
Field: Aliso Canyon
County: Los Angeles
Well: Standard Sesnon 25 A
Surface Location: Sec 28 3N 16W S.B.B.M.
A.P.I. No. 03721322
Dan Neville
Title: Senior Storage Field...
(President, Secretary, or Agent)

Date: 12/27/2010

Signature: ~~(Person Submitting Report)~~

Address: PO Box 2300, SC9365, Chatsworth, CA, 91313-2300
Telephone Number: 818-700-3810

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, and initial production data.

Start Date	Ops. DOGGR Rpt
10/18/2010	Installed BPV plug and nippled down production tree. Nippled up class III BOP. Rigged up working floor and tubing equipment.
10/19/2010	Rigged up tester, installed BPV, and tested blind rams to 300 psi low and 5000 psi high for twenty minutes. Removed BPV and tested pipe rams to 300 psi low and 5000 psi high for twenty minutes. Tested Hydril to 300 psi low and 3000 psi high for twenty minutes. Tested all control valves and inside BOP, TIW valve to 300 psi low and 5000 psi high. (M Davis DOGGR waived witness of BOP test). Unlanded tubing and ran in well to 8025'. Engaged and released bridge plug. Pumped 50 bbls with full circulation (10 bbls to fill). Pulled out of well laying down 3-1/2" tubing to 7500'. Took gas kick circulation out gas cut fluids.
10/20/2010	Filled well with 10 bbls. Pulled out laying down 3-1/2 tubing. Pulled out of well and laid down bridge plug. Made up WEA inflatable test packer and ran in well to 3070'.
10/21/2010	Filled well with 5 bbls. Pulled to 3045', dropped dart and pressured to 2200 psi to set packer. Pressured annulus to 1870 psi for one hour (425 psi loss) Rigged up Western wireline, ran in well and retrieved dart. Pulled out of well with packer to 2950', dropped dart and pressued packer to 2200 psi to set packer. Pressured annulus to 2230 psi for one hour (no psi loss). Ran in well with wire line and retrieved dart. Pulled out of well and laid down packer. Ran in well with kill string to 3172'.
10/25/2010	Filled well with 15 bbls. Pulled out of well laying down kill string (104 jts.). Changed pipe rams to 5-1/2" and rigged up casing tongs. Made up 1 jt 2-7/8" tubing with mule shoe, ball seat, 6-5/8" HES G-77 hydraulic set packer, crossover, 1 jt 3-1/2" tubing, no/go nipple, 1 jt 3-1/2" tubing, 3-1/2" sliding sleeve, 7 jts 3-1/2" tubing, gas lift mandrel, 1 jt 3-1/2" tubing, 3-1/2" x 5-1/2" crossover. Ran in well with 5-1/2" LT&C casing applying seal lube to threads to 3500'.
10/26/2010	Filled well with 2 bbls. Measured and picked up 203 joints of 5-1/2" 20# LT&C casing to 8170'.
10/27/2010	Filled well with 2 bbls. Picked up 1 jt 3-1/2" tubing, spacing pup joints and tubing hanger. Dropped ball to set packer. Pressured tubing to 2000 psi to set packer. Pressured to 2500 psi to blow ballseat. Landed in tubing hanger with 12,000 lbs compression per HES tubing move. Made up hold down studs and tested annulus to 500 psi for twenty minutes (25 psi loss). Nippled down BOP and nippled up production tree.
10/28/2010	Rigged down hoist and loaded out equipment for rig move. Cleaned location.
10/29/2010	Installed laterals and blind flanges. Cleaned location.

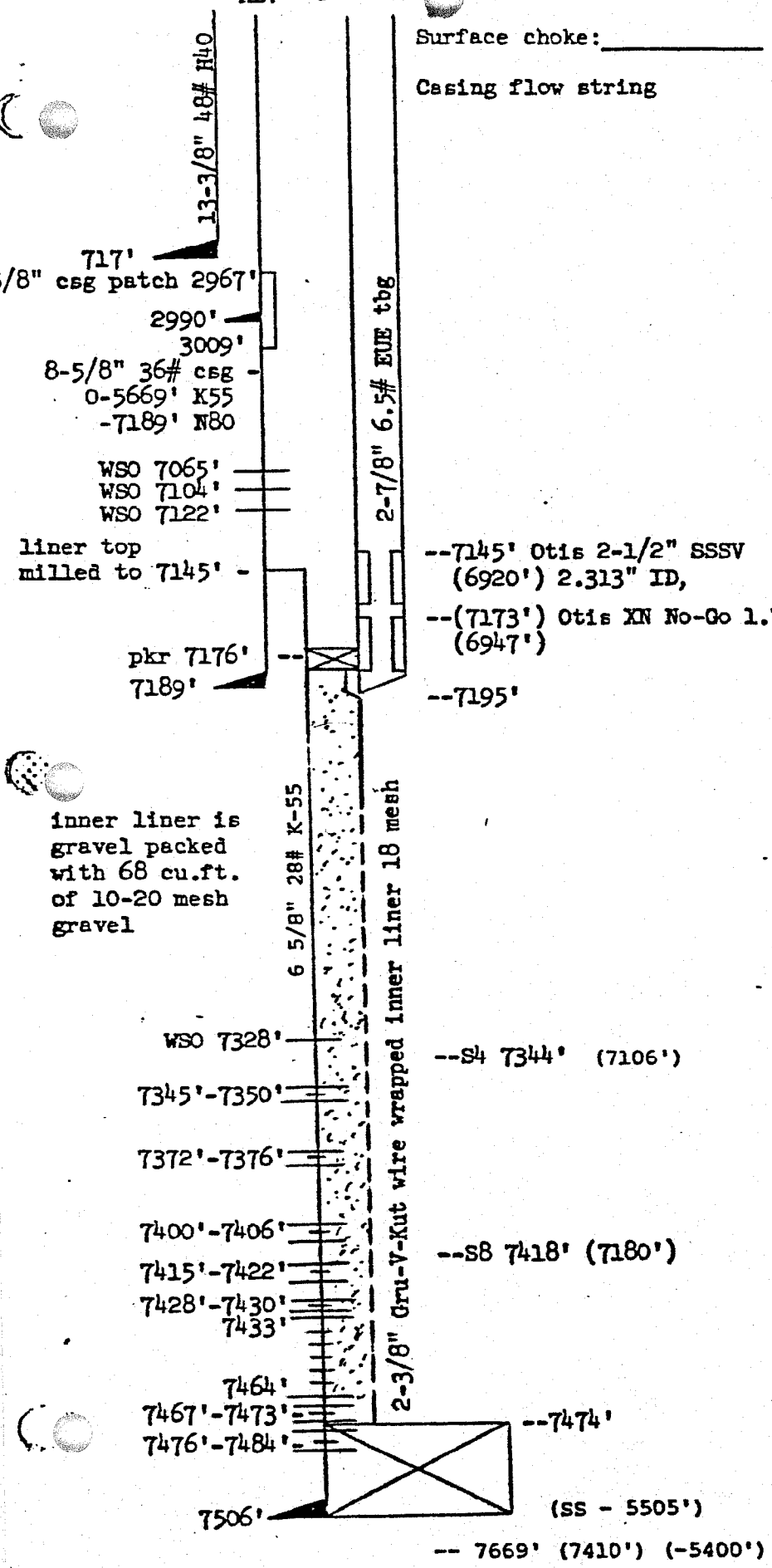
DEC 27 2010

50

Ex. I - 29

Elevation: 1995' G.L.
KB: 15' M.V. 11'

IW-58



Surface choke: _____

Casing flow string

--7145' Otis 2-1/2" SSSV (6920') 2.313" ID,

--(7173') Otis XN No-Go 1.791" ID (6947')

--7195'

inner liner is gravel packed with 68 cu.ft. of 10-20 mesh gravel

--S4 7344' (7106')

--S8 7418' (7180')

--7474'

(SS - 5505')

-- 7669' (7410') (-5400')

11/11/72 - Well spud
12/14/72 - Well completed
1/9/73 - 2/19/73 - Pressure tested csg, plugged back to 7474', flow tested perf's & ran tbg with SSSV.
8/28/75 - 9/23/75 - Squeezed at 2990', cleaned out to 7474', washed perf's, ran & gravel packed 2-3/8" inner liner, ran 6-5/8" csg as patch 2926'-3060' & ran tbg with SSSV.
11/2/76 - 7/29/77 - Pulled 6-5/8" csg patch, squeezed at 2990', Triangle Noise Log indicated shoe leak, milled 6-5/8" liner from 7009' to 7145', squeezed WSO holes at 7122', pressure tested csg, ran 8-5/8" csg patch 2967'-3009', cleaned out to 7193', ran tbg with SSSV. Well is currently suspended because 2-3/8" liner is plugged.

WELL VOLUME

	Cu.Ft.	Bbl.
Tubing	234	42
Csg/Lnr.	51	9
Annulus	2068	368

5/30/85

AC_CPUC_0145076
SoCalGas-5.0840

Ex. I - 30

(CHATS)

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator: Southern California Gas Company | Field: Aliso Canyon | County: Los Angeles
Well: Fernando Fee 32 E | Surface Location: Sec 27 3N 16W S.B.B.M.
A.P.I. No. 03721321 | Todd Van de Putte | Title: Senior Storage Field...
(President, Secretary, or Agent)

Date: 6/7/2013 | Signature: Todd Van de Putte
(Person Submitting Report)

Address: PO Box 2300, SC9365, Chatsworth, CA, 91313-2300 | Telephone Number: 818-701-3339

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, and initial production data.

Start Date	Ops. DOGGR Rpt
3/19/2013	Rigged up the Western wireline unit and ran in the well. Pulled the PXN plug and shifted the sliding sleeve open. Rigged down and moved out the wireline unit.
3/22/2013	Moved in and rigged up the Ensign #321 rig and tied down the hoist. Rigged up to kill the well. Rigged up the associated rig equipment and secured the well.
3/25/2013	Opened the well with 1400 psig surface pressure on the tubing and the casing. Rigged up and pumped 40 bbl of hi-vis HEC polymer and displaced with 110 bbl of 8.5 ppg KCl brine. Killed the well per schedule with 277 bbl of 8.5 ppg KCl brine. Installed the back pressure plug and nippled down the production tree. Nippled up the Class III 5M BOPE and secured the well.
3/26/2013	Rigged up the WEA test truck and the associated test equipment. Pressure tested the blind rams to 300 psig (low) and 5000 psig (high) for twenty minutes. Pressure tested the pipe rams to 300 psig (low) and 5000 psig (high) for twenty minutes. Pressure tested the Hydril annular preventer to 300 psig (low) and 3500 psig (high) for twenty minutes. Pressure tested all the control valves and the choke manifold to 300 psig (low) and 5000 psig (high) for twenty minutes. (All pressure tests held). Changed the pipe rams from 3-1/2" to 4-1/2". Opened the well with 0 psig surface pressure on the tubing and 200 psig surface pressure on the casing. Bled down the casing and filled the well with 80 bbl of 8.5 ppg KCl brine. Backed out the hold down studs. Attempted to release the seals from the packer at 7143', worked the pipe and released the seals from the packer. Rigged up the WEA casing tongs. Pulled out of the well and laid down the 4-1/2" completion casing to 6700'. Circulated gas from the KCl brine and secured the well.
3/27/2013	Opened the well with 0 psig surface pressure on the tubing and 200 psig on the casing. Filled the well with 70 bbl of 8.5 ppg KCl brine and circulated gas cut brine. Pulled out of the well and laid down the 4-1/2" LT&C completion casing. Pulled to 4700' and the packer hung up, worked the pipe and the packer came free. Pulled out of the well to a kill string at 2800' and secured the well.
3/28/2013	Filled the well with 8 bbl of 8.5 ppg KCl brine. Pulled out of the well and laid down the 4-1/2" completion casing. Laid down (3) joints of 3-1/2" tubing, packer and the production equipment, and (3) joints of 2-7/8" tubing. Rigged down the casing tongs, changed the pipe rams form 4-1/2" to 3-1/2". Measured and picked up an 8-5/8" casing scraper and a bumper sub on 3-1/2" tubing. Measured and picked up 3-1/2" tubing to 3800' and secured the well.
3/29/2013	Filled the well with 10 bbl of 8.5 ppg KCl brine. Measured and picked up 3-1/2" tubing to 7145' and secured the well. Shut down the rig for other field operations. Opened the well, pulled out of the well to 5200' and secured the well.
4/1/2013	Opened the well and filled with 15 bbl of 8.5 ppg KCl brine. Pulled out of the well and laid down the casing scraper and installed the shooting flange. Rigged up the Schlumberger wire line unit and associated equipment. Made up the USIT tool on wireline. Ran the USIT log from 7145' to surface. Rigged down and moved out the Schlumberger wireline equipment and nippled down the shooting flange. Ran in the well to a kill string at 2400' and secured the well.
4/2/2013	Pulled out of the well with the kill string. Measured and picked (10) joints of 1" CS Hydrl tubing and crossovers. Ran in the well with 3-1/2" tubing and tagged at 7265'. Attempted to work the tubing down. Nippled up the PGSR, reverse circulated, washed down to 7286' and circulated the well clean. Pulled out of the well to 7140' and secured the well.
4/3/2013	Filled the well with 14 bbl of 8.5 ppg KCl brine. Ran in the well to 7286', cleaned out the 2-3/8" liner. Continued to clean out the 2-3/8" liner to 7409'. Reverse circulated the hole clean, pulled to 7250' and secured the well.
4/4/2013	Opened the well with 0 psig surface pressure on the tubing and the casing. Filled the well with 65 bbl of 8.5 ppg KCl brine. Ran in the well and tagged bottom at 7409'. Attempted to clean out the well and circulated the well clean. (DOGGR - D. Ortiz wavied the clean out depth and witness of the tag). Pulled out of the well to 7240' and secured the well.
4/5/2013	Filled the well with 72 bbl of 8.5 ppg KCl brine. Ran in the well to 7409' and rigged up the HES cementing equipment. Held a safety meeting with crews. Pressure tested the lines to 2000 psig. Pumped 10 bbl of fresh water ahead mixed and pumped 16 bbl (50 sx) of 14.8 ppg Class "G" cement with additives and displaced with 58 bbl of 8.5 ppg KCl brine. Estimated top of cement at 6960'. Pulled out of the well to 6700', rigged up and reverse circulated 90 bbl with a trace of cement to surface. Squeezed from surface with 200 psig surface pressure. Secured the well and cleaned the mud pit.

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator: Southern California Gas Company
Field: Aliso Canyon
County: Los Angeles
Well: Fernando Fee 32 E
Surface Location: Sec 27 3N 16W S.B.B.M.
A.P.I. No. 03721321
Todd Van de Putte
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History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, and initial production data.

Start Date	Ops. DOGGR Rpt
4/8/2013	Opened the well with 0 psig surface pressure on the tubing. Filled the well with 10 bbl of 8.5 ppg KCl brine. Tagged the top of cement at 6997' (E Blivens - DOGGR waived the witness of tag). Pulled out of the well and laid down (10) joints of 1" CS Hydril tubing with crossovers. Made up the WEA 8-5/8" test packer on 3-1/2" tubing and ran in the well to 6900'. Filled the well, set the test packer and pressure tested below the packer to 500 psig surface pressure for twenty minutes (The cement plug and casing below the test packer held pressure). Pressure tested the tubing/casing annulus to 500 psig (Pressure bled down 100 psig in 10 minutes). Released the test packer and secured the well.
4/9/2013	Filled the well with 2 bbl of 8.5 ppg of KCl brine. Pulled out of the well to 5000', filled the well and set the test packer. Pressure tested below the test packer to 1240 psig surface pressure (pressure leaked off 1000 psig in 10 minutes). Pressure tested the tubing/casing annulus to 1240 psig (pressure leaked off 400 psig in 10 minutes). Released the test packer, ran in the well to 6000' and filled the well. Set the test packer and pressure tested below the test packer to 800 psig surface pressure (held pressure). Released the test packer, pulled out of the well to 5811' and pressure tested below the test packer to 879 psig surface pressure (held pressure). Released the test packer, pulled out of the well to 5711', and set the test packer. Pressure tested below the test packer to 925 psig surface pressure (pressure leaked off 700 psig in 10 minutes). Released the test packer, ran in the well to 5741' and set the test packer. Pressure tested below the test packer to 912 psig surface pressure (pressure leaked off 700 psig in 10 minutes). Released the test packer, ran in the well to 5780' and set the test packer. Pressure tested below the test packer to 800 psig surface pressure (leak estimated between 5741' and 5780'). Pulled out of the well to 3500', set the test packer and pressure tested the tubing/casing annulus to 1900 psig surface pressure (pressure leaked off 600 psig in 10 minutes). Released the test packer, pulled out of the well to 2800' and set the test packer. Pressure tested the tubing/casing annulus to 2200 psig surface pressure for 10 minutes (held pressure) (Squeeze holes at 2990' leaking). Released the test packer and secured the well.
4/10/2013	Filled the well with 3 bbl of 8.5 ppg KCl brine. Pulled out of the well and laid down the test packer. Ran in the well with 3-1/2" tubing to 6100'. Pulled out of the well, laid down the 3-1/2" tubing to 3000' and secured the well.
4/11/2013	Pulled out of the well and laid down the 3-1/2" tubing. Changed pipe rams from 3-1/2" to 2-7/8". Changed the pipe trailers, measured and picked up 2-7/8" tubing to 4800'. Held BOP drill and secured the well.
4/12/2013	Measured and picked up 2-7/8" tubing to 6012' and landed in the tubing in the hanger. Loaded the pump and the hoses, secured the well and cleaned the location.
4/15/2013	Nippled down the Class III 5M BOPE and nippled up the production tree. Loaded rig and associated equipment. Rigged down the hoist and spotted tanks at FF 32 D. Rigged down the rig equipment and cleaned the location.

Ex. I - 31

Due to the large file size, this exhibit is an excerpt. The native file of this document is available upon request.

SUBMIT IN DUPLICATE

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS

DIVISION OF OIL AND GAS
RECEIVED
JUL 18 1986
VENTURA, California

History of Oil or Gas Well

Operator Southern California Gas Co. Field Aliso Canyon County Los Angeles
Well IW #58, Sec. 27, T 3N, R 16W, SB B. & M.
A.P.I. No. 037-21321 Name J. W. Gourley (Person submitting report) Title Agent (President, Secretary or Agent)
Date July 17, 1986

Signature J.W. Gourley 7/17/86
N.W. Buss for J.W. Gourley

Box 3249, Terminal Annex, Los Angeles, CA 90051 (Address)
(213) 689-3925 (Telephone Number)

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Date	
	GWO No. 90927: was issued to recover packer/liner and regravel pack a new liner
1986	
3-14	Loaded out rig at Porter Fee #1. Moved to IW #58 and set in rig. Rigged up. Laid 2" line to wellhead.
3-15	Circulated well and removed 8" xmas tree. Installed 9" BOPE. Tested choke manifold, blind rams, pipe rams to 3000 psi; Hydril bag to 2300 psi. Test witnessed by Stephen P. Mulqueen of the D.O.G. Attempted to release from Baker packer at 7176'.
3-17	Attempted to unlatch from packer for 3 hours. Rigged up wireline. Ran free point tool. Tool did not work. Ran a second free point tool and found tubing stuck in seals. Ran string shot. Made backoff at No-Go nipple at 7172'.
3-18	Pulled out of well, laying down 2-7/8" tubing; found wireline in tubing. Pulled 4000' of wireline out of tubing. Installed flow line. Picked up kelly. Unloaded 2-7/8" drill pipe. Picked up 5-1/2" wash pipe and drill collars, along with 2-7/8" drill pipe.
3-19	Finished running in well with 2-7/8" drill pipe and located top of fill at 7166'. Drilled out fill to 7176' at top of packer. Backscuttled well clean. Mixed 10 sacks sawdust. Circulated well.
3-20	Ran to 7176' and backscuttled clean. Laid down wash pipe. Made up screw-in sub. Ran in and screwed into fish at 7166'. Jarred on fish. Released from packer. Pulling out of well with fish.

SoCalGas-5.0846

1986

3-21 Laid down production equipment. Rigged up wireline. Ran CCL. Stopped at 7185'. Pulled out and changed tool. Ran in but were unable to get below 7185'. Ran in well with one joint of 2-3/8" tubing with 45° cutoff. Backscuttled clean. Pulling out of well.

3-22 Rigged up wireline and ran in to 7192'. Pulled out of well. Made chemical cut in extension at 7189'. Ran in well with packer recovery tool to 7176'. Attempted to release packer; did not release. Pulled to kill string. Secured well.

3-24 Filled well with 4 bbls. Pulled out of well with tool. Checked tool and ran in well. Latched into packer and jarred on packer with 50,000# over string weight. Released from packer. Laid down tools. Rigged up wireline and ran in well to packer at 7176'. Fired string shot. Ran in well with 2-3/8" perforated pup joint on 2-7/8" drill pipe. Worked perforated pup joint inside packer while circulating at 3.7 bbls. per minute at 2200 psi.

3-25 Filled well with 2 bbls. Pulled out of well. Made up retrieving tool with bumper sub, jars, three drill collars and ran in well. Latched packer at 7176'. Jarred on packer. Would not release. Released from packer.

3-26 Laid down packer retrieving tool. Made up inside mechanical cutter and ran in well on 2-7/8" drill pipe. Made cut 53" below top of packer. Laid down tool. Picked up packer retrieving tool. Ran in well with bumper sub, jars and drill collars on 2-7/8" drill pipe. Latched into packer. Jarred on packer at 50,000# over string weight. No movement. Released from packer. Secured well.

3-27 Filled well with 2 bbls. Pulled kill string. Laid down packer retrieving tool. Made up 5-1/2" O.D. mill shoe, two junk subs, jars, drill collars. Ran in well on 2-7/8" drill pipe. Ran in to top of packer at 7176'. Milled over packer to 7178' and pulled up to top of packer. Circulated and cleaned well. Pulled out of well to kill string and secured well.

1986

3-28 Finished pulling out of well. Laid down mill shoe. Picked up packer retrieving tool. Ran in with bumper sub, jars, drill collars on 2-7/8" drill pipe. Latched into packer. Pulled 30,000# weight to release packer. Appeared latch released. Latched into top of packer. Began jarring at 50,000# over string weight. Had 8" up movement in 4 hours. Continued jarring with no movement. Released from packer and secured well.

3-29 Removed packer retrieving tool. Picked up 5-1/2" O.D. x 4-7/8" I.D. washover shoe, two junk subs, jars and drill collars and ran in on 2-7/8" drill pipe. Located top of packer at 7175', one foot high. Washed over to 7177' and milled on packer and rubbers to 7178'. Circulated bottoms up.

3-31 Changed out washover shoe. Ran in to 7175'; washed over packer to 7178'. Milled 6" on packer. Circulated well clean.

4-1 Pulled out of well with top sleeve from packer on outside of wash pipe. Laid down wash pipe. Made up latching tool and ran in and latched packer at 7175'. Pulled out of well. Laid down fish, including packer, 4-1/2" ported extension, lower seal bore, 4" lower extension, 2-7/8" 8rd x 4" 8rd crossover, 2-7/8" 8rd x 2-3/8" 8rd crossover and top half of shearout safety.

4-2 Ran in well with 300' of wash pipe with mill shoe on bottom. Ran in and located top of sand at 7222'. Cleaned out sand over liner to 7380' and circulated bottoms up. Recovered no sand. Would not backscuttle. Washed to 7411', but would not backscuttle. Washed up, laying down single to top of liner at 7176'. Pulled two stands and secured well.

4-3 Worked into top of liner at 7176'. Washed and backscuttled over liner to 7416'. Unable to backscuttle. Circulated and worked pipe out of liner to 7176'. Backscuttled bottoms up. Pulling out of well.

4-4 Made up outside cutter tool on 120' of wash pipe. Ran in and worked over fish at 7176'. Tool stopped at 7209'. Unable to work down. Cut 2-3/8" tubing at 7205' and pulled out. Recovered 10' including shearout sub and 2-3/8" tubing. Made up overshot. Ran in and latched onto fish. Jarred on liner for 2-1/2 hours.

1986

4-5 Rigged up wireline and ran free point, which stopped at 7213'. Released overshot and pulled out of well. Made up wash pipe. Ran in, worked and washed over fish from 7205'-7474'. Circulated bottoms up. Pumped 60 bbls. high viscosity pill and circulated well clean. Circulated and worked out of liner. Backscuttled clean at 7146'. Pulled out of well.

4-6 Stood back wash pipe and made up overshot. Ran in and latched onto fish at 7205'. Worked loose and pulled out of well. Laid down 266' of 2-3/8" liner. Laid down wash pipe and made up sawtooth. Ran in well to 7474'. Backscuttled well. Pulled out of well.

4-7 Made up bit and casing scraper. Ran in well to 7474'. Backscuttled clean. Circulated polymer completion fluid out of well with new clean fluid. Pulled out of well. Ran neutron log from 7466' to 5465'. Ran casing caliper log.

4-8 Made up bridge plug. Ran in and set bridge plug in 6-5/8" at 7155'. Tested casing with 1950 psi for one hour (no pressure drop). Released bridge plug and pulled out of well. Ran tubing-conveyed perforating guns to 7474'. Set RTTS retainer at 7313'. Rigged up surface flow lines.

4-9 Rigged up lines and tested to 3000 psi. Pressured drill pipe to 1150 psi with gas. Pressured annulus to 1500 psi to fire gun. Flowed well to Baker tank for 45 minutes. Filled pipe with 30 bbls. Released retainer and circulated gas out of well. Pulled out of well. Laid down guns. Perforated intervals 7474'-7400' and 7385'-7345'. Ran open ended with sawtooth collar. Backscuttled at 7474'. Pulled out of well. Picked up 7 joints 2-3/8" 8rd liner.

4-10 Found bad weld on wire-wrapped liner. Laid down wire-wrapped liner. Ran in well to top of liner. Pulled out and laid down 2-7/8" drill pipe (244 joints). Ran in well, picking up 2-7/8" tubing. Changed out collars.

4-11 Changed 4300' of 2-7/8" collars. Picked up 2-7/8" tubing to 7205'.

4-12 Ran in to 7473'. Circulated and filtered fluid in well. Pulled out of well to kill string. Inspected wire-wrapped liner. Rig on standby waiting on welder to weld centralizers on liner.

1986

4-13 Welded centralizers on 2-3/8" liner. Pulled kill string. Picked up 5 joints (196') 2-3/8" 10rd, 0.006 wire-wrapped liner, including one blank joint. Picked up 193' of 1" pipe. Made up gravel pack tools. Ran in well. Could not work gravel pack cup tool down liner. Pulled out of well. Laid down wire-wrapped liner. Ran in well with 6-1/4" tapered mill and dressed liner top. Circulated bottoms up.

4-14 Ran 197.34' of 2-3/8" liner on over-the-top gravel pack tool. Liner includes 140.46' of 6-gauge wire-wrapped screen with 1' bull plugged blank on bottom and 56.5' of blank, crossover and landing nipple on top. Installed 193' of 1" pipe in liner and landed assembly at 7474'. Pressure tested lines to 3000 psi. Recorded circulating pressures. Closed back side and recorded 900 psi injection pressure, pumping at 1 bbl./minute. Pumped 5 bbls. prepad, 15 bbls. of 15#/gallon slurry, 5 bbls. backpad at 1 bbl./minute - no sand out. Mixed 25 sacks more gravel and pumped at 1 bbl./minute. Sanded out and repressured 4 times to 2750-2300 psi. Reversed out two tubing volumes. Estimated 78 sacks of gravel in place. Waited two hours. Retested pack to 2300 psi. Pulled out of well with gravel pack tools. Made up Baker lead seal for 6-5/8" casing.

4-15 Ran in well and set Baker lead seal adapter on 2-3/8" liner. Top at 7272'. Released tool and pulled out. Rigged up wireline and ran junk ring to 7272'. Made up Otis 6-5/8" 28# "WB" packer. Packer hung up when running in well from 5433'-7145'. Set packer at 7240'. Pulled out of well, sticking coming out of well from 7145'-4500'. Ran in well and tested packer and seals. Tested to 1500 psi for 30 minutes. Seals hanging up while pulling out at 5433'. Ran kill string.

4-16 Laid down kelly. Rigged up Hydro-Test and made up production equipment, hydrotesting tubing in well at 5000 psi. Spaced out and landed 12,000# on packer. Pulled 20,000# over tubing weight to check latch. Tested xmas tree to 5000 psi for 20 minutes.

4-17 Circulated 63#/cu.ft. polymer completion fluid out of well with inhibited salt water. Released rig at 6:01 a.m., 4-17-86.

Ex. I - 32

Well
Fernando Fee 32E

API #: 04-037-21321-00
Sec 27, T3N, R16W

Cut CSG 6' BGL & Welded on Plate
13-3/8" TOC Surface
9-5/8" ETOC Surface

Inner Casing (2/7/2019) 116'
9-5/8" (8.681" ID), 47#, L-80
0' - 67' Hyd. 563
67' - 116' LT&C
17-1/2" Hole (to 720')
CMT'D w/ 6 BBLS‡‡‡ thru 3/4" TBG hung @ 76' in annulus

Surface Casing 717'
13-3/8" (12.715" ID), 48#, H-40, ST&C
0' - 717'
CMT'D w/ 596 CF,
Good CMT Returns to Surface

Shot Holes 1630' - 1635'
(‡3 BBLS SQZ'D Away, 9/15/2017)

11" Hole (720' - 7190')

Stage Collar 2988'

8-5/8" ETOC (1st Stage) 3299'

Six (6) HPF 4135' - 4140'
(†††2.4 BBLS SQZ'D Away, 9/13/2017)

Six (6) HPF 5110' - 5115'
(†1.6 BBLS SQZ'D Away, 9/11/2017)

Six (6) HPF 6065' - 6070'
(***SQZ'D, Press built to 1200 psi immediately & held 15 min, 9/8/2017)

Six (6) HPF 6467' - 6472'
(unable to get inj. rate, no bleed off, ‡‡‡SQZ'D, press. up to 1500# & held solid, 9/6/2017)

Production Casing
8-5/8" (7.825" ID), BT&C
680' (Stub) - 5669' 36#, K-55
5669' - 7189' 36#, N-80

CMT'D w/ 1004 CF (1st Stage)
+ 911 CF thru Stage Collar @ 2988'
(2nd Stage), No CMT Returns to Surface (2nd Stage)

7189'

Inner Liner (4/14/1986)
2-3/8" (1.995" ID), 4.7#, J-55
7272' - 7474'

7272'

7-5/8" Hole (7190' -7515')

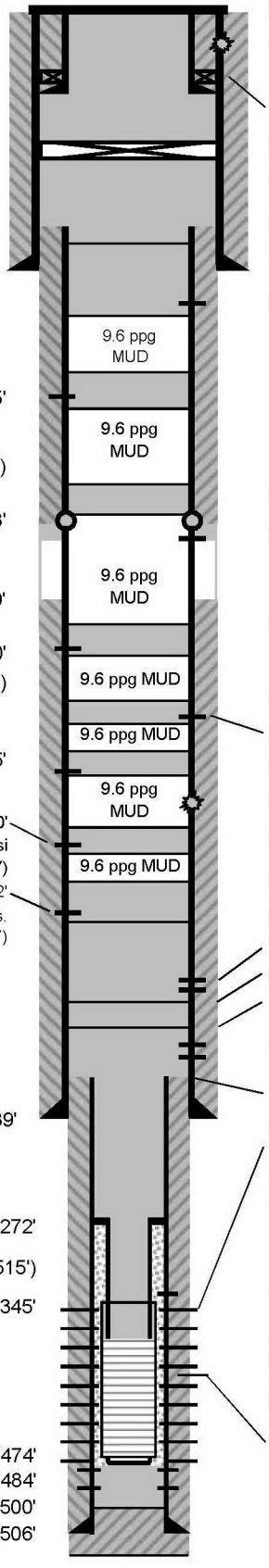
7345'

CMT'D Liner
6-5/8" (5.791" ID), 27.65#, K-55, SFJ
7145' - 7506'

CMT'D w/ 125 SKS* + 25 SKS CMT SQZ'D Away thru TOL

7474'
7484'
Top of CMT 7500'
7506'

TD 7515'
TVD (7271')
Directionally Drilled: Yes (TD is 1134' W, 793' N of Surf)



Surface - 376' CMT Plug (376 CF)
36' Hole in 13-3/8" CSG
(9/25/2018, ‡‡‡CMT'D)

76' Top of 9-5/8" Swell Packer

376' - 385' Inflation Packer (2/7/2019)
385 - 700' CMT Plug
(577 CF in 2 Stages, C/O f/ Surface)
680' 8-5/8" CSG Stub & ETOC (2nd Stage)
700' - 821' CMT Plug
(9 BBLS Down SQZ'D‡‡)
800' - 805' Shot Holes (Negative Inj. rate,‡‡SQZ'D, 9/18/2017)

1506' - 1645' CMT Plug (9 BBLS Down SQZ'D‡)

2814' - 2980' CMT Plug (9 BBLS)

2990' Four (4) 1/2" Holes (44 SKS CMT SQZ'D Away, 9/11/1975 + 105 SKS CMT SQZ'D Away, 5/31/1977 + Calc'd 21 CF SQZ'D Away, 8/11/2016)

4018' - 4150' CMT Plug (7.5 BBLS Down SQZ'D†††)

4721' - 4844' CMT Plug (50 CF/38 SKS Down SQZ'D††)

4829' - 4834' Six (6) HPF (††1.6 BBLS SQZ'D Away, 9/12/2017)

5001' - 5123' CMT Plug (50 CF/38 SKS Down SQZ'D†)

5741' - 5780' CSG Leak (Calc'd 28 CF SQZ'D Away, 8/10/2016)

5904' - 6087' CMT Plug (61 CF/34 SKS SQZ'D***)

6222' - 6506' CMT Plug (62 CF/34 SKS SQZ'D‡‡‡)

6506' - 6941' CMT Plug (172 CF/95 SKS, 8/20/2016)

6930' - 6932' Eight (8) 0.44" Holes (8/19/2016, CMT'D Off by Plug)

6941' - 7006' CMT Plug (34 CF/19 SKS, 8/18/2016)

7006' - 7409' CMT Plug (90 CF/50 SKS, SQZ'D, 4/5/2013)

7104' Four (4) 1/2" Holes (Co. WSO, 135 SKS CMT SQZ'D, 7/5/1977)

7122' Four (4) 1/2" Holes (WSO, 12/3/1972, See Notes**)

7145' TOL & TOC (See Notes**)

6-5/8" Perfs:
7345' - 7385', 7400' - 7474' Eight (8) 0.41" HPF (4/9/1986)
7345' - 7350', 7372' - 7376', 7400' - 7406', 7415' - 7422', 7428' - 7430', 7433' - 7464', 7467' - 7473', 7476' - 7484' Four (4) 1/2" HPF (12/12/1972)

7328' Four (4) 1/2" Holes (Co. WSO, 12/10/1972)

2-3/8" Perfs:
7333' - 7473' 0.006" WWS
Gravel Packed w/ 78 SKS 40-60

7409' C/O Fill (4/4/2013)

7474' - 7500' CMT Plug (2/19/1973)

Operator: So. California Gas Co.
Work Order #: 92873
Lease: Fernando Fee
Field: Aliso Canyon
Status: Abandoned Gas Storage
3000TDS: ±800' (±800')
10000TDS: 4119' (4099')

Ground Elevation: 1995' asl
Datum to Ground: 15' KB
Spud Date: 11/10/1972
Completion Date: 12/14/1972
Abandonment Date: 2/14/2019

Junk: None

Notes

*Partial to full circulation while displacing CMT.

**8-5/8" Shoe leak confirmed 6/2/1977. Milled top of 6-5/8" liner f/ 6998' to 7145' and CMT SQZ'D WSO holes @ 7122' on 6/28/1977 w/ 90 SKS + 38 SKS Away

Holes found in 6-5/8" Liner between 7145' - 7240' in 7/2008

Geologic Zone Markers	md	(tvd)
PGS	1629'	(1628')
A1	4119'	(4099')
A36	4829'	(4788')
UP	5099'	(5041')
LP	5517'	(5420')
UDA1	5858'	(5726')
MDA	6469'	(6297')
LDA	6764'	(6571')
MP	6935'	(6730')
S1	7221'	(6997')
S4	7343'	(7110')
S8	7414'	(7177')
S10	7460'	(7220')
S12	±7489'	(±7247')

Prepared by: CAM (5/3/2016)
Updated by: CAM (4/4/2019)
InterAct

Ex. I - 33

Elevation: 2505' G.L.
KB: 12'
MV: 23'

IW-74

Surface choke: _____

Casing flow string

6/6/73 - Well spud
7/15/73 - Well completed
6/23/76 - 7/3/76 Cleaned out to 7392', ran 2-7/8" tbg with SSSV
8-7-81 - 8-13-81 - Repaired leaking casing patch. Set Pengo 8 5/8" patch @ 2726' - 2773'.

NOTE: Stage collar @ 2793' by original measurement. Later CCI located same @ 2749'.

13-3/8" 48# H40

797'

8 5/8"pengo patch

2726'

Stage Collar 2793'

2773'

2-7/8" 6.5# N-80 EUE tbg

--7338' Otis 2-1/2" SSSV (7268') 2.313" ID

8-5/8" 36# csg
0-5910' K55
-7525' N80

--7368' Otis "XN" No-Go 2.205" x 2.313" (7297')

pkr 7384' -

— x-over 3 1/2" 7379'

--7390'

lnr 7392'

WSO 7500'

7525'

--S4 7525' (7454')

--S8 7583' (7511')

276 cu ft
6-9 gravel
in 14" hole

--HZ 7705'

--Frew 7760' (7686')

6-5/8" 28# K-55 with 30 mesh slots

7932' TD (SS - 5351')

--7992' (7917') (-5400')

WELL VOLUME

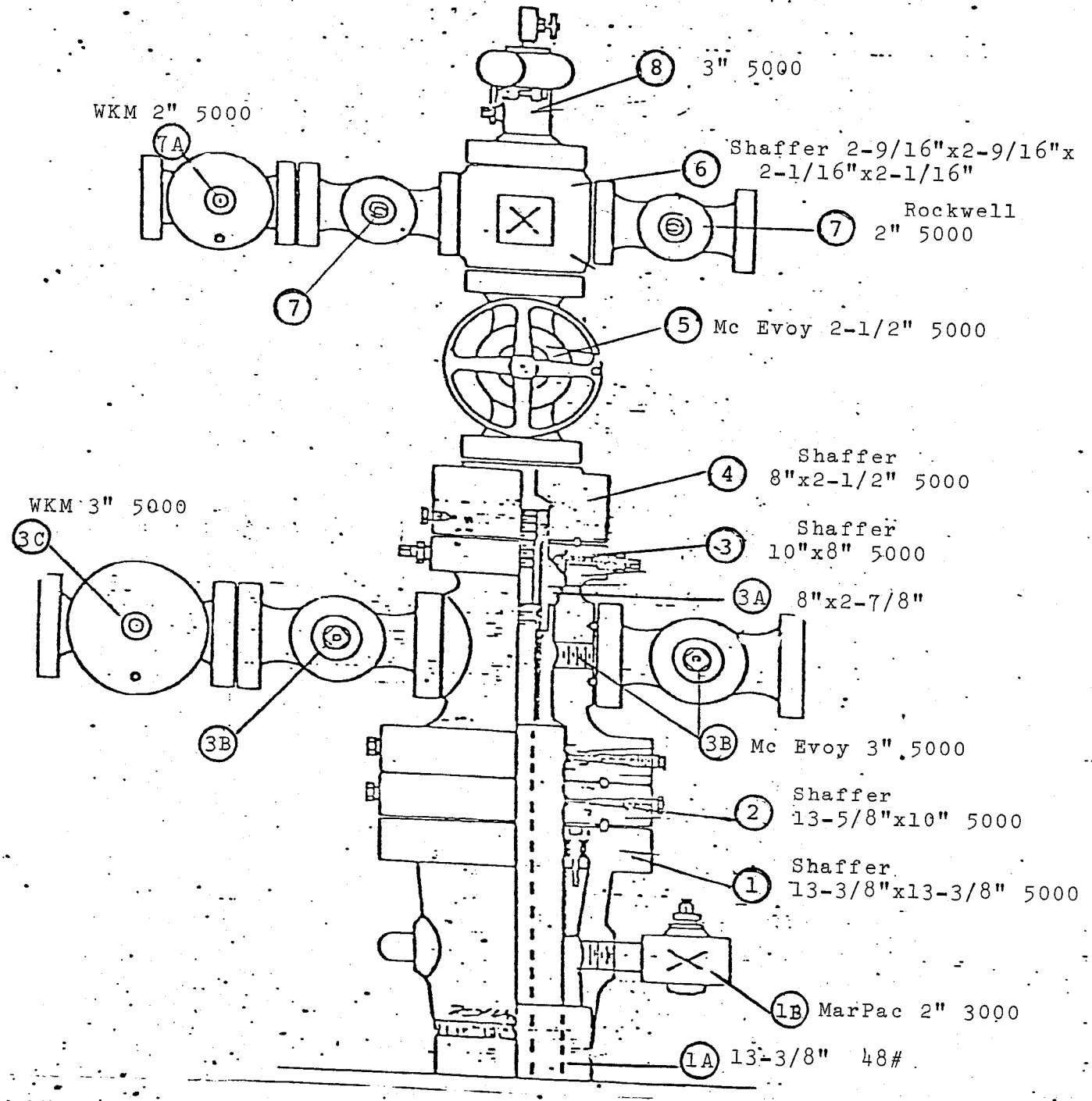
	Cu.Ft.	Bbl.
Tubing	240	43
Csg/Lnr.	99	18
Annulus	2133	380

5/30/85

AC_CPUC_0080244

SoCalGas-5.0854

TYPE IV



Well Name: IW 74 - Aliso Canyon

Mfgr.: Shaffer

Date Prepared: 11-30-82

WELLHEAD DESCRIPTION

Well No. IW - 74

Field. Aliso

Date Prepared. 3-19-81

Wellhead Mfgr. Shaffer

1. Casing Head. Shaffer Size. 13-5/8" x 13-3/8" 5000 Type. KD SOW

   Slips & Pack-off. 13-5/8" x 8-5/8" KD

   A. Surface Csg. Size. 13-3/8" Wt. 48# Grade. H-40

   B. Casing Head Valve Maypac Size. 2" 3000 Fig.No. CSB-790-JN

2. Seal Flange. Shaffer Size. 13-5/8" x 10" 5000

   A. Type Seal. PS-63 L.S. Ring. B-160 & R-54

3. Tubing Head. Shaffer Size. 10" x 8" 5000 Type. 55-63 L-1

   Ring. R-54 & Ring. R-50

   Outlets. 2 - 3" Sec. Seal. Lock screw

   Valve Removal Thrd. 2-1/2" line pipe

   A. Tubing Hanger. Shaffer Size. 8" x 2-7/8" Type. AJO

   B.P.V. Size. 2-7/8" Thrd. 4 LH

   B. Tubing Head Valves. Mc Evoy Size. 3" 5000 Fig.No. 21055

   C. Automatic Csg. Valve. WKM Size. 3" 5000 Fig.No. 114522

4. Adapter Seal Flange. Shaffer Size. 8" x 2-1/2" 5000 Type. AJO

   A. Ring Size. R-50 & R-27

5. Master Valve. Mc Evoy Size. 2-1/2" 5000 Fig.No. 129

6. Xmas Tree Cross. Shaffer Size 2-1/16" x 2-1/16" Bore 2-1/2" x 2-1/2" Thru. 2-1/2" Across. 2-1/16"

7. Tubing Wing Valves. Rockwell Size. 2" 5000 Fig.No. 21055

   A. Automatic Tbg. Valve. WKM Size. 2" 5000 Fig. No. 110261

8. Unibolt Size 2-1/2" x 3" x 3-1/8" 5000 Inside Thrds. 2-7/8" EUE

9. Wt. Landed in Csg. Head. 270,000 Wt. 36# Grade. K-55 Butt. 8-5/8"

10. Wt. Landed on Doughnut. 34,000 Wt. 6.5 Grade. K-55 2-7/8"

11. Tubing Head to Ground Level. Above 5.20 Below

AC_CPUC_0080246

SoCalGas-5.0856

JN 2 9 1981

MISCELLANEOUS WORK ORDER

M.W.O. NO. 99950

DIVISION No. Basin DEPT. Underground Storage ORG. CODE KZ DATE 6-22-81

THIS M.W.O., WHEN PROPERLY APPROVED, WILL AUTHORIZE A DIRECT EXPENDITURE OF $ 90,000

Aliso Canyon - IW 74 - Storage Well

REASON FOR REQUEST To repair leaking cement stage collar by installing a Pengo casing patch. Rerun tubing with existing safety system and return well to operation.

ESTIMATE OF DIRECT COST	AMOUNT	
Material	17,000	00
Contract	73,000	00
TOTAL ESTIMATED DIRECT COSTS	90,000	00

%	ACCOUNT	AMOUNT	
100	26280.5	90,000	00

TO BE BILLED TO: (INCLUDE ADDRESS OF BILLEE)

PLANT ACCOUNTING APPROVAL:

REMARKS:

REQUESTED BY:	PREPARED BY:	EXAMINED & APPROVED BY:	
J. W. Tenfelder	P.D. Yu	D. Guire	

MANAGEMENT APPROVALS

SOUTHERN CALIFORNIA GAS CO.—3045B

RECEIVED
JUL 03 1981
TIME_____UGS

SOUTHERN CALIFORNIA gas COMPANY

INTEROFFICE CORRESPONDENCE

Diets/mlw 6/23/81

TO Mr. J. W. Tenfelder FROM G. C. Abrahamson GCA DATE 6-11-81

SUBJECT Program, material request, budget cost estimate and DOG NOTICE to repair stage collar leak at IW #74, Aliso Canyon.

Please find attached a program to repair leak through stage collar at 2793' in IW #74 at Aliso Canyon. The well files show the following current conditions in this well: 13-3/8" cemented 797', 8-5/8" cemented 7525', WSO 4-1/2" holes at 7500', stage collar 2793', 540' 6-5/8" landed 7932', slotted 7932'-7392' and gravel flow packed with 276 cu. ft. of gravel.

We propose to pull tubing and clean out to packer at 7370'. We will locate stage collar at 2793' with collar locator. Set casing patch over stage collar. Run tubing changing to chamfered collars below casing patch. Re-land tubing with Otis safety system that is now in the well.

The DOG NOTICE was sent under separate cover for your handling.

We have estimated 16 - 8 hour tours, 9 calendar days and a total MWO cost of $90,000 for the proposed work.

If you desire any changes in the material presented, please advise.

64-D

WORKOVER PROGRAM

OPERATOR: Southern California Gas Company

FIELD: Aliso Canyon

WELL: IW #74

CONTRACTOR: To be selected

APPROXIMATE LOCATION: From station #84, 580.31'S and 3307.11'W

ELEVATION: Ground level 2505'. Take all measurements from original Kelly bushing, 12' above ground level

SAFETY: Hard hats are to be worn by all personnel on or near a rig. No smoking is permitted within 100' of the wellhead.

PRESENT CONDITIONS:

13-3/8" 48# H-40 cemented 797'
8-5/8" cemented 7525', WSO 4-1/2" holes at 7500' stage collar 2793'.

Detail:

0-5910' 36# K-55
5910'-7525' 36# N-80

540' 6-5/8" 28# K-55 landed 7932', slotted 7932'-7392'. Gravel flow packed with 276 cu. ft. of 6 - 9 gravel in 14" hole.

TUBING DETAIL:

Otis 8-5/8" Permatrieve packer 7370'
2-7/8" tubing landed 7378'
Otis production tube
Otis 4 seals
Otis latch-in-locator
Otis 10' blast joint
Otis 1.791" NO-GO nipple
Otis 20' blast joint
Otis 2-7/8" annular flow safety system

Gas leak is reported through stage collar at 2793'.

PROGRAM:

1. Move in and rig up with Baker tank.

2. Kill well with 74#/cu. ft. HEC polymer completion fluid. Pump down tubing at about 3 bbls per minute and bleed off gas to Gas Company system. Obtain assistance from Aliso Canyon shift foreman when killing well. Volume of well = 500 bbls.

3. Install back pressure valve in doughnut and remove xmas tree. Send tree in for inspection and repairs.

4. Install H&H oil tool 8" 5000 psi Class III BOPE. Equipment to include 2-7/8" pipe rams, blind rams and Hydril bag with 80 gallon 1500 psi accumulator with remote stations and auxiliary nitrogen. Also install 8" 5000 psi spool with choke and kill line with a check valve. Choke manifold to be connected to the Gas Company system with block valve and bleeder as well as connections to Baker tank. Kill line to be connected to contractor's mud pump. Use all steel lines. Use new API rings on all untested BOPE connections.

5. Pressure test pipe rams and complete shut-off rams to 4000 psi with water. Pressure test choke manifold to 4000 psi with water. Pressure test Hydril bag to 3000 psi with water. The Division of Oil and Gas to be given sufficient notice to allow a witness to be present.

6. Unlatch from packer and pull 2-7/8" tubing. Lay down Otis production equipment. Otis to pick up equipment and clean, inspect and pressure test for reuse in this well. Run 7-5/8" bit and casing scraper and clean out to packer at 7370'.

7. Run collar locator and locate stage collar now reported at 2793'. Set "Pengo" casing patch over stage collar from 2773'-2813'. Adjust depth of patch according to collar locator.

8. Run 2-7/8" tubing with locator and two seals. Set 10,000# on packer. Close pipe rams and pressure test seals and packer to 1500 psi. Keep tubing full and observe for returns. Change to chamfered collars below casing patch.

9. Rerun tubing applying Baker seal, drifting and hydrotesting to 5000 psi holding each test for 1 minute.

Tubing to Include:

Otis production tube
Otis 3 seals
Otis latch-in-locator
Otis 10' heavy wall tube
Otis 2.205" NO-GO nipple
Otis 20' heavy wall tube
Otis 2-7/8" annular flow safety system

10. Space out and land tubing on packer with up to a maximum of 10,000#. Pull 30,000# over weight of tubing to check latch.

11. Set back pressure valve in doughnut. Remove BOPE and install xmas tree. Pressure test xmas tree at 5000 psi with oil for 20 minutes.

12. Circulate polymer completion fluid out of well with waste salt water. Tighten all wellhead bolts. Check all wellhead valves closed. Install blind flanges on all wellhead valves. Release rig.

GCA

G. C. Abrahamson
6-11-81

Approved: J. W. Tenfelder

cc: Rig Supervisor
Relief Rig Supervisor
Contract Pusher (2)

Kern Guppy
M.E. Melton
J.W. Tenfelder

Well File

Ex. I - 34

Due to the large file size, this exhibit is an excerpt. The native file of this document is available upon request.

DOGGR Dist2@DOC

From: Kroh, Jovy E <JKroh@semprautilities.com>
Sent: Wednesday, May 3, 2017 3:24 PM
To: DOGGR Dist2@DOC
Cc: Iguaz, Jose; McMahon, Thomas D.
Subject: 03721357 Rework Porter 26B
Attachments: 03721357_Rework_05-03-2017.pdf

Hello,
Please see attached NOI to rework Porter 26B.
I will be out on leave starting May 15, returning June 13. During this time Jose Iguaz (661-384-5337 / 818-700-3889) will be the main contact for this well.

Thanks,
Jovy

Jovy Kroh
Southern California Gas Company
Sr. Gas Storage Field Engineer
Direct: 818-725-1119
Cell: 937-239-0279

SoCalGas-5.0866

DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

CHECK LIST-RECORDS RECEIVED AND WELL STATUS

Operator: **Southern California Gas Company** WELL DESIGNATION **"Porter" 26B**

API No. **03721357** SE **28** T: **3N** R: **16W** , **SB** B. and M.

County: **Los Angeles** FIELD: **Aliso Canyon**

Type of Notice: **Supplementary** **Date** **6/20/2017** **Report Number:** **P217-0188**

RECORDS RECEIVED (ATTACH PAGES IF REQUIRED)

	Date	OK	NEED	Remarks
Well Summary (OG100)				
History (OG103)				
E-Log				
Mud Log				
Dipmeter				
Directional				
Core and/or SWS				

NEW STATUS

DATE: _____

NOTICE OF RECORDS DUE

DATE: _____

DATE: _____

DATE: _____

DATE: _____

WELL STATUS INQUIRY

DATE: _____

DATE: _____

Well Stat

Change Required: _____

Change Done: _____

ABANDONMENTS/REABANDONMENTS/DRILLS/REDRILLS

CalWims Abandonment Form: _____ SURFACE INSPECTION NEEDED _____ COMPLETED _____
Date and inspector

FINAL LETTER NEEDED _____ COMPLETED _____ Calwims DRILL/REDRILL Form _____
(Date)

ENGINEER'S CHECK LIST

T-REPORT(S) _____ OPERATOR'S NAME _____ WELL DESIGNATION _____ SIGNATURE _____

Calwims Location _____ Calwims ELEVATION: _____ CONFIDENTIAL RELEASE DATE: _____ PERMIT REQUIREMENTS MET _____

CLERICAL CHECK LIST

LOCATION CHANGE (OG165) _____ ELEVATION CHANGE (OG165) _____ RELEASE OF BOND (OG150) _____

REMARKS

RECORDS SCANNED: _____
(Date)

RECORDS APPROVED: _____
(Date and Engineer)

Modified OGD2

AOR Datbase _____

I 'RAL RESOURCES AGENCY OF CALIFORNI
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS & GEOTHERMAL RESOURCES
1000 S. Hill Rd, Suite 116 Ventura, CA 93003 - 4458

No. P 217-0188

Old	New
010	010
FIELD CODE	
00	00
AREA CODE	
30	30
POOL CODE	

PERMIT TO CONDUCT WELL OPERATIONS

GS Rework-Return to Production/Injection
"Sesnon-Frew" - Modelo (Miocene-Eocene) Formation

Ventura, California
June 22, 2017

Roberto (Bob) Dentici, Agent
Southern California Gas Company (S4700)
555 West 5th Street, ML 17G4
Los Angeles, CA 90013

Your **Supplementary** proposal to **REWORK** well **"Porter" 26B**, A.P.I. No. **037-21357**, Section **28**, T. **03N**, R. **16W**, **SB** B. & M., **Aliso Canyon** field, **Any** area, **Sesnon-Frew** pool, **Los Angeles** County, dated **6/20/2017**, received **6/20/2017** has been examined in conjunction with records filed in this office. (Lat: **34.315720** Long: **-118.557310** Datum:**83**)

THE PROPOSAL IS APPROVED PROVIDED:

1. Blowout prevention equipment, as defined by this Division's publication No. M07, shall be installed and maintained in operating condition and meet the following minimum requirements: Class **III 5M** on the **8 5/8"** casing or lubricator for wireline work.
2. Hole fluid of a quality and in sufficient quantity to control all subsurface conditions in order to prevent blowouts shall be used.
3. Blowout prevention practice drills are conducted at least weekly and recorded on the tour sheet. A practice drill may be required at the time of the test/inspection.
4. Clean out of the well shall be run from surface to **7932'** or as deep as possible.
5. A **Cement Bond Log** and **Gyro Survey Log** shall be run on the **8 5/8"** casing from ±7932' or as deep as possible.
6. A **Casing Wall Thickness Inspection, Ultrasonic Imaging Tool, Cement Bond Log,** Neutron Log, **Magnetic Flux log,** and **Multi-Arm Caliper Inspection** shall be performed on the **6 5/8"** inner string from shoe to surface to demonstrate that the casing has integrity after installation.
7. The new **6 5/8"** inner string shall be cemented from shoe to **2526'.**
8. The depth of each critical zone present in this well location are: **800', 4255', 4829', 5251', 5560', 5660', 6348', 6608', 7110', 7391', 7468', 7583', 7677'** and **7760'.**
9. Perforation and squeeze operations shall be conducted in the **8 5/8"** casing before installation of the **6 5/8"** inner string based on a review of the **Cement Bond Log.**
10. If perforating and squeeze operations are conducted, the perforation operations shall by performed as follows: **5' long, 4 shots per foot,** and with **90°** phasing and shall be located in a permeable part of the formation, within **25'** from the top of the critical zones. A calculated minimum of **150'** linear in the annular space shall be squeezed.

Continued on Next Page

Blanket Bond Dated: 7/6/1999
UIC Project No. 0100006
cc:

Engineer Chris Alcock
Office (805) 654-4761

Kenneth A. Harris Jr.
State Oil and Gas Supervisor

By _____
Patricia A. Abel, *District Deputy*

CAL/cal

A copy of this permit and the proposal must be posted at the well site prior to commencing operations. Records for work done under this permit are due within 60 days after the work has been completed or the operations have been suspended. Issuance of this permit does not affect the Operator's responsibility to comply with other applicable state, federal, and local laws, regulations, and ordinances.

OG111 (revised 6/2011)

11. During squeeze operations, pressure during the squeeze operation shall not exceed fracture gradient.
12. Before the inner **6-5/8"** casing string is run and cemented, the **8 5/8"** casing shall be pressure tested from the **6 5/8"** liner top at **7372' to 7300'**.
13. ****Step 17 of the submitted NOI states the operation to place gravel in the 6 5/8" liner. The placement of gravel in the lower portion of the 6 5/8" liner shall not be allowed.**
14. Pressure testing shall be conducted to demonstrate the mechanical integrity of the **2 7/8"** bottom hole assembly.
15. A Temperature and Noise log are run on the well from the packer to surface.
16. Pressure testing shall be conducted to demonstrate the mechanical integrity of the **6 5/8"** inner string.
17. Injection shall be through tubing and packer only. Injection or withdrawal through the casing is not permitted.
18. In all other respects, the provisions of Division Order #1109 and its amendments shall remain in effect.
19. This office shall be contacted by phone prior to making any program changes and no changes are made without Division approval.
20. **THIS DIVISION SHALL BE NOTIFIED TO:**
    a. Inspect the installed blowout prevention equipment prior to commencing **downhole** operations.
    b. Witness the perforating operations determined to be necessary after **CBL** evaluation.
    c. Witness any remedial cement squeezes thru perforations, if necessary, as a result of the casing log evaluation.
    d. Witness a pressure test of the **8 5/8"** casing between the bridge plug and the packer to **3625 psig** for 60 min.
    e. Witness a pressure test of the **6 5/8"** inner string to **3625 psig** for 60 min.
    f. Witness a pressure test of the **6 5/8"** casing to **1,000 psig** and the tubing to 3,700 psig.

NOTE:

1. The base of the freshwater zone is at **800'±**.
2. No operation shall be undertaken or continued that will contaminate or otherwise damage the environment.
3. Please contact this office if the **Cement Bond Log** proposed in Step 6 of the program as soon as possible to make adjustments to the cementing program.
4. This permit is being issued as part of Division Order No. 1109 dated March 4, 2016. Any well that fails any of the testing must be taken out of service and isolated from the storage reservoir pursuant to the Safety Review Testing Regime.
5. The required History of Oil or Gas Well (OG103) shall include a complete description of the required pressure testing. **An updated casing and tubing diagram shall be included with the well history.**
6. **A Well Summary Report (Form OG 100)** and **Well History (Form OG 103)** shall to be submitted to the Division within 60 days after the well is drilled, reworked, plugged and abandoned, or if the work is suspended. Any additional well work will require an additional notice to be submitted to this office prior to resuming well operations.

Enclosure: Attachment 1 to DOGGR Order 1109. Safety Review Testing Regime for the Aliso Canyon Natural Gas Storage Facility

ATTACHMENT 1
TO DOGGR ORDER 1109

SAFETY REVIEW TESTING REGIME
FOR THE ALISO CANYON NATURAL GAS STORAGE FACILITY

This document identifies the requirements of this comprehensive safety review that shall be completed by the Southern California Gas Company (Operator) and verified by the Department of Conservation, Division of Oil, Gas, and Geothermal Resources (Division). The Operator shall use accepted industry practices and procedures.

The Division has consulted with independent technical experts from the Lawrence Berkeley, Lawrence Livermore, and Sandia National Laboratories ("National Laboratories") to develop the requirements of this facility safety review. The National Laboratories experts independently reviewed and concurred with the testing requirements for the safety review detailed below.

This comprehensive safety review requires that each of the active injection wells in the Aliso Canyon Storage facility either pass a thorough battery of tests in order to resume gas injection or be taken out of operation and isolated from the underground gas storage reservoir. Several steps, detailed below, are required in this safety review. Documentation of all testing required under this comprehensive safety review shall be provided electronically to the Division within 72 hours of completion of a test in digital (i.e. LAS) and printed (i.e. pdf) form. All pressure tests required under this comprehensive safety review shall be witnessed by Division staff. A well that is properly plugged and abandoned in accordance with Public Resources Code section 3208 is not subject to testing under this comprehensive safety review. A well that does not pass all tests must be repaired, retested, and pass all tests, or be plug and abandoned.

REQUIRED TESTS FOR EACH WELL IN THE FACILITY

Step 1: The Operator shall perform an initial casing assessment on the well consisting of temperature and noise logs.

a. Temperature Log:
A temperature survey shall be run from the surface to the packer to measure the temperature within the wellbore. A temperature survey that demonstrates no unexplained anomalous temperature changes in the well is one indication of casing integrity.

b. Noise Log:
An acoustic sensor survey capable of detecting the sound of fluid flow will be conducted the length of the well above the packer to the surface. The survey will include stops at least every 250 feet and at the midpoint of any anomaly detected by the temperature survey. The absence of anomalous sound above the packer is an indication of well integrity

SoCalGas-5.0870

Step 2: The results of the Temperature Logs and Noise Logs will be independently reviewed by Division engineers. Any unexplained abnormal findings in this set of tests shall be addressed by the Operator in one of the following ways:

a. Conduct further investigation and demonstrate to the Division's satisfaction that the abnormal finding is not an indicator of a lack mechanical integrity;
b. Remediate the well to the Division's satisfaction; or
c. With Division review and approval, remove the well from operation and isolate the well from the underground gas storage reservoir in accordance with Steps 4b through 7b below.

Necessary actions to remediate any abnormalities revealed by these tests will be reviewed by Division engineers. Once repairs or mitigations are completed, the Temperature Log and Noise Log must then be repeated on the well and reviewed by Division engineers to ensure that there are no additional abnormal test results and to confirm the issue was repaired.

Step 3: After these tests are completed on the well, and all required action has been completed, the operator shall either:

a. Conduct the additional tests and evaluations on the well, outlined in Steps 4a through 7a below, in order to gain approval for injecting gas through that well; or
b. Remove the well from operation and isolate the well from the underground gas storage reservoir in accordance with Steps 4b through 7b below.

REQUIRED TESTS IF A WELL IS INTENDED TO RESUME OPERATIONS

If Temperature and Noise Logs have been completed on a well and they indicate well integrity, and the Operator designates the well to return to injection operations, then the Operator shall perform the additional testing outlined in Steps 4a through 7a. The results of these tests will be independently reviewed by Division engineers and posted publicly. Each of the following tests requires that the production tubing be removed from the well.

Step 4a: The Operator shall conduct a **Casing Inspection log.**
The Operator shall conduct a Casing Inspection log of the well that measures the thickness of the production casing, from the surface to the bottom of the gas storage reservoir cap rock. If the Inspection reveals a reduction in wall thickness, the current minimum strength of the casing will be calculated. If the current minimum strength of the casing has diminished to the point that it cannot withstand authorized operating pressures for the well plus a built-in additional safety factor of pressure, the well has failed this test. *A passing test for a casing inspection log would show no thinning of the casing that diminishes the casing's ability to contain at least 115% of the well's maximum allowable operating pressure as authorized in the current Project Approval Letter.*

Step 5a: The Operator shall conduct a **Cement Bond Log** for the well.
The Operator shall conduct a Cement Bond Log (CBL) that measures the bonding between cement and the production casing of the well, and also the bonding between the annular cement and the formation. Cement should be solidly bonded to both the well's production casing and the geologic formation to ensure a seal that prevents fluids from migrating up or down the outside of the well. *A passing test for a cement bond log shows definitive bond, as demonstrated by sonic waveform,*

SoCalGas-5.0871

between cement and casing and between cement and the gas storage formation and/or cap rock for at least 100 feet above the top of the gas storage reservoir.

Step 6a: The Operator shall conduct a **Multi-Arm Caliper Inspection** of the well. The operator shall conduct an inspection that measures any internal degradation or significant changes to the well's geometry from the surface to the top of the gas storage reservoir, using a minimum 32-arm caliper tool. If the inspection reveals a thinning or deformity of the casing, the current strength of the casing will be calculated. If the current strength of the casing has diminished, such that it cannot withstand authorized operating pressures plus a built-in safety factor of additional pressure, the well fails this inspection. *A passing test for a Multi-Arm Caliper Inspection would show no deformation or thinning of the casing that diminishes the casing from being able to properly contain at least 115% of each well's maximum operating pressure.*

Step 7a: The Operator will conduct a **Pressure Test** of the production casing and of the well once the production tubing has been reinstalled. The Operator may conduct the casing pressure test prior to reinstalling the production tubing. Using a digital recorder, the operator will conduct a liquid-filled positive pressure test within the production tubing of the well, and in the annular space between the production tubing and the casing, to determine the well's ability to withstand normal operating pressures. The production tubing will be isolated and then pressure tested. The annular space between tubing and casing will be pressure tested. This testing also evaluates the integrity of any packers, which seal the annular space between the tubing and casing. The pressure test will be one hour and begin at a pressure of 115% of the maximum operating pressure or the minimum yield strength of the casing and tubing, whichever is less. *A passing pressure test is a pressure loss not exceeding 10% for any 30 minute period during the hour long test.*

After conducting the above tests, the Operator will conduct any indicated remediation so that the well can pass these tests. All remediation will be subject to the review of Division engineers. The well would then be required to undergo the tests once again to demonstrate well integrity.

If the well passes the Casing Wall Thickness Inspection, the Cement Bond Log, the Multi-Arm Caliper inspection and the Pressure Test to the Division's satisfaction, then the Division may clear the well for use for gas injections and withdrawal, once the Division has authorized resumption of injection into the gas storage reservoir. As noted below, wells approved for operation will only be permitted to inject or withdraw gas through the production tubing.

REQUIRED ACTIONS IF THE WELL IS TO BE TAKEN OUT OF OPERATION AND ISOLATED FROM THE GAS STORAGE RESERVOIR:

If the operator elects to take a well out of service, then the following steps shall be taken to isolate the well from the gas storage reservoir:

Step 4b: The Operator shall confirm the presence of cement outside the well's external casing in the section of the well that prevents the movement of gas from the underground gas storage reservoir to shallower geologic zones above the gas storage reservoir. Existing cement bond logs and well construction

SoCalGas-5.0872

records may be used to make this confirmation. This confirmation requires concurrence from Division engineers.

Step 5b: The Operator shall install a mechanical seal or "packer" within the well's production casing and install a mechanical plug within the well's production tubing, if applicable. These seals shall be set in place near the bottom of the well, within the portion of the well surrounded by cement. This kind of seal is an industry standard practice for isolating a well from reservoir gases or fluids and will further protect the casing from internal gas pressure.

Step 6b: The Operator shall fill the well with fluid to the well's surface in order to create appropriate downward hydrostatic pressure in the well that further contributes to the integrity of the well seal.

These measures will isolate a well from the underground gas reservoir, as confirmed by National Laboratory experts. Each of the above actions is subject to review and approval by Division Engineers.

Step 7b: Once the Operator has completed steps 4b, 5b, and 6b, and the seal is in place at the bottom of the well and the well is filled with fluid above the seal, the operator shall:

a. Conduct daily gas monitoring at the surface of the non-operational well, including monitoring the area around the well perimeter and in the annular space between the plugged casing string and the outmost casing;
b. Conduct noise log, temperature log and positive pressure test every six months;
c. Conduct weekly monitoring of fluid levels in the well or, install and operate real-time pressure monitors that provide immediate notification to the operator when pressures deviate from normal in the well's interior tubing and its annular space.

The above monitoring shall be reported to Division engineers and maintained as a part of the well file. Division engineers will review all submitted information for evaluation on a regular basis to ensure that the well taken out of service has maintained safety, and the operator shall take all necessary steps maintain the safety of the well.

Any well taken out of operation cannot be approved to resume operations and gas injection until the successful completion of the battery of tests outlined above in Steps 4a through 7a (Casing Wall Thickness Inspection, the Cement Bond Log, the Multi-Arm Caliper Extension and the Pressure Test) is completed. Those tests must be successfully completed within one year of completing step 6b. If a well cannot successfully complete all necessary steps required in this safety review after one year of completing step 6b, then the well shall be properly plugged and abandoned in accordance with Public Resources Code section 3208.

REQUIREMENTS FOR WELLS RESUMING OPERATIONS IN ALISO CANYON

The Division's authorization to resume injection in the Aliso Canyon Storage Facility will be contingent on the successful completion of this comprehensive safety review. The State Oil and Gas Supervisor must confirm in writing that all wells in the facility have either completed and passed the full battery of tests required in the safety review, been taken out of service and isolated from the underground gas storage reservoir, or been properly plugged and abandoned in accordance with Public Resources Code Section 3208.

SoCalGas-5.0873

Ex. I - 35

Well
Porter 26B

API #: 04-037-21357-00
Sec 28, T3N, R16W

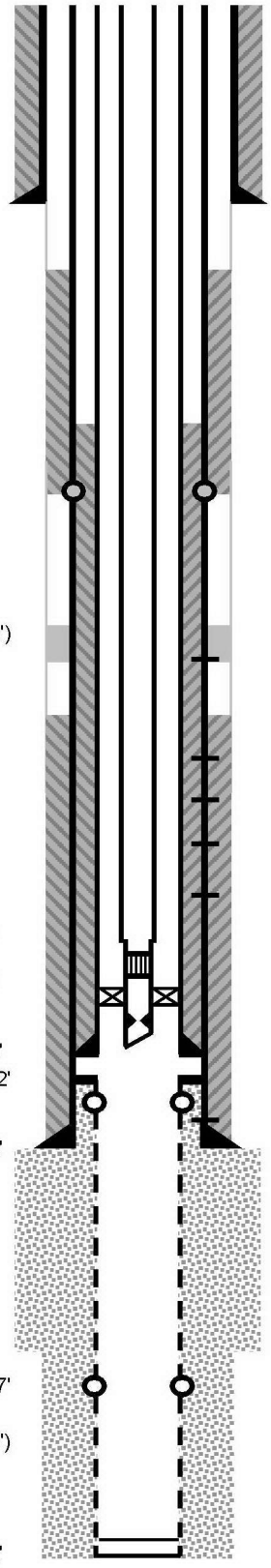
Operator: So. California Gas Co.

Lease: Porter
Field: Aliso Canyon
Status: Active Gas Storage
3000TDS: ±800' (±795')
10000TDS: TBD

Ground Elevation: 2505' asl
Datum to Ground: 12' KB

Spud Date: 6/6/1973
Completion Date: 7/15/1973
Last Rework Date: 8/4/2017

Junk: None



13-3/8" TOC Surface

17-1/2" Hole (to 799')

Surface Casing
13-3/8" (12.715" ID), 48#, H-40, ST&C
0' - 797'
797'
CMT'D w/ 570 CF + 100 SKS,
Good CMT Returns to Surface

6-5/8" ETOC 2609'

Inner Casing (7/18/2017)
6-5/8" (5.921" ID), 24#
0' - 7375'
CMT'D w/ 83 BBLS

11" Hole (799' - 7525')

Production Casing
8-5/8" (7.825" ID), BT&C
0' - 5910' 36#, K-55
5910' - 7525' 36#, N-80

CMT'D w/ 1150 CF + 100 SKS (1st Stg.),
+ 1100 CF thru Stage Collar @ 2793'
(2nd Stg.), No CMT Returns to Surface

7375'
Burns LSA w/ PC below 7392'

7525'

14" Hole (7525' - 7717')

Liner (7/13/1973)
6-5/8" (5.791" ID), 27.65#, K-55, SFJ
7392' - 7932'

Burns PC 7737'

11" Hole (7717' - 7932')

TD 7932' 7932'
TVD (7858')
Directionally Drilled: Yes (TD is 196' W, 893' N of Surf)

Tubing (8/2/2017)
4-1/2" (3.95" ID), 12.6#, Hydril 513
0' - 7290'
3-1/2" (2.992" ID), 9.3#, L-80, Hydril 563
7290' - 7363'

1100' 8-5/8" ETOC (2nd Stage)

Stage Collar @ 2793' (by orig. measurement)
(Later located f/ 2746' - 2749' during collar log run on 8/10/1981)

4174' *8-5/8" ETOC
4250' - 4255' Four (4) HPF (Calc'd 20 CF SQZ'D Away*
+ 7 BBLS SQZ'D Away, 6/29-7/5/2017)
4400' 8-5/8" ETOC (1st Stage)
4819' - 4824' Four (4) HPF (7 BBLS SQZ'D Away, 6/28/2017)
5246' - 5251' Four (4) HPF (7 BBLS SQZ'D Away, 6/27/2017)
5653' - 5658' Four (4) HPF (7 BBLS SQZ'D Away, 6/26/2017)
6604' - 6609' Four (4) HPF (5 BBLS SQZ'D Away, 6/23/2017)
7290' 4-1/2" x 3-1/2" X-Over
7296' Sliding Sleeve (2.813" ID, opens down, closes up)
7340' HES AS1-X PCKR (COE @ 7344', 8/2/2017)
7360' "XN" Nipple (2.75" Profile w/ 2.635" No-Go)
7363' Wireline Re-entry Guide

7500' Four (4) 1/2" Holes (7/6/1973) WSO

Liner Perfs:
7392' - 7523'
2" x 30M, 12R, 6"C SMC Slots
7523' - 7737' & 7760' - 7932'
2" x 30M, 28R, 6"C SMC Slots

Gravel Packed w/
276 CF (92% of Calc'd) 6-9

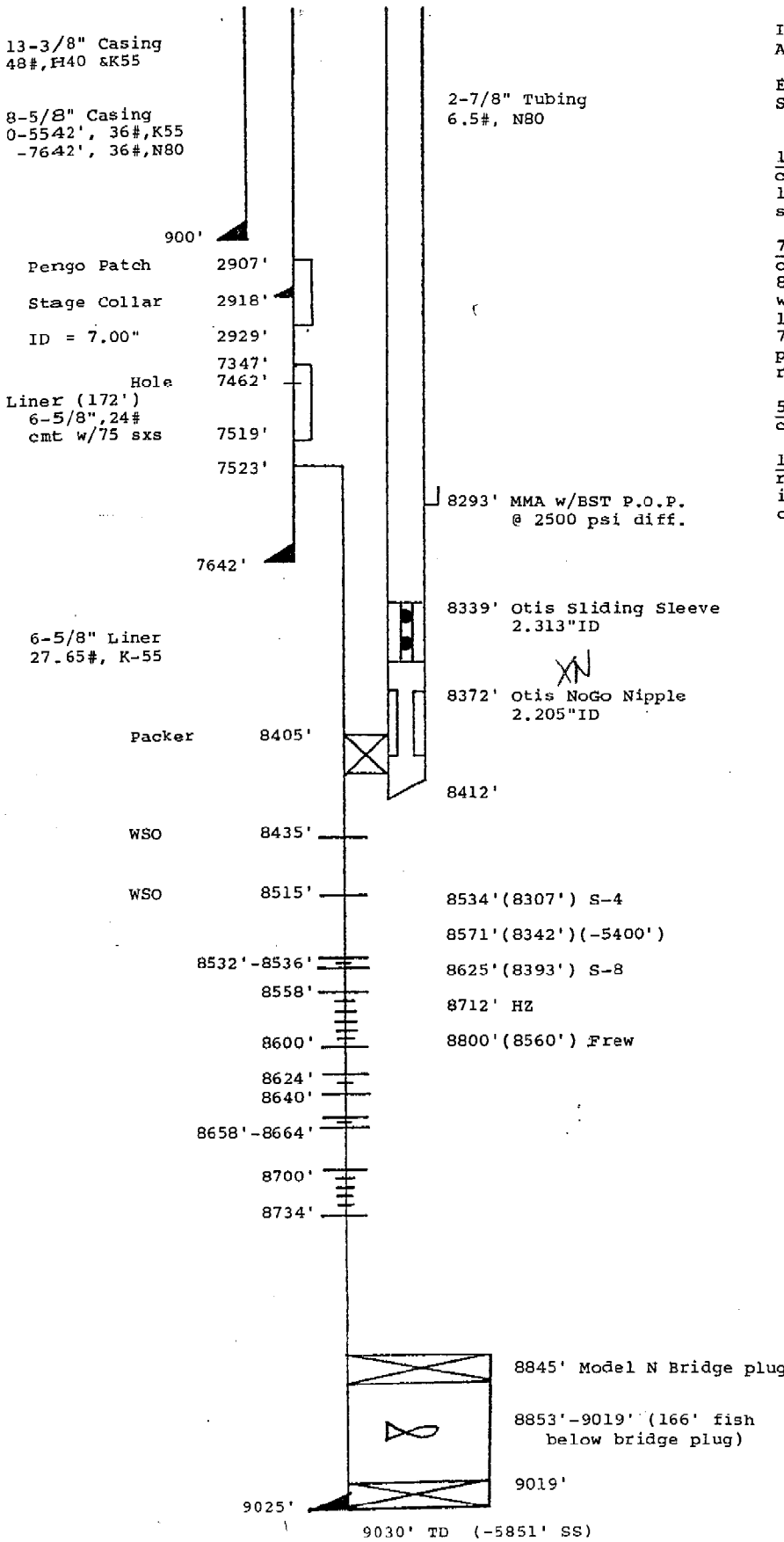
7922' Cleaned out (7/27/2017)

Top of Zone Markers	md	(tvd)
MPupth	4255'	(4222')
A36	4829'	(4793')
UP	5208'	(5170')
LP	5560'	(5520')
UDA1	5660'	(5619')
MDA	6348'	(6299')
LDA	6608'	(6555')
MP	7110'	(7048')
S1	7391'	(7323')
S4	7468'	(7399')
S8	7583'	(7512')
S14	7677'	(7605')
FREW	7760'	(7687')

Prepared by: MAM (5/27/2016)
Updated by: LD (5/16/2018)

InterAct

Ex. I - 36



IW-77
ALISO CANYON FIELD

Elevation: 2927'GL, 15' KB, 13' MV
Status: Injection/Withdrawal Well
Casing flow string

1/13/73-2/25/73: Well drilled and completed. 128' of drilling assembly left @ 7728'-7956' and 7818'-7956', side tracked and cemented.

7/23/76-11/12/76: Cleanout to top of fish @ 8853', set bridge plug @ 8845' to abandon fish and bottom of well, ran and cmtd 172' of 6-5/8" liner to patch hole in casing @ 7462', ran Gearhart-Ownes casing patches 2878'-2910', 2911'-2953' and ran tubing w/SSSV.

5/5/80-6/16/80: Repair gas leak in caprock.

11/21/86-12/4/86: Workover to remove leaking casing patches and installed new casing patch over stage collar.

Volumes

	CuFt	Bbl
Tubing	274	49
Csg/liner	78	14
Annulus	2270	404
Totals	2622	467

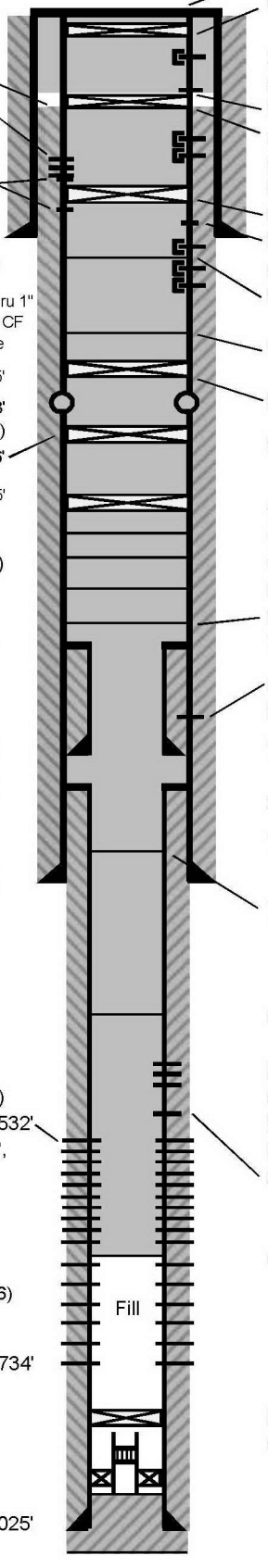
JDM:hs
4/29/87

AC_CPUC_0000018
AC_BLD_0015544
SoCalGas-5.0877

Ex. I - 37

Well
Standard Sesnon 25B ST2

API #: 04-037-21323-02
Sec 28, T3N, R16W



Cut CSG 6' BGL & Welded on Plate
13-3/8" TOC Surface
CIBP (COE @ 56', 2/1/2019) 55'
17-1/2" Hole
8-5/8" ETOC (2nd Stg.) 562' (‡Calc'd)‡‡
Four (4) 0.5 HPF 799' - 804'
(no comunication or flow, 1/17/2019)
0.43" GSX Deep Penetrating Charges 806' - 811'
(¥¥¥14 BBLS Hyd. SQZ'D Away, 1/18/19)
8-5/8" CSG Cut 810' & 820'
(unable to recover, 1/10-11/2019)

Surface Casing 900'
13-3/8" (12.715" ID), 48#, K-55, ST&C f/ 0' - 900'

CMT'D w/ 700 CF* + Top Job in 3 stages (171 CF thru 1" pipe @ 75' + 100 SKS (Class "G", 3% CaCl2) + 189 CF of ready mix pea gravel, 2% CaCl2), CMT to Surface

CMT Ret./CIBP (COE @ 2797', 12/28/2018) 2795'

8-5/8" Stage Collar & ETOC (1st Stage) 2918'
(Located by wireline 12/3/86, See Notes***)

Ret./CIBP (COE @ 3207', 12/26/2018) 3206'

CMT Retainer (COE @ 4476', 12/20/2018) 4475'

11" Hole (to 7650')

Inner Liner (CSG Patch) (10/12/1976)
6-5/8" (5.921" ID), 24# 7347'
7347' - 7519'

CMT'D w/ 75 SKS,
Good Returns to TOL
7519'

7523'

Production Casing
8-5/8" (7.825" ID), 36#, BT&C
0' - 5542' K-55
5542' - 7642' N-80 7642'

CMT'D w/ 1955 CF (1st Stage)
+ 1500 CF thru Stage Collar
@ 2996'*** (2nd Stage),
Full circulation throughout job,
No CMT Returns to Surface‡

7-5/8" Hole (7650' - 9030')

6-5/8" Perfs: 8532'
8532' - 8536'**, 8558' - 8600'**, 8624' - 8640',
8658' - 8664', 8670' - 8674',
8684' - 8688', 8700' - 8734'**
Four (4) 0.4" HPF (3/1973, **See Notes)
8532' - 8540', 8558' -8608', 8660' - 8682'
Four (4) ~0.28" HPF (2/9-2/10/2006)
8624' - 8640' Two (2) ~0.28" HPF (2/9/2006)

Liner
6-5/8" (5.791" ID), 27.65#, K-55, SFJ 8734'
7523' - 9025'

CMT'D w/ 500 CF,
Good Returns to TOL

PBTD 9019'

9025'

TD 9030'
TVD (8784')
Directionally Drilled: Yes (TD is 1129' E, 165' N of Surf)

6' (BGL) - 55' CMT Plug (8.4 BBLS)
57' Top of CMT (86.5 BBLS Below & thru Perfs¥¥¥ w/ CMT Returns to Surface
390' Drilled Holes (did not obtain sample)¥
549' - 559' (4) 0.4" Sallow HPF (CMT'D¥¥¥)
560' - 562' CIBP (1/22/2019)
562' - 814' CMT Plug (29 BBLS Hyd. SQZ¥¥¥)
570' & 800' Drilled Holes¥
814' CMT Ret./CIBP (COE @ 815', 1/16/2019)
817' - 946' CMT Plug (8 BBLS)
865' 8-5/8" CSG Cut (unable to recover, 1/8/2019)
922', 997', 1023' Drilled Holes¥
946' - 1849' CMT Plug
(55 BBLS in 2 Stages)
1849' - 2795' CMT Plug
(56 BBLS in 2 Stages)
2799' - 3206' CMT Plug (24.3 BBLS)
3208' - 4475' CMT Plug
(74.5 BBLS in 3 Stages)
4478' - 4520' CMT Plug (2.5 BBLS)
4520' - 4757' CMT Plug (13.5 BBLS)
4757' - 5869' CMT Plug (67.5 BBLS in 3 Stages)
5869' - 6693' CMT Plug (50 BBLS in 2 Stages)
6693' - 7602' CMT Plug (47.5 BBLS in 2 Stages)
7347' Co. WSO on Splice
7462' Hole/Leak in 8-5/8" CSG (10/8/76)
(CMT SQZ'D 2X, 51 CF + 90 CF Away)
7519' Co. WSO on Splice
6-5/8" x 8-5/8" Lap WSO
7585' Sidetrack (ST2) KOP (from ST1) into this wellbore (See History)
7602' - 8297' CMT Plug
(22 BBLS in 2 Stages)
8297' - 8684' CMT Plug (14.5 BBLS, 1.9 BBLS Hydrostatic SQZ'D Away)
8432' - 8433' (4) 1/2" HPF (144 CF CMT SQZ'D Away, 6/5/80)
8434' (4) 1/2" Holes (157 CF CMT SQZ'D Away, 5/17/80)
8434' Reshot (4) 1/2" Holes (72 CF CMT SQZ'D Away, 5/28/80)
8435' (4) 1/2" Holes WSO
8515' (4) 1/2" Holes WSO
8684' Cleaned out Light Metal, Formation Sand & Large Formation Rocks (Unable to Work Below, 11/26/2018)
8845' 6-5/8" Model "N" BP
8853' Top of Junk (see desc. above)

Operator: So. California Gas Co.
Work Order: 92869
Lease: Standard Sesnon
Field: Aliso Canyon
Status: Abandoned Gas Storage
3000TDS: ±800' (±800')
10000TDS: 4688' (4687')

Ground Elevation: 2927' asl
Datum to Ground: 15' KB

Spud Date: 1/13/1973
Sidetrack (ST2) Kick-off Date: 2/13/1973
Completion Date: 3/16/1973
Abandonment Date: 2/1/2019

Junk: 5 JNTs 2-7/8" TBG, Sliding Sleeve, 6-5/8" Baker PCKR, Top of Junk @ 8853'

Wellbore History

Orig. Hole (OH) TD @ 7984'
(See Standard Sesnon 25B)
ST1 KOP @ 7811'
TD @ 7956'
(See Standard Sesnon 25B ST1)
ST2 KOP @ 7585'
TD @ 9030'

Notes

*No circulation throughout job

**Perfs @ 8532' - 8600' treated w/ 60 CF 3% HCl, 276 BBL "Clay Lok". Perfs @ 8700' - 8734' treated w/ 45 CF 3% HCL, 200 BBL "Clay Lok".

***Orig. drilling history reports 8-5/8" Stage Collar at 2996'

¥0.281" Drilled Holes for Fluid Samples (Plugged & Monitored Press. Test Successfully, 12/15 - 12/16/2018)

‡‡CBL indicated no CMT behind CSG string (1/19/2019)

Geologic Zone Markers	md	(tvd)
A1	4688'	(4687')
A36	5547'	(5545')
UP	5841'	(5834')
LP	6317'	(6290')
UDA1	6674'	(6621')
MDA	7512'	(7356')
LDA	7733'	(7561')
MP	8250'	(8046')
S1	8448'	(8232')
S4	8534'	(8313')
S8	8624'	(8398')
S12	8716'	(8485')
S14	8758'	(8525')
FREW	8798'	(8563')

Prepared by: LD (6/2/2016)
Updated by: CAM (2/14/2019)
InterAct

Ex. I - 38

Due to the large file size, this exhibit is an excerpt. The native file of this document is available upon request.

STATE OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL AND GAS

REPORT ON PROPOSED CHANGE OF WELL DESIGNATION

R.D. Phillips, Agent
Southern Calif. Gas Company
810 S. Flower St.
Los Angeles, CA. 90017

Ventura, California
February 23, 1990

Your request, dated February 13, 1990, proposing to change the designation of wells in Sec. 27, T. 3N, R. 16W, SB B.&M., Aliso Canyon field Los Angeles County, District No. 2, has been received.

The proposed change in designation, in accordance with Section 3203, Public Resources Code, is authorized as follows:

From:		To:
IW 56	(037-21354)	"Porter" 32F (037-21354)
IW 57	(037-21355)	"Porter" 32D (037-21355)
IW 58	(037-21321)	"Fernando Fee" 32E (037-21321)
IW 60	(037-21276)	"Porter" 32B (037-21276)
IW 61	(037-21277)	"Porter" 32A (037-21277)
IW 62	(037-21313)	"Fernando Fee" 32F (037-21313)
IW 73	(037-21358)	"Fernando Fee" 32B (037-21358)
IW 75	(037-21356)	"Fernando Fee" 32D (037-21356)
IW 76	(037-21359)	"Fernando Fee" 32C (037-21359)
IW 77	(037-21323) Sec. 28	"Standard Sesnon" 25B (037-21323)
IW 78	(037-21360)	"Porter" 32C (037-21360)
IW 81	(037-21363)	"Porter" 32E (037-21363)

bb

M.G. MEFFERD, State Oil and Gas Supervisor

By Patrick J. Kinneaf
Patrick J. Kinneaf, Deputy Supervisor

OGD157

SoCalGas-5.0882

SUBMIT IN DUPLICATE

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS

DIVISION OF OIL AND GAS
RECEIVED
MAR 9 1987
VENTURA, CALIFORNIA

History of Oil or Gas Well

Operator Southern California Gas Co. Field Aliso Canyon County Los Angeles
Well IW #77, Sec. 28, T 3N, R 16W S.B.B. & M.
A.P.I. No. 037-21323 Name R. M. Morrow (Person submitting report) Title Agent (President, Secretary or Agent)
Date March 6, 19 87

Signature N.W. Buss for R.M.Morrow

Box 3249, Terminal Annex, Los Angeles, CA 90051 (213) 689-3925
(Address) (Telephone Number)

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests and initial production data.

Date	
	MWO No.: 99722: was issued to remove two casing patches and set new casing patch
1986	
11-21	Loaded out rig to move from Montebello MGS #15-28 to IW #77 at Aliso Canyon.
11-24	Set in rig on IW #77 and rigged up. Removed xmas tree and installed BOPE. Tested blind rams, pipe rams, choke manifold to 3000 psi; and Hydril bag to 2300 psi. Test witnessed by Bill Winkler of the D.O.G.
11-25	Installed pitcher nipple. Released from packer. Laid down tubing hanger. Circulated bottoms up. Pulled out and laid down production equipment. Ran spear on 4-3/4" drill collars in well. Located patch at 2878'; jarred on top swage and secured well.
11-26	Pulled out of well; did not recover top swage. Ran in and jarred swage loose. Pulled out and recovered swage. Made up fishing tools. Ran in well and jarred casing patch loose. Pulled out of hole and laid down patch. Made up millshoe, ran in and located seal.
11-27	Holiday
11-28	Milled swage loose. Ran in with spear to 2918'. Jarred swage loose. Recovered bottom swage from no. 1 patch and top swage from no. 2 patch. Ran in to 2918' and jarred patch no. 2 loose. Pulled out of hole and laid down patch. Ran in with millshoe to 2900'.

SoCalGas-5.0883

1986

11-29 Milled swage loose at 2923'. Circulated clean and pulled out of well. Laid down all fishing tools. Ran in well with 7-5/8" bit and casing scraper to 7347'. Pulled out and made up 5-5/8" bit and 6-5/8" 27# casing scraper. Ran in well to 8405'. Backscuttled clean.

12-1 Rig shut down due to high winds.

12-2 Pulled out of well with bit and scraper. Ran in well with bull plug, 2 seals, locator, ported sub and 8-5/8" 36# RTTS tool on 2-7/8" tubing. Ran in well to 8405'. Unable to set RTTS tool with seals in production packer. Tested annulus to 1500 psi. Leaked 100 psi in 2 minutes. Released packer.

12-3 Using wireline, ran casing collar log from 3100'-2100'. Located stage collar at 2918'. Made up Pengo casing patch on wireline. Set top of patch at 2907', bottom at 2929'. Ran 2-7/8" 6.5# N-80 EUE tubing string consisting of bull plugged Baker 2 seals, one joint 2-7/8" tubing, Otis 2.205" No-Go nipple, one joint 2-7/8" tubing, Otis 2-7/8" sliding sleeve (closed), one joint 2-7/8" tubing, BST gas lift mandrel with pump-out plug set at 2500 psi and 2-7/8" tubing to surface. Drifted and hydrotested to 5000 psi. Spaced out and landed with 10,000# on packer. Pulled 20,000# to check latch. Tested seals, packer and annulus to 1500 psi. Secured well.

12-4 Using wireline, opened sliding sleeve. Changed over from 63#/cu.ft. polymer completion fluid to 3% KCl water. Set back pressure valve in doughnut. Removed BOPE and installed xmas tree. Tested xmas tree to 5000 psi with oil for 20 minutes. Removed back pressure valve. Released rig at 3:00 p.m.

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

No. T 286-239

DIVISION OF OIL AND GAS

Report on Operations

R. M. Morrow, Agent
SOUTHERN CALIF. GAS CO.
810 S. Flower St.
Los Angeles, CA 90051

Ventura Calif.
Dec. 1, 1986

Your operations at well IW 77, API No. 037-21323,
Sec. 28, T. 3N R.16W, S.B. B.& M. Aliso Canyon Field, in Ventura County,
were witnessed on 11/24/86. Bill Winkler, representative of
the supervisor, was present from 1630 to 2000. There were also present Drilling Engineer

Present condition of well: 13 3/8" cem 900' 8 5/8" cem 7650', pc 2995', csg. patch 2878'-2910' & 2918'-2960'; 6 5/8" cem 7523' to 9025', perf 8515' & 8515' WSO, perf at intervals 8532' to 8734'.

The operations were performed for the purpose of Testing the blowout prevention equipment and installation.

DECISION:

THE BLOWOUT PREVENTION EQUIPMENT AND ITS INSTALLATION ON THE 8 5/8" CASING ARE APPROVED.

Note: Deficiency-Failed & Corrected, Choke Value Failed.

mep

M. G. MEFFERD

Murray W. Dosch

SoCalGas-5.0885

Ex. I - 39

Due to the large file size, this exhibit is an excerpt. The native file of this document is available upon request.

FORM 103

SUBMIT IN DUPLICATE

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS

DIVISION OF OIL AND G
RECEIVED
OCT 19 1979
SANTA PAULA, CALIFORNIA

History of Oil or Gas Well

OPERATOR SOUTHERN CALIFORNIA GAS COMPANY FIELD ALISO

Well No. I.W. #82, Sec. 27, T. 3N, R. 16W, S.B. B. & M.

Date 10/24/78, 19 Signed P.S.M./ P. S. Magruder, Jr.

P.O. Box 3249 Terminal Annex
Los Angeles, California 90051 Title Agent
(Address) (Telephone Number) (President, Secretary or Agent)

It is of the greatest importance to have a complete history of the well. Use this form to report a full account of all important operations during the drilling and testing of the well or during re-drilling, altering of casing, plugging, or abandonment with the dates thereof. Be sure to include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, shooting and initial production data.

Date	MWO 99530
1978	History of Well I.W. #82 - Aliso
7-25	Killed well with 450 barrels of 86#/cu.ft. brine-polymer drilling fluid.
8-9	Moved in California Production Service Rig #D-4. Started rigging up.
8-10	Finished rigging up. Removed Xmas tree and installed B.O.P.E. Tested blind rams and pipe rams to 4000 psi with water and nitrogen for 20 minutes each test. Tested Hydril "GK" to 3000 psi with water and nitrogen for 20 minutes. Released tubing from packer. Attempted to circulate well. Required 188 barrels to fill well. Unable to maintain circulation. Well was taking fluid at a rate of 100 barrels per hour.
8-11	Pumped in 90 sec. viscosity pill to establish circulation. Let pill stand at bottom of well for two hours. Pulled up 12 stands of tubing and attempted to circulate. Unable to maintain circulation and lost 32 barrels to well. Ran 12 stands back in well and pumped in 150 sec. viscosity pill (8 sacks carbonates and 2 sacks HEC polymer).
8-12	Established circulation. Circulated well. Pulled tubing out of well. Picked up Kelly and picked up fishing tools to recover GO-International casing patch. Did not recover patch.
8-13	Rig and crew idle.
8-14	Attempted to recover top section of 8 5/8" casing patch at 3967'. Set spear at 4002' but unable to jar patch loose.
8-15	Ran 5 3/4" spear to 3967' and engaged top of casing patch. When pulling out of well, one stand (60') of 2 7/8" tubing and fishing tools were dropped into well. Unable to run full gauge tools through casing head area, possibly because of junk in wellhead. Made several unsuccessful attempt to run 7 1/4" Johnston Bridge Plug.

SoCalGas-5.0888

8-16 Ran Lynes bridge plug and set at 100'. Dumped two sacks of sand on bridge plug. Removed B.O.P.E. and tubing head. Using Alco casing jacks and spear, removed 40' casing patch from well leaving bottom seals in well. Reinstalled B.O.P.E.

8-17 Reamed 7 13/16" O.D. tapered mill through tight spot in 8 5/8" casing at 14'. Ran in with Lynes retrieving head and circulated sand out. Recovered Lynes packer. Ran Johnston bridge plug and set at 510'. Pressure tested 8 5/8" casing from 510' to surface with 3000 psi for one hour - test O.K. Ran in well with 6 5/8" guide and overshot. Engaged fish at 7086' and pulled to 3989'. Jarred fish through bad spot in casing.

8-18 Laid down fish and fishing tools. Ran in well with Otis seal plug on latch-in locator and set in Otis packer at 7166'. Pulled up 20,000# to check latch. Spotted 10 sacks sand on top of Otis packer at 7166'. Waited one hour. Located sand at 7169'.

8-19 Spotted 10 sacks of sand on top of packer at 7166'. Ran in with 7 13/16" tapered mill and milled from 3990' to 3997'. Circulated well clean. Pulled out of well. Picked up 4 3/4" O.D. jars.

8-20 Rig and crew idle.

8-21 Ran in well with 7 13/16" tapered mill. Reamed from 4038' to 4039'. Ran to 4075' and circulated well clean. Continued running in well. Reamed past tight spot at 5372'. Ran in to 6098' and reamed to top of sand at 7112'. Pulled out of well. Rigged up Welex and shot four 1/2" holes at 7090'. Made up Johnston positrieve squeeze tool with 250' of 2 7/8" tubing stinger below squeeze tool and started running into well.

8-22 Ran in well to 7113'. Spotted 50 cu.ft. of fresh water and established breakdown of 10 cu.ft./minute at 1750 psi. Backscuttled water out. With open-end tubing hung at 7091' and Johnston positrieve squeeze tool at 6841', Dowell mixed and pumped 50 cu.ft. of Neat Class "G" cement with 30 cu.ft. of water ahead, 4 cu.ft. of water behind and 222 cu.ft. of mud to equalize. Pulled 5 stands and backscuttled 22 cu.ft. of excess cement out of well. Cement in place at 11:25 A.M. Set Johnston squeeze tool at 6540' and squeezed away 7.5 cu.ft. of cement at a final pressure of 2500 psi. Held pressure for two hours. Bled off pressure and pulled out of well. Broke off and laid down Johnston squeeze tool. Made up 7 5/8" bit and scraper with 4 drill collars on tubing and ran in well. Tagged soft cement at 6983'. Drilled out from 6983' to 7080'. Circulated well clean.

8-23 Drilled and cleaned out cement from 7080' to 7110'. Circulated well. Pulled out of well and laid down bit and scraper. Made up Johnston positrieve squeeze tool with 250' of 2 7/8" tubing tail on bottom and ran in to 5204'. Set squeeze tool and pressure tested holes at 7090'. Pressure bled from 2500 psi to 1500 psi at a rate of 2 cu.ft. per minute. Ran in to 7091' and set squeeze tool. Obtained breakdown at 2200 psi at a rate of 3 cu.ft. per minute.

8-24 With open-end tubing hung at 7091' and Johnston positrieve squeeze tool at 6841', Dowell mixed and pumped 50 cu.ft. of Neat Class "G" cement with 30 cu.ft. of water ahead, 4 cu.ft. of water behind and 215 cu.ft. of mud to equalize. Pulled 5 stands and backscuttled 20 cu.ft. of excess cement out of well. Cement in place at 7:15 A.M. Set Johnston squeeze tool at 6540' and squeezed away 9 cu.ft. of cement at a final pressure of 2500 psi. Held pressure for four hours. Bled off pressure and pulled out of well. Laid down Johnston squeeze tool. Made up 7 5/8" bit and scraper with four drill collars on tubing and ran in well. Tagged cement at 6978'. Drilled out from 6978' to 7110'. Circulated well clean.

8-25 Pulled tubing out of well. Laid down bit and scraper. Made up Johnston positrieve squeeze tool and ran in to 4300'. Set tool and pressure tested casing. Pressure bled from 2500 psi to 2400 psi in 20 minutes. Pulled tubing and squeeze tool out of well. Rigged up Dresser Atlas and shot two 1/2" holes from 7088' to 7089'. (2 shots misfired). Made second run and shot four 1/2" holes from 7088' to 7089'. Made up squeeze tool and ran in to 7019'.

8-26 With open-ended tubing hanging at 7091' and Johnston positrieve squeeze tool at 6841', Dowell spotted 30 cu.ft. of fresh water and established breakdown of less than 1 cu.ft. per minute at 1900 psi. Backscuttled water out. Dowell mixed and pumped 50 cu.ft. of Neat Class "G" cement with 30 cu.ft. of water ahead, 4 cu.ft. of water behind and 215 cu.ft. of mud to equalize. Pulled 5 stands and backscuttled 36 cu.ft. of excess cement out of well. Cement in place at 9:30 A.M. Set Johnston squeeze tool at 6540' and squeezed away 2 cu.ft. of cement at a final pressure of 2500 psi. Held pressure for 4 hours. Bled off pressure and pulled out of well. Laid down squeeze tool. Made up 7 5/8" bit and scraper with four drill collars on tubing and ran in well. Tagged top of cement at 7094'.

8-27 Rig and crew idle.

8-28 Drilled out cement from 7094' to 7120'. Circulated well clean. Made up Johnston positrieve squeeze tool and ran into well. Set tool at 4300' and pressure tested casing. Pressure bled from 2500 psi to 2300 psi in two minutes. Ran tubing to 7090' and spotted 30 cu.ft. of water across perforations. Pressured up on casing. Casing held 2500 psi O.K. for 20 minutes. Continued pressure testing casing up hole. Isolated possible casing leak between 6014' and 6055'.

8-29 Rigged up Triangle and ran Noise Log. Recorded from 7110' to 3000'. Rigged up McCullough to run Casing Inspection and Caliper Logs. Recorded Caliper Log from 7086' to 3000'.

8-30 Rigged up McCullough to complete Caliper Log. Recorded from 3000' to surface. Ran McCullough Casing Inspection Log. Tool malfunctioned No log was obtained. Rigged up Triangle to verify accuracy of of previously run Noise Log. Results were inconclusive.

8-31 Rigged up McCullough and ran Casing Inspection Log. Recorded from 7080' to surface. Ran Triangle Noise Log. Recorded from 7080' to surface. Determined that gas movement behind casing had stopped. Made up Johnston positrieve squeeze tool and ran in well. Set squeeze tool at 6027' and pressure tested casing to 2000 psi. Casing held pressure. Continued pulling up and testing at 5' intervals. Found no leaks between 6027' and 5894'.

9-1 Picked up Johnston 8 5/8" bridge plug and ran in well on 2 7/8" tubing. Set bridge plug at 6998'. Spotted 10 sacks of sand on top of plug. Pulled tubing out of well. Picked up Johnston positrieve squeeze tool and ran into well. Tagged top of sand at 6970'. Set squeeze tool at 6967' and pressure tested bridge plug. Plug held 3000 psi for 20 minutes. Changed over from polymer fluid to lease water.

9-2 Set Johnston positrieve squeeze tool at 6000'. Tested 8 5/8" casing from 6000' to 6998' with 3000 psi for one hour. Test inconclusive. Made tests with packer set at 4000', 5407', 5997', 5710', 5586' and 5523' with inconclusive results. Will change positrieve squeeze tool.

9-3 Rig and crew idle.

9-4 (Labor Day) Rig and crew idle.

9-5 Laid down Johnston test tool. Ran Baker fullbore. Pressure tested 8 5/8" casing from 6998' to 4000' with 3000 psi for one hour - O.K. Tested from 3995' to surface with 3000 psi for one hour - O.K. Isolated leak in 8 5/8" casing at 3997'.

9-6 Removed B.O.P.E. and installed tubing head. Reinstalled B.O.P.E. Tested pipe rams and blind rams at 4000 psi for 20 minutes. Tested Hydril GK at 3000 psi for 20 minutes. Tests witnessed and approved by D.O.G. Tested flanges and seals on tubing head at 5000 psi. Made up Jonston retrieving head and started running in well.

9-7 Ran in with Johnston retrieving head. Located sand fill at 6970'. Cleaned out to 6998'. Pulled Johnston bridge plug from 6998'. Laid down bridge plug and retrieving tool. Made up Otis retrieving head and ran in to 7056'. Changed over from lease water to 83# per cu.ft. polymer drilling fluid. Cleaned out fill from 7056' to 7159'

9-8 Attempted to recover Otis packer plug. Unable to latch onto plug due to junk (remainder of casing patch seal) wedged inside retrieving tool. Made up new retrieving tool and ran back to top of plug. Latched onto plug and pulled out of packer. Circulated well to clear gas. Approximately 13 barrels were lost to formation. Spotted high viscosity pill (300 sec.) across production zone. Started pulling out of well.

9-9 Ran in well with sawtooth collar on 2 3/8" tubing and cleaned out fill from 7258' to 7333'. Circulated well clean.

9-10 Rig and crew idle.

9-11 Ran in with production tester and set packer at 7082' with tail to 7102'. Opened tool at 11:30 A.M. for 5 minute initial flow. Closed for three hour initial shut-in. Final flow 6 1/2hours with gas to surface at 6:30 P.M. Flowed gas 2 1/2 hours. Closed tool at 9:00 P.M. for final shut-in. Backscuttled well to clear tubing of gas.

9-12 Pulled Lynes tester. Pressure chart readings were as follows:

IH 3970 psi
FH 3920 psi
IF 2300 psi
FF 2240 psi
ISI 2900 psi
FSI 2930 psi

Ran 2 7/8" tubing with 200' 2 3/8" tubing on bottom and sawtooth collars. Cleaned out from 7299' to 7335'. Circulated gas-cut mud from well. Ran in with production Lynes tester #2 to 7102'.

9-13 Set Lynes production tester at 7083' with tail to 7103'. Opened tool at 7:08 A.M. Closed tool at 10:08 A.M. Closed tool for final shut-in at 7:08 P.M. Backscuttled tubing free of gas and secured well. (Final pressure 880 psi).

9-14 Pulled out with Lynes production tester, pressures as follows:

Hydrostatic	3950 psi
Initial Flow	2110 psi
Final Flow	2020 psi
Final Shut-in	2965 psi

Ran Noise Log and found no gas leakage. Ran 7 5/8" bit and 8 5/8" casing scraper to 4100'. Circulated well clean.

9-15 Set casing patch in 8 5/8" 36# casing at 4016' - top 3974' (42') over stage collar leak at 3997'. Laid down 4 3/4 drill collars, Kelly and swivel.

9-16 Ran Otis 2 7/8" annular flow safety system on 2 7/8" EUE 8rd tubing, removing collars, cleaning pins, applying Bker seal and hydrotesting each joint to 5000 psi for one minute test. Landed tubing with 10,000# on packer. Pulled 25,000 and checked latch. Tubing string weight 42,000#.

9-17 Rig and crew idle.

9-18 Removed B.O.P.E. and installed Xmas tree. Rigged up Associated Services test pumps and tested Xmas tree to 5000 psi. Circulated 82#/cu.ft. polymer drilling fluid out of well with lease salt water. Rigged up Archer Reed, ran in and pulled side-door choke. Set plug in NO-GO nipple and tested packer and seals to 2000 psi for 20 minutes. Pulled tubing plug. Started rigging down. RELEASED RIG at 10:00 P.M.

AA/emr

SoCalGas-5.0892

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

No. T 278-266

DIVISION OF OIL AND GAS

Report on Operations

Mr. P. S. Haggruder, Jr., Agent
Southern Calif. Gas Co.
P.O. Box 54790 Terminal Annex
Los Angeles, CA 90054

Santa Paula, Calif.
Sept. 7, 1978

Your operations at well IW 82, API No. 037-21458, Sec. 34, T. 3N, R. 16W S.B. B.& M. Aliso Canyon Field, in Los Angeles County, were witnessed on 9/6/78. T.E. Adams, representative of the supervisor, was present from 1700 to 2000. There were also present J. Awalt, company foreman

Present condition of well: additions to the casing record since proposal dated 7/20/78: Perf. 7088-7089' (cem. off)

The operations were performed for the purpose of testing the blowout prevention equipment and installation.

DECISION:

THE BLOWOUT PREVENTION EQUIPMENT AND INSTALLATION ARE APPROVED.

b

M. G. MEFFERD
State Oil and Gas Supervisor

By _____
Deputy Supervisor
John L. Hardoin

SoCalGas-5.0893

Ex. I – 40

FORM 103 SUBMIT IN DUPLICATE △ OSP

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS

History of Oil or Gas Well

OPERATOR SOUTHERN CALIFORNIA GAS COMPANY FIELD Aliso Canyon

Well No. I.W. #83 - A.P.I. No.037-21455, Sec. 28, T. 3N, R. 16W, S.B. B. & M.

Date July 27, 1978 Signed P. S. Magruder, Jr.

P. O. Box 3249, Terminal Annex
Los Angeles, California Title Agent
(Address) (Telephone Number) (President, Secretary or Agent)

It is of the greatest importance to have a complete history of the well. Use this form to report a full account of all important operations during the drilling and testing of the well or during re-drilling, altering of casing, plugging, or abandonment with the dates thereof. Be sure to include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, shooting and initial production data.

Date	
1978	
6-16	Killed well with 610 barrels of 72#/cu.ft. polymer drilling fluid. Removed lateral lines.
6-17	Moved in California Production Service Rig #D-4 and riggued up.
6-18	Rig and crew idle.
6-19	Removed Xmas tree. Installed Class III 5000 psi B.O.P.E. Pressure tested with water and nitrogen, as follows: Blind rams to 4000 psi Pipe rams " 4000 psi Hydril bag " 3000 psi Above tests witnessed and approved by Division of Oil and Gas. Released tubing from packer.
6-20	Well took 50 barrels of drilling fluid overnight. Pulled tubing. Laid down safety system, production equipment and 2 3/8" tubing. Ran 7 5/8" bit with casing scraper to top of packer at 8803'. Circulated well.
6-21	Well took 40 barrels of drilling fluid overnight. Continued pulling out of well. Ran Otis retrieving tool and latched into Permatrieve packer at 8803'. Unable to release packer. Pulled out and removed Otis tool.
6-22	Ran jars and bumper sub above Otis retrieving tool. Engaged packer at 8803'. Tripped jars once. Pulled out of well with packer leaving all but one packing element from packer in well. Ran Otis plug which was set and tested in 6 5/8" packer at 9080'. Pulled above top of 6 5/8" 8802'.
6-23	Ran 2 7/8" tubing to 9048' and circulated well. Halliburton equalized 35 sacks

of sand inside 6 5/8" liner. Pulled out of well. Ran 7 5/8" bit and 8 5/8" 36# casing scraper to top of 6 5/8" liner at 8822'. Circulated well. Pulled above top of 6 5/8" liner at 8822'.

6-24 Pulled out of well. Welex shot four 1/2" holes from 8811' to 8812'. Started in well with open-end 2 7/8" tubing.

6-25 Rig and crew idle.

6-26 Ran in well to top of liner at 8822'. Worked through hanger but could not get below 8846'. Rigged up Dowell and equalized six (6) sacks of sand. Pulled up and waited two hours. Sand bridged at top of liner at 8822'. Backscuttled clean down to 8846'. Re-spotted sand at 8846'. Pulled two stands and located sand at 8820'. Rigged up Dowell - had breakdown of 3 cu.ft. per minute at 1500 psi. Hung tubing at 8818' and pumped 5 cu.ft. water. Mixed 50 cu.ft. of Class "G" cement with 1% D-65 and with 5 cu.ft. water behind and 275 cu.ft. drilling fluid. Pulled to 8398' and squeezed away 32 cu.ft. at 2500 psi.

6-27 Pulled out of well. Rigged up power swivel. Ran 7 5/8" bit on 172' of 4 3/4" drill collars. Drilled out cement from 8695' to 8818'.

6 Ran in well and cleaned out fill from 8805' to 8818'. Pulled out. Rigged up Triangle and ran Noise Log which indicated gas still leaking by shoe. Pressure tested holes at to 3000 psi but could not get breakdown.

6-29 Pulled out of well. Rigged up Welex and shot four 1/2" holes at 8811'. Ran in to 8815' with open-end tubing. Pumped in 50 cu.ft. water. Pumped 4 cu.ft. per minute at 2800 psi. Hung tubing at 8818' - pumped in 30 cu.ft. water, 25 sacks of Class "G" cement with 1% D-65 and 5 cu.ft. water behind. Pulled to 8507', squeezed 20 cu.ft. - held 2500 psi on cement for two hours.

6-30 Pulled out. Made up 7 5/8" bit and scraper. Ran in and located cement at 8735'. Drilled out cement to 8818'. Circulated well clean.

7-1 Ran in and located fill at 8803'. Backscuttled clean to 8818' and pulled out of well. Rigged up and ran Triangle Noise Log which indicated gas leakage had stopped. Ran in well with sawtooth collar on 2 7/8" tubing. Cleaned out sand from 8818' to 8819'. Tools stopped.

7-2 Rig and crew idle.

7-3 Pulled out of well with 2 7/8" tubing to 1400' and transmission failed

7-4 Rig and crew idle. (Holiday)

7-5 Pulled out of well. Made up 4 3/4" bit and 4 3/4" drill collar. Ran in well and cleaned out rubber at top of liner hanger at 8822'. Cleaned out sand down to packer at 9060'. Circulated clean.

7-6 Pulled out of well. Made up Otis retrieving tool. Ran in and pulled packer plug loose. Circulated gas cut mud. Pulled out and laid down Otis tools. Measured and picked up 12 joints of 2 3/8" C.S. Hydril tubing (396'). Ran in well - had to work through packer at 9066'. Ran in to 9424' - no fill.

7-7 Ran in well to bottom of liner at 9424'. Pulled out. Made up Lynes drill stem test tools. Ran in and tested all Lynes valves and 1 1/2" test lines.

7-8 Set tester at 8796' with tail to 8816'. Took initial flow and shut in. Opened tool at 8:00 A.M. - did not have enough pressure to flow well in withdrawal line and opened into Baker tank. Bled off drilling fluid and well pressure dropped to zero. Closed valve on Lynes head and pressure built up to 560 psi. Reopened to Baker tank and pressure bled to zero. Closed in and pressure built to 350 psi. Bled off small amount of gas and drilling fluid. Closed tool at 4:00 P.M. and backscuttled gas from tubing.

7-9 Rig and crew idle.

7-10 Bled off well. Pulled tester loose. Rigged up Triangle Noise Log. Ran from 8830' to 7800' indicating no gas leak.

7-11 Pulled out of well. Rigged up Welex and ran Otis Permatrieve packer and set same at 8800' with bottom at 8805'. Ran Pengo 8 5/8" casing patch and set top at 3936' and bottom at 3978' with stage collar at 3958'. Rigged down "GO".

7-12 Rigged up Hydrotest and tubing tongs. Hydrotested tubing in well. Tested each joint to 5000 psi. Changed collars, cleaned pins and applied Baker seal.

7-13 Finished hydrotesting in well. Loaded out power tongs and test tools. Unable to latch into packer at 8800'. Pulled 2 3/8" tubing and tools through packer. Ran back in but still unable to latch into packer. Pulling out slowly - collars hanging on bottom of casing patch at 3978'.

7-14 Finished pulling out of well. Broke off Otis seal assembly and latch-in. Replaced seals and latch-in. Ran back in well, hydrotesting to 5000 psi for one minute. Spaced out tubing and landed with 10,000# on packer. Pulled 25,000# over weight of tubing to check latch. Removed B.O.P.E. and installed Xmas tree.

7-15 Rigged up Associated Services test pumps and tested Xmas tree to 5000 psi. Circulated 72#/cu.ft. polymer drilling fluid out of well with salt water. Ran in and pulled separation sleeve. Set plug in NO-GO nipple and tested packer and seals to 1000 psi. Pulled tubing plug.
RELEASED RIG at 6:00 P.M. (7-15-78).

jp

Ex. I – 41

PORTER 47

DAILY DRILLING REPORT

3-29 Continued running tubing and 1" control line. Tested safety valve and control line through donut with 5000 psi for 45 minutes, OK. Landed tubing. Tore out BOPE and installed production head. Tested through test port with 4500 psi for 15 minutes, OK. Tested through unibolt against Shaffer donut plug with 4650 psi for 15 minutes, OK. Rigged up Otis wireline. Closed sliding sleeve at 6782'. Set No-Go plug at 8254'. Pressured tubing and set Otis hydraulic packers. Pulled No-Go plug. Tested top packer by pressuring annulus with 1140 psi for 15 minutes, OK. Opened sleeve at 6782'. Control line at 5000 psi for overnight test.

SEE SUPPLEMENT DATED 4-20-73

SEE SUPPLEMENT DATED 5-4-73

PORTER 47

DAILY DRILLING REPORT

3-23 No morning tour. Waiting on cement, continued running 4-1/8" bit and scraper, tagged cement at 7888' (60' high) drilled and cleaned hard cement 7888-8058' circulated from 8104' for one hour. Pressure tested from surface to 8126' with 1625 psi for 30 minutes, OK. Started out of hole with bit and scraper.

3-24 Continued pulling bit and scraper, ran retrieving tool and released bridge plug at 8126'. Ran in from 8126' to set bridge plug onbottom. Stopped at 8138'. Believe cement from squeeze at 8056' was pumped into liner below bridge plug through unsqueezed WSO holes at 8138'. Pulled bridge plug, ran 4-1/8" bit and 5" casing scraper. Tagged cement at 8138'. Drilled and cleaned out soft cement 8138-8200' and hard cement at 8283'. Drilled and cleaned out hard cement at 8297' to 8352'. All perforations cemented, circulated on bottom one hour. Started out of hole with bit and scraper.

3-26 Continued pulling bit and scraper. Rigged up Dresser-Atlas. Ran cement bond log 7900-8355', cement bond at top of S-4 questionable. Jet perforated four 1/2" holes at 8135'. Made up and ran Johnston tester and bridge plug in tandem, set bridge plug at 8158'. Pulled up and set test tool at 8062', tail to 8080'. Opened tool at 6:50 pm. Dead throughout one hour test. Pulled bridge plug and tester. Recovered 5' rise oily workover fluid, charts OK. WSO. Witnessed and approved by P. R. Wygle of the D.O.G.

3-27 Rigged up Dresser-Atlas jet perforated four 1/2" holes 8159-8189', 8200-8223', 8270-8276', 8330-8343'. Used 3-1/2" carriers and 11.0 gram charges. Made up and ran Baker Model "C" bridge plug and fullbore packer. Set bridge plug at 8242'. Pulled up and set fullbore packer at 8140'. Pumped into formation at rate of 0.8 barrels per minute at 2200 psi. Too tight for Halliburton Clay-Lok. Pulled bridge plug and fullbore.

3-28 Rigged up to run Otis packer, Page safety valve and 1" GST control line. Tested safety valve and control line connections with 4850 psi for 20 minutes, OK. Ran into 5623'. Tested control line and safety valve with 4975 psi for 30 minutes, OK.

PORTER 47

DAILY DRILLING REPORT

3-21 Installed BOPE on new tubing head. Used rig pump. Tested pipe rams and casing from surface to 6911' with 1650 psi for 15 minutes, OK. Made up Baker 5" fullbore packer and retrieved tool. Ran in and recovered bridge plug at 6911'. Reset bridge plug at 8126'. Pulled up and set fullbore at 8056'. Tested bridge plug and 5" casing at 8056-8126' with 1625 psi for 15 minutes, OK. Pulled up and set fullbore at 7486'. Tested 7486-8126', no good. Tested from surface to 7486' - inconclusive. Picked up 14' of pup joints to space out properly between collars. Set fullbore at 7816'. Tested 7816-8126', no good. Tested from surface to 7816' with 1700 psi for 15 minutes, OK. Set fullbore at 7943' and tested 7943'-8126', no good. Set full bore at 8007' and tested at 7008'-8126', no good. Set fullbore at 8038' and tested 8038-8126', no good. Tested from surface to 8038' with 1750 psi for 15 minutes, OK. Leak isolated between 8038-8056'; collar at 8052' with fullbore set at 8038'. Could not break down formation with 3100 psi surface pressure (approximately 6650 psi at hole). Collar leak indicated, with fullbore hanging at 8056'. Pumped in two sacks of sand. Pulled up and hung fullbore at 7864'. Rigged up Go-International Jet, perforated four 3/8" holes at 8056' using 1-11/16" bore tubing perforator. Set fullbore at 7864'. Could not break down formation with 3100 psi surface pressure.

NOTE: All measurements are to center of packing element. Add 5' to all figures for correlation with CBL/CCL.

3-22 With fullbore hanging at 8093' pumped in 500 gallons of 15% HCL. Pulled up and set fullbore at 7555'. Pressure tubing to 3000 psi and shut well in for 2-1/2 hours. Broke down holes at 8056' with 4000 psi. Took fluid at a rate of 8 cf/minute at 3500 psi. Hung fullbore at 8093' and backscuttled out acid. Pulled up and hung fullbore at 7864'. With 20 cf fresh water ahead, mixed and pumped 50 sacks Class "G" cement with 0.75% CFR-2. Displaced with 5 cf fresh water and 161 cf workover fluid. Closed tool and squeezed 49 cf cement to formation. Final pressure 3300 psi. Released pressure and had 2 cf bleed-back. Used Halliburton equipment. Pulled fullbore packer. Started in hole with 4-1/8" bit and 5" casing scraper.

PORTER 47

DAILY DRILLING REPORT

3-13-73 Filled hole. Took one barrel. Circulated out fill from 8345' to 8357'. Turn on junk at 8357'. Circulated on bottom for 1-1/2 hours. Started out of hole. Rig broke down with bit and scraper at 7633'. Circulated 2 hours from 7633' waiting on engine.

3-14 Replaced rig engine.

3-15 Filled hole; took one barrel. Circulated one hour from 7633'. Pulled bit and scraper. Rigged up Dresser-Atlas. Ran cement bond log 6700-8354', Neutron Lifetime gama ray log 7780-8352' and Densi-Log 7800-8351'. Start in hole with 7" casing scraper.

3-16 Filled hole. Took one barrel. Continued running 7" casing scraper. Tagged top of liner at 6887'. Started out of hole. Discovered cracked brake flange on rig. Shut down for repairs with scraper at 1532'.

3-17 Pulled 7" scraper from 1532'. Made one 5" Baker Model "C" bridge plug at 1233'. 2-3/8" tubing below 7" Baker fullbore packer. Ran in and set in bridge plug at 8122' with fullbore hanging 6833', tail to 8075'. Tested from surface to 2811' with 1500 psi. No good. Set full bore at 6833' to 8122' with 1500 psi. No good. Tested on surface to 6833' with 1700 psi for 15 minutes. OK. Dropped down to retrieve bridge plug. Discovered that bridge plug as not set properly. Reset same at 8122'. Reset fullbore at 6833', tail to 8075'. Tested 6833' to 8122' with 1700 psi. No good. Retrieved bridge plug and set same at 6911'. Set fullbore at 5609', tail to 6851' and tested 5609-6911' with 1700 psi for 15 minutes, OK. Splice OK. Pulled bore and set same at 3525', tail to 4767'. Tested from surface to 3525' with 2150 psi for 15 minutes, OK. Pulled fullbore and set same at 2505' tail to 3747'. Tested from surface to 2505' with 3200 psi for 15 minutes, OK. Pulled full bore packer. Test summary 7" casing, OK. 5"x7" splice OK. Leaking 5" liner between 6911-8122'.

3-19 Filled 7"x 13-3/8" annulus. Took 45 barrels. Tore out BOPE and tubing heads. Rigged up spear in casing jacks. Could not unland 7" casing. Cut off casing head. Found 184,000# on casing. Welded extension on 7" casing.

3-20 X-rayed 7" weld, OK. Cut off base plug and welded on new casing head. X-rayed casing head weld, OK. Relanded 7" casing with 185,000#. Installed new tubing head. Tested primary fill with 3275 psi for 15 minutes, OK. Tested secondary fill with 3300 psi for 15 minutes, OK.

Ex. I – 42

(ALISO COPY)

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator: Southern California Gas Company
Well: Frew 3
A.P.I. No. 03700666

Field: Aliso Canyon
Surface Location: Sec 29 3N 16W S.B.B.M.

County: Los Angeles

Todd Van de Putte
(President, Secretary, or Agent)

Title: Senior Storage Field...

Date: 10/31/2013

Signature: Todd Van de Putte
(Person Submitting Report)

Address: PO Box 2300, SC9365, Chatsworth, CA, 91313-2300

Telephone Number: 818-701-3339

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, and initial production data.

Start Date	Ops. DOGGR Rpt
5/22/2013	Opened the well with 2000 psig surface pressure on the tubing. Rigged up and pumped 50 bbl of hi-vis HEC polymer and displaced with 66 bbls of 8.6 ppg KCl brine. Filled the well per schedule with 78 bbl of 8.6 ppg KCl brine. Installed the back pressure plug and nippled down the production tree. Nippled up and function tested the Class III 5M BOPE and secured the well.
5/23/2013	Rigged up the WEA test pump truck. Pressure tested the blind rams to 300 psig (low) and 5000 psig (high) for twenty minutes. Pressure tested the pipe rams to 300 psig (low) and 5000 psig (high) for twenty minutes. Pressure tested the Hydril annular preventer to 300 psig (low) and 3600 psig (high) for twenty minutes. Pressure tested the choke manifold and all the control valves to 300 psig (low) and 5000 psig (high) for twenty minutes (All BOPE equipment tested good). Rigged down and moved out the BOPE testing equipment. Rigged up the working floor, the tubing equipment, cleaned the location and secured the well.
5/28/2013	Filled the well with 33 bbl of 8.6 ppg KCl brine. Circulated the well and changed pipe rams from 2-7/8" to 3-1/2" . Unlanded the tubing and worked the completion tubing free from the permanent packer at 7630'. Pulled out of the well and laid down the 3-1/2" tubing and the SSSV control line. Laid down the 3-1/2" SSSV, 150 joints of 3-1/2" tubing and secured the well.
5/29/2013	Filled the well with 23 bbl of KCl brine. Pulled out of the well and laid down the 3-1/2" tubing and the production equipment. Changed the pipe rams from 3-1/2" to 2-7/8". Measured and picked up a 5-1/2" casing scraper and bumper sub on 2-7/8" tubing. Measured and picked up 2-7/8" tubing to 3200' and secured the well.
5/30/2013	Filled the well with 28 bbl of 8.6 ppg KCl brine. Measured and picked up 2-7/8" tubing to 7550' and tagged a tight spot. Worked through the tight spot at 7550' (could not clean up). Ran in the well to 7630' and rigged up and reverse circulated 70 bbl of KCl brine. Pulled out of the well to a kill string at 2900' and secured the well.
5/31/2013	Topped off the well with 30 bbl of 8.6 ppg KCl brine. Pulled out of the well and laid down the 5-1/2" casing scraper and the bumper sub. Nippled up a shooting flange with a packoff and rigged up the Schlumberger wireline unit. Made up the USIT tools and ran in the well. Tagged the permanent packer at 7630' and ran USIT log to 3400' in the 5-1/2" innerstring (Lost signal could not log.) Pulled out of the well and rigged down the wireline unit. Nippled down the shooting flange/packoff. Ran in the well to 3000' with a kill string and secured the well.
6/3/2013	Filled the well with 36 bbl of 8.6 ppg KCl brine. Pulled out of the well with the kill string. Made up a 4-5/8" string mill on 2-7/8" tubing and ran in the well to 7545'. Nippled up the PGSR and picked up the power swivel. Milled from 7545' to 7550' (Lost torque and pump pressure) Laid down the power swivel, pulled out of the well to 5800' and secured the well.
6/4/2013	Filled the well with 35 bbl of 8.6 ppg KCl brine. Pulled out of the well (left 4.6" string mill and bit sub in the well). Made up a 4.625" over shot with 3.75" grapple and a bumper sub on 2-7/8" tubing. Ran in the well to 7533' (Tagged 11' high) and attempted to work over the fish. Pulled out of the well and laid down the overshot. Ran in the well with a kill string to 2800' and secured the well.
6/5/2013	The well required 26 bbl of 8.6 ppg KCl brine to fill. Ran in the well to 7533'. Rigged up and pumped 20 gallons diesel and displaced with 43 bbl of KCl brine. Pulled out of the well. Made up a 1-1/8" spear with a 1.277" grapple and a bumper sub on 2-7/8" tubing. Ran in the well to 7533' and engaged the fish. Pulled free at 12K lb over the string weight. Pulled out of the well to 5300' and secured the well.
6/6/2013	The well required 25 bbl of 8.6 KCl brine to fill. Pulled out of the well and laid down the fish (recovered the mill and the bumper sub.) Made up a 4.25" mill and (2) 3-1/8" drill collars on 2-7/8" tubing. Ran in the well to the tight spot at 7539'. Rigged up the power swivel and PGSR and cleaned the tight spot area to 7546'. Ran in the well to the permanent packer at 7630' and laid down the power swivel and PGSR. Pulled out of the well to 5300' and secured the well.
6/7/2013	Filled the well with 27 bbl of 8.6 ppg KCl brine. Pulled out of the well and laid down the 4.25" mill and made up a new 4.5" mill. Ran in the well to 7539', rigged up the power swivel and PGSR. Cleaned out the tight spot in the 5-1/2" innerstring from 7539' to 7546' and ran in the well to the top of the permanent packer at 7630'. Rigged down the power swivel and nippled down the PGSR. Pulled out of the well to 6700' and secured the well.
6/10/2013	Filled the well with 30 bbl of 8.6 ppg KCl brine. Pulled out of the well and laid down (2) 3-1/2" drill collars and the 4.5" mill. Measured and picked up (14) joints of 1" P-110 tubing tail on 2-7/8" tubing and ran in well to 8001' (TD at 8020', 19' of fill). Nippled up the PGSR and circulated out fill to 8008' (Hard fill could not clean out). Circulated the well clean and pulled out of the well to 7600'. Nippled down the PGSR and secured the well.

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator: Southern California Gas Company
Field: Aliso Canyon
County: Los Angeles
Well: Frew 3
Surface Location: Sec 29 3N 16W S.B.B.M.
A.P.I. No. 03700666
Todd Van de Putte
Title: Senior Storage Field...
(President, Secretary, or Agent)

Date: 10/31/2013
Signature: Todd K Van de Putte
(Person Submitting Report)

Address: PO Box 2300, SC9365, Chatsworth, CA, 91313-2300
Telephone Number: 818-701-3339

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Start Date	Ops. DOGGR Rpt
6/11/2013	The well required 30 bbl of 8.6 ppg KCl brine to fill. Pulled out of the well with wet tubing (found plugged tubing). Laid down (14) joints of 1" tubing and changed out the tubing equipment. Made up a WEA 5-1/2" lok-set bridge plug on 2-7/8" tubing. Ran in the well rabbiting tubing and found more asphaltines in the tubing. Ran in the well to 7200' and secured the well.
6/12/2013	Filled the well with 25 bbl of 8.6 ppg of KCl brine. Ran in the well with the 5-1/2" bridge plug to 7624', set the bridge plug and filled the well. Pressure tested the annulus to 500 psig (bled to 0 psig). Released the bridge plug and pulled to 7616', pressure tested to 500 psig (opened the 5-1/2" x 7" inner string annulus and circulating through the annulus). Released the bridge plug and pulled to 7490' (40' above bad spot). Set the bridge plug and pressure tested to 500 psig (held pressure). Released the bridge plug and ran in the well to 7624', set the bridge plug, and filled the 5-1/2" annulus. Pumped into the 7"X 5-1/2" annulus at 1 bpm with 300 psig. Released the bridge plug, pulled out of the well and laid down the bridge plug. Ran in the well to 2800' with a kill string and secured the well.
6/13/2013	The well required 25 bbl of 8.6 ppg KCl brine to fill. Pulled out of the well with the kill string. Made up a Baker seal assembly with latch, 6' , 2-7/8" pup joint, XN nipple with PXN plug in place, 4', 2-7/8" pup joint, WEA on/off tool on 2-7/8" tubing. Ran in the well to the permanent packer at 7630', stabbed into packer and pulled 10,000lb over string weight to check the latch. Released from the on/off tool and filled the well. Pressure tested the annulus to 500 psig (Bled down to 0 psig in two minutes). Pulled out of the well to a kill string at 2800' and secured the well.
6/14/2013	The well required 17 bbl of 8.6 ppg KCl brine to fill. Pulled out of the well and laid down the top half of the on/off tool. Ran in the well with a kill string to 2800' and secured the well.
6/17/2013	Cleaned the location and perform misc site work as directed.
6/18/2013	The well required 24 bbl of 8.6 ppg KCl brine to fill. Pulled out of the well with the kill string. Rigged down the tubing equipment and the working floor. Nippled down the BOPE and nippled down the tubing head (sent in for repairs). Pulled the primary seals and made up a 5-1/2" casing spear. Unlanded the 5-1/2" inner string, stacked out the innerstring and released the spear. Nippled up a cross over flange and nippled up the Class III 5M BOPE. Rigged up the working floor and the tubing equipment. Made up the top half of the on/off tool with a perforated sub on 2-7/8" tubing. Ran in the well to 3000' and secured the well.
6/19/2013	The well required 14 bbl of 8.6 ppg KCl brine to fill. Ran in the well to the on/off tool at 7630'. Released from the packer and circulated well with 200 bbl of KCl brine. Pulled out of the well to 7500' (Rig down for repairs to replace or repair traveling block) and secured the well.
6/24/2013	The well required 50 bbl of 8.6 ppg KCl brine to fill. Pulled out of the well with packer seals. Made up a 4-3/4" drill collar and a spear and engaged the 5-1/2" innerstring casing. Attempted to release from the seals at 7650' (no movement). Rigged up theTiger wireline unit and made up a 5-1/2" chemical cutter. Ran in the well to 7590', correlated and attempted to cut the 5-1/2" innerstring casing at 7580' (Casing did not cut). Worked the pipe, released the spear and secured the well.
6/25/2013	The well required 24 bbl of 8.6 ppg KCl brine to fill. Rigged up the Tiger wireline unit and made up the free point indication tools through the spear. Ran in the well to 2000' pulled up 140,000 lb then up to 180,000 lb (The 5-1/2" innerstring casing pulled free). Rigged down the Tiger wireline unit and rigged up the 5-1/2" casing tongs. Pulled out of the well and laid down/loaded the 5-1/2" innerstring casing (Laid down 111 joints of 5-1/2"). Secured the well.
6/26/2013	The well required 23 bbl of 8.6 ppg KCl brine to fill. Continued to lay down the 5-1/2" 20# N-80 inner string. Rigged down the 5-1/2" casing tongs and slips. Rigged up the tubing handling equipment. Moved out the 5-1/2" innerstring casing. Made up a 4" spear, a 4.805" grapple, 4.75" jars, (2) 4.75" drill collars, 4.75" accellerator, and a 4.75" bumper sub on the 2-7/8" L-80 work string. Ran in the well with the spear and BHA and secured the well. Spear at 7260' (279' above ETOF @ 7539').
6/27/2013	Filled the well with 24 bbl with 8.6 ppg KCl brine. Ran in the well with a 4" spear, 4.805" grapple, 4.50' extension, 6" stop, 4.75" jars, (2) 4.75" drill collars, 4.75" accelerator, and a 4.75" bumper sub on 2-7/8" L-80 work string. The 6" stop ring would not pass 7493'. Pulled free with 20k lb over string weight. Pulled out of the well and laid down the 6" stop ring. Picked up the previous BHA with a 5.5" stop ring and ran in the hole, engaged top of 5-1/2" 20# innerstring at 7539'. Jarred for 10' with 50k lb over string weight then pulled free. Continued to pull out of the well with 1000 lb over string weight. Pulled up the hole to 6490' and secured the well.

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HISTORY OF OIL OR GAS WELL

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Start Date	Ops. DOGGR Rpt
6/28/2013	Filled the well with 24 bbl of 8.6 ppg KCl brine. Pulled out of the well and laid down the BHA (No casing recovery, spear slipped off). Ran in the well with a kill string to 2817', secured the rig and the well.
7/1/2013	Filled the well with 30 bbl of 8.6 ppg KCl brine. Pulled out of the hole with the kill string. Made up a 4.75" taper mill and a bumper sub on 2-7/8" tubing. Ran in the well to 7531'. Picked up a power swivel and milled 5.5" from 7531' to 7539'. Pulled out of the well to a kill string at 2970' and secured the well.
7/2/2013	The well required 10 bbl of KCl brine to fill. Pulled out of the well with the kill string and laid down the 5.5" mill. Made up a spear with a 4.805" grapple, 12' extension, bumper sub, jars, (2) 4-2/3" drill collars and an accelerator on 2-7/8" tubing and ran in the well to a kill string at 2800' and secured the well. Opened the well and ran into the top of 5-1/2" innnerstring at 7531'. Engaged the innerstring and jarred at 80,000 lb to 120,000 lb for 50' and pulled out of the well to 5700' (at 10,000 lb over string weight) and secured the well.
7/3/2013	Filled the well with 4 bbl of KCl brine. Pulled out of the well and laid down the fishing tools (no recovery.) Made up a spear with a 4.08" grapple, bumper sub, jars, (2) 4-3/4" drill collars and an acceleator on 2-7/8" tubing. Ran in the well to 7539', engaged the 5-1/2" innerstring and jarred loose. Pulled out of the well, stood back the fishing tools and laid down 46' of 5-1/2" innerstring casing). Ran in the well to 2800' with a kill string and secured the well.
7/8/2013	Filled the well with 10 bbl of 8.6 ppg KCl brine. Pulled out of the well with the kill string. Made up 2-7/8" saw-tooth collar ran in the well to the cut at 7580'. Nippled up the PGSR and made up a swivel. Worked on the fish and cleaned out to the packer at 7650' (asphaltines in returns). Reverse circulated the well clean and nippled down the PGSR. Pulled out of the well to a kill string at 2800' and secured the well.
7/9/2013	Repaired the rig. Filled the well with 30 bbl of 8.6 ppg KCl brine. Pulled out of the well with the kill string. Made up a 5-1/2" hydraulic casing cutter with 4-1/2" stabilizer on 2-7/8" tubing. Ran in the well to 7580', worked into the stub and tagged the packer at 7630'. Nippled up the PGSR and picked up the power swivel. Pulled to 7640', opened the casing cutter and attempted to cut (No torque at the tool). Nippled down the PGSR and the power swivel. Pulled out of well to 6400' and secured the well.
7/10/2013	Filled well with 29 bbl of 8.6 ppg KCl brine. Pulled out of the well with the kill string and laid down the casing cutter (found cutter had malfunctioned knives did not open.) Made up a 3-5/8" hydraulic cutter with stabilizer on 2-7/8" tubing. Ran in the well to 7580', worked into the stub. Nippled up the PGSR and the power swivel. Ran in the well to 7620', opened the casing cutter and cut the 5-1/2" casing (200 psig pressure drop and lost torque). Nippled down the PGSR and the power swivel. Pulled out of the well to 6000' and secured the well.
7/11/2013	The well was standing full of KCl brine. Pulled out of the well and laid down the 5-1/2" casing cutter. Made up a spear with 4.695" grapple, 6' extension, 5" stop, bumper sub, jars (1) joint 3-1/2" drill pipe, (2) 4-3/4" drill collars, and an accelerator on 2-7/8" tubing. Ran in the well to top of the 5-1/2" casing stub at 7580', engaged the casing, jarred on the 5-1/2"casing at 80,000 lb and jarred free. Pulled to 7545' and jarred on the 5-1/2" casing (Pulled out of the casing stub), re-engaged the casing stub and jarred on the 5-1/2" casing. (pulled out of the casing stub). Re-engaged the casing stub, jarred, and pulled out of the casing stub. Pulled out of the well to 2800' and secured the well.
7/12/2013	Filled the well with 24 bbl of 8.6 ppg KCl brine. Pulled out of the well and laid down the fishing tools (No casing recovery). Made up a spear with a 4.805" grapple, 6' extension, 5" stop, bumper sub, jars, (1) joint 3-1/2" drill pipe, (2) 4-3/4" drill collars, and an accelerator on 2-7/8" tubing. Ran in the well to the top of the 5-1/2" casing stub at 7580', engaged the casing stub and jarred free. Pulled out of the well and laid down the fishing tools and 45' of 5-1/2" casing . Made up a 4-1/2" string mill on 2-7/8" tubing. Ran in the well to a kill string at 2800' and secured the well.
7/15/2013	The well required 7 bbl of 8.6 ppg KCl brine to fill. Ran in the well to the top of the 5-1/2" casing stub at 7624', nippled up the PGSR and the power swivel. Reamed through the top of the 5-1/2" casing stub and cleaned out fill to the permanent packer at 7630'. Reverse circulated the well clean, nippled down the PGSR and the power swivel. Pulled out of the well to a kill string at 2800'. Shut down the rig for repairs and secured the well.

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
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HISTORY OF OIL OR GAS WELL

Operator: Southern California Gas Company | Field: Aliso Canyon | County: Los Angeles
Well: Frew 3 | Surface Location: Sec 29 3N 16W S.B.B.M.
A.P.I. No. 03700666 | Todd Van de Putte | Title: Senior Storage Field...
(President, Secretary, or Agent)

Date: 10/31/2013 | Signature: Todd R Van de Putte
(Person Submitting Report)

Address: PO Box 2300, SC9365, Chatsworth, CA, 91313-2300 | Telephone Number: 818-701-3339

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Start Date	Ops. DOGGR Rpt
7/16/2013	The well required 2 bbl of KCl brine to fill. Pulled out of the well with the mill and laid down the BHA/ tools. Made up a spear with a 4.408" grapple, 5' extension, bumper sub, jars, (1) joint 3-1/2" drill pipe, (2) 4-3/4" drill collars and an accelerator on 2-7/8" tubing. Ran in the well to the top of the 5-1/2" casing stub at 7605' and attempted to work through a tight spot. Rigged up and attempted to circulate down. Pulled out of the well and laid down the BHA/tools. Made up a spear, an extension, bumper sub, jars, (3) joints 3-1/2" drill pipe,(1) 4-3/4" drill collar and an accelerator on 2-7/8" tubing. Ran in the well to 2800' and secured the well.
7/17/2013	Filled the well with 2 bbl of 8.6 ppg KCl brine. Ran in the well to the top of the 5-1/2" casing stub at 7620', engaged the casing stub, and jarred loose. Pulled out of the well and laid down the BHA/fish (full recovery; 30' of 5-1/2" and the seal assembly). Laid down the drill pipe, drill collars and the fishing tools. Made up an 7" all weight casing scraper and bumper sub on 2-7/8" tubing. Ran in the well to 3500' and secured the well.
7/18/2013	The well required 22 bbl of 8.6 ppg KCl brine to fill. Ran in the well with the 7" casing scraper to 7495', worked down to 7543' and attempted to work down hole. (Could not go deeper.) Rigged up and reverse circulated the well clean for the USIT log. Pulled out of the well and laid down the 7" casing scraper. Ran in the well with a kill string to 2800' and secured the well.
7/19/2013	The well required 24 bbl of KCl brine to fill. Pulled out of the well with a kill string and nippled up the shooting flange for the USIT log. Rigged up the Schlumberger wireline unit and made up the USIT/Neutron tools. Ran in the well to 7650', logged the 7" production casing with the USIT/Neutron tools from 7650' to the surface. Rigged down and moved out the Schlumberger wireline unit and nippled down the shooting flange. Ran in the well with a kill string to 2800' and secured the well.
7/22/2013	The well required 24 bbl of 8.6 ppg KCl brine to fill. Pulled out of the well with the kill string and nippled up the shooting flange. Move in and rigged up the Scientific Drilling wireline unit. Made up the Gyro survey tools and ran in the well with Gyro tools to 7650'. Logged from 7650' to the surface. Rigged down and moved out the Scientific Drilling wireline unit and nippled down the shooting flange. Ran in the well with a kill string to 2800' and secured the well.
7/23/2013	Loaded the drill collars, fishing tools and the excess 2-7/8" tubing. Filled the well with 25 bbl of 8.6 ppg KCl brine. Pulled out of the well with the kill string. Measured and picked up a 2-1/16" mule shoe and (15) joints of 2-1/16" CS hydril tubing on 2-7/8" tubing. Ran in the well and tagged fill at 7975'. Nippled up the PGSR and the power swivel and cleaned out fill to 8014'. Reverse circulated the well clean (bottom 9' of perfs covered). Pulled out of the well to 7525' and secured the well.
7/24/2013	Filled the well with 24 bbl of 8.6 ppg KCl brine. Ran in the well and tagged at 8014' (W. Beil DOGGR waived witness of tag). Circulated the well clean, pulled to 7500' and secured the well.
7/25/2013	The well required 25 bbl of 8.6 ppg KCl brine to fill. Ran in the well to 8014', rigged up and circulated well clean (W. Biel DOGGR verbal to place bottom cement plug). Rigged up the HES cementing equipment. Held safety meeting with the crews and pressure tested the lines and the equipment to 2000 psig. Mixed and pumped 16 bbls (50 sx) of 14.8 ppg Class "G" cement with additives and displaced with 41 bbl of KCl brine. Estimated top of cement at 7419'. Pulled out of the well to 7300', Rigged up and reverse circulated 80 bbl (2 cu. ft. cement returns to the surface). Pulled to 6900', secured the well and rigged down and moved out the HES cementing equipment.
7/26/2013	Filled the well with 36 bbl of 8.6 ppg KCl brine. Ran in the well and tagged the top of the plug cement at 7466' (47' low). Pulled out of the well and laid down (15) joints of 2-1/16" tubing. Ran in the well to 7464', spaced out the tubing for the cement plug and secured the well.
7/29/2013	Filled the well with 36 bbl of 8.6 ppg KCl brine. Moved in and rigged up the HES cementing equipment. Held a safety meeting with crews. The HES pump truck down for repairs, waited on repairs. The HES pump truck could not be repaired on the location; fuel pump out. Rigged down the HES pump truck and secured the well.
7/30/2013	Filled the well with 23 bbl of KCl brine. Rigged up the HES cementing equipment and held safety meeting with crews. Pressure tested the lines and equipment to 2500 psig. With the tubing tail at 7566', mixed and pumped 5 bbls fresh water ahead followed by 129 cuft (70 sacks) of 14.8 ppg Class "G" cement with additives and displaced with 39 bbls of KCl. Cement in place at 12:30. Pulled out of the well to 6846' and reverse circulated 80 bbl of KCl brine with approximately 3 cuft cement returns to the surface. Secured the well.

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Well: Frew 3 | Surface Location: Sec 29 3N 16W S.B.B.M.
A.P.I. No. 03700666 | Todd Van de Putte | Title: Senior Storage Field...
(President, Secretary, or Agent)

Date: 10/31/2013 | Signature: Todd R Van de Putte
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Start Date	Ops. DOGGR Rpt
7/31/2013	Filled the well with 25 bbl of 8.6 ppg KCl brine. Ran in the well to 6943' and tagged the cement plug (B. Hesson DOGGR waived witness of cement tag). Rigged up and pressure tested the 7" production casing (pumped in the well with 200 psig at 3 bpm). Pulled out of the well and made up a 7" test packer on 2-7/8" tubing. Ran in the well to 6840". Set the 7" test packer, pressure tested down to 1000 psig surface pressure for twenty minutes (held pressure). Released the test packer and pulled to 5650', set the test packer and pressure tested down to 1000 psig surface pressure for twenty minutes(held presure). Pulled to 5586', set the test packer and tested down to 1000 psig surface pressure for twenty minutes(held pressure). Pulled to 3492', set the test packer and pressure tested to 1000 psig surface pressure for twenty minutes (held pressure). Pulled to 3392', set the test packer and pressure tested to 1000 psig surface pressure for twenty minutes (held pressure). Pulled to 3209', set the test packer and pressure tested to 500 psig surface pressure for twenty minutes (held pressure). Pulled to 2204', set the test packer and pressure tested down pumped away at 200 psig at 3 bpm. Filled the annulus and re-tested to 1000 psig surface pressure for twenty minutes (held pressure). Ran in the well to 2706', set the test packer and pressure tested the annulus at 300 psig at 3 bpm. Released the test packer and secured the well.
8/1/2013	Filled the well with 16 bbl of 8.6 ppg KCl brine. Pulled out of the well and laid down the test packer. Ran in the well with 2-7/8" tubing to 6943'. Rigged up and pumped 53 bbl of 72 lb/cuft abandonment mud with the top of mud plug at 5600'. Pulled out of the well and rigged up Tiger wireline unit. Made up a 5" perforating gun with 4 - 0.5" hpf, 90 degrees phasing. Ran in the well, correlated and perforated from 5575' to 5580'. Rigged down and moved out the Tiger wireline unit. Made up a 7" test packer on 2-7/8" tubing and ran in the well to 3100' and secured the well.
8/2/2013	The well required 15 bbl of KCl brine to fill. Ran in the well with the 7" test packer to 5565', set the test packer and established perforation pump in rate at 2 bpm with 500 psig surface pressure. Pulled out of the well and laid down the 7" test packer. Made up a 7" cement retainer and ran in the well to 5565', set the retainer and released from the retainer. Stabbed into the 7" retainer and established a pump in rate at 2.5 bpm at 500 psig surface pressure and secured the well.
8/5/2013	Filled the well with 25 bbl of KCl brine. Rigged up the HES cementing equipment, held a safety meeting with the crew and pressure tested the cementing equipment and lines to 2500 psig. Stabbed into the 7" retainer at 5565', established a pump-in rate at 2.5 bpm at 500 psig. and unstabbed from the retainer. Mixed and pump 22.9 bbl (129 cuft/70 sacks) of 14.8 ppg Class "G" cement with additives and displaced with 9 bbl of KCl brine. Stabbed into the retainer and squeezed a total of129 cuft (Final squeeze pressure 390 psig @ 1.2 bpm). Unstabbed from the 7" retainer and reverse circulated with 70 bbl KCl brine with a trace of cement to surface. Rigged up the HES cementing equipment, mixed and pumped 9.6 bbl (30 sacks/ 54 cuft) of 14.8 ppg Class "G" cement with additives and displaced with 31 bbl of KCl brine. Pulled out of the well to 5300', rigged up and reverse circulated 60 bbl with 6 cuft of cement returns to the surface. Pulled out of the well to 5146', rigged down and moved out HES cementing equipment and secured the well. (E. Blevins DOGGR waived the witness of the cement squeeze and cement plug).
8/6/2013	Filled the well with 26 bbl of KCl brine. Ran in the well and tagged the cement plug at 5437' (E. Blevins waived and approved the witness of tag). Rigged up and pumped 79 bbl of 72 lb/cuft abandonment mud with the top of the mud plug at 3450'. Laid down the excess 2-7/8" tubing, pulled out of the well and laid down the stab in guide. Ran in the well to 3450'. Moved in and rigged up the HES cementing equipment, held a safety with the crews and pressure tested the equipment and lines to 1500 psig. With open ended tubing at 3450', mixed and pumped 22.5 bbl (126 cuft/ 70 sacks) of 14.8 ppg Class "G" cement with additives and displaced with 16 bbl of KCl brine. Pulled out of the well to 2860', rigged up and reverse circulated with 60 bbl of KCl brine (3 cuft of cement returns to the surface). Pulled to 2750' and secured the well.
8/7/2013	Filled the well with 15 bbl of KCl brine. Ran in the well to 2942', tagged the cement plug (E. Blevins DOGGR witnessed and approved cement tag). Pulled out of the well and laid down the excess 2-7/8" tubing. Pulled out of the well and laid down the stab in guide. Ran in the well with a WEA 7" test packer. The 7" 23# production casing tested good at 700 psig surface pressure from 2658' to the top of the cement at 2942' and from 2643' to the surface. Located holes in the 7" production casing and obtained an injection rate of 3 bpm at 200 psig between 2643' and 2658'. Pulled out of the well and laid down the 7" WEA test packer. (B. Hesson verbally approved mudding the hole from top of the cement at 2942' to the holes at 2658' as well as a cement plug from the holes at 2658' to +/- 1838'). Ran in the well open ended and spotted 11 bbl of 72 lb/cuftf abandonment mud in the 7" 23# production casing from 2942' to 2658' and secured the well.

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HISTORY OF OIL OR GAS WELL

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Well: Frew 3 | Surface Location: Sec 29 3N 16W S.B.B.M.
A.P.I. No. 03700666 | Todd Van de Putte | Title: Senior Storage Field...
(President, Secretary, or Agent)

Date: 10/31/2013 | Signature: Todd R Van de Putte
(Person Submitting Report)

Address: PO Box 2300, SC9365, Chatsworth, CA, 91313-2300 | Telephone Number: 818-701-3339

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Start Date	Ops. DOGGR Rpt
8/8/2013	The well required 15 bbl of KCl brine to fill. Rigged up the HES cementing equipment and held a safety meeting with the crews. Pressure tested the lines and equipment to 2000 psig. With the 2-7/8" tubing tail at 2655', mixed and pumped 32.4 bbl (181 cuft/100 sacks) of 14.8 ppg Class "G" cement with additives and displaced with 10.6 bbl of KCl brine. (Estimated top of cement at 1838'). Pulled out of the well to 1753', rigged up and reverse circulated with 50 bbl of KCl brine (Trace of cement returns to the surface). Pulled to1600' and secured the well.
8/9/2013	The well required 30 bbl of KCl brine to fill. Ran in the well to 2658' (No cement) and attempted to pressure test the 7" production casing. Pumped at 2 bpm at 300 psig. Pulled out of the well to 1600', rigged up and reverse circulated and secured the well.
8/12/2013	Filled the well with 16 bbl of KCl brine. Ran in the well to 2658', rigged up the HES cementing equipment and held a safety meeting with the crews. With the 2-7/8" tubing tail at 2658', mixed and pumped 19.7 bbl (111 cuft/60 sacks) of 14.8 ppg Class "G" cement with flo-chek additives and displaced with 12 bbl of KCl brine. Estimated top of cement at 2155'. Pulled out of the well, cleared the tubing, ran in the well to 1813' and secured the well.
8/13/2013	Filled the well with 2 bbl of KCl brine. Ran in the well and tagged the cement at 2255' (W. Biel DOGGR witnessed and approved cement tag and mudding of well). Rigged up and pumped 57 bbls of 72 lb/cuft abandonment mud with the top at 810'. Pulled out of the well and laid down the excess 2-7/8" tubing. Made up a WEA 7" casing cutter, ran in the well to 900', rigged up the PGSR and the power swivel. Cut the 7" production casing at 900' and rigged down the power swivel. Pulled out of the well and laid down the casing cutting tools. Rigged down the working floor, nippled down Class III 5M BOPE and secured the well.
8/14/2013	Rigged up and cut the well head bolts and nippled down the tubing head. Made up a 7" spear, unlanded 7" production casing at 40,000 lb, removed the pack off and the slips. Rigged up the working floor and the WEA casing tongs. Pulled out of the well and laid down the 7" production casing (Laid down 20 jts, 889', KB 896'). Rigged down the 7" casing tongs and rigged up the tubing equipment. Made up a 13-3/8" casing scraper and a bumper sub on 2-7/8" tubing. Ran in the well to the top of the 7" production casing stub. Pulled out of the well and laid down the 13-3/8" casing scraper. Loaded tools, equipment and secured the well.
8/15/2013	Moved in and rigged up the Schlumberger wireline unit and held a safety meeting with the crews. Made up the 13-3/8" USIT/Neutron tools, ran in the well to 890' and logged to the surface. Rigged down and moved out the Schlumberger wireline unit. Made up a WEA 13-3/8" cement retainer and ran in the well to 555' and the retainer stopped. Pulled out of the well, laid down the 13-3/8" retainer and secured the well.
8/16/2013	Nippled up a Class II BOPE and cleaned the location.
8/19/2013	Opened the well with 0 psig surface pressure on the tubing and the casing. Filled the well with 1 bbl of KCl brine. Gas scoped the cellar and welded a 2" nipple on the casing head. Ran in the well to 889', rigged up and pressure tested the well to 200 psig surface pressure. Moved in and rigged up the HES cementing equipment and held safety meeting with the crews. Pressure tested the equipment and the lines to 2000 psig. Mixed and pumped 61 bbl (342 cuft/190 sacks) of 14.8 ppg Type III cement with additives and displaced with 2.5 bbl of KCl brine (Esitmated top of the cement at 500'). Pulled to 437', rigged up and reverse circulated out 18 bbl of cement. Pulled to 300', secured the well and cleaned the location.
8/20/2013	The well was standing full of KCl brine. Ran in the well to 514', tagged the cement (M. Davis DOGGR witnessed and approved cement tag and mudding of well.) Rigged up and pumped 23 bbl of 72 lb/cuft abandonment mud form 514' to 360'. Pulled out of the well and laid down the excess 2-7/8" tubing. Rigged down and moved out the working floor and the tubing equipment. Nippled down the Class II BOPE. Rigged up the working floor and tubing equipment. Ran in the well to 360', rigged up for a top job and secured the well.
8/21/2013	Spotted a vacuum truck. moved in and rigged up the HES cementing equipment and held a safety meeting with the crews. Pumped 2 bbl of water and pressure tested the equipment and the lines to 1000 psig. Mixed and pumped 62 bbl (348 cuft) of 14.8 ppg Type III cement with additives with full cement returns to the surface. (W. Beil DOGGR witnessed cementing of well). Laid down the 2-7/8" tubing and topped off the cement plug. Rigged down and moved out the HES cementing equipment. Cleaned the cellar, the cement bins and rigged down equipment.
8/22/2013	Ran in the well to 29' and tagged the cement plug. Rigged down the hoist and loaded the BOPE. Cleaned the mud pit and the Baker tanks.

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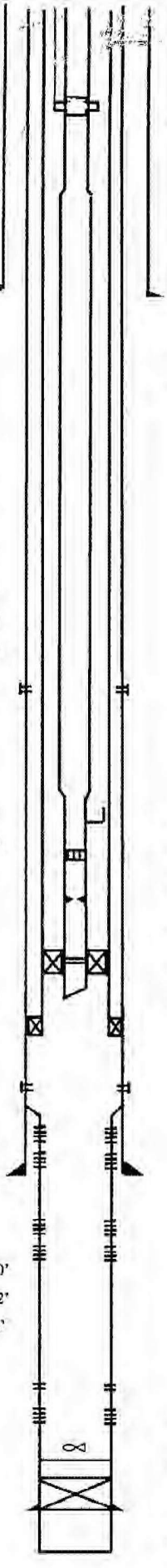
Start Date	Ops. DOGGR Rpt
8/23/2013	Moved in and rigged up the HES cementing equipment and held a safety meeting with the crews. With the 2-7/8" tubing tail at 29', mixed and pumped 6 bbl (33 cuft/24 sacks) of 14.8 ppg Type III cement with additives with cement returns to the surface. Cleaned the cellar and moved equipment off of the location.
8/24/2013	Cleaned the location. Cut off the 13 3/8" casing head and cut the 13-3/8" surface casing to an elevation of 7' below ground level.
9/20/2013	Removed the cellar floor around the 13-3/8" surface casing.
9/25/2013	Met with Mark Davis (CADOGGR). Witnessed the surface cement plug. Verified no leaks. Welded the steel plate to the 13-3/8" surface casing stub with four 2" long welds around the circumference of the steel plate . Welded: "Frew 3 03700666 9-25 -2013 " on the plate.

Ex. I – 43

FREW 3
ALISO CANYON



Surface Casing:
13-3/8" 54.5# J-55
0' - 1055'

Inner-string:
5-1/2" 20# N-80
AB FL-4S
0' - 7650'

Production Casing:
7"
0' - 835' 23# N-80
835' - 4641' 23 # J-55
4641' - 6732' 23 # N-80
6732' - 7799' 26 # N-80

Hole in 7" casing at 3240'
(Sqzd with 147 cf cmt)

5-1/2" Baker Model F
packer at 7622' (prv 7630')

7" Otis Permatrieve
packer at 7650'

WSO holes at 7660' (sqzd)

Liner:
5" 18# J-55
7681' - 8102'

Perfs: 4 spf (1977)
7715' - 7730'
Perfs: 4 spf (1973)
7755' - 7758', 7766' - 7790'
7818' - 7836', 7840' - 7842'
7845' - 7846', 7850' - 7856'
7870' - 7880'
WSO holes at 7985'
Perfs: 2 spf (1963)
7992' - 8023'

489' Baker Model T5 SCSSV

Tubing
0' - 491' (2-7/8" 6.5# N80 8rd EUE)
491' - 7477' (3-1/2" 9.3# N80 8rd EUE)
7477' - 7620' (2-7/8" 6.5# N80 8rd EUE)
Note: 3-1/2" tubing collars turned down to 4.25" OD

7508' PSID-U GLM w/ 1.0" latch
7552' Otis XD Sliding Sleeve (2.313")
7589' Otis XN Nipple (2.313" bore, 2.205" nogo)
7620' 2-7/8" x 2-3/8" crossover (1.991" ID)
7622' Baker Model E latch and seal units (2)
7624' Baker guide shoe

Top of fish at 8020'
Top of cement plug at 8050'
Liner cemented at 8102'
TD at 8485'

Jim Dayton 11\19\94, DG Neville 5/8/95
W:\AC\FREW3\MEC_F3.PUB

Elevation (GRD):	2479' ASL
Elevation (KB):	2487' ASL
Elevation (KB):	8' AGL
Status:	Injection/Withdrawal
Flow Regime:	Tubing Flow
Surface Loc.:	535.5' S and 1275.1'W from station 84
Bottomhole Loc.:	At 7800' MD, wellbore is 36' N and 9' W of surface location.

9/21/44 - 3/30/45: Well drilled and completed.

11/5/63 - 11/23/63: Milled up liner and deepened well to 8485' from original TD of 8006'. Ran and cemented 5" liner at 8102'. Drilled out cement to 8050'.

5/1/73 - 5/22/73: Converted well to gas storage. Ran bit and scraper to 8003' and was unable to clean out further. Jet perforated at 4 spf various intervals in Sesnon zone.

9/8/77 - 9\20\77: Cleaned out to 8020'. Left a cone off 4-1/8" bit in well. Perforated 4 spf from 7715' to 7730'. Pressure tested casing and completed well with 2-7/8" tubing and an SSSV.

1/28/86 - 2/11/86: Ran internal caliper log and casing inspection log. Identified hole in casing at 3240'. Squeezed hole and pressure tested casing to 1000 psi. Ran 5-1/2" inner casing string and completed with 2-3/8" tubing.

10/28\94 - 11\3\94: Converted well from casing flow to tubing flow. Installed SCSSV and ran large diameter tubing string.

	Well Volume	
	Cu. Ft.	Bbl
Tubing	359	64
Innerstring	1187	212
Csg/Lnr	41	8
Total	1587	284

Zone Tops		
MP	7283'	(7283')
S1	7582'	(7582')
S4	7676'	(7676')
S6	7718'	(7718')
S8	7760'	(7760')

	Reviewed By	Date
Drilling:	DG Neville	5/11/95
Petroleum:	R Patterson	5/11/95
Region:	Tom McDonald	5/17/95

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Ex. I – 44

9-15-90 Woods
Day 79. Milled top of 6-5/8" liner down 2' (top at 6905'). Circulated clean. Pulled out of well. Made up 5-3/4" x 2-1/4" taper mill. Ran in and reamed thru top of 6-5/8" liner. Pulled up to top of liner and secured well.
MWO 99183 $282,000 Daily $ 4,780
Cumulative $449,765

9-17-90 Patterson
Day 80. Pulled and laid down 5-3/4" OD taper mill. Loaded out all fishing tools. Ran 7-5/8" bit and 8-5/8" 36#/ft casing scraper to liner top (6902' D.P.). Started out of well with scraper. Secured well.
MWO 99183 $282,000 Daily $ 5,437
Cumulative $455,202

9-19-90 Patterson
Day 81. Pulled out of well with bit and 8-5/8" scraper. Ran Vertilog 8-5/8" casing inspection log from surface to 6898' (tagged 6-5/8" liner top at 6902'). Found areas of corrosion in 8-5/8" casing at 6832', 2350', and 966' (correlated to NLL, 11-18-72). Ran 5-5/8" bit and 6-5/8" 28#/ft. casing scraper to 7184' and then started out of hole. Secured well.
MWO 99183 $282,000 Daily $ 19,998
Cumulative $475,200

9-19-90 Patterson
Day 82. Pulled out of well with bit and 6-5/8" scraper. Ran in hole with 5" OD x 10' long Cavins surge tool assembly on 10 joints 2-7/8" tubing, crossed over to 3-1/2" drillpipe. Surged 6-5/8" liner and worked tool from 7185'-7188'. Pulled tool and recovered 3 gallons of iron cuttings and sand, plus a 26" piece of 6-5/8" casing. Ran kill string. Secured well.
MWO 99183 $282,000 Daily $ 4,358
Cumulative $479,558

9-20-90 Patterson
Day 83. Pulled kill string. Ran 5" OD x 10' long surge tool assembly on 10 joints 2-7/8" tubing, crossed over to drillpipe. Worked surge tool to 7188' and surged 6-5/8" liner. Pulled surge tool - recovered small amount of wire wrap pieces and small packer pieces. Started in well with Model C retrievable bridge plug and Model C-1 fullbore retrievable packer.
MWO 99183 $282,000 Daily $ 5,920
Cumulative $485,478

9-08-90 Woods
Day 73. Mixed 70 bbls. of fluid. Continued to wash over 2-3/8" liner from 7034'-7101'. Backscuttled well clean. Started out of well to check mill shoe.
MWO 99183 $282,000 Daily $ 7,045
Cumulative $414,857

9-10-90 Woods
Day 74. Finished pulling out. Had 156' of 2-3/8" liner stuck in wash pipe. Laid down fish. Found shoe full of junk. Changed shoe and ran in wash over liner from 7086' - 7127'. Backscuttled clean work and jarred wash pipe free. Backscuttled clean. Secured well.
MWO 99183 $282,000 Daily $ 6,786
Cumulative $421,643

9-11-90 Woods
Day 75. Continued to mill and wash over 2-3/8" liner from 7127' to 7170'. Unable to make any hole. Attempted to backscuttle but tools plugged. Pulled out of well slow with wet pipe.
MWO 99183 $282,000 Daily $ 6,672
Cumulative $428,315

9-12-90 Woods
Day 76. Finished pulling out wet. Recovered 78' of 2-3/8" liner (screen) from wash pipe. Made up new shoe. Ran in mill and washed over 2-3/8" liner from 7164' to 7182' (mill on bottom). Backscuttled clean and pulled out of well. Secured well.
MWO 99183 $282,000 Daily $ 6,266
Cumulative $434,581

9-13-90 Woods
Day 77. Pulled out of well. No recovery. Laid down wash pipe and made up overshot for 2-3/8" liner. Ran in well to top of liner.
MWO 99183 $282,000 Daily $ 5,761
Cumulative $440,342

9-14-90 Woods
Day 78. Ran in and attempted to work overshot over top of 2-3/8" liner to 7187'. Pulled out of well. No fish in overshot. Made up 7-5/8" string mill. Ran in well to top of liner. BOPE drill with crew - 49 seconds. Secured well.
MWO 99183 $282,000 Daily $ 4,643
Cumulative $444,985

8-31-90 Patterson
Day 67. Pulled out of well with packer retrieving tool. Recovered 6-5/8" Retrieva-D packer (bottom 2.65') ported extension, lower seal bore, 4" extension sub, X-overs (2), 2-3/8" shear-out safety joint, 2-3/8" collar, and severed 2-3/8" liner (0.17' long). Ran 5" mill shoe, 10 joints washpipe (5" OD x 4-1/4" ID x 289.47' long), drive sub, jars, and drill pipe to 6885'. Mixed new fluid and changed well over to 76#/cu.ft. workover fluid. Secured well.
MWO 99183 $282,000 Daily $ 5,043
Cumulative $379,863

9-01-90 Patterson
Day 68. Pumped 70 barrels of calcium chloride fluid before getting 76 lb/cu.ft. returns. Circulated and conditioned well fluid to 76 lbs./cu.ft. and 40 sec./qt. viscosity. Secured well.
MWO 99183 $282,000 Daily $ 6,013
Cumulative $385,876

9-04-90 Woods
Day 69. Rig is down to repair mud pump with new liners.
MWO 99183 $282,000 Daily $ 0
Cumulative $385,876

9-05-90 Woods
Day 70. Milled and washed over 2-3/8" liner from 6829' to 6939'. Pulled to kill string. Slipped and cut drilling line. Pulled out of well. Had 17' of 2-3/8" liner inside of wash pipe. Laid down fish. Made up new mill shoe on 5" wash pipe. Ran kill string. Secured well.
MWO 99183 $282,000 Daily $ 8,274
Cumulative $394,150

9-06-90 Woods
Day 71. Milled and washed over 2-3/8" liner from 6939' to 7012'. Milled lugs at 6979' and 6994'. Unable to make hole. Checked backscuttle tool (o.k.). Backscuttled clean. Started out of well to check mill shoe.
MWO 99183 $282,000 Daily $ 7,247
Cumulative $401,397

9-07-90 Woods
Day 72. Finished pulling out of well. Changed out mill shoe and ran in well. Milled and cleaned out junk and sand from 7012'-7034'. Backscuttled well clean. Pulled wash pipe to top of 6-5/8" liner. Well took 30 bbls of fluid.
MWO 99183 $282,000 Daily $ 6,415
Cumulative $407,812

8-24-90 Killebrew
Day 61. Milled element and 6-5/8" from 6902'-6903'. Circulated and cleaned well with three sacks. Sawdust backscuttled. Pulled 40 stands. Secured well.
MWO 99183 $282,000 Daily $ 4,713
Cumulative $334,676

8-25-90 Killebrew
Day 62. Finished pulling mill shoe. Recovered one quart of metal and one piece of rubber. Made up Homco Bowen 7-3/8" overshot with a 5-1/2" grapple and bottom hole assembly. Ran in well to 6896'. Jarred on fish to 135,000#. Pulled to 2050'. Secured well.
MWO 99183 $282,000 Daily $ 6,408
Cumulative $341,084

8-27-90 Killebrew
Day 63. Pulled out of well. Changed from 5-1/2" to 5-3/8" grapple. Ran in to 6896'. Jarred on fish to 160,000 lbs. Pulled out of well. Laid down overshot. Made up 7" x 6-1/4" x 12' washover pipe and surge tools. Ran in well to 2450'. Secured well.
MWO 99183 $282,000 Daily $ 4,503
Cumulative $345,587

8-28-90 Killebrew
Day 64. Ran in well with surge tool. Unable to get the 7" x 6-1/4" wash pipe over the packer. Surged for junk at 6895' - 6900'. Pulled surge tool . Recovered two pieces of metal. Made up Homco Bowen overshot with 5-1/2" grapple. Ran in well to 6903'. Unable to attach grapple to fish. Secured well.
MWO 99183 $282,000 Daily $ 8,024
Cumulative $353,611

8-29-90 Killebrew
Day 65. Pulled out of well with 5-1/4" grapple . Made up 4-1/2" grapple and ran in well to 6897'. Jarred on fish to 202,000 lb. - 110,000 lb. over string weight. Pulled out of well to 2100'. Secured well.
MWO 99183 $282,000 Daily $ 12,188
Cumulative $365,799

8-30-90 Patterson
Day 66. Pulled out of well with overshot fishing assembly. Recovered 4-11/16" close-catch overshot bowl, Baker latch-in locator sub (damaged from milling), two seal units, production tube, and two small diameter seal units (lower seal bore). Ran Baker Retrieva-D packer retrieving tool to 6900' and attached to packer. Jarred to 152,000 lbs (56,000 lbs over string weight) for one hour. Lost resistance--pulled to kill string.
MWO 99183 $282,000 Daily $ 9,021
Cumulative $374,820

8-16-90 Woods
Day 55. Pulled out of well. 4-5/8" grapple gone from overshot. Made up 7-3/8" mill shoe built up to 7.5" OD x 5.6" ID with tungsten carbide insert buttons. Ran in to 6897'. Backscuttled well clean and worked over fish to 6898'. Hydraulic hoses blew out on rotary table. Secured well and shut down to repair.
MWO 99183 $282,000 Daily $ 7,175
Cumulative $305,091

8-17-90 Woods
Day 55. Continued to mill on 6-5/8" casing at 6897'. Attempted to drill with no pump for 30 minutes. Would not mill. Hydraulics on rotary table bad. Laid down backscuttle tools. Checked out rotary hydraulics. Milled 9-1/2 hours.
MWO 99183 $282,000 Daily $ 4,247
Cumulative $309,338

8-18-90 Woods
Day 56. Rig is down to repair rotary table hydraulics.
MWO 99183 $282,000 Daily $ 1,650
Cumulative $310,988

8-20-90 Killebrew
Day 57. Repaired brakes and mud pump. Started milling at 11:00 a.m. Cleaned out to 6899'. Pulled mill shoe #4. Made up mill #5 and ran in to 2059'. Secured well.
MWO 99183 $282,000 Daily $ 4,175
Cumulative $315,163

8-21-90 Killebrew
Day 58. Finished running in well with 7-1/2" x 5-1/2 mill shoe. Continued to mill 6-5/8" 28# liner from 6899' to 6902'. Circulated bottoms up. Secured well.
MWO 99183 $282,000 Daily $ 6,296
Cumulative $321,458

8-22-90 Killebrew
Day 59. Pulled mill #5. Made up 7-1/2" x 5-1/2" mill shoe #6. Ran in well to 2600'. Closed in well. Changed drill line.
MWO 99183 $282,000 Daily $ 6,337
Cumulative $327,795

8-23-90 Killebrew
Day 60. Rig down at 7:00 a.m. to replace brakes until 3:00 p.m. Ran in to 6270'.
MWO 99183 $282,000 Daily $ 2,168
Cumulative $329,963

8-10-90 Killebrew
Day 50. Pulled kill string. Made up cavins surge tool. Ran in well and surged from 6892' to 6900'. Pulled out of well to kill string. Secured well.
MWO 99183 $282,000 Daily $ 3,945
Cumulative $272,897

8-11-90 Killebrew
Day 51. Pulled out of well with surge tool. Recovered one gallon of metal plus two slivered pieces of 6-5/8" liner (each approx. 11' long). Made up Homco 4-5/8" grapple in 7-3/8" Bowen overshot, 6" bumper-sub, 6" jars, 4-6" drill collars and accelerator. Ran in well to 6896' and attached to fish. Jarred on fish. Pulled out of well. Recovered 6" piece of 6-5/8". Ran kill string. Secured well.
MWO 99183 $282,000 Daily $ 8,003
Cumulative $280,900

8-13-90 Woods
Day 52. Pulled kill string. Made up 7-1/16" impression block on two joints 2-7/8" tubing. I.B. showed 1-3/16" x 3/16" mark in center of block. Ran to 6900' on sand line. Had to cut and splice sand line on way out (3-1/2 hours). Finished pulling out. Changed out Hydril bag. Made up 5-3/4" x 2-1/2" taper mill. Ran kill string.
MWO 99183 $282,000 Daily $ 4,258
Cumulative $285,971

8-14-90 Woods
Day 53. Finished running in. Stopped at 6896'. Milled to 6897'. Pulled out. Mill showed to wear on 5-3/4" O.D. Had 2 pieces of tubing 6" long 2" wide in mill. Laid down mill. Made up 5-5/8" x 4-3/4 gr. overshot. Ran in to 20 stands. Change of orders. Pulled out to kill string.
MWO 99183 $282,000 Daily $ 6,117
Cumulative $292,088

8-15-90 Woods
Day 54. Finished running in well. Latch on fish at 6897'. Jarred on fish to 180,000#. Overshot started slipping out. Pulled out of well to kill string. BOPE drill with crew - 46 seconds.
MWO 99183 $282,000 Daily $ 5,820
Cumulative $297,916

8-01-90 Killebrew
Day 42. Finished running in well. Reamed from 6887' - 6892'. Continued milling 6-5/8" 28# liner from 6892' to 6897'.
MWO 99183 $282,000 Daily $ 4,894
Cumulative $229,756

8-02-90 Killebrew
Day 43. Milled and cleaned out rubber from 6897' - 6898'. Secured well.
MWO 99183 $282,000 Daily $ 6,034
Cumulative $235,790

8-03-90 Killebrew
Day 44. Pulled out of well with Homco 7-1/2" x 5-1/2" mill shoe. Made up Cavins surge tool. Ran in well to 3100'.
MWO 99183 $282,000 Daily $ 3,317
Cumulative $239,107

8-04-90 Killebrew
Day 45. Finished running in well with Cavins surge tool. Surged at 6893'. Pulled out of well. Recovered one gallon of metal and rubber. Made up 2-3/4" basket grapple on bumper sub, jars, four 6" drill collars. Ran in well to 5883'.
MWO 99183 $282,000 Daily $ 7,014
Cumualtive $246,121

8-06-90 Killebrew
Day 46. Ran in well and attached grapple to 2-7/8" tubing at 6887'. Jarred on fish to 170,000 lb. Tried to work packer down hole. Pulled out of hole wet. Recovered metal, rubber, a piece of 2-7/8" tubing 12" long. Ran kill string to 2100'. Secured well.
MWO 99183 $282,000 Daily $ 5,742
Cumulative $251,863

8-07-90 Killebrew
Day 47. Pulled kill string. Made up Homco 7-1/2" x 5-1/2" mill shoe. Ran in well. Milled over packer from 6894' to 6898'. Sheared bolts on rotary table drive shaft at 3:45 p.m. Closed in well until a.m.
MWO 99183 $282,000 Daily $ 7,546
Cumulative $259,409

8-08-90 Killebrew
Day 48. Continued milling on 6-5/8" liner at 6898'. Rubber and metal returns over shale shaker. Milled to 6898'.
MWO 99183 $282,000 Daily $ 4,911
Cumulative $264,320

8-09-90 Killebrew
Day 49. Milled from 6899' to 6900'. Backscuttled and circulated bottoms up. Pulled to kill string.
MWO 99183 $282,000 Daily $ 4,632
Cumulative $268,992

21

7-24-90 Killebrew
Day 35. Pulled kill string. Made up shoe and washover pipe running in well (15 stands per hour) to avoid fluid from flowing over top of 3-1/2" drill pipe.
MWO 99183 $282,000 Daily $ 4,258
Cumulative $194,085

7-25-90 Killebrew
Day 36. Finished running in well to 6883' with sawtooth washover shoe. Milled between 6-5/8" x 8-5/8" pipe for 70 minutes - made 3". Circulated bottoms up. Recovered gravel and small metal stringers.
MWO 99183 $282,000 Daily $ 4,258
Cumulative $198,343

7-26-90 Killebrew
Day 37. Milled with sawtooth between 8-5/8" x 6-5/8" pipe for 90 minutes (no progress). Pulled out of well. Sawtooth showed no wear. Ran kill string. Secured well.
MWO 99183 $282,000 Daily $ 6,020
Cumulative $204,363

7-27-90 Killebrew
Day 38. Made up 5" surge tool. Ran in well and surged from 6883' to 6890'. Pulled out of well with surge tool, recovered metal cuttings. Made up Homco 7-1/2" x 5-1/2" mill shoe on 38' wash pipe. Ran in well with kill string to 2090'. Secured well.
MWO 99183 $282,000 Daily $ 5,797
Cumulative $210,160

7-28-90 Killebrew
Day 39. Ran in well with Homco 7-1/2" x 5-1/2" mill shoe. Milled from 6883' to 6889'. Broke high pressure hydraulic hose on rotary table at 3:30 p.m. Circulated well clean. Cleaned ditch magnet. Secured well.
MWO 99183 $282,000 Daily $ 3,945
Cumulative $214,105

7-30-90 Killebrew
Day 40. Cleaned out 2' fill. Milled 6". Rig down for repair. Working on hydraulic system for rotary table.
MWO 99183 $282,000 Daily $ 6,499
Cumulative $220,604

7-31-90 Killebrew
Day 41. Milled on 6-5/8" liner from 6889' to 6892'. Pulled millshoe #1. Made total of 9'. Heeled off 3/8". Made up mill shoe #2. Ran in well to 3596'. Secured well.
MWO 99183 $282,000 Daily $ 4,258
Cumulative $224,862

7-16-90 Woods
Day 28. Milled on 6-5/8" 28# liner and hanger from 6863' to 6868'. Backscuttled clean. Pulled up and secured well.
MWO 99183 $282,000 Daily $ 5,296
Cumulative $159,151

7-17-90 Woods
Day 29. Milled on 6-5/8" 28# liner from 6868' to 6870'. Total footage milled - 11'. Circulated clean. Pulled out mill #1 (50% used). Made up mill #2. Ran kill string and secured well.
MWO 99183 $282,000 Daily $ 4,736
Cumualtive $163,887

7-18-90 Woods
Day 30. Finished running in mill down to liner at 6870' two hours (would not mill). Pulled out with mill #2. Cut bottom wing off mill. Made up tools. Ran kill string in well. Secured well.
MWO 99183 $282,000 Daily $ 4,258
Cumulative $168,145

7-19-90 Woods
Day 31. Milled on 6-5/8" liner from 6870' to 6882'. Circulated clean. Secured well. BOPE drill - 50 seconds.
MWO 99183 $282,000 Daily $ 7,631
Cumulative $175,776

7-20-90 Woods
Day 32. Pulled out of well. Made up washover mill shoe 7-9/16" OD x 5-9/16" ID on 6" drill collars. Ran in to 6800'. Secured well. Repaired tongs (1/2 hour).
MWO 99183 $282,000 Daily $ 3,735
Cumulative $179,511

7-21-90 Woods
Day 33. Milled on 6-5/8" liner from 6882' to 6883'. Circulated well clean and pulled out of well. Laid down wash pipe. Ran kill string. Secured well.
MWO 99183 $282,000 Daily $ 9,766
Cumulative $189,277

7-23-90 Killebrew
Day 34. Rig and crew idle - short one man. Homco adding tungsten carbide and boron to mill shoe.
MWO 99183 $282,000 Daily $ 550
Cumulative $189,827

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7-07-90 Killebrew
Day 21. Pulled kill string. Made up midway overshot with 2-7/8" grapple. Ran in well and attached grapple to 2-7/8" fish at 6889'. Jarred and worked fish to 140,000 lbs. (50,000 lbs. over hook weight). Pulled out of well to kill string, hydraulic tongs down for repair.
MWO 99183 $282,000 Daily $ 4,153
Cumulative $115,512

7-09-90 Killebrew
Day 22. Rig down for repair. Working on hydraulic pipe tongs.
MWO 99183 $282,000 Daily $ 447
Cumulative $116,062

7-10-90 Killebrew
Day 23. Rig started running at 8:30 a.m. Pulled out of well. No recovery. Made up 5-1/16" x 4" mill shoe on bottom hole assembly and ran in well to 6823'.
MWO 99183 $282,000 Daily $ 8,464
Cumulative $124,526

7-11-90 Killebrew
Day 24. Ran in and milled on junk at 6892'. With reverse circulating tool. Pulling out of well with 50 stand. Rig down from 12:30 - 3:00 p.m. Finished pulling out of well. Laid down mill. Made up Midway grapple on bottom hole assembly. Ran in to 2057'. Secured well.
MWO 99183 $282,000 Daily $ 3,735
Cumulative $128,261

7-12-90 Killebrew
Day 25. Finished running in well to latch at 6892'. Attached grapple to latch and jarred to 180,000 lbs. (90,000 lbs. over hook weight). Pulled out of well. Left overshot bowl and grapple. Recovered a piece of metal out of extension (10" long - 2" wide) with threads. Ran kill string.
MWO 99183 $282,000 Daily $ 6,761
Cumulative $135,022

7-13-90 Killebrew
Day 26. Pulled kill string. Modify pilot mill. Ran in well to 6859'. Circulated and conditioned drilling fluid.
MWO 99183 $282,000 Daily $ 6,721
Cumulative $141,743

7-14-90 Killebrew
Day 27. Milled on 6-5/8" 28# liner and 6-5/8" x 8-5/8" liner hanger from 6859' to 6863'. Secured well.
MWO 99183 $282,000 Daily $ 12,112
Cumulative $153,855

6-29-90 Woods
Day 15. Attached grapple to fish. Jarred and worked pipe attempting to release latch and seals. Pulled out of well. No recovery. Ran kill string and secured well.
MWO 99183 $282,000 Daily $ 5,048
Cumulative $ 92,139

6-30-90 Woods
Day 16. Rig shut down. Insufficient rig personnel (no derrickman).
MWO 99183 $282,000 Daily $ 550
Cumulative $ 92,689

7-02-90 Killebrew
Day 17. Pulled kill string. Made up 5" washpipe with sawtooth on bottom and 4-3/4" overshot. Ran in well to 6890' and backscuttled for 45 minutes. Attached to fish and worked 7 rounds of torque into pipe. Latch did not release. Released overshot from fish. Pulling out of well.
MWO 99183 $282,000 Daily $ 6,009
Cumulative $ 98,698

7-03-90 Killebrew
Day 18. Pulled out of well. Made up outside cutting tool. Running in well. Rig shut down for repairs on right angle drive.
MWO 99183 $282,000 Daily $ 3,279
Cumulative $101,977

7-04-90 Killebrew
Day 19. Rig and crew idle. Holiday.
MWO 99183 $282,000 Daily $ 3,279
Cumulative $101,977

7-05-90 Killebrew
Day 19. Ran in and out of 2-7/8" tubing at 6889' just above packer. Pulled out of well. Recovered 27.12' of 2-7/8" tubing. Made up Midway grapple on fishing assembly and started running in well to 1970'. Secured well.
MWO 99183 $282,000 Daily $ 5,851
Cumulative $107,828

7-06-90 Killebrew
Day 20. Finish running in well to fish at 6892'. Backscuttled - 45 minutes. Attempted to attach grapple to latch with no success. Pulled out of well to kill string 2050'. Secured well.
MWO 99183 $282,000 Daily $ 3,526
Cumulative $111,359

6-22-90 Woods
Day 9. Repaired Foster Tongs (two hours). Pulled kill string. Made up fishing tools. Waited on sub. Blocks fell 3' to floor when fast line came out of drum. Shut rig down to wait on new drilling line. Strung new drilling line. Secured well. (Downtime on rig 9 hours).
MWO 99183 $282,000 Daily $ 2,377
Cumulative $ 57,906

6-23-90 Woods
Day 10. Made up fishing tools. Ran in and attempted to screw onto fish. Pulled loose from fish at 30,000 lbs. over. Ran chemical cutter. Tool stopped at 6861'. Pulled chemical cutter and CCL. Circulated and attempted to screw onto fish - would come off fish at 30,000 lbs. over. Backscuttled clean. Secured well.
MWO 99183 $282,000 Daily $ 5,672
Cumulative $ 63,578

6-25-90 Woods
Day 11. Pulled out of well. Picked up one joint of 5" washover pipe with mill shoe. Ran in and circulated over fish from 6863' - 6892'. Backscuttled clean. Pulled to top of fish. Secured well.
MWO 99183 $282,000 Daily $ 4,258
Cumulative $ 67,836

6-26-90 Woods
Day 12. Ran into well at 6892'. Backscuttled for thirty minutes. Pulled out of well with wash pipe. Laid down washover pipe. Made up Bowen overshot and ran in well to 4760'. Closed in well to repair blocks at 4:00 p.m.
MWO 99183 $282,000 Daily $ 3,840
Cumulative $ 71,676

6-27-90 Woods
Day 13. Finished running in well and attached grappel to fish at 6861'. Jarred on latch and seals, worked pipe free. Pulling out of well to 1800'. Secured well.
MWO 99183 $282,000 Daily $ 3,004
Cumulative $ 74,680

6-28-90 Woods
Day 14. Pulled out of well. Made up Midway's Baasch Ross 3-1/16" grapple. Ran in well to 6690'. Secured well.
MWO 99183 $282,000 Daily $ 12,411
Cumulative $ 87,091

6/29/90. [illegible]

6-15-90 Killebrew
Day 3. Attempted to release seals and latch from packer with no success. Using Dialog ran free point and back off shot. Combination free point showed movement of pipe to packer. Fired string shot in packer at 6893', but unable to unlatch from packer. Pulled Dialog tools. Secured well.
MWO 99183 $282,000 Daily $ 3,758
Cumulative $ 32,559

6-16-90 Killebrew
Day 4. Using Dialog backed off 2-7/8" tubing at 6861'. Pulled and re-dressed doughnut. Using hydrotest, tested pipe rams, blind rams and manifold to 4000 psi. Tested Hydril bag to 2700 psi. Layed down doughnut and secured well.
MWO 99183 $282,000 Daily $ 8,001
Cumulative $ 40,560

6-18-90 Killebrew
Day 5. Pulled 2-7/8" 6.5# J-55 8rd EUE tubing and accessories, leaving one joint of tubing latched into the packer. Changed pipe rams from 2-7/8" to 3-1/2". Ran 2-7/8" tubing kill string in well. Picked up and stood back kelly and 6" drill collars. Rigged up to pick up 3-1/2" drill pipe. Secured well.
MWO 99183 $282,000 Daily $ 3,658
Cumulative $ 44,218

6-19-90 Woods
Day 6. Pulled kill string. Made up 5" mill shoe, one joint of 5" wash pipe, bumper sub, and jars. Picked up and ran 3-1/2" IF drill pipe to 6800'. Secured well.
MWO 99183 $282,000 Daily $ 4,258
Cumulative $ 48,476

6-20-90 Woods
Day 7. Located 6-5/8" liner top at 6859'. Shut down for 7 hours to repair leak in stand pipe and to replace swivel packing. Backscuttled and cleaned out sand from 6861' (top of 2-7/8" tubing) to 6892' (top of packer). Secured well.
MWO 99183 $282,000 Daily $ 2,795
Cumulative $ 51,271

6-21-90 Woods
Day 8. Wash over fish from 6861' - 6892'. Backscuttled sand out of well. Pulled out of well. Laid down wash pipe, had no x-over sub from 3-1/2" FH box to 2-7/8" 8rd pin. Ran kill string. Secured well. Had BOPE drill - 56 seconds.
MWO 99183 $282,000 Daily $ 4,258
Cumulative $ 55,529

6-06-90 Killebrew
Day 0. Load and moved rig from WEZU 24B (Honor Rancho) to Fernando Fee 35C. Set in rig.
MWO 99183 $282,000 Daily $ 1,850
Cumulative $ 1,850

6-07-90 Killebrew
Day 0. Welding repairs made to derrick. Rig crew cleaning up WEZU 24B location.
MWO 99183 $282,000 Daily $ 0
Cumulative $ 1,850

6-08-90 Killebrew
Day 0. Begin rigging up - string drilling line.
MWO 99183 $282,000 Daily $ 12,723
Cumulative $ 14,573

6-09-90 Killebrew
Day 0. Continue rigging up over well.
MWO 99183 $282,000 Daily $ 1,475
Cumulative $ 16,048

6-11-90 Killebrew
Day 0. Rig and crew idle due to shortage of rig personnel.
MWO 99183 $282,000 Daily $ 550
Cumulative $ 16,598

6-12-90 Killebrew
Day 0. Continued rigging up.
MWO 99183 $282,000 Daily $ 2,331
$ 18,929

6-13-90 Killebrew
Day 1. Using instrument service checked fluid level and pressure. (Annulus 1346', 450 psi - tubing 1426' 500 psi). Set back pressure valve. Removed xmas tree and installed BOPE. Secured well.
MWO 99183 $282,000 Daily $ 5,706
Cumulative $ 24,635

6-14-90 Killebrew
Day 2. Using Hydrotest, tested BOPE. Donut leaking fluid. No test. Tubing and annulus pressure 74 psig. Tubing Fluid level 267', annulus fluid level 441'. Pressure release tubing hanger from tubing head. Work tubing trying to release seals and latch from Baker Retrieva "DA" packer.
MWO 99183 $282,000 Daily $ 4,165
Cumulative $ 28,801

Ex. I – 45

9-21-90 Patterson
Day 84 Finished running in well with packer and bridge plug. Set bridge plug at 6895' (top) and tested 8-5/8" casing to 700. Set packer at 5601' and tested to 1500 psi (5601'-6895'). Recovered bridge plug and set at 5633'. Tested 8-5/8" casing to 900 psi (o'-5633'). Set bridge plug at 4407' and tested 8-5/8" casing to 1500 psi (0'-4107'). All tests good-no leaks. Started out of well with packer and bridge plug.
MWO 99183 $282,000 Daily $ 7,650
Cumulative $493,128

9-22-90 Patterson
Day 85. Pulled out of well and laid down Model "C" packer and retrievable bridge plug. Left piece of bow spring (7-1/4" x 1-5/8" x 3/16") from plug in well. Ran Halliburton 8-5/8" 36# x 6-5/8" 28# lead seal driveover adapter and set on top of 6-5/8" liner at 6902' (top of lead seal at 6900'). Started out of well with setting tool.
MWO 99183 $282,000 Daily $ 8,152
Cumulative $501,280

9-24-90 Patterson
Day 86. Pulled out with lead seal adapter setting tool. Ran 5-5/8" bit on 2-7/8" tubing, crossed over to 3-1/2" drillpipe to 7190' - unable to work deeper. Circulated well clean. Cleaned circulating pit and all Baker tanks. Pulled bit up above liner top. Secured well.
MWO 99183 $282,000 Daily $ 6,344
Cumulative $507,624

9-25-90 Patterson
Day 87. Ran in hole with 5-5/8" bit to 7190'. Filtered 270 bbls. CaCl workover fluid on surface. Circulated well and filtered 300 bbls. of wellbore workover fluid. Secured well.
MWO 99183 $282,000 Daily $ 8,493
Cumulative $516,117

9-26-90 Patterson
Day 88. Completed filtering of all CaCl workover fluids on the surface and in the well. Pulled out of well with 5-5/8" bit and 6-5/8" casing scraper. Made up Vann tubing conveyed perforating assembly, maximum differential bar vent, 8-5/8" RTTS packer, and annulus valve on 3-1/2" drillpipe. Ran in hole to 6800'. Secured well.
MWO 99183 $282,000 Daily $ 8,616
Cumulative $524,733

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SoCalGas-5.0930

9-27-90 Patterson

Day 89. Completed running in hole. Tagged bottom of hole with perforating assembly and picked up 10' to set packer and test lines. Waited for Gas Co. personnel to tie choke manifold into kill line. Ran GR correlation log from 6800' - 7000'. Reset packer 10' lower. Pressured well to 2150' psi surface pressure for 150 psi underbalance (est. fluid level: 5800'). Dropped perforating bar - pressure built to 2300 psi. Flowed well for 11 minutes. Killed by bullheading 78 bbls. Secured well.

MWO 99183 $282,000

Daily $ 11,734
Cumulative $536,467

9-28-90 Patterson

Day 90. Bled off drillpipe and annulus. Ran pulling tool and hydraulic jars on 0.092" slick line and recovered Vann drop bar. Dropped bar for second perforation firing attempt - no indication of firing. Latched onto drop bar with slickline pulling tool and spudded tools twice at 7027'. Recovered drop bar. Pulled perforating assembly - guns failed to fire due to fine metal and rock debris above firing head. Ran drillpipe kill string.

MWO 99183 $282,000

Daily $ 8,528
Cumulative $544,995

9-29=90 Patterson

Day 91. Pulled kill string. Re-ran 4" Vann perforating assembly, maximum differential bar vent, 8-5/8" RTTS packer, and annulus valve on 3-1/2" drillpipe. Positioned guns (to perforate 7070'-7110' and 7149'-7179', 4 HPF) and set packer at 6839'. With fluid level in drillpipe at 1525' (for 200 psi underbalance), dropped firing bar. Noticed 600' rise in fluid level (stabilized). Pumped 17 bbls and pulled 6 stands. Secured well.

MWO 99183 $282,000

Daily $ 5,109
Cumulative $550,104

10-1-90 Patterson

Day 92. Laid down packer and guns, and loaded out. Made up bit and casing scaper for 6-5/8" casing. Ran in well and located fill at 7188', cleaning out to 7190' (2' of fill). Backscuttled gas out of well. Pulled to top of liner.

MWO 99183 $282,000

Daily $ 20,623
Cumulative $570,727

10-2-90 Patterson
Day 93. Pulled out of well. Rigged up to pick up 2-3/8" wire wrapped liner. While picking up liner over torque, pipe had bad box. Laid down liner. Ran kill string.
MWO 99183 $282,000 Daily $ 2,317
Cumulative $574,044

10-3-90 Woods
Day 94. Pulled kill string. Ran 2-3/8" wire wrap liner (249.88' total). Picked up 1.315" OD tail pipe. Ran in well to 7179' (top at 6930'). Mixed and pumped slurry with 45 cu.ft. of 40-60 sand. Established 21 cu.ft. in place when pressure went from 626 psi to 1200 psi. Backscuttled sand out with pressure at 2000 psi.
MWO 99183 $282,000 Daily $ 6,454
Cumulative $578,302

10-4-90 Woods
Day 95. Circulated 3 barrels per minute at 700 psi. Pumped 15 cu.ft. 40-60 sand. Backscuttled well clean-no sand. Waited 2 hours. Break circulation at 3 barrels per minute. Pumped 10 cu.ft. 40-60 sand. Pressured to 1200 psi. Backscuttled well clean-no sand. Waited 1-1/2 hours. Break circulation at 3 barrels per minute and 800 psi. Secured well.
MWO 99183 $282,000 Daily $ 6,454
Cumulative $584,756

10-5-90 Woods
Day 96. Mixed and pumped 11 cu.ft. of 40-60 sand down at 1.5 bbls. per minute. Unsuccessfully attempted to backscuttle. Released from liner. Worked tool to top of 6-5/8" liner. Freed pipe backscuttled clean-no sand. Pulled out of well and laid down tubing with tools. Ran kill string.
MWO 99183 $282,000 Daily $ 5,423
Cumulative $590,179

10-6-90 Woods
Day 97. Rigged up Atlas Wireline. Ran Photon Log. Stopped liner top. Pulled out of well and removed centralizer. Added weight. Ran in, stopped at liner top. Riiged down Atlas and ran in with 1" tubing. Located fill at 7169'. Backscuttled fill out of well. Pulled out of liner and secured well.
MWO 99183 $282,000 Daily $ 7,817
Cumulative $597,996

10-8-90 Woods
Day 98. Rigged up Atlas Wireline. Ran Photon Log. Stopped at 6963'. Pulled out of well and added weight bars. Ran in well to 7080'. Could not go down. Logged up to 6700'. Pulled out of well. Loaded out Atlas Wireline and ran kill string. Secured well.
MWO 99183 $282,000 Daily $ 7,520
Cumulative $605,516

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10-9-90 Woods
Day 99. Made up Halliburton lead seal drive over adaptor and ran in well to 2-3/8" liner top. Set lead seal adapter (top at 6927'). Released from lead seal. Pulled out of well. Made up and set Baker bridge plug at 5925'. Tested to 1000 psi. Pulling out of well laying down drill pipe.
MWO 99183 $282,000 Daily $ 28,003
Cumulative $633,5196

10-10-90 Woods
Day 100. Laid down 3-1/2" IF drill pipe (217 joints), 6" drill collars and tools. Changed out Tongs. Ran kill string. Secured well.
MWO 99183 $282,000 Daily $ 4,571
Cumulative $ 638,090

10-11-90 Woods
Day 101. Loaded out tools. Lowered cellar floor.
MWO 99183 $282,000 Daily $ 6,510
Cumulative $644,660

10-12-90 Woods
Day 102. Digging out cellar floor with S & E construction crew to lower wellhead.
MWO 99183 $282,000 Daily $132,863
Cumulative $777,523

10-13-90 Woods
Day 103. Pulled kill string. Rigged up to unland 8-5/8" casing. Attempted to remove tubing head and 8-5/8" seal flange. Pulled 68,000 lb. could not break seal flange loose. Made up tubing head and BOPE. Ran kill string. Secured well.
MWO 99183 $282,000 Daily $ 3,779
Cumulative $781,302

10-15-90 Woods
Day 104. Cut casing head off and lowered 33". Welded new 13-5/8" casing head on. Cooled for 2 hours. X-ray weld (o.k.). Relanded 8-5/8" casing with 100,000# weight in slips. Installed 8-5/8" packing. Ran top bridge plug. Secured well.
MWO 99183 $282,000 Daily $ 6,763
Cumulative $788,065

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SoCalGas-5.0933

10-17-90 Woods
Day 106. Nippled up BOPE, tested to 1000 psi (o.k.). Tested seal flange landing spool seal with 4000 psi (test o.k.). Laid down tools. Pulled top bridge plug from 60'. Ran in well to retrieve bridge plug set at 6000'. Found drilling line very bad. Changed out drilling line.
MWO 99183 $282,000 Daily $ 6,278
Cumulative $820,066

10-18-90 Woods
Day 107. Ran in latch plug. Released plug and pulled out. Laid down bridge plug. Rigged up wireline. Made up Otis 8-5/8" packer. Ran in and set at 6850'. Packer did not set and fell down well to top of liner. Rigged down wireline. Ran in with seal overshot. Attempted to latch onto packer, no indication at surface that packer was latched. Started out of well.
MWO 99183 $282,000 Daily $ 3,758
Cumulative $823,824

10-19-90 Woods
Day 108. Finished pulling out. Recovered Otis packer. Made up new packer. Rigged up Tiger wireline. Ran packer and set at 6850'. Loaded out Tiger wireline. Made up Otis test seals (overshot). Ran kill string. Secured well.
MWO 99183 $282,000 Daily $ 7,542
Cumulative $831,366

10-20-90 Woods
Day 109. Ran in and located packer at 6850'. Pulled 20,000# weight over set 10,000# down on packer. Tested packer with 1500 psi for 30 minutes (o.k.). Released from packer. Pulled out of well to kill string. Made breaks on kelly. Held BOPE drill with crew - 49 seconds. Secured well.
MWO 99183 $282,000 Daily $ 5,222
Cumulative $836,588

10-22-90 Woods
Day 110. Pulled kill string. Changed pipe rams to 6-5/8". Picked up 6-5/8" casing, Hydro-testing to 5000 psi, Torque-n-turn connections 4800' - 5500 ft-lbs. Ran to 2680'. Secured well.
MWO 99183 $282,000 Daily $ 6,358
Cumulative $842,973

10-23-90 Woods
Day 111. Continued running 6-5/8" N-80 AB FL-4S casing to 6847'. Located and latched packer. Pulled 20,000# over string weight. Set 10,000# on packer. Tested backside to 1,500 psi (o.k.). Released from packer. Rigged down Hydro-test and loaded out. Secured well.
MWO 99183 $282,000 Daily $ 16,562
Cumulative $859,555

10-24-90 Woods
Day 112. Rigged up and pumped 155 bbls. of 63# inhibited 2% KCL water to fill 6-5/8" - 8-5/8" casing annulus. Landed 6-5/8" on packer and pulled 20,000# over. Tested with 1500 psi (o.k.). Set top bridge plug. Removed BOPE. Installed slip and packing tubing head with 20,000# down in packer. Tested seal flange and tubing head to 5000 psi. BOPE to 1000 psi. Secured well.
MWO 99183 $282,000 Daily $ 12,839
Cumulative $872,374

10-25-90 Woods
Day 113. Pulled bridge plug. Rigged up Hydro-test and made up production equipment. Ran in, Hydro-testing to 4000 psi. Located packer and pulled 20,000# over. Tested to 1500 psi (o.k.). Released from packer. Spaced out and landed tubing with 10,000# on packer. Installed back pressure valve. Removed BOPE and installed xmas tree. Secured well.
MWO 99183 $282,000 Daily $ 30,018
Cumulative $902,407

10-26-90 Woods
Day 114. Tested xmas tree to 5000 psi. Rigged up Archer Reed wireline. Opened Otis (XD) sliding sleeve. Rigged down Archer Reed. Circulated 76# fluid out of well with 63# 2% inhibited KCl water. Released rig.
MWO 99183 $282,000 Daily $ 4,297
Cumulative $906,704

10-26-90 Woods
Day 0. Rigged down and loaded out rig.
MWO 99183 $282,000 Daily $ 600
Cumulative $907,304

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Ex. I – 46

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County Los Angeles
Well Porter 32 Sec 27 3N 16W S.B.B.M.
A.P.I. No. 03700719 Name Tom McMahon (Person submitting report) Title SIMP Project Manager (President, Secretary, or Agent)
Date 3/8/2017 (Month, day, year) Signature Thomas McMahon
Address PO Box 2300, SC9365, Chatsworth, CA, 91313-2300 Telephone Number 714-398-5020

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, and initial production data.

Start Date	Ops this Report (DOGGR)
9/23/2016	Mov in rig up equipment
9/24/2016	Bled well. 280 psi on Tubing 40 psi on Casing. Bleed well into Canister. Well would not Bleed down. Pressure rising on gauge. Rig up Mud pump. Waited on fluid. Pumped down tubing. No cumunication on back side. Pumped down back side. Presure up to 500 psi. Sleeve closed or plugged.
9/26/2016	Bled well off. Removed prduction tree. Installed 11" Class III BOP. Tested BOP. BOP Inspection witnessed by DOGGR.
9/27/2016	Attempt to pull seals out of Baker Model "D" Packer. No good. Wait on wire line. Rigged up Tiger wire line and chemical cut tubing at 7419'. (WLM). Pulled tubing hanger and pup joints.
9/28/2016	Pulled 2 3/8" tubing. Made up fishing tools. Picked up 2.7/8" work string.
9/29/2016	Ran in hole with wash pipe on 2 7/8" tubing. Stacked out a 5433'. Tripped out of hole. Ran kill string
9/30/2016	Tripped in hole. Attempted to wash over fish.
10/1/2016	Tripped out of hole. Checked shoe, good condition. Made up bent pup joint and tripped in hole.
10/3/2016	Tripped in hole. Washed over fish. Tripped out of hole to kill string
10/4/2016	Tripped in hole Latched on to fish. Jarred on fish. Fish came free or parted. Tripped out of to kill string.
10/5/2016	Tripped out of hole with kill string. Laid down fish. Recovered 14' of 2 3/8" tubing. Tripped in hole. Latched on to fish. Jarred on fish. Fish parted. Tripped out of hole.
10/6/2016	Tripped out of hole with fish. Recovered 2 feet of 2 3/8" tubing. Laid down 2 3/8" PH6 tubing. Ran kill string.
10/7/2016	Removed BOP. Unlanded 5 1/2" inner string. Installed BOP.
10/8/2016	Attempted to unjay 5 1/2" casing from packer, no good. Rigged up wire line and cut casing at 5414'. Laid down 3 joints.
10/10/2016	Laid down 100 joints of 5 1/2" Inner string casing.
10/11/2016	Laid down 5 1/2" inner casing. Made up fishing tools and tripped in hole. Latched on to fish. Jarred on fish. Tripped out of hole to 2900'.
10/12/2016	Tripped out of hole. Recovered fish. Tripped in hole with millshoe. Milled on packer.
10/13/2016	Tripped out of hole. Changed mill shoe. Tripped ing hole. Milled on packer.
10/14/2016	Tripped out of hole with wash over shoe. Made up overshot and tripped in hole. Latched on to fish. Tripped out of the hole with 20 stands.
10/15/2016	Tripped out of hole. Retrieved packer. Make up 7" scraper and trip in hole to 7438'.
10/17/2016	Tripped out of hole with scraper. Ran retievable bridge plug and set at 7435'. Tripped out of hole to kill string.
10/18/2016	Ran Schlumberger USIT and CBL Log
10/19/2016	Open up well high winds gust up to 52 MPH Wait for wind to die down. Shut down do to High winds close in well secure location
10/20/2016	Tripped in hole with retrieving tool. Circulated sout of hole. Latch onto bridge plug and released. Tripped out of hole to killstring.
10/21/2016	Tripped out of hole with bridge plug. Made up mill shoe and tripped in hole to 7438'. Millover packer from 7438' to 7440.5'.
10/22/2016	Milled on packer. Tripped ot of hole. Changed mill shoe. Tripped in hole with killstring.

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RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County Los Angeles
Well Porter 32 Sec 27 3N 16W S.B.B.M.
A.P.I. No. 03700719 Name Tom McMahon (Person submitting report) Title SIMP Project Manager (President, Secretary, or Agent)
Date 3/8/2017 (Month, day, year)
Signature
Address PO Box 2300, SC9365, Chatsworth, CA, 91313-2300 Telephone Number 714-398-5020

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, and initial production data.

Start Date	Ops this Report (DOGGR)
10/24/2016	Tripped in hole. Milled over packer. Packer falling down hole. Tripped out of hole to kill string
10/25/2016	Tripped out of hole. Made up overshot and tripped in hole. Latched onto packer. Tripped out of hole with packer to kill string.
10/26/2016	Tripped out of hole. Laid down fish and fishing tools. Tripped in hole with retrievable bridge plug and set at 7440' COE. Tripped out hole. Made at 7" full bore test packer and tripped in hole to kill string.
10/27/2016	Tripped in hole with test packer to 7413'. Tested bridge plug to 500 psi. Good test. Tripped out of hole to 4600' with test packer. Tested below packer to 500 psi. Good test. Tested above packer no test. Tested cacing from 4600' to 1910'. Good test below packer. No test abve packer. Stared bleeding off at 1273'.. Pulled up to 669'. Getting communication through tubing tring to test above packer. Pulled up to 654'. Tested above packer to 500 psi. good test. tophole in casing is around 660'.
10/28/2016	Service Rig. Gauge Pressure on Tubing (0psi) and Casing (0psi). Pumped 8 bbls to fill casing. Gauge Tanks 355 bbls of fluid on location. POOH With 20 Joints of (2 7/8") P-110 tubing Change out Baker Hughes 7" Test packer. RIH With 48 Joints of (2 7/8") P-110 tubing Set packer at 1529' Test casing from 1502' down 7,443' Test good. Straddle casing. Casing test good from (1,323') to (7,443') and (653' to Surface. Holes Between 653' to 1,323'. POOH With (42) Joints of (2 7/8") P-110 tubing. Lay down 7" Baker Hughes Test Packer. Wait on orders and for 7" Bridge plug. P/U and RIH With Baker Hughes 7" Lock Set Bridge plug. and (41) Joints of (2 7/8") P-110 tubing set Bridge plug at 1300' POOH With (41) Joints of (2 7/8") P-110 Tubing Lay down Retrieving tool. P/U 7" Baker Hughes Test packer and RIH With 22 joints of (2 7/8") P-110 tubing set packer and test from 700' to 1300' test to 700 psi test Test from. (654' to 845' Would not test) (845' to 1300' Test Good) (1300' to 1323' Test Bad). POOH With Test packer. RIH With Retrieving Head and 43 Joints of (2 7/8")P-110 Tubing. Dump 10' of sand on top of bridge plug POOH With tubing. Close in well secure all valves. Pick up all trash clean location.
10/31/2016	Tripped out of hole. Made up retrievable bridge plug and tripped in hole to 6010'.. Attempted to set bridge plug. No good. Tripped out of hole. Made up new bridge plug and tripped in hole to 6010'. Set bridge plug at 6010'. tripped out of hole to kill string.
11/1/2016	POOH standing back in derrick (114) Joints of (2 7/8") P-110 Tubing Lay down retrieving head. Spot in and Rig up Tiger Wire Line. RIH and Shoot holes at (5,970'to 5,980'). POOH Rig out wire line. Pick up 7" Full Bore Packer and RIH With (186) Joints of (2 7/8") P-110 tubing Set packer at (5,913').Spot in and Rig up Halliburton Cement crew. Attempted to establish injection rate. Pumped .08 bbls to 2100 psi. Bled down to 17oo psi. Pressured back up to 2100 psi. No injection rate, formation tight. Unset packer and POOH Standing back in derrick (186) Joints of (2 7/8") P-110 tubing. Pick up and RIH With (6) Joints of (2 7/8") N-80 tubing, 7" Packer and (80) Joints of (2 7/8") P-110 tubing. Close in well secure all valves. Pick up all trash clean location
11/2/2016	RIH With tubing out of derrick (102) Joints of (2 7/8") P-110 tubing. Tag top of sand at (5,987') POOH with 1 joint of tubing and RIH With 10' of Pup Joints. Rig up Halliburton Cement crew. Pressure test lines to (2,500 PSI) Pump 10BBL Of fresh water 4BBL of cement followed by 34bbl of fresh water. POOH With (6) Joints of (2 7/8") P-110 tubing, Reverse circulate Pump 90 Barrels of Polymer fluid. Clean out lines. Rig out Cement crew. Close in well secure all valves. Slip and cut 520' of drill line Pick up all trash clean location and tools.
11/3/2016	Tagged cement at 5946'. Witnessed by DOGGR Emie Blains. Tripped out of hole. Ran full bore packer to 1300'. Established injection rate at 1 bbl/min at 1000 psi.Tripped out of hole. Ran cement ratainer and set at 1300'.

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RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County Los Angeles
Well Porter 32 Sec 27 3N 16W S.B.B.M.
A.P.I. No. 03700719 Name Tom McMahon (Person submitting report) Title SIMP Project Manager (President, Secretary, or Agent)
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Start Date	Ops this Report (DOGGR)
11/4/2016	Spot in and Rig up Halliburton cement crew. Pressure test lines to (2,500psi) Test good. Pump 4bbl of fresh water, Squeezed away 7bbl of cement followed by 7.5bbl of fresh water at 1 bbm with final circulating pressure of 805 psi. Pull out of cement retainer and reverse circulate clean out tubing. R/O Cement crew. POOH With (41) Joints on (2 7/8") P-110 tubing. Lay down Baker tool. RIH With (26) Joints of (2 7/8") P-110 tubing. Dump 10' of sand on top of cement retainer. Rig up Halliburton Cement Crew. Pump 22 Barrels of cement Cover holes from (845' to 645') POOH With tubing leave 6 Joints of (2 7/8") P-110 Close in well and down squeeze 3 barrels of fresh water with 0 PSI. R/O Halliburton. Close in Well secure all valves. Pick up all trash clean location. Rig up pump Grease and service rig
11/5/2016	RIH with 12 Joints of (2 7/8") P-110 tubing Tag top of cement at (528') POOH laying down 22 Joints of (2 7/8") P-110 tubing. RIH With (6 1/8") Bit, Bit Sub 4 Drill collars, X-over, and 12 joints of (2 7/8") P-110 tubing. Spot in and Rig up Ensign 2.5 Power Swivel. Function test and set torque to (2,500psi). Establish Circulation and drill on Cement from (528') to (851') Using Ensign 2.5 Power Swivel. Tested casing at 700'. Pressure bled down 500 psi to 100 psi in 1 min 45 sec. Tested casing at 851'. 2 bbls/min at 200 psi. Pull High on Power Swivel Close in well secure all valves Pick up all trash clean location
11/7/2016	POOH With 37 Joints of (2 7/8") P-110 tubing Stand back in derrick 4 drill collars and BHA. RIH With (27) Joints of (2 7/8") P-110 tubing. Rig up Halliburton Cement Crew. Pump 25 Barrels of cement Cover holes from (845' to 645') POOH With tubing leave 6 Joints of (2 7/8") P-110 Close in well and down squeeze 11 barrels of fresh water With final pressure of 480 psi. Clise in well. R/O Halliburton. Close in well secure all valves. Pick up all trash clean location
11/8/2016	Tagged cement at 488'. Drilled out cement from 488' to 691', Tested casing to 500 psi. Good Test. Drill out cement from 691' to 755'. Tested casing. No good. Pumping away at 2 bpm with 450 psi. Tripped out of hole. Ran in hole open ended to 755'. Secure well.
11/9/2016	Rig up Halliburton Cement Crew. Pump 24 Barrels (135 cuft) 75sx of cement Cover holes from (755 to 645) POOH With tubing leave 4 Joints of (2 7/8") P-110 Close in well and down squeeze 11 barrels of fresh water with a final circulating pressure of 350 psi. R/O Halliburton. Close in well secure all valves. pick up all trash clean location. Clean Rig and wash out Ensign pump. Wait on cement.
11/10/2016	Tagged cement at 478'. Drilled out cement from 478' to 860'. Tested casing to 500 psi. Tripped in hole to 1300'. Tripped out of the hole to kill string.
11/11/2016	Tripped out of hole. Ran scraper to 1300'. Ran Bond Log from 1300' to surface. Made up Baker Milling assembly and tripped in hole to kill string.
11/14/2016	Wait on orders from DOGGR. Clean rig open well. POOH standing back in derrick (20) Joints of (2 7/8") P-110 tubing Lay down BHA. Dump sand from surface onto Cement retainer dumped (3) 50 Pound bags of sand. Pick up and RIH With 7" Bridge plug, and 32 Joints of (2 7/8") P-110 tubing. Set Bridge plug at (1,000')' POOH With 4 Joints of (2 7/8") P-110 tubing and dump 7-50# Sacks of sand. POOH standing back in derrick (30) Joints of (2 7/8") P-110 tubing. Close in well Secure all valves pick up all trash clean location.

OG103 (6/97/GSR/5M) SUBMIT IN DUPLICATE

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County Los Angeles
Well Porter 32 Sec 27 3N 16W S.B.B.M.
A.P.I. No. 03700719 Name Tom McMahon (Person submitting report) Title SIMP Project Manager (President, Secretary, or Agent)
Date 3/8/2017 (Month, day, year) Signature
Address PO Box 2300, SC9365, Chatsworth, CA, 91313-2300 Telephone Number 714-398-5020

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, and initial production data.

Start Date	Ops this Report (DOGGR)
11/15/2016	Service Rig. Gauge Pressure on Tubing (0psi) and Casing (0psi). Pumped 0 bbls to fill casing. Gauge Tanks 355 bbls of fluid on location. Spot in and Rig up Tiger Wire Line. Shoot holes in casing at (774' to 780') (794' to 800') (844' to 850') (878' to 884') and (890' to 900') R/O Wire line. RIH With (32) Joints of (2 7/8") P-110 tubing Tag top of sand at (980') POOH With 2 Joints and set tubing tail at (949'). Rig up Halliburton Cement Crew. Pump (31) Barrels of cement Cover holes from (774' to 900') POOH With tubing leave 2 Joints of (2 7/8") P-110 Close in well and down squeeze 21 barrels of fresh water with a final circulating pressure of 275 psi.. R/O Halliburton. Close in well secure all valves. Clean location spot in and Rig up king swivel.
11/16/2016	Drilled out cement from 764' to 950'. Ran scraper. Ran CBL from 983' to surface.
11/17/2016	Tripped in hole to 950'. Pumped 32 bbls (180 cu,ft 100 sx) of 14.8 ppg cement. Squeezed awy 35 bbls. fianl circulating pressure of 480 psi. Shut down wait for 1.5 hrs. Pressure bled down to 124 psi and flat lined. Shut down and wait on cement.
11/18/2016	Tripped in hole to 832'. Pumped 29 bbls (162 Cu,ft 90 sx, 2% CC) of 14.8 ppg cement. Tripped out of hole to 60'. Down squeezed 1.8 bbls. Pressure came up to 1000 PSI. Bled down to 220 psi in one hour. Pressured back up to 1000 psi and closed in well. Wait on cement.
11/19/2016	Service Rig. Gauge Pressure on Tubing (0psi) and Casing (0psi). Pumped 0 bbls to fill casing. Gauge Tanks 355 bbls of fluid on location. RIH With tubing and tag top of cement at (134') POOH laying down (18) Joints of (2 7/8") P-110 tubing. Rig up Ensign 2.5 Power Swivel Function test and set torque to 2,000 psi. Establish Circulation and drilled Cement from (134' to 340') "Cement was hard" Circulate 40 Barrels of KCL water down the tubing up the casing to clean out well.
11/21/2016	Drilled out cement from 340' to 755'.
11/22/2016	Drilled out cement from 755'to 983', Ran scraper. Ran bond log from 983' to surface. Submitted log to DOGGR. Waiting on DOGGR response.
11/28/2016	Wait on DOGGR for BOND log cement results. Clean cement out of pump and half bin.
11/29/2016	Spot in and rig up Western Wire Line shoot holes from (800' to 820') Rig out Wire line. RIH with (27) Joints of (2 7/8") P-110 tubing set tubing tail at (854'). Rig up Halliburton Cement Crew. Pump (12) Barrels of cement Cover holes from (800' to 820') POOH With tubing leave 13 Joints of (2 7/8") P-110. Applied 200 psi on casing. Clsed in well. R/O Halliburton. Wait on Cement to dry. Clean location and Rig
11/30/2016	Tagged cement at 595'. Witnessed by DOGGR Ernie Blevins. Drilled out cement from 595' to 860'. Ran scraper to 1000'. Circulated 2 tubing volumes. Pulled out of hole.
12/1/2016	Retrieved RBP. Milled out cement retainer. Pull to kill string.
12/2/2016	Attempt to POOH with Tubing. Shut in well and wait due to High Winds 40 plus MPH wind on work floor. Close in well. Pick up trash.
12/5/2016	Laid down milling tools. Ran in hole to 5822'. Drillied out cement from 5822' to 5990'. Tripped out of hole. Ran scraper.
12/6/2016	Ran scraper. Circulated hole clean. Tripped out of hole. Tripped in hole. Circulated sand out and retrieved RBP. Tripped out of hole.
12/7/2016	Removed BOP. Removed 7" casing spool. Installed new 7" casing spool. Installed BOP and tested.
12/8/2016	Ran collar locator.

OG103 (6/97/GSR/5M) SUBMIT IN DUPLICATE

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County Los Angeles
Well Porter 32 Sec 27 3N 16W S.B.B.M.
A.P.I. No. 03700719 Name Tom McMahon (Person submitting report) Title SIMP Project Manager (President, Secretary, or Agent)
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Address PO Box 2300, SC9365, Chatsworth, CA, 91313-2300 Telephone Number 714-398-5020

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, and initial production data.

Start Date	Ops this Report (DOGGR)
12/9/2016	Ran string mill gauge run. Made up retrieving tool and ran in hole to 7340'.
12/12/2016	Retrieved RBP. Ran 5" scraper
12/13/2016	Scraped 5" liner. Ran 5" RBP
12/14/2016	Ran 5 1/2" casing
12/15/2016	Ran 5 1/2" casing
12/16/2016	Cemented 5 1/2" casing. Set 5 1/2" slips
12/19/2016	Wait on weather. High winds.
12/20/2016	Wait on weather
12/21/2016	Removed BOP. Installed DSA and tubing spool. Installed BOP and tested.
12/22/2016	Changed out 11" 5M Hydril. Picked up BHA and tripped in hole.
12/27/2016	Wait on weather. High winds. Tested casing to 3625 psi. Witnessed by DOGGR Mark Davis.
12/28/2016	Tripped in hole. Drill out float collar.
12/29/2016	Drilled out shoe track. Tripped out of hole. Made up scraper. Cut and slip drill line
12/30/2016	Ran 5 1/2" scraper. Circulated 2 bottoms up. Pulled out of hole to kill string
1/3/2017	Ran wire line logs.
1/4/2017	Ran USIT log.
1/5/2017	Pulled RBP. Ran 5" scraper
1/6/2017	Pulled scraper. RIH open ended. Clean out liner. Lay down work string
1/9/2017	Lay down tubing
1/10/2017	Rigged up to run completion. Shut down due to weather.
1/13/2017	Ran 2 7/8" comlpetion
1/17/2017	Ran 2 7/8" completion
1/18/2017	Spot packer fluid. Set plug at 7393'. Test casing to 1000psi. Good test. Test tubing to 3700psi. Good test. Both test was witnessed by Mark Davis. Open sleeve.
1/19/2017	Remove BOP. Install production tree. Rig down.

OG103 (6/97/GSR/5M) SUBMIT IN DUPLICATE

Ex. I – 47

Due to the large file size, this exhibit is an excerpt. The native file of this document is available upon request.

INFORMATION FOR COMPLIANCE WITH THE CALIFORNIA ENVIRONMENTAL QUALITY ACT OF 1970 (CEQA)

If an environmental document has been prepared by the lead agency, submit a copy of the ***Notice of Determination*** or ***Notice of Exemption*** with this notice. Please note that a CEQA determination by a local jurisdiction, if required, must be complete, or the Division may not issue a permit.

CRITICAL WELL DEFINITION

As defined in the California Code of Regulations, Title 14, Section 1720 (a), "Critical well" means a well within:

(1) 300 feet of the following:
  (A) Any building intended for human occupancy that is not necessary to the operation of the well; or
  (B) Any airport runway.
(2) 100 feet of the following:
  (A) Any dedicated public street, highway or the nearest rail of an operating railway that is in general use;
  (B) Any navigable body of water or watercourse perennially covered by water;
  (C) Any public recreational facility such as a golf course, amusement park, picnic ground, campground or any other area of periodic high-density population; or
  (D) Any officially recognized wildlife preserve.

WELL OPERATIONS REQUIRING BONDING

1. Drilling, redrilling, or deepening any well.
2. Milling out or removing a casing or liner.
3. Running and cementing casing or tubing.
4. Running and cementing liners and inner liners.
5. Perforating casing in a previously unperforated interval for production, injection, testing, observation, or cementing purposes.
6. Drilling out any type of permanent plug.
7. Reentering an abandoned well having no bond.

This form may be printed from the DOGGR website at www.conservation.ca.gov/dog/

Rec'd 08-01-16 DOGGR Ventura.

Well
Porter 32

API #: 04-037-00719-00
Sec 27, T3N, R16W

Operator: So. California Gas Co.

Lease: Porter
Field: Aliso Canyon
Status: Active Gas Storage
BFW:
USDW:

Ground Elevation: 2079.1' asl
Datum to Ground: 6.92' DF

Spud Date: 6/1/1944
Completion Date: 9/1/1944
Last Rework Date: 1/27/1989

Junk: Remnants of hole opener bits & milled 5" liner that was removed & replaced; milled down to 7850'

13-3/8" TOC Surface

17-1/2" Hole

Surface Casing
13-3/8", 54.5#, J-55
0' - 522'

CMT'D w/ 400 SKS,
Good CMT Returns to Surface

522'

12-1/4" Hole (522' - 2112')

10-5/8" (2112' - 7600')

Inner CSG
5-1/2", 17#, X-Line (See Notes**)
0' - 5440'

7" TOC (per CBL, 11/24/1974) 5330'

Otis XLB PCKR 5440'

Production Casing
7"
0' - 3489' 23#, J-55
3489' - 5238' 23#, N-80
5238' - 6828' 26#, N-80
6828' - 7600' 29#, N-80

CMT'D w/ 400 SKS

7455'

7600'

13" Hole (7600' - 7850')

Liner
5" (10/21/1975)
7455' - 7582' 18#, K-55
7582' - 7849' 18#, N-80

7849'

6" Hole (7850' - 7994')

TD 7994'
TVD (7941')
Directionally Drilled: Yes (TD is 304' W, 494' S of Surf)

Inhibited Drilling Fluid

Inhibited Drilling Fluid

Tubing
2-3/8", 4.7#, J-55 (1/27/1989)
0' - 7445'

4026' "7" ETOC (After 1st SQZ)

4510' - 4590' 7" CSG Leak (197 CF CMT Calc'd SQZ'D Away*, 9/21/1974 + Addnl 96 CF + 14 CF + 10 CF CMT Calc'd SQZ'D Away btwn. 9/24-28/1974)

Notes
4723' - 4732' 59.1% Original Wall Thickness Remaining per Dia-Log Caliper Survey (11/24/1972), 94.7% Original Wall Thickness Remaining per Electronic Casing Inspection Log (11/25/1972)
**5-1/2" inner string run 10/3/74, rerun 11/5/75 & 10/30/79

7369' Otis XO SSD

7403' Otis XN No-Go Nipple

7438' Baker "D" PCKR (10/27/1975)

7445' Tail

7539' Four (4) 1/2" Holes (Co. WSO, 12/5/1972, 115 CF + 115 CF + 115 CF CMT SQZ'D, 9/9/1975)

7540' Four (4) 1/2" Holes (109 CF CMT SQZ'D Away, 12/1/1972)

7541' Four (4) 1/2" Holes (100 CF CMT SQZ'D Away, 12/3/1972)

7600' (Shoe) WSO

Liner Perfs:
7471' - 7582' 2" x 30M Slots
7582' - 7848' 0.018" Ga. Gru-V-Kut WWS

Gravel Packed w/
239 CF 8-12

7850' Top of Junk (see desc. Above)

CMT Plug @ 7870-7994'
(40 SKS, C/O from 7849')

Top of Zone Markers	md (tvd)
A36	4741' (4740')
UP	5063' (5059')
LP	5543' (5531')
UDA1	5971' (5950')
LDA	6798' (6760')
MP	7275' (7228')
S1	7523' (7473')
S4	7616' (7565')
S8	7723' (7672')
K1	7978' (7925')

Prepared by: MAM/CAM (6/9/2016)
Updated by: CAM (7/29/2016)

InterAct

Rec'd 08-01-16 DOGGR Ventura.

Completed Work Summary - Porter 32		
Step	Work Completed	Date
4b	TOC at 5330' per CBL. Log shows good bond from 7500'-7523' (top of S1) and between the MP and S1 from 7310'-7380'.	11/24/1974
5b	Packer set at 7438'.	10/27/1975

Rec'd 08-01-16 DOGGR Ventura.

Casing Pressure Test Safety Check (1000 psi)

Well	Packer Depth MD/TVD	Casing Size/Grade/Weight	Depth MD	Burst PSI	85% of Burst PSI	Pressure at Depth w/1000 psi Surface Pressure	Press < 85% of Burst
Porter 32	7438'/7390'	7", 23#, J-55	3489	4360	3706	2542	Yes
		7", 23#, N-80	5238	6340	5389	3315	Yes
		7", 26#, N-80	6828	7240	6154	4018	Yes
		7", 29#, N-80	7438	8160	6936	4288	Yes
Porter 32A	7160'/7142'	8-5/8", 36#, K-55	5848	4460	3791	3585	Yes
		8-5/8", 36#, N-80	7160	6490	5517	4165	Yes
Porter 39	8400'/8346'	7", 29#, N-80	60	8160	6936	1027	Yes
		7", 23#, J-55	4070	4360	3706	2799	Yes
		7", 23#, N-80	5775	6340	5389	3553	Yes
		7", 26#, N-80	7268	7240	6154	4212	Yes
		7", 29#, N-80	8400	8160	6936	4713	Yes
Fernando Fee 32B	7350'/6863'	8-5/8", 36#, K-55	5863	4460	3791	3591	Yes
		8-5/8", 36#, N-80	6810	6490	5517	4010	Yes
		6-5/8", 28#, K-55*	7350	6970	5925	4249	Yes
Fernando Fee 32D	7032'/7012'	8-5/8", 36#, K-55	5564	4460	3791	3459	Yes
		8-5/8", 36#, N-80	7032	6490	5517	4108	Yes
Fernando Fee 34BR	7350'/7217'	8-5/8", 36#, K-55	7350	4460	3791	4249	No

* Actual pipe in well is a non-API grade so assumed closest size, weight & grade of API pipe

SoCalGas-5.0947

Rec'd 08-01-16 DOGGR Ventura.

Ex. I – 48

HR Vertilog

Magnetic Flux Leakage Inspection

Advanced Analysis

Company	Southern California Gas Company
Well	Porter # 35
Field	Aliso Canyon Storage Pool
County	Los Angeles
State	California
Location:	

Section 27	Township 3N	Range 16W

Date	Feb. 26, 2016
Service Order	US106087
Recorded by	Matthew J Wood
Witnessed by	Mr.Jeff Sandoval
API Serial No.	37-00722

Permanent Datum:	G.L.	Elevation: 2094.000 ft.	Depth	7852.000
Log Measured From:	K.B.	7.000 ft. above Perm. Datum	Btm. Log Interval	7821.140
Drilling Measured From:	K.B.	2101.000 ft. above Perm. Datum	Top Log Interval	21.010
			Fluid Type	Polymer

Casing Data

Size	Weight	Grade	From	To	Length
7 inch	23.0 lb/ft	J55 (HR Std)	0	3351	3351.0
7 inch	23 lb/ft	N-80	3351	5055	1704.0
7 inch	26 lb/ft	N-80	5055	6616	1561.0
7 inch	29 lb/ft	N-80	6616	7910	1294.0
6 inch	18	N-80 Liner	7877	8142	265.0
2.875	N/A	Liner	7851	8134	283.0
13 3/8 inch	55 lb/ft	N/A	0	505	505.0

Equipment Data

Tool	7 to 9-5/8 Inch HRVRT 96 FL + 96 DIS Tool
Magnetizer	7 to 9-5/8 Inch HRVRT 96 FL + 96 DIS Tool
Telemetry	MUX-DB
Software Version	6.0.0.0

Calibration Data

Calibration File Name	4997-7-001-PA10409816-QA10409824.CAL

SoCalGas-5.0949

Date of Calibration	10/14/2014 15:00
Calibration Identifier	F2ECB25B-FBB1-4305-A362-411F79038733
Tool Number	4997-00
Calibrator Number	4997-7-001
Calibrator Size	(7 In - 178 mm)
Calibration Source File	20141015_072957_MEM.MVL
Calibration Software Rev	Microvision 32-bit 7.0.1.0
Comment	RMA1108

Calibration Data

Calibration File Name	4997-7-001-PA10409816-U.CAL
Date of Calibration	04/03/2015 09:27
Calibration Identifier	B7AF82F3-FAAB-4CE0-9570-44283CC7656D
Tool Number	4997-00
Calibrator Number	4997-7-001
Calibrator Size	(7 In - 178 mm)
Calibration Source File	20150403_083948_MEM.MVL
Calibration Software Rev	Microvision 32-bit 7.3.2.2
Comment	RMA1167

Calibration Data

Calibration File Name	4997-7-001-QA10409824-L.CAL
Date of Calibration	04/03/2015 09:27
Calibration Identifier	B7AF82F3-FAAB-4CE0-9570-44283CC7656D
Tool Number	4997-00
Calibrator Number	4997-7-001
Calibrator Size	(7 In - 178 mm)
Calibration Source File	20150403_083948_MEM.MVL
Calibration Software Rev	Microvision 32-bit 7.3.2.2
Comment	RMA1167

In making interpretations of logs our employees will give customer the benefit of their best judgment. But since all interpretations are opinions based on inferences from electrical or other measurements, we cannot, and we do not guarantee the accuracy or correctness of any interpretation. We shall not be liable or responsible for any loss, cost, damages, or expenses whatsoever incurred or sustained by the customer resulting from any interpretation made by any of our employees.

Remarks

Thank you for choosing Baker Hughes Wireline Services.
The tools zero point was at K.B. 7' ABOVE PD.
This log was put on depth with the 56-MFC log of baker hughes 2/26/2016.
N/A Unknown or unavailable at the time of logging.

Interpretation

HRVRT Analysis was depth correlated to Imaging Caliper logged 26 Feb 2016.
The top joint is a short joint.

SoCalGas-5.0950

The HRVRT encountered a high stick and pull through the collars which may result in some collars with reported elongated lengths.

22.04 ft	Hardware - External Casing Head Response.
508.23 ft	Hardware - Bottom of 13 3/8" External Casing.
3355.79 ft	7" Casing Grade change; 23# J55 above, 23# N80 below.
5058.76 ft	7" Casing Weight change; 23# N80 above, 26# N80 below.
6618.99 ft	7" Casing weight change; 26# N80 above, 29# N80 below.

Perforated Interval - Mechanical perforations, Possible Squeezed. Logged from 7808.5' - 7818'. Refer to casing record.

There were no Centralizers or Scratchers observed through the recorded interval.

Joint Interpretation Summary

Joint	From	To	Length	Class	Max Depth	Position	ID/OD
1	21.01	40.96	19.95	Class 1	-	-	-
2	40.96	81.87	40.91	Class 1	-	-	-
3	81.87	124.90	43.03	Class 1	-	-	-
4	124.90	168.01	43.11	Class 1	-	-	-
5	168.01	211.59	43.58	Class 1	-	-	-
6	211.59	254.70	43.11	Class 1	-	-	-
7	254.70	296.99	42.29	Class 1	-	-	-
8	296.99	340.38	43.39	Class 1	-	-	-
9	340.38	384.84	44.46	Class 1	-	-	-
10	384.84	427.41	42.57	Class 1	-	-	-
11	427.41	470.31	42.90	Class 1	-	-	-
12	470.31	513.74	43.43	Class 1	-	-	-
13	513.74	556.71	42.97	Class 1	15.0%	520.39	OD
14	556.71	599.11	42.40	Class 1	-	-	-
15	599.11	640.49	41.38	Class 1	-	-	-
16	640.49	683.90	43.41	Class 1	-	-	-
17	683.90	727.67	43.77	Class 1	-	-	-
18	727.67	770.36	42.69	Class 1	-	-	-
19	770.36	813.89	43.53	Class 1	-	-	-
20	813.89	856.93	43.04	Class 1	-	-	-
21	856.93	900.42	43.49	Class 1	-	-	-
22	900.42	941.64	41.22	Class 1	-	-	-
23	941.64	982.94	41.30	Class 1	18.0%	975.28	ID
24	982.94	1026.73	43.79	Class 1	-	-	-
25	1026.73	1070.27	43.54	Class 1	-	-	-
26	1070.27	1113.17	42.90	Class 1	-	-	-
27	1113.17	1154.67	41.50	Class 1	-	-	-
28	1154.67	1198.20	43.53	Class 1	-	-	-
29	1198.20	1242.45	44.25	Class 1	-	-	-
30	1242.45	1285.60	43.15	Class 1	-	-	-
31	1285.60	1328.28	42.68	Class 1	-	-	-
32	1328.28	1370.30	42.02	Class 1	-	-	-
33	1370.30	1412.43	42.13	Class 1	-	-	-
34	1412.43	1455.48	43.05	Class 1	-	-	-
35	1455.48	1497.95	42.47	Class 1	-	-	-
36	1497.95	1539.17	41.22	Class 1	-	-	-
37	1539.17	1580.93	41.76	Class 1	-	-	-
38	1580.93	1623.27	42.34	Class 1	-	-	-
39	1623.27	1665.75	42.48	Class 1	-	-	-
40	1665.75	1709.09	43.34	Class 1	-	-	-

SoCalGas-5.0951

41	1709.09	1750.83	41.74	Class	1	-	-	-	
42	1750.83	1792.20	41.37	Class	1	-	-	-	
43	1792.20	1835.45	43.25	Class	1	-	-	-	
44	1835.45	1878.84	43.39	Class	1	-	-	-	
45	1878.84	1921.53	42.69	Class	1	-	-	-	
46	1921.53	1963.44	41.91	Class	1	-	-	-	
47	1963.44	2005.74	42.30	Class	1	-	-	-	
48	2005.74	2048.09	42.35	Class	1	-	-	-	
49	2048.09	2089.96	41.87	Class	1	19.0%	2088.30	OD	
50	2089.96	2132.17	42.21	Class	2	20.0%	2124.34	OD	
51	2132.17	2174.87	42.70	Class	2	32.0%	2136.38	OD	
52	2174.87	2215.40	40.53	Class	1	-	-	-	
53	2215.40	2257.84	42.44	Class	1	17.0%	2245.31	OD	
54	2257.84	2300.41	42.57	Class	1	-	-	-	
55	2300.41	2343.13	42.72	Class	1	-	-	-	
56	2343.13	2385.28	42.15	Class	1	-	-	-	
57	2385.28	2427.43	42.15	Class	1	-	-	-	
58	2427.43	2470.50	43.07	Class	1	-	-	-	
59	2470.50	2512.97	42.47	Class	1	-	-	-	
60	2512.97	2554.93	41.96	Class	1	-	-	-	
61	2554.93	2598.39	43.46	Class	1	-	-	-	
62	2598.39	2640.42	42.03	Class	1	-	-	-	
63	2640.42	2679.14	38.72	Class	1	16.0%	2658.25	OD	
64	2679.14	2721.91	42.77	Class	1	-	-	-	
65	2721.91	2764.09	42.18	Class	1	-	-	-	
66	2764.09	2807.06	42.97	Class	1	-	-	-	
67	2807.06	2849.01	41.95	Class	2	21.0%	2826.16	OD	
68	2849.01	2892.27	43.26	Class	1	-	-	-	
69	2892.27	2935.42	43.15	Class	1	-	-	-	
70	2935.42	2977.43	42.01	Class	1	-	-	-	
71	2977.43	3020.33	42.90	Class	2	22.0%	2981.57	OD	
72	3020.33	3062.54	42.21	Class	1	-	-	-	
73	3062.54	3104.90	42.36	Class	1	-	-	-	
74	3104.90	3147.74	42.84	Class	1	15.0%	3116.57	OD	
75	3147.74	3189.72	41.98	Class	1	16.0%	3182.39	OD	
76	3189.72	3231.67	41.95	Class	1	-	-	-	
77	3231.67	3271.32	39.65	Class	1	-	-	-	
78	3271.32	3313.68	42.36	Class	1	-	-	-	
79	3313.68	3355.79	42.11	Class	1	-	-	-	
80	3355.79	3398.13	42.34	Class	4	85.0%	3396.30	OD	anomaly. Fail at 3355-3398'.
81	3398.13	3441.27	43.14	Class	4	86.0%	3420.03	OD	
82	3441.27	3484.13	42.86	Class	4	61.0%	3463.54	OD	
83	3484.13	3526.71	42.58	Class	1	-	-	-	
84	3526.71	3567.80	41.09	Class	1	-	-	-	
85	3567.80	3610.91	43.11	Class	1	-	-	-	
86	3610.91	3651.72	40.81	Class	1	-	-	-	
87	3651.72	3692.53	40.81	Class	1	-	-	-	
88	3692.53	3734.82	42.29	Class	1	-	-	-	
89	3734.82	3777.78	42.96	Class	1	-	-	-	
90	3777.78	3820.15	42.37	Class	1	-	-	-	
91	3820.15	3862.45	42.30	Class	1	-	-	-	
92	3862.45	3906.01	43.56	Class	1	-	-	-	
93	3906.01	3949.54	43.53	Class	1	-	-	-	
94	3949.54	3993.45	43.91	Class	1	-	-	-	
95	3993.45	4034.21	40.76	Class	1	-	-	-	
96	4034.21	4076.87	42.66	Class	1	-	-	-	
97	4076.87	4119.21	42.34	Class	1	-	-	-	
98	4119.21	4163.02	43.81	Class	1	-	-	-	
99	4163.02	4204.61	41.59	Class	1	-	-	-	
100	4204.61	4247.13	42.52	Class	1	-	-	-	
101	4247.13	4289.06	41.93	Class	1	-	-	-	
102	4289.06	4331.91	42.85	Class	1	-	-	-	
103	4331.91	4375.23	43.32	Class	1	-	-	-	

104	4375.23	4414.79	39.56	Class	1	-	-	-
105	4414.79	4458.32	43.53	Class	1	-	-	-
106	4458.32	4501.90	43.58	Class	1	-	-	-
107	4501.90	4545.14	43.24	Class	1	-	-	-
108	4545.14	4585.85	40.71	Class	1	-	-	-
109	4585.85	4628.75	42.90	Class	1	-	-	-
110	4628.75	4671.20	42.45	Class	1	-	-	-
111	4671.20	4714.13	42.93	Class	1	-	-	-
112	4714.13	4757.35	43.22	Class	1	-	-	-
113	4757.35	4800.25	42.90	Class	1	-	-	-
114	4800.25	4843.64	43.39	Class	1	-	-	-
115	4843.64	4885.03	41.39	Class	1	-	-	-
116	4885.03	4929.40	44.37	Class	1	-	-	-
117	4929.40	4973.68	44.28	Class	1	-	-	-
118	4973.68	5015.12	41.44	Class	1	-	-	-
119	5015.12	5058.76	43.64	Class	1	15.0%	5047.02	OD
120	5058.76	5101.23	42.47	Class	1	-	-	-
121	5101.23	5144.50	43.27	Class	1	-	-	-
122	5144.50	5187.05	42.55	Class	1	-	-	-
123	5187.05	5230.38	43.33	Class	1	-	-	-
124	5230.38	5274.73	44.35	Class	1	-	-	-
125	5274.73	5317.03	42.30	Class	1	-	-	-
126	5317.03	5360.74	43.71	Class	1	16.0%	5358.34	ID
127	5360.74	5404.43	43.69	Class	1	-	-	-
128	5404.43	5438.33	33.90	Class	1	-	-	-
129	5438.33	5481.50	43.17	Class	1	-	-	-
130	5481.50	5525.55	44.05	Class	1	-	-	-
131	5525.55	5567.60	42.05	Class	1	-	-	-
132	5567.60	5602.76	35.16	Class	1	-	-	-
133	5602.76	5646.45	43.69	Class	1	-	-	-
134	5646.45	5688.17	41.72	Class	1	-	-	-
135	5688.17	5728.63	40.46	Class	1	-	-	-
136	5728.63	5773.47	44.84	Class	1	-	-	-
137	5773.47	5811.29	37.82	Class	1	15.0%	5809.12	ID
138	5811.29	5853.37	42.08	Class	1	-	-	-
139	5853.37	5896.22	42.85	Class	1	-	-	-
140	5896.22	5940.29	44.07	Class	1	-	-	-
141	5940.29	5982.72	42.43	Class	1	-	-	-
142	5982.72	6026.16	43.44	Class	2	21.0%	6024.23	ID
143	6026.16	6067.41	41.25	Class	1	-	-	-
144	6067.41	6109.27	41.86	Class	1	-	-	-
145	6109.27	6152.20	42.93	Class	1	16.0%	6150.03	ID
146	6152.20	6193.96	41.76	Class	1	18.0%	6191.30	ID
147	6193.96	6237.44	43.48	Class	1	-	-	-
148	6237.44	6279.45	42.01	Class	1	-	-	-
149	6279.45	6321.90	42.45	Class	1	-	-	-
150	6321.90	6364.59	42.69	Class	1	-	-	-
151	6364.59	6407.91	43.32	Class	1	-	-	-
152	6407.91	6452.41	44.50	Class	1	-	-	-
153	6452.41	6495.07	42.66	Class	1	-	-	-
154	6495.07	6536.03	40.96	Class	1	-	-	-
155	6536.03	6577.82	41.79	Class	1	-	-	-
156	6577.82	6618.99	41.17	Class	1	-	-	-
157	6618.99	6661.42	42.43	Class	1	-	-	-
158	6661.42	6699.15	37.73	Class	1	-	-	-
159	6699.15	6735.69	36.54	Class	1	-	-	-
160	6735.69	6774.12	38.43	Class	1	-	-	-
161	6774.12	6809.39	35.27	Class	1	-	-	-
162	6809.39	6851.66	42.27	Class	1	-	-	-
163	6851.66	6895.35	43.69	Class	1	-	-	-
164	6895.35	6938.38	43.03	Class	1	-	-	-
165	6938.38	6982.42	44.04	Class	1	-	-	-
166	6982.42	7024.99	42.57	Class	1	-	-	-
167	7024.99	7067.73	42.74	Class	1	-	-	-

168	7067.73	7110.01	42.28	Class 1	-	-	-
169	7110.01	7150.56	40.55	Class 1	-	-	-
170	7150.56	7193.90	43.34	Class 1	-	-	-
171	7193.90	7237.19	43.29	Class 1	-	-	-
172	7237.19	7270.75	33.56	Class 1	-	-	-
173	7270.75	7315.45	44.70	Class 1	-	-	-
174	7315.45	7356.90	41.45	Class 1	-	-	-
175	7356.90	7401.53	44.63	Class 1	-	-	-
176	7401.53	7444.88	43.35	Class 1	-	-	-
177	7444.88	7485.03	40.15	Class 1	-	-	-
178	7485.03	7527.41	42.38	Class 1	-	-	-
179	7527.41	7569.33	41.92	Class 1	-	-	-
180	7569.33	7613.27	43.94	Class 1	-	-	-
181	7613.27	7656.20	42.93	Class 1	-	-	-
182	7656.20	7699.61	43.41	Class 1	-	-	-
183	7699.61	7742.57	42.96	Class 2	27.0%	7727.40	ID
184	7742.57	7785.74	43.17	Class 1	-	-	-
185	7785.74	7821.14	35.40	Class 1	19.0%	7787.06	ID

Southern California Gas Company Porter # 35

File 20160226_161504_RSP_0_0_0_0_0.mvl

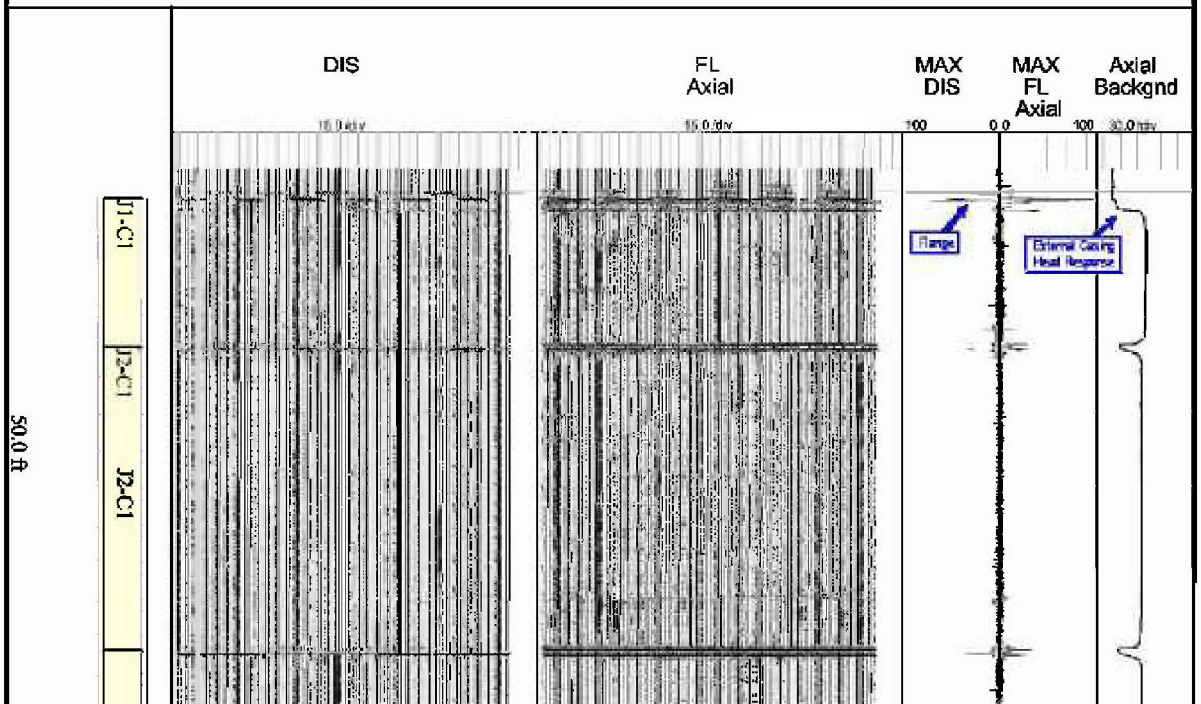
Main Log
5" / 100'

Class 1
0 - 20%

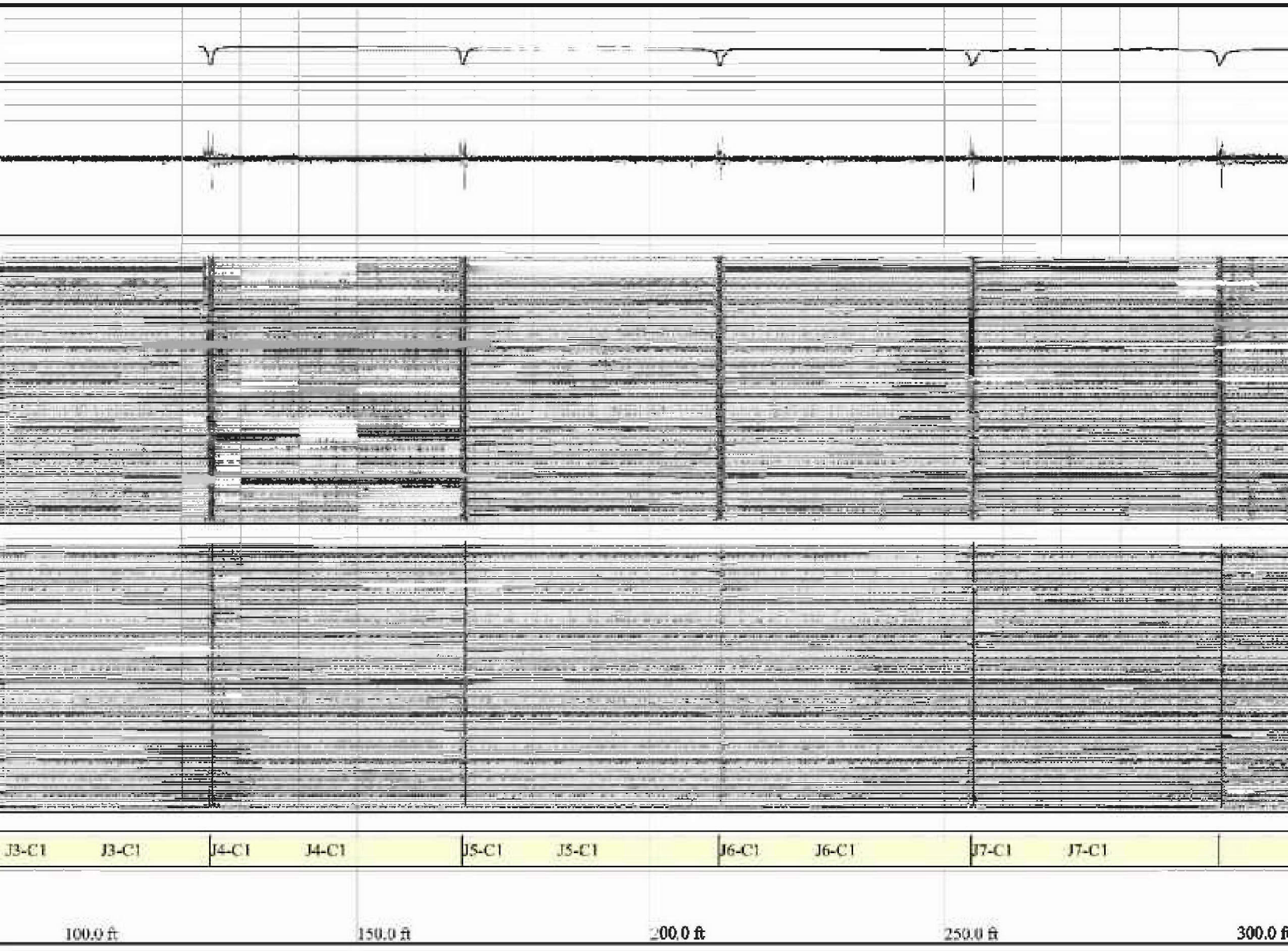
Class 2
20 - 40%

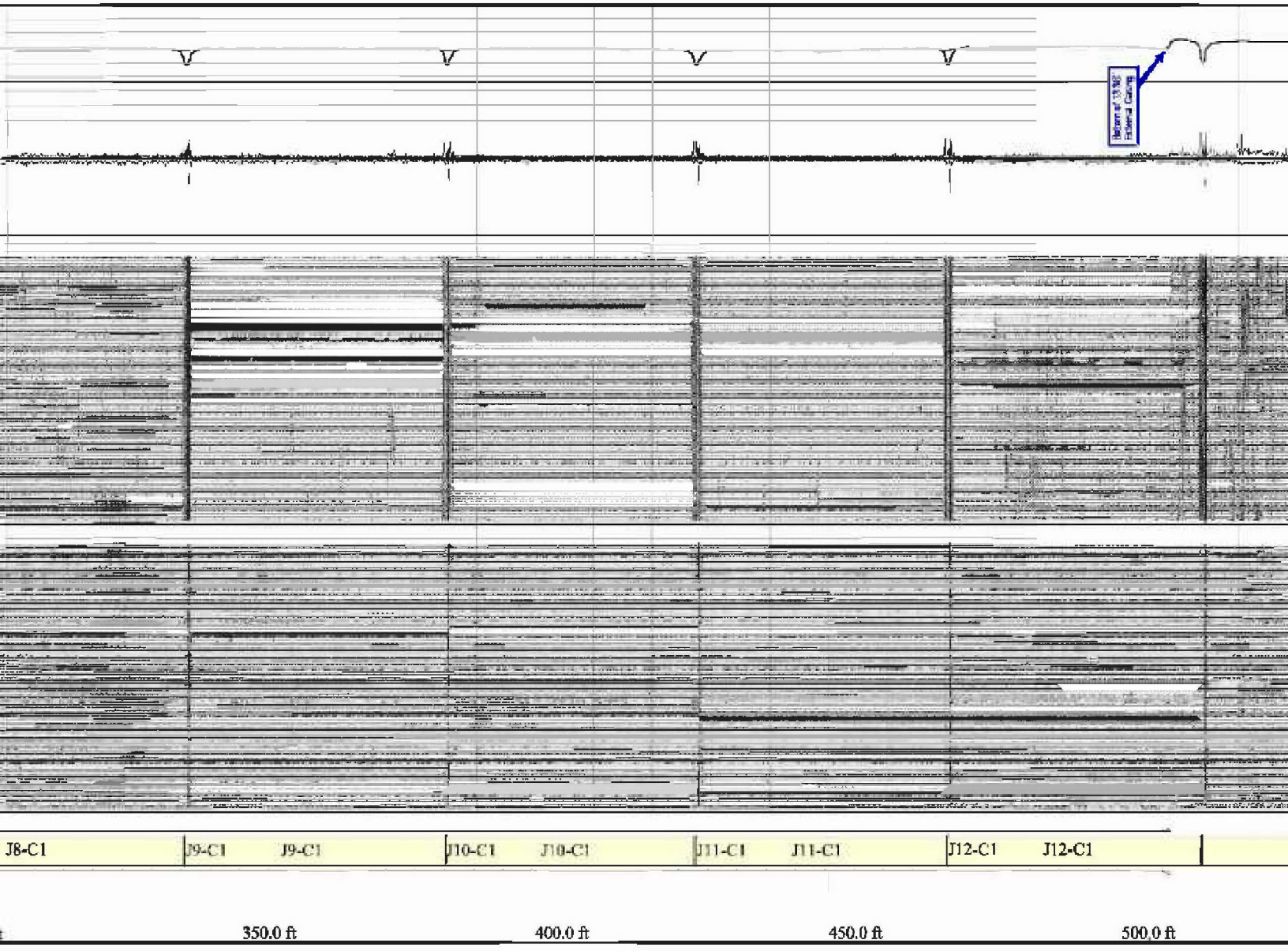
Class 3
40 - 60%

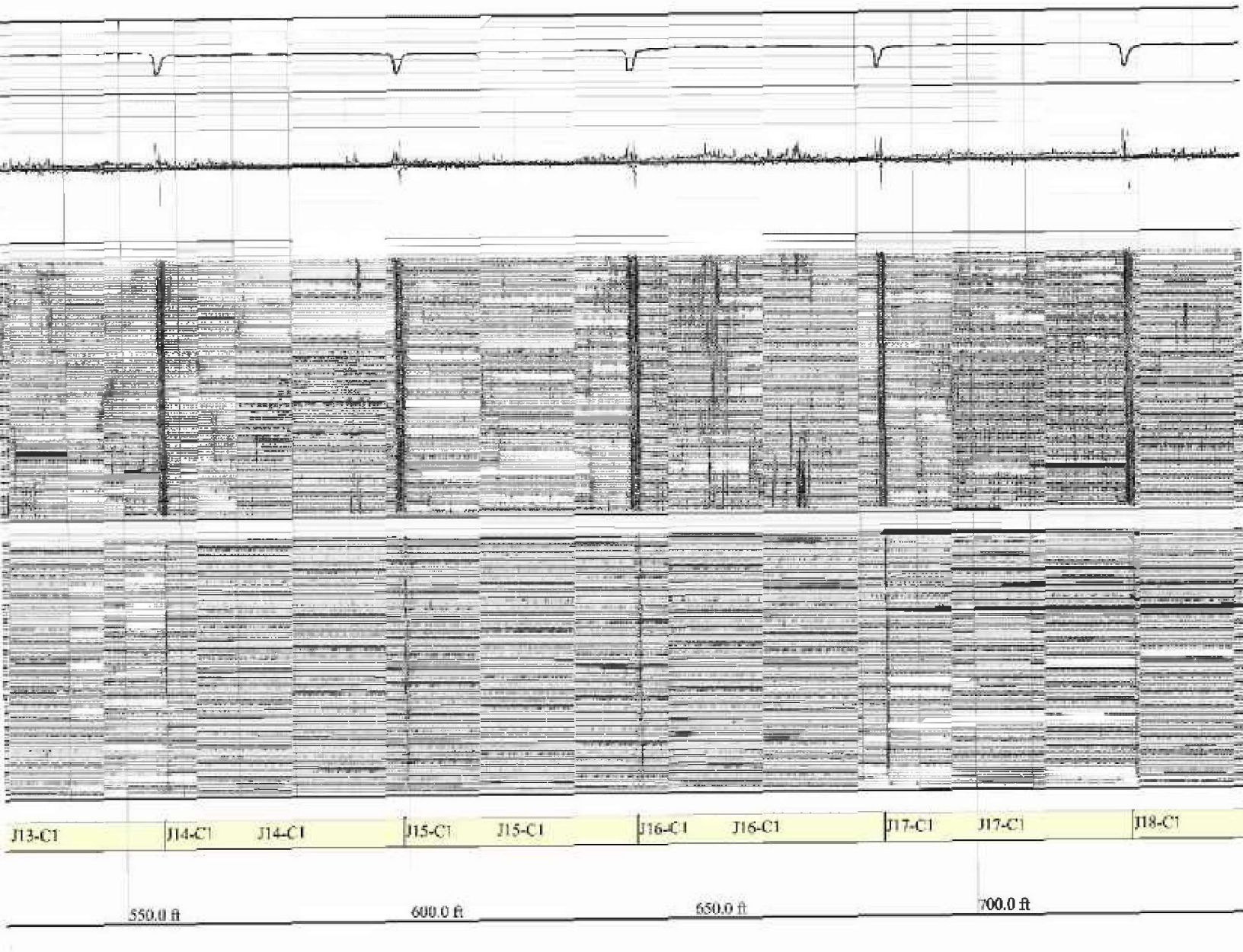
Class 4
60 - 100%

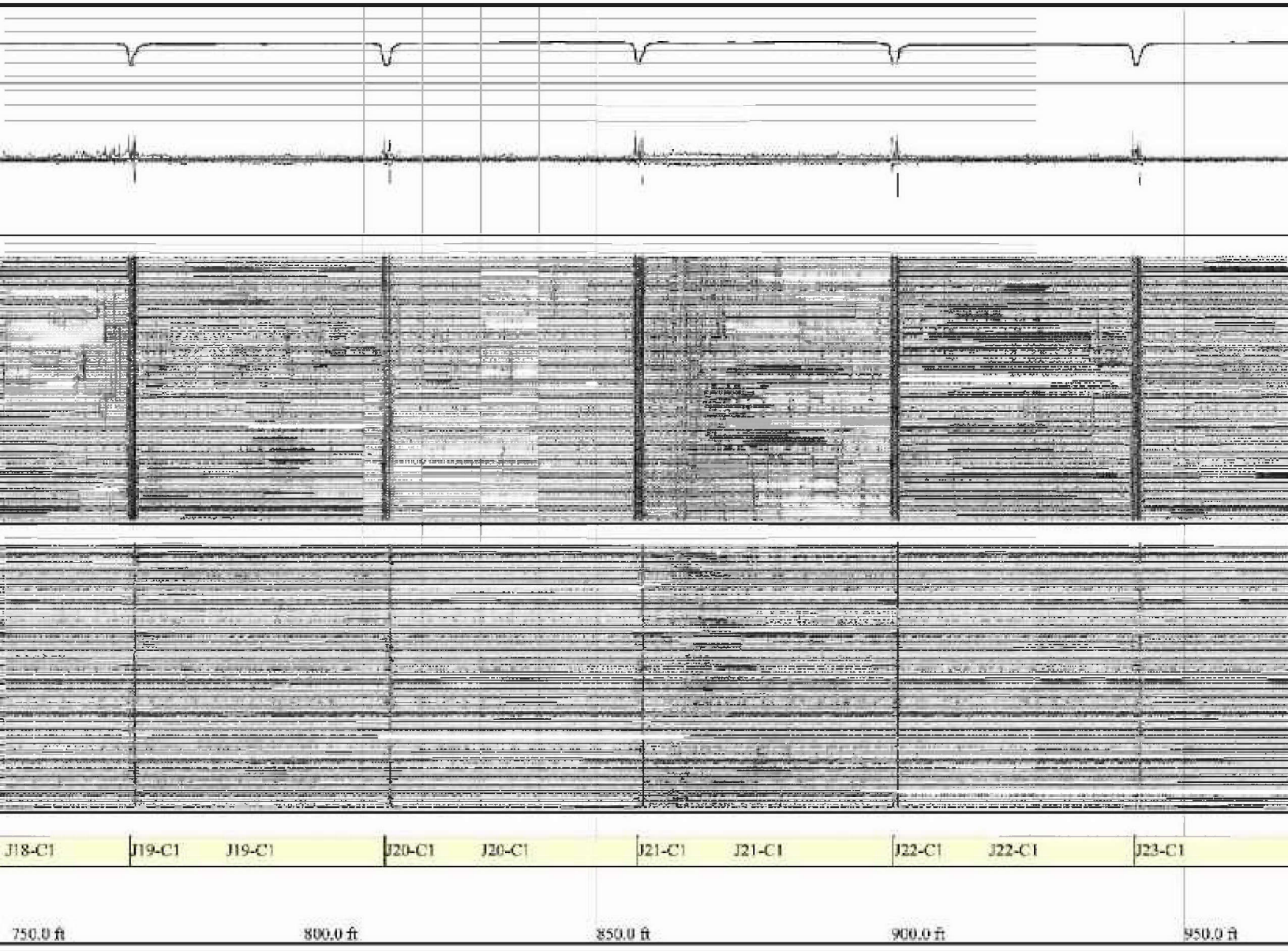


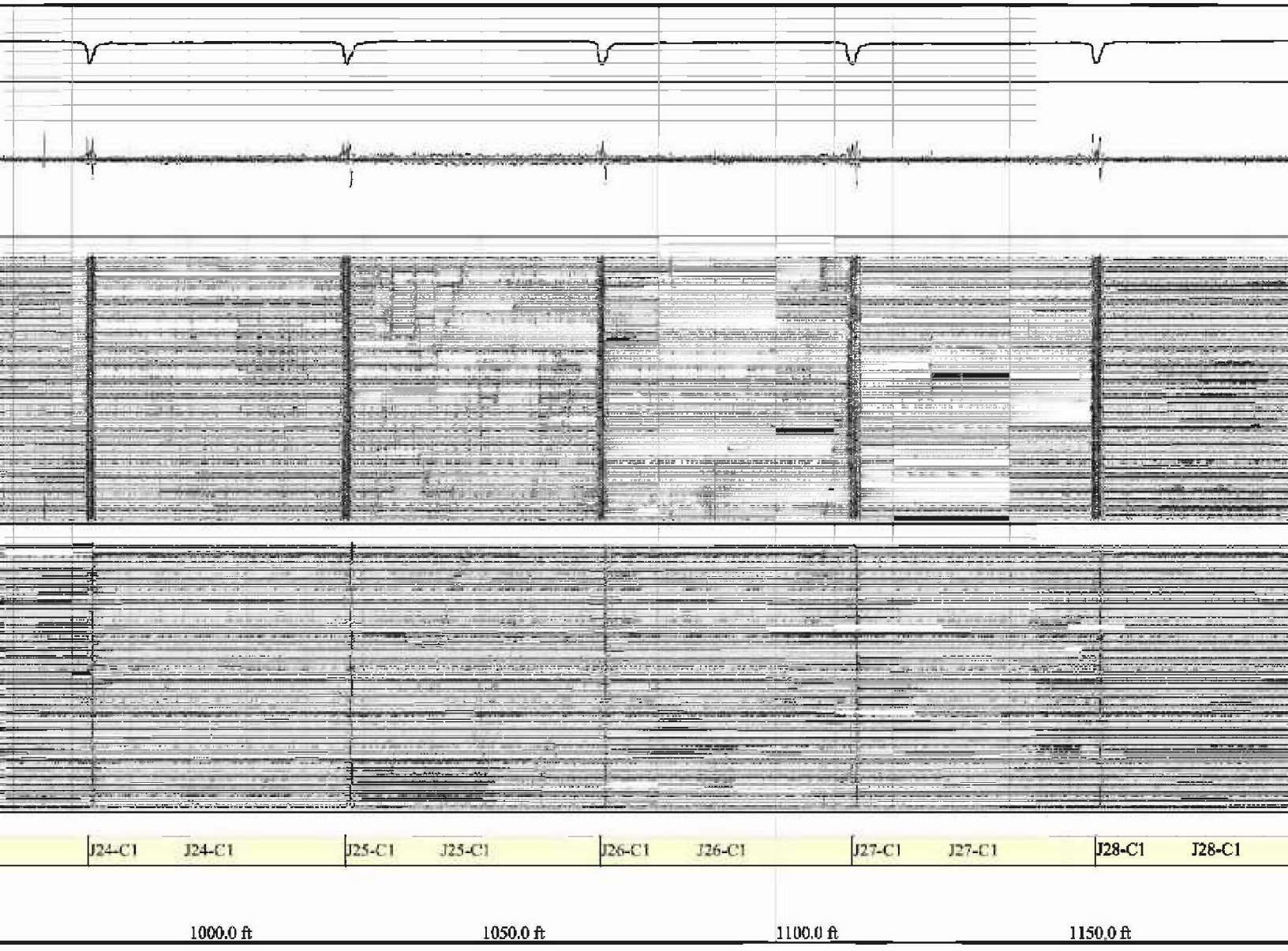
SoCalGas-5.0954


J3-C1
J3-C1
J4-C1
J4-C1
J5-C1
J5-C1
J6-C1
J6-C1
J7-C1
J7-C1
100.0 ft
150.0 ft
200.0 ft
250.0 ft
300.0 ft


J8-C1
J9-C1
J9-C1
J10-C1
J10-C1
J11-C1
J11-C1
J12-C1
J12-C1
350.0 ft
400.0 ft
450.0 ft
500.0 ft


J13-C1
J14-C1
J14-C1
J15-C1
J15-C1
J16-C1
J16-C1
J17-C1
J17-C1
J18-C1
550.0 ft
600.0 ft
650.0 ft
700.0 ft


J18-C1
J19-C1
J19-C1
J20-C1
J20-C1
J21-C1
J21-C1
J22-C1
J22-C1
J23-C1
750.0 ft
800.0 ft
850.0 ft
900.0 ft
950.0 ft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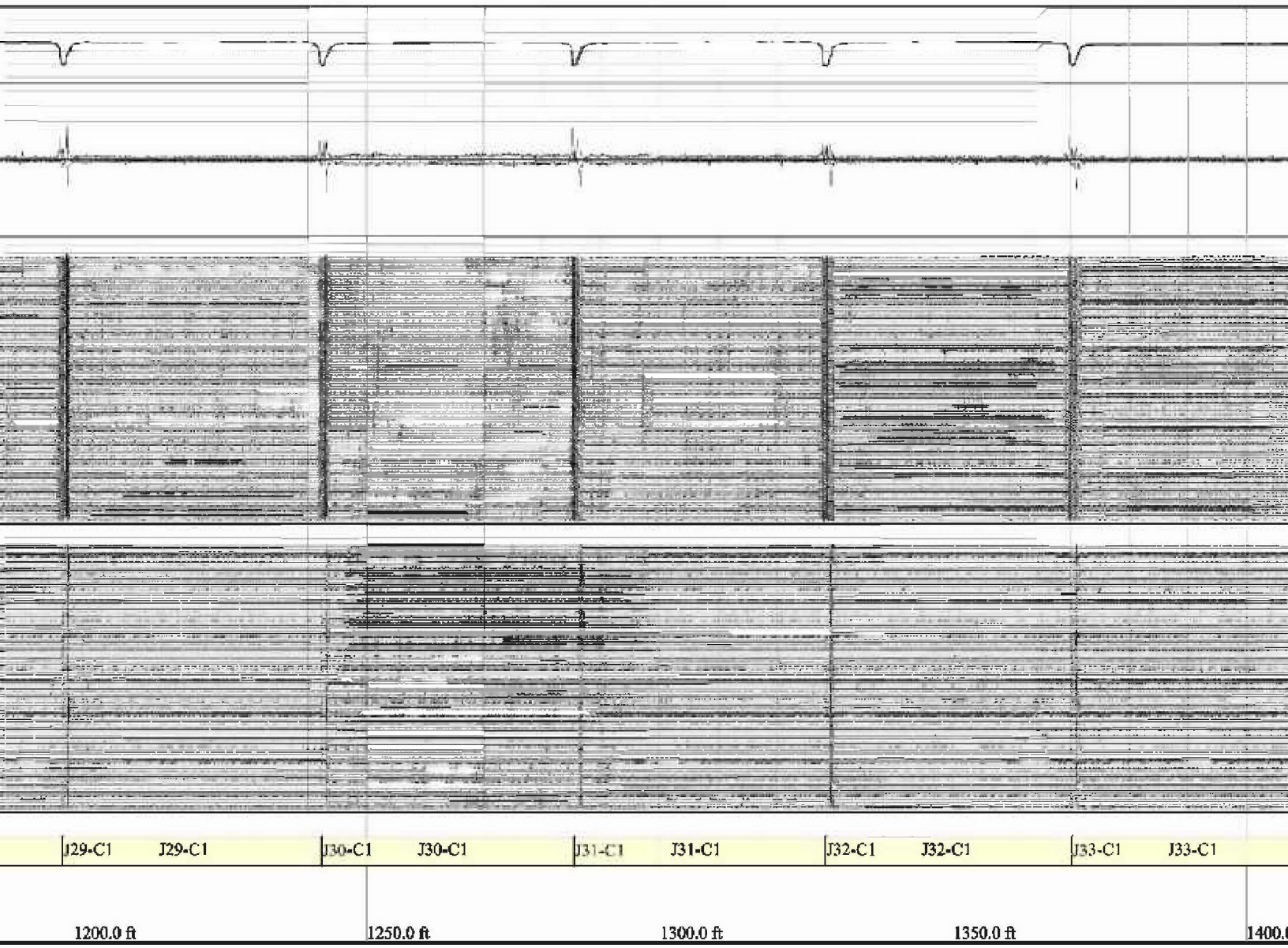
J24-C1
J25-C1
J25-C1
J26-C1
J26-C1
J27-C1
J27-C1
J28-C1
J28-C1
1000.0 ft
1050.0 ft
1100.0 ft
1150.0 ft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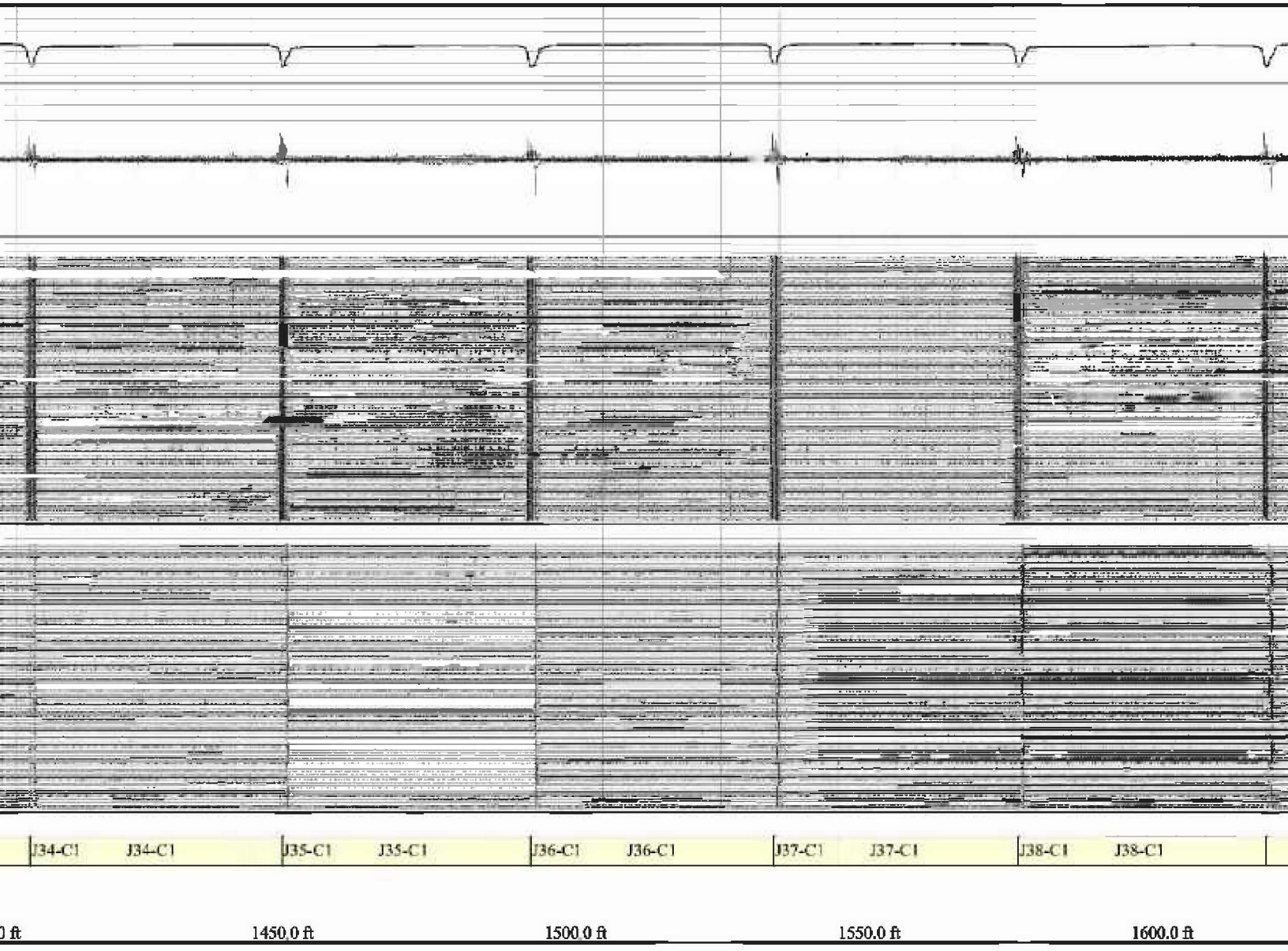
J29-C1
J30-C1
J30-C1
J31-C1
J31-C1
J32-C1
J32-C1
J33-C1
J33-C1
1200.0 ft
1250.0 ft
1300.0 ft
1350.0 ft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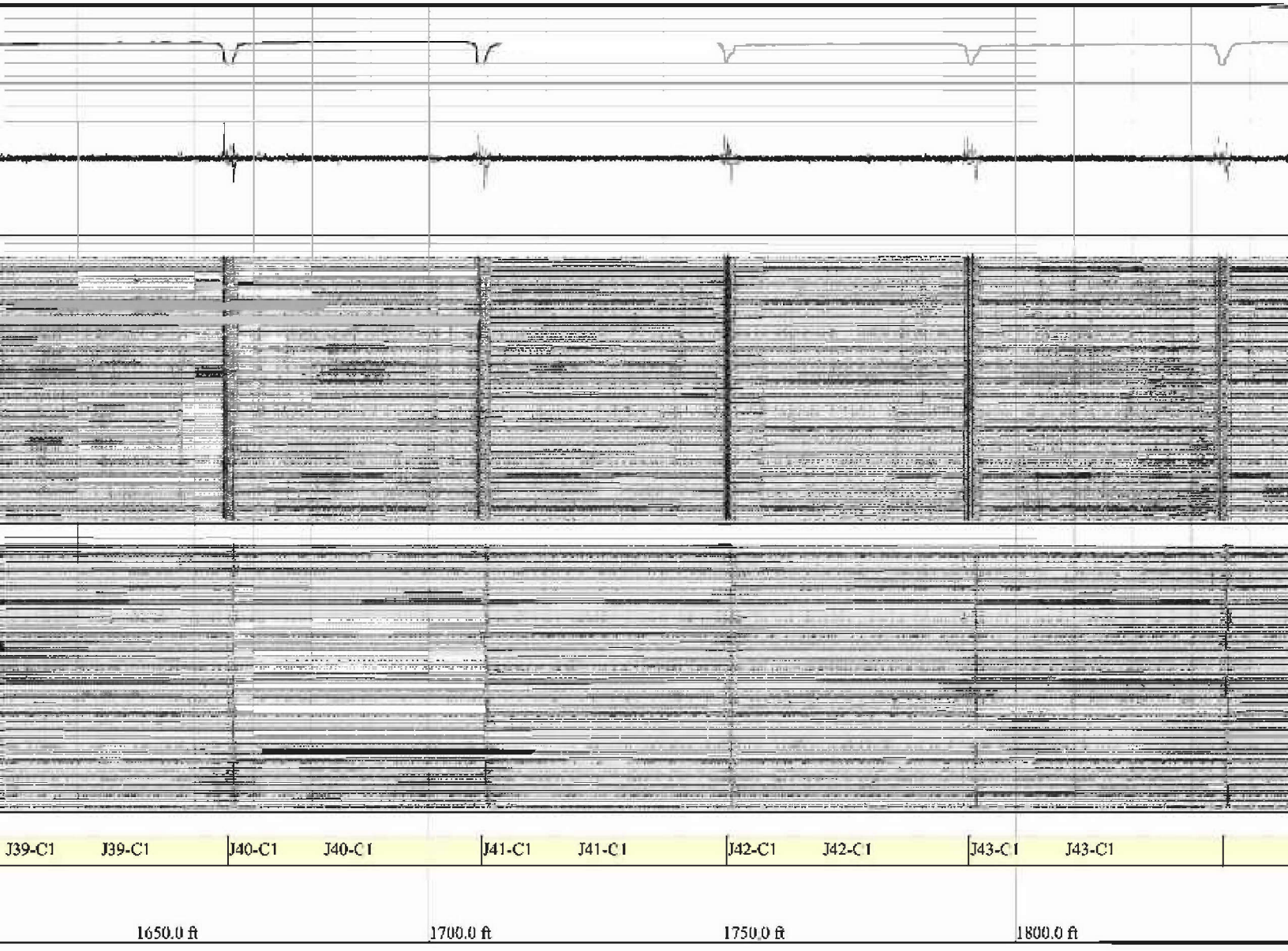
J34-C1
J35-C1
J35-C1
J36-C1
J36-C1
J37-C1
J37-C1
J38-C1
J38-C1
0 ft
1450.0 ft
1500.0 ft
1550.0 ft
1600.0 ft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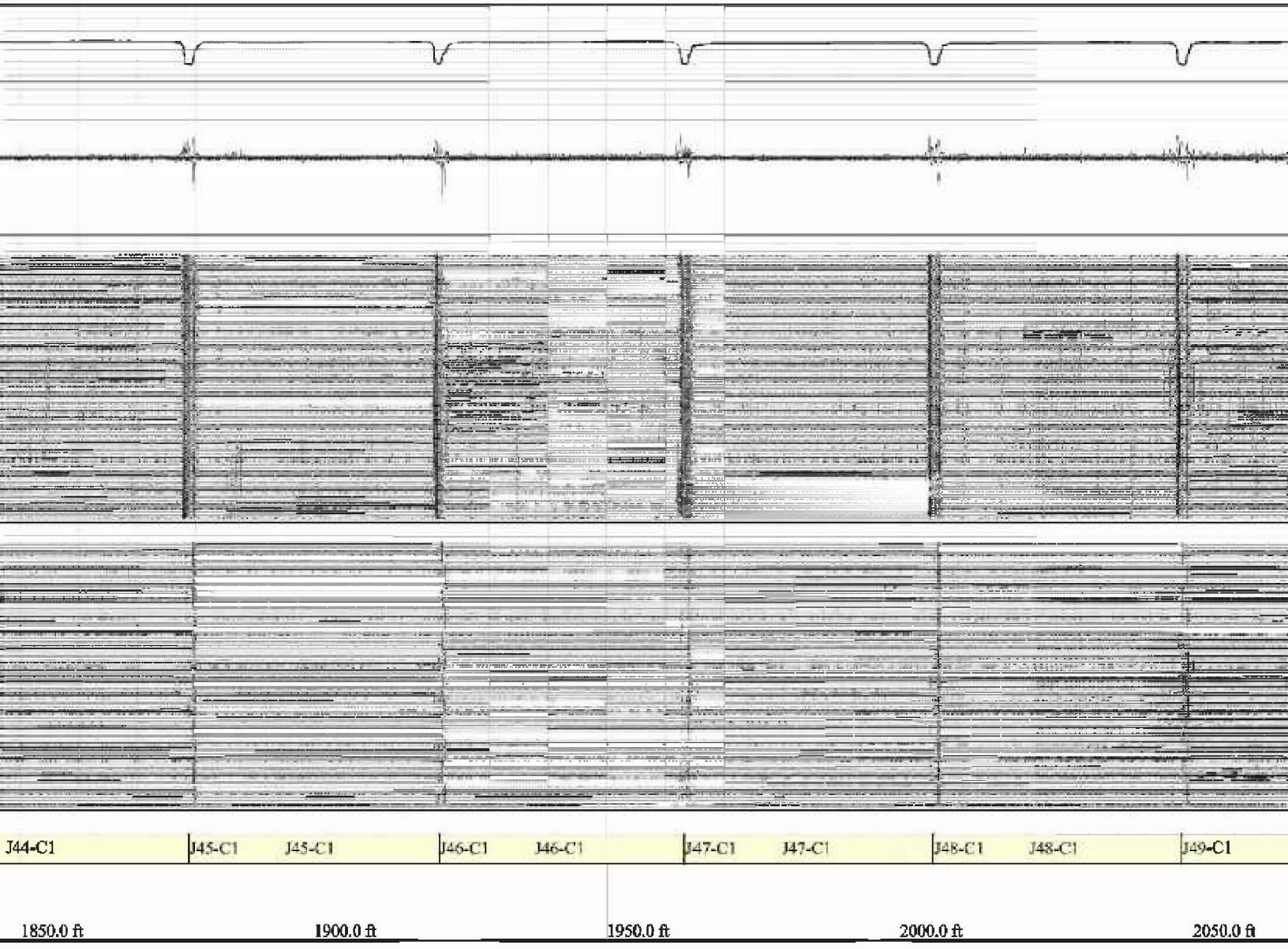
J39-C1
J40-C1
J40-C1
J41-C1
J41-C1
J42-C1
J42-C1
J43-C1
J43-C1
1650.0 ft
1700.0 ft
1750.0 ft
1800.0 ft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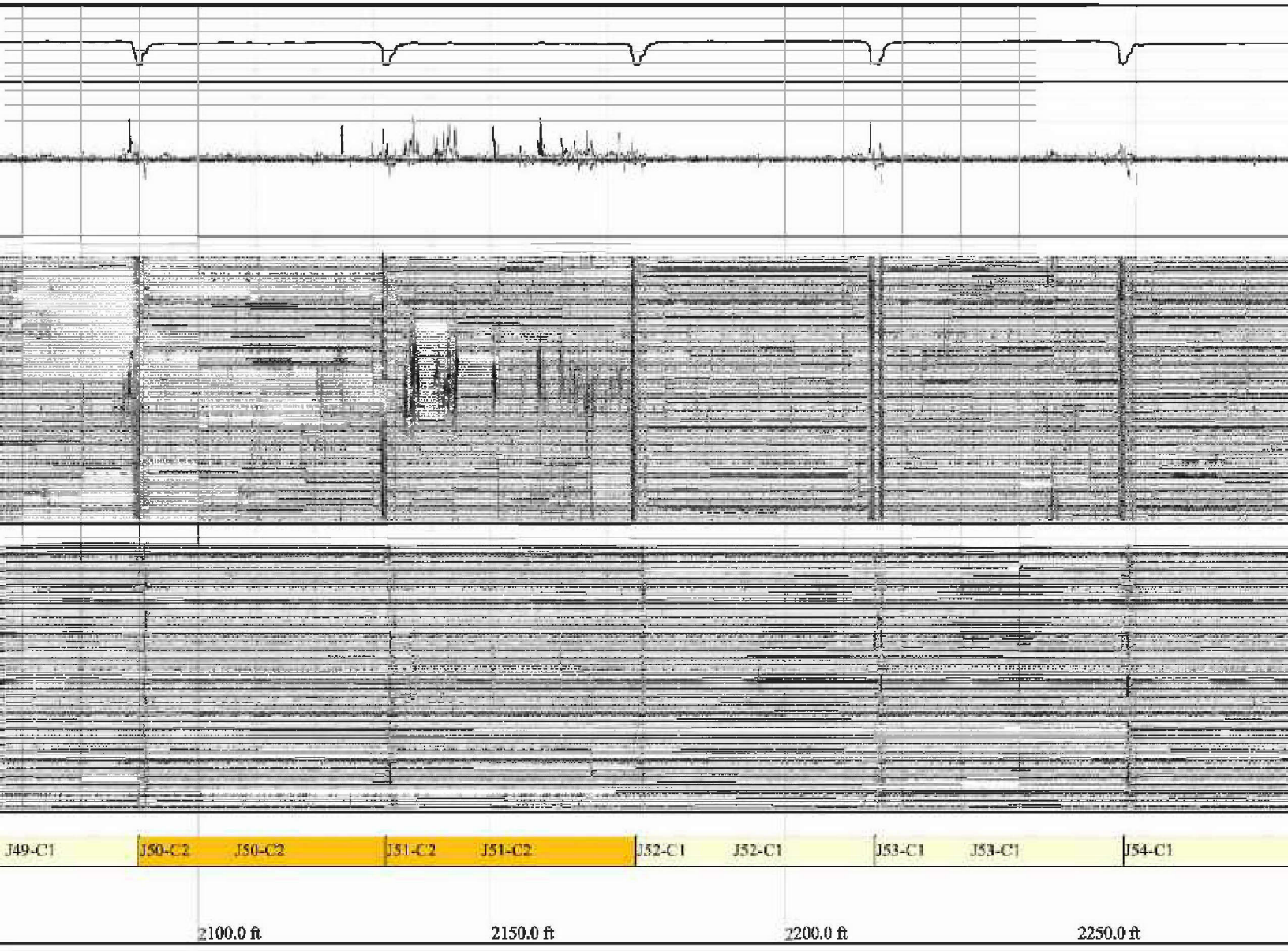
J45-C1
J45-C1
J46-C1
J46-C1
J47-C1
J47-C1
J48-C1
J48-C1
J49-C1
1850.0 ft
1900.0 ft
1950.0 ft
2000.0 ft
2050.0 ft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J50-C2
J50-C2
J51-C2
J51-C2
J52-C1
J52-C1
J53-C1
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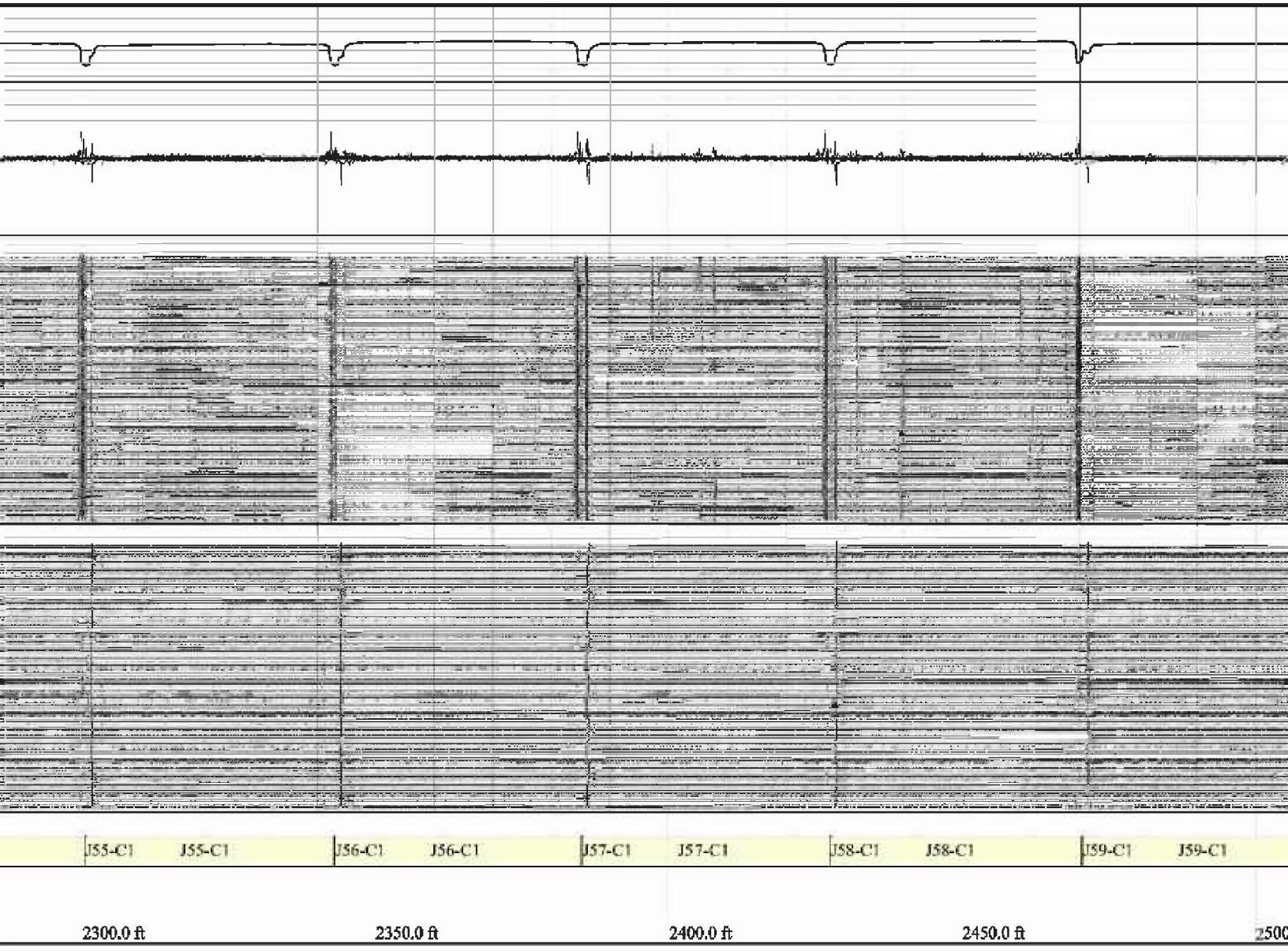
2150.0 ft
2200.0 ft
2250.0 ft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J56-C1
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J57-C1
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J58-C1
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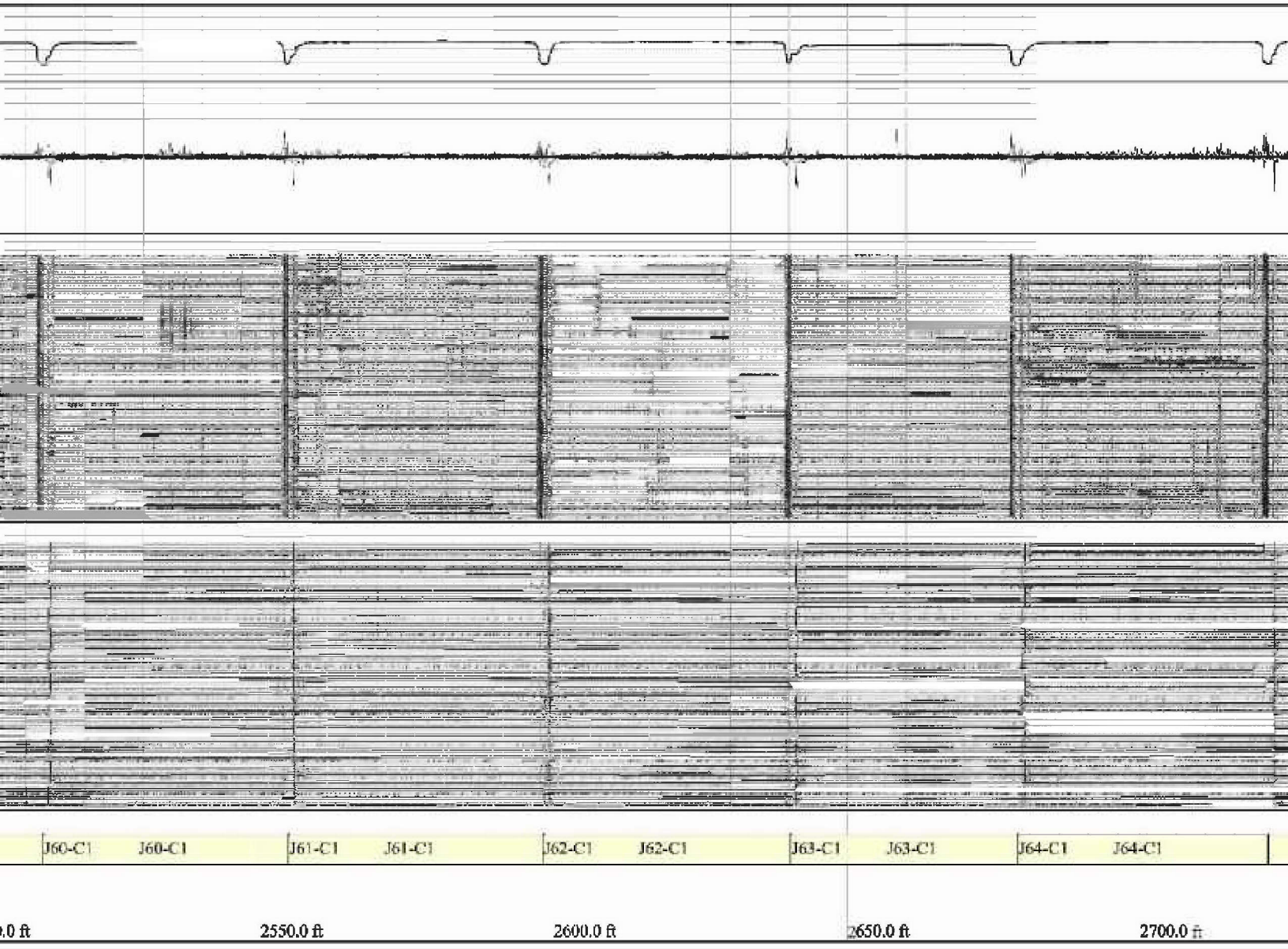
2400.0 ft
2450.0 ft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J61-C1
J61-C1
J62-C1
J62-C1
J63-C1
J63-C1
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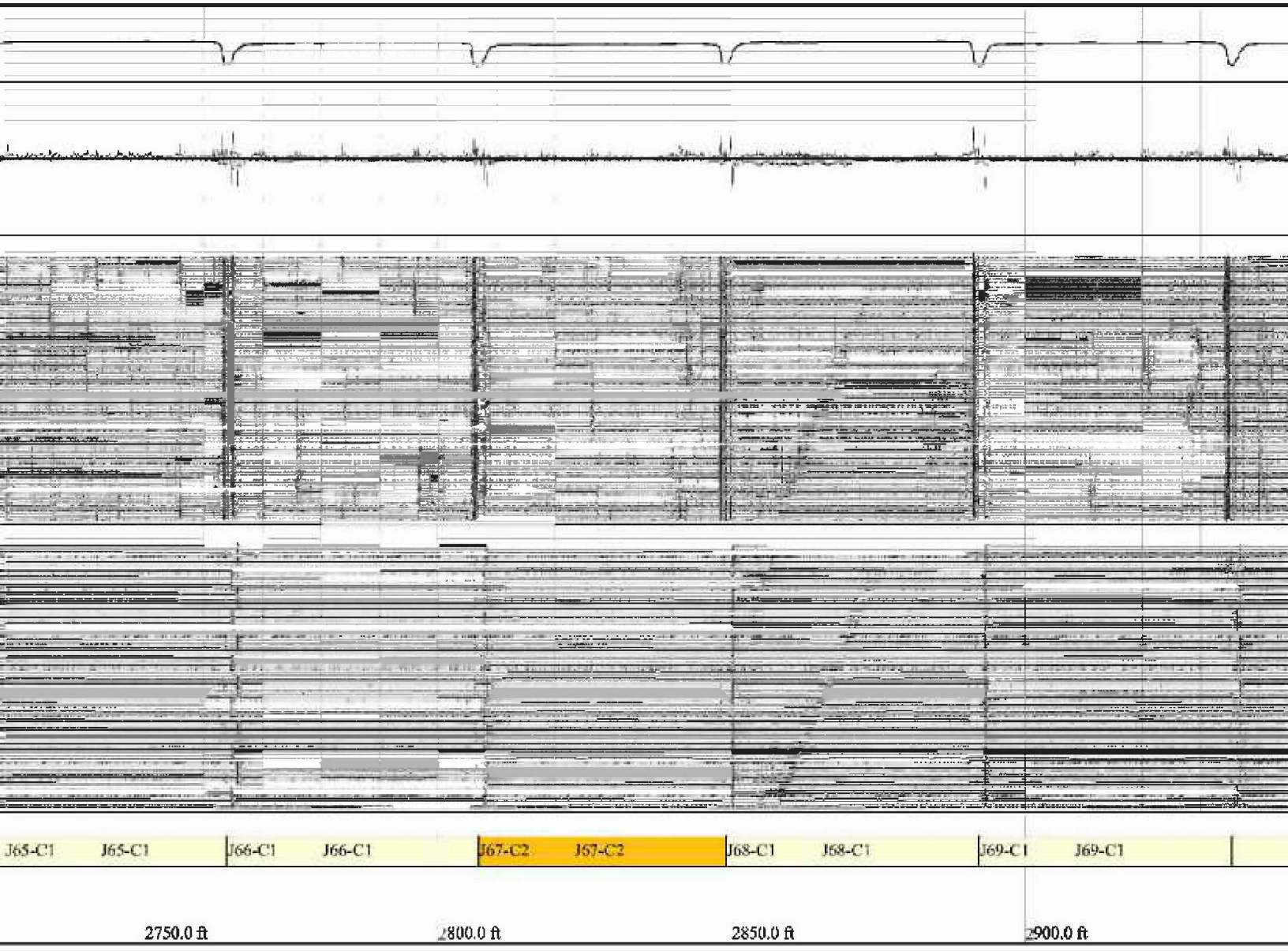
2650.0 ft
2700.0 ft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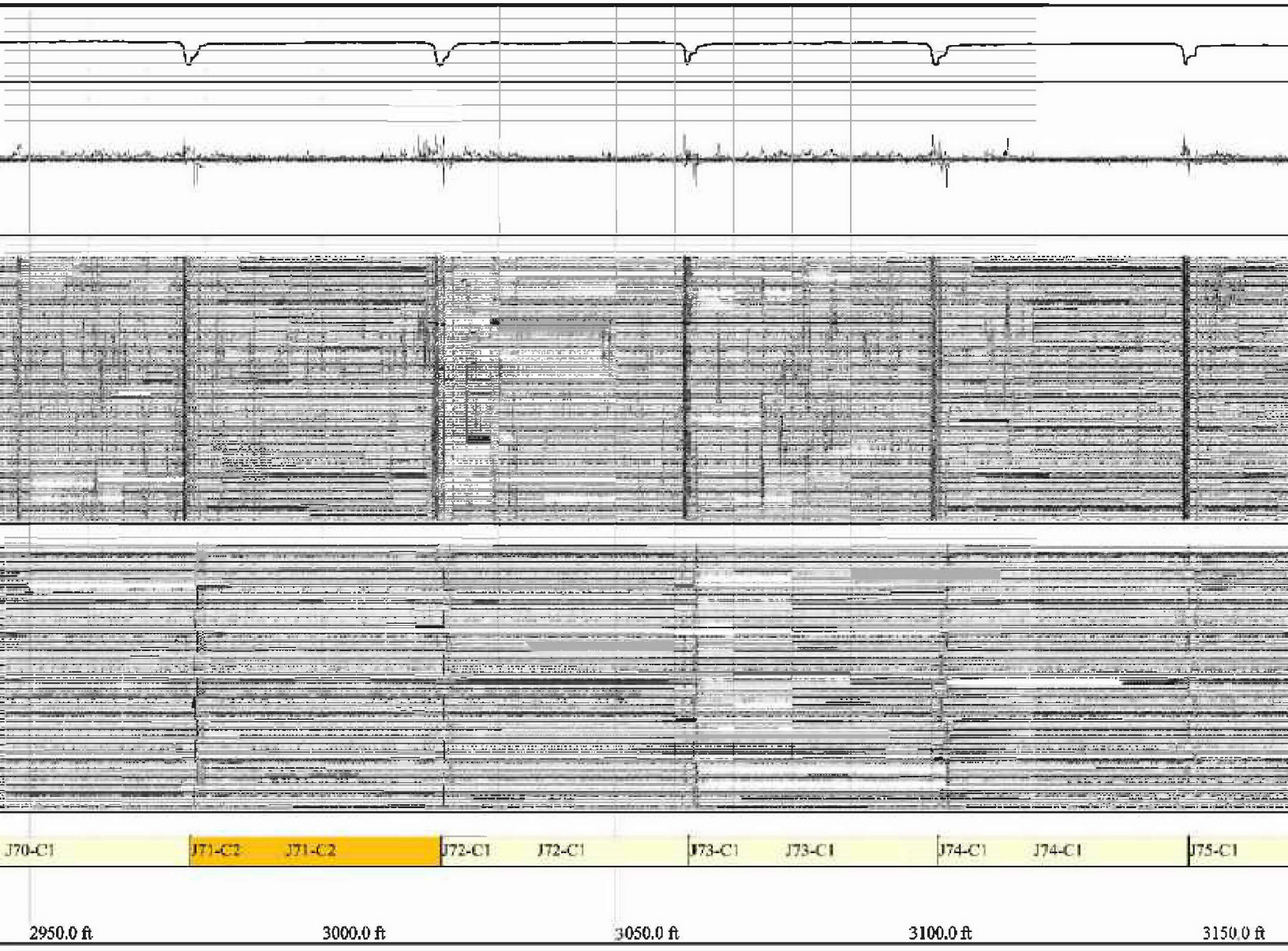
J65-C1
J66-C1
J66-C1
J67-C2
J67-C2
J68-C1
J68-C1
J69-C1
J69-C1
2750.0 ft
2800.0 ft
2850.0 ft
2900.0 ft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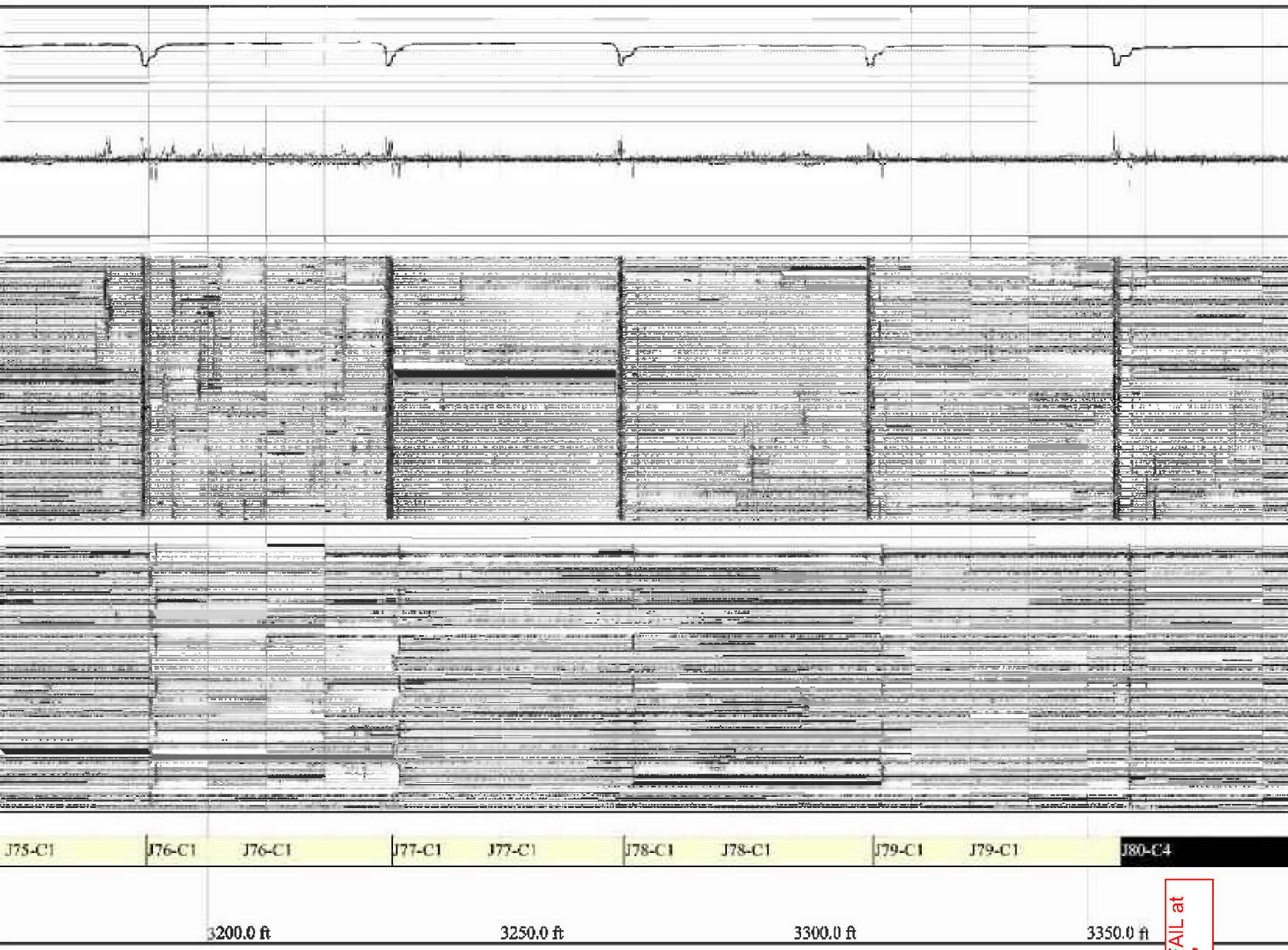
J71-C2
J71-C2
J72-C1
J72-C1
J73-C1
J73-C1
J74-C1
J74-C1
J75-C1
2950.0 ft
3000.0 ft
3050.0 ft
3100.0 ft
3150.0 ft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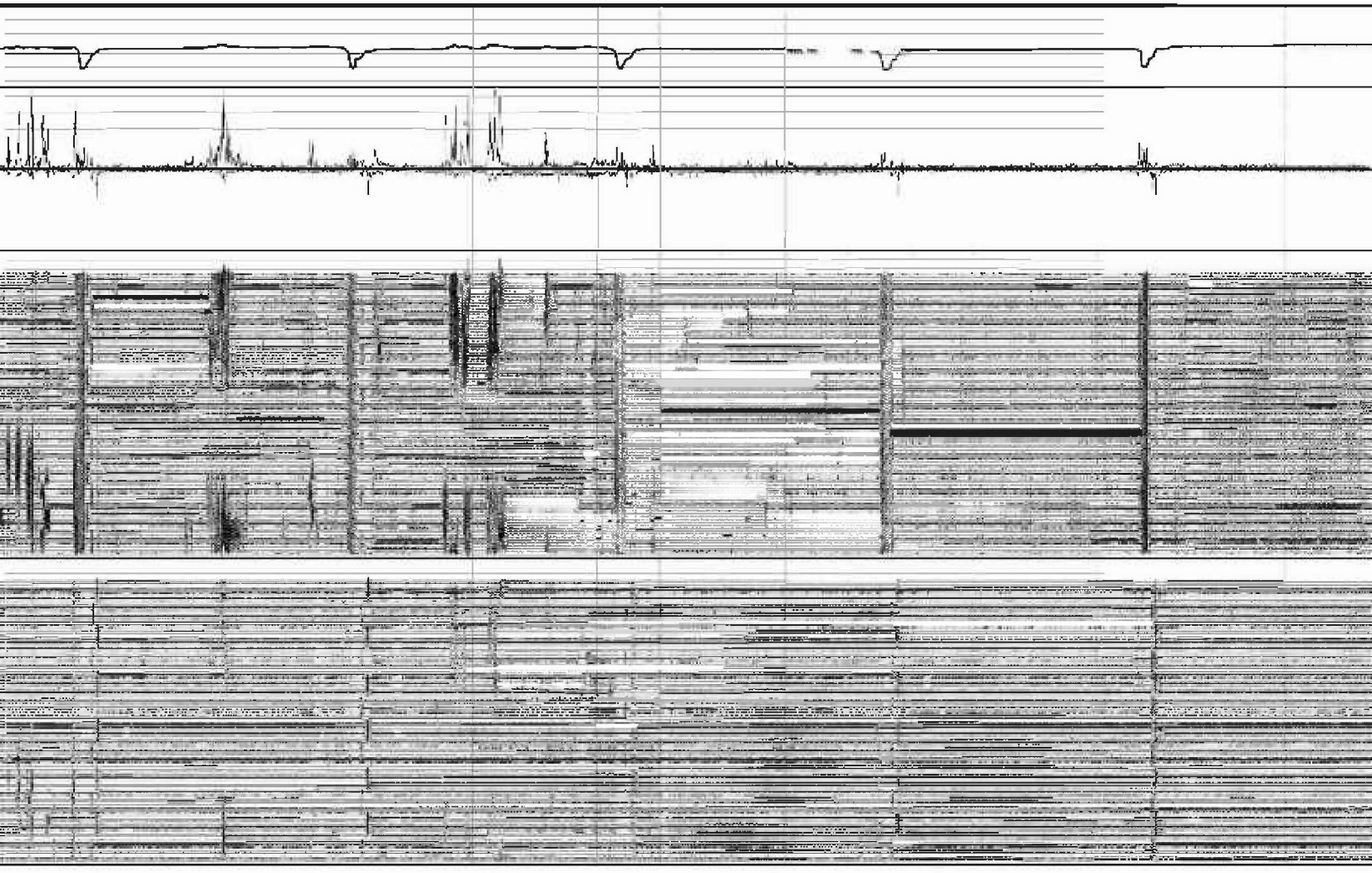
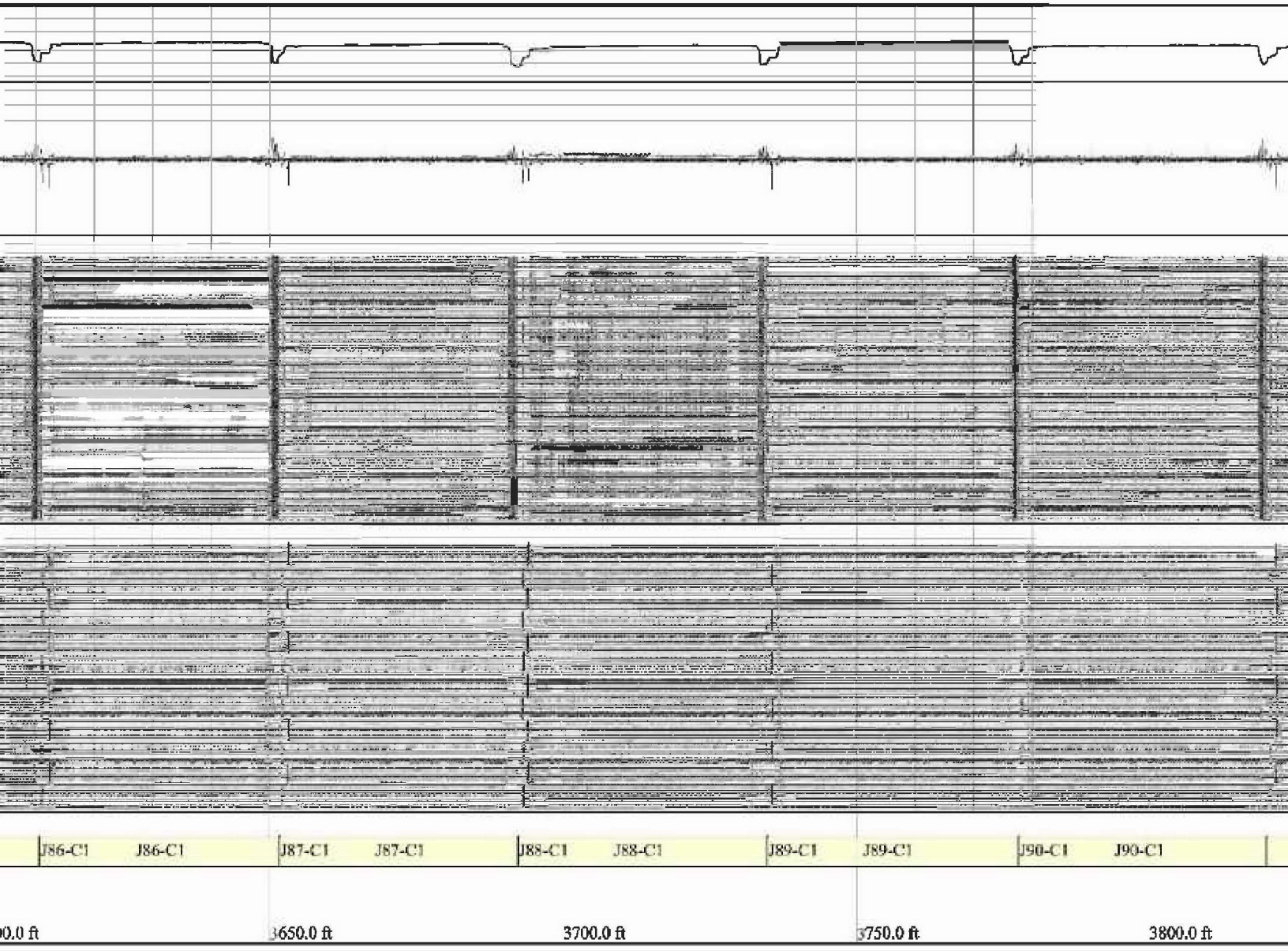
J76-C1
J76-C1
J77-C1
J77-C1
J78-C1
J78-C1
J79-C1
J79-C1
J80-C4
3200.0 ft
3250.0 ft
3300.0 ft
3350.0 ft
anomaly. FAIL at 3355-3398'



anomaly. FAIL at 3355-3398'.

3400.0 ft 3450.0 ft 3500.0 ft 3550.0 ft 360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J87-C1
J87-C1
J88-C1
J88-C1
J89-C1
J89-C1
J90-C1
J90-C1
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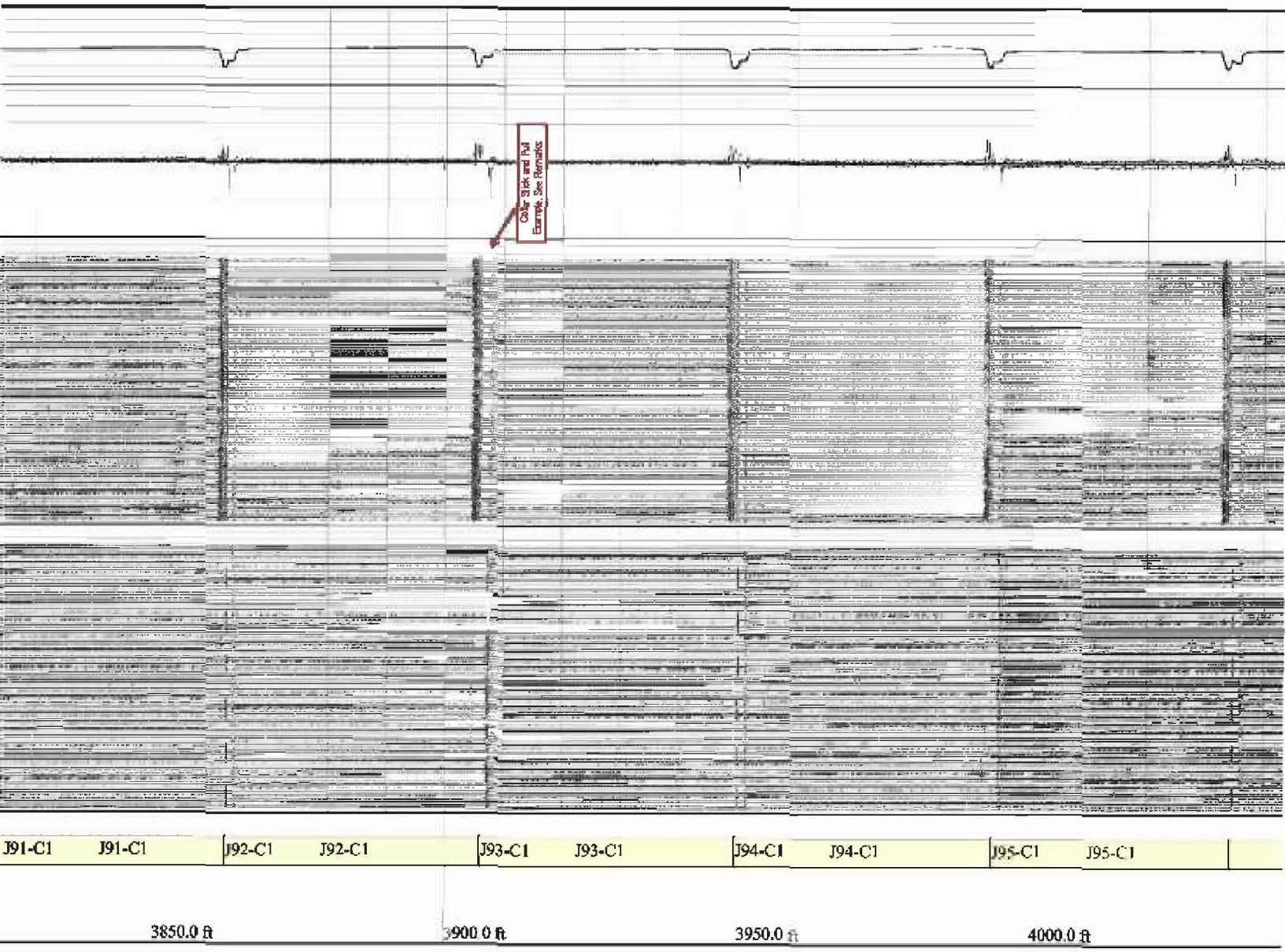
3700.0 ft
3750.0 ft
3800.0 ft



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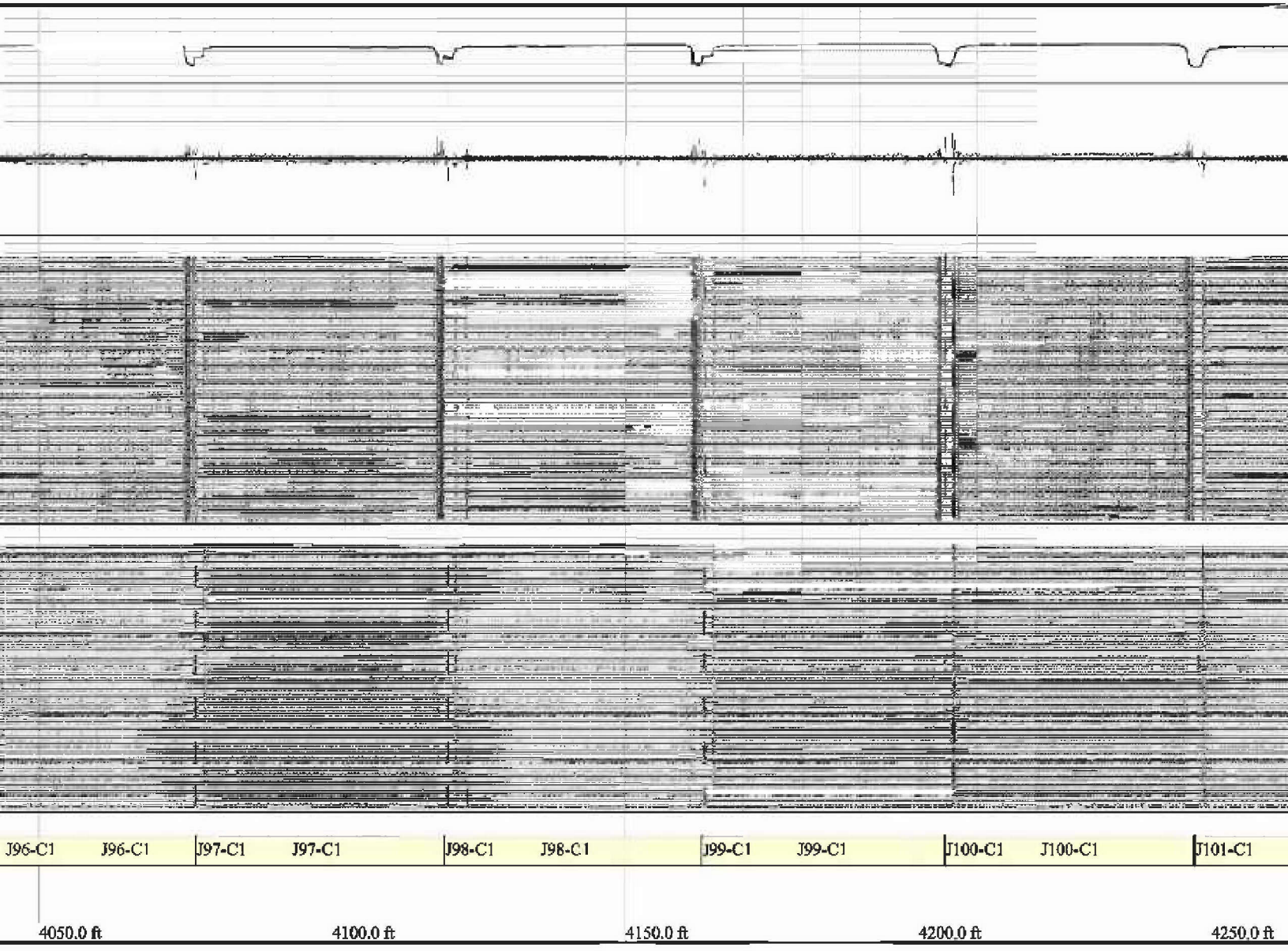
3850.0 ft 3900.0 ft 3950.0 ft 4000.0 ft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J99-C1
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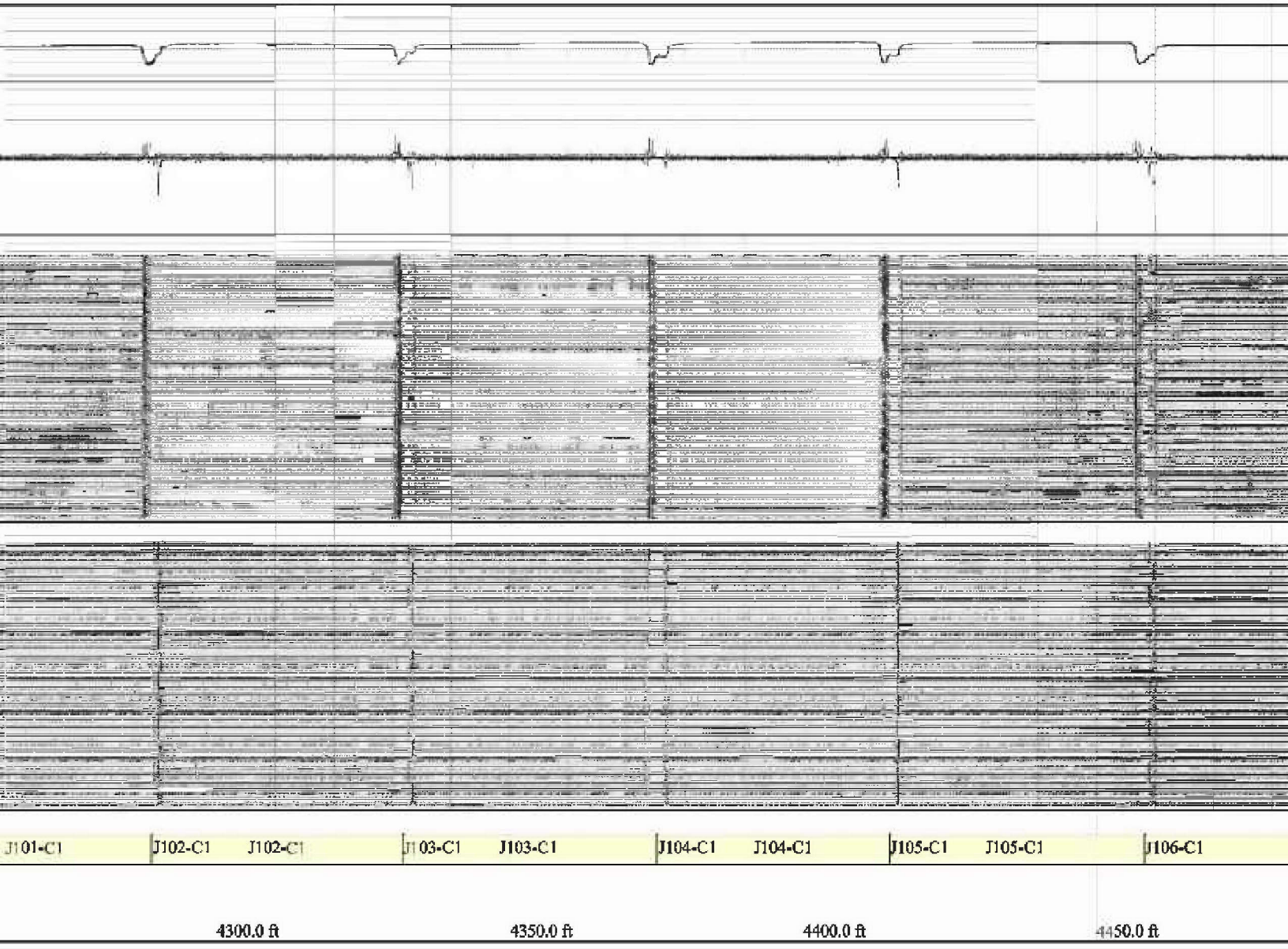
4200.0 ft
4250.0 ft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J104-C1
J104-C1
J105-C1
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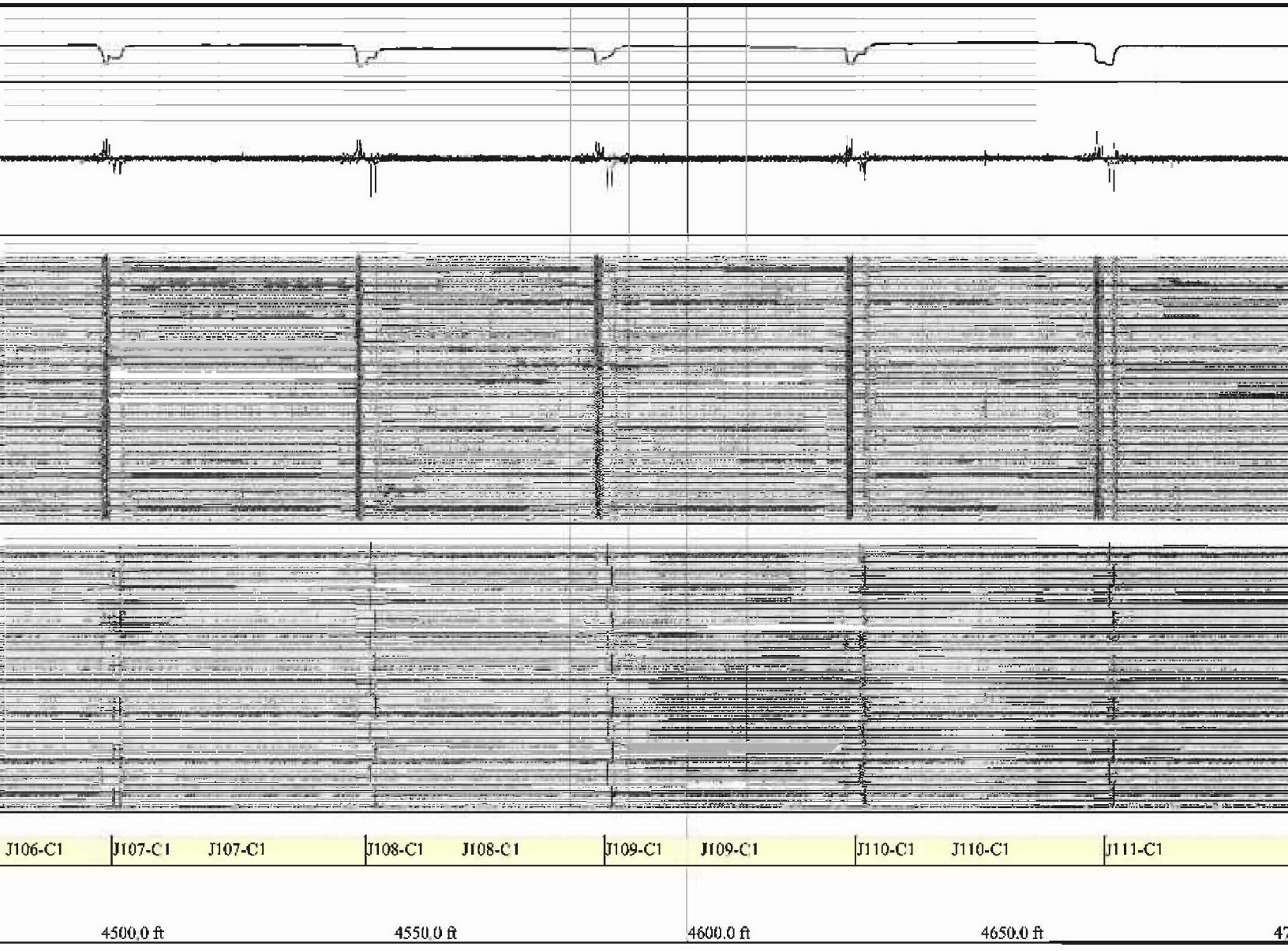
4400.0 ft
4450.0 ft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J109-C1
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J110-C1
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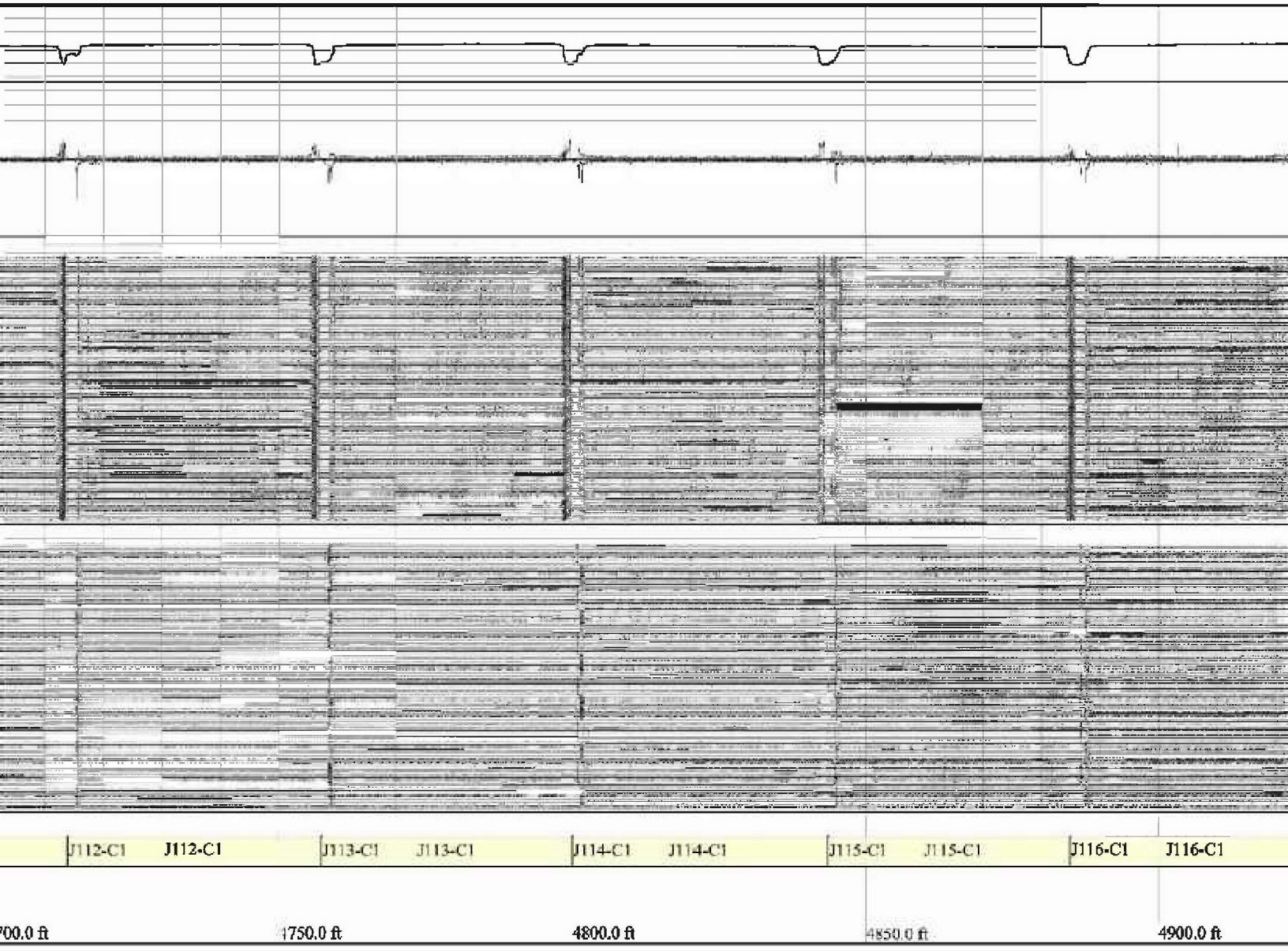
4600.0 ft
4650.0 ft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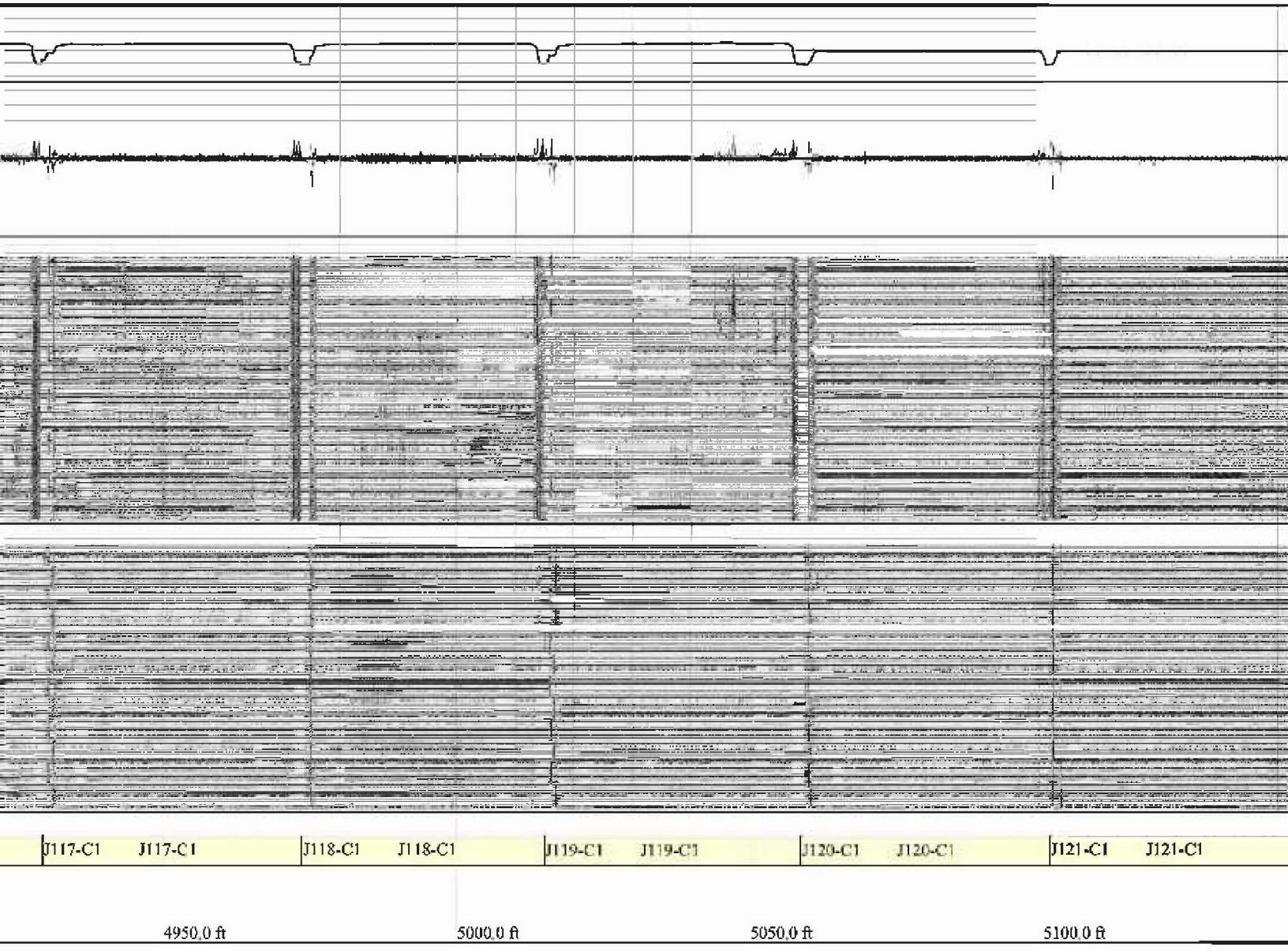
4850.0 ft
4900.0 ft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J120-C1
J120-C1
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J121-C1
4950.0 ft
5000.0 ft
5050.0 ft
5100.0 ft

5150.0 ft
5200.0 ft
5250.0 ft
5300.0 ft
5350.0 ft
J122-C1
J122-C1
J123-C1
J123-C1
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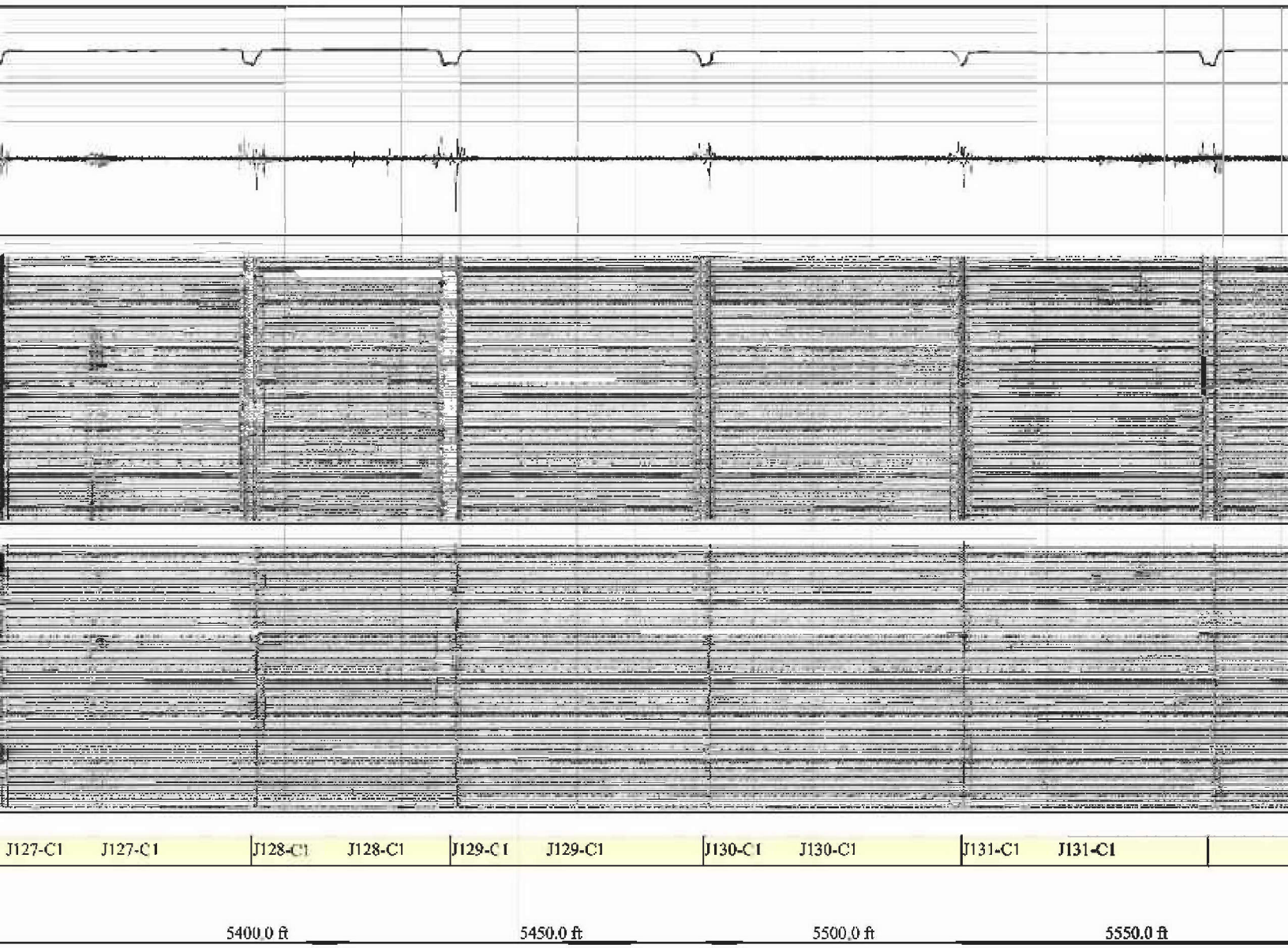
J126-C1
J126-C1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J130-C1
J130-C1
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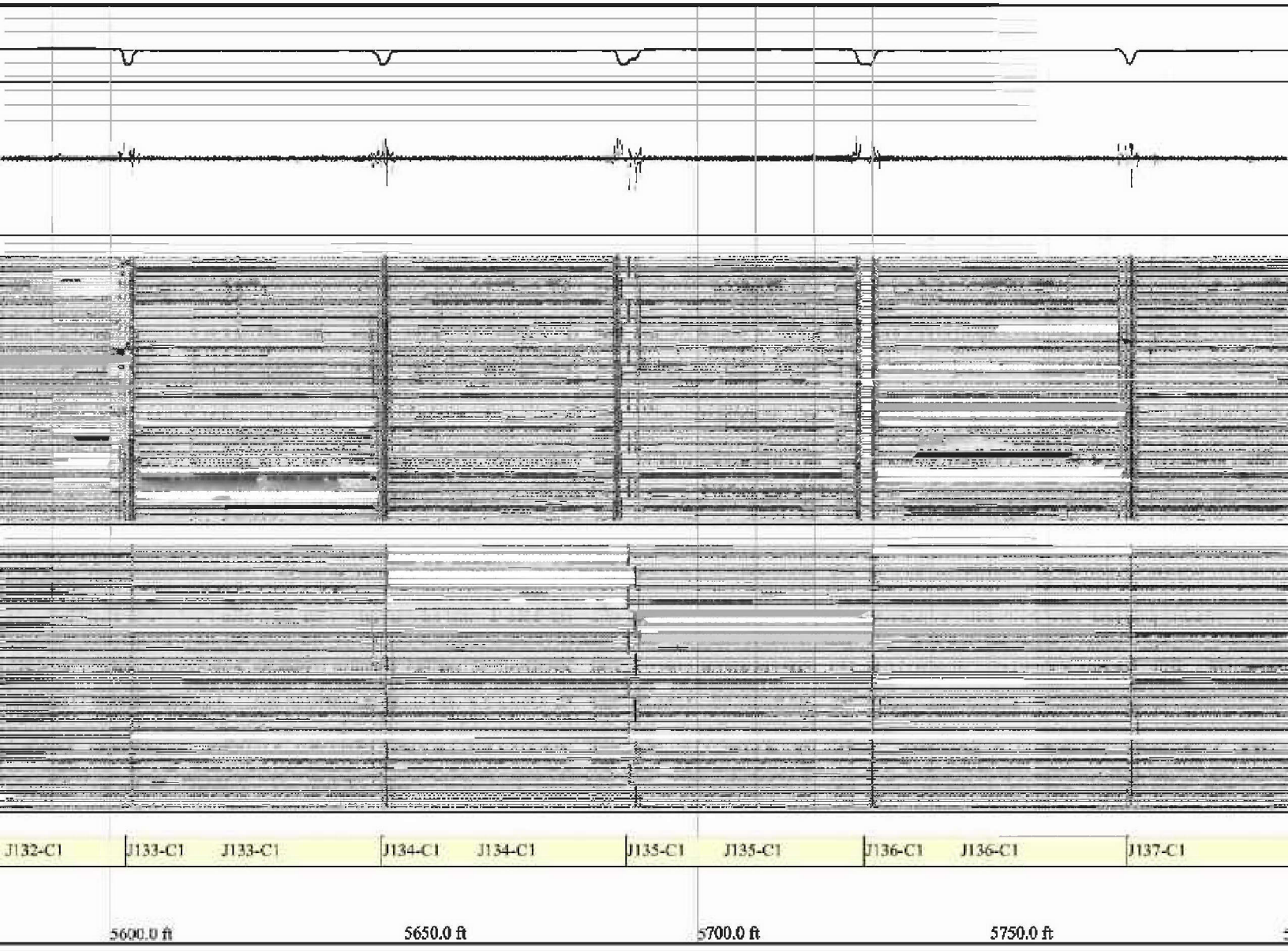
5500.0 ft
5550.0 ft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J136-C1
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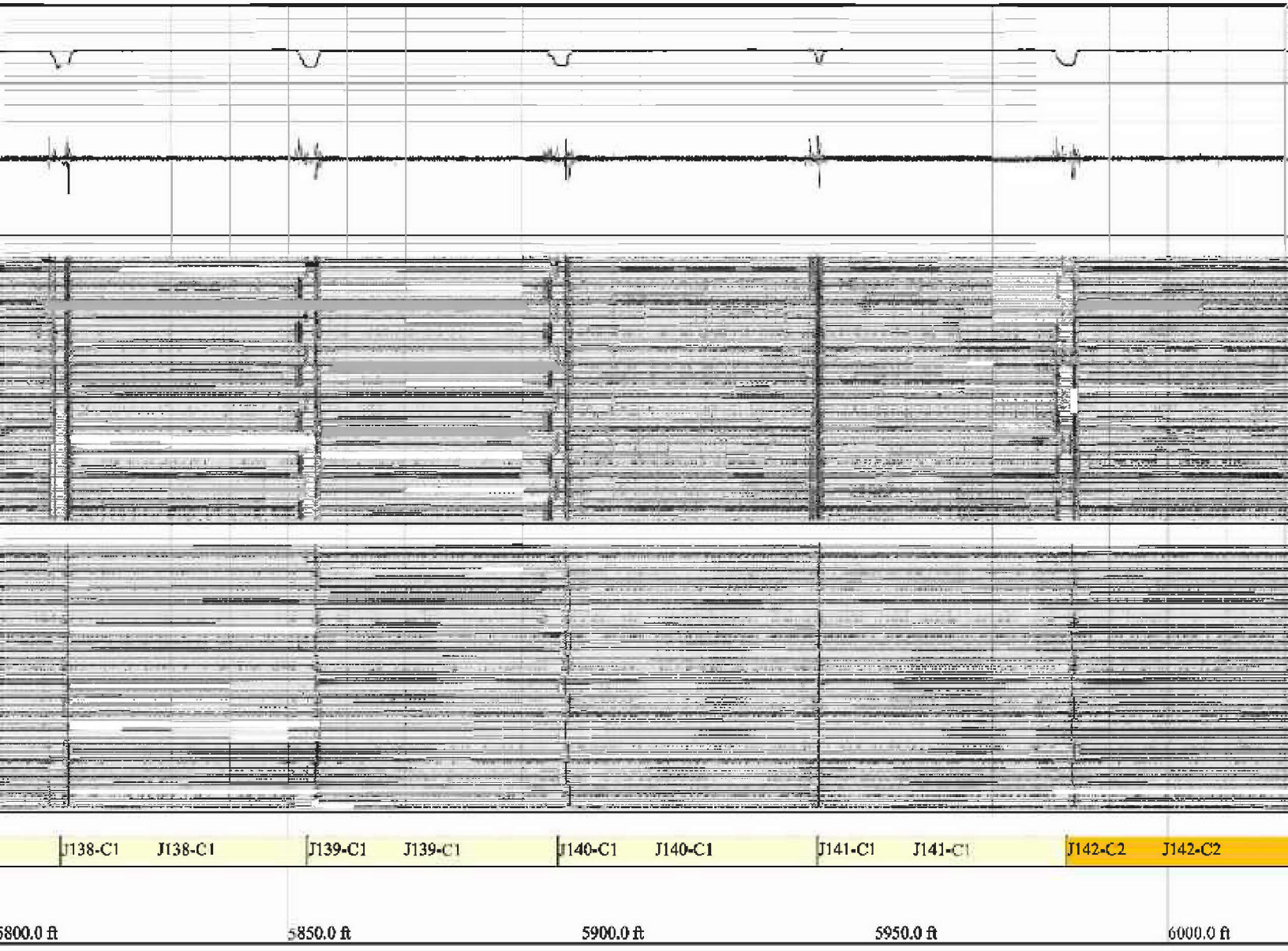
5700.0 ft
5750.0 ft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J140-C1
J140-C1
J141-C1
J141-C1
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J142-C2
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5850.0 ft
5900.0 ft
5950.0 ft
6000.0 ft

6200.0 ft
6150.0 ft
6100.0 ft
6050.0 ft
J147-C1
J146-C1
J145-C1
J144-C1
J143-C1

6250.0 ft
6300.0 ft
6350.0 ft
6400.0 ft
6450.0 ft
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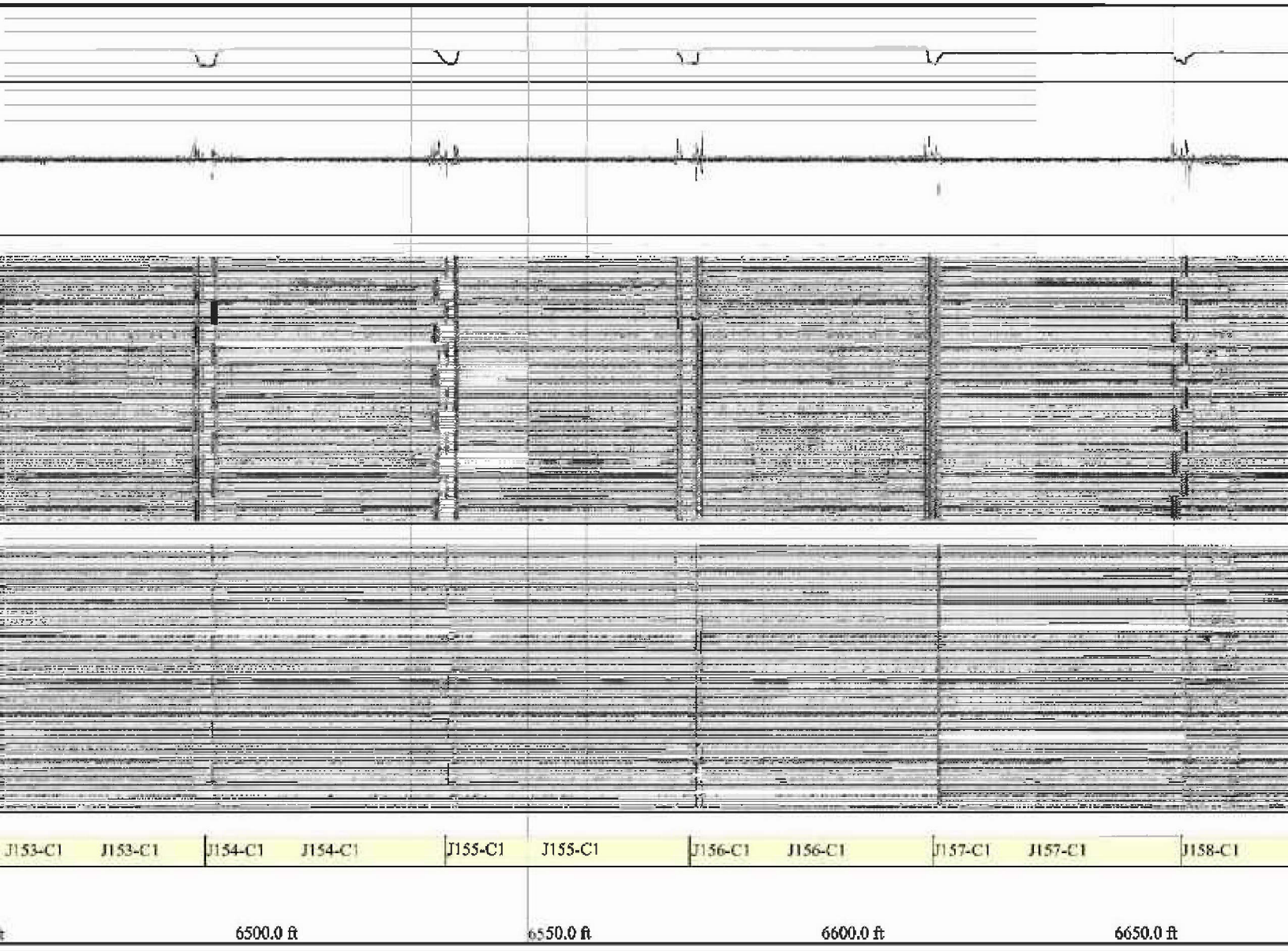
J149-C1
J150-C1
J151-C1
J152-C1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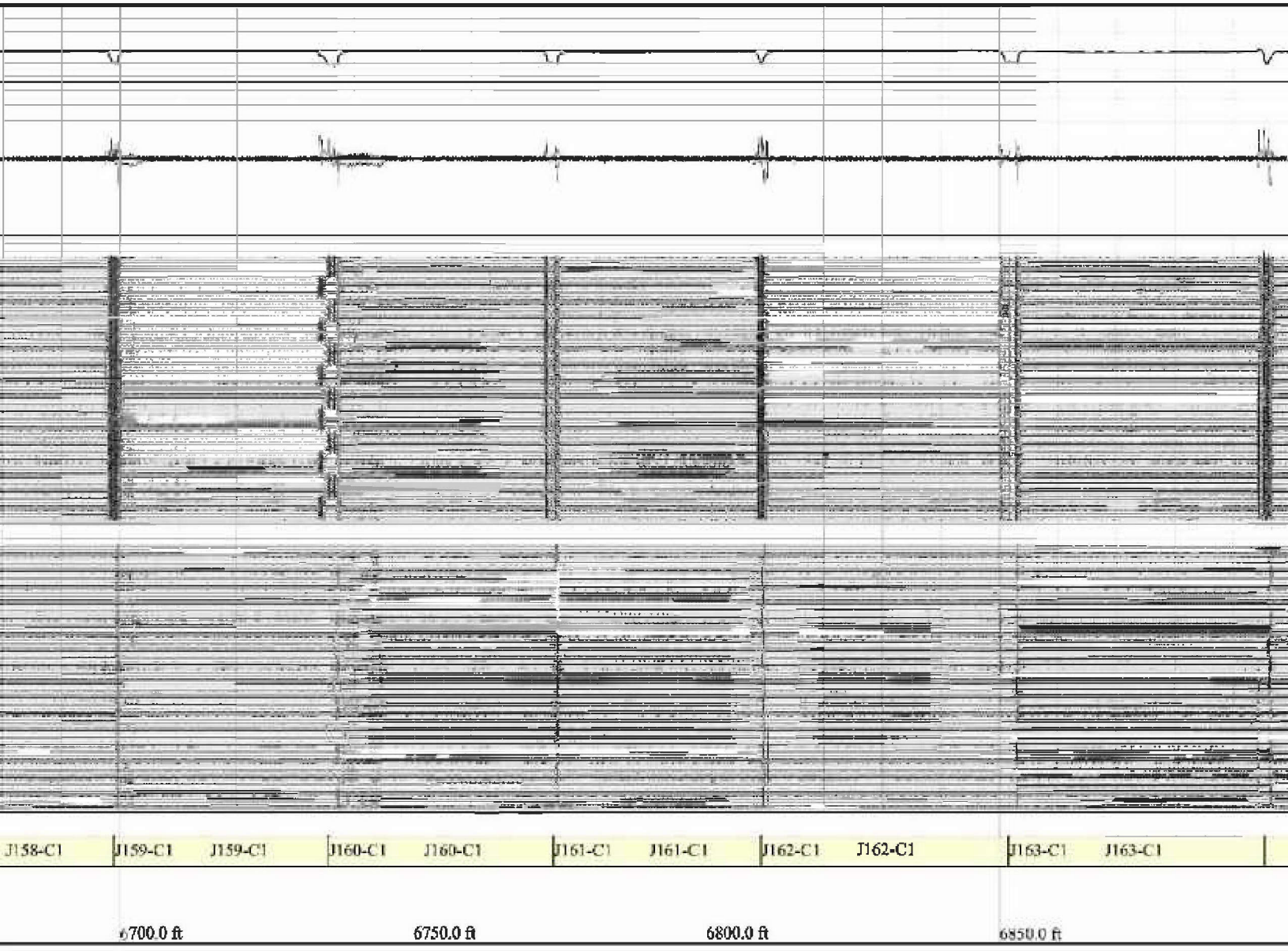
6600.0 ft
6650.0 ft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J161-C1
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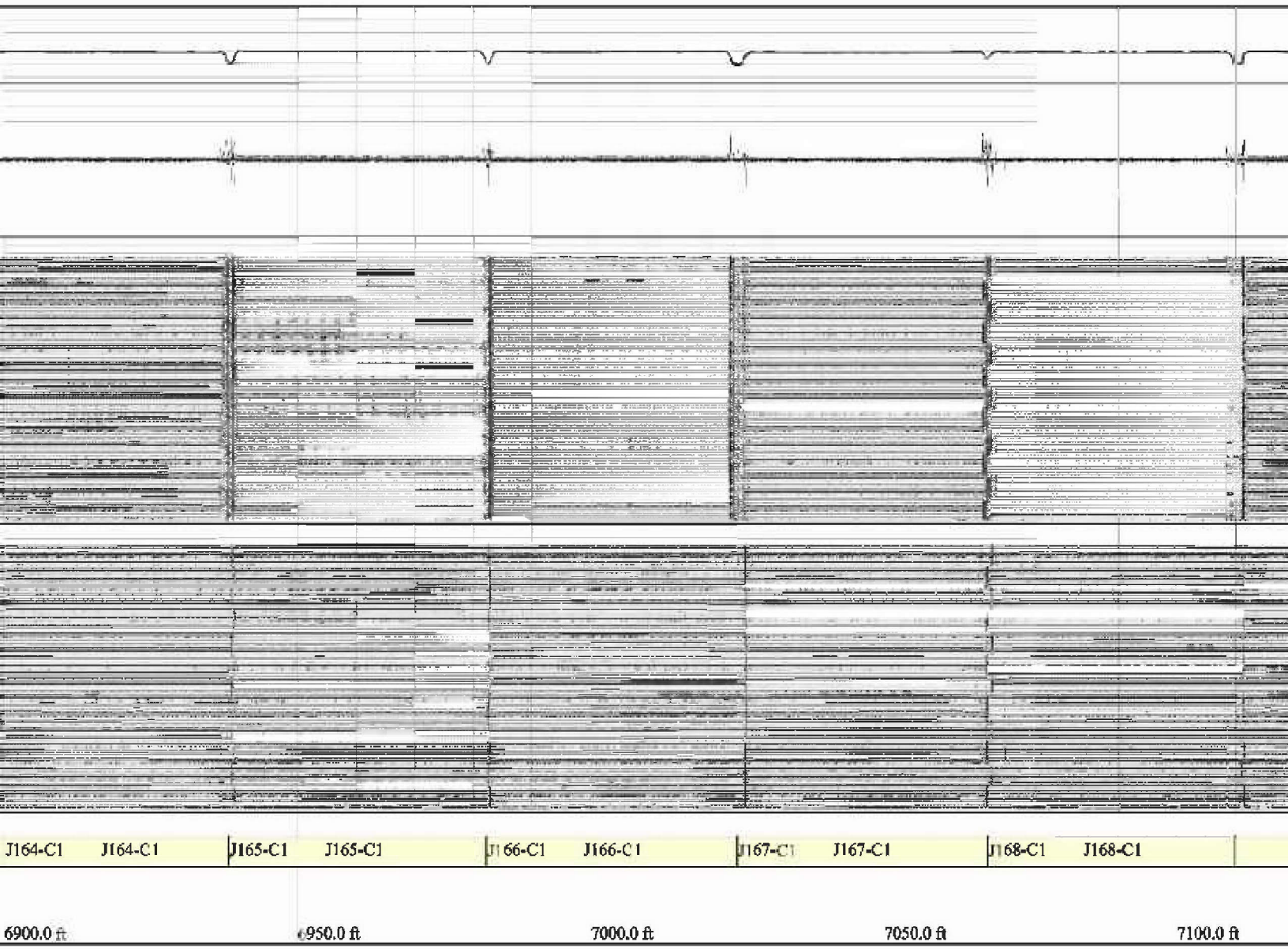
6800.0 ft
6850.0 ft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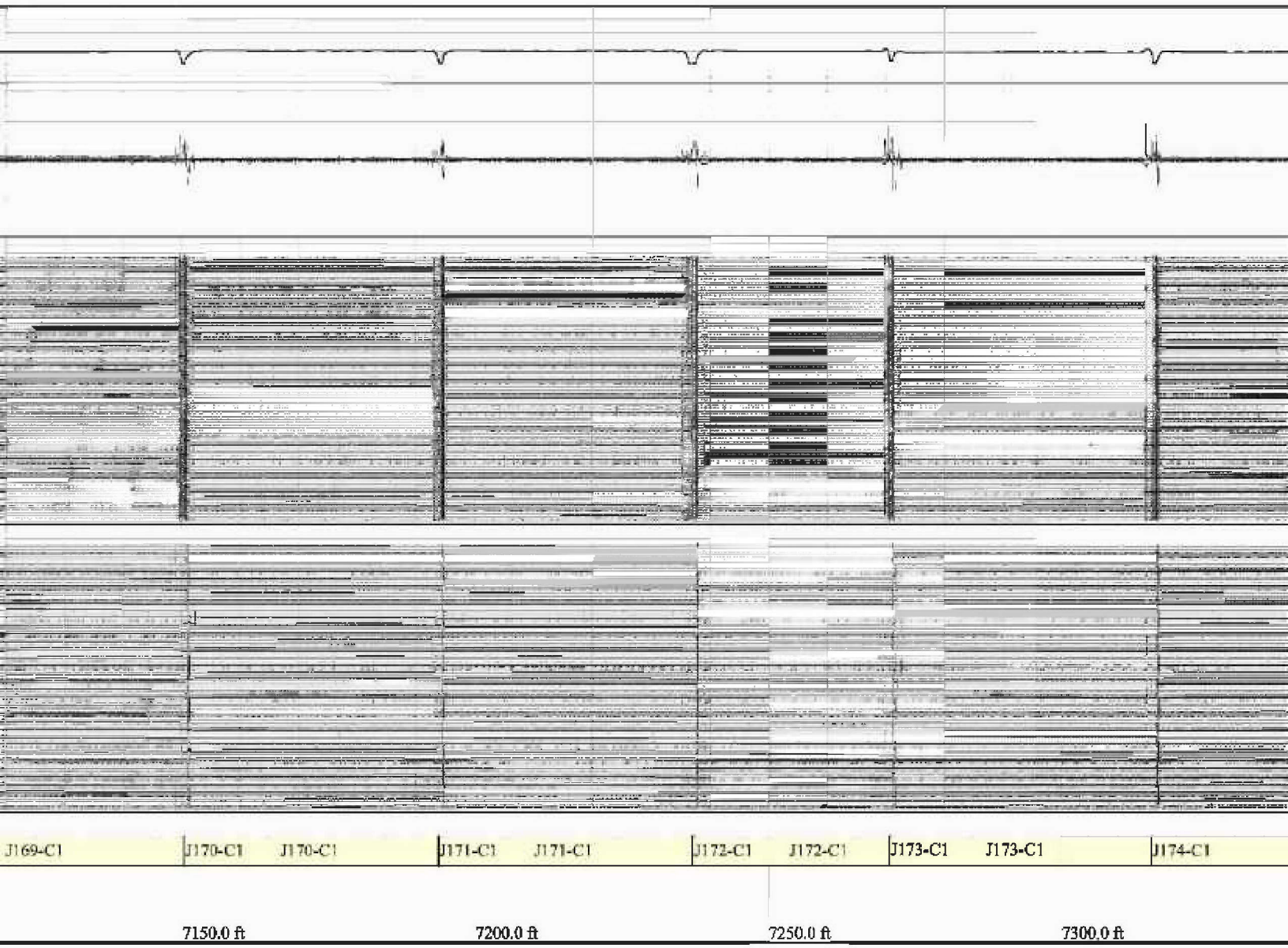
7100.0 ft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J172-C1
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J173-C1
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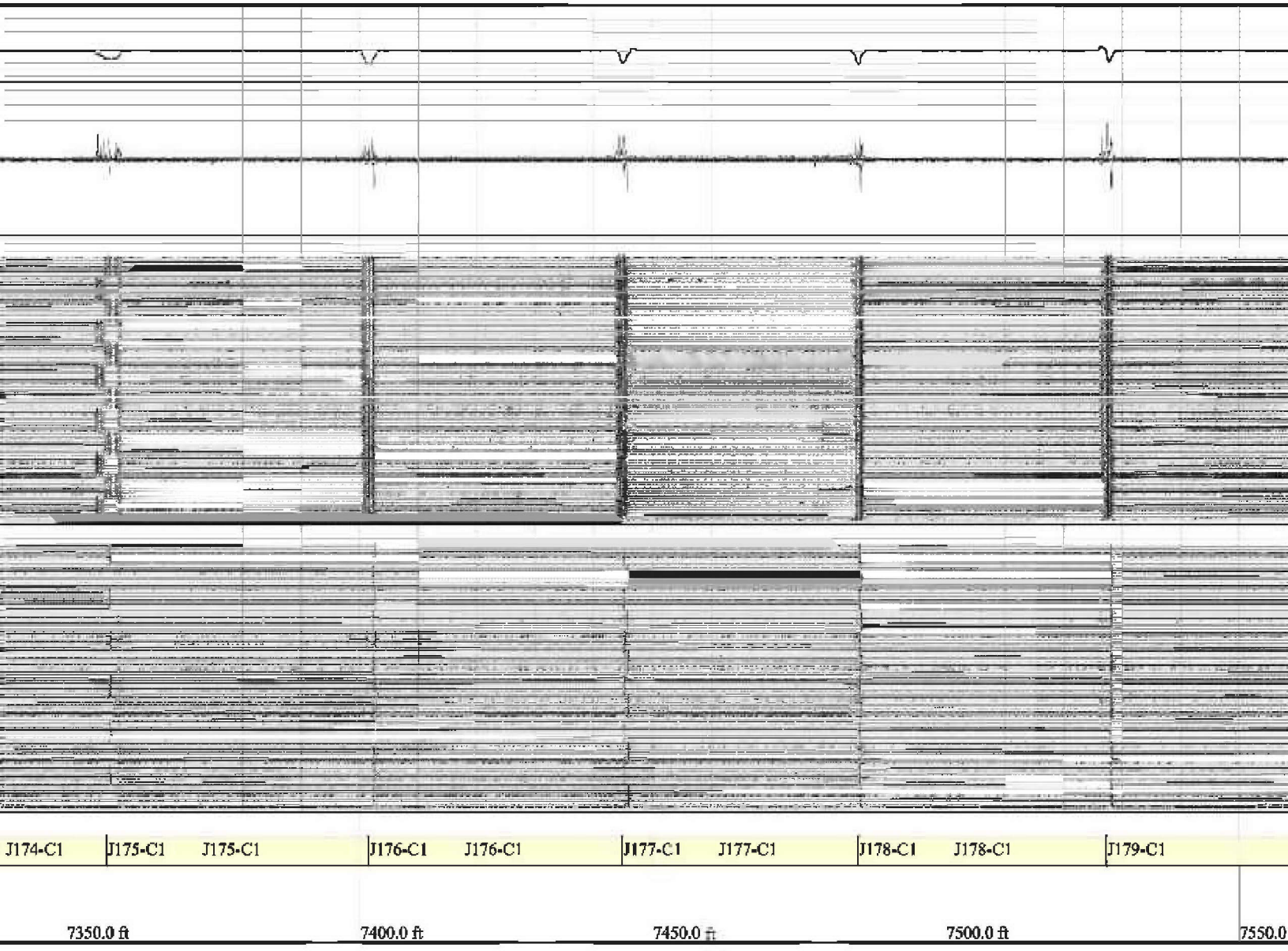
7250.0 ft
7300.0 ft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J177-C1
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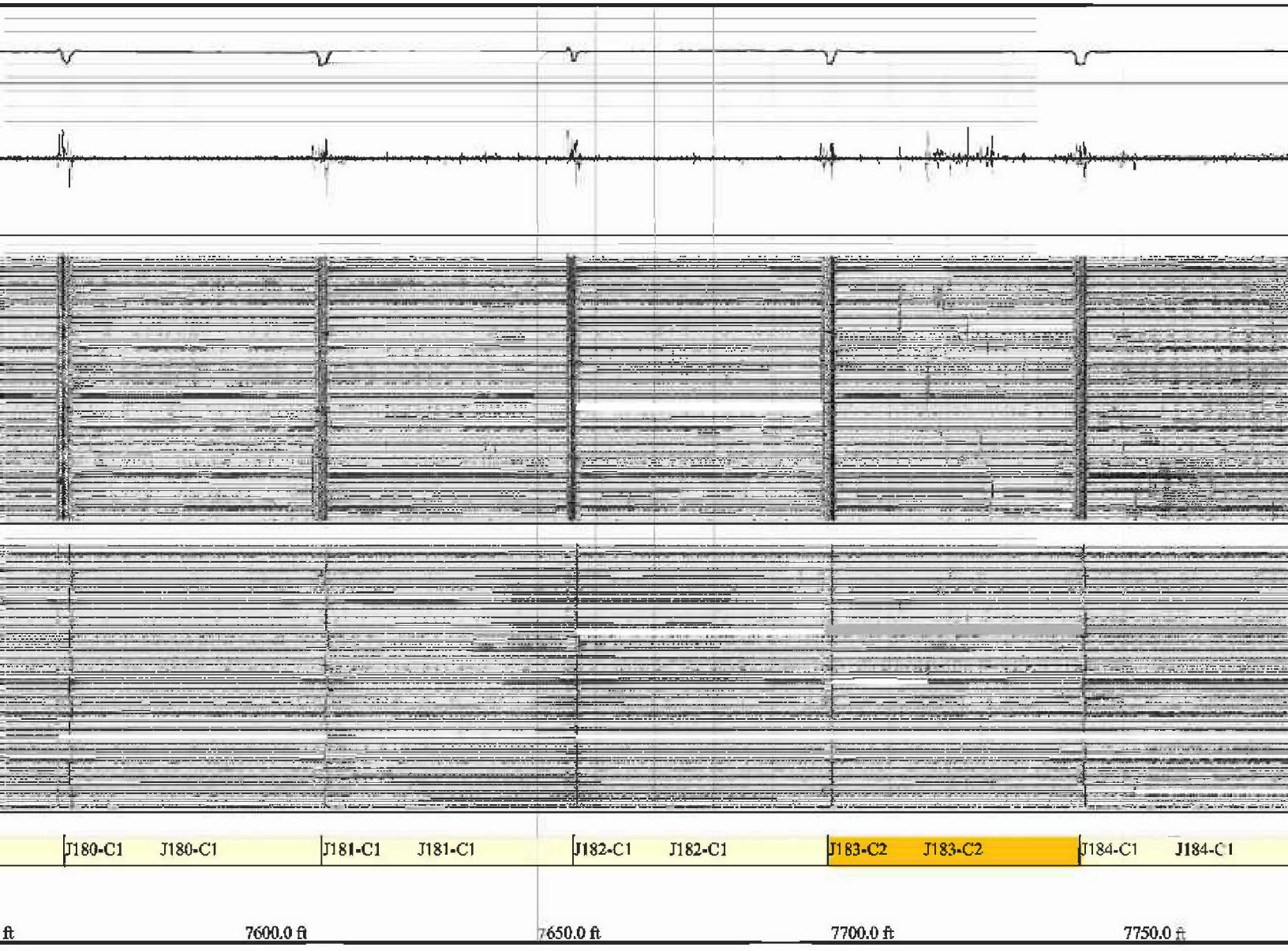
7500.0 ft
7550.0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J181-C1
J182-C1
J182-C1
J183-C2
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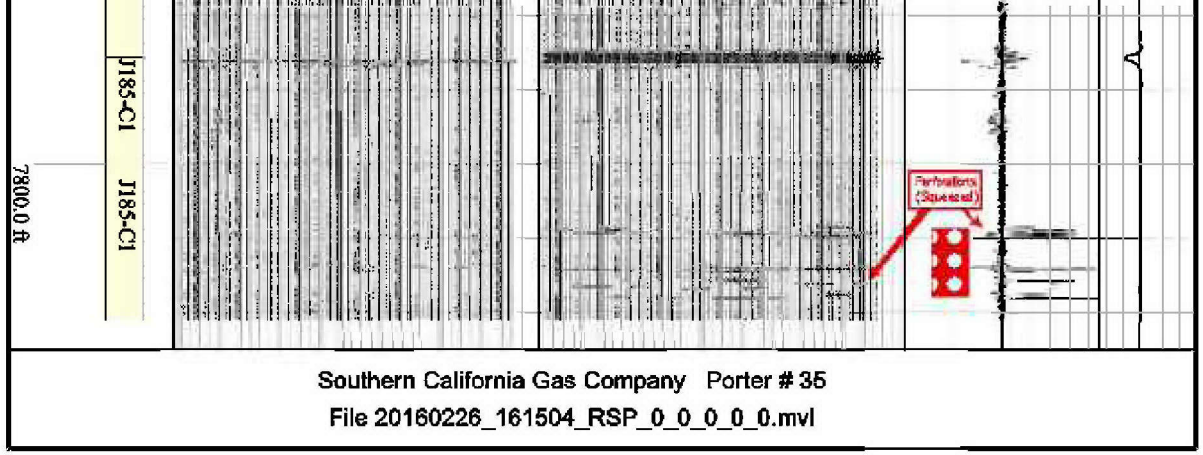
7700.0 ft
7750.0 ft



Joint Summary

Southern California Gas Company
Aliso Canyon Storage Pool
Porter # 35

Identifier	Start Log Depth	Joint Length	Diameter	Weight	Max ML Depth	Max ML Position	Min Burst Pressure	Joint Depth Class
	ft	ft	in	lb/ft	%	ft	psi	
JT-1	21.01	19.95	7.000	23.0	0			1
JT-2	40.96	40.91	7.000	23.0	0			1
JT-3	81.87	43.02	7.000	23.0	0			1
JT-4	124.90	43.11	7.000	23.0	0			1
JT-5	168.01	43.58	7.000	23.0	0			1
JT-6	211.59	43.11	7.000	23.0	0			1
JT-7	254.70	42.29	7.000	23.0	0			1
JT-8	296.99	43.39	7.000	23.0	0			1
JT-9	340.38	44.47	7.000	23.0	0			1
JT-10	384.84	42.57	7.000	23.0	0			1
JT-11	427.41	42.90	7.000	23.0	0			1
JT-12	470.31	43.43	7.000	23.0	0			1
JT-13	513.74	42.97	7.000	23.0	15	520.39	5746	1
JT-14	556.71	42.40	7.000	23.0	0			1
JT-15	599.11	41.38	7.000	23.0	0			1
JT-16	640.49	43.41	7.000	23.0	0			1
JT-17	683.90	43.77	7.000	23.0	0			1
JT-18	727.67	42.69	7.000	23.0	0			1
JT-19	770.36	43.53	7.000	23.0	0			1
JT-20	813.89	43.04	7.000	23.0	0			1
JT-21	856.93	43.49	7.000	23.0	0			1
JT-22	900.42	41.22	7.000	23.0	0			1
JT-23	941.64	41.30	7.000	23.0	18	975.28	5830	1
JT-24	982.94	43.79	7.000	23.0	0			1
JT-25	1026.73	43.54	7.000	23.0	0			1
JT-26	1070.27	42.90	7.000	23.0	0			1

SoCalGas-5.0990

JT-27	1113.17	41.50	7.000	23.0	0			1
JT-28	1154.67	43.54	7.000	23.0	0			1
JT-29	1198.20	44.25	7.000	23.0	0			1

Southern California Gas Company
Aliso Canyon Storage Pool
Porter # 35

Identifier	Start Log Depth	Joint Length	Diameter	Weight	Max ML Depth	Max ML Position	Min Burst Pressure	Joint Depth Class
	ft	ft	in	lb/ft	%	ft	psi	
JT-30	1242.45	43.14	7.000	23.0	0			1
JT-31	1285.60	42.68	7.000	23.0	0			1
JT-32	1328.28	42.02	7.000	23.0	0			1
JT-33	1370.30	42.14	7.000	23.0	0			1
JT-34	1412.43	43.04	7.000	23.0	0			1
JT-35	1455.48	42.47	7.000	23.0	0			1
JT-36	1497.95	41.22	7.000	23.0	0			1
JT-37	1539.17	41.77	7.000	23.0	0			1
JT-38	1580.93	42.33	7.000	23.0	0			1
JT-39	1623.27	42.49	7.000	23.0	0			1
JT-40	1665.75	43.34	7.000	23.0	0			1
JT-41	1709.09	41.74	7.000	23.0	0			1
JT-42	1750.83	41.37	7.000	23.0	0			1
JT-43	1792.20	43.25	7.000	23.0	0			1
JT-44	1835.45	43.39	7.000	23.0	0			1
JT-45	1878.84	42.70	7.000	23.0	0			1
JT-46	1921.53	41.91	7.000	23.0	0			1
JT-47	1963.44	42.30	7.000	23.0	0			1
JT-48	2005.74	42.35	7.000	23.0	0			1
JT-49	2048.09	41.88	7.000	23.0	19	2088.42	5371	1
JT-50	2089.96	42.20	7.000	23.0	20	2124.34	5815	2
JT-51	2132.17	42.70	7.000	23.0	32	2136.38	5286	2
JT-52	2174.87	40.53	7.000	23.0	0			1
JT-53	2215.40	42.45	7.000	23.0	17	2245.31	5779	1
JT-54	2257.84	42.57	7.000	23.0	0			1
JT-55	2300.41	42.71	7.000	23.0	0			1
JT-56	2343.13	42.15	7.000	23.0	0			1
JT-57	2385.28	42.15	7.000	23.0	0			1
JT-58	2427.43	43.07	7.000	23.0	0			1

Joint Summary

Southern California Gas Company
Aliso Canyon Storage Pool
Porter # 35

SoCalGas-5.0991

Identifier	Start Log Depth	Joint Length	Diameter	Weight	Max ML Depth	Max ML Position	Min Burst Pressure	Joint Depth Class
	ft	ft	in	lb/ft	%	ft	psi	
JT-59	2470.50	42.48	7.000	23.0	0			1
JT-60	2512.97	41.96	7.000	23.0	0			1
JT-61	2554.93	43.45	7.000	23.0	0			1
JT-62	2598.39	42.04	7.000	23.0	0			1
JT-63	2640.42	38.72	7.000	23.0	16	2658.25	5744	1
JT-64	2679.14	42.77	7.000	23.0	0			1
JT-65	2721.91	42.18	7.000	23.0	0			1
JT-66	2764.09	42.97	7.000	23.0	0			1
JT-67	2807.06	41.95	7.000	23.0	21	2826.16	5720	2
JT-68	2849.01	43.26	7.000	23.0	0			1
JT-69	2892.27	43.15	7.000	23.0	0			1
JT-70	2935.42	42.01	7.000	23.0	0			1
JT-71	2977.43	42.89	7.000	23.0	22	2981.57	5758	2
JT-72	3020.33	42.21	7.000	23.0	0			1
JT-73	3062.54	42.37	7.000	23.0	0			1
JT-74	3104.90	42.83	7.000	23.0	15	3116.57	5784	1
JT-75	3147.74	41.98	7.000	23.0	16	3182.39	5704	1
JT-76	3189.72	41.95	7.000	23.0	0			1
JT-77	3231.67	39.65	7.000	23.0	0			1
JT-78	3271.32	42.36	7.000	23.0	0			1
JT-79	3313.68	42.11	7.000	23.0	0			1
JT-80	3355.79	42.34	7.000	23.0	85	3396.30	0	4
JT-81	3398.13	43.14	7.000	23.0	86	3420.03	0	4
JT-82	3441.27	42.86	7.000	23.0	61	3463.54	5360	4
JT-83	3484.13	42.59	7.000	23.0	0			1
JT-84	3526.71	41.09	7.000	23.0	0			1
JT-85	3567.80	43.11	7.000	23.0	0			1
JT-86	3610.91	40.81	7.000	23.0	0			1
JT-87	3651.72	40.81	7.000	23.0	0			1

anomaly. FAIL at 3355-3398'

Inspection Date: 02-26-2016
Report Date: 03-01-2016

Joint Summary

Southern California Gas Company
Aliso Canyon Storage Pool
Porter # 35

Identifier	Start Log Depth	Joint Length	Diameter	Weight	Max ML Depth	Max ML Position	Min Burst Pressure	Joint Depth Class
	ft	ft	in	lb/ft	%	ft	psi	
JT-88	3692.53	42.30	7.000	23.0	0			1
JT-89	3734.82	42.96	7.000	23.0	0			1
JT-90	3777.78	42.36	7.000	23.0	0			1
JT-91	3820.15	42.31	7.000	23.0	0			1
JT-92	3862.45	43.56	7.000	23.0	0			1
JT-93	3906.01	43.53	7.000	23.0	0			1
JT-94	3949.54	43.92	7.000	23.0	0			1
JT-95	3993.45	40.76	7.000	23.0	0			1
JT-96	4034.21	42.66	7.000	23.0	0			1

SoCalGas-5.0992

JT-97	4076.87	42.34	7.000	23.0	0	1
JT-98	4119.21	43.81	7.000	23.0	0	1
JT-99	4163.02	41.59	7.000	23.0	0	1
JT-100	4204.61	42.52	7.000	23.0	0	1
JT-101	4247.13	41.93	7.000	23.0	0	1
JT-102	4289.06	42.85	7.000	23.0	0	1
JT-103	4331.91	43.32	7.000	23.0	0	1
JT-104	4375.23	39.56	7.000	23.0	0	1
JT-105	4414.79	43.53	7.000	23.0	0	1
JT-106	4458.32	43.59	7.000	23.0	0	1
JT-107	4501.90	43.24	7.000	23.0	0	1
JT-108	4545.14	40.72	7.000	23.0	0	1
JT-109	4585.85	42.89	7.000	23.0	0	1
JT-110	4628.75	42.45	7.000	23.0	0	1
JT-111	4671.20	42.93	7.000	23.0	0	1
JT-112	4714.13	43.22	7.000	23.0	0	1
JT-113	4757.35	42.90	7.000	23.0	0	1
JT-114	4800.25	43.38	7.000	23.0	0	1
JT-115	4843.64	41.40	7.000	23.0	0	1
JT-116	4885.03	44.36	7.000	23.0	0	1

Joint Summary

Southern California Gas Company
Aliso Canyon Storage Pool
Porter # 35

Identifier	Start Log Depth	Joint Length	Diameter	Weight	Max ML Depth	Max ML Position	Min Burst Pressure	Joint Depth Class
	ft	ft	in	lb/ft	%	ft	psi	
JT-117	4929.40	44.29	7.000	23.0	0			1
JT-118	4973.68	41.44	7.000	23.0	0			1
JT-119	5015.12	43.64	7.000	23.0	15	5047.02	8063	1
JT-120	5058.76	42.47	7.000	26.0	0			1
JT-121	5101.23	43.27	7.000	26.0	0			1
JT-122	5144.50	42.54	7.000	26.0	0			1
JT-123	5187.05	43.33	7.000	26.0	0			1
JT-124	5230.38	44.35	7.000	26.0	0			1
JT-125	5274.73	42.30	7.000	26.0	0			1
JT-126	5317.03	43.71	7.000	26.0	16	5358.34	8967	1
JT-127	5360.74	43.69	7.000	26.0	0			1
JT-128	5404.43	33.91	7.000	26.0	0			1
JT-129	5438.33	43.17	7.000	26.0	0			1
JT-130	5481.50	44.06	7.000	26.0	0			1
JT-131	5525.55	42.04	7.000	26.0	0			1
JT-132	5567.60	35.17	7.000	26.0	0			1
JT-133	5602.76	43.69	7.000	26.0	0			1
JT-134	5646.45	41.72	7.000	26.0	0			1
JT-135	5688.17	40.46	7.000	26.0	0			1
JT-136	5728.63	44.84	7.000	26.0	0			1
JT-137	5773.47	37.83	7.000	26.0	15	5809.12	9149	1

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JT-138	5811.29	42.08	7.000	26.0	0			1
JT-139	5853.37	42.85	7.000	26.0	0			1
JT-140	5896.22	44.06	7.000	26.0	0			1
JT-141	5940.29	42.44	7.000	26.0	0			1
JT-142	5982.72	43.44	7.000	26.0	21	6024.23	8808	2
JT-143	6026.16	41.25	7.000	26.0	0			1
JT-144	6067.41	41.86	7.000	26.0	0			1
JT-145	6109.27	42.93	7.000	26.0	16	6150.03	9141	1

Joint Summary

Southern California Gas Company
Aliso Canyon Storage Pool
Porter # 35

Identifier	Start Log Depth	Joint Length	Diameter	Weight	Max ML Depth	Max ML Position	Min Burst Pressure	Joint Depth Class
	ft	ft	in	lb/ft	%	ft	psi	
JT-146	6152.20	41.76	7.000	26.0	18	6191.30	9174	1
JT-147	6193.96	43.48	7.000	26.0	0			1
JT-148	6237.44	42.00	7.000	26.0	0			1
JT-149	6279.45	42.46	7.000	26.0	0			1
JT-150	6321.90	42.69	7.000	26.0	0			1
JT-151	6364.59	43.32	7.000	26.0	0			1
JT-152	6407.91	44.50	7.000	26.0	0			1
JT-153	6452.41	42.66	7.000	26.0	0			1
JT-154	6495.07	40.95	7.000	26.0	0			1
JT-155	6536.03	41.79	7.000	26.0	0			1
JT-156	6577.82	41.17	7.000	26.0	0			1
JT-157	6618.99	42.42	7.000	29.0	0			1
JT-158	6661.42	37.74	7.000	29.0	0			1
JT-159	6699.15	36.54	7.000	29.0	0			1
JT-160	6735.69	38.43	7.000	29.0	0			1
JT-161	6774.12	35.27	7.000	29.0	0			1
JT-162	6809.39	42.26	7.000	29.0	0			1
JT-163	6851.66	43.70	7.000	29.0	0			1
JT-164	6895.35	43.03	7.000	29.0	0			1
JT-165	6938.38	44.04	7.000	29.0	0			1
JT-166	6982.42	42.57	7.000	29.0	0			1
JT-167	7024.99	42.74	7.000	29.0	0			1
JT-168	7067.73	42.28	7.000	29.0	0			1
JT-169	7110.01	40.55	7.000	29.0	0			1
JT-170	7150.56	43.34	7.000	29.0	0			1
JT-171	7193.90	43.29	7.000	29.0	0			1
JT-172	7237.19	33.56	7.000	29.0	0			1
JT-173	7270.75	44.70	7.000	29.0	0			1
JT-174	7315.45	41.45	7.000	29.0	0			1

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Southern California Gas Company
Aliso Canyon Storage Pool
Porter # 35

Identifier	Start Log Depth	Joint Length	Diameter	Weight	Max ML Depth	Max ML Position	Min Burst Pressure	Joint Depth Class
	ft	ft	in	lb/ft	%	ft	psi	
JT-175	7356.90	44.63	7.000	29.0	0			1
JT-176	7401.53	43.35	7.000	29.0	0			1
JT-177	7444.88	40.15	7.000	29.0	0			1
JT-178	7485.03	42.38	7.000	29.0	0			1
JT-179	7527.41	41.92	7.000	29.0	0			1
JT-180	7569.33	43.94	7.000	29.0	0			1
JT-181	7613.27	42.93	7.000	29.0	0			1
JT-182	7656.20	43.40	7.000	29.0	0			1
JT-183	7699.61	42.96	7.000	29.0	27	7727.40	10031	2
JT-184	7742.57	43.18	7.000	29.0	0			1
JT-185	7785.74	35.40	7.000	29.0	19	7787.06	10349	1

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Ex. I – 49

Due to the large file size, this exhibit is an excerpt. The native file of this document is available upon request.

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

Rec'd 10-13-16 DOGGR Ventura.

HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County

Well Porter 35 Sec. 28, T3N, R16W, S.B.B.&M.

A.P.I. No. 03700722 Name Tom McMahon (Person submitting report) Title SIMP Project Manager (President, Secretary, or Agent)

Date 9/27/2016 (Month, day, year)

Signature Thomas J McMahon

Address PO Box 2300, SC9365, Chatsworth, CA, 91313-2300 Telephone Number 714-398-5020

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, and initial production data.

Daily Operation Period: 1/4/2016 - 1/5/2016

Operations this Report Period (DOGGR)

Daily Operation Period: 1/5/2016 - 1/6/2016

Operations this Report Period (DOGGR)

Daily Operation Period: 1/6/2016 - 1/7/2016

Operations this Report Period (DOGGR)

Daily Operation Period: 1/7/2016 - 1/8/2016

Operations this Report Period (DOGGR)

Daily Operation Period: 1/8/2016 - 1/9/2016

Operations this Report Period (DOGGR)

Complete JSP & JSA, Hold safety meeting with rig personnel and WSM. Service rig equipment and start it. Check well pressures: SITP - 1460 psi & SICP - 200 psi. Field pressure - 1514 psi. Hold Pre-job safety meeting with Weatherford testers and R/U BOP testing equipment. BOP equipment was inspected by DOGGR personnel. Pressure test BOPE as per Gas Company Standard 224.05: Pressure test pipe and blind rams, all lines and connections at 300 psi low / 5000 psi high for 20 min. each test. Annular preventer at 300 psi low / 3500 psi high for 20 min each test. Good test. Bleed off pressure and R/D Weatherford equipment. Inspect all wellhead lock screws. All good. Secure well and hoist for the weekend.

Daily Operation Period: 1/11/2016 - 1/12/2016

Operations this Report Period (DOGGR)

CompleteJSP & JSA. Hold safety meeting with crew and WSM. Service and start rig equipment. Field pressure: 1364 psi. Check well pressure. SITP 1800 psi and SICP - 1700 psi. R/U kelly hose and return line. Pump 80 bbls of 3% KCL water down tubing. 0 psi & 60 bbls down the casing and attempted off pressure. Casing flowing. Pump 50 bbls of 3% KCL water down casing. 800 psi. Bleed off well to 0 psi. Pumped 50 bbls of 3% KCL water down casing. 0 psi. Monitor well for 30 minutes. Casing started flowing. Close well in as directed by WSM. Spot 500 bbls tank. Secure well and hoist till AM.

Daily Operation Period: 1/12/2016 - 1/13/2016

Operations this Report Period (DOGGR)

Complete JSP & JSA. Hold safety meeting with rig crew and WSM. Service rig and start. Field pressure - 1399 psi. Check well pressure. SITP - 1750 psi & SICP - 780 psi. Mix 738 bbl's of 8.5 ppg, 60 vis. polymer. and 90 bbl's of 8.5 ppg 80 vis polymer. Secure well and hoist till AM.

Daily Operation Period: 1/13/2016 - 1/14/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig and equipment. Field pressure - 1385 psi, SITP - 1535 psi, SICP - 1200 psi. Rigged up kelly hose. Pumped 90 bbl's of 8.5 ppg, 80 vis polymer followed by 46 bbl's of 8.5 ppg 60 vis polymer began to bleed down casing. Continued to pump a total of 272 bbl's of 8.5 ppg 60 vis polymer. Gained circulation at 192 bbl's of polymer away. Circulate gas out of the well for 30 minutes. Checked well. Well dead. Monitor well for 30 minutes and backed out hanger rams. Opened well and attempted to pull seals from Baker packer. Working up to 80K and putting in right hand torque. Unable to pull seals. Held pre-job safety meeting with Ensign and Western Wireline. Spotted in and rigged up wireline unit and lubricator. Secure well and rig till AM.

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RESOURCES AGENCY OF CALIFORNIA
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HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County

Well Porter 35 Sec. 28, T3N, R16W, S.B.B.&M.

A.P.I. No. 03700722 Name Tom McMahon (Person submitting report) Title SIMP Project Manager (President, Secretary, or Agent)

Date 9/27/2016 (Month, day, year)

Signature

Address PO Box 2300, SC9365, Chatsworth, CA, 91313-2300 Telephone Number 714-398-5020

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, and initial production data.

Daily Operation Period: 1/14/2016 - 1/15/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig and equipment. Field pressure 1353 psi. Check well pressure: SITP - 0 psi. SICP 0 psi. Fill hole with 36 bbl's of 8.5 ppg 70 vis polymer. Open well. Held pre-job safety meeting with Western Wireline and crew. Rigged up lubricator. Run in with Radial Torch cutter and cut tubing at 7828'. Cutter stuck. Worked cutter free. Pulled out with cutter. Laid down lubricator. Work tubing up to 85K and using right hand torque. Rigged up kelly hose and circulated. No good. Shut down pump. Rigged up Lubricator and run in the Chemical cutter and cut tubing at 7774'. Pulled out with cutter and rigged down Western wireline. Filled hole with 10 bbl's of polymer. Pulled out of the hole standing back tubing. Filled the hole every 10 stands and tally tubing. Stood back 80 stands. Lost 100 bbl's of polymer for the day. Secure well.

Daily Operation Period: 1/15/2016 - 1/16/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig and equipment. Field pressure - 1325 psi. Check well pressure: SITP - 0 psi, SICP - 0 psi. Open well. Filled well with 10 bbl's of 8.5 ppg 60 vis. polymer. Pulled out of the hole with (89) joints of 2 7/8" J-55 tubing. Break out and lay down (1) 2 7/8" J-55 pup jt, (1) gas mandrel (1) 2 7/8" pup jt and 17.38 of cut joint. Filling hole every 10 stands. Install 11" 5M x 7" 5M crossover flange and circulating head. Tally and pick up 5 3/4" washover shoe, 74.78' of 5 3/4" washover pipe. Drive sub and crossover with 2 7/8" N-80 pup joint. Run in hole with washpipe on (16) joints of 2 7/8" J-55 tubing. Found tight spot at 575'. Unable to work through. Pull out of the hole with washpipe and stand back. Change tubing equipment. Tally and pick up 7" all weight scraper. Run in hole on (250) joints of 2 7/8" J-55 tubing. Tagged top of fish at 7,768'. Pulled out of the hole and stood back (40) joints of 2 7/8" J-55 tubing. Filling the hole every 10 stands. At 15:25 had BOP drill with crew. 58 seconds to secure well. Discussed proper well control procedures. lost 188 bbl's of 8.5 ppg 60 vis polymer. Secure well for the weekend.

Daily Operation Period: 1/18/2016 - 1/19/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig and equipment. Field pressure = 1211 psi. Check well pressure: SITP = 0 psi, SICP = 0 psi. Open well. Filled well with 1 bbl of 8.5 ppg 60 vis polymer. Pulled out of the hole. Stand back (260) joints of 2 7/8" J-55 tubing. Break out and lay down scraper. Make up 7" 23# positive scraper. Run in the hole and found a tight spot at 77'. Worked through. Run in hole with (22) joints of 2 7/8" J-55 tubing to 649'. Pulled out of the hole and stand back (22) joints of 2 7/8" J-55 tubing. Make up tandem scrapers. 7" 23# positive, 8' pup joint and 7" all weight scraper. Run in the hole on (18) joints of 2 7/8" and stopped at 567'. Pull out of the hole and stand back (18) joints of 2 7/8" J-55 tubing. Pick up 23' of 5 3/4" wash over pipe. Run in the hole on (26) joints of 2 7/8" J-55 tubing to 826'. Had light friction at 575'. Pull out of the hole and stand back (26) joints 2 7/8" J-55 tubing. Break out crossover and drive sub. Rig up handling equipment. Make up (2) joints of 5 3/4" washover pipe, drive sub and crossover. Rig down handling equipment. Run in the hole with 5 3/4" BHA on (246) joints of 2 7/8" J-55 tubing. Had to push through bad spot at 567'. Tail at 7,709'. Secure well and hoist till AM.

Daily Operation Period: 1/19/2016 - 1/20/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig and equipment. Field pressure: 1175 psi. SITP = 0 psi, SICP = 0 psi. Open well. Filled hole. Hole was full. Rig up kelly stand. Reverse circulate. Broke circulation with 2.5 bbl's of 8.5 ppg 60 vis polymer at 2.5 bpm at 500 psi. Rotated tubing to get over fish at 7,768'. Washover fish to top of packer at 7,825'. Circulate for 30 minutes at 4 bpm at 800 psi. Pulled out of the hole and stood back (250) joints of 2 7/8" J-55 tubing. Filling the hole every 10 stands. Rig up 5 3/4" handling equipment. Broke out and laid down 5 3/4" washpipe and shoe. Rigged down handling equipment. Picked up and made up 5 3/4" overshot loaded with 2.875" grapple, 4 3/4" Bumper Sub, Tubing jar and 2 7/8" N-80 pup joint. Run in the hole on 2 7/8" J-55 tubing. Rigged up 2 7/8" Pancake swivel and engaged fish. Worked tubing from 50K to 70K. Pulled free. Pulled out of the hole. Laid down 2 joints of 2 7/8" N-80 tubing and stood back (198) joints of 2 7/8" J-55 tubing. Filling the hole every 10 stands. Secured well till AM.

SoCalGas-5.0999

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

Rec'd 10-13-16 DOGGR Ventura.

HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County

Well Porter 35 Sec. 28, T3N, R16W, S.B.B.&M.

A.P.I. No. 03700722 Name Tom McMahon (Person submitting report) Title SIMP Project Manager (President, Secretary, or Agent)

Date 9/27/2016 (Month, day, year)

Signature

Address PO Box 2300, SC9365, Chatsworth, CA, 91313-2300 Telephone Number 714-398-5020

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, and initial production data.

Daily Operation Period: 1/20/2016 - 1/21/2016

Operations this Report Period (DOGGR)

Ensign monthly safety meeting. Held safety meeting. Serviced rig and equipment. Field pressure: 1150 psi, SITP = 0 psi, SICP = 0 psi. Opened well and filled with 1 bbl of 8.5 ppg 60 vis polymer. Pulled out the hole with (50) joints of 2 7/8" J-55 tubing and BHA. Did not have fish. Broke out 5 3/4" overshot to add extension and change grapple. Made up bottom hole assembly as follows. 5 3/4" Overshot with 3 21/32" grapple, 13.98' of 5 3/4" extensions, Bumper sub, Tubing jar and (1) 2 7/8" N-80 pup joint. Ran in the hole with (248) joints of 2 7/8" J-55 tubing. Picked up (2) joints of 2 7/8" N-80 tubing and (1) 2 7/8" N-80 pup joint. Rotated tubing to get over top of fish at 7,768'. Engaged fish and jarred on fish 25K over. Rotated tubing with no success. Released from fish. Pulled out of the hole and stood back (50) joints of 2 7/8" J-55 tubing filling the hole every 10 stands. Secure well till the AM.

Daily Operation Period: 1/21/2016 - 1/22/2016

Operations this Report Period (DOGGR)

Held safety meeting, Service rig and equipment. Field pressure: 1125 psi, SITP = 0 psi, SICP = 0 psi. Filled well with 1 bbl of 8.5 ppg 60 vis polymer. Pulled out of the hole and stood back (198) joints of 2 7/8" J-55 tubing. Broke out and laid down fishing tools. Ran in the hole with (Weatherford) 7" 23-26# Bridge Plug and (251) joints of 2 7/8" J-55 tubing. Set Bridge Plug at 7,760' COE. Released from Bridge Plug and laid down 2 joints of 2 7/8" N-80 tubing. Filled casing and tested casing to 500 psi for 30 minutes. Good test and bled off pressure. Dump approximately 10' of sand. Displaced wit 44 bbl's of 8.5 ppg 60 vis polymer at 2 bpm. Pulled out of the hole and stood back (228) joints of 2 7/8" J -55 tubing. Filling the hole every 10 stands. Secure well till the AM.

Daily Operation Period: 1/22/2016 - 1/23/2016

Operations this Report Period (DOGGR)

Held safety meeting. Field pressure: 1091 psi, SITP = 0 psi, SICP = 0 psi. Open well and filled with 1 bbl of 8.5 ppg 60 vis polymer. Pulled out of the hole with (20) joints of 2 7/8" J-55 tubing and bridge plug running tool. Held BOP drill with rig personnel at 6:47 AM. 56 seconds to secure well and discussed proper well control procedures. Remove circulating head. Held pre-job safety meeting with WSM, Schlumberger and crew. Spotted in and rigged up wireline unit and equipment. Made up and ran in the hole with USIT log. Tag down at 7,754' (wireline measurement) and logged from 7,754' to surface. Kept well full while logging. Rigged down Schlumberger wireline unit. Ran in the hole with (20) joints of 2 7/8" J-55 tubing. Tubing tail at 621'. Did not loose any fluid this tour. Secured well for the weekend.

Daily Operation Period: 1/25/2016 - 1/26/2016

Operations this Report Period (DOGGR)

Held safety meeting. Field pressure = 1018 psi. SITP = 0 psi, SICP = 0 psi. Tried to fill well. Well was full. Pulled out of the hole with (20) joints of 2 7/8" J-55 tubing. Held pre-job safety meeting. Rigged up Scientific Drilling. Ran in hole with Gyro to 7,750'. Gyro well from 7,750' to surface. Rigged down Scientific Drilling. Prep well for Caliper log. Held pre-job safety meeting. Rigged up Western wireline unit. Ran in hole with 60 arm caliper to 7,744' (wireline measurement). Logged from 7,744' to surface. Rigged down Western wireline. Ran in the hole with (20) joints of 2 7/8" J-55 tubing. Secure well till the AM.

Daily Operation Period: 1/26/2016 - 1/27/2016

Operations this Report Period (DOGGR)

Held safety meeting. Field pressure = 1005 psi. SITP = 0 psi, SICP = 0 psi. Well standing full. Pulled out of the hole with (20) joints of 2 7/8" J-55 tubing. Made (WTFD) 7" test packer. Ran in the hole with (108) joints of 2 7/8" J-55 tubing. Set packer at 3,351'. Test casing below packer from sand plug at 7,754' to 3,351' to 1,920 psi for 30 minutes charted. Good test. Bled off well. Tested annulus from 3,351' to surface to 2,210 psi for 30 minutes charted. Bled off well and released packer. Pulled out of the hole with (22) joints of 2 7/8" J-55 tubing. Try to set packer at 2,700'. Could not set. Moved packer up to 2,681' and set. Tested annulus from 2,681' to surface to 2,500 psi for 30 minutes charted. Good test Bled off well and released packer. Pulled out of the hole with (24) joints of 2 7/.8" J-55 tubing. Set packer at 2,040'. Tested annulus from 2,040' to surface to 2,790 psi for 30 minutes charted. Good test. Bled off well and released packer. Pulled out of the hole with (22) joints of 2 7/8" J-55 tubing. Set packer at 1,390'. Tested annulus from 1,390' to surface to 3,080 psi for 30 minutes charted. Good test. Bled off well and released packer. Pulled (24) joints of 2 7/8" J-55 tubing. Set packer at 730'. Tested annulus from 730' to surface to 3,370 psi for 30 minutes charted. Good test. Bled off well and released packer. Pulled out of the hole with (22) joints of 2 7/8" J-55 tubing. Set packer at 70'. Tested annulus from 70' to surface to 3,400 psi for 30 minutes charted. Good test. Bled off well and released packer. Pulled out of the hole with (2) joints of 2 7/8" J-55 tubing and laid down packer. Filled well and shut blind rams. Tested casing from 7,754' to surface to 1,000 psi for 30 minutes charted. Witnessed by Kris Gustfson of the DOGGR. Bled off well and ran in the hole with (20) joints of 2 7/8" J-55 tubing. Secure well till the AM.

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HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County

Well Porter 35 Sec. 28, T3N, R16W, S.B.B.&M.

A.P.I. No. 03700722 Name Tom McMahon (Person submitting report) Title SIMP Project Manager (President, Secretary, or Agent)

Date 9/27/2016 (Month, day, year)

Signature

Address PO Box 2300, SC9365, Chatsworth, CA, 91313-2300 Telephone Number 714-398-5020

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Daily Operation Period: 1/27/2016 - 1/28/2016

Operations this Report Period (DOGGR)

Held safety meeting. Field pressure = 988 psi, SITP = 0 psi, SICP = 0 psi. Well standing full. Pulled out of the hole with (20) joints of 2 7/8" J-55 tubing. Nippled up shooting flange. Held pre-job safety meeting. Rigged up (Halliburton) wireline unit and lubricator. Ran in the Cast - M casing inspection log. Log from 7,753' to surface. Rigged down (Halliburton) wireline unit and lubricator. Nippled down shooting flange. Ran in the hole with (20) joints of 2 7/8" J-55 tubing. Secure well till the AM.

Daily Operation Period: 1/28/2016 - 1/29/2016

Operations this Report Period (DOGGR)

Held safety meeting. Field pressure 981 psi, SITP = 0 psi, SICP = 0 psi. Well standing full. Pulled out of the hole with (20) joints of 2 7/8" J-55 tubing and stood back. Rigged out hand rails and floor. Nippled down Annular preventer and double gate and riser spool. Nippled down 13 5/8" X 8" 5M tubing spool. Welder cut 5 bolts. Pulled 30K to remove tubing spool. Loaded out tubing spool and production tree to send to Cameron. Cameron inspected casing stub and seals. Nippled up 13 5/8" spool, 13 5/8" X 9" DSA and riser. Nippled up double gate BOP. Filled the hole and shut well in. Secure well till Monday.

Daily Operation Period: 2/1/2016 - 2/2/2016

Operations this Report Period (DOGGR)

Held safety meeting. Field pressure = 982 psi. SITP = 0 psi, SICP = 0 psi. Nippled down double gate BOP and riser. Nippled down crossover spool. Nippled up tubing spool and casing valve. Tested casing valve to 300 psi low and 5000 psi high for 30 minutes. No good. Worked valve. Retest. No good. Found leaking by VR plug. Pulled VR plug. Inspected plug and reset VR plug. Retested. Good test. Pulled VR plug.Packed void with plastic packing. Tested P seals to 300 psi low and 2600 psi high for 30 minutes. Good test. Tested void to 300 psi low and 2600 psi high for 30 minutes. Good test. Nippled up flange to casing valve. Nippled up riser. Nippled up double gate BOP and annular preventer. Secure well till the AM.

Daily Operation Period: 2/2/2016 - 2/3/2016

Operations this Report Period (DOGGR)

Held safety meeting. Field pressure = 982 psi. SITP = 0 psi. SICP = 0 psi. Continued nippling up choke line, kill line, hoses and function test BOP. Test connections to 1000 psi. Good test. Ran in well with (248) joints of 2 7/8" J-55 tubing. Rigged up to lay down tubing. Pulled out of the well laying down 2 7/8" J-55 tubing. Filled the well every 20 joints with 8.5 ppg 60 vis polymer. Laid down (228) joints. Left (20) joints of 2 7/8" J-55 tubing as a kill string. Secure well till the AM.

Daily Operation Period: 2/3/2016 - 2/4/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig. Field pressure = 981 psi. SITP = 0 psi, SICP = 0 psi. Well standing full. Pulled out and laid down (20) joints of 2 7/8" J-55 tubing. (Doby Hagar) loaded out and hauled off (248) joints of 2 7/8" tubing and (1) cut joint. Offloaded (285) joints of 2 7/8", P-110 CTR tubing. Made up (Weatherford) retrieving tool. (Tuboscope) trained crew on handling the CTR tubing.Tallied and picked up (191) 2 7/8", P-110 CTR tubing. Secured well till the AM

Daily Operation Period: 2/4/2016 - 2/5/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig. Field pressure = 978 psi. SITP = 0 psi, SICP = 0 psi. Continued Picking up 2 7/8", P-110 CTR tubing. Rigged up circulating rubber, tubing swivel and kelly hose to reverse circulate. Broke circulation at 3 bpm at 500 psi. Circulated out sand to bridge plug at 7,760'. Circulated clean with 80 bbl's of 8.5 ppg 60 vis. polymer. Shut down pump and release bridge plug. Rigged down circulating equipment. Pulled out of the well with 245 joints of 2 7/8", P-110 CTR tubing. Laid down bridge plug and retrieving tool. Tallied fishing tools and picked up 5 3/4' overshot with 2 7/8" grapple, (2) 5 3/4" extension, 5 3/4" X 3 1/2" IF drive sub. 4 3/4" lubricated bumper sub, 4 3/4" jar, (2) 4 3/4" drill collars, 4 3/4" slinger, 3 1/2" IF X 2 7/8" 8rd crossover. Could not make up bumper sub to drive sub. Bad thread. Change out bumper subs. Ran in the well with bottom hole assembly on (20) joints of 2 7/8", P-110 CTR tubing. Secure well till the AM.

SoCalGas-5.1001

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

Rec'd 10-13-16 DOGGR Ventura.

HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County
Well Porter 35 Sec. 28, T3N, R16W, S.B.B.&M.
A.P.I. No. 03700722 Name Tom McMahon (Person submitting report) Title SIMP Project Manager (President, Secretary, or Agent)
Date 9/27/2016 (Month, day, year)
Signature
Address PO Box 2300, SC9365, Chatsworth, CA, 91313-2300 Telephone Number 714-398-5020

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, and initial production data.

Daily Operation Period: 2/5/2016 - 2/6/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig. Field pressure = 978 psi, SITP = 0 psi, SICP = 0 psi. Continued running in the well with (222) joints of 2 7/8", P-110 tubing and fishing BHA. Picked up (1) of 2 7/8", P-110 tubing and worked over fish. Set off jars at 40K over string weight twice and fish came free. Laid down (1) of 2 7/8", P-110 tubing and stood back (242) joints of 2 7/8", P-110 tubing. Broke down fishing tools and stood back drill collars. Laid down cut joint of 2 7/8", J-55 tubing, 4' - 2 7/8", J-55 pup joint, Camco KP-5 safety system, KP-5 safety nipple, Camco 20' blast joint, Camco NO GO "D" nipple and 2' of cut blast joint. Made up 5 3/4' overshot with 3 21/32" grapple, (1) 5 3/4" extension, 5 3/4" X 3 1/2" IF drive sub. 4 3/4" lubricated bumper sub, 4 3/4" jar, (2) 4 3/4" drill collars, 4 3/4" slinger, 3 1/2" IF X 2 7/8" 8rd crossover. Ran in the well with (100) joints of 2 7/8", P-110 tubing. Secure well for the weekend.

Daily Operation Period: 2/8/2016 - 2/9/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig. Field pressure = 976 psi, SITP 0 psi, SICP = 0 psi. Well standing full. Open well. Continued running in the well with (140) joints of 2 7/8", P-110 tubing and fishing BHA. Picked up (5) joints of 2 7/8", P-110 tubing. Worked over top of fish. Pulled 30K over string weight to jar on fish. Grapple slipped off. Worked back over fish. Rotated while slowly pulling up to rotate seals out of the packer. We could get rotation down to the fish but would slip off when pulling up to setting off the jars. Dead pulled 70K over string weight and slip off of fish. Pulled out of the well with (244) joints of 2 7/8", P-110 tubing. Filled the well every 10 stands with 8.5ppg 60 vis polymer. Broke down fishing tools and stood back drill collars. Inspected grapple. Grapple was dull but could tell we were over the fish. Made up 5 3/4' overshot with 3 5/8" grapple, (1) 5 3/4" extension, 5 3/4" X 3 1/2" IF drive sub. 4 3/4" lubricated bumper sub, 4 3/4" jar, (2) 4 3/4" drill collars, 4 3/4" slinger, 3 1/2" IF X 2 7/8" 8rd crossover. Ran in the well with (204) joints of 2 7/8", P-110 tubing. Tail at 6,555'. Secure well till the AM.

Daily Operation Period: 2/9/2016 - 2/10/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig. Field pressure = 961 psi. SITP = 0 psi, SICP = 0 psi. Open well. Continued running in with (41) joints of 2 7/8", P -110 CTR tubing. Rigged up circulating head. Circulated down to the fish at 3 bpm at 700 psi. Latched on to fish at 7,816'. Pressure spiked to 1,900 psi. Shutdown pump. Rigged down circulating equipment. Jarred on fish at 120K. Rotated to the right on fish while working tubing. Jarred on fish at 120K. Pulled free. Went back down to see if the grapple slipped off. Could not engage fish. Pulled out of the well with (245) joints of 2 7/8", P-110 CTR tubing. Filling the well every 10 stands with 8.5 ppg 68 vis polymer. Broke down fishing tools and stood back drill collars. Fish had parted at the latch. Recovered 8' of the cut blast joint and top of locator on top of the seal assembly. Installed dead line in rig. Ran in the well with (50) joints of 2 7/8", P-110 CTR tubing for a kill string. Lost 20 bbl's of 8.5 ppg 68 vis polymer this tour. Secure well till the AM.

Daily Operation Period: 2/10/2016 - 2/11/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig. Field pressure = 934 psi, SITP = 0 psi, SICP = 0 psi. Open well. Filled well with 9 bbl's of 8.5 ppg 68 vis polymer. Pulled out of the well with (50) joints of 2 7/8", P-110 CTR tubing and stood back. Tallied and made up 6" X 5 3./4" mill shoe, 2' - 5 3/4" extension, 5 3/4" X 3 1/2" IF drive sub, 3 1/2" IF X 3 1/2" reg crossover, 5 7/8" boot basket, 3 1/2" reg X 3 1/2" IF sub, 4 3/4" jars, (4) 4 3/4" drill collars, 3 1/2" IF X 2 7/8" 8rd crossover, 2 7/8", 8rd X 2 7/8" CTR crossover. Ran on (243) joints of 2 7/8", P-110 CTR tubing. Tag top of packer at 7,824'. Rigged up circulating equipment and power swivel. Started milling at 2 1/2 bpm at 400 psi. Milled approximately 18". Circulated clean. Pulled high. Secure well till the AM.

Daily Operation Period: 2/11/2016 - 2/12/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig. Field pressure = 890 psi. SITP = 0 psi, SICP = 0 psi. Open well. Well standing full. Continue milling over Baker Retieva D packer. Pumping at various rates and pumping both long and reverse circulating and dry milling. Made approximately 2 1/2 ft. We believe we are still in the element section. We could not make any more hole and had no torque. Possible parts are spinning or shoe is worn out. Decision was made to pull and inspect shoe. Reverse circulated clean with120 bbl's at 4 bpm at 800 psi. Rigged out power swivel. Laid down one joint of 2 7/8", P-110 CTR tubing. Pulled out of the well and stood back (190) joints of 2 7/8", P-110 CTR tubing. Filling the well every 10 stands with 8.5 ppg, 60 vis polymer. Secure well till the AM.

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Rec'd 10-13-16 DOGGR Ventura.

HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County

Well Porter 35 Sec. 28, T3N, R16W, S.B.B.&M.

A.P.I. No. 03700722 Name Tom McMahon (Person submitting report) Title SIMP Project Manager (President, Secretary, or Agent)

Date 9/27/2016 (Month, day, year)

Signature

Address PO Box 2300, SC9365, Chatsworth, CA, 91313-2300 Telephone Number 714-398-5020

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Daily Operation Period: 2/12/2016 - 2/13/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig, Field pressure = 910 psi, SITP = 0 psi, SICP = 0 psi. Open well. Filled well with 8.5 ppg 60 vis polymer. Pulled out of the hole with (50) joints of 2 7/8", P-110 CTR tubing. Filling the hole every 10 stands with 8.5 ppg 60 vis polymer. Broke down milling assembly. Stood back drill collars. Shoe was worn out. Made up new shoe. 6" X 5 3./4" mill shoe, 2' - 5 3/4" extension, 5 3/4" X 3 1/2" IF drive sub, 3 1/2" IF X 3 1/2" reg crossover, 5 7/8" boot basket, 3 1/2" reg X 3 1/2" IF sub, 4 3/4" jars, (4) 4 3/4" drill collars, 3 1/2" IF X 2 7/8" 8rd crossover, 2 7/8", 8rd X 2 7/8" CTR crossover. Ran in the hole with (245) joints of 2 7/8", P-110 CTR tubing. Rigged up power swivel. Continue milling on (Baker) 7" Retrieva D packer. Getting metal shavings and rubber back. Element rings are spinning. Working through the element section. Pulled high and reversed 2 tubing volumes. Lost 10 bbl's of 8.5 ppg 60 vis polymer this tour. Secure well till the AM.

Daily Operation Period: 2/13/2016 - 2/14/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig. Field pressure = 926 psi. SITP = 0 psi, SICP = 0 psi. Opened well. Filled the hole with 1 bbl of 8.5 ppg 60 vis polymer. Continued milling operations. Reverse circulating at 1 bpm at 300 psi. Getting back good cuttings and some rubber pieces. Still looks as if we are fighting the rings spinning between the elements. Made a few inches. Continue milling. Stopped make hole and not very many cuttings. Circulated the hole clean at 4 bpm at 800 psi for 30 minutes. Rigged out power swivel. Pulled out of the hole with (192) joints of 2 7/8", P-100 CTR tubing. Filling the hole every 10 stands with 8.5 ppg 60 vis polymer. Held BOP drill, 58 seconds. Secure well till Monday.

Daily Operation Period: 2/15/2016 - 2/16/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig. Field pressure = 948 psi, SITP = 0 psi, SICP = 0 psi. Open well. Filled hole with 8 bbl's of 8.5 ppg, 60 vis polymer. Continued pulling out with (50) joints of 2 7/8", P-110 CTR tubing and milling BHA. Broke down milling assembly and stood back drill collars. Made up new shoe. 6" X 5 3./4" mill shoe, 2' - 5 3/4" extension, 5 3/4" X 3 1/2" IF drive sub, 3 1/2" IF X 3 1/2" reg crossover, 5 7/8" boot basket, 3 1/2" reg X 3 1/2" IF sub, 4 3/4" jars, (4) 4 3/4" drill collars, 3 1/2" IF X 2 7/8" 8rd crossover, 2 7/8", 8rd X 2 7/8" CTR crossover. Ran in with (243) joints of 2 7/8", P-110 CTR tubing. Rigged up power swivel. Tagged fish and reverse 2 tubing volumes at 5 bpm at 700 psi. Continued milling on (Baker) 7" Retieva D packer. Pumping 1 bpm Getting good cuttings back but still not making much hole. Looks like something is spinning with us possibly the rings in the element section. Got a little rubber in our returns. Reverse circulating at 1 bpm at 300 psi. Not making any hole. Reverse circulated 2 tubing volumes at 4 bpm at 1000 psi. Pulled high. Lost 20 bbl's of 8.5 ppg, 60 vis polymer this tour. Secured well till the AM.

Daily Operation Period: 2/16/2016 - 2/17/2016

Operations this Report Period (DOGGR)

Held safety meeting, Service rig. Field pressure = 924 psi, SITP = 0 psi, SICP = 0 psi. Open well. Filled hole with 4 bbl's of 8.5 ppg, 60 vis polymer. Continued milling on (Baker) 7" Retieva D packer. Dry milled on packer. Tried various speed and weight. No torque. Rigged down power swivel. Pulled out of the hole with (40) joints of 2 7/8", P-110 CTR tubing. Filled hole with 8.5 ppg, 60 vis polymer. Rig losing power. Secure well till the AM. Rig down due to electrical problem. Lost 4 bbl's of 8.5 ppg, 60 vis polymer this hour.

Daily Operation Period: 2/17/2016 - 2/18/2016

Operations this Report Period (DOGGR)

Ensign monthly safety meeting.Held safety meeting. Service rig. Field pressure = 927 psi, SITP = 0 psi, SICP = 0 psi. Open well. Filled hole with 4 bbl's of 8.5 ppg, 60 vis polymer. Finished repairs on rig. Continued pulling out of the hole with (222) joints of 2 7/8", P-110 CTR tubing. Broke down milling assembly and stood back drill collars. Shoe was worn but still had carbide on it. Made up new shoe. 6" X 5 3./4" mill shoe, 2' - 5 3/4" extension, 5 3/4" X 3 1/2" IF drive sub, 3 1/2" IF X 3 1/2" reg crossover, 5 7/8" boot basket, 3 1/2" reg X 3 1/2" IF sub, 4 3/4" jars, (4) 4 3/4" drill collars, 3 1/2" IF X 2 7/8" 8rd crossover, 2 7/8", 8rd X 2 7/8" CTR crossover. Ran in with (240) joints of 2 7/8", P-110 CTR tubing. Lost 4 bbl's of 8.5 ppg, 60 vis polymer this tour. Secured well till the AM.

SoCalGas-5.1003

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DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

Rec'd 10-13-16 DOGGR Ventura.

HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County

Well Porter 35 Sec. 28, T3N, R16W, S.B.B.&M.

A.P.I. No. 03700722 Name Tom McMahon (Person submitting report) Title SIMP Project Manager (President, Secretary, or Agent)

Date 9/27/2016 (Month, day, year)

Signature

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Daily Operation Period: 2/18/2016 - 2/19/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig. Field pressure = 969 psi, SITP = 0 psi, SICP = 0 psi. Open well. Filled hole with 2 bbl's of 8.5 ppg, 60 vis polymer. Picked up 3 joints of 2 7/8", P-110 CTR tubing. Rigged up power swivel. Started out dry milling. Reverse circulating at 1 bpm at 300 psi and 6K to 8K weigh on mill. Continued milling over (Baker) 7" Retieva D packer. Get getting a lot of metal back. Reverse circulated 2 tubing volumes at 5 bpm at 1000 psi. Pulled high. Lost 2 bbl's of 8.5 ppg, 60 vis polymer. Secure well till the AM.

Daily Operation Period: 2/19/2016 - 2/20/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig. Field pressure + 999 psi, SITP = 0 psi, SICP = 0 psi. Filled the hole with 1 bbl's of 8.5 ppg, 60 vis polymer. Rigged down power swivel. Pulled out of the hole with (242) joints of 2 7/8", P-110 CTR tubing and milling assembly. Filling the hole every 10 stands with 8.5 ppg, 60 vis polymer. Broke down milling assembly and stood back drill collars. Broke off shoe. Shoe look good with only little wear. Made up new shoe and ran with 6" X 5 3./4" mill shoe, (2) 5 3/4" extension, 5 3/4" X 3 1/2" IF drive sub, 3 1/2" IF X 3 1/2" reg crossover, 5 7/8" boot basket, 3 1/2" reg X 3 1/2" IF sub, 4 3/4" jars, (4) 4 3/4" drill collars, 3 1/2" IF X 2 7/8" 8rd crossover, 2 7/8", 8rd X 2 7/8" CTR crossover. Ran in the hole on (242) joints of 2 7/8", P-110 CTR tubing. Picked up 3 joints of 2 7/8", P-110 CTR tubing. Rigged up power swivel and circulating head. Continued milling on (Baker) 7" Retrieva D packer. Pumping 1 bpm at 300 psi. Running various weights from 3K to 8K on shoe. Getting good metal shavings back. Reverse circulated 2 tubing volumes at 5 bpm at 1000 psi. Pulled high, Secured well till the AM.

Daily Operation Period: 2/20/2016 - 2/21/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig. Field pressure = 1014 psi, SITP = 0 psi, SICP = 0 psi. Open well. Filled hole with 1 bbl of 8.5ppg, 60 vis polymer. Reversed circulated at 1 bpm at 250 psi. Continued milled on (Baker) 7" Retrieva D packer. Packer fill approximately 5'. Continued to mill on packer. Reversed circulated clean with 2 tubing volumes of 8.5 ppg, 60 vis polymer at 5 bpm at 1000 psi. Lost 1 bbl of 8.5 ppg, 60 vis polymer this tour. Secure well for the weekend.

Daily Operation Period: 2/22/2016 - 2/23/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig. Field pressure = 1013 psi, SITP = 0 psi, SICP = 0 psi. Open well. Filled well with 5 bbl's of 8.5 ppg, 60 vis polymer. Reversed circulated at 1 bpm at 100 psi. Continued milling on (Baker) 7" Retrieva D packer. Made approximately 4". Circulated clean with 100 bbl's of 8.5 ppg, 60 vis polymer at 5 bpm at 1000 psi. Rigged out power swivel. Pulled out of the hole with (190) joints of 2 7/8", P-110 CTR tubing. Filling the hole every 10 stands with 8.5 ppg, 60 vis polymer. Lost 5 bbl's this tour. Secured well till the AM.

Daily Operation Period: 2/23/2016 - 2/24/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig. Field pressure = 955 psi. SITP =0 psi, SICP = 0 psi. Filled the hole with 2 bbl's of 8.5 ppg, 60 vis polymer. Continued pulling out of the hole with (104) joints of 2 7/8", P-110 CTR tubing and milling assembly. Filling the hole every 10 stands with8.5 ppg, 60 vis polymer. Broke down milling assembly and stood back drill collars. Mill shoe showed signs of wear but in good condition. Made up fishing tools. Spear with 2.335" grapple, 5 1/2" stop sub, 2 3/8" IF X 3 1/2" IF crossover, 4 3/4" Bumper sub, 4 3/4" Jars, (4) 4 3/4" drill collars, 4 3/4" Slinger, 3 1/2" IF X 2 7/8" 8rd crossover, 2 7/8", 8rd X 2 7/8" CTR crossover. Ran in the hole on (243) joints of 2 7/8", P-110 CTR tubing. Rigged up circulating equipment. Pumping at 1 bpm at 200 psi. Tagged top of packer at 7,828' and speared. Jarred on packer, Able to work packer down. Jar on packer at 75K and pulling to 80K. Packer dragging. Hanging up at every casing collar having to jar out. Working packer out of the hole. Pulled (110) joints of 2 7/8", P-110 CTR tubing. Lost 2 bbl's of 8.5 ppg, 60 vis polymer this tour. Secure well till the AM.

Daily Operation Period: 2/24/2016 - 2/25/2016

Operations this Report Period (DOGGR)

Held safety meeting. Serviced rig. Field pressure = 908 psi, SITP = 0 psi, SICP = 0 psi. Open well. Filled the hole with 2 bbl's of 8.5 ppg, 60 vis polymer. Pulled out of the hole (126) joints of 2-7/8", P-110 CTR, Filled the hole every 10 stands with 8.5 ppg, 60 vis polymer. Fish was hanging up in each casing collar. Worked packer to 40K to 50K above string weight to release from casing collar. Packer would not pass 350'. Attempted to work fish past 350' with no success. Ran in the hole with (22) joints of 2 7/8", P-110 CTR tubing for a kill string. Lost 2 bbl's of 8.5 ppg, 60 vis polymer this tour. Secure well till the AM.

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HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County

Well Porter 35 Sec. 28, T3N, R16W, S.B.B.&M.

A.P.I. No. 03700722 Name Tom McMahon (Person submitting report) Title SIMP Project Manager (President, Secretary, or Agent)

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Daily Operation Period: 2/25/2016 - 2/26/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig. Field pressure = 968 psi, SITP = 0 psi, SICP = 0 psi. Open well. Filled the hole with 2 bbl's of 8.5 ppg, 60 vis polymer. Continue working packer out of the hole. Pulled (30) joints of 2 7/8", P-110 CTR tubing. Working packer through casing collars. Broke down fishing tools. Stood back drill collars and laid down Slinger, Bumper sub and Jars. Laid down spear and packer. Load out fishing tools. Rigged down power swivel.Tallied and made up (Weatherford) 7" scraper and Bumper sub and ran in on (248) joints of 2 7/8", P-110 CTR tubing. Tagged top of liner at 7,842'. (7,851' on program). Pulled out of the hole with scraper and (190) joints of 2 7/8", P-110 CTR tubing. Filling the hole every 10 stands with 8.5 ppg, 60 vis polymer. Secured well till the AM.

Daily Operation Period: 2/26/2016 - 2/27/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig. Field pressure = 968 psi. SITP = 0 psi, SICP = 0 psi. Filled the hole with 2 bbl's of 8.5 ppg, 60 vis polymer. Pulled out of the hole with (58) joints of 2-7/8" P-110 CTR tubing, Laid down (1) Bumper sub, (1) 7" AW Scraper. Held pre-job safety meeting with Baker Hughes, Rigged up wire line unit and lubricator, Ran in the hole with Multi-finger caliper tool, Baker Hughes tagged @ 7853'. Logged well from 7852'-5800', Pulled out of the hole and laid down Multi-Finger Caliper tool, Ran in the hole with High Resolution Vertilog tool, Logged well from 0'-7843' and back up from 7843'-0', as High Resolution Vertilog tool was coming up through BOP tool hung up and parted @ cable head, Vertilog tool fell down hole, Rigged down lubricator and wire line unit, Laid down 4-3/4" Drill collars from derrick. Ran in the hole with (50) joints of 2-7/8" P-110 CTR tubing. Secured well till the AM.

Daily Operation Period: 2/27/2016 - 2/28/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig. Field pressure = 957, SITP = 0 psi, SICP = 0 psi. Open well. Well standing full. Pulled out of the hole with (50) joints of 2-7/8" P-110 CTR tubing. Made up and Ran in the hole with 5-3/4" Overshot w/ 3-1/4" grapple, (1) 2-7/8" Nipple, (1) 4-1/2" Bumper sub, (1) 2-7/8" P-110 Pup Jt 8RD EUE, (1) 2-7/8" EUE X 2-7/8" TKC XO, (247) joints of 2-7/8" P-110 CTR tubing, Tag High Resolution Verti-log Tool (fish) @ 7813', engage fish with overshot, setting 12K down on fish. Pulled out of the hole with (247) joints of 2-7/8" P-110, (1) 2-7/8" EUE X 2-7/8" TKC XO, (1) 2-7/8" P-110 Pup Jt 8RD EUE, (1) 4-1/2" Bumper sub, (1) 2-7/8" Nipple, (1) 5-3/4" Overshot w/ 3-1/4" grapple, Over shot came back empty. Consulted with Baker Hughes wire line personnel and Weatherford Tool hand. Decision was made to run a 3-1/8" Grapple and make attempt to engage the Swivel of the High Resolution Verti-log tool. Made up and ran in the hole with 5-3/4" Overshot w/ 3-1/4" grapple, (1) 2-7/8" Nipple, (1) 4-1/2" Bumper sub, (1) 2-7/8" P-110 Pup Jt 8RD EUE, (1) 2-7/8" EUE X 2-7/8" TKC XO on (114) joints of 2-7/8" P-110 CTR tubing. Secured well for the weekend.

Daily Operation Period: 2/29/2016 - 3/1/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig. Field pressure = 984 psi, SITP = 0 psi, SICP = 0 psi. Opened well. Filled the hole with 1 bbl of 8.5 ppg, 60 vis polymer. Continued running in the hole with (132) joints of 2 7/8", P-110 CTR tubing and fishing assembly.Picked up 1 joints of 2 7/8", P-110 CTR tubing and latched on to logging tools at 7,822'. Pulled 10k over string weight and fish pulled free. Pulled out of with (247) joints of 2 7/8", P-110 CTR tubing. Filling the hole every 10 stands with 8.5 ppg, 60 vis polymer. Laid down logging tools. Broke down and laid down fishing tools. (Baker) down loaded data from tools. Data was good. Made (Weatherford) 7" 23-29# Loc-Set bridge plug and ran in the hole on 2 7/8", P-110 CTR tubing. Set bridge plug at 1,023' and test to 400 psi for 5 minutes. Released and continue running in the hole with a total of (248) joints of 2 7/8", P-110 CTR tubing. Set bridge plug at 7,837' and released. Pulled (1) stand and test to 1000 psi for 5 minutes. Dumped 10' of sand and displaced with 44 bbl's of 8.5 ppg, 60 vis polymer. Pulled (40) joints of 2 7/8", P-110 CTR tubing. Secured well till the AM.

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Daily Operation Period: 3/1/2016 - 3/2/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig. Field pressure = 964 psi, SITP = 0 psi, SICP = 0 psi. Open well. Well standing full. Continued pulling out of the hole with (208) joints of 2 7/8", P-110 CTR tubing. Laid down retrieving head. Made up (Weatherford) 7" 23-29# test packer. Ran in the hole on 2 7/8", P-110 CTR tubing. Set at 500' and tested casing annulus to 3625 psi for 30 minutes. Good test. Released packer and continued running in the hole. Set packer at 1000' and tested casing annulus to 3275 psi for 30 minutes. Good test. Released packer and continued running in the hole. Set packer at 1500' and tested casing annulus to 3100 psi for 30 minutes. Good test. Released packer and continued running in the hole. Set packer at 2000" and tested casing annulus to 2925 psi for 30 minutes. Good test. Released packer and continued running in the hole. Set packer at 2500' and tested casing annulus to 2750 psi for 30 minutes. Good test. Released packer and continued running in the hole. Set packer at 3350' and tested casing annulus to 2525 psi for 30 minutes. Good test. Test down the tubing from 3350' to BP at 7837' to 2450 psi for 30 minutes. Released packer. Pulled out of the hole with (106) of 2 7/8", P-110 CTR tubing and packer. Filled the hole every 10 stands with 8.5 ppg, 60 vis polymer. Broke out and laid down (Weatherford) test packer. Made up retrieving head and ran in the on (50) joints of 2 7/8", P-110 CTR tubing. Secure well till further notice.

Daily Operation Period: 3/7/2016 - 3/8/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig. Field pressure = 1023 psi. SITP = 0 psi, SICP = 0 psi. Open well. Well standing full. Continue running in the hole with retrieving head and (198) joints of 2 7/8", P-110 CTR tubing. Laid down one joint and made up circulating equipment. Reverse circulated sand off of bridge plug at 7,837' two tubing volumes. Picked up one joint and release bridge plug. Reversed circulated out gas with 190 bbl's of 8.5 ppg, 60 vis polymer at 3.8 bpm at 1000 psi. Rigged out circulating equipment. Pulled out of the with (246) joints of 2 7/8", P-110 CTR tubing and bridge plug. Filling the hole every 10 stands with 8.5 ppg, 60 vis polymer. Laid down (Weatherford) bridge plug and retrieving head. Tallied and picked up a 45 mule shoe, 11 joints of 1 1/4", P-110, WTS-8 Hydril tubing, 1 1/4" X 2 7/8" 8rd crossover and ran in on (140) joints of 2 7/8", P -110 CTR tubing. Secured well till the AM.

Daily Operation Period: 3/8/2016 - 3/9/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig. Field pressure = 1039 psi, SITP = 0 psi, SICP = 0 psi. Filled the hole with 1.5 bbl's of 8.5 ppg, 60 vis polymer. Continued running in the hole with (238) joints of 2 7/8", P-110 CTR tubing. Tagged liner top at 7,851', Rigged up circulating equipment. Reversed circulated at 2 bpm at 300 psi. Could not get in the liner. Tried rotating and circulating between reversing and the long way. Fell in the liner and tagged at 7,870'. Rotated and worked through several spots. Could not get past 7,919'. Continued rotating and circulating between reversing and the long way. Tagged again at 7,927'. Continued rotating and circulating between reversing and the long way. Could not get past 7,927'. Rigged down circulating equipment. Pulled out of the hole with (80) joints of 2 7/8", P-110 CTR tubing. Filled the hole every 10 stands with 8.5 ppg, 60 vis polymer. Lost 10 bbl's of 8.5 ppg, 60 vis polymer this tour. Secured well till the AM.

Daily Operation Period: 3/9/2016 - 3/10/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig. Field pressure = 1048 psi, SITP = 0 psi, SICP = 0 psi. Open well. Filled well with 1.5 bbl's of 8.5 ppg, 60 vis polymer. Continued pulling out of the hole with (166) joints of 2 7/8", P-110 CTR tubing. Laid down 1 1/4" X 2 7/8" crossover, (11) joints of 1 1/4" WTS-8 Hydril tubing, 45 mule shoe. Made up (Weatherford) Loc-set bridge plug and ran in the hole on (40) joints of 2 7/8", P-110 CTR tubing. Set at 1,260' and tested to 500 psi for 10 minutes. Continued running in the hole with (208) joints of 2 7/8", P-110 CTR tubing. Tagged liner top @ 7,845'. Pulled up 15' and set at 7,830'. Test to 500 psi for 10 minutes. Dumped 10' of sand and displaced with 44 bbl's of 8.5 ppg, 60 vis polymer. Pulled out of the hole laying down (40) joints of 2 7/8", P-110 CTR tubing. Secure well till the AM.

Daily Operation Period: 3/10/2016 - 3/11/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig. Field pressure = 1145 psi. SITP = 0 psi, SICP = 0 psi. Open well. Filled the hole with 1 bbl of 8.5 ppg, 60 vis polymer. Continued laying down (208) joints of 2 7/8", P-110 CTR tubing. Filling the hole every (20) joints with 8.5 ppg, 60 vis polymer. Laid down (Weatherford) retrieving head. Swap out trailers. Picked up (112) joints of 2 7/8", J-55 8rd blue band tubing. Open ended. Held BOP drill (41) seconds . Discussed well control procedures. Continue picking up tubing. Tubing tail at 3,390'. Secure well till the AM.

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

Rec'd 10-13-16 DOGGR Ventura.

HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County

Well Porter 35 Sec. 28, T3N, R16W, S.B.B.&M.

A.P.I. No. 03700722 Name Tom McMahon (Person submitting report) Title SIMP Project Manager (President, Secretary, or Agent)

Date 9/27/2016 (Month, day, year)

Signature

Address PO Box 2300, SC9365, Chatsworth, CA, 91313-2300 Telephone Number 714-398-5020

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Daily Operation Period: 3/11/2016 - 3/12/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig. Field pressure = 1045 psi, SITP = 0 psi, SICP = 0 psi. Open well. Well standing full. Continued picking up (144) joints of 2 7/8", J-55, 8rd blue band tubing. Tagged top of sand at 7,814'. Laid down (2) joints and remove circulating head. Made up hanger and landed tubing. Tail at 7,778'. Screwed in lock screws and tested hanger to 500 psi for 10 minutes. Started rigging down and loading out equipment. Secure well till the AM.

Daily Operation Period: 3/12/2016 - 3/13/2016

Operations this Report Period (DOGGR)

Held safety meeting. Service rig. Field pressure = 984 psi, SITP = 0 psi, SICP = 0 psi. Open well. Nipple down 11", 5M annular and double gate BOP. Nippled up 2 9/16" 5M tree. Rigged up Cameron to test void. 300 psi low / 5000 psi high. No test. Tighten packing gland on hanger lock screws. Better but still no test. No visual leaks. Bled off air several times. Tried retesting a couple more times with no success. No visible leaks through the tree. Nippled down tree. Inspected ring grooves, API ring and extended neck seals. Installed new API ring and nippled up tree. Retest tree. Bled off air several times and retested. Good test 300 psi low and 5000 psi high. Rigged down Cameron. Rigged down rig. Rigged out the rest of the equipment. Ready to move to Fernando Fee 38C.

(254) joints of 2 7/8", J-55 8rd blue band tubing in well. Tail at 7,778.94'
(Weatherford) 7", 23-32# Loc-Set bridge plug at 7,830
Top of sand at 7,814'
Well full of 8.5 ppg, 60 vis polymer

Daily Operation Period: 4/6/2016 - 4/7/2016

Operations this Report Period (DOGGR)

Noise log indicated fluid movement down hole. Fluid Level shot after noise log indicated that the fluid level was at 2,600'.

Zero psi on the casing. 1 psi on the tubing. Started with 294 bbls 3% KCL polymer kill fluid in the 500 bbl tank.

Held safety meeting with HES and Onyx. Rig up Halliburton to pump 3% KCL polymer kill fluid from the 500 bbl tank down the tubing. Rig up Onyx choke and hard line from the casing to the 500 bbl tank. Pressure tested the pump and lines to 2,000 psi. Good. Pumped down the tubing with returns going to the 500 bbl tank at 5 bpm and 1,000 psi. Received immediate returns on the casing indicating that the well was standing full. Pumped a total of 302 bbls. (calculated circulating volume was 274 bbls). Shut pump down. No flow. Rigged HES and Onyx down. Secured the well

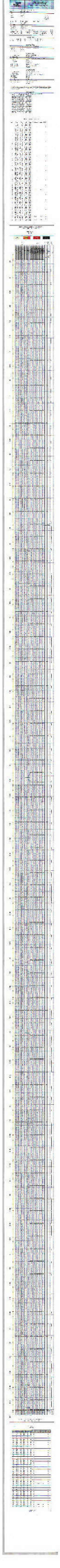
Re-strapped 500 bbl tank. Had 294 bbls remaining proving that the well was standing full prior to pumping.

Daily Operation Period: 7/19/2016 - 7/19/2016

Operations this Report Period (DOGGR)

MIRU 5000 psi test truck and iron to tubing wing valve. RU choke manifold to casing wing valve. RU vac truck to manifold and carbon canisters to vac truck.
Opened casing valve and topped off well with fluid by slowly pumping down tubing. With DOGGR representative on location, shut-in casing and pressured-up tubing to 600 psi.
Tested packer, tubing plug and casing for 1 hour. Test recorded digitally and with circle-chart. Test witnessed approved by DOGGR. Bled down pressure, shut-in well, RDMO

Ex. I – 50



Ex. I – 51

Due to the large file size, this exhibit is an excerpt. The native file of this document is available upon request.

Rec'd 05-04-17 DOGGR Ventura.

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County Los Angeles
Well Standard Sesnon 4 A Sec 28, T3N, R16W, S.B.B.&M.
A.P.I. No. 03721375 Name Tom McMahon (Person submitting report) Title SIMP Manager (President, Secretary, or Agent)
Date 4/26/2017 (Month, day, year)
Signature
Address PO Box 2300, SC9365, Chatsworth, CA 91313-2300 Telephone Number 714-398-5020

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Start Date	Ops this Report (DOGGR)
9/22/2016	HSM: TOOH w/kill string. M/U SLB logging tools to log from 8217' to 3900' in 6 5/8" Csg. R/D & run kill string. Secure well - lock in rams & secure location.
9/23/2016	HSM; NOI issued. Pull kill string of 20 stands and M/U 6 5/8" RBP and RIH to 7980' and Set & sand off. TOOH and P/U Test Pkr. NOTE; Cliff Knight from DOGGR; Notified Engineering to set RBP at 8000' (just in top of MP) in order to get Work Permit Laydown test Pkr and RIH with RBP retrieving tool and circulate out sand. Unset RPB and move down 20' to 8000' (COE). Set and sand off. TOOH to killstring of 1250' & Shut in well
9/24/2016	HSM; Pull killstring w/RPB retrieving tool M/U a weatherford Arrow-set Pkr/On-Off tool and RIH t/ 8950' and set. R/U Pros and test Tbg to 1000 psi for 1 hr.-Good. Pull up and close in well & secure
9/26/2016	HSM; TOOH w/252 jnts. N/D Bope & install Tbg spool and test lower/upper seals-250 low & 1050 high. Good. N/U Bope & install Rig floor. Secure well and cleaned location.
9/27/2016	HSM; Spot in Weatherford BOPE Test truck and test Bope. RIH w/253 jnts of CRT tubing. Spot in pipe wrangler and TOOH sideways. Load out with Crane. Run kill string and secure well.
9/28/2016	HSM; Laydown CRT killstring and load out. Spot in 300 jnt of L-80 yellow band Tbg on racks. P/U On and Off tool, then RIH with 130 jnts of tbg utilizing the pipe wrangler. P/U Baker S.C. hydraulic Packer & continue to RIH w/75 jnts of Tbg. Secure well.
9/29/2016	HSM; Continued to RIH w/Baker straddle Pkr. Engage on/off tool & set S.C. Baker hydraulic Pkr @ 3991 (COE) and drop ball. Pressure up to; 1300/1600/2200 and set. Pressure Test Casing at 1000 psi for 1 hr and electronically chart. DOGGR; Curtis Welty-GOOD TOOH & lay down Baker retrieving tool. RIH t/ a kill string of 3843' and land Hanger. N/D BOPE and set aside. N/U Well head tree with No issues. Clean location-Set up to move Rig to Frew 4
9/30/2016	HSM; RDMO of SS4A and remove plates and clean cellar. Utilize (2) cranes to move off (large BOPE) and move to FREW 4 and set equip,
1/6/2017	COME BACK TO THIS WELL (HAD TO WAIT FOR HANGER TO BE MADE) HSM; 0 psi on well. Test BOPE to 300 low/5000 high psi. Move pump closer to Rig. Unland hanger & pull 83 jnts of Tbg. Secure well. DOGGR; Ernie Blevins here for BOPE inspection; Good
1/9/2017	HSM; 0 psi on well. Pull kill string. M/U Baker dummy seal tool and RIH t/3886' (126 jnts) and engage upper Pkr. R/U Wireline and RIH t/7928' & cut 2 7/8" Tbg. Good cut. (10 k in tension). TOOH w/wireline & R/D. M/U Pkr retrieving tool and RIH w/100 jnts of Tbg & Shut in well.
1/10/2017	HSM; 0 psi on well. Continue to RIH and engage 6 5/8" Hydraulic Pkr, on second attempt-sheared out @ 42 k over. TOOH slowly & layed down Pkr (good condition). M/U 4 11/16" Baker overshot w/bumper sub & RIH to Fish @ 8000' Half turn to right and unset Weatherford Pkr-pulled 20 stands. Secure well
1/11/2017	HSM; 0 psi on well. Added 3 bbls of fluid to well. Continue to TOOH w/2nd Pkr (Weatherford) & lay down. M/U retiieving tool & RIH t/7990' and circulate sand out. Engage 6 5/8" RBP and unset & let sit for 1/2 hr. Clean location for rain storm coming. Pull 50 jnts of Tbg. Secure well
1/12/2017	HSM; 0 psi on well. Continue to pull 6 5/8" RBP & laydown. M/U Weatherford 4.5" retrieving tool. RIH & circulated sand off. Engage RBP and unset/relax elements. Circulate 200 bbls and secure well
1/13/2017	HSM; 0 psi on well after unsetting 4.5" RBP. Fluid down @ 135'. Forward circulate any gas out. Bullhead high Vis pill of 25 bbls into liner. 4.5" RBP hanging up (tight area at 8717/rbp set at 8727') continue to TOOH, laydown bridge plug-3 elements missing. (Run 4.5" scraper). Run killstring & secure well.
1/17/2017	HSM; 0 psi on well. Cirulate 50 bbls of fluid-full returns. TOOH w/killstring. M/U 4" all weight scraper and RIH t/8244' (top of perfs) & unable to go further. TOOH & laydown scraper. P/U 2 3/8" mule shoe and RIH t/Kill sting depth. Secure well. NOTE; Construction requested to move our tanks/pump & support equip. to be able to trench. Will do tomorrow.

Rec'd 05-04-17 DOGGR Ventura.

RESOURCES AGENCY OF CALIFORNIA
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DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County Los Angeles

Well Standard Sesnon 4 A Sec 28, T3N, R16W, S.B.B.&M.

A.P.I. No. 03721375 Name Tom McMahon (Person submitting report) Title SIMP Manager (President, Secretary, or Agent)

Date 4/26/2017 (Month, day, year)

Signature

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Start Date	Ops this Report (DOGGR)
1/18/2017	HSM; Ensign Monthly Meeting in Valencia; 0 psi on well. Continue to RIH w/mule shoe & tag bottom @ 8737' with NO issues. TOOH and lay down mule shoe. P/U Baker Cast iron bridge plug. & RIH to kill string depth. **MOVE PUMP/2 Baker Tanks/plates for CONSTRUCTION to trench for laterals
1/19/2017	HSM; 0 psi on well. Continue to RIH s/Cast Iron bridge plug t/8227' & set. Pressure test to 500 psi and chart for 15 minutes. GOOD. TOOH to killstring depth. Shut in well. Off load 95 jnts of 4.5" inner string/Move Baker tank/re-position pipe wrangler. Slip & Cut Drilling line of 76'.
1/20/2017	HSM; 0 psi on well. Pull killstring & laydown the Baker Cast iron bridge plug setting tool. Have Weatherford change out Variable Rams to 4.5" Rams. Spot in Tong hand. HSM w/all personel to run 4.5" /513 inner string. Heavy winds/Rain. P/U shoe/FC & 30 joints of 4.5" inner liner and torque to specs. Close in well/secure location. NOTE; 5 fwy -snow on grapevine & rocks falling in roads to location
1/23/2017	HSM; Wait on Weatherford Tong hand. 0 psi on well. Continue to RIH w/67 jnts of 4.5" inner string & tally with shoe @ 8200' and hanger @ 3900'. Have Doby pull (3) cellars as they were Full. Heavy Rain/Hail. Circulate forward 100 bbls with no issues. Note; Rig mechanic to change out two clutch rams (sticking)
1/24/2017	HSM; 0 psi on well. Crane to position in Hanger. Change pipe rams back to VBR's. Off load 3.5" IF-DP. Spot in cement return tank. Utilize Ensign Gill -Drill pipe tongs. Not working correctly/rig down. Use Weatherford Drillpipe tongs. M/U Baker Hanger/bumper sub. Continue to RIH w/ 30 joints of 13.3# Drillpipe to 8 Klbs of torque. Shut in well.
1/25/2017	HSM; 0 psi on well. Continue to RIH w/hanger on DP. RIH w/95 jnts of Drill pipe. Attempt to pump down DP and pressured up. Discussed forward ops with Baker, Reverse circ. & try and free drill pipe scale on top of plug. Then forward circ and broke free. Circulated 120 bbls with no issues. Spot in Halliburton cement crew. Rig up Cement head to drill pipe. Baker drop ball down to landing collar ball seat @ 8150'. Pump total of 90 bbls of 8.6 ppg fluid down tubing. Set packer slips with 1800 psi. Blow ball seat @ 2400 psi. Release off packer. Pump 74 BBLS of 13.5/14.8 PPG lead cement (Premium G). Pump plug down with displacement of 93.5 bbls of 8.6 polymer fluid & bump plug @ 500 psi. Set Baker liner hanger packer @ 3897' and reverse out excess cement. Rig down Halliburton. Pull (5) stand & close in well
1/26/2017	HSM; 0 psi on well. Reverse Circ. 50 bbls. Continue TOOH sideways w/DP. Hydraulic line to tongs broke. Shut down and repair. Laydown all drill pipe & load out.(124 total). P/U 8 5/8" Scraper & bumper sub & RIH t/killstring depth. Shut in well
1/27/2017	HSM; HIGH WINDS/25-35 mph steady with gusts of 54 at RIG FLOOR. 0 psi on well. Continue to RIH w/scraper &14 stands of Tbg. Wind got worse-Unsafe & Shut in well. Stand by
1/30/2017	HSM; 0 psi on well. Continue to RIH w/scraper. Circulate 1.5 hole volume (250 bbls). TOOH. P/U 8 5/8" RBP and RIH & set at 860'/ pressure test, good. Sand off. TOOH and P/U Baker Packer and RIH, set @ 753'/ test backside-Good. Forward circulate and 0 psi @ 3.5 bbls/min. Secure well
1/31/2017	HSM; Reposition Packer, test-good. R/U cementers & pump 84 bbls of class III cement @ 1.5 bbls/min @ 44 psi. No returns. Pull up and reverse out. No returns. Attempt to fill hole. No good. Shut in well.
2/1/2017	HSM; 0 psi . RIH & set Pkr. Wait on Halliburton Cementers @ Ward 3. R/U Cementers and pump 90 bbls of class III cement w/ 2% Calcium chloride. 27 pis @ 2bbls a minute. TOOH-no signs of cement on tail. Shut in well. Order out more cement for tomorrow.
2/2/2017	HSM; 0 psi on well. RIH w/5 singles/Pkr and stand by for Halliburton cementers.R.U Cementers & HSM; Pumped 130 bbls of Class III cement w/2% Calcuim chloride & 7 bags of CC for the last 30 bbls. Pumped @ 1.5 bbls/min and final pressure was 222 psi. Got water returns between 13 3/8" & 8 5/8" Csg. Displace with 3.8 bbls & pulled out of hole. Filled hole and standing Full. Shut in blind rams & secure location.

Rec'd 05-04-17 DOGGR Ventura.

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HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County Los Angeles

Well Standard Sesnon 4 A Sec 28, T3N, R16W, S.B.B.&M.

A.P.I. No. 03721375 Name Tom McMahon (Person submitting report) Title SIMP Manager (President, Secretary, or Agent)

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Start Date	Ops this Report (DOGGR)
2/3/2017	HSM; 0 psi on well. Fluid level fell 1/2 bbl overnight., topped off. Applied 300 psi on 8 5/8" Csg., held-Good. RIH & Tag Cement @ 541'. TOOH & P/U Drilling assembly of 7 7/8" Bit/ (4) 4-1/16" Drill collars. RIH & tag cement. Pull up and circulate hole clean. Start drilling out cement with 2.5 power swivel @ 3 bbls/min. Drilled down to 652' of 845' (193' to go). Pulled up and circulate hole clean. Shut in well/secure location. NOTE; Repaired shaker screens for proper flow. Installed plates over SS-4 (from pressure/noise & temp log) and installed wrangler to run 6 5/8" Csg on Wednesday
2/6/2017	HSM; 0 psi on well. Continue to Drill out cement F/652' F/778' (126') & Power swivel started to leak excessivly hydraulic fluid. Shut down and changed out unit. Pull up and secure well.
2/7/2017	HSM; 0 psi on well. Continue to Drill out cement F/745' T/829'. Drill bit broke free, went down to sand @ 745' and circulated hole clean, above sand. TOOH & stand back collars/& laydown bit. P/U Scraper and RIH w/20 jnts. Close in well. NOTE: Moved Wrangler out and Pumped cellar/pump/shaker bin down. Pumped location of large puddles
2/8/2017	HSM; 0 psi on well. Continue to RIH w/scraper & tag RBP sand, pull up and circulate a hole volume. TOOH & laydown BHA. Spot in Doby Crane 30 ton & N/D BOPE. Remove old spool. Have welder dress 8 5/8" stub. Install 11" spool and test 300 low & 2750 psi High-GOOD. Install BOPE & Rig floor. P/U Baker retrieving tool and RIH w/ 20 stands of Tbg. Secure well.
2/9/2017	HSM: Continue to RIH w/retrieving tool & pull RBP. TOOH. P/U Pollish bore mill & RIH and pollish top of hanger. TOOH and prepare to Run 6 5/8" Casing tomorrow. Spot in wrangler and layout Casing. RIH with killstring.
2/10/2017	HSM; 0 psi on well. TOOH w/killstring. Change out VBR rams to 6 5/8". M/U BHA of a Baker seal assembly/Float shoe/Float collar jnt. (Baker lock 1st two jnts). Centrilize every other Jnt. RIH filling every 5 jnts. Torque to an average of 6500 ft/lbs. Had to wait for correct elevators. RIH w/19 joints with no issues. Rain increased where Seal Lube not insured. Close Rams and secure location.
2/13/2017	HSM; Continue to RIH w/6 5/8" inner string of 66 joints/ (1) pup & (1) 20' jnt to space out. Land on hanger at 3897'. Pressured up to 500 psi on the backside. GOOD. Close in well. Secure location.
2/14/2017	HSM; 0 psi on well. Wait on Halliburton cementers. Clean location for environmental inspection. Inspected-GOOD. Halliburton Cementers arrived at Noon. Spot in and Rig up. HSM & Pulled up 3' to expose hanger ports. Pump 20 bbls of Mud flush followed by 170 sxs of 13.5 ppg lead then 50 sxs of 14.8 ppg tail Cement (86 bbls total). Bumped plug at 123 bbls of displacement. Checked floats good. LAND SEAL with 20 k down then 10 k up. Set slips. Wash across spool and clean out lines. Drain BOPE & and install clam shell 6 5/8" Slips and set in place at spool. GOOD. Shut in well.
2/15/2017	MONTHLY ENSIGN SAFETY MEETING: HSM; 0 psi on well. Remove rig floor. Use 4 ways and remove Annular. Sling up double-gate and pull up. Slips at correct height, have Cameron torque down (12) bolts on slips. Replace double gate and close pipe rams. Secure location for weekend. Wait for Spool.
2/21/2017	HSM; 0 psi on well. Remove double-gate Bope. Cold cut 6 5/8" Csg for spool. Install spool & test (6) 300 low/5000 psi high-all good. Install X-over spool and N/U Bope. Close blind rams/Secure location.
2/22/2017	HSM; 0 psi on well. Weatherford changed pipe rams out. Test BOPE; blinds/annular/pipe rams of 300 low and 5000 high-Good. M/U 5.5/8" bit & 4 collars. RIH and tag cement @ 3805'. P/U swivel and drilled down (bridged off cement) to 3836'. Circulate clean. Shut in.
2/23/2017	HSM; 0 psi on well. Continue to drill out cement & plug-float collar F/3836' T/3890'. Circulate clean. Rig out power swivel. TOOH and laydown BHA. P/U 6 5/8" positive scraper and RIH w/62 jnt. and close in same.
2/24/2017	HSM; 0 psi on well. Continue to RIH w/scraper & tag hanger pull up and reverse circulate 100 bbls. TOOH and lay down BHA. RIH w/2 3/8" Hydril string and TOOH sideways. R/U and spot in wrangler to set out Tbg. RIH w/Killstring. Slip and cut 30' of Drilling line CASING TEST; Doggr - Curtis Willy to witness pressure test w/PROS. Pressure up to 4002 psi for 1 hr & decreased to 3923 psi (79 psi).GOOD. He signed chart/permit
2/27/2017	HSM; 0 psi on well. TOOH w/Tbg & laydown collars. Wait on tubing to be delivered via Doby. Offload 2 3/8" Tbg and strap. M/U 3 3/4" Bit and (4) drill collars with 121 jnts of Tubing. Obstruction at 3950' (FC rubbers-in 4.5"). R/U power swivel and shut in well. Secure location.
2/28/2017	HSM; 0 psi on well Continue to RIH pushing down rubbers from 6 5/8" FC. R/U power swivel and rotate down and circulate clean. R/D power swivel. RIH to 8140' and tag rubber/cement stringers. Circulate 150 bbls clean @ 2.3 bbls min. Pull up and rig out swivel for larger power swivel (Ensign). Secure well.
3/1/2017	HSM; 0 psi on well. Exchanged out power swivel from Weatherford to Ensign (more HP). Drilled out cement F/8110' T/8195'. Tagged cast iron bridge plug @ 8225'. Pulled up and circulated hole clean. Shut in well.
3/2/2017	HSM; 0 psi on well. Continue to circulate from 80 bbls of 150. Shakers clean. R/D Ensign powerswivel. TOOH w/25 stands. Winds increasing from 25 to 45 mph (50 in derrick-Tbg moving out of fingers) Close in well and standby for weather to subside.

SoCalGas-5.1014

Rec'd 05-04-17 DOGGR Ventura.

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County Los Angeles
Well Standard Sesnon 4 A Sec 28, T3N, R16W, S.B.B.&M.
A.P.I. No. 03721375 Name Tom McMahon (Person submitting report) Title SIMP Manager (President, Secretary, or Agent)
Date 4/26/2017 (Month, day, year) Signature
Address PO Box 2300, SC9365, Chatsworth, CA 91313-2300 Telephone Number 714-398-5020

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, and initial production data.

Start Date	Ops this Report (DOGGR)
3/3/2017	HSM; 0 psi on well. Continue to TOOH w/drilling assembly. Laydown BHA.(Drill Bit looks good 4/5-warn teeth from cement) M/U 4.5" scraper and RIH T/8150'. NOTE: 1 hour waiting on weather (34-42 mph winds in derrick). TOOH w/Scraper to killstring. Shut in well and secured location (containments).
3/6/2017	HSM; 0 psi on well. TOOH w/kill string and laydown 4" Scraper. R/U SLB lubricator and Log well. Made 2 runs F/8135' T/3900' (4.5" csg) & F/3900' to surface. R/D SLB. Run killstring and Shut in well.
3/7/2017	HSM; 0 psi on well. TOOH w/killstring. R/U SLB and continue to log last 250' to surface. R/U Baker Vertilog tool (Mag.Flux Leakage)- High Rez. 1st run in 4.5" Csg F/8135' T/3900'. TOOH and change tool and 2nd run in 6 5/8" Csg F3860' T/Surface. R/D. RIH w/killstring. Shut in well.
3/8/2017	HSM; 0 psi on well. TOOH w/killstring. R/U Baker wireline & run Caliper log in 4.5" Csg F/8235' T/Surface in (2) runs. R/D Baker. P/U drilling BHA of 3 3/4" drill bit (4) collars and RIH T/ 2 3/8" Tbg. on ground & 50 stands in derrick NOTE; FEMSA/SCG Management tour here to see logging unit in operation.
3/9/2017	HSM; 0 psi on well. Continue to RIH w/drilling assembly. Tight area around 3950'. Rotate through and tag Cast iron bridge plug @ 8225'. P/U Ensign power swivel and start drilling CIBP. WOB-2-4 k / 110 Rpm / 2 bbls-min. / 550 psi. Drilled out CIBP in 3 hrs. temporary lost returns and then re-gained back. Bridge plug fell to bottom & chased it down to (8695'-w/fill and bridge plug). Reverse circulated out gas. Pulled up to TOL & Shut in.
3/10/2017	HSM; 0 psi on well with bridge plug drilled out. On a vacuum. Plant a 20 bbl high vis pill at TOL. TOOH & lay down drilling BHA. NOTE: Drill bit intact and looked good. M/U Baker 3.80" string mill and RIH T/3926' and ream out rough spot after stacking out on it. Went through it 8 times. GOOD. TOOH sideway w/50 jnts of 2 3/8" Tbg. 110 jnts as kill string. NOTE: changed out Hydraulic hose for tongs under rig.
3/13/2017	HSM; 0 psi on well. Continue to TOOH sideways w/2 3/8" Tbg & string mill BHA. RIH w/254 jnts of 2 7/8" Tbg. TOOH sideways of 154 jnts of Tbg & left killstring in well of 100 jnts. Secure well & prep for running completions
3/14/2017	HSM; 0 psi on well. Continue to TOOH sideways w/2 7/8" Tbg & haul away. Offload 2 3/8" Tbg and strap. Added 22 bbls of fluid. M/U Weatherford Pkr /Xn nipple/SS/X profile and (2) jnts of Tbg. RIH & pressure test to 4100 psi. & chart. GOOD Continue to RIH /hydro test with 54 jnts of Tbg. Shut in well.
3/15/2017	HSM; 0 psi on well. Added 2 bbls of fluid. Continue to RIH w/ 2 3/8" Tbg w/seal lube. Offload and strap 125 jnts of 2 7/8" L-80 Tbg. P/U Hanger and M/U and close in rams
3/16/2017	HSM; 0 psi on well. Pumped 50 bbls of Pkr fluid and displaced w/25 bbls of polymer. Set 4.5" ASI-X Mech Pkr @ a COE of 8004' in 8.5 k-ft/lbs of Compression. Locked in lock down well head screws. DOGGR: Cliff Knight to witness; -Tested backside T/1000 psi for 1 Hr. GOOD. Wireline set PXN plug 1.875" & prong @ 8019'. TOOH & L/D wireline. -Pressured up Tubing and Tested to 3900 psi for 1 hr. Test Good NOTE; Sliding Sleeve Closed R/D rig floor and N/D BOPE & set out on truck. Install New Cameron Tree & close in same
3/17/2017	HSM; 0 psi on well. Cameron torqued tree & tested Wellhead seals 300 low / 5000 high. Good. Rig down support equipment and stage at SS-44B well. Tight location at SS-4A. NOTE: Plug installed and sliding sleeve closed/full of fluid. NOTE: ENSIGN to perform DOT 2 Rig inspection with Mechanics. Also change all Clutches out.
3/20/2017	MIRU Western wireline slickline unit. Ran 2' B shifting tool & opened sleeve at 7,935'. Pooh. C.W.I. R.D.M.O.
3/29/2017	MIRU & unloaded fluid w/ N2.
3/30/2017	Purged well bore. Applied pressure. retrieved prong & plug. Flow tested well. C.W.I. RDMO.
4/5/2017	SITP = 1,321 p.s.i. Opened & purged tbg. to attmoshere obtaining & confirming natural gas was at surface. Well went flat. C.W.I. & turned well over to operations

OG103 (6/97/GSR/5M) SUBMIT IN DUPLICATE

Rec'd 05-04-17 DOGGR Ventura.

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County Los Angeles

Well Standard Sesnon 4 A Sec 28, T3N, R16W, S.B.B.&M.

A.P.I. No. 03721375 Name Tom McMahon (Person submitting report) Title SIMP Manager (President, Secretary, or Agent)

Date 4/26/2017 (Month, day, year) Signature

Address PO Box 2300, SC9365, Chatsworth, CA 91313-2300 Telephone Number 714-398-5020

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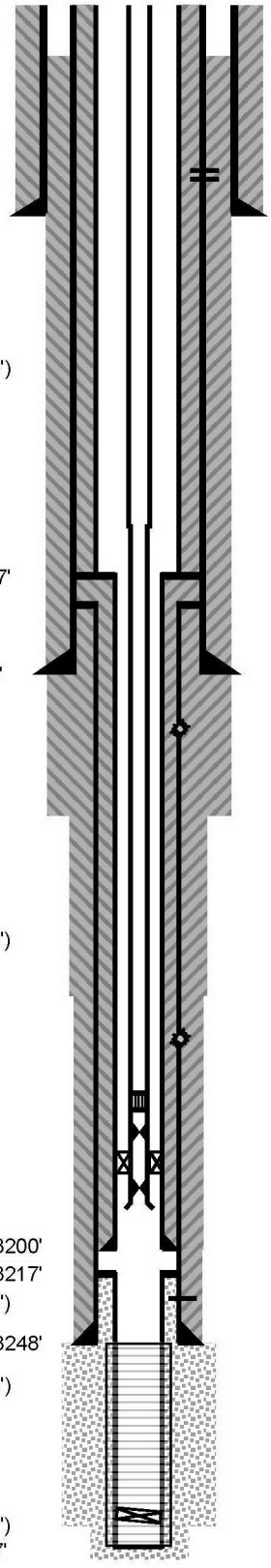
Start Date	Ops this Report (DOGGR)
9/7/2016	DOGGR: Notified that we are on well and Permit in hand - plan forward; Ernie Blevins SCG: Control Room Notified were on Well SS4A- Nick Alderson Wireline; Removed PXN plug body @3896' MIRU- Placed Rig as to allow Construction to install Laterals/Trenches/support equip. for SS4B HSM; Tbg psi @ 1000 psi- bled down to 0 (slight flow) R/U & Pump High Vis HEC pill of 50 bbls & chase with a Tbg volume of 23 bbls Install BPV & NU Bope w/ variable double gate rams. Spot in pipe wrangler Secure location
9/8/2016	HSM: Repair Accumulator (power cord) & Test BOPE 5000 high/300 low with Variable Rams. Soft Dig back Anchors for Rig so as to have Construction get by with no Guy wire issues. Test all BOPE equip-Good Release from Otis J latch @ 3910' with no issues. Laydown Hanger and 1 jnt. Secure well. DOGGR: BOPE Inspection done by Curtis Welty from Cypress office; Good
9/9/2016	HSM: TOOH w/ 127 joints of 2 7/8" Tbg. Then have welder fabricate 3 lifters to pull 134 joints of 3 1/2" Flush Joint Tbg. Pulled 104 jnts of 3.5" utilizing the pipe wrangler, leaving 30 in hole for kill string. Had Cameron re dress the hanger Secure location
9/10/2016	HSM; Continue to pull 30 jnts of 3.5" F.J. Tbg and laydown. P/U 8 5/8" all weight scraper/bumper sub and RIH w/126 jnts of P-110 (2 7/8" tbg) to top of Permatrieve Pkr @ 3915' & tally in hole. Circulate on top of Pkr of 238 bbls clean. Pull 5 stands Secure well and location
9/12/2016	HSM; TOOH w/Scraper & L/D. P/U Weatherford Spear/Bumper Sub/Jars and RIH t/3915' & engage Permatrieve Pkr and pull out with No issues. TOOH and laydown (all intact) P/U a 6 5/8" all weight scraper and RIH with Tbg from Derrick and 50 jnt on the racks utilizing the pipe wrangler. Shut in and secure well
9/13/2016	HSM; Continue to RIH utilizing the pipe wrangler P/U from racks w/6 5/8" all weight scraper. Circulate on bottom a full well volume. TOOH & laydown scraper. P/U Fishing BHA and RIH t/6850'with no issues. Secure well
9/14/2016	HSM; RIH w/40 jnts of Tbg and engage permatrieve Pkr @ 8206' & jar out @ 40 k over. TOOH and laydown Pkr fully intact. P/U 2 1/16" clean out string of 20 jnts and RIH to TOL. Secure well.
9/15/2016	HSM; RIH w/Tbg to bottom @ w/2 1/16" Tbg and circulate 150 bbls. (no fill). TOOH & L/D 20 jnts of hydril Tbg. R/U SDI and Gyro Survey every 25' F/8737' T/GL. with no issues. R/D and run killstring. Secure well.
9/16/2016	HSM; Pulled killstring and R/U Baker Logging & Caliper logged F/8737' to surface. P/U 4.5" RBP and RIH set @ 8727' and sanded off. Pulled 10 stands and shut in well.
9/17/2016	HSM; TOOH w/250 jnts. R/U Baker Loggers & Log High Resolution F/3927' to Surface with no issues. RIH with killstring and secure well and location
9/19/2016	HSM; TOOH w/killstring. M/U lockset Pkr and RIH to Block Test the following intervals; A) 1000' at 3625 psi for 1 hr = Good B) 2000' at 3200 psi for 1 hr = Good C) 3000' at 2800 psi for 1 hr = Good D) 3900' at 2400 psi for 1 hr = Good DOGGR witness; Arsenio Laguazad and sign permit TOOH w/ Pkr and lay down. Run kill string and secure well and location
9/20/2016	HSM: RIH w/RBP and set @ 3900' & sand off. TOOH. N/D BOPE and remove Well head Spool to Cameron. Mark flanges for proper install for laterals. Install weatherford spool and N/U Bope. Install Rig floor. Close blind rams and secure location.
9/21/2016	HSM; Ensign Crew met at montly meeting in Valencia. Arrive on location. 0 psi on well. P/U retieving tool and RIH to sand at 3890' and clean out. Engage RBP and TOOH & L/D. R/U SLB lubricator and USIT log from 3900' to surface, re-log any anomolies. R/D and run killstring. Secure location.

Ex. I – 52

Well
Standard Sesnon 4A Orig. Hole & ST1

API #: 04-037-21375-00, -01
Sec 29, T3N, R16W

Operator: So. California Gas Co.



13-3/8" & 6-5/8" TOC Surface

8-5/8" ETOC 219'

17-1/2" Hole (to 962')

Surface Casing
13-3/8" (12.615" ID), 54.5#, K-55, BT&C
0' - 928' 928'

CMT'D w/ 500 CF + 150 SKS* +
"Pumped 17 yds of 6 SK Pre
Gravel Mix" Top Job

11" Hole (962' - 4665')

Inner CSG (2/14/2017)
6-5/8" (5.791" ID), 28#, L-80, BT&C
0' - 3897' (w/ Tie Back Seals & Ports)

CMT'D w/ 483 CF/220 SKS,
15 BBLS Returns to Surface

3897'

Production Casing
8-5/8" (7.825" ID), 36#, K-55, LT&C
0' - 4065'
4065'

CMT'D w/ 1140 CF

Inner Liner (1/25/2017)
4-1/2" (3.96" ID), 12.6#, L-80, Hydril 513
3897' - 8200'

CMT'D w/ 415 CF, CMT Returns to TOL

9-7/8" Hole (4665' - 6526')

CMT'D Liner
6-5/8", K-55, FJ
3927' - 4214' 24# (5.921" ID)
4214' - 5097' 28# (5.791" ID)
5097' - 8248' 24# (5.921" ID)

CMT'D w/ 493 CF* + SQZ'D TOL
5X's w/ total of 1069 CF Away
(Calc'd)

8200'
8217'

7-5/8" Hole (6526' - 8248')

8248'

8" Hole (8248' - 8715')

WWS Liner
4-1/2" (4.0" ID), 11.6#, K-55, ST&C
8217' - 8737'

5-5/8" Hole (8715' - 8771')

TD 8771' 8737'
TVD (8153')
Directionally Drilled: Yes (TD is 2847' W, 597' N of Surf)

181' Sidetrack (ST1) KOP (f/ Orig. Hole) into this wellbore (see WB History)

815' - 825' Four (4) 1/2" HPF (SQZ'D 3x's w/ a total of 1611 CF CMT, Calc'd, SQZ'D Away, last SQZ had water returns btwn. 8-5/8" & 13-3/8", 1/31/2017)

Tubing (3/16/2017)
2-7/8" (2.441" ID), 6.5#, L-80, EUE
0' - 3786'
2-3/8" (1.991" ID), 4.7#, L-80, EUE
3786' - 8017'

3786' 2-7/8" x 2-3/8" X-Over

3897' 4-1/2" TOL & TOC

3927' 6-5/8" TOL & TOC (WSO, Appvd then SQZ'D w/ 50 SKS, 1/23/1975. WSO Re-Apprvd 1/28/1975)

4291' - 4296' Holes in 6-5/8" btwn. (25 SKS + 3 CF CMT SQZ'D Away, 1/13/1979)

7488' - 7518' Holes in 6-5/8" btwn. (2 CF CMT SQZ'D Away, 1/11/1979)

7926' WXO Sliding Sleeve (1.875" ID)
7961' WX Nipple (1.875" ID)
8001' WEA AS1-X PCKR (COE @ 8004', 3/16/17)
8016' WXN Nipple (1.875" w/ 1.791" No-Go)
8017' Wireline Re-entry Guide

8220' Four (4) 1/2" Holes WSO (1/18/1975)
(20 SKS CMT SQZ'D, 1/19/75 + 100 SKS CMT SQZ'D, 1/27/1975)

4-1/2" Perfs:
8244' - 8737' Gru-V-Kut 0.018" Gauge

8695' Top of Junk/Fill (see desc. above)

Lease: Standard Sesnon
Field: Aliso Canyon
Status: Active Gas Storage
3000TDS: ±800' (±797')
10000TDS: 2954' (2812')

Ground Elevation: 2885.58' asl
Datum to Ground: 17' KB

Spud Date: 11/12/1974
Completion Date: 3/15/1975
Last Rework Date: 3/20/2017

Junk: Cast Iron BP Milled & Pushed to 8695' (3/9/2017)

Wellbore History

Orig. Hole (-00) TD @ 455'±
(11" Hole drifted 2' f/ IW-59 Cellar)
181' - 408' CMT Plug
(422 SKS, C/O f/ 134')
Sidetrack (ST1) KOP @ 181'
into current wellbore (-01)

Notes

Many problems w/ lost circ. during drilling. CMTing, WSO's obtained w/ difficulty

*No circulation throughout job

**No circulation while displacing CMT

Top of Zone Markers	md (tvd)	
PEupth	2954'	(2812')
FREWupth	4295'	(4029')
CRupth	4520'	(4239')
A36	5751'	(5401')
UP	6107'	(5738')
LP	6590'	(6186')
UDA1	6828'	(6406')
MDA	7402'	(6935')
LDA	7692'	(7195')
MP	7980'	(7449')
S1	8334'	(7766')
S4	8428'	(7851')
S8	8534'	(7945')
S14	8674'	(8069')

Prepared by: MAM (7/7/2016)
Updated by: LD (5/16/2018)
InterAct

Ex. I – 53

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

Rec'd 05-05-17 DOGGR Ventura.

HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County Los Angeles
Well Porter 42 C Sec 28 3N 16W S.B.B.M.
A.P.I. No. 03721878 Name Tom McMahon (Person submitting report) Title SIMP Project Manager (President, Secretary, or Agent)
Date 1/19/2017 (Month, day, year) Signature Thomas D McMahon
Address PO Box 2300, SC9365, Chatsworth, CA, 91313-2300 Telephone Number 714-398-5020

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Start Date	Ops this Report (DOGGR)
9/26/2016	Well Shut in @ 30 psi SITP / 20 psi SICP. MIRU hoist and related equipment. Secured rig well and location.
9/27/2016	Well Shut in @ 30 psi SITP / 20 psi SICP.MIRU Onyx testers. Bled well to carbon filter cannisters. Killed well reversing 70 bbls of 3% KCL. Well @ 0 psi static.RDMO Onyx. Cameron installed BPV in tubing hanger. ND tree. NU BOPE. MIRU Weatherford testing. Tested BOPE and manifold according to GCS 224.05.
9/28/2016	Well shut in @ 0 psi SITP / 0 psi SICP. daily field pressure 1,263 psi. Unlocked BOPE. BOPE inspection approved by Doggr. Jay Hoff. Rigged up tubing swivel. Attempted to release HES J-latch packer seals@ 6,811'.Could not release packer or on-off tool. RU wireline attempted to cut tubing string unsuccessfully. CIW.
9/29/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Daily field pressure 1,260 psi. RIH with freepoint on wireline.Tubing string was stuck @ GLM. Cut tubing string @ 6,671'. POOH with tubing,hanger pup joint. LD 110 joints of 3 1/2"N-80 tubing CIW and Secured.
9/30/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Daily field pressure @ 1,263. Continued POOH laying down 3 1/2" N-80 production tubing. MU and RIH with Baker 8 1/8" waspipe, mill shoe,jars drill collars and 14 joint of 2 7/8" P110 to 662'. CIW.
10/1/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Daily field pressure @ 1,265 psi. Continued RIH picking up 2 7/8" P110 workstring and Baker washpipe assembly. Tagged @ 6,741. Pulled up to 6,678'. CIW.
10/3/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Reverse circulated 2 bbls p/m @ 0 psi annulus over GLM @ 6,718. Cleaned out light scale to 6,744'. Reversed 4.5 bbls p/m 60 bbls. POOH with washpipe. RIH with overshot and jars to retrieve 3 1/2" fish and GLM.
10/4/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Daily pressure 1,268 psi. RIH with overshot. Jared on stuck 3 1/2" tubing and GLM. Could not jar free or rotate off of HES equipment. Released overshot from fish. POOH to kill string. Prepare for tubing cut in the am.
10/5/2016	Well shut in @ 0 psi SITP / 0 psi SITP. Daily field pressure 1,267 psi. POOH with kill string. RIH with full opening tools. Latched on to fish. Circulated clean 600 bbls. MIRU Tiger Wireline. RIH with 2.25" jet cutter. Attempted to cut stuck 3 1/2" tubing @ 6,748'. Cutter failed. RDMO wireline. CIW.
10/6/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Daily field @ 1,267 psi. Released overshot and POOH. With CTR P110 work string and over shot. MU 8 3/8" crown shoe and 8 1/8" wash pipe and Baker assembly. RIH with 2 7/8" CTR P110 tubing to 6,663' , 11' above fish. CIW.
10/7/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Daily firld @ 1,267 psi. RU power swivel and reverse circulated washing over fish from 6,674' to 6,814' w 8 1/8" washpipe.Cleaned out sand from 6,780' to top of packe HES packer @ 6,814'. POOH with washpipe assembly. MU 3.50" grapple in 5 3/4" overshot and bumpersub. RIH to kill string. CIW.
10/8/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Daily field pressure 1,269 psi. RIH with work string and over shot to top of fish @ 6,671'. RU power swivel. Circulated and latched on to fish. Worked string attempting to release J-latch on HES packer. Tubing became free. POOH with P110 work string and overshot with cut tubing fish. RIH with kill string to1,289'.
10/10/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Daily field @ 1,269 psi. POOH with kill string. MU Baker dress mill and assembly. RIH on 2 7/8" CTR P110. Tagged top of fish @ 6,748'. Milled on fish conventionally circulating @ 3 bbls p/m with 300 psi annulus.Milled to 6,751'. Let clean up. Returns showed light metal and KCL. POOH to 4,849'. CIW
10/11/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Daily field pressure @ 1,269 psi. POOH with 2 7/8" work string and 8 1/8" dress mill with stabilizer. MU Baker 8 3/8" crown shoe and (3) joints of 8 1/8" washpipe and assembly. RIH to top of fish 6,751'. CIW.
10/12/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Broke reverse circulation @ 3.5 bbls p/m. Washed over fish and tagged HES 9 5/8" WB packer @ 6,809'. Milled on packer with 8 3/8" shoe to 6,811'.Circulated clean metal and light scale. CIW.

SoCalGas-5.1020

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HISTORY OF OIL OR GAS WELL

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Start Date	Ops this Report (DOGGR)
10/13/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Daily field @ 1,268 psi. Continued milling on HES 9 5/8" WB packer from 6,811 to 6,811.5'. POOH with milling assembly. CIW.
10/14/2016	Well shut in @ o psi SITP / 0 psi SICP. Daily filed pressure @ 1,270 psi. Continued POOH with P110 tubing and Baker washover pipe / milling assembly.Changed shoe. RIH and continued milling on packer @ 6,812'. Pulled up. Circulated clean. CIW.
10/15/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Daily field pressure @ 1,282 psi. Continued milling on HES 9 5/8" WB packer. Milled @6,812'. Could not make hole after 4 hrs of milling.Cleaned up reversing 150 bbls @ 4.00 bbls per min. CIW.
10/17/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Daily field pressure 1,269 psi. POOH and laid down Baker BHA and mill shoe. MU new Baker overshot and BHA. RIH and latched on to fish @ 6,751'. Jarred on fish @ 100K over string. Tubing pulled free with 12K weight gain. POOH with tubing to 3,375'. CIW
10/18/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Daily field pressure @ 1,269 psi. Continued POOH with work string and fishing BHA. RIH with new grapple and extension. Jarred on fish. Released on-off tool. POOH to kill string depth. CIW.
10/19/2016	Well shut in@ 0 psi SITP / 0 psi SICP. Daily field pressure @ 1,277 psi. Continued POOH with P110 tubing and Baker fishing BHA. LD cut 3 /12" tubing. sliding sleeve, 1 joint, pup and upper section of HES on-off tool. RIH with milling assembly to on-off. Milled lugs off HES on-off tool to 4.00" OD. Circulate clean. CIW.
10/20/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Daily field pressure @ 1,266 psi. Rversed clean with tubing tail @ top of fish @ 6,806' (fish @ 6,808'). POOH with CTR P110 work string and Baker BHA. Wash shoe was heavily damaged and skim cut up one side.MU new 8 3/8" wash shoe with carbide. RIH with assembly to 4,706'. CIW.
10/21/2016	Well shut in @ 0 psi SITP / 0 psi SICP. daily field pressure @ 1,266 psi. Continued in hole with 2 7/8" CTR P110 work string and 8 3/8" mill shoe on washpipe. Tagged top fish @ 6,810. Milled over fish , milling skim cut shoe from previous run. Milled on HES 9 5/8" WB packer. Packer milled up and pushed free from 6,813 to 6,841'. Clean up POOH to 2,715'. CIW.
10/22/2016	Well shut in @ 600 psi SITP / 600 psi SICP. RU Carbon cannisters and and seperator to annulus. Pumped to tubing side. Vent annulus to cannisters on 18/24 choke while pumping 9.3# ppg 110 visc HEC polymer down tubing. Vent casing to 11 psi. Pumped 25 bbls of 9.3# HEC down casing. Well static. Installed tubing inside bope. Opened BOP RIH with and Baker BHA to 6,731'. Pumped 55 bbls of 9.3# 110 viscHECdown tubing folowed with 20 bbls of 8.5# 3% KCL. CIW. Secured rig,well and BOPE.
10/24/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Unlocked BOP rams. POOH with 130 joints of CTR P110 workstring slowly to prevent swabbing formation. Pumped 1.5 bbls of 8.5# 3%kcl for tubing displacement. POOH to 2,700' and removed inline tubing checkvalve. Well was static. Continued out of hole with Baker BHA and washpipe with 8 3/8" shoe. MU 8 1/8" overshot with 4.00" grapple. MU Jars and BHA. RIH with 178 joints of 2 7/8" CTR P110 tubing to 5,751'. CIW. Secured.
10/25/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Opened BOPE. RIH with remaining (28) joints of 2 7/8" P110 tubing. Latched on to fish @ 6,810'. Over pulled 20K. Pulled HES WB packer free. POOH with occational spot drag @ 10K to 12K over string. POOH to Baker fishing assembly. Retrieved seal,j-latch and tail section wwith pups and XN nipple. MU 4.961" grapple/spear and RIH. Engaged packer @ 4,670. Pulled 10k over and pulled free. Pulled 2 joints and worked trough casing collar with 15 over. Closed well in with tail @ 4,604.
10/26/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Pumped well control fluids. Continued POOH with P110 workstring, Baker BHA with spear and HES WB packer remnant. MU 8 1/8" guide shoe, 1 7/8"grapple and CTR P110 tubing to 6,841". Tagged top of IJ tubing fish. Attempted to latch with rotation on tongs with poor results. CIW.

SoCalGas-5.1021

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

Rec'd 05-05-17 DOGGR Ventura.

HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County Los Angeles
Well Porter 42 C Sec 28 3N 16W S.B.B.M.
A.P.I. No. 03721878 Name Tom McMahon (Person submitting report) Title SIMP Project Manager (President, Secretary, or Agent)
Date 1/19/2017 (Month, day, year) Signature
Address PO Box 2300, SC9365, Chatsworth, CA, 91313-2300 Telephone Number 714-398-5020

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, and initial production data.

Start Date	Ops this Report (DOGGR)
10/27/2016	Well shut in @ 0 psi SITP / 0 psi SICP. RU circulating head and 2.5k power swivel. Pumped 1.00 bbls p/m 3% KCL down tubing while attempting to latch up 1 1/4" IJ tubing @ 6,841'. Worked tubing and overshot with light applied string weight and rotation. Attempted to latch up to fish. Attempts failed to latch fish. POOH with P110 and Baker BHA. Inspected grapple. RIH with cleanout string 2 1/16" Hydril & 2 7/8" P110. CIW.
10/28/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Daily field pressure @ 1,274 psi. Continued in hole with Hydril 2 1/16" and 2 7/8" P110 cleanout string. Tagged fill inside 5 1/2" liner @ 7,503'. Mixed and pumped 60 bbls calcium carbonate pill for lost circulation. Pulled up to 6,878'. CIW.
10/29/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Daily field @ 1,274 psi. Attempted to fill well with 3% KCL. Pumped down tubing @ 3 bbls p/m with 3% 8.5ppg KCL. Pumped theoretical casing volume of 533 bbls. Hole would not fill. Pulled tubing tail to 6,226'. RU to tubing and pumped 60 bbl. high visc 9.0# 36 pp/bbl saturated calcium carbonate plug. CIW.
10/31/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Daily field pressure @ 1,275 psi. RIH with tubing to 7,503'. Tagged fill. Pulled up to 6,491'.Spot 80 bbls 10.0# 72# per barrel Calcium Carbonate pill. POOH with CTRP110 & 2 1/16" CS hydril string. MU Baker Kelo socket and fishing BHA with jars and RIH with 210 joints of CTR P110 to 6,828'. CIW.
11/1/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Daily field pressure @ 1,276. Picked up 1 joint of P110 and rigged up power 2.5k swivel. Worked over 1 1/4" IJ tubing fish @ 6,844'. Pulled 8k over pull. POOH with tubing and BHA. Baker tool had failed and had damaage. RIH with overshot and new BHA. Latched up fish @ 6,845. Worked several times @ 30K overpull. POOH with 2K weight gain. POOH with tools to 4,479'. CIW
11/2/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Daily field pressure @ 1,277 psi. Continued POOH with CTR P110 tubing and Baker BHA to fishing tools. Did not retrieve fish. MU Baker kelo socket and BHA. RIIH to top of fish. RU power swivel. Worked over fish to top of 7 5/8" liner. Could not get good over pull. Kelo socket kept pulling off. Hung back swivel. POOH with tubing to 3,500'+. CIW
11/3/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Continued POOH with work string and Baker fishing tools. Inspected kelo socket and extension. MU and RIH with 1.90" grapple in 5 3/4" overshot 8 1/8" guide shoe and Baker BHS. RIH to Top of fish enagaged @ 6,842'. Worked to 6,872'. Pulled on fish.Unable to pull free. Backed of 1 1/4' fish. Gained 2k. POOH to kill string. CIW.
11/4/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Daily field pressure @ 1,278. POOH with P110 tubing to Baker BHA. POOH with BHA to overshot and retrieved 26 joints of 1 1/4" IJ tubing. LD fish. MU and RIH with Baker 7 5/8" all weight casing scraper to top of 5 1/2" liner. Pumped 50 bbls 3% KCL to flush. No restrictions were encountered with scraper. POOH to 3,068'. CIW.
11/5/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Daily field pressure @ 1,276 psi. Continued POOH with work string tallying and 7 5/8" AW casing scraper.MU 7 5/8" Baker RBP with unloader. RIH @ set RBP @ 7,450 COW. Filled casing with 3% KCL. Pressure teasted casing and RBP to 1,000 psi for 15 min. Good. POOH with (30) 6,480'. Dumped 10 cu. ft 100 mesh sand. Displaced with 43 bbls. CIW
11/7/2016	Well shut in @ 0 psi SITP / 0 psi SICP.Daily field pressure @ 1,277 psi. POOH with remaining (206) joints of 2 7/8" CTR P110 and Baker 7 5/8" retrieving tool. Filled casing with 10 bbls of 3% KCl while pulling. Casing standing full and static. LD Baker drill collars and loaded out all tools. LD 2 1/16" cleanout string. Prepared location for wireline casing integrity logs. CIW. Secured rig well and location.
11/8/2016	Well shut in @ 0 psi SICP. Standing full with 3% KCL.RBP set @ 7,450'. MIRU Baker Wireline. Ran Caliper Imagery /Verta Logs from 7,426' to Surface.Repeat runs from 7,410'. Loaded out logging tools RDMO Baker. CIW Secured.

SoCalGas-5.1022

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

Rec'd 05-05-17 DOGGR Ventura.

HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County Los Angeles
Well Porter 42 C Sec 28 3N 16W S.B.B.M.
A.P.I. No. 03721878 Name Tom McMahon (Person submitting report) Title SIMP Project Manager (President, Secretary, or Agent)
Date 1/19/2017 (Month, day, year)
Signature
Address PO Box 2300, SC9365, Chatsworth, CA, 91313-2300 Telephone Number 714-398-5020

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Start Date	Ops this Report (DOGGR)
11/9/2016	Well shut in @ 0 psi SICP. Daily field pressure @ 1,279 psi.Well standing full with 3% KCL. MIRU Schlumberger wireline services. Ran Usit / CBL logs on 9 5/8" and 7 5/8" casing from 7,400' to 6,868'. cahnged tools and logged from 6,868' to 22' /surface. CIW.
11/10/2016	Well shut in @ 0 psi SICP with annulus standing full 3% KCL RBP set @ 7,450'. RIH with 1,900' 2 7/8" tubing tail and Baker 9 5/8" Lok-Set Test packer. RIH w 2 7/8" CTR P110 tubing. Set packer @ 3,046'. Tested 9 5/8"casing above packer to 3,625 psi. Tested 9 5/8" and 7 5/8" casing below packer to 2,350 psi against RBP @ 7,450'. Test below packer on 7 5/8" would not test. Bled off 350 psi in 10 min. Chart / Digitally recorded test on 9 5/8" for 1hr @ 3,700 psi. Test on 9 5/8" witnessed and approved by Cliff Knight DOGGR. CIW .Secured.
11/11/2016	Well shut in @ 0 psi SITP / 0 psi SICP. daily field pressure @ 1,277 psi. Released Baker test packer.Ran down hole to 5,445'. Pressure tested casing tio 3,000 psi (good) for 15 min.POOH with tubing and tset packer. POOH laid down 1,900' tail. RIH with Test packer to 6,856' above 7 5/8" lap. Attempted to test casing and lap. Could not get solid test on digital gauge.Lost 159 psi in 30 mins. Pressure bled from 2,350 applied test pressure to 0 psi. CIW.
11/12/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Daily field pressure @ 1,279 psi. Released Baker 9 5/8" test packer. Pulled up hole testing 30' intervals from 6,846' 6,815' 6,784; to 6,753. Solid test from 6,753' to surface. Released 9 5/8" test packer and POOH. RIH with kill string to 1,900'+. Plan forward to run RBP to 7 5/8" lap and pinpoint problem area with 9 5/8" packer.
11/14/2016	Well shut in @ 0 psi SITP / 0 psi SICP/ POOH with kill string. MU Baker 9 5/8" test packer. RIH with 10 joint tail. RIH to 6,790 attempted to test 9 5/8" caing lap nad 7 5/8" casing to RBP @ 7,490. Pressure tseted to 1,415 psi with 216 psi loss in 1hr. Moved RBP to 6,857 (10') above 7 5/8" lap @ 6,767'. Attempted to test with same results losing 75 psi in 15 min. CIW. Secured.
11/15/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Daily field pressure @ 1,282 psi. Released 9 5/8" test packer @ 6.857'. POOH. RIH with 7 5/8" test packer to 6,877'. Tested 7 5/8" casing to 1,253 psi. tthrough tubing. Held pressure tset for 1hr with a pressure loss of 1 psi. 1,411 psi inital to 1,410 psi final (stabilized). Chart and digitally recorded.Test witnessed and approved by Randall Morlan Doggr.Bled pressure to 0 psi. Released test packer. CIW.
11/16/2016	Well shut in @ 0 psi SITP / 0 psi SICP, Daily field pressure 1,280 psi. PPOH with 7 5/8" test packer. RIH with 9 5/8" tset packer. Tested 9 5/8" casing @ 5,445' to 2,660 psi for 1hr. Pressure loss of (9) psi 2,651 psi final. Released and moved test packer down hole to 6,753'. Set and tested casing to 1,701 psi for 1 hr with pressure loss of (11) psi 1,690 psi final. Pros chart and digitally recorded tests. Tests were witnessed and approved by Doggr rep. Randall Morlan. Released test packer. CIW.
11/17/2016	Well shut in @ 0 psi SITP / 0 psi SICP. POOH with 9 5/8" test packer. MU and RIH with Baker retriving tool for 7 5/8" RBP. Circulated off sand cap @ 7,432' to RBP @ 7,450'. Latched up and let EQ. Released and let elements relax. POOH with RBP to 4,638' CIW
11/18/2016	Well shut in @ 0 psi SITP / 0 psi SICP. daily field pressure 1,283 psi. Continued POOH with 7 5/8" RBP. MU Baker fishing tools. RIH with 4 11/16" overshot and bumper sub,(237) joints of P110 tubing to 7,496'. Attempted to work into 5 1/2" liner with poor results. Notified engineering. POOH to 3,960'. CIW.
11/19/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Daily field pressure. Continued POOH with Baker fishing tools. RIH with 7 5/8" Baker packer to 7,450' Set and established injestion rate 2.5 bbls p/m @ 150 psi, @ 3.0 bbls p/m @ 250 psi. Released packer and POOH to 4,016'+. CIW. Secured.
11/21/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Daily field @ 1,284 psi. Continued POOH with CTR P110 work string and Baker 7 5/8" test packer. MU Baker 7 5/8" cement retainer. RIH and set @ 7,450' COE. Filled annulus and pressure tested to 500 psi. with bleed off due to lap and bad casing @ 6,753+. Established injection rate @ 2.5 bbls p/m with 150 psi and 3.0 bbls p/m @ 250 psi. with no visible increase or comunication to annulus above retainer. Stung out of retainer.CIW.Secured well and rig. EOT.

SoCalGas-5.1023

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

Rec'd 05-05-17 DOGGR Ventura.

HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County Los Angeles
Well Porter 42 C Sec 28 3N 16W S.B.B.M.
A.P.I. No. 03721878 Name Tom McMahon (Person submitting report) Title SIMP Project Manager (President, Secretary, or Agent)
Date 1/19/2017 (Month, day, year)
Signature
Address PO Box 2300, SC9365, Chatsworth, CA, 91313-2300 Telephone Number 714-398-5020

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Start Date	Ops this Report (DOGGR)
11/22/2016	Well shut in @ 0 psi SITP / 0 psi SICP. daily field pressure @ 1,285 psi. Reverse circulated 80 bbls of 3% KCL with retainer stinger @ 7,440' Retainer @ 7,450' MIRU Halliburton cement services. Pumped 1.8 ppg Xhem-Plug cement with super CBL additive. Stung into retainer @ 7,450. Pumped 12 bbls of cement slurry below. Final pressure @ 16 psi. Unstung from retainer @ pumped 10 bbls cemt balancing 200' plug from 7,450 to 7,250'. Dispaced with 9 bbls fresh. Pulled up to 71,00'. Reverse circulated 40 bbls of 3% KCL. Retrieved 1/4 bbls cement. Shut down pump. POOH with 34 joint to 6,030'. Reverse circulated 55 bbls of clean #% with no cement residual in returns. CIW. Secured. Released Halliburton services.
11/23/2016	Well shut in @ 0 psi SITP /0 psi SICP. daily field @ 1,285 psi. opened up BOPE. RIH with 2 7/8" CTR P110 tubing with Baker cement retainer stinger tail. Tagged top of cement @ 7,259' with 5K applied string weight. Tag witnessed and approved by Doggr representative Ernie Blevins. Pulled tubing tail up to 6,960+. Cleared tubing tail with 20 bbls of 3% KCL @ 3.0 bbls p/m with excellent returns. CIW. Secured rig and well. EOT
11/28/2016	Well shut in @ 0 psi SITP / 0 psi SICP. daily field 1,286 psi. Unlocked BOPE. Filled hole with 5 bbls KCL. Reverse circulated 20 bbls. Pressure tested annulus to 1,300 psi. Pressure loss to 7 5/8" lap @ 185 psi in 10 min. Bled to 0 psi POOH with 2 7/8" P110 tubing and Baker stinger. MIRU Western Wireline. Perforated 4 spf 1/2" squeeze holes from 7,208' to 7,218'. RIH with open ended tubing to 7,255'. MIRU Halliburton.Mixed and pumped 70 sx. (23) bbls of 14.8 ppg Chem-Plug cement. Displaced with 38 bbls of fresh water. Tubing volume 41 bbls. Balanced cement plug from 7,255' to 6,753'. POOH to 6,464'. Reversed clean with 60 bbls of 3% KCL. Recovered 1/4 bbls of cement. Closed kelly and pressured annulus to 1,000 psi in 200 psi increments. Final squeeze pressure @ 1,100 psi. Squeezed 1.6 bbls behind pipe. theoretical TOC @ 6,786'. CIW. Secured.
11/29/2016	Well shut in @ 0 psi SITP / 0 psi SICP. RIH with tubing and tagged TOC @ 6,852'. Pulled up and circulated clean. RIH and tagged TOC for Doggr representative Ernie Blevins. Witnessed and approved. MIRU Halliburton cementing services. Mixed and pumped 32sx. 10 bbls of14.8 ppg Chem Plug cement. Displaced with 37 bbls of fresh water. Balanced plug from 6,852' to 6,627' (225'). POOH to 6,464'. Reversed clean with 60 bbls of 3% KCL. Recovered grey water only. POOH with (202) joints of 2 7/8" tubing. MU 8 1/4" tri cone bit. RIH with (162) joints to 5,142'. CIW Secured.
11/30/2016	Well shut in @ 0 psi SITP / 0 psi SICP. RIH with (50) joints of 2 7/8" tubing from 5,142' to tag TOC @ 6,711'. Doggr rep Ernie Blevins witnessed. Discussed with engineering and Doggr reviewed well history and logs. Decision was made to bring TOC to above 6,600'. POOH with tubing and bit. RIH with open ended tubing to TOC @ 6,711'. Prep. to pump balanced cement plug to 6,520' in the am. CIW.
12/1/2016	Well shut in @ 0 psi SITP 0 psi SICP. Daily field pressure @ 1,284. Tagged TOC @ 6,711'. Reversed clean with 90 bbls of 3% KCL. MIRU Halliburton. Mixed and pumped 42 sx. 76 cu/ft 13.5 bbls of 14.8 ppg Chem-Plug cement. Displaced with 37 bbls. Balanced cement plug in 9 5/8" 53.5# from 6,711' to 6,520' TOC. Pulled tubing to 6,400'. Reversed clean with 80 bbls of 3%. Recovered grey water only. Released Halliburton. POOH with (202) joints total. RIH with 8 3/8" bit (202) joints to 6,400'. CIW Secured.
12/2/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Daily field. RIH with (4) joints of 2 7/8" CTR P110 tubing and tagged TOC @ 6,538'. Pulled (2) joints and circulated 200 bbls while waiting on Doggr rep. Rigged out kelly. RIH and tagged TOC @ 6,538 for doggr. Pressure tested casing and cement to 1,100 psi. Chart and digitally recorded with Pros testing. Held pressure @ 1,098 psi with 16 psi pressure drop in 1hr to 1,082 psi final. Tag and test witnessed and approved by Curtis Welty. Bled to 0 psi. RDMO Pros. POOH laying down (150 joints of 2 7/8" tubing. CIW. Secured with tail @ 1,791. EOT.
12/5/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Continued POOH laying down P110 work string. Tallied and RIH with open ended 2 7/8" J-55 tubing to 1,572'. Landed tubing hanger. Secured rig. Prepared for ND, NU, test and RDMO. Secured rig well and BOPE.

SoCalGas-5.1024

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

Rec'd 05-05-17 DOGGR Ventura.

HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County Los Angeles
Well Porter 42 C Sec 28 3N 16W S.B.B.M.
A.P.I. No. 03721878 Name Tom McMahon (Person submitting report) Title SIMP Project Manager (President, Secretary, or Agent)
Date 1/19/2017 (Month, day, year)
Signature
Address PO Box 2300, SC9365, Chatsworth, CA, 91313-2300 Telephone Number 714-398-5020

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Start Date	Ops this Report (DOGGR)
12/6/2016	Well shut in @ 0 psi SITP / 0 psi SICP. Tubing hanger landed and secured with open ended tubing tail @ 1,572. Daily field pressure @ 1,290 psi. Insatlled BPV in tubing hanger. ND Class III bope. Installed WKM 3 1/8" 5000 psi master valve. Pressure tested 300 / 5000 and chart recorded (good). Bled to 0 psi. RDMO Cameron. RDMO rig and all support equipment. Loaded out and moved off. Cleaned location released to operations.

SoCalGas-5.1025

Ex. I – 54

Rec'd 05-04-17 DOGGR Ventura.

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County Los Angeles

Well Ward 3 A Sec. 27, T3N, R16W, S.B. B&M

A.P.I. No. 03722306 Name Tom McMahon (Person submitting report) Title SIMP Manager (President, Secretary, or Agent)

Date 4/27/2017 (Month, day, year)

Signature

Address PO Box 2300, SC9365, Chatsworth, CA 91313-2300 Telephone Number 714-398-5020

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Start Date	Ops this Report (DOGGR)
11/30/2016	Safety meeting. (vehicle or heavy equiment). Serivce rig and equipment. Field pressue 1287-psi-Continue RIH w/180-jts of 3.5" tbg T/ 7178'-Roll tbg on plastic. Spot power swivel on containment-R/U pwer swivel. P/U 1-jt of 3.5" tbg. Pump 80-bbls of high vis polymer, displace w/ 50-bbls. Rotate tbg w/ swivel and Cut 3.5" tbg @ 7210'- R/D power swivel. L/D 1-jt of 3.5" tbg. Fill casing w/ 29-bbls of polymer-POOH w/ 226-jts of 3.5" tbg, x/o, (4) DC, Bushing, L/D 2-jts of 6" wash pipe, L/D cut 3.5" tbg, L/D 6" cutter-RIH w/ 5.75" overshot loaded w/ 3.5" grapple, LBS, Jar, (4) 4.75" DC, Slinger, X/O, 48-jts of 3.5" tbg, to 1620'-SWI. Secure well and rig.
12/1/2016	Safety meeting. (crane and lifting equipment). Serivce rig and equipment. Field pressue 1284-psi-Continue RIH w/180-jts of 3.5" tbg, p/u 8' pup jt. Ingage fish @ 7210'-Jar on seals, start @ 120k and work up to 130k no movement-Release overshot. L/D 2-jts and 8' pup jt-POOH w/ 178-jts of 3.5" tbg, tail @ 1620'-SWI. Secure rig.
12/2/2016	Safety meeting. (High Winds). Serivce rig and equipment. Field pressue 1284-psi-Windy conditions, 35-mph, Stand by. Shut down due to windy conditions.
12/5/2016	Safety meeting. (fire hazard). Serivce rig and equipment. Field pressue 1289-psi-Continue POOH w/ 48-jts of 3.5" tbg, X/O, L/D slinger, stand back (4) DC, L/D Jar and LBS, L/D overshot-RIH w/ 7-1/2" x7-3/8" shoe, 1-jt of 7-3/8" wash pipe, Bushing, X/O, (4) 4-3/4" DC, X/O, 228-jts of 3.5" tbg T/ 7225'-N/U flange and circulating head. P/U Power swivel. P/U 1-jt of 3.5" tbg, tag @ 7228'-Begin milling over packer F/ 7228'. It takes 3200 ft lbs to 4000 ft lbs to rotate tools. Pull up to 7225'. Reverse 2x tbg volume-SWI. Secure well and rig.
12/6/2016	Safety meeting. (slips, trips, falls). Serivce rig and equipment. Field pressue 1289-psi-R/D power swivel, N/D flange and PGSR. L/D 5-jts of 3.5" yellow tbg. Move power swivel off location-Move wash pipe trailer off loaction. Spot Weatherford L/D trailer on containment. Spot pipe racks on plastic-POOH L/D 184-jts of 3.5" tbg, tail @ 1541'. Note: Rotate tbg @ 6080', 1800 ft lbs. Rotate tbg @ 4968', 1400 ft lbs. Rotate tbg @ 4077', 1200 ft lbs. Rotate tbg @ 2967', 700 ft lbs-SWI. Secure well and rig.
12/7/2016	Safety meeting. (pinch points). Serivce rig and equipment. Field pressue 1283-psi-Continue L/D 40-jts of 3.5" tbg-Crane loading 224-jts of 3.5" tbg from pipe racks onto trailers-Crane unloading 246-jts of 3.5" PH/6 tbg from trailers to pipe racks. Tally tbg-RIH P/U 48 jts of 3.5" PH/6 tbg, tail @ 1650'- SWI. Secure well and rig.
12/8/2016	Safety meeting. (working w/ chemicals). Serivce rig and equipment. Field pressue 1286-psi- Contiue RIH P/U 179-jts of 3.5" PH/6 tbg, tail @ 7221'-Move pipe racks and pipe wrangerler. Spot pipe trailer and power swivel-SWI. Secure well and rig.
12/9/2016	Safety meeting. (heat /cold stress). Serivce rig and equipment. Field pressue 1289-psi-N/U flange and circulating head. P/U Power swivel. P/U 1-jt of 3.5" tbg, tag @ 7228'-Begin milling over packer F/ 7228' T/ 7230'. Packer stuck in wash pipe. Come up and Unable to go down-R/D power swivel, N/D flange and PGSR. L/D 2-jts of 3.5" tbg-POOH slow w/ 178-jts of 3.5" tbg, tail @ 1667'-SWI. Secure well and rig.
12/12/2016	Safety meeting. (vehicle or heavy equipment). Serivce rig and equipment. Field pressue 1289-psi-Ajust containment under swivel and pipe trailer-Continue POOH w/ 48-jts of 3.5" tbg, X/O, 4-DC, bushing, L/D 1-jt of wash pipe and 1-shoe. Found thin pieces of metal in wash pipe-RIH w/ 5.75" overshot loaded w/ 3.5" grapple, LBS, Jar, (4) 4.75" DC, Slinger, X/O, 228-jts of 3.5" tbg. Ingage fish @ 7211'. Packer draging up hole. L/D 2-jts of 3.5" tbg-Slowly POOH w/ 108-jts of 3.5" tbg, tail @ 3828'-SWI. Secure well and rig.
12/13/2016	Safety meeting. (overhead utilities). Serivce rig and equipment. Field pressue 1291-psi-Continue POOH w/ 118 jts of 3.5" tbg, x/o, Slinger, (4) DC, strip on 8-5/8" casing stub, POOH w/ jar, LBS, overshot and fish. L/D cut piece, seals and packer-Unload sracper from trailer. RIH w/ 8-5/8" scraper, bumper sub, (4) 4.75" DC, X/O, 226-jts of 3.5" tbg, P/U 5-jts of 3.5" tbg, tag TOL @ 7278'. L/D 1-jt of 3.5" tbg-POOH w/ 90-jts of 3.5" tbg, tail @ 4480'-SWI. Secure well and rig.
12/14/2016	Safety meeting. (crane and lifting equipment). Serivce rig and equipment. Field pressue 1291-psi-Continue POOH w/ 140-jts of 3.5" tbg, L/D (4) DC on trailer w/ crane, L/D BS and scraper-Load all Weatherford fishing equipment, collars and fishing baskets. Send back to Weatherford-Load out power swivel and spot off location on containment-Off load 15-jts of 2-1/16" tbg and all handling equipment. Tally 15-jts of 2-1/16" tbg-RIH w/ 2-1/16" pup jt and 15-jts of 2-1/16" tbg, x/o's, 218-jts of 3.5" tbg, tail @ 7250'-SWI. Secure well and rig.
12/15/2016	Safety meeting. (underground utilities). Serivce rig and equipment. Field pressue 1291-psi-Continue RIH w/ 13-jts of 3.5" tbg, tag fill @ 7644'. N/U flange and circulating head-C/O fill F/ 7644' T/ 7671'. Reverse 3X tbg volume @ 7671'- L/D 2-jts of 3.5" tbg, N/D flange and PGSR-POOH w/ 230-jts of 3.5" tbg, x/o, L/D 15-jts of 2-1/16" tbg and pup jt-RIH w/ 40-jt kill string, tail @ 1246'-SWI. Secure well and rig.
12/16/2016	Safety meeting. (watch for rock in road after heavy rain). Serivce rig and equipment. Field pressue 1291-psi-POOH w/ 40-jt kill string-N/U X/O flange and shooting flange-R/U DI Drill survey truck. Survey F/ surface T/ 7671'POOH. R/D DI drill-N/D X/O flange and shooting flange-RIH w/ 8 -5/8" RBP, 40-jts of 3.5" tbg, tail @ 1263'-SWI. Secure well and rig.
12/19/2016	Safety meeting. (windy conditions). Serivce rig and equipment. Field pressue 1291-psi-Windy conditions, 35-mph, Stand by. Shut down due to windy conditions 41-mph.
12/20/2016	Safety meeting. (slips,trips,falls). Serivce rig and equipment. Field pressue 1290-psi-Continue RIH w/ 193-jts of 3.5" tbg-P/U 1-jt w/ king swivel, tag TOL @ 7278'. Pull up 10' and set RBP 7268'-Test casing to 500-psi and it leaks off to 0 @ 7268'. Release RBP, Pull up and unable to set @ 7215'. Go back and tag LT @ 7278'. Set again @ 7268'. Release and set @ 7218'. Test casing and it leaks again at the same rate 500 to 0 psi in a couple of minutes. Release RBP and L/D king swivel-POOH w/ 116-jts of 3.5" tbg, tail @ 4861'-SWI. Secure well and rig.

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RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County Los Angeles

Well Ward 3 A Sec. 27, T3N, R16W, S.B. B&M

A.P.I. No. 03722306 Name Tom McMahon (Person submitting report) Title SIMP Manager (President, Secretary, or Agent)

Date 4/27/2017 (Month, day, year)

Signature

Address PO Box 2300, SC9365, Chatsworth, CA 91313-2300 Telephone Number 714-398-5020

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, and initial production data.

Start Date	Ops this Report (DOGGR)
12/21/2016	Safety meeting. (crane and lifting equipment). Serivce rig and equipment. Field pressue 1292-psi-POOH w/ 116-jts of 3.5" tbg, 8' pup jt, retrieving tool and RBP. Unloader was stuck open. Load out RBP onto truck-RIH w/ 8-5/8" RBP, 8' pup jt, 190-jts of 3.5" tbg. Stacking out @ 5900'. Work RBP free and drag up the hole 10' T/ 5890'. Tried 2 times and same results-R/U pump and hoses. Spot 64-bbls high vis pill. R/D hose and pour boy swivel-Pooh w/ 150-jts of 3.5" tbg, RBP @ 1263'-SWI. Secure well and rig.
12/22/2016	Safety meeting. (heat/cold stress). Serivce rig and equipment. Field pressue 1292-psi-Windy conditions, 35-mph +, Stand by-POOH w/ 40-jts 3.5" tbg, 8' pup and Baker 8-5/8" RBP. Brake down and load onto truck-RIH w/ bull nose and (2) 7.6" string mills, 8' pup jt PH/6, X/O, 190-jts of 3.5" tbg, tag @ 5887'. L/D 1-jt of 3.5" tbg-N/U flange and circulating head. Spot power swivel. R/U Power swivel. P/U 1-jt of 3.5" tbg-Begin milling F/ 5885' T/ 5892'. Pull mill up T/ 5883'-Circulate 2x bg volume @ 5883'- SWI. Secure well and rig.
12/27/2016	Safety meeting. (vehicle or heavy equipment). Serivce rig and equipment. Field pressue 1294-psi-Spot 80-bbls high vis pill down tbg-Stand by 35-mph + winds. Shit down due to 35-mph + winds.
12/28/2016	Safety meeting. (overhead utilities). Serivce rig and equipment. Field pressue 1294-psi-R/D power swivel, N/D flange and PGSR. L/D 2-jts of 3.5" tbg-POOH w/ 188-jts of 3.5" tbg, L/D string mill assembly-RIH w/ 7.6" single string mill, X/O, 8' pup jt PH/6, 190-jts of 3.5" tbg, tag @ 5887'. L/D 1-jt of 3.5" tbg-N/U flange and circulating head. R/U Power swivel. P/U 1-jt of 3.5" tbg and make connection-Begin milling F/ 5892' T/ 5909'. Pull up T/ 5883'.-Circulate 2x tbg volume @ 5883'-SWI. Secure well and rig.
12/29/2016	Safety meeting. (underground utilities). Serivce rig and equipment. Field pressue 1295-psi-Continue milling F/ 5909' T/ 5917', fell thru @ 5917' and slide down T/ 5945'-Reverse 2x tbg volume @ 5945'-R/D power swivel, N/D flange and PGSR. L/D 1-jts of 3.5" tbg-Continue RIH slow w/ 12-jts of 3.5" tbg, stack out @ 6287'-POOH w/ 162-jts of 3.5" tbg, tail @ 1262'-SWI. Secure well and rig.
12/30/2016	Safety meeting. (slips,trips,falls). Serivce rig and equipment. Field pressue 1294-psi-POOH / 40-jts of 3.5" tbg, 8' pup jt, L/D string mill-Off load tools from trailer w/ crane. Tally and picture tools-RIH w/ 7.57" string mill, 3.5" jars, (2) jts of 3.5" HWDP, X/O, 8' pup jt PH/6, 196-jts of 3.5" tbg, tag @ 6116'. Pull 2-jts, tail @ 6110'-SWI. Secure well and rig.
1/3/2017	Safety meeting. (crane and lifting equipment). Serivce rig and equipment. Field pressue 1296-psi-POOH w/ 184-jts of 3.5" tbg. Change of plans-RIH w/ 186-jts of 3.5" tbg, tag @ 6116'. Stand back 2-jt-N/U flange and circulating head. R/U Power swivel. P/U 1-jt of 3.5" tbg-Begin milling F/ 6116' T/ 6118' fell thru T/ 6145'. Circulate 1x tbg volume @ 6145'-R/D power swivel, L/D 1-jt of 3.5" tbg-Continue RIH w/ 10-jts 3.5" tbg, tag @ 6375'. Stand back 2-jts-R/U Power swivel. P/U 1-jt of 3.5" tbg-Begin milling F/ 6375' T/ 6377'. Circulate 2x tbg volume @ 6377'. Tail @ 6372'-SWI. Secure well and rig.
1/4/2017	Safety meeting. (heat/cold stress). Serivce rig and equipment. Field pressue 1296-psi-Continue milling F/ 6377' T/ 6382' fell thru @ 6382' T/ 6394'. Circulate 1x tbg volume-R/D power swivel, L/D 1-jt of 3.5" tbg-Continue RIH w/ 30-jts 3.5" tbg, tag TOL @ 7278'. R/U king swivel.Pull up 2' T/ 7276'-Reverse Circulate 2x tbg volume @ 7276'-L/D king swivel and 2-jts of 3.5" tbg. N/D flange and PGSR- POOH w/ 230-jts of 3.5" tbg, L/D 8' pup, X/O, (2) jts of 3.5" HWDP, 3.5" jars, 7.57 string mill-Unload sracper from trailer.RIH w/ 8-5/8" scraper, bumper sub, X/O, 8' PH/6 pup jt,72-jts of 3.5" tbg, tail @ 2557'-SWI. Secure well and rig.
1/5/2017	Safety meeting. (fire hazard). Serivce rig and equipment. Field pressue 1290-psi-Continue RIH w/ 162-jts of 3.5", tag TOL @ 7278'-R/U king swivel. Tag and Pull up 2' T/ 7276'. Reverse Circulate 2x tbg volume @ 7276'. L/D king swivel and 2-jts of 3.5" tbg-POOH w/ 192-jts of 3.5" tbg, tail @ 1264'. SWI- R/O power swivel and move off locaton. N/U shooting flange on X/O spool. Help crane load Baker tools and mills -Secure well and rig.
1/6/2017	Safety meeting. (wireline logging). Serivce rig and equipment. Field pressue 1290-psi-POOH w/ 40-jt kill string, L/D 8-5/8" scraper assembly-N/U X/O spool w/ shooting flange. R/U Schlumberger CBL tools w/ lubricator. Log well F/ surface T/ 7278'. Log well F/ 7278' T/ surface. R/D SLB wireline. N/D spool-RIH w/ 5.5' scraper, BS, 2-jts of 2-7/8" tbg, X/O, 40-jts of 3.5" tbg, tail @ 1320'-SWI. Secure well and rig.
1/9/2017	Safety meeting. (working w/ chemicals) Serivce rig and equipment. Field pressue 1294-psi-Continue RIH w/ 194-jts of 3.5" to 7339'. Make sevrel paases w/ scraper F/ 7280' T/ 7339'-R/U pourboy swivel. Reverse Circulate 2x tbg volume @ 7339'. L/D swivel-POOH w/ 196-jts of 3.5" tbg, tail @ 1258'-Secure well and rig.
1/10/2017	Safety meeting. (heat/cold stress). Serivce rig and equipment. Field pressue 1297-psi-POOH w/ 40-jt kill string, X/O, 2-jts 2-7/8" tbg, 5.5" srcaper assembly-N/U spool w/ shooting flange-R/U Western wireline w/ full lubricator. RIH w/ 60-arm caliper tool. Caliper liner F/ 7386' T/ 7278'-Off load 2-pallets of sand from Halliburton truck. Tally and move 4-jts of 2-7/8 tbg to trailer-RIH w/ 6-jts of 2-7/8" tbg, X/O, 232-jts of 35" tbg, tail @ 7393'-Secure well and rig.
1/11/2017	Safety meeting. (vehicle/heavy equiment). Serivce rig and equipment. Field pressue 1297-psi-Spot in crane off load Baker totes and pallet of sand from Halliburton truck. Lift 30 cu ft of 20/40 sand with crane to rig floor. Empty 30 bags of 60 mesh sand into 2-tote-Dump 30 cu ft of 20/40 sand down tubing while trickling water-R/U king swivel and hose. Move pipe up and down 30' while pumping .5-bpm down tbg. R/D king swivel and hose-POOH w/ 40-jts of 3.5' tbg, tail @ 6150'-Secure well and rig.
1/12/2017	Safety meeting. (overhead utilities). Serivce rig and equipment. Field pressue 1297-psi-RIH w/ 41 jts of .5" tbg, tag sand @ 7398'. POOH w/ 7-jts of 3.5" tbg, tail @ 7206'- R/U crane. Hold sand tote over well and Dump 30 cu ft of 60 mess sand down tubing while trickling water-R/U poorboy and hose. Displace tbg w/ 50-bbls polymer. R/D poorboy and hose-POOH w/ 40-jts of 3.5' tbg, tail @ 5964'-Secure well and rig-Change shaker screen F/ #16 T/ #20.

Rec'd 05-04-17 DOGGR Ventura.

RESOURCES AGENCY OF CALIFORNIA
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HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County Los Angeles

Well Ward 3 A Sec. 27, T3N, R16W, S.B. B&M

A.P.I. No. 03722306 Name Tom McMahon (Person submitting report) Title SIMP Manager (President, Secretary, or Agent)

Date 4/27/2017 (Month, day, year)

Signature

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Start Date	Ops this Report (DOGGR)
1/13/2017	Safety meeting. (underground utilities). Serivce rig and equipment. Field pressue 1298-psi-RIH w/ 43 jts of 3.5" tbg, tag sand @ 7282'. POOH w/ 3-jts of 3.5" tbg, tail @ 7206'-Dump 6 cu ft of # 30 sand down tubing while trickling water-R/U poorboy and hose. Displace tbg w/ 50-bbls polymer. R/D poorboy and hose-POOH w/ 20-jts of 3.5' tbg, tail @ 6584'-Wait on sand to settle-RIH w/ 22-jts of 3.5" tbg, tag top of sand @ 7252', circulate down to 7264', reverse 2x tbg volume , tag top of sand @ 7264'-POOH w/ 140-jts 3.5" tbg, tail @ 2925'-Secure well and rig.
1/17/2017	Safety meeting. (crane / lifting equipment). Serivce rig and equipment. Field pressue 1299-psi-POOH w/ 88-jts of 3.5" tbg, X/O, L/D 6-jts of 2-7/8" tbg-RIH w/ 8-5/8" Baker RBP, retrieving tool, 8' pup jt, 83-jts of tbg, R/U king swivel. Set COE @ 2585'-Pull 3-jts of 3.5" tbg. Fill casing and tbg. Test casing T/ 600-psi. No test its leaking 100-psi in 15-minutes. Tryied 3-times same results. Rih w/ 3-jts, release RBP and reset @ 2570'. Pull 3-jts of 3.5" tbg. Test casing T/ 550-psi. No test its leaking 100-psi in 15-minutes. Tryied 2-times same results.POOH w/ 80-jts of 3.5" tbg, 8' pup jt, retrieving tool-RIH w/ 8-5/8" EA retrievamatic Baker packer, X/O, 8' pup jt, 81-jts of 3.5" tbg, set @ 2530'-Test RBP @ 2570' T/ 600-psi, bled down to 200-psi in 3-minutes. Chart Test casing F/ 2530' T/ surface T/ 600-psi for 15-minutes, good test-R/D testing equipment. Release packer. POOH w/ 45-jts of 3.5' tbg, tail @ 1140'-Secure well and rig.
1/18/2017	Safety meeting. (fire hazard). Serivce rig and equipment. Field pressue 1299-psi-POOH w/ 36-jt kill string, x/o, 8' pup jt, L/D packer on trailer-RIH w/ retriving tool, 8' pup jt, x/o, 83-jts of 3.5" tbg-R/U king swivel and hose. Ingauge RBP @ 2570', let equalize for 30-minutes. Release RBP and let rubbers set for 30-minutes. R/O king swivel and hose-POOH w/ 83-jts of 3.5" tbg, 8' pup jt, retrieving toolw/ 8-5/8" RBP. L/D plug-RIH w/ 8-5/8" Baker RBP, retrieving tool, 8' pup jt, 83-jts of tbg, R/U king swivel. Set COE @ 2593'-Pull 3-jts of 3.5" tbg, tail @ 2503'. Chart test RBP & casing T/ 600-psi for 15-minutes, good test- Dump 8 cu ft of sand down tubing while trickling water.Estamated Top of sand @ 2568'.R/U poorboy and hose.Displace tbg w/ 17.5-bbls polymer.R/D poorboy and hose-POOH w/ 80-jts of 3.5" tbg, 8' pup jt, retrieving tool-Clear floor of tools and equiment.R/D work floor and stairs. Spot crane,N/d HYD bag and remove-Secure well and rig.
1/19/2017	Safety meeting. (slips,tips,falls). Serivce rig and equipment. Field pressue 1301-psi-N/D BOP and rmove w/ crane. Get Hot work permit. Cut DSA bolts off well. Pull tbg spool and DSA off and load on cameron truck-N/U X/O spools and 5k double gate BOP. M/u 3" and 2" coflex hoses. R/U working floor-Chart test BOP to 500-psi for 15-minutes, good test. Swi-Spot weatherford pipe wrangler and pipe racks on tight location-Off load 44-jts of 6-5/8" casing w/ crane and tally-Secure rig.
1/20/2017	Safety meeting. (crane / lifting equipment). Serivce rig and equipment. Field pressue 1310-psi-Off load 143-jts of 6-5/8" casing w/ crane and tally total of 187 joints-Secure location-pump pit down to safe level.
1/23/2017	Safety meeting. (pinch points). Serivce rig and equipment. Field pressue 1301-psi-Empty cellar with cellar pump. N/D BOP, N/U X/O spools-Land DSA and tbg spool. N/U w/ cameron hyd wrenchs. Test DSA T/ 250-psi low and 3000-psi high, test tbg spool 250-psi low and 3200-psi high. R/D cameron-N/U BOP and bag, N/U coflex hoses. R/U floor and stairs-Install test hanger and 3.5" pu jt. Test piep rams 250-psi low and 5000-psi high. Test bag 250 low and 3500 high. Note: Cliff Knight w/ Doggr witnessed and approved BOP testing. R/D Weatherford-R/U tbg equipment. RIH w/ retrieving tool, 8' pup jt, x/o, 80-jts of 3.5" tbg, tail @ 2504'-Secure well and rig.
1/24/2017	Safety meeting. (work w/ chemicals). Serivce rig and equipment. Field pressue 1302-psi-N/U X/O and PGSR. RIH w/ 3-jts 3.5" tbg, install king swivel. Tag sand @ 2574'. C/O sand F/ 2574' T 2593'. Reverse 2xtbg volume. Release RBP. L/D king swivel. N/D X/O and PGSR-POOH w/ 83-jts of 3.5" tbg, x/o, 8' pup, retrieving tool w/ RBP. L/D Baker RBP on trailer-N/U x/o and shooting flange. R/U Western wireline w/ full lubricator. RIH w/ 8-5/8" Baker CIBP, set COE @ 2590'. POOH w/ wireline. R/D western. N/D x/o and shooting flange-RIH w/ 3.5" collar, x/o, 84-jts of 3.5" tbg, tag CIBP @ 2595',tbg measurements. Pull 4-jts, tail @ 2492'-Dump 6.5 cu ft of sand down tubing while trickling water. Estamated Top of sand @ 2575'. R/U poorboy and hose. Displace tbg w/ 17.5-bbls polymer. R/D poorboy and hose-Weight on sand to fall-RIH w/ 5-jts of 3.5" tbg, tag Top of sand @ 2575'-POOH w/ 83-jts of 3.5" tbg, x/o, collar-Secure well and rig.
1/25/2017	Safety meeting. (heat/cold stress). Serivce rig and equipment. Field pressue 1302-psi-N/U x/o and shooting flange. R/U Western wireline w/ full lubricator. RIH w/ 4" x 20' perf gun, tag sand @ 2570'. Perf F/ 2550' T/ 2530', 180° phasing, 2-spf, .40" holes. POOH w/ wireline-Open 13-3/8" casing, Chart Test 8-5/8" casing T/ 700-psi for 15-minutes and in bled down 50-psi in 15-minutes. No communication between 8-5/8" and 13-3/8" . Take chart to office-R/D Western wireline. n/d shooting flange and x/o. load all equipment on trailer-RIH w/ 3.5" collar, x/o, 40-jts of 3.5" tbg, tail @ 1251'-Empty cellar with cellar pump. Help gas company rep sniff gas from 13-3/8" gas and take water samples. Unable to get gas sample all water coming out. Load RBP, retieving tool and #4 setting tool in Baker trailer-Secure well and rig.
1/27/2017	Safety meeting. (vehicle/heavy equipment). Serivce rig and equipment. Field pressue 1302-psi-POOH w/ 40-jt kill string, x/o, 3.5" collar-N/U x/o and shooting flange. R/U Western wireline w/ full lubricator. RIH w/ 4" x 20' perf gun, Perf F/ 2530' T/ 2510', 180° phasing, 2-spf, .40" holes. POOH w/ wireline-Open 13-3/8" casing, Chart Test 8-5/8" casing T/ 700-psi for 15-minutes and in bled down 50-psi in 15-minutes. No communication between 8-5/8" and 13-3/8" . Take chart to office-R/D Western wireline. n/d shooting flange and x/o. load all equipment on trailer -Secure well and rig.
1/30/2017	Safety meeting. (overhead utilities). Serivce rig and equipment. Field pressue 1302-psi-N/U X/O and shooting flange. Spot truck. R/U Baker wireline. RIH w/ CBL, neutron, gama ray, log F/ 2570' T/ surface. R/D wireline-Empty cellar with cellar pump. Help gas company rep sniff gas and take sample of gas from 13-3/8" casing valve. Send sample to office-Secure well and rig.

SoCalGas-5.1029

Rec'd 05-04-17 DOGGR Ventura.

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Start Date	Ops this Report (DOGGR)
1/31/2017	Safety meeting. (underground/Utilities). Serivce rig and equipment. Field pressue 1302-psi-N/U X/O and shooting flange. Spot Western wireline truck and unload lubricator & gun-R/U Western wireline w/ full lubricator. RIH w/ 4" x 5' perf gun, Perf F/ 2060' T/ 2055', 90° phasing, 4-spf, .43" holes. POOH w/ wireline-Pump down 8-5/8" casing taking returns in the 13-3/8", 3-bpm @ 150-psi. circulate 250-bbls-R/U Western wireline w/ full lubricator. RIH w/ 8-5/8" Baker CIBP, set COE @ 2000'. POOH w/ wireline. R/D western. N/D x/o and shooting flange. Test plug to 500-psi, good test-RIH w/ Baker CICR stab in tool, X/O, 64-jts of 3.5" tbg T/ 1999'-Remove striping plate. N/U X/O and circulating head. Space out tbg for cement job. Need 13' of pup jts in the moring-Secure well and rig.
2/1/2017	Safety meeting. (crane / lifting equipment). Serivce rig and equipment. Field pressue 1302-psi-space out well with 11' of pup jts. Stab into CICR. Put 500-psi on casing-R/U Halliburton cemeters. Test lines T/ 2500-psi. Pump and circulate out the13-3/8" casimg valve w/ 15-bbls fresh, 171-bbls of cmt (530 sacks), (960 cu ft) displace w/ 15.25-bbls polymer. SITP 500-psi-Pull out of CICR reverse circulate 30-bbls of polymer, send residuals into half bin. Switch valves and circulate down tbg 5-bpm, pumped 131-bbls total- R/D cement equipment. Pull 3' pup and 5' pup jts. N/D X/O and pgsr-POOH w/ 64-jts 3.5" tbg, x/o, Baker stab in. load stab in on trailer-Picture and caliper (4) 4-3/4" drill collars. P/U drill collars and stand back in derrick-Spot power swivel on containment. Have crane lift swivel to floor. Hang power swivel-Secure well and rig.
2/2/2017	Safety meeting. (fire hazard). Serivce rig and equipment. Field pressue 1302-psi-Off load Baker packer plicker, LBS, Jars. Picture and tally Baker tools-RIH w/ Baker packer plucker w/ junk baskets, (4) 4-3/5" DC, LBS, oil Jar, 58-jts of 3.5" tbg, tail @ 1975'-N/U flange and circulating head. R/U Power swivel. P/U 2-jt of 3.5" tbg. Tag CICR @ 2008'-Begin milling CICR F/ 2008' T/ 2010', its sliding down. Circulate 146-bbls-R/D swivel. L/D 2-jts of 3.5" tbg. N/D and remove X/O and PGSR-POOH w/ 58-jts of 3.5" tbg, X/O, (4) DC, jar, LBS, plucker assemble. CICR is not on plucker. Milled down ring was found in shoe-C/O to tbg equipment. Rih w/ 40-jts kill string, tail @ 1247'-Secure well and rig.
2/3/2017	Safety meeting. (slips,trips,falls). Serivce rig and equipment. Field pressue 1304-psi-POOH w/ 40-jt kill string-RIH w/ 5-7/8" short catch w/ 4-5/8" grapple, LBS, Jar, 4-DC, X/O, 59-jts of 3.5" tbg-R/U king swivel and P/U 1-jt, circulate down to fish @ 2012'. Latch fish and pull free. L/D king swivel-POOH w/ 60-jts of 3.5" tbg, x/o, 4-DC, jar, LBS, over shot w/ CICR. Load fishng tool into Baker truck-RIH w/ 7-3/8" rock bit w/ junk basket, (4) 4-3/5" DC, 60-jts of 3.5" tbg T/ 2006'-N/U flange and circulating head. R/U Power swivel. P/U 1-jt of 3.5" tbg. Tag TOC @ 2012'-Begin drilling cement F/ 2012' T/ 2057'. Circulate 3x tbg volume 30-bbls. Pull bit T/ 2035'-Secure well and rig.
2/6/2017	Safety meeting. (pinch points). Serivce rig and equipment. Field pressue 1305-psi- Continue drilling cement F/ 2057' T/ 2065', fell thru T/ 2069'. Circulate 2x tbg volume. R/D power swivel- Test casing T/ 500-psi with 13-3/8" casing open for 15-minutes. It leaked 100-psi in 15-minutes-RIH and stack out @ 2070'. L/D 6-jts 0f 3.5" tbg. RIH w/ 3-stands from derrick. R/U power swivel-C/O cement stringers F/ 2070' T/ 2162', slide down T/ 2256'. Circulate 2x tbg volume. Rack back swivel. RIH w/ tbg from derrick, tag sand @ 2575'. R/U swivel, Clean out sand F/ 2575' T / 2585'-R/D swivel. L/D 1-jts of 3.5" tbg. N/D and remove X/O and PGSR-POOH w/ 78-jts of 3.5" tbg, x/o, 4-DC, L/D junk basket, L/D bit sub, L/D 7-3/8" bit-Make up and RIH w/ 3.5" sawtooth, x/o, 8-5/8" srcaper, BS, (4) 4-3/5" DC, 60-jts of 3.5" tbg T/ 2002'-Secure well and rig.
2/7/2017	Safety meeting. (working w/ chemicals). Serivce rig and equipment. Field pressue 1300-psi-Continue RIH w/ tbg, tag sand @ 2585'. Reverse circulate F/ 2585' T /2595' 100-bbls. Pump strait ahead 150-bbls @ 5-bpm-L/D 1-jt of 3.5" tbg. POOH w/ 78-jts of 3.5" tbg, x/o, 4-DC, L/D BS, L/D 8-5/8" scraper, x/o, 3.5" sawtooth collar-RIH w/ Baker packer plucker w/ junk baskets, (4) 4-3/5" DC, LBS, oil Jar, 77-jts of 3.5" tbg, tail @ 2565'-N/U x/o flange and circulating head. R/U Power swivel. P/U 2-jt of 3.5" tbg. Tag CICR @ 2595'Begin milling CICR F/ 2595' T/ 2596', its sliding down. Circulate 150-bbls-R/D swivel. L/D 1-jt of 3.5" tbg. N/D and remove X/O and PGSR-POOH slow w/ 46-jts of 3.5" tbg, tail @ 1169'-Secure well and rig.
2/8/2017	Safety meeting. (hear/cold stress). Serivce rig and equipment. Field pressue 1305-psi-POOH slow w/ 32-jts of 3.5" tbg, X/O, (4) DC, L/D jar, L/D LBS, L/D plucker assemble w/ CICR on it-RIH w/ 3.5" sawtooth, x/o, 8-5/8" srcaper, BS, (4) 4-3/5" DC, 230-jts of 3.5" tbg, tag top of sand @ 7272'-POOH w/ 230-jts of 3.5" tbg, x/o, 4-DC, L/D BS, L/D 8-5/8" scraper, x/o, 3.5" sawtooth collar-RIH w/ 38-jt kill string, tail @ 1190'-Secure well and rig.
2/9/2017	Safety meeting. (vehicle/heavy equipment). Serivce rig and equipment. Field pressue 1305-psi-POOH w/ 38-jt kill string-Land hanger w/ pup jt. Change pipe rams T/ 6-5/8". Close bag and Test to 500-psi. no leaks-R/U Weatherford 6-5/8" casing equipment-RIH thread locking re-enrty collar, 1-jt of 6-5/8" casing w/ float, 1-jt of 6-5/8" casing, 1-jt of 6-5/8" casing w/ float, 3-jts of 6-5/8" casing, 20' pup, add tread lube on 45-jts of 6-5/8" casing, added centralizers on every jt of casing, tail @ 2240'. Up 45k, down 10k @ 1000'. @ 1500', 68k and 20k, @ 2000', 86k and 24k-Secure well and rig.
2/10/2017	Safety meeting. (overhead utilities). Serivce rig and equipment. Field pressue 1303-psi-Continue RIH w/ 63-jts of 6-5/8" casing installing centralizers on every jt of casing, tail @ 4810'. Up and down weights @ 2500', 104k and 28k, @ 3000', 131k and 31k, @ 3500', 160k and 34k, @ 4000', 190k and 40k, @ 4500', 220k and 44k-Secure well and rig.
2/13/2017	Safety meeting. (underground utilities). Serivce rig and equipment. Field pressue 1303-psi-Continue RIH w/ 57-jts of 6-5/8" 24# casing. Tail @ 7256'. Cameron on location and land casing on slips @ 150k- Spot crane and load 16-jts of 6-5/8" casing onto trailer. R/D Weatherford casing equipment. R/D Weatherford pipe wrangler and pipe racks-Pump 130-bbls of polymer down 6-5/8" casing, send returns to return tank. Switch valves and continue Circulating 236-bbls of fresh polymer. 366-bbls of fresh polymer circulated-Secure well and rig.

Rec'd 05-04-17 DOGGR Ventura.

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County Los Angeles

Well Ward 3 A Sec. 27, T3N, R16W, S.B. B&M

A.P.I. No. 03722306 Name Tom McMahon (Person submitting report) Title SIMP Manager (President, Secretary, or Agent)

Date 4/27/2017 (Month, day, year)

Signature

Address PO Box 2300, SC9365, Chatsworth, CA 91313-2300 Telephone Number 714-398-5020

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, and initial production data.

Start Date	Ops this Report (DOGGR)
2/14/2017	*Safety meeting. (crane / lifting equipment). Serivce rig and equipment. Field pressue 1303-psi-Spot Halliburton on loaction.* R/U pump truck, bulk truck, water truck. Install cement head. Test lines T/ 4500k-high. Pump 10-bbls fresh w/ green dye, 10-bbls spacer-76 bbls/230 sacks of 13 5# of lead cmt & 36 bbls/110 sacks of 14.8 tail, drop wiper plug and displace w/ 245-bbls polymer did not bump plug-final circulating pressure 2800 @ 2 bbls/min. had 5 bbls of green dye fresh water back at surface.Cip @ 9:30am. R/D Halliburton.***EST. TOP OF CEMENT @ 900'***-R/D stairs and floor. Install 4-way sling on BOP. N/D BOP and lift off flange. Cameron on location and pack off casing slips. N/U BOP and test slips to 500-psi, good test.Secure well and rig.
2/21/2017	Safety meeting. (fire hazard). Serivce rig and equipment. Field pressue 1303-psi-Spot crane. Off load DSA and tbg spool from cameron truck. N/D Bag, co-flex hoses, Double gate-Spot Cameron on location. Cut 6-5/8' casing. N/U DSA and tbg spoool. Test DSA 250-low ans 4600-high. Test tbg spool 250-low and 4600-high. R/D Cameron-N/U crossover spool, double gate, land bag. Shut blind rams-Secure well and rig.
2/22/2017	*Safety meeting. (slips,trips,falls). Serivce rig and equipment. Field pressue 1303-psi-Continue N/U bag, co-flex hoses.* R/U floor extentions and strairs-Land hanger w/ 3.5" pup jt. Remove check valve. Test bag T/ 300-L and 3500-H. Test pipe rams, 2" valves, 3" valves, co-flex hoses, choke maifold T/ 300-L and 5k-H. remove pup jt and install check valve. Test blind rams 300-L and 5k-H. R/D Weatherford tester***BOP inspection done by Miguel Oziedo with DOGGR***L/D (4) 4-3/4" drill collars. Bring all 4-3/4" equipment off floor-Picture and tally drilling BHA. RIH w/ 5.75" bit, BS, (4) 4.25" DC, X/O, tally 100-jts of 3.5" PH/6 tbg from derrick, tail @ 3225'-Secure well and rig.
2/23/2017	Safety meeting. (pinch points). Serivce rig and equipment. Field pressue 1306-psi-Continue RIH strapping 126-jts of PH/6 tbg from derrick, tag TOC @ 7123'. L/D 8-jts from derrick-N/U x/o flange and circulating head. R/U Power swivel. P/U 2-jt of 3.5" tbg. Tag TOC @ 7123'-Begin C/O wiper plug and cement F/ 7123' T/ 7165'. Drill out float and cement F/ 7165' T 7180'. Reverse Circulate 3x tbg volume. Pull bit up T/ 7160'-Secure well and rig.
2/24/2017	Safety meeting. (working w/chemicals). Serivce rig and equipment. Field pressue 1306-psi-Continue C/O cement F/ 7180' T / 7224', reverse 2x tbg volume @ 7224'-R/D swivel. L/D 1-jt of 3.5" tbg. N/D and remove X/O and PGSR-POOH w/ 228-jts of 3.5" tbg, x/o, 4-DC, bit sub @ 5.75" bit. Close blind rams and test casing to 1000 -psi, good test- Picture and tally scraper BHA. RIH w/ 6.625" scraper, BS, (4) 4.25" DC, X/O, 229-jts of 3.5" PH/6 tbg, tag @ 7224'-Reverse circulate 2x tbg volume @ 7224'-L/D 1-jt of 3.5" tbg. POOH w/ 114-jts of 3.5" tbg, tail @ 3661'-Secure well and rig.
2/27/2017	Safety meeting. (heat/cold stress). Serivce rig and equipment. Field pressue 1307-psi-POOH w/ 114-jts of 3.5" tbg, x/o, 4-DC, BS, scraper-N/U shooting flange. Spot truck. R/U Baker Hughes wireline. RIH w/ 56-arm caliper, tag @ 7224', log F/ 7224' T/ surface. First HRVT logging tool wouldnt go past well head. L/D tool and RIH w/ back up HRVT logging tool, log F/ surface T / 5700', unable to get past 5700'. Log F/ 5680' T/ surface. R/D wireline-Secure well and rig.
2/28/2017	Safety meeting. (heat/cold stress). Serivce rig and equipment. Field pressue 1310-psi-Spot Schlumberger wireline. R/U SLB. RIH w/ USIT logging tool, Log F/ surface T/ 7220'. Log F/ 7220' T/ surface. R/D SLB wireline- RIH w/ test packer-Secure well and rig.
3/1/2017	Safety meeting. (overhead utilities). Serivce rig and equipment. Field pressue 1309 -psi-Continue RIH w/ test packer, set Halliburton test packer COE @ 4000'-R/U PROS tester. Ernie Blevins w/ DOGGR witnessed and approved pressure integrity test of 6-5/8" 24# casing F/ 7223' T/ surface for 1-hour F/ 9am T/10am, F/ 2348-psi bled T/ 2338-psi. Ernie Blevins w/ DOGGR witnessed and approved pressure integrity test of 6-5/8" 24# casing F/ 4000' T/ surface for 1-hour F/ 10:40am T/ 11:40am, F/ 3789-psi bled T/ 3774-psi. R/D Pros tester-Release Halliburton packer, wait 30-minuites for packer to relax. L/D 1-jt of 3.5" tbg. POOH w/ 128-jts of 3.5" tbg, x/o, test packer. Load packer into Halliburton truck-RIH w/ 5.75" bit, BS, (4) 4.25" DC, X/O, 156 -jts of 3.5" PH/6 tbg from derrick, tail @ 4962'-Secure well and rig.
3/2/2017	Safety meeting. (underground utilities). Serivce rig and equipment. Field pressue 1309-psi-Continue RIH w/ 73-jts of 3.5" tbg, T/ 7220'-N/U x/o flange and circulating head. R/U Power swivel. P/U 1-jt of 3.5" tbg. Tag TOC @ 7223'-Begin C/O cement and float collar F/ 7223' T/ 7256', C/O cement strings F/ 7256' T/ 7267. Circulate well clean @ 7267'-R/D swivel. N/D and remove X/O and PGSR-POOH L/D 15-jts of 3.5" tbg and stand back 108-js of 3.5" tbg, tail @ 3470'-Secure well and rig.
3/3/2017	Safety meeting. (crane / lifting equipment). Serivce rig and equipment. Field pressue 1310-psi-Continue POOH w/ 108-js of 3.5" tbg, x/o, 4-DC, x/o, 5.75" bit. R/D 4.25" tbg equipment-R/U 2-3/8" tbg equipment. RIH w/ 4.75" bit, BS, P/U 15-jts of 2-3/8" PH/6, x/o, 219-jts 0f 3.5" tbg, T/ 7256'-N/U x/o flange and circulating head. R/U Power swivel. P/U 1-jt of 3.5" tbg. Tag @ 7267'-Begin C/O F/ 7267' T/ 7281', power swivel broke down. Call weattherford for repairs. Circulate well clean @ 7281'. Pull bit up T/ 7257'-Secure well and rig.
3/6/2017	Safety meeting. (Slips trips & fallst). Serivce rig and equipment. Field pressue 1310-psi-Continue C/O F/ 7281' T/ 7321', circulate well clean @ 7321'-R/D swivel. N/D and remove X/O and PGSR. L/D 2-jts of 3.5" tbg-POOH w/ 220-jts of 3.5" tbg, x/o, 15-jts of 2-3/8" tbg, BS, 4.75' bit. Note: 3-roller cones missing-RIH w/ 38-jt kill string, tail @ 1177'-Secure well and rig.
3/7/2017	Safety meeting. (fire/hazard). Serivce rig and equipment. Field pressue 1310-psi-POOH w/ 38-jts of 3.5" tbg-Unload 6-Drill collars and tool basket-Picture, caliper tools. RIH w/ 4.75" junk basket, x/o, (6) 3-1/8" DC, x/o, 14-jts of 2-3/8" PH/6 tbg, x/o, 216-jts of 3.5" tbg-N/U x/o flange and circulating head. R/U Power swivel. P/U 1-jt of 3.5" tbg. Tag @ 7321'-Begin circulating with junk basket F/ 7321' T/ 7321'-R/D swivel. N/D and remove X/O and PGSR. L/D 1-jts of 3.5" tbg-POOH w/ 100-jts of 3.5" tbg, tail @ 4335'-Secure well and rig.

Rec'd 05-04-17 DOGGR Ventura.

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HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County Los Angeles

Well Ward 3 A Sec. 27, T3N, R16W, S.B. B&M

A.P.I. No. 03722306 Name Tom McMahon (Person submitting report) Title SIMP Manager (President, Secretary, or Agent)

Date 4/27/2017 (Month, day, year)

Signature

Address PO Box 2300, SC9365, Chatsworth, CA 91313-2300 Telephone Number 714-398-5020

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Start Date	Ops this Report (DOGGR)
3/8/2017	Safety meeting. (slips,trips,falls). Serivce rig and equipment. Field pressue 1312-psi-Safety meeting. (slips,trips,falls). Serivce rig and equipment. Field pressue 1312-psi-POOH w/ 120-jts 3.5" tbg, 14-jts of 2-3/8" tbg, (6) DC's and junk basket. Note: found 1-cone, cement pieces and small slip pieses from CICR-L/D (6) 3-1/8" drill collars due to flared connections-RIH w/ 4.5" junk basket, x/o, 14-jts of 2-3/8" PH/6 tbg, x/o, 221-jts of 3.5" tbg-N/U x/o flange and circulating head. R/U Power swivel. P/U 1-jt of 3.5" tbg. Tag @ 7321'-Begin circulating with junk basket F/ 7321' T/ 7322'-R/D swivel. N/D and remove X/O and PGSR. L/D 2-jts of 3.5" tbg-POOH w/ 50-jts of 3.5" tbg, tail @ 5710'-Secure well and rig.
3/9/2017	Safety meeting. (pinch points). Serivce rig and equipment. Field pressue 1310-psi-POOH w/ 170-jts 3.5" tbg, 14-jts of 2-3/8" tbg, junk basket. *Note: found 2-cones and 1-shaft-Unload 6 serviced 3-1/8" Drill collars and tool basket from trailer. Load 6-used drill collars and tool basket on* trailer-Stand by on tools from Weatherford. Clean location, greese rig and tongs while waiting-Caliper and measure shu. RIH w/ 4" sawtooth shu basket, 14-jts 2-3/8", 148-jts of 3.5" tbg, tail @ 5030'- Secure well and rig.
3/10/2017	Safety meeting. (working w/ chemicals). Serivce rig and equipment. Field pressue 1310-psi-RIH w/ 73-jts of 3.5" tbg T/ 7294'-N/U x/o flange and circulating head. R/U Power swivel. P/U 1-jt of 3.5" tbg. Tag @ 7322'-Begin circulating with junk basket F/ 7322' T/ 7323'-R/D swivel. N/D and remove X/O and PGSR. L/D 2-jts of 3.5" tbg-POOH w/ 220-jts of wet 3.5" tbg, 14-jts of 2-3/8", 4" sawtooth finger basket. Note: found pluged x/o's, pluged with metal and some sand-RIH w/ 4.75" bit, (6) 3-1/8" collars, 14-jts of 2-3/8" PH/6, 30-jts of 3.5" tbg, tail @ 1550'-Secure well and rig.
3/13/2017	Safety meeting. (heat/cold stress). Serivce rig and equipment. Field pressure 1260-psi-RIH w/ 186-jts of 3.5" tbg T/ 7309'-N/U x/o flange and circulating head. R/U Power swivel. P/U 1-jt of 3.5" tbg. Tag @ 7324'-C/O cement F/ 7324' T/ 7376'. Circulate well clean @ 7376'-R/D swivel. N/D and remove X/O and PGSR. L/D 1-jt of 3.5" tbg-POOH w/ 36-jts of 3.5" tbg, tail @ 6255'-Secure well and rig.
3/14/2017	Safety meeting. (vehicle/heavy equipmentt). Serivce rig and equipment. Field pressue 1260-psi-POOH w/ 182-jts of 3.5" tbg, 14-jts of 2-3/8", (6) 3-1/8" DC, BS, 4.75" bit in fair condition-RIH w/ 4.75" sealed bearing bit, (6) 3-1/8" collars, 14-jts of 2-3/8" PH/6, 218-jts of 3.5" tbg T/ 7371'-N/U x/o flange and circulating head. R/U Power swivel. P/U 1-jt of 3.5" tbg. Tag @ 7376'-C/O F/ 7376' T/ 7383'. Circulate well clean @ 7383'-R/D swivel. POOH w/ 5-jts of 3.5" tbg, tail @ 7246'-Secure well and rig.
3/15/2017	Safety meeting. (overhead utilities). Serivce rig and equipment. Field pressue 1311-psi-'-RIH w/ 4-jts of .5" tbg. R/U swivel and p/u 1-jt, tag @ 7383'-C/O F/ 7383' T/ 7437". Circulate well clean @ 7435". Note: drill break F/ 7402' T 7408' R/D swivel. POOH to above liner top @ 7246'-Secure well and rig.
3/16/2017	Safety meeting. (underground utilities). Serivce rig and equipment. Field pressue 1312-psi-RIH w/ 8-jts of .5" tbg. R/U swivel and p/u 1-jt, tag @ 7437'-C/O cement F/ 7437' T/ 7475'-Reverse circulate 3x tbg volume @ 7475'- R/D swivel. N/D and remove X/O and PGSR. L/D 2-jt of 3.5" tbg-POOH w/ 40-jts of 3.5" tbg, tail @ 6255'-Secure well and rig.
3/17/2017	Safety meeting. (crane / lifting equipment). Serivce rig and equipment. Field pressue 1312-psi-POOH w/ 180-jts of 3.5" tbg, 14-jts of 2-3/8", (6) 3 -1/8" DC, BS, 4.75" bit in fair condition. Inspect bit.-RIH w/ 4.75" sealed bearing bit w/ jets taken out, (6) 3-1/8" collars, 14-jts of 2-3/8" PH/6, 212 -jts of 3.5" tbg Tail @ 7185'-N/U x/o flange and circulating head. Tail @ 7185'-Secure well and rig.
3/20/2017	Safety meeting. (fire/hazard). Serivce rig and equipment. Field pressue 1311-psi-RIH w/ 8-jts of .5" tbg. R/U swivel and p/u 1-jt, tag @ 7475'-C/O cement F/ 7475' T/ 7485'. C/O sand F/ 7485' T/ 7658'-Reverse circulate 3x tbg volume @ 7658'-R/D swivel. L/D 2-jt of 3.5" tbg, N/D PGSR. POOH w/ 14-jts of 3.5" tbg, tail @ 7184'-Secure well and rig.
3/21/2017	Safety meeting. (slips,trips,falls). Serivce rig and equipment. Field pressue 1311-psi-POOH w/ 212-jts of 3.5" tbg, 14-jts of 2-3/8", L/D (6) 3-1/8" DC, BS, 4.75" bit in good condition-L/D (4) 4.75" drill collars. Clear floor of all 3-1/8" and 4-3/4" drill collar equipment, load into baskets. Use crane to load out power swivel. Spot tbg racks for L/D pipe-Picture and tally scraper BHA. RIH w/ 5.5" scraper, BS, X/O, 14-jts of 2-3/8" PH/6, 216-jts of 3.5" PH/6 tbg, tag @ 7175'-Secure well and rig.
3/22/2017	Safety meeting. (pinch points). Serivce rig and equipment. Field pressue 1312-psi-RIH w/ 16-jts of 3.5" tbg, tag @ 7648' (10' high)-Reverse circulate fill out F/ 7648' T/ 7658'. Change hole over w/ 300-bbls of fresh polymer-POOH L/D 210-jts of 3.5" PH/6 tbg adding thread protectors on each end, tail @ 1165'- Unload Hydril 563 3.5" production tbg from 1st trailer. Spot thread protector baskets and x/o's-Secure well and rig.
3/23/2017	Safety meeting. (crane / lifting equipment). Serivce rig and equipment. Field pressue 1313-psi-Windy conditions 40-mph winds in derrick-Off load 2nd trailer w/ production tbg. Tally 240-jts of 3.5" 563-hyd tbg. Tally pup jts. Unload Halliburton packer and sleeve from trailer-Unload Weatherford tongs and elevators. Set up tongs and hoses. Function test and set torques-Spot vac truck and wash pump, catch bin and frac tank -Secure well and rig. Take trash to bins. Eot.
3/24/2017	Safety meeting. (Running completiont). Serivce rig and equipment. Field pressue 1313-psi-POOH L/D 22-jts of 3.5" tbg, 15-jts of 2-3/8" tbg, BS, 5.5" scraper w/ 4.75" bit-Change over to 3.5" tbg equipment. Set up tbg tong computer system. Western wireline on ,location and load plug into XN-nipple. X/N nipple 2.813" w/ 2.75" no-go- RIH 3.5" re-entry collar, XN-Nipple (2.75") loaded w/ Western wireline plug, pup jt, 6-5/8" ASI retrievable packer, pup jt, 1-jt of 3.5" L-80 9.3# 563-HYD, pup jt, Sliding sleeve, 1-jt of 3.5" L-80 9.3# 563-HYD. R/U tester and unable to get test. R/U wireline and unable to find plug at 104', went to 200'. plug is gone. R/D wireline. decision was made to keep running pipe to kill string depth and will bundle test when plug is here on Monday-Continune RIH w/ 48-jts of 3.5" L-80 9.3# 563-HYD, tail @ 1619'-Secure wel.

SoCalGas-5.1032

Rec'd 05-04-17 DOGGR Ventura.

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator Southern California Gas Company Field Aliso Canyon County Los Angeles

Well Ward 3 A Sec. 27, T3N, R16W, S.B. B&M

A.P.I. No. 03722306 Name Tom McMahon (Person submitting report) Title SIMP Manager (President, Secretary, or Agent)

Date 4/27/2017 (Month, day, year)

Signature

Address PO Box 2300, SC9365, Chatsworth, CA 91313-2300 Telephone Number 714-398-5020

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, and initial production data.

Start Date	Ops this Report (DOGGR)
3/27/2017	Safety meeting. (working w/ chemicals). Serivce rig and equipment. Field pressue 1314-psi-R/U Western wireline. RIH and set 2.805" plug in xn @ 1614'. Test w/ pros F/ 3756-psi T/ 3736-psi 20-psi drop in 30-minutes. RIH and pull plug F/ 6114'. R/D wireline-Continue RIH w/ 176-jts of 3.5" 9.3# 563-hyd, 10' pup, 4' pup jt, tbg hanger-R/U king swivel w/ 8' pup jt. Circulate 100-bbls of packer fluid down tbg out casing-Set packer COE @ 7150', up weight 84K, down weight 72K. Pull 30k over for 30-minutes. Land hanger,run lock screws.Test casing to 1000-psi for 15-minutes. R/D Weatherford tbg equipment-Secure well and rig.
3/28/2017	Safety meeting. (Heat/cold stress). Serivce rig and equipment. Field pressue 1313-psi-R/U Western wireline. RIH and set (2.813") PXN-plug body in plug @ 7165'. POOH. RIH w/ prong and set in body @ 7165'. POOH. R/D wireline-R/U PROS tester. Ernie Blevins w/ DOGGR witnessed and approved pressure integrity test of 3.5" tbg F/ 7165' T/ surface for 1-hour F/ 9:18am T/10:18am, F/ 3839-psi bled T/ 3836-psi. Ernie Blevins w/ DOGGR witnessed and approved pressure integrity test of 6-5/8" 24# casin and packer F/ 7150' T/ surface for 1-hour F/ 10:42am T/ 11:42am, F/ 1107-psi bled T/ 1106-psi. R/D Pros tester-RIH w/ wireline and shift sleeve open. POOH. R/D Western wireline-R/U Cameron. Set 2-way. R/D floor and stairs. N/D HYD bag, N/D BOP and co-flex hoses-N/U well head. Chart Test bonnet 300-low, 5000-high. Unable to test shell due to tree cap o-ring is bad. R/D cameron-Secure well and rig.
3/29/2017	Safety meeting. (vehicle/heavy equipment). Serivce rig and equipment. Field pressue 1313-psi-Install tree cap. Chart Test shell 300-low, 5000-high. Pull BPV. R/D cameron- Drop wires. RDMO. Load all equipment w/ crane onto trailers. Install guards around well-Remove guards on 32D, 32E, 32F and install 4-1" plates on each well 2" high total-spot plate rig up on. Roll out containment. Spot rig mat on containment-Road rig from Ward 3A to Porter 32C location. Spot rig on jacks-secure location.
4/17/2017	MIRU Premier N2 & Onyx flowback equipment. Pumped N2 through casing taking fluid returns f/ tbg. to tank via separator. Recovered 227 bbls. C.W.I. S.I.S.D.F.N.
4/18/2017	Closed sleeve. Applied pressure. Retrieved prong & plug. Flow tested well. Well went flat. C.W.I.

SoCalGas-5.1033

Ex. I – 55

Elevation: 1995' G.L.
KB: 12'
MV 8'

Observation Well

IW-60

13-3/8" -40# H-40
Cmt'd 505 SX

694'

8-5/8" -36# K55-N80
Cmt'd 600 SX

2-7/8" 6.5# N80 Tbg.

---7039'

---Top of cement 7053'

---7152'

Inr. 7283'

WSO 7285'

shoe 7359'

6-5/8" 28#
J-55 FJ liner

7416'

7454'

7476'

Perfs
4-1/2" per ft.

7550'

7559' -7565'

7580'

7582' TD

---S4 7390' (7154')

---S8 7475' (7232')

7666' (7407') (-5400')

9/12/72 - Well spud.
11/14/72 - Well completed.
7/26/77 - Well pulled and tubing replaced - run with downhole safety system.
7/27/82-8/12/82 - Plugged back and converted to an Observation Well. Plugged with cement from 7582'-7152'. Squeezed holes in casing at 7207'..7250', 7278'. Cut window from 7260'-7280' and squeezed with 10 cu. ft. cement. Ran tubing open-ended and located top of cement at 7053'.

Volume	Cu. Ft.	BBL
Tubing -	229	40.7
Annulus -	2038	362.9
Total -	2267	403.6

5-30-85

Ex. I – 56

SUBMIT IN DUPLICATE

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS

History of Oil or Gas Well

Operator Southern California Gas Co. Field or County Aliso Canyon
Well I. W. #70, Sec. 29, T 3N, R 16W., SB. B. & M.
A.P.I. No. 037-21375 Name P. S. Magruder, Jr. (Person submitting report) Title Agent (President, Secretary or Agent)
Date February 22, 1979, 19

Signature P.S.M. / O. S. Magruder

P.O. Box 3249 Terminal Annex, Los Angeles, Ca. 90051 (Address) (213) 689-3561 (Telephone Number)

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests and initial production data.

Date	
1978	Program: To pull tubing and 5" innerstring. Correct leak in 6 5/8" liner. Set packers in 6 5/8" and 8 5/8" casings and connect with blank tubing. Rerun safety system and return the well to gas storage operation.
12-15	0 Day. Killed well with 400 barrels of 80# brine-polymer completion fluid and began rigging up.
12-16	1st Day. Moved California Production Service Co. rig #D-6 onto wellsite and began rigging up.
12-17	Rig and crew idle.
12-18	2nd Day. Completed rig up. Circulated well. Installed back pressure valve in tubing hanger. Removed tree and installed BOPE.
12-19	3rd Day. Pressure tested blank rams, 2 7/8" pipe rams and choke manifold to 4,000 psi with water and nitrogen for 20 minutes - OK. Tested Hydril bag to 3,000 psi with water and nitrogen for 20 minutes. All tests were witnessed and approved by D.O.G. Released from Otis "Permatrieve" packer at 8,200'. Pulled up to 8,138'.
12-20	4th Day. Laid down 115 joints of 2 7/8" tubing and 121 joints of 2 3/8" tubing. Ran Otis retrieving tool on 2 7/8" drill pipe. Picked up 2,100' of 2 7/8" drill pipe.
12-21	5th Day. Continued picking up 2 7/8" drill pipe. Latched into Otis "Permatrieve" packer at 8,209'. Pulled packer loose - could not pull packer above 8,178'.
12-22	Rig and crew idle.
12-23	Rig and crew idle.

OG 103 (6-78-GSRI-10M)

1978 History of Well Report for I.W. #70, Aliso Canyon

12-24 Rig and crew idle.

12-25 Rig and crew idle.

12-26 6th Day. Retrieved Otis 5" "Permatrieve" packer. Ran 7 5/8" bit and 8 5/8" casing scraper on 2 7/8" drill pipe to 3,894'. Circulated and pulled out of well. Ran 5" inside cutter on 2 7/8" drill pipe and cut 5" casing at 3,916'. Started out of well with cutter.

12-27 7th Day. Pulled 5" cutter out of well. Ran 5" spear and attached to top liner hanger. Retrieved 8 5/8" x 5" liner hanger and 14' of casing. Ran 5" overshot and attached to 5" liner. Ran Free-point and found 5" innerstring free above 7,490'.

12-28 8th Day. Released overshot from 5" innerstring and pulled out of well. Ran 5" inside casing cutter to 7,315' and cut casing. Ran 5" overshot and attached 5" casing. Jarred innerstring loose (180,000#) and started out of well.

12-29 9th Day. Finished pulling out of well with overshot and recovered 5" innerstring from 3,916' to 7,315' (3,399'). Ran 5" spear in well and latched into 5" innerstring at 7,315'. Jarred and pulled 190,000# for one hour. Innerstring would not move. Released spear and started out of well.

12-30 10th Day. Finished pulling out of well with spear. Ran 5" cutter to 7,395' and cut 5" innerstring. Started in well with 5" spear.

12-31 Rig and crew idle.

1979

1-1 Rig and crew idle.

1-2 11th Day. Stood by with crew waiting for wind to subside.

1-3 12th Day. Attached 5" spear to innerstring. Pulled out of well. Recovered 80' of 5" casing from 7,315' to 7,395'. Ran 5" cutter to 7,555' and cut 5" innerstring. Started in well with 5" spear.

1-4 13th Day. Attached 5" spear to innerstring. Pulled innerstring from 7,395' to 7,555' out of well (Recovered 160'). Ran 6 5/8" casing scraper to 7,455' and circulated well. Ran 5" inside cutter to 7,875'. Cut 5" innerstring and started out of well.

1-5 14th Day. Finished pulling out of well with 5" cutter. Ran 5" spear to 7,555' and attached to 5" innerstring. Pulled out of well with innerstring from 7,555' to 7,875' (Recovered 320'). Started in well with 5" inside cutter

1979

History of Well Report for I.W. #70, Aliso Canyon

1-6 15th Day. Cut 5" innerstring at 8,190'. Ran 5" spear and attached to innerstring at 7,875'. Pulled out of well recovering 5" innerstring from 7,875' to 8,217'. Ran 6 5/8" casing scraper to 8,217', circulated well, and started out of well.

1-7 Rig and crew idle.

1-8 16th Day. Finished pulling out of well with 6 5/8" scraper. Ran 6 5/8" retrievable plug and retrievable retainer in well. Set plug at 8,200' and retainer at 8,185'. Pressure tested plug to 1,500 psi - OK. Started out of 6 5/8" casing, pressure testing below retrievable retainer. Isolated hole between 7,488' and 7,518'; had pressure loss of 500 psi in 2 minutes. Pressure tested annulus to 1,500 psi with retainer at 7,488'. Pressure loss of 500 psi in 1 minute. Continued testing 6 5/8" annulus to isolate top hole.

1-9 17th Day. Continued testing 6 5/8" annulus. Isolated top hole between 4,291' and 4,296'. Released retainer and pulled out of well. Reset retrievable bridge plug at 7,618'. Spotted 3 sacks of sand on retrievable plug and pulled out of well. Made up 300' of 2 3/8" tubing tail on retrievable retainer and started in well.

1-10 18th Day. Checked sand fill above retrievable plug at 7,618'. Mixed and spotted 5 sacks of sand on plug at 7,618'. Conditioned mud.

1-11 19th Day. With tubing tail at 7,530', mixed spotted and balanced 25 sacks (29 cu.ft.) of class "G" cement with 0.75% "CFR-2" from 7,530' to 7,380'. Pulled tail to 7,200', backscuttled drill pipe; set retrievable retainer and displaced 2 cu.ft. of cement out casing at 1,500 psi in 2 hours. Shut well in for four additional hours. Released retainer and pulled out of well. Started in well with 6 5/8" casing scraper and 5 5/8" bit.

1-12 20th Day. Drilled out cement from 7,488' to 7,530'; cleaned out to 7,598'. Ran retrievable retainer to 4,800'. Pressure tested below retainer to 1,000psi (Held OK). Started out of well.

1-13 21st Day. Finished pulling out of well with retrievable retainer. Made up 180' of tubing tail on 6 5/8" retainer; ran tail to 4,394'. With retainer at 4,204', spotted, equalized, and balanced 25 sacks of class "G" cement with 0.75% "CFR-2" from 4,394' to 4,244'. Pulled tail up to 4,210', backscuttled tubing and set retainer. Displaced 23 cu.ft. at 1,500 psi with pressure dropping to 1,200 psi. Shut well in for four hours. Released retainer and pulled out. Ran 6 5/8" bit and scraper to 5,000'. Did not find any cement. Started out of well.

1-14 Rig and crew idle.

1979 History of Well Report for I.W. #70, Aliso Canyon

1-15 22nd Day. Pulled out of well with bit and scraper. Made up Johnston "Positrieve" squeeze tool and ran in well. Set squeeze tool at 4,324'. Tested casing with 1,500 psi for 15 minutes, OK. Pulled up to 4,268' and set squeeze tool. Pressured up to 1,500 psi. Pressure bled down to 800 psi and held. Pulled out of well and made up Johnston "Bobcat" bridge plug. Ran in well and set bridge plug at 4,400'. With pipe hung at 4,396', pumped 5 sacks of sand on top of bridge plug. Tagged sand at 4,390' and pulled up to 2,000'.

1-16 23rd Day. Pulled out of well. Ran 8 5/8" squeeze tool with 381' of 2 3/8" tubing tail. With 2 3/8" tubing hung at 4,296', pumped 25 cu.ft. of water ahead of 50 sacks of class "G" cement with 0.75% "CFR-2" with 5 cu.ft. water behind. Displaced with 95 cu.ft. of mud. Pulled up to 3,816'. Backscuttled out. Set squeeze tool at 3,435'. Squeezed 3 cu.ft. out holes at 1,500 psi. Pulled out of well. Made up 5 5/8" bit and 6 5/8" casing scraper. Ran in well and drilled out cement from 4,046' to 4,325'. Cleaned out to 4,392'. Pulled up to top of 6 5/8" liner.

1-17 24th Day. Tested from 4,400' to surface with 1,000 psi for 20 minutes, OK. Pulled out of well with bit and scraper. Made up Johnston retrieving tool and ran in well. Circulated sand out and retrieved bridge plug from 4,400'. Ran in well and cleaned out sand from 7,593' to 7,618'. Retrieved bridge plug from 7,618'. Made up 3 7/8" bit and casing scraper.. Ran in well to 2,362'.

1-18 25th Day. Ran in well with 3 7/8" bit and 4 1/2" casing scraper. Cleaned out fill from 8,522' to 8,672'. Changed over from 74# to 68# polymer completion fluid. Pulled out of well with bit and scraper (lost two cones in well). Made up Servco 3 7/8" mill on 2 3/8" tubing. Ran in well milling on junk. Pulled up to 7,983'.

1-19 26th Day. Ran in well. Milled on junk from 8,672' to 8,676'. Pulled out of well and made up Midway washover junk shoe with wire fingers inside. Ran in well. Washed over junk from 8,676' to 8,680'. Pulled out of well and recovered no junk. Ran in well to 2,000' with 3 7/8" mill.

1-20 27th Day. Pulled out of well. Made up Servco 3 3/4" junk mill and ran in well. Milled on junk from 8,680' to 8,687'. Pulled out of well. Made up Servco 3 3/4" "Econo-mill" and ran in well.

1-21 Rig and crew idle.

1-22 28th Day. Cleaned out with 3 3/4" O.D. Servco "Econo-mill" from 8,687' to 8,698'. Mill stopped. Pulled out of well, ran new 3 3/4" O.D. "Econo-mill" and cleaned out from 8,698' to 8,702'.

1-23 29th Day. Cleaned out well with Servco "Econo-mill" from 8,702' to 8,704'. Pulled out of well and ran 3 3/4" O.D. Servco junk mill. Measured in well. Corrected clean out depth to 8,764'. Started out of well.

1979 History of Well Report for I.W. #70, Oso Canyon

1-24 30th Day. Ran 555' of 2 3/8" tubing tail on 2 7/8" drill pipe to 8,733'. Mixed spotted and balanced 5 sacks of sand in well. Filled from 8,764' to 8,748'. Mixed, spotted and balanced 10 additional sacks of sand in well, waited 2 hours and cleaned excess fill out to 8,712'.

1-25 31st Day. Tagged fill at 8,677'. Backscuttled out to 8,710' and pulled out of well. Ran 4 1/2" casing scraper to 8,710'. Pulled out of well. Made up 4 1/2" wash tools and started in well.

1-26 32nd Day. Washed liner from 8,710' to 8,230'. Pulled out of well with wash tool. Started in well with sawtooth collar on 600' of 2 3/8" tubing tail.

1-27 33rd Day. Cleaned out fill from 8,702' to 8,710'. Circulated well, then backscuttled well. Pulled out of well and installed 4 1/2" wash tools on 600' of 2 3/8" tubing. Started in well.

1-28 Rig and crew idle.

1-29 34th Day. Spotted 15% acid (10% HCL and 5% HF) to Atlas wash tools; washed from 8,710' to 8,620', acid back-check valve failed. Backscuttled acid out of well and started out of well. Drill pipe parted 1,024' from surface. Ran 7 5/8" x 3 7/8" Bowen overshot and 3 1/2" bumper sub to 1,024'; attached overshot to fish and pulled out of well. Recovered all fish (7,116' 2 7/8" drill pipe and 570' of 2 3/8" tubing with Atlas wash tool).

1-30 35th Day. Laid down and loaded out 2 7/8" drill pipe. Unloaded 2 7/8" tubing and started in well.

1-31 36th Day. Finished picking up 2 7/8" tubing. Installed 555' of 2 3/8" tubing tail and 4 1/2" wash tool on 2 7/8" tubing and started in well.

2-1 37th Day. Using 10% HCL and 5% HF acid with inhibitor, washed perforations from 8,710' to 8,230' (30 gallons per foot). Circulated spent acid out of well, and started out of well with wash tools.

2-2 38th Day. Pulled 4 1/2" washing tools out of well. Ran 6 5/8" Retrievable retainer to 8,212'. Pressure tested annulus at 1,000 psi for 30 minutes. Pulled 6 5/8" Retrievable retainer out of well. Ran 6 5/8" Otis "Permatrieve" packer and set at 8,194'. Started out of well with line when engine on truck failed. Shut well in with 8,000' of line in well by packing off lubricator and closing Hydril bag.

2-3 39th Day. Retrieved McCullough wireline from well leaving wireline setting tool and collar locator.

2-4 Rig and crew idle.

2-5 40th Day. Ran 4 11/16" O.D. x 2 1/2" overshot on 2 7/8" bumper sub to 8,194', attached to wireline setting tool and retrieved from well. Ran Otis seal assembly to 6 5/8" "Permatrieve" packer at 8,192'. Pressure tested to 500 psi, OK. Spotted inhibited mud from 8,190' to 3,800'. Pulled out of well laying down excess 2 7/8" tubing and 2 3/8" tubing tail.

2-6 41st Day. Finished pulling out of well. Set 8 5/8" Otis "Permatrieve"

2-6 Continued

packer on electric line at 3,915'. Ran Otis latch-type seal to packer and pressure tested to 1,500 psi, Ok. Pulled out of well, changing collars.

2-7 42nd Day. Made up Otis Production tube and 3.25" O.D. x 16' seal assembly on 3 1/2" Hydril flush joint tubing and started in well pressure testing to 5,000 psi for 1 minute.

2-8 43rd Day. Finished picking up 3 1/2" flush joint tubing; made up Otis 4" x 4' latch-type seal assembly, 10' blast joint, 2.25" NO-GO nipple, 20' blast joint, and 2 7/8" Otis Annular flow safety system; ran assemblys to their pack off seats; checked lower seal spacing when top packer latch was in place (6' of seals below packer, 8' of seals above packer). Installed doughnut and landed in tubing head with 10,800# setdown weight on top packer at 3,915'. Installed back pressure valve in doughnut. Removed BOPE and installed tree.

2-9 44th Day. Pressure tested tree and doughnut seals to 5,000 psi. Removed back pressure valve and retrieved Otis separation tool from safety mandrel. Displaced 68# polymer completion fluid from well with 63# lease water. Closed well in, blind flanged valves and released rig at 7:00 p.m.

Ex. I – 57

FORM 103

SUBMIT IN DUPLICATE

STATE OF CALIFORNIA

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF OIL AND GAS

History of Oil or Gas Well

OPERATOR GETTY OIL COMPANY, Operator FIELD ALISO CANYON

Well No. SFZU P-45, Sec. 27, T. 3N, R. 16W, S.B. B. & M.

Date March 3, 1969 Signed C. G. Nelson
C.G. Nelson

P.O. Box 811, Ventura, Calif. 643-2154 Title Agent
(Address) (Telephone Number) (President, Secretary or Agent)

It is of the greatest importance to have a complete history of the well. Use this form to report a full account of all important operations during the drilling and testing of the well or during re-drilling, altering of casing, plugging, or abandonment with the dates thereof. Be sure to include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, shooting and initial production data.

1969
Date

HISTORY

1/15-21

C.P.S. Hoist moved in, rigged up. Rigged up swab and lubricator. Checked surface pipe and 7" casing, found pressures equalized - indicating possible casing failure at shallow depth, or packing leaking in head. Filled hole with 150 barrels salt water, circulated. Removed tree and installed B.O.P.E. Pulled tubing. Began running Johnston bridge plug; bridge plug stopped at 710'. Pulled out. Ran open ended tubing OK to 7497'. Circulated with lease water (6:30 A.M. to 3:00 P.M.) Pulled out. Ran 6" O.D. impression block OK to 850'; hit no tight spots, but reflected imprint of 7" casing stub, indicating casing possibly parted. Ran 6" bit and 7" casing scraper OK to 850': found no tight spots. Ran Johnston bridge plug to 7300'; pulled back - set bridge plug at 7220'. Circulated 1 1/2 hours, no gas in returns. Ran Johnston Tension 7" packer to 810': Tested 7" casing for leaks at 1500#. Found break in 7" casing at 177'. Tested packoff in 7" landing head to 500# O.K. Laid down Johnston tools. Ran 2 7/8" open end tubing to 3000' and circulated. Pulled out. Pulled casing from break at 178'. Ran Bowen 7" casing cutter, cut 7" casing at 185': Reran 7" casing with Burns 7" lead seal casing bowl. Retrieved bridge plug from 7300'. Circulated 2 hours. Reset plug at 240'. Tested casing OK. Laid down bridge plug. Hydrotested tubing and gas lift equipment. Could not set packer at 7485' or 7300'. Pulled out. Found 4' pup unscrewed from MM mandrel, left MM mandrel, 30' tubing and packer in hole. Ran Midway tools, recovered all of fish. Reran tubing, set packer OK at 7485'. Installed gas lift valves and packer and moved out.

Casing Record

10 3/4" 40.5# c 505'
7" 23 & 26# effec. to 7600'
Casing Bowl at 185'
WSO 4 h's 7390'*
J.P. 4 h's (Seg) 7510'(Cmtd);
7511' (Cmtd.) and 7444'
G.P. 4 h/ft 7520-7595'
Ineffec. Csg. Below Retainer at 7600'
48'-7" c 7648'
WSO shoe at 7648'*
G.P. 4 h/ft 7613-7633' (Cmtd.)
*Witnessed and approved by D.O.G.

DIVISION OF OIL AND GAS
RECEIVED
MAR 4 1969
INGLEWOOD, CALIFORNIA

SoCalGas-5.1044

SoCalGas-5.1045

FORM 111

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS

REPORT ON PROPOSED OPERATIONS No. P 169-248

Mr. C. G. Nelson, Agent
GETTY OIL COMPANY, OPERATOR
P. O. Box 811
Ventura, California 93002

Inglewood, Calif.
March 10, 1969

DEAR SIR:

Your (037-00732) proposal to alter casing Well No. "SFZU" P-45, Section 27, T. 3 N, R. 16 W, S.B. B. & M., Aliso Canyon Field, Los Angeles County, dated 3/3/69, received 3/4/69, has been examined in conjunction with records filed in this office.

With reference to your notice our decision is as follows:

DECISION
THE PROPOSAL IS APPROVED.

RR:nw

cc C. G. Nelson

Blanket Bond

F. E. KASLINE, State Oil and Gas Supervisor

By [signature], Deputy

SoCalGas-5.1046

FORM 107

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS

RECEIVED
MAR 4 1969
INGLEWOOD, CALIFORNIA

Notice of Intention to Deepen, Redrill, Plug or Alter Casing in Well

This notice must be given before work begins; one copy only

Ventura, Calif. March 3, 1969

DIVISION OF OIL AND GAS

In compliance with Section 3203, Chapter 93, Statutes of 1939, notice is hereby given that it is our intention to commence the work of ~~deepening, redrilling, plugging~~ or altering casing at Well No. "SFZU" P-45 (037-00732)
(Cross out unnecessary words)

, Sec. 27, T. 3N, R. 16W, S.B. B. & M.

Aliso Canyon Field, Los Angeles County.

The present condition of the well is as follows:

1. Total depth. T.D. 8835'; Pg. 7600'

2. Complete casing record, including plugs:

10 3/4" 40.5# c 505'
7" 23, 26# effec. to 7600'
WSO 4 h's 7390'*
J.P. 4 h's (Seg.) 7510' (Cmtd); 7511' (Cmtd) and 7444'
G.P. 4 h/ft 7520-7595'
Ineffec. Casing Below Retainer at 7600'
48'-7" c 7648'
WSO shoe at 7648'*
G.P. 4 h/ft 7613-7633' (Cmtd)

*Witnessed and approved by D.O.G.

3. ~~Last produced~~ Presently flowing 58 BOPD; 2 BWPD; 290 MCF
(Date) (Oil, B/D) (Water, B/D) (Gas Mcf/D)

The proposed work is as follows: Repair 7" casing (parted at 185') with Burns casing bowl.

Alter casing

MAP	MAP BOOK	CARDS	WELL	FORMS 114	FORMS 121
			B	ARG	ARG

P.O. Box 811, Ventura, Calif.
(Address)

643-2154
(Telephone No.)

GETTY OIL COMPANY, Operator
(Name of Operator)

By C. G. Nelson
C.G. Nelson, Agent

ADDRESS ONE COPY OF NOTICE TO DIVISION OF OIL AND GAS IN DISTRICT WHERE WELL IS LOCATED

SoCalGas-5.1047

Getty Oil Company P.O. Box 811, Ventura, California 93001 | (805) 643-2154

March 3, 1969

DIVISION OF OIL AND GAS
RECEIVED
MAR 4 1969
INGLEWOOD, CALIFORNIA

Division of Oil & Gas
830 N. La Brea Avenue
Inglewood, California 90302

Gentlemen:

In reviewing the well history on our well SFZU P-45, it was determined that no Form 107 (Notice of Intention to Perform Work) had been submitted to your office outlining a recent casing repair.

On January 15, 1969 the well was entered for routine remedial work, at which time the 7" casing was found to be parted at 178'. The casing was pulled from the depth of the part, and cut at 185'. A Burns casing bowl was run with 7" casing and set at 185'.

The attached form 107 and Well History detail the work performed.

Very truly yours,

GETTY OIL COMPANY

C. G. Nelson

C. G. Nelson, Agent

EJH:brm

Attachments

Ex. I – 58

SUBMIT IN DUPLICATE

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS

DIVISION OF OIL AND GAS
RECEIVED
DEC - 1 1977
SANTA PAULA, CALIFORNIA

History of Oil or Gas Well

Operator SOUTHER CALIFORNIA GAS COMPANY Field or County Aliso Canyon
Well name and No. STANDARD SESNON #12, Sec. 29, T 3N, R 16W, S.B.B. & M.
A.P.I. well No. 037-00764 Name P. S. Magruder, Jr. (Person submitting report) Title Agent (President, Secretary or Agent)
Date November 7, 19 77

Signature P. S. Magruder

P. O. Box 3249, Terminal Annex, Los Angeles, California 90051 (Address) (213) 689-3561 (Telephone Number)

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests and initial production data.

Date	
1977	
9- 9	Killed well using 74#/cu.ft. polymer drilling fluid.
9-10	Moved California Production Service Rig #D-4 from Frew #2 to Standard Sesnon #12 and rigged up.
9-11	Rig and crew idle.
9-12	Finished rigging up. Circulated polymer fluid in well to remove gas-cut drilling fluid. Tested wellhead seals. Removed Christmas tree and installed B.O.P.E. Tested with water pipe rams and blind rams to 4000 psi for 20 minutes each test. Tested Hydril bag to 3000 psi for 20 minutes. These tests were witnessed and approved by D.O.G. Conducted similar tests, using nitrogen - all tests O.K. Unseated production string from packers. Pulled above packers. Circulated polymer drilling fluid.
9-13	Pulled production string out of well. Ran in well with 6" bit and casing scraper. Stopped at 3453' or 79' above 7" x 6 5/8" crossover. Circulated polymer drilling fluid to clean well. Bled off annulus between 9 5/8" x 13". Ran in well to 8733' with sawtooth collar and 14 joints of 2 3/8" Hydril.
9-14	Cleaned fill from 9062' to 9107' with sawtooth collar. Circulated polymer drilling fluid to clean well. Pulled out and ran back in with Baker "DR" plug. Set "DR" plug in Baker packer at 8744'. Tested plug to 2000 psi. Replaced polymer drilling fluid in well with fresh water.
9-15	Pulled out of well. Ran in well with Baker fullbore and set at 3100'. Tested casing from 3100' to 8744' 2800 psi for 60 minutes. Tested from 3100' to surface at 3000 psi - indications of leak. Pulled to 2180' and started testing casing between surface and 2180' at 3000 psi - pressure dropped suddenly to zero. (Designed testing pressure 3500 psi). Filled 7" casing annulus with 115 cu.ft. water. Pumped more water at 100 psi in 7" casing, annulus pressure rose in 7" x 9 5/8" annulus. Tested from 2180' to 8744' at 1000 psi.

SoCalGas-5.1050

9-16 Pulled out of well. Ran back in open-ended to 8744' and replaced fresh water in well with brine-polymer drilling fluid. Pulled out of well. Ran back in with Baker full-bore. Located leak in 7" casing between 553' and 554' - final testing as follows:

Surface to 553' at 1800 psi - O.K.
" " 554' " " " - unable to hold pressure
554'" 8744' " 1000 psi - O.K.

Ran 17 more stands to secure well.

9-17 Tested 7" casing from 580' to 8740' at 2500 psi for 30 minutes - O.K. Pulled out of well and ran back in with Baker Lok-Set bridge plug and set it at 920'. Tested plug at 500 psi. Spotted 5 cu.ft. of sand on top of plug. Tagged top of sand, pulled out and ran back in with cutting knives. Made cut in 7" casing at 615'. Pulled out and ran back in ten stands to secure well.

9-18 Rig and crew idle.

9-19 Removed B.O.P.E. Unlanded 7" casing and recovered 12 1/2 joints to parted casing at 553'. Pin of Speedtite thread (Hydril EU) was damaged and jumped out of damaged box causing a leak in the casing. Ran spear and recovered 62' of 7" casing from where cut at 615'. Casing all in good condition except for one damaged connection at 553'. Ran mill and dressed stub of 7" casing at 615'. Pumped inhibitor treated brine-polymer drilling fluid in well and pulled out. Removed 10" x 13" spool to replace leaking 9 5/8" packing.

9-20 Casing (9 5/8") was cut off at top of casing head and therefore was no 9 5/8" secondary seal. Cleaned cellar. Removed packing from 9 5/8". Picked up 9 5/8" spear and installed casing jacks. Preparing to unland 9 5/8" and repair 13 3/8" casing.

9-21 Unlanded 9 5/8" casing. Found that 13 3/8" casing was parted near cellar floor. Jack-hammered out 12" of cellar. Cut off 13 3/8" casing and butt welded with casing head. This lower casing head will allow secondary seal on 9 5/8" intermediate casing.

9-22 Checked 13 3/8" butt weld with X-Ray. Landed 9 5/8" casing on slips with 160,000#. Packed off 9 5/8" and installed spool. Pressure tested 9 5/8" seals under 3000 psi. Ran Bowen casing bowl over 7" stub at 615'. Pulled 60,000#. Pressure tested 7" casing from surface to 900' under 4000 psi.

9-23 Landed 7" casing on slips in spool with 200,000# using casing jacks. Cut off 7" and installed B.O.P.E. Tested blind rams and 7" casing to 900' with 4000 psi for 20 minutes, using water. Tested seals on 7" to 4000 psi for 20 minutes. Tested blind rams with nitrogen to 4000 psi for 20 minutes.

SoCalGas-5.1051

9-24 Ran in hole with Baker retrieving tool which would not go through casing bowl. Pulled out of hole. Removed B.O.P.E. Picked up 7" casing. Pulled out of hole, laying down 7". Recovered all new 7" 8rd casing and 274' of 7" Speedtite casing from parted connection. Top of 7" at 889'. Ran impression block on tubing - showed 7" casing. Ran casing cutter. Located sand at 910'. Cut 7" casing at 900'.

9-25 Rig and crew idle.

9-26 Pulled out with casing cutter. Ran back in with spear and recovered 10' cut piece of 7" casing top at 900'. Ran in with casing dressing tool. Dressed 7" casing stub for one hour. Pulled out. Ran in with impression block. Impression block showed rough edge of casing stub. Ran in with Baker retrieving tool and circulated polymer drilling fluid to remove sand from top of plug at 920'. Retrieved bridge plug and reset plug at 1400'. Spotted 5 sacks of sand on top of plug. Ran in and made inside cut in 7" casing at 1070'. Pulled out. Ran in with spear and recovered casing.

9-27 Pulled out 181' of 7" casing. Ran in with casing dressing tool. Dressed 7" casing stub for one hour. Pulled out. Ran in with impression block. Pulled out. Ran in with Bowen casing bowl and 27 joints of 7" casing. Latched on to 7" casing stub. Pulled 200,000# and set in casing slips. Started pressure testing 7" casing between surface and 1400' to 3500 psi. Casing parted at 3200 psi pressure. Pulled out 7" casing up to casing bowl.

9-28 Pulled out 154' of old 7" casing where the Speedtite joint had parted top of 7" stub at 1224'. Ran in well with Baker retrieving tool. Circulated polymer drilling fluid to remove sand from top of Baker bridge plug at 1400'. Recovered bridge plug and pulled out. Ran in with 6 5/8" Baker Lok-Set plug and set same at 4000'. Spotted 5 cu.ft. of sand on top of bridge plug. Pulled out. Ran in with Midway spear and latched same near top of stub. Ran McCullough free-point on wireline. Limited pulling capacity indicated movement of 7" and 6 5/8" casing at least down to 3700'. Pulled out. Ran in with inside cutter to make a cut in 6 5/8" casing at 3600'.

9-29 Ran inside casing cutter to 3600' and made cut in 7" casing. Pulled out. Ran in well with spear and latched onto casing and tried to pull. Unable to pull casing. Pulled out of well and ran back in with casing cutters and made cut at 2429'. Pulled out. Ran in with spear and latched onto casing and started pulling out. Pulled out 14 joints of 7" Speedtite and 25 joints of 7" 8rd casing.

9-30 Ran in well with 7" spear, jars and bumper sub to top of 7" casing stub at 2429'. Pulled loose and laid down with 7" and 6 5/8" casing. Top of

SoCalGas-5.1052

6 5/8" casing stub at 3600'. Ran in well with Midway dressing tool, worked on top of stub for one hour. Circulated bottoms up and pulled out.

10-1 Ran in well with impression block. Pulled out. Impression block showed inside dimension of 6 5/8" casing. Ran 7" casing with 6 5/8" Bowen casing bowl and latched on to 6 5/8" stub at 3600'. Landed casing with 150,000#. Installed slips and packing. Cut off 7" casing. Pressure tested casing seals. Reinstalled B.O.P.E.

10-3 Tested casing from 4000' to surface with 3700 psi for 20 minutes - O.K. Ran in to 3871' and displaced brine-polymer drilling fluid with fresh water containing surfactant. Tested casing from 4000' to surface with 3000 psi for 60 minutes - O.K. Recovered bridge plug. Ran Baker fullbore cementer to 2180'. Tested casing from 2180' to surface with 3500 psi for 60 minutes - O.K. Pulled to 800' and tested casing from 800' to surface with 4000 psi for 60 minutes - O.K. Pulled fullbore tool and started in well with Baker retrieving tool.

10-4 Ran to 4000'. Displaced water with brine-polymer drilling fluid. Recovered "DR" plug from packer at 8756'. Assembled seals and safety system and hydrotested to 5000 psi. Ran tubing, changing couplings, applying Baker seal and hydrotesting to 5000 psi.

10-5 Re-ran tubing while changing collars, cleaning threads, applying Baker seal and hydrotesting to 5000 psi.

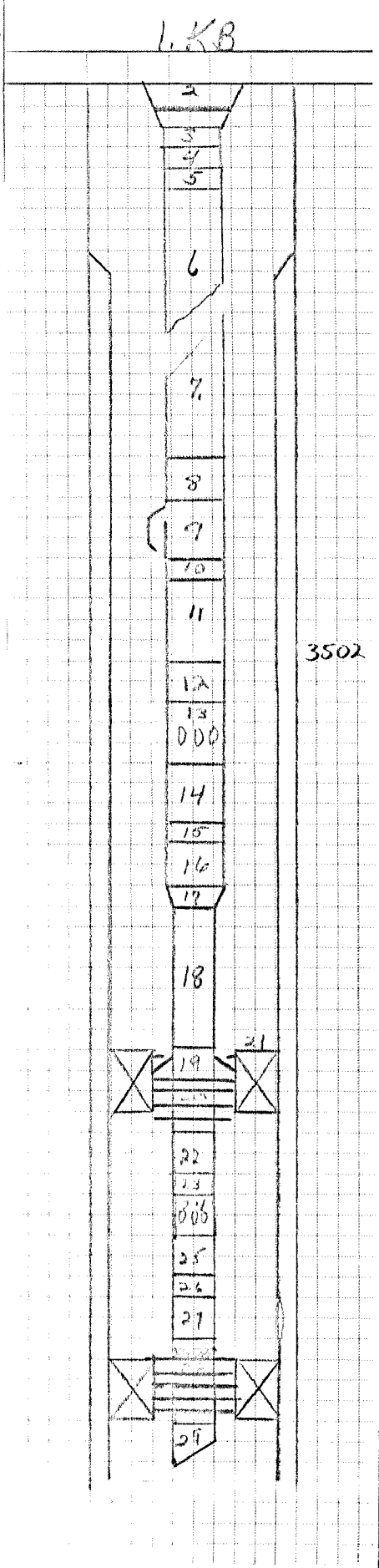
10-6 Continued running completion tubing string, changing couplings, applying Baker seal and hydrotesting to 5000 psi.

10-7 Landed tubing with 10,000# on packer at hook load of 52,000#. Checked latch with 25,000# pull over weight of tubing. Installed tubing hanger plug and removed B.O.P.E. Reinstalled Christmas tree and pressure tested to 5000 psi. Displaced brine-polymer fluid with waste salt water. Ran tubing plug, unable to find NO-GO nipple at 8416'. Left Otis plug in 2 7/8" x 2 3/8" X-over at 8427'. Ran 2.215" plug which was set in safety system at 8395'. Pressure tested packer and seals with 2000 psi for one hour.
RIG RELEASED at 10:00 P.M. (10/7/77).

JP

SoCalGas-5.1053

WELL PROFILE



OPERATOR SOUTHERN CALIFORNIA GAS COMPANY

WELL # STANDARD SESNON #12

FIELD Aliso Canyon

COUNTY Los Angeles

STATE California

DATE October 11, 1977

☐ NEW COMPLETION ☒ WORKOVER

	CASING	LINER	TUBING 1	TUBING 2	TUBING 3
SIZE					
WEIGHT					
GRADE					
THREAD					
DEPTH					

ITEM NO.	TUBING DETAILS	LENGTH	DEPTH
1.	K.B.	15.00	15.00
2.	Doughnut	.80	15.80
3.	Pup Joint 2 7/8" N-80 EUE 8rd	1.00	16.80
4.	Pup Joint 2 7/8" N-80 EUE 8rd	4.00	20.80
5.	Pup Joint 2 7/8" N-80 EUE 8rd	6.00	26.80
6.	26 Joints 2 7/8" N-80 EUE 8rd Tubing	775.37	802.17
7.	244 Joints 2 7/8" J-55 EUE 8rd Tubing	7540.47	8342.64
8.	Pup Joint N-80 2 7/8" EUE 8rd	4.09	8346.73
9.	Gas Lift Mandrel (EMPTY)	8.32	8355.05
10.	Pup Joint N-80 2 7/8" EUE 8rd	1.80	8356.85
11.	1 Joint 2 7/8" J-55 EUE 8rd Tubing	30.59	8387.44
12.	Pup Joint 2 7/8" N-80 EUE 8rd	4.11	8391.55
13.	Otis Tubing Flow Safety System (EMPTY)	3.73	8395.28
14.	Blast Joint 3 5/8" O.D.	19.89	8415.17
15.	Nipple 2.205" NO-GO	1.16	8416.33
16.	Blast Joint 3 5/8" O.D.	9.86	8426.19
17.	X-Over 2 7/8" EU x 2 3/8" EU	1.05	8427.24
18.	10 Joints 2 3/8" EUE 8rd Tubing	328.76	8756.00
	Baker Model "D" Packer	.....	8756.00
19.	Baker Latch	1.05	8757.05
20.	4 Seals	3.30	8760.35
21.	2 Joints 2 3/8" EUE 8rd Tubing	59.60	8819.95
22.	Pup Joint 2 3/8" EUE 8rd J-55	6.00	8825.95
23.	Otis Sliding Side Door (OPEN)	2.86	8828.81
24.	3 Joints 2 3/8" J-55 EUE 8rd Tubing	89.39	8918.20
25.	NO-GO 1.536" Nipple X-N	1.11	8919.31
26.	1 Joint 2 3/8" EUE 8rd Tubing	31.44	8950.25
	Baker Model "D" Packer	.....	8950.00
27.	10 Baker Seals	8.80	8959.55
28.	Production Tube	5.85	8965.40

COMMENTS:

SoCalGas-5.1054

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS

Report on Operations

No. T 277-271

Mr. P. S. Magruder, Jr., Agent
Southern Calif. Gas Co.
P.O. Box 54790 Terminal Annex
Los Angeles, Calif. 90054

Santa Paula, Calif.
Oct. 6, 1977

DEAR SIR:

Operations at well No. "SFZU" SS-12, API No. 037-00764, Sec. 29, T. 3N, R. 16W, S.B., B & M. Aliso Canyon Field, in Los Angeles County, were witnessed on 9/12/77. Mr. T. E. Adams, representative of the supervisor was present from 1730 to 1900. There were also present Jeevan Anand, reservoir engr.

Present condition of well: No additions to the casing record since proposal dated 9/13/77.

The operations were performed for the purpose of testing the blowout prevention equipment and installation.

DECISION:

THE BLOWOUT PREVENTION EQUIPMENT AND INSTALLATION ARE APPROVED.

b

M. G. MEFFERD
~~JOHN F. MATTHEWS, JR.~~
State Oil and Gas Supervisor

By John L. Hardoin Deputy
John L. Hardoin

SoCalGas-5.1055

No.P277-333

REPORT ON PROPOSED OPERATIONS

Santa Paula, California

Sept. 13, 1977

Mr. P. S. Magruder, Jr., Agent
Southern Calif. Gas Company
P.O. Box 54790 Terminal Annex
Los Angeles, Calif. 90054

Your rework proposal to gas storage well "SFZU" SS-12 (Name and number), A.P.I. No. 037-0764, Section 29, T. 3N, R. 16W, S.B. B. & M., Aliso Canyon field, Los Angeles County, dated 9-3-77, received 9-12-77, has been examined in conjunction with records filed in this office.

THE PROPOSAL IS APPROVED PROVIDED THAT:

1. The drilling fluid used shall be of a quality and in sufficient quantity to control all subsurface conditions in order to prevent blowouts; and a reserve supply of this material shall be kept on hand to meet any emergency.
2. Blowout prevention equipment, at least of the Division of Oil and Gas Class III,3M rating, shall be installed and maintained in operating condition at all times.
3. THIS DIVISION SHALL BE NOTIFIED TO WITNESS A PRESSURE TEST OF THE BLOWOUT PREVENTION EQUIPMENT BEFORE COMMENCING DOWNHOLE OPERATIONS.

Blanket Bond
MD:b

NOTE: A COPY OF THIS APPROVAL SHALL BE POSTED AT THE WELL SITE PRIOR TO COMMENCING OPERATIONS.

M. G. MEFFERD
State Oil and Gas Supervisor

By _____
Deputy Supervisor

John L. Hardoin

OG111 (11-76—GSR1—30M)

SoCalGas-5.1056

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS

Notice of Intention to Rework Well

DIVISION OF OIL AND GAS
RECEIVED
SEP 12 1977
SANTA PAULA, CALIFORNIA

This notice and indemnity or cash bond shall be filed, and approval given, before rework begins. If operations have not commenced within one year of receipt of the notice, this notice will be considered cancelled.

FOR DIVISION USE ONLY		
BOND	OGD114	OGD121
BB	✓	✓

DIVISION OF OIL AND GAS

In compliance with Section 3203, Division 3. Public Resources Code, notice is hereby given that it is our intention to rework well No. STANDARD SESNON #12, API No. 037-00764, Sec. 29, T. 3N, R. 16W, S.B. B. & M., Aliso Canyon Field, Los Angeles County.

The present condition of the well is as follows:

1. Total depth. 9112' - cement plug 9107'

2. Complete casing record, including plugs and perforations:

13 3/8" cemented 790'
9 5/8" " 3770' - milled section
7" and 6 5/8" cemented 9110', squeezed 8817'
WSO 8816', squeezed 8880', segregation 8958'
Perforated 9107' - 9055', 9045' - 8963', 8935' - 8880'
8870' - 8825'.
202' 5" landed 8690' - top 8488' lead seals

3. Present producing zone name Sesnon Zone in which well is to be recompleted --

4. Present zone pressure 3650 psi New zone pressure --

5. Last produced Gas Storage Well (Date) ____ (Oil, B/D) ____ (Water, B/D) ____ (Gas, Mcf/D)

or

6. Last injected ____ (Date) ____ (Water, B/D) ____ (Gas, Mcf) ____ (Surface pressure, psig.)

The proposed work is as follows:

1. Move in and rig up. Kill well. Install BOPE and pressure test.
2. Clean out to 9107'. Pressure test 6 5/8" and 7" casings.
3. Perform any remedial work indicated by pressure testing.
4. Run tubing with down hole safety system.
5. Return well to gas storage operation.

It is understood that if changes in this plan become necessary we are to notify you immediately.

Address P.O. Box 3249 Terminal Annex (Street)
Los Angeles (City) California (State) 90051 (Zip)
Telephone Number (213) 689-3561

Southern California Gas Company (Name of Operator)
By P.S. Magruder Jr. (Name) P.S. Magruder, Jr. (Date) 9-3-77
Type of Organization Corporation (Corporation, Partnership, Individual, etc.)

OG107 (8-75—GSRI—15M)

SoCalGas-5.1057

DIVISION OF OIL AND GAS
RECEIVED
SEP 12 1977
SANTA PAULA, CALIFORNIA

STANDARD SESNON #12 - ALISO CANYON

Program to pressure test casing and install new down hole safety system.

TUBING WITHDRAWAL ONLY

Take all measurements from original derrick floor 9' above ground.

PRESENT CONDITIONS:

13 3/8" cemented 790' 54-5# J-55
9 5/8" cemented 3770' milled section
7" and 6 5/8" cemented 9110' squeezed 8817'
WSO 8816', squeezed 8880', segregation
8958'
3502' 7" - 6 5/8" 3502' - 9110'
Perforated 9107' - 9055'
9045' - 8963'
8990' - 8935'
8870' - 8825'
202' 5" landed 8690', top 8488'
15# Hydril flush joint
Lead seals top and bottom (covers tight 6 5/8" casing)

CASING DETAILS:

			80% Safety Factor BURST	COLLAPSE
7"	0 - 376'	23# N-80	5070	3440
	376' - 1809'	23# J-55	3490	2630
	1809' - 2048'	23# N-80	5070	3440
	2048' - 3502'	23# J-55	3490	2630
6 5/8"	3502' - 3852'	28# J-55	4840	4360
	3852' - 7120'	24# N-80	5950	4440
	7120' - 8560'	24# N-80	5950	4440
	8560' - 9110'	28# N-80	7050	5700

TUBING DETAIL:

Baker Model "D" packer 8950' (6 5/8")
Baker Model "D" packer 8756' (6 5/8")
2 3/8" and 2 7/8" tubing landed 8952'
Baker "R" nipple (2 3/8") 8947'
Baker sliding sleeve (2 3/8") 8840' open
Baker "F" nipple (2 3/8") 8714'
Baker "F" nipple (2 3/8") 8683'
Baker sliding sleeve (2 3/8") 8651' open
Cameo gas lift mandrel with dummy 8440'

SoCalGas-5.1058

PROGRAM:

1. Move in and rig up.

2. Open sliding sleeve at 8651'. Kill well with 72#/cu. ft. brine polymer drilling fluid. Check bottom hole pressure before moving in rig. Volume of well = 335 barrels.

3. Install back pressure valve in doughnut. Remove Xmas tree and install class III 5000 psi BOPE. Pressure test complete shut-off rams and pipe rams to 4000 psi with water and nitrogen. Also pressure test Hydril bag to 3000 psi with water and nitrogen.

4. Pull tubing. Run special clearance tubing (packer bore 3.25") and clean out to 9107' using saw tooth collar.

5. Run 6 1/8" bit and casing scraper. Clean out to 3502'.

6. Plug Model "D" packer 8950' and pressure test plug in packer with rig pump. Circulate polymer drilling fluid out of well with fresh water treated with surface tension agent. Pressure test casing, using cement retainer and cement pump truck equipped with calibrated pressure chart and pressure gauge, as follows:

3100'	to 8950'	with 2800 psi	for	60	minutes
Surface	" 3100'	" 3000 psi	"	60	"
"	" 2180'	" 3500 psi	"	60	"
"	" 800'	" 4000 psi	"	60	"

Change to polymer drilling fluid.

7. Perform any remedial work indicated by pressure testing. Pull plug from Model "D" packer.

8. Run 2 3/8" and 2 7/8" 8rd EUE J-55 tubing, change collars, clean pins, apply Baker seal and hydrotest to 5000 psi holding each test for one minute. Tubing to include:

Baker 2 3/8" production tube
Baker 10 seals
Baker 2 3/8" sliding sleeve (open)
Baker 4 seals
Baker Latch-in-locator
Otis 10' heavy wall tube
" 1.56" "NOGO" nipple with 2 3/8" threads
" 20' heavy wall tube
" tubing flow safety system
One joint 2 3/8" tubing
Otis empty gas lift mandrel
2 3/8" tubing to 8400', 2 7/8" tubing to surface with 800' of 2 7/8" 8rd EUE N-80 on top

9. Land tubing on packer with up to 10,000 pounds on packer - pull up to 25,000 pounds over weight of tubing to check latch.

SoCalGas-5.1059

PROGRAM: (Concluded)

10. Install back pressure valve in doughnut. Remove BOPE and reinstall Xmas tree. Pressure test Xmas tree to 5000 psi. Retest well head seals to 3500 psi.

11. Circulate brine polymer drilling fluid out of well with waste salt water. Set tubing plug in "NOGO" nipple and pressure test seals and packer to 2000 psi. Remove tubing plug and release rig.

G. C. ABRAHAMSON
July 13, 1977

cc: Rig Supervisor
Contract Pusher (2)
Relief Rig Supervisor
D.O.G. (S.P.) ✓
B. Jones
D. Smiley
J. Melton
D. Justice)
M. Grijalva)

Well File
Spare Copy

GCA/jp

Ex. I – 59

Rec'd 09-01-17 DOGGR Ventura.

Well
Porter 42B

API #: 04-037-21877-00
Sec 28, T3N, R16W

Current Well Configuration

Operator: So. California Gas Co.

Lease: Porter
Field: Aliso Canyon
Status: Active Gas Storage
BFW: ±800' (±800')
USDW:

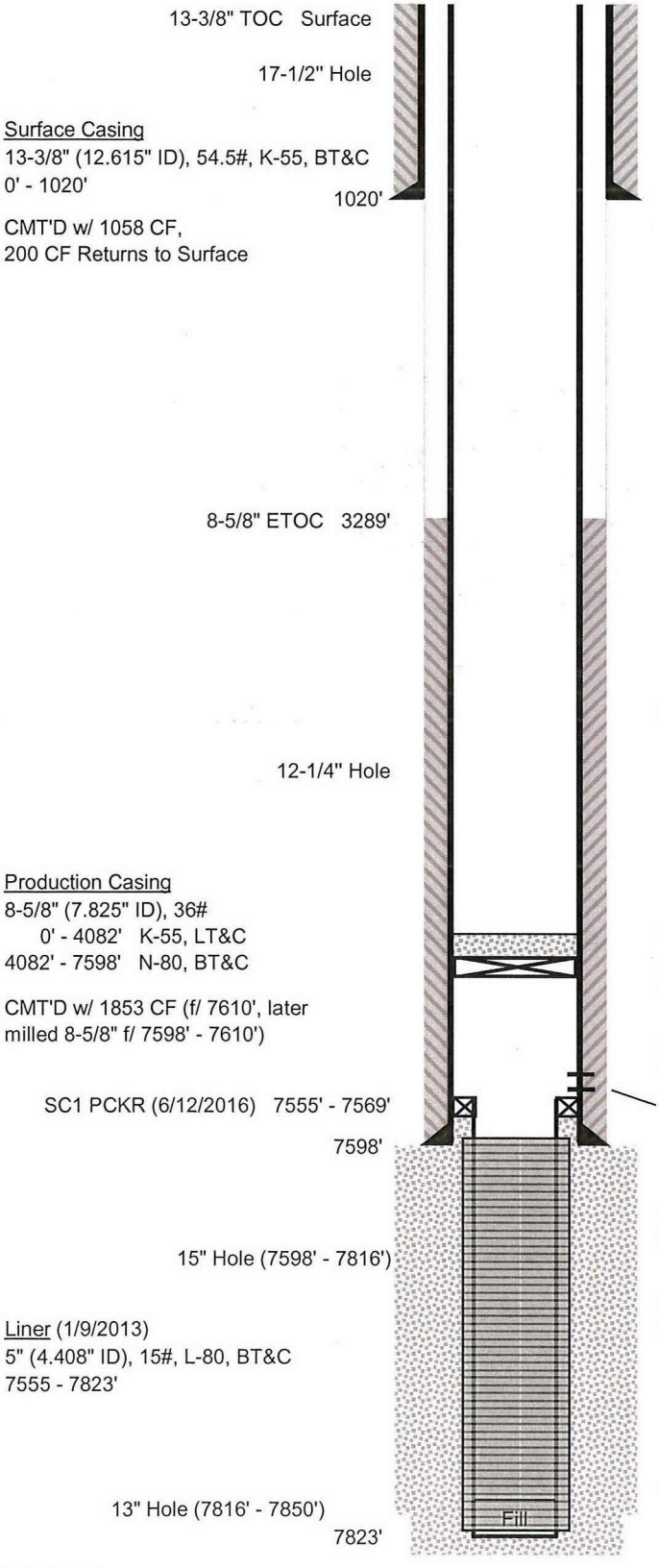
Ground Elevation: 1963' asl
Datum to Ground: 22' KB

Spud Date: 12/9/1978
Completion Date: 2/11/1979
Last Rework Date: 6/18/2016

Junk: None

Notes

USIT log run on 1/11/1992 detected minor CSG damage @ 7488' - 7490'. Anomoly is likely either parted CSG or a landing collar. Pressure Test between 7358' - 7552' Held, 6/1/2016.



Top of Zone Markers	md (tvd)
A1	4046' (4045')
A36	4925' (4911')
UP	5188' (5161')
LP	5632' (5584')
UDA1	5995' (5928')
MDA	6731' (6617')
LDA	6859' (6738')
MP	7332' (7185')
S1	7524' (7367')
S4	7596' (7435')
S8	7695' (7529')

TD 7850'
TVD (7677)
Directionally Drilled: Yes (TD is 237' E, 991' N of Surf)

Prepared by: LD (4/26/2016)
Updated by: CAM (8/18/2017)

InterAct

Ex. I – 60

SUBMIT IN DUPLICATE

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS

History of Oil or Gas Well

Operator Southern California Gas Co. Field or County Aliso Canyon
Well Porter #42-B, Sec. 28, T 3N, R 16W, SB B. & M.
A.P.I. No. 037-21877 Name P.S. Magruder Jr. (Person submitting report) Title Agent (President, Secretary or Agent)
Date February 27, 1979, 19

Signature P.S. Magruder Jr.

P.O. Box 3249 Terminal Annex, Los Angeles, Ca. 90051 (Address) (213) 689-3561 (Telephone Number)

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests and initial production data.

Date	
1978	Program: Move Kenai-Camrich drilling Co. rig #23 onto wellsite, which is approximately 2,666.68' South and 2,519.6' West of Station #84, Aliso Canyon gas storage field. Drill and complete as a gas storage well in the S-4 sand with an approximate bottom hole location of 980' North and 230' West of surface location.
12-4	12-4 through 12-8-78, moved Kenai-Camrich Rig #23 onto wellsite and rigged up.
12-9	0Day. Completed rig up. Mixed mud and drilled rat hole with Dyna-drill. Spudded in at 4:00 p.m., December 9, 1978, drilled 17 1/2" hole to 206'. Mud wt. 64#, Vis. 58 sec.
12-10	1st Day. Drilled 17 1/2" hole from 206' to 581' with bit #1 and to 737' with bit #2. Mud wt. 72#, Vis. 52 sec., W.L. 14.8cc., solids 14%.
12-11	2nd Day. Drilled 17 1/2" hole from 737' to 995' with bit #2 and to 1,020' with bit #3. Circulated hole clean and pulled out to run 13 3/8" casing. Ran 26 joints of 13 3/8" K-55 Buttress casing, equipped with a B & W float guide shoe, 3 scratchers, 2 centralizers and a stop ring in top of first collar. Total on hook 1,023.26' including shoe.
12-12	3rd Day. With 13 3/8" casing shoe at 1,020' and stop ring at 984', Dowell cementers pumped 100 cu.ft. of water with green dye ahead of

SoCalGas-5.1063

History of Well Report for Porter #42-B, Aliso Canyon

1978

12-12 continued

438 sacks of class "G" cement plus 8% gel and 3% calcium chloride and, followed by 200 sacks of class "G" cement plus 3% calcium chloride and displaced with 857 cu.ft. of mud. Bumped plug with 750 psi. Cement in Place at 4:10 a.m.. Had approximately 200 cu.ft. of cement return to surface. Landed casing, welded on casing head and X-rayed same.

12-13 4th Day. Installed BOPE and tested blank rams to 2,700 psi with water and nitrogen for 20 minutes, ok. Made up drilling assembly and ran in hole. Pressure tested pipe rams, "GK" Hydril, upper and lower Kelly cocks, standpipe valves, and manifold to 2,700 psi with water and nitrogen for 20 minutes, ok. Witnessed and approved by D.O.G.

Mud wt. 71#, Vis. 40 sec., W.L. 14.4cc., solids 14%, sand 2%.

12-14 5th Day. Drilled 12 1/4" hole from 1,020' to 1,363' with bit #4 and to 1,630' with bit #5.

Mud wt. 75#, Vis. 42 sec., W.L. 8.4cc., sand 2%, solids 14%.

12-15 6th Day. Drilled 12 1/4" hole from 1,630' to 1,840' with bit #5 and to 2,093' with bit #6.

Mud wt. 73#, Vis. 45 sec., W.L. 8.7cc., sand 1%, solids 14%.

12-16 7th Day. Drilled 12 1/4" hole from 2,093' to 2,150' with bit #6 and to 2,405' with bit #7.

12-17 8th Day. Drilled 12 1/4" hole from 2,405', to 2,763' with bit #8 and to 2,991' with bit #9.

Mud wt. 71#, Vis 42 sec., W.L. 9.2cc., sand 1/2%, solids 11%.

12-18 9th Day. Drilled 12 1/4" hole from 2,991' to 3,031' with bit #9, to 3,279' with bit #10 and 3,390' with bit #11.

Mud wt. 73#, Vis 42 sec., W.L. 9.2cc., sand 1/2% solids 11%.

12-19 10th Day. Drilled 12 1/4" hole from 3,390' to 3,529' with bit #11 and to 3,778' with bit #12.

Mud wt. 72#, Vis 40 sec., W.L. 8.6cc., sand 1/2% solids 9%.

12-20 11th Day. Drilled 12 1/4% hole from 3,778' to 4,155' with bit #13. Dyna-drilled 12 1/4" hole from 4,155' to 4,180' with bit #14 on Dyna-drill #1.

Mud wt. 72#, Vis 39 sec., W.L. 8.4cc., Sand 1/2%, solids 8%.

12-21 12th Day. Dyna-drilled 12 1/4" hole from 4,180' to 4,208' with bit #15 and to 4,244' with bit #16 on Dyna-drill #1-B.

Mud wt. 72#, Vis. 40 sec., W.L. 7.6cc., sand 1/2%, solids 7%.

SoCalGas-5.1064

12-22 13th Day. Dyna-drilled 12 1/4" hole from 4,244' to 4,305' with bit #17 and to 4,312' with bit RR#16 on dyna-drills #1-C and #1-D guided by Eastman "DOT" tool.

Mud wt. 71#, Vis, 38 sec., W.L. 7.5cc., sand 1/4%, solids 7%.

12-23 14th Day. Dyna-drilled 12 1/4" hole from 4,312' to 4,367' with RR bit #16 on Dyna-drill #1-D. Directionally drilled 12 1/4" hole to 4,394' with bit #18.

Mud wt. 71#, Vis 40 sec., W.L. 6.8cc., sand 1/4%, solids 6%.

12-24 15th Day. Directionally drilled 12 1/4" hole from 4,393' to 4,463' with bit #18. Ran in with Dyna-drill #2 and bit #19.

Mud wt. 70#, Vis. 38 sec., W.L. 6.9cc., sand 1/45, solids 6%.

12-25 16th Day. Dyna-drilled 12 1/4" hole from 4,463' to 4,514' with bit #19 on Dyna-drill #2. Directionally drilled 12 1/4" hole from 4,514' to 4,553' with bit #20.

12-26 17th Day. Directionally drilled 12 1/4" hole from 4,553' to 4,804' with bit #20 and to 5,075' with bit #21. Reamed from 4,800' with bit #22.

Mud wt. 70#, Vis. 40 sec., W.L. 7.2cc., sand 3/4%, solids 8%.

12-27 18th Day. Reamed from 4,831' to 5,075'. Directionally drilled 12 1/4" hole from 5,075' to 5,337' with bit #22 and to 5,451' with bit #23.

Mud wt. 70.5#, Vis. 43 sec., W.L. 6.4cc., sand 3/4%, solids 8%.

12-28 19th Day. Directionally drilled 12 1/4" hole from 5,451' to 5,714' with bit #23 and to 5,929' with bit #24.

Mud wt. 72#, Vis 42 sec., W.L. 7.0cc., sand 1/2% solids 8%.

12-29 20th Day. Dyna-drilled 12 1/4" hole from 5,929' to 5,953' with bit #25 and to 5,955' with bit #26 on Dyna-drill #3 guided by Eastman "DOT" tool.

Mud wt. 72.5#, Vis. 42 sec., W.L. 7.7cc., sand 1/2%, solids 8%.

12-30 21st Day. Dyna-drilled from 5,955' to 5,977' with bit #26 and to 6,002' with bit #27 on Dyna-drill #3 guided by Eastman "DOT" tool.

Mud wt. 72.5#, Vis. 47 sec., W.L. 7.4cc., sand 1/2%, solids 8%.

12-31 22nd Day. Directionally drilled 12 1/4" hole from 6,002' to 6,435' with bit #28.

Mud wt. 72.5#, Vis. 44 sec., W.L. 6.4cc., sand 1/2%, solids 8%.

SoCalGas-5.1065

1-1 History of Well Report for Porter #42-[redacted] Aliso Canyon

1-1 23rd Day. Directionally drilled 12 1/4" hole from 6,435' to 6,836' with bit #29.

Mud Wt. 72#, Vis. 36 sec.

1-2 24th Day. Directionally drilled 12 1/4" hole from 6,836' to 6,991' with bit #30. While running directional survey at 6,991', piano wire survey line parted leaving over 6,000' of wire inside drill pipe. Started to pull drill pipe and main drive in gear box failed.

Mud wt. 72#, Vis. 40 sec., W.L. 6.6cc., sand 1/2%, solids 8%.

1-3 25th Day. Repairing rig

1-4 26th Day. Repairing rig.

1-5 27th Day. Repairing rig.

1-6 28th Day. Repairing rig.

1-7 29th Day. Finished repairing rig at 9:00 p.m.. Circulated through stuck pipe at 6,950' for 2 hours. Spotted 3 barrels of Baroid "XMDL" and "Torque Trim" around bottom hole drilling assembly.

Mud wt. 72#, Vis. 46 sec., W.L. 8.6cc., sand 1/2%, solids 9%.

1-8 30th Day. Worked stuck pipe. Pumped 140 bbls of oil down drill pipe and displaced with 525 cu.ft. of drilling fluid. Top of oil at 5,750'. Rigged up Archer Reed to retrieve .092" wireline from inside 4 1/2" drill pipe. Retrieved only 300' and could not find wireline again. At 9:00 p.m., pumped 634 cu.ft. of drilling fluid down drill pipe and moved top of oil to 4,400', bottom of oil at 5,750'. Rigged up Dia-Log and ran spear which became stuck at 6,730'.

1-9 31st Day. Continued jarring on spear and pulled out of rope socket. Ran overshot and latched onto spear. Pulled out of rope socket and left fishing tools inside drill collars. Ran free point but, could not go past 3,920'. Retrieved approximately 3,000' of .092" wireline. Ran overshot and could not pull tools out. Top of wireline fish at 6,855'. Ran free point. 4 1/2" pipe stuck at 5,724'. Circulated and conditioned mud.

Mud wt. 71#, Vis. 40 sec., W.L. 6.4cc., sand 1/2%, solids 9%, oil 6%.

1-10 32nd Day. Circulated and conditioned mud. Spotted 70 bbls of oil around drill collars and heavy wall drill pipe. Ran a free point, and backed off drill pipe at 5,240'. Ran jars and bumper sub and a screw in sub on bottom of six drill collars.

1-11 33rd Day. Jarred on fish and ran Dia-Log "freepoint". Pipe free at 5,955' and backed off at 5,933' wireline measurment. Recovered 692' of fish. Made up and ran new fishing tools. Found top of fish at 5,841' drillers depth.

SoCalGas-5.1066

1-12 34th Day. Jarred on fish and ran a "feeler" on Dia-Log freepoint. Would not go past 5,955'. Ran an "Impression" block on Dia-Log wireline, results, inconclusive. Ran a wireline spud bit and drilled on obstruction to 6,208'. Ran a Cavins wireline junk bailer to 6,208'. First run okay. Second run bailer came off sinker bars. Chased bailer to top of other fish inside 4 1/2" drill pipe. Top of inside fish now at 6,835'.

1-13 35th Day. Ran Dia-Log wireline "freepoint" and backed off at 6,264'. Recovered 336' of heavy wall drill pipe. Ran back in and jarred on fish now at 6,264'.

1-14 36th Day. Jarred on fish and had a slight movement at 2:00 a.m. Fish came free at 4:00 a.m. Pulled out of hole with fish. Made up drilling assembly.

1-15 37th Day. Ran bit #31. Circulated and conditioned mud at 6,000'. Reamed from 6,000' to 6,991'. Circulated and conditioned mud at 6,991'. Directionally drilled 12 1/4" hole from 6,991' to 7,156' with bit #31.

Mud wt. 70#, Vis. 46 sec., W.L. 5.8cc., sand 1/2%, solids 8%.

1-16 38th Day. Wiped hole four stands at 7,156'. Directionally drilled 12 1/4" hole from 7,156' to 7,185' with bit #31, and to 7,344' with bit #32. Wiped hole four stands at 7,265'.

Mud wt. 72#, Vis. 48 sec., W.L. 5.6cc., sand 1/2%, solids 9%.

1-17 39th Day. Directionally drilled 12 1/4" hole from 7,344' to 7,575' with bit #33.

Mud wt. 72#, Vis. 47 sec., W.L. 5.8cc., sand 1/2%, solids 9%

1-18 40th Day. Circulated well clean, pulled out with bit #33 to 1,000', ran in to 7,575'. Circulated and conditioned drilling fluid. Pulled out. Ran Welex Induction Log and Caliper from 7,575' to 1,000'.

Mud wt. 72#, Vis. 44 sec., W.L. 5.8cc., sand 1/2%, solids 9%.

1-19 41st Day. Directionally drilled 12 1/4" hole from 7,575' to 7,610' with bit #33. Circulated and conditioned mud at 7,610', and pulled up to 6,780' and ran back to 7,610'. Circulated hole clean (no fill). Pulled out and ran Welex Induction and Caliper Log from 7,610' to 5,500'.

1-20 42nd Day. Circulated and conditioned mud at 7,610'. Wiped hole from 7,610' to 6,780'. Pulled out and laid down all 12 1/4" tools. Changed rams to 8 5/8" and pulled bit guide. Rigged up and ran 8 5/8" casing as follows: 86 joints of N-80 36# buttress with the first 24 joints sand blasted with two centralizers and three scratcher clusters on bottom three joints and centralizers on every other joint for 989.63', B & W shoe on bottom and float collar on top of the first three joints which were Baker locked.

Mud wt. 72#, Vis. 48 sec., W.L. 5.8cc., sand 1/2%, solids 9%.

SoCalGas-5.1067

1979

1-21 43rd Day. Finished running 8 5/8" casing to 7,610'. Circulated and reciprocated pipe. Added inhibitor while circulating. Cemented 8 5/8" casing shoe at 7,610' as follows: 500 cu.ft. of "CWT" wash followed with 1,200 cu.ft. of 1.1 class "G" cement treated with "Litepoz 7" premixed with 1.0% "D-65" and 0.5% "D-60", followed with 350 sacks of class "G" cement with 0.75% "D-65" and 0.5% "D-60", followed with 250 cu.ft. of "Self Stress" with 0.5% "D-65" amd 0.2% "D-108". Used top and bottom plugs. Reciprocated pipe while displacing cement. Cement in Place at 2:33 p.m. Set slips with hook load of 270,000# and cut off 8 5/8" casing. Installed 8" 5,000# seal flange and tubing head. Reinstalled BOPE.

1-22 44th Day. Tested blank rams, choke manifold and Kelly cock to 4,000 psi with water and nitrogen for 20 minutes, tested ok.

1-23 45th Day. Pressure tested BOPE, pipe rams to 4,000 psi for 20 minutes with water and nitrogen. Tested "GK" Hydril to 2,700 psi with water and nitrogen and all tested ok. Drilled out cement from 7,401' to 7,590' with bit #34. Circulated and pulled out of well to run Cement Bond Log.

Mud wt. 72#, Vis. 40 sec., W.L. 8.6cc., sand trace, solids 8%.

1-24 46th Day. Ran Welex Neutron Cement Bond Log, and recorded from 7,594' to 3,110'. Ran in well with casing scraper and displaced clay-water drilling fluid with 72# "HEC" brine-polymer completion fluid. Shot four 1/2" holes at 7,500' and pressure tested holes. Had 600 psi build up then pressure fell back to zero. Pumped away 50 cu.ft. per minute.

Mud wt. 72#, Vis. 38 sec., W.L. 9.0cc., solids 8%.

1-25 47th Day. Ran in well with Halliburton "E-Z" drill retainer to 7,512' and spotted 100 cu.ft. of water. Pulled up to 7,392' and set packer. Obtained breakdown of 1 cu.ft. per minute at 2,500 psi. Squeezed away 40 cu.ft. of 13% acid (10% HCL and 3% HF) with a final breakdown of 10 cu.ft. per minute at 1,800 psi. Squeezed away 89 cu.ft. of class "G" cement with 0.75% "D-65". Final squeeze pressure was 2,500 psi.

1-26 48th Day. Ran in well and drilled out retainer and cement from 7,390' to 7,463' with bit #35 and to 7,478' with bit #36.

Mud wt. 72#, Vis. 41 sec., W.L. 9.2cc., solids 9%, sand trace.

1-27 49th Day. Drilled on "E-Z" drill retainer and cement from 7,493' to 7,520' with bit #37. Pressure tested shot holes from 7,500' to 7,501' at 2,500 psi for 20 minutes, OK. Shot four 1/2" holes; 7,498' - 7,49 ' Pressure tested holes on two tests to 2,500 psi for 20 minutes, each with Dowell cementing truck. Ran WSO with Lynes test tools. Packer set at 7,434' with tail to 7,452'. Opened tool at 11:00 p.m. Had a two minute blow then dead for balance of one hour test, Witnessed and approved by D.O.G. Had 20' fluid rise. Initial pressure 50 psi, final flow pressure, 50 psi. Hydrostatic pressure 3,700 psi.

1-28 50th Day. Ran in and drilled out remaining cement and cement guide shoe at 7,610'. Drilled 7 5/8" hole from 7,610' to 7,712' with bit #38.

Mud wt. 73#, Vis. 39 sec., W.L. 8.8cc., solids 9%.

1-29 51st Day. Drilled 7 5/8" hole from 7,712' to 7,763' with bit #39 and to 7,799' with bit #40.

Mud wt. 72#, Vis. 41 sec., W.L. 8.6cc., solids 9%.

1-30 52nd Day. Drilled 7 5/8" hole from 7,799' to 7,816' T.D. with bit #40. Ran "IES" Log and Density Neutron Log. Opened 7 5/8" hole to 15" from 7,610' to 7,630' with hole opener #1.

Mud wt. 72#, Vis 38 sec., W. L. 9.6cc., solids 9%.

1-31 53rd Day. Opened 7 5/8" hole to 15" from 7,630' to 7,642' with hole opener #2, and to 7,655' with hole opener #3.

Mud wt. 72#, Vis. 43 sec., W.L. 9.2cc., solids 9%.

2-1 54th Day. Opened 7 5/8" hole to 15" from 7,655' to 7,704' with hole opener #3, and to 7,747' with hole opener #4.

Mud wt. 72#, Vis. 40 sec., W.L. 9.2cc., solids8%.

2-2 55th Day. Opened 7 5/8" hole to 15" from 7,747' to 7,764' with hole opener #5 and to 7,789' with hole opener #6.

Mud wt. 72#, Vis. 45 sec., W.L. 9.2cc., solids 8%.

2-3 56th Day. Opened 7 5/8" hole to 15" from 7,789' to 7,798' with hole opener #7. Made a clean out run and cleaned out fill from 7,798' to 7,816' with rerun 7 5/8" bit #38.

Mud wt. 72#, Vis. 42 sec., W.L. 9.4cc., solids 8%.

2-4 57th Day. Ran in hole with hole opener #8 and could not get through casing shoe at 7,610'. Ran 7 5/8" bit #RR38 and cleaned out through 8 5/8" casing shoe. Ran hole opener #8, tool would not open at 7,798'. Pulled out for new hole opener.

Mud wt. 72#, Vis. 45 sec., W.L. 9.4cc., solids 8%.

2-5 58th Day. Opened 7 5/8" hole to 15" from 7,798' to 7,816' with hole opener #9. Ran a Sharp 15" hole opener #10 and gage reamed from 7,610' to 7,816'. Ran Dresser Atlas Caliper Log with bore hole volume integretor and recorded from 7,816' to 7,560'.

SoCalGas-5.1069

1979 History of Well Report for Porter #42-B, Aliso Canyon

2-6 59th Day. Ran 7 5/8" bit to 7,816'. Pulled up to 8 5/8" casing shoe and cleaned mud tanks. Changed over completion fluid to 63# filtered polymer-brine gravel pack fluid. Ran 10 joints of 5 1/2" 20# liner as follows: 1 blank 10' pup joint with a bull plug on bottom followed by 5 joints of wire wrap for 218.68' followed by 2 blank joints for 83.25' followed by 1 wire wrap for 41.50' and 10' pup joint on top with a 7' Burns Liner Hanger with lead seal for a total of 367'. Liner equipped with five 5 1/2" x 15" centralizers and the 2 blanks with weld on centralizers. Hung liner 5' off bottom. Top of liner at 7,443' and bottom at 7,811'.

Mud wt. 63#, Vis. 38 sec., W.L. 10.6cc., solids 4%.

2-7 60th Day. Tested port collar to 1,000 psi. Opened port collar and circulated before gravel packing. Gravel packed with 30 sacks and pressured up to 900 psi. Reverse circulated out approximately 10 sacks of gravel. Gravel packed at 15 to 20 sacks per hour. Gravel packed liner with 272 sacks of 20 x 40 Monterey gravel and had a pack off of 1,000 psi. Reverse circulated and tested port collar to 900 psi.

Mud wt. 63#, Vis. 36 sec., W.L. 10.4cc., solids 4%.

2-8 61st Day. Pulled out gravel packing tools and ran in with wash tool and washed liner. Laid down wash tool and ran gravel packing tool. Had a pack off of 1,000 psi, unable to displace more gravel. Ran Dresser Atlas "photon" log.

2-9 62nd Day. Finished running Dresser Atlas "photon" log. Ran A Baker "Retrieva-D" packer on Welex wireline and set at 7,400'. Laid down 4 1/2" drill pipe and 6" drill collars.

2-10 63rd Day. Unloaded and measured 3 1/2" tubing. Changed 4 1/2" pipe rams in BOPE to 3 1/2". Changed collars on 30 joints of 3 1/2" N-80 tubing. Picked up and ran tubing with 2 seals and locator sub. Set 20,000# on 8 5/8" 36# packer at 7,403'. Closed pipe rams and tested packer to 1,500 psi for 20 minutes, test was ok.

2-11 64th Day. Hydrotested tubing to 5,000 psi. Spaced out and landed 65 joints of 3 1/2" N-80 EUE tubing and 175 joints of J-55, 3 1/2" tubing and an 8' J-55 pup joint on top. Landed with 20,000# on packer at 7,403', tubing measurments and 7,400', wireline measurments. Installed xmas tree and tested to 5,000 psi for 20 minutes. Displaced brine-polymer completion fluid with 450 bbls of waste lease brine. Retightened all xmas tree nuts. Released rig at 11:59 p.m., 2-11-79.

Ex. I – 61

Response to Data Request

Blade Response to SoCalGas Data Request

Prepared for:
Messrs. A. Patel and G. Healy

Purpose:
Blade response to the SoCalGas Data Request December 12, 2019.

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Date:
Jan. 9, 2020

Version:
1

Project Number:
N/A

Blade Energy Partners Limited and its affiliates (Blade) provide our services subject to our General Terms and Conditions (GTC) in effect at time of service, unless a GTC provision is expressly superseded in a separate agreement made with Blade. Blade's work product is based on information sources which we believe to be reliable, including information that was publicly available and that was provided by our client; but Blade does not guarantee the accuracy or completeness of the information provided. All statements are the opinions of Blade based on generally-accepted and reasonable practices in the industry. Our clients remain fully responsible for all clients' decisions, actions and omissions, whether based upon Blade's work product or not; and Blade's liability solely extends to the cost of its work product.

Version Record

Version	Issue Date	Issued As/ Type of Version	Author	Checked By	Project Leader
1	Jan. 9, 2020	Final	Blade	Blade	RMK

Version History

Version	Date	Description of Change

SoCalGas-5.1073

Table of Contents

1 Background 4

2 Questions and Responses 5

2.1 Question 1 5

2.2 Question 1.a. 5

2.3 Question 1.b. 5

2.4 Question 1.c. 6

2.5 Question 1.d. 6

3 Nomenclature 7

3.1 Abbreviations and Acronyms 7

SoCalGas-5.1074

1 Background

Southern California Gas Company (SoCalGas) issued a data request to Blade Energy Partners (Blade) on December 12, 2019.

Blade reviewed the data request and prepared responses to each part of the request. The SoCalGas questions are included verbatim followed by the Blade responses in Section 2.

SoCalGas-5.1075

2 Questions and Responses

2.1 Question 1

With regards to YOUR statement in the BLADE REPORT, at pp. 5 and 238, that SoCalGas lacked an "understanding of the groundwater depths relative to the surface casing shoe and production casing..." at SS 25, please respond to the following questions:

2.2 Question 1.a.

Identify and describe any and all INDUSTRY STANDARD(S) that YOU considered, evaluated or assessed in connection with the above statement.

2.2.1 Response 1.a.

Blade did not consider, evaluate or assess any INDUSTRY STANDARD(S) regarding "The lack of understanding of groundwater depths . . ." statement referenced in the root cause analysis (RCA) report. The above-mentioned statement is Blade's technical conclusion based on the observations and data collected, reviewed and evaluated during the RCA investigation, as discussed in more detail below.

Blade conducted a technical RCA to determine the cause of the 7 in. production casing failure in well SS-25. External corrosion on the 7 in. production casing was identified as a direct root cause of the SS-25 casing failure as discussed in the RCA report. Groundwater is discussed in the Blade report in Section 2.7. An aqueous environment had to be present in the 7 in. × 11 3/4 in. annulus for the microbial corrosion to occur. Groundwater is the only logical explanation that could allow the corrosion to take place. The pH of the drilling fluid left behind the casing would have been too high to allow corrosion. Over time, the residual drilling fluid, which was left in the annulus after the production casing was cemented, was replaced by groundwater. Groundwater also caused the external corrosion in the 11 3/4 in. surface casing, resulting in numerous holes above 400 ft. Casing integrity depends on maintaining sufficient casing wall thickness to withstand the pressure loads on the casing. Corrosion reduced casing wall thickness and therefore the casing pressure capacity.

During the RCA, Blade did not identify any pre-incident data, whether proprietary or public, that discussed the depth or characteristics of groundwater in the area. Borehole TH-1/RBMW-1 was drilled to a depth of 1,110 ft at a location approximately 600 ft from SS-25. Blade requested this borehole to locate possible water sources and specified an evaluation program to assess formations and identify any associated water sources as part of the RCA. Groundwater was located and sampled in TH-1/RBMW-1 between 900 – 1,000 ft. (A shallower adjacent well TH-2/RBMW-2 located and sampled groundwater between 340 – 440 ft.) The TH-1/RBMW-1 groundwater depth is deeper than the 800 ft value typically included in Aliso Canyon well NOIs as the base of freshwater.

2.3 Question 1.b.

Produce any and all DOCUMENTS related to any INDUSTRY STANDARDS identified in response to Request 1(a).

SoCalGas-5.1076

2.3.1 Response 1.b.

No Industry standards were utilized to assess the "The lack of understanding of groundwater depths . . ." statement referenced in the RCA report.

2.4 Question 1.c.

Identify any and all LAWS that YOU considered, evaluated or assessed in connection with the above statement.

2.4.1 Response 1.c.

Blade did not consider, evaluate or assess any LAWS regarding "The lack of understanding of groundwater depths . . ." statement referenced in the RCA report.

2.5 Question 1.d.

For each LAW that YOU evaluated in preparing the BLADE REPORT identified in response to Request 1(c), state YOUR understanding as to whether SoCalGas complied with the LAW.

2.5.1 Response 1.d.

Blade did not consider, evaluate or assess any LAWS regarding "The lack of understanding of groundwater depths . . ." statement referenced in the RCA report.

SoCalGas-5.1077

3 Nomenclature

3.1 Abbreviations and Acronyms

Term	Definition
BFW	Base of Freshwater
Blade	Blade Energy Partners
DOGGR	Division of Gas, Oil, and Geothermal Resources
NOI	Notice of Intent
RCA	Root Cause Analysis
SoCalGas	Southern California Gas Company

SoCalGas-5.1078

Ex. I – 62

Due to the large file size, this exhibit is an excerpt. The native file of this document is available upon request.

Company: Southern California Gas Company (U 904 G)
Proceeding: 2016 General Rate Case
Application: A.14-11-XXX
Exhibit: SCG-06

SOCALGAS

DIRECT TESTIMONY OF PHILLIP E. BAKER

UNDERGROUND STORAGE

November, 2014

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Table PEB-3 below further summarizes the descriptive characteristics of all four storage fields.

Table PEB-3
Southern California Gas Company
Descriptive Statistics of Storage Fields

Descriptive Statistic	Aliso Canyon	La Goleta	Honor Rancho	Playa del Rey	Total All Fields
Year Field Placed in Service	1973	1941	1975	1942	-
Injection/Withdrawal/Observation Wells (number)	115	20	40	54	229
Gas Compressor Units (number)	8	8	5	3	24
Compression Horsepower (bhp)	42,000	5,700	27,500	6,000	81,000
Maximum Reservoir Pressure (psig)	3,600	2,050	4,400	1,700	-
Working Gas (Bcf)	86.2	21.5	26.0	2.4	136.1
Maximum Withdrawal Rate (MMcfd)	1,860	420	1,000	400	3,760
Maximum Injection Rate (MMcfd)	600	140	300	75	1,115
Maximum Well Depth (feet)	10,691	6,912	13,300	6,575	-
Minimum Well Depth (feet)	6,997	4,247	9,165	6,049	-
Average Well Depth (feet)	8,146	4,886	9,959	6,339	-

C. Risk Management Practices in Storage

The risk policy witnesses, Diana Day (Exhibit SCG-02) and Doug Schneider (Exhibit SCG-03), describe how risks are assessed and factored into cost decisions on an enterprise-wide basis. Several of my costs address safety risks associated with the storage system. Most specifically, I propose to establish a new SIMP, described and discussed below in the O&M and Capital cost sections, to mitigate safety-related risks.

While we have historically managed risk at our storage facilities by relying on more traditional monitoring activities and identification of potential component failures, we believe that it is critical that we adopt a more proactive and in-depth approach. Historically, safety and risk considerations for wells and their associated valves and piping components have not been addressed in past rate cases to the same extent that distribution and transmission facilities have been under the Distribution and Transmission integrity management programs. As a prudent storage operator, SoCalGas proposes to manage and approach the integrity of its storage well assets, which all fall under the jurisdiction of the California Department of Oil, Gas and Geothermal Resources (DOGGR), in a manner consistent with the approach adopted for distribution and transmission systems. Risk management activities, processes, and procedures

for well integrity should have a focus similar to those employed under the Company's pipeline risk mitigation programs.

Accordingly, in this rate case, we propose to establish a highly proactive approach to evaluating and managing risks associated with wells in our storage system through a new SIMP, modeled after the successes of our pipeline integrity management programs (TIMP and DIMP). Through the implementation of the SIMP, better storage well system data will be collected, maintained and modeled to identify the top risks throughout Storage. Comprehensive plans to mitigate those risks will be developed and implemented.

1. Risk Assessment

Currently, risk assessment of our storage system is of a qualitative nature and is based on our long experience in operating and managing SoCalGas' storage facilities. During routine system assessments, we monitor the condition of our assets and consider the risks they may pose on safety, reliability, and the environment.

The future of risk assessment for our storage system is moving towards a more robust and quantitative approach that will help us capture more information on the condition of our storage wells and develop models that will assist in prioritizing risk mitigation activities. The details of this new risk assessment are captured in further sections of my testimony describing the SIMP.

2. Risk Mitigation Alternatives Evaluation

Well risk mitigation is evaluated on a case-by-case basis. Whenever a well may pose a safety risk, we act immediately to address the problem. Alternatives, such as plugging and abandoning the well, versus a major repair or well replacement, are evaluated based on conditions, including the age of the well, prior repair or maintenance history, performance during withdrawal or injection periods, and surface considerations, such as susceptibility to landslides. These various conditions, and their associated costs, are evaluated to determine the safest, most cost-effective mitigation option. Another consideration that may influence repair decisions is the age and condition of certain well components that may have become obsolete and are no longer supported by the original equipment manufacturer and cannot be readily replaced or maintained.

At a very high level, alternatives to mitigate risks posed by deteriorating, aging, obsolete or failed storage equipment include:

- Replacement of equipment / storage wells
- Overhaul of equipment / storage wells

- Repair of equipment / storage wells
- Abandonment of a storage well / equipment
- Installation of additional equipment

3. Risk Reduction Benefits

The proposed mitigation activities are expected to address safety, reliability and environmental risks by either maintaining a certain acceptable level of control over those risks, or by further reducing the potential impacts of the risks. While there are no current means to provide a quantitative risk reduction forecast, it is my belief that the proposed mitigation activities will greatly assist in controlling and reducing the risks in our storage system.

In addition to establishing a more quantitative risk analysis of our storage wells as discussed below, the SIMP will result in a more effective prioritization of required capital expenditures that address risks that impact safety, reliability and the environment.

4. Integration of Risk Mitigation Actions and Investment Prioritization

The implementation of the proposed SIMP will establish an integrated risk management and investment prioritization process for storage management at SoCalGas. Storage wells are an integral gas delivery component, and an unanticipated safety concern could interrupt access to the working gas asset and potentially lead to a complete shutdown of a storage field.

Models to be developed from captured well data will evaluate threats and risks that exist in our storage system. This will allow for a prioritization of those storage well threats, based on their location, age, condition and other factors, thereby establishing a robust methodology for prioritizing storage management investments.

5. Investment Included in Request to Support Risk Mitigation

Investments related to the SIMP are necessary to establish a risk management program. Future mitigation activities that will result from the implementation of the SIMP will be risk-driven and will address identified and prioritized risks. SoCalGas forecasts $5.676 million annually in O&M and $24.272 million annually in capital costs for the implementation of the SIMP. It is anticipated that the SIMP will last for six years, the estimated length of time required to inspect all of the wells and mitigate any identified conditions. After this six-year period, when the program is complete, future inspection and mitigation costs will be addressed through routine operations.

D. Support To/From Other Witnesses

In addition to sponsoring my own organization's costs, I also provide sponsorship of the New Environmental Regulatory Balancing Account (NERBA) cost forecast for the reporting requirements under Subpart W for Gas Engineering, Gas Transmission and Underground Storage for witnesses Raymond Stanford (Exhibit SCG-07), John Dagg (Exhibit SCG-05), and myself. The costs associated with Subpart W reporting requirements are illustrated in the cost detail in section II.C of my testimony. Policy testimony in support of NERBA and storm water regulations is provided by Environmental Services witness Jill Tracy (Exhibit SCG-17).

II. NON-SHARED COSTS

A. Introduction

Table PEB-4 below summarizes the total non-shared O&M forecasts for the listed cost categories.

Table PEB-4
Southern California Gas Company
Non-Shared O&M Summary of Costs

UNDERGROUND STORAGE	Thousands of 2013 Dollars		
Categories of Management	**2013 Adjusted Recorded**	**TY2016 Estimated**	**Change**
Underground Storage – Routine	$30,681	$34,101	$3,420
New Environmental Regulatory Balancing Account (NERBA) (Existing Balancing Account)	$314	$404	$90
Storage Integrity Management Program (Proposed New Balancing Account)	$0	$5,676	$5,676
Total	**$30,995**	**$40,181**	**$9,186**

B. Underground Storage – Routine O&M

Table PEB-05 below summarizes the non-shared O&M forecasts for routine storage operations.

Ex. I – 63

Due to the large file size, this exhibit is an excerpt. The native file of this document is available upon request.

SUPERIOR COURT OF THE STATE OF CALIFORNIA
COUNTY OF LOS ANGELES, CENTRAL DISTRICT

COORDINATION PROCEEDING SPECIAL TITLE (Rule 3.550)	JCCP No. 4861
SOUTHERN CALIFORNIA GAS LEAK CASES	Hon. Carolyn B. Kuhl Department SS12
THIS DOCUMENT RELATES TO: All Actions.	

— — —

Wednesday, November 20, 2019

— — —

CONFIDENTIAL
SUBJECT TO FURTHER CONFIDENTIALITY REVIEW

Videotaped Deposition of RAVI M. KRISHNAMURTHY, Ph.D., VOLUME 1, held at Bradley Arant Boult Cummings LLP, 600 Travis, Suite 4800, Houston, Texas, commencing at 9:12 a.m. on the above date, before Susan Perry Miller, Registered Diplomate Reporter, Certified Realtime Reporter, Certified Realtime Captioner, and Notary Public.

— — —

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SoCalGas-5.1088

asked them for information regarding longitudinal or circumferential through-wall defects?

A. Basically we were after other wells that may have had similar failures as SS-25. That's really all we were after.

Q. And were you after information that SoCalGas had regarding those types of casing defects prior to the SS-25 blowout?

A. Prior or post? Prior, we were looking at actual data. We couldn't find any. But we recognized the SIMP program was pretty intense and there were a lot of other casings being pulled. So that was what we were after.

Q. In the response to that question number 2 dated March 23rd, 2018, according to page 26343, SoCalGas provided a list of wells, and then on page 26344 there was an amended response dated March 22nd, 2019, and they included some revised information.

Do you see that?

A. Yes.

Q. And did you review the well

CERTIFICATE

I, SUSAN PERRY MILLER, Registered Diplomate Reporter, Certified Realtime Reporter, Certified Court Reporter and Notary Public, do hereby certify that prior to the commencement of the examination, RAVI M. KRISHNAMURTHY, Ph.D. was duly sworn by me to testify to the truth, the whole truth and nothing but the truth;

That signature of the witness was reserved by the witness or other party before the conclusion of the deposition;

That the foregoing is a verbatim transcript of the testimony as taken stenographically by and before me at the time, place and on the date hereinbefore set forth, to the best of my ability.

I DO FURTHER CERTIFY that I am neither a relative nor employee nor attorney nor counsel of any of the parties to this action, and that I am neither a relative nor employee of such attorney or counsel, and that I am not financially interested in the action.

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My Commission Expires 03/30/2020

Dated: 4th day of December, 2019

Ex. I – 64

SOUTHERN CALIFORNIA GAS COMPANY

CPUC-SAFETY AND ENFORCEMENT DIVISION DATA REQUEST DATED FEBRUARY 8, 2016

Question 1:

List of transmission lines and high pressure supply lines within 20 miles of Aliso Canyon Storage Field

Response 1:

CONFIDENTIAL: Submitted Under the Provisions of General Order 66-C and Section 583 of the Public Utilities Code

Enclosed is a list of transmission line pipe and high pressure supply line pipe within 20 miles of Aliso Canyon:

Response1_CPUC_D R_02.08.2016.pdf

For reference, a (high-level) map of the 20 mile radius is enclosed:

Response1A_CPUC_ DR_02.08.2016.pdf

Note: Some of the pipelines listed above are short in length and may not be visible on a map depicting a 20 mile radius.

Also, the attached list reflects our current database. While we have attempted to make this list as accurate as possible, it may contain some short segments that are pending reclassification as non-line pipe.

Question 2:

Which of these pipelines had Risk and Integrity Management Assessments

SOUTHERN CALIFORNIA GAS COMPANY

CPUC-SAFETY AND ENFORCEMENT DIVISION DATA REQUEST DATED FEBRUARY 8, 2016

Response 2:

CONFIDENTIAL: Submitted Under the Provisions of General Order 66-C and Section 583 of the Public Utilities Code

Per a (telephone) follow-up conversation between Kris Keas and Matt Epuna on February 10, 2016 enclosed is a list of the pipelines that have had a Transmission Integrity Management Assessment performed:

Response2_CPUC_D
R_02.08.2016.pdf

In addition to these TIMP assessments, transmission and distribution pipelines are also inspected and maintained through a comprehensive maintenance program. Some of these maintenance activities include, but are not limited to: leak survey, pipeline patrol, valve inspection, cathodic protection, and other activities as prescribed by state and federal safety regulations.

Question 3:

Assessment methods/ mile(s)

Response 3:

See Response 2.

Question 4:

Date(s) of assessments

Response 4:

See Response 2.

Question 5:

Anomalies noted

SOUTHERN CALIFORNIA GAS COMPANY

CPUC-SAFETY AND ENFORCEMENT DIVISION DATA REQUEST DATED FEBRUARY 8, 2016

Response 5:

CONFIDENTIAL: Submitted Under the Provisions of General Order 66-C and Section 583 of the Public Utilities Code

The enclosed file contains the conditions (refer to 49 CFR 192.933), remediation methods and remediation dates for pipelines within 20 miles from Aliso Canyon:

Response5_CPUC_D
R_02.08.2016.pdf

Question 6:

Remediation and methods, if any

Response 6:

See Response 5.

Question 7:

Dates of remediation

Response 7:

See Response 5.

Ex. I – 65

REUTERS

campaign to slow coronavirus spread
9 MINUTES AGO

shuts borders to foreign nationals
16 MINUTES AGO

U.S. LEGAL NEWS
FEBRUARY 5, 2020 / 11:07 AM / A MONTH AGO

Chesapeake Energy, others sued for $1 million in fatal Texas oil-well blast

Liz Hampton

(Reuters) - Chesapeake Energy Corp and three oilfield service firms were sued by the daughter of a worker who suffered fatal injuries when a Texas oil well exploded in flames last month.

The wrongful death suit seeks at least $1 million from Chesapeake Energy, Forbes Energy Services, Eagle Pressure Control and Halliburton Co. It was filed this week in Harris County District Court by Madison Hendrix, whose father, Brad Hendrix, died in a hospital days after the blast.

Hendrix alleged that Chesapeake, the well owner, and the oilfield service companies were negligent, failed to provide a safe work environment or adequate medical care to the workers.

Chesapeake declined to comment and Eagle Pressure Control did not immediately respond to a request for comment. Forbes Energy Services said it was "beyond saddened that three

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Halliburton said it was not performing any services on the rig when the well-control incident occurred. Its well-control unit, Boots & Coots, was hired to handle the post-incident well intervention work, a spokeswoman for the company said.

Brad Hendrix was a well-intervention technical adviser at Eagle Pressure Control, according to his LinkedIn profile. He was one of three workers fatally injured in the Jan. 29 explosion near Deanville, Texas.

A second Eagle Pressure Control employee, Windell Beddingfield, died on the day of the accident, according to an attorney for the family. His mother last week sought a temporary restraining order against Chesapeake to require it to preserve evidence from the blast.

A third victim, identified by local media as Brian Maldonado of San Diego, Texas, died in a hospital over the weekend. A fourth worker was airlifted to a hospital and has not been identified.

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when natural gas leaked from a well during a workover operation and exploded near Deanville, about 75 miles (120 km) east off Austin.

WildHorse Resource Development Corp, which Chesapeake acquired last year, also was named in the lawsuit.

Reporting by Liz Hampton in Houston; Editing by Matthew Lewis and Peter Cooney

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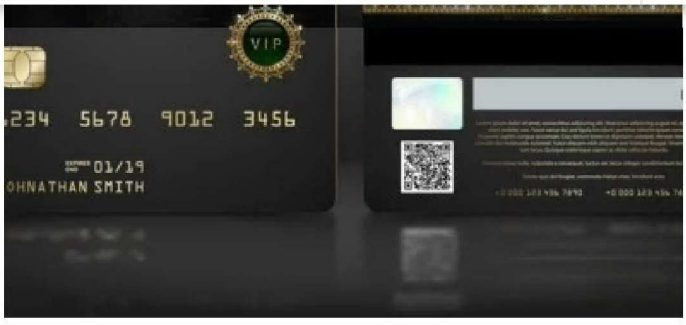

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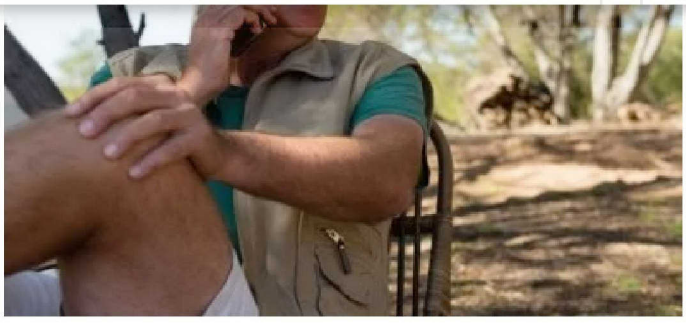

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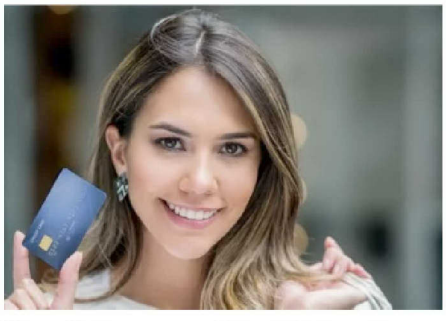

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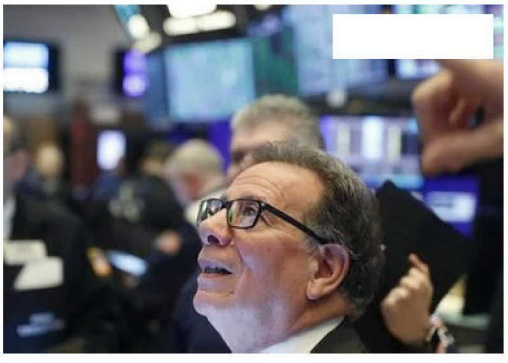

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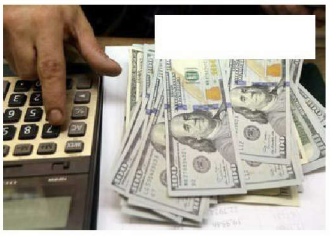

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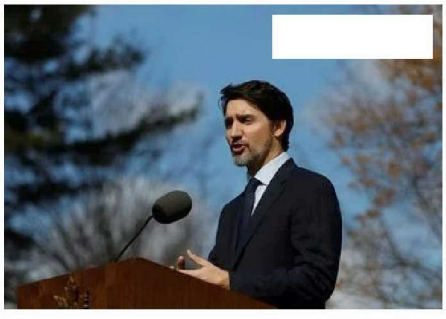

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Federal agencies probe Chesapeake well blowout that killed 3 workers in Texas

- February 5, 2020 (2020-02-05T08:29:56+00:00)

The Chesapeake well blowout and fire that has now claimed the lives of three workers in South Texas is being probed by at least two federal agencies as well as a Texas agency.

Investigators for the Occupational Safety and Health Administration and the Chemical Safety Board were in Burleson County this week at the site of a blowout that occurred Jan. 29 according to a report by the *San Antonio Business Journal.*

OSHA first appeared on site Sunday, and CSB is completing its on-site investigation this week, according to documents provided to the Business Journal by the Railroad Commission of Texas (https://www.bizjournals.com/profile/company/org_xx_302eae52a72d11e8abd612c1e58b58b2), which is also investigating the incident. In addition, the Railroad Commission document said other agencies would be on-site and off-site over the coming week, although it didn't name those agencies.

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Neither OSHA nor the CSB responded to requests for further information.

One worker died immediately when natural gas in the well sparked a fire, according to initial reports. Two later died of their injuries in the hospital, with one dying over the weekend. The condition of the fourth worker injured in the blast hasn't been made known.

The well belongs to Oklahoma-based Chesapeake Energy Corp., and the workers were employed by contractors hired by Chesapeake (NYSE: CHK) to drill it. The mother of one of the victims has already filed a lawsuit against Chesapake Energy.

"We are deeply saddened to learn that a third contractor has died as a result of injuries sustained in last week's well control incident," Chesapeake spokesman Gordon Pennoyer (https://www.bizjournals.com/sanantonio/search/results?q=Gordon%20Pennoyer) said in a statement. "Our thoughts and our prayers remain with those impacted. The cause of the incident is currently under investigation."

The Chemical Safety Board also investigated the January 2018 well blowout that killed five workers near Quinton, Oklahoma. It later issued a report blaming some of the operators for the tragedy.

The CSB is a nonregulatory agency, meaning it cannot issue fines or citations. It can give recommendations to agencies such as OSHA and the U.S. Environmental Protection Agency, both of which can take enforcement actions based on such recommendations. Investigations typically take several months while OSHA must issue a citation or penalty within six months of a violation occurring, according to CSB's website.

Source: San Antonio Business Journal

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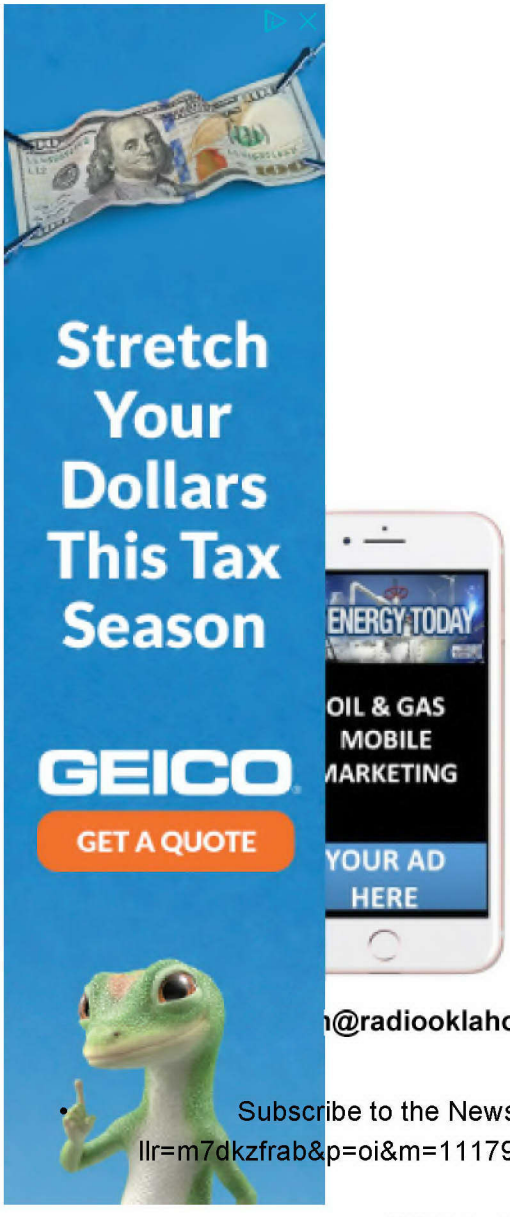

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Feds To Probe Fatal Chesapeake Energy Oil Well Accident

February 4, 2020

Federal officials are stepping into an investigation of an accident at a Chesapeake Energy oil well that left three men dead and another hospitalized.

In a Monday statement, the U.S. Chemical Safety and Hazard Investigation Board announced it has deployed a team to investigate the fatal Jan. 30 accident in Burleson County that killed three workers and left one hospitalized.

Known as the CSB, the federal agency was launched in 1998 to investigate accidents and to determine the conditions and circumstances that led up to them. As part of its work, the agency identifies the cause or causes of accidents so that similar events might be prevented.

The federal investigation will run alongside ones being conducted by state and local authorities.

In a court filing, family members reported that 38-year-old Windell Beddingfield of Tyler died at the scene.

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The identity of the second worker who died has not been released but family members of 25-year-old Brian Maldonado reported that the San Diego, Texas died in the hospital on Saturday.

Eleven people from Chesapeake, Fort Worth oil field service company Eagle Pressure Control and Alice oil field service company C.C. Forbes were working at the well at the time of the incident, a report from the Railroad Commission of Texas shows.

Investigators believe that an unexpected amount of natural gas entered the well and ignited. What caused the ignition remains under investigation.

Beddingfield and the second man who died worked for

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C.C. Forbes. The companies could not immediately be reached comment about the federal investigation.

Source: Chron

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Justin Hicks
The CSB did a very through job with the Patterson 219 explosion.
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Ex. I – 68

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FEATURED

One killed, three injured in well site accident

'Flash fire' incident claims life of Wyoming man

By Amy Dalrymple Forum News Service

Jun 20, 2016

The workover rig in McKenzie County where three men were injured and one was killed Saturday morning in an explosion.

Photo by Elizabeth Hackenburg

WATFORD CITY, N.D. – One worker has died and three were injured in a fire at a McKenzie County oil well site over the weekend, the Occupational Safety and Health Administration said Monday.

SoCalGas-5.1122

Crews were working on a workover rig on a well about 8 miles east of Watford City when the well ignited about 8:30 a.m. Saturday, said Eric Brooks, director of the Bismarck area OSHA office.

The owner of the well, XTO Energy, described the incident as a “flash fire.”

Johnny Stassinos, 52, Rock Springs, Wyo., died from his injuries Saturday afternoon at Trinity Hospital in Minot, the McKenzie County Sheriff’s Office said.

Daniel Montes, 28, Fruita, Colo., and Richard Maheu, 27, Rock Springs, Wyo., suffered serious burns and were in critical condition at Regions Hospital in St. Paul, the sheriff’s office said.

Justin Pyle, 30, Grand Junction, Colo., was treated and released for minor injuries from McKenzie County Heathcare Systems Hospital in Watford City, officials said.

The workers were employees of Most Wanted Well Service and SEI Well Service, said Emily Snooks, a spokeswoman for XTO, a subsidiary of Exxon Mobil Corp.

OSHA has launched an investigation and an inspector will be at the site today, Brooks said.

XTO has also formed an investigation team to determine the cause of the incident, Snooks said.

“We are greatly saddened by this tragic incident, and we express our deepest sympathy to the workers and the families of those affected,” Snooks said.

Alison Ritter, spokeswoman for the Department of Mineral Resources, said crews were working on a well that had been fracked when the well “experienced a kick of gas” on Saturday morning.

When deputies arrived on scene, the fire was out, authorities said. First-responders provided basic first aid on scene. One victim was airlifted from the scene and two were transported from the Watford City Airport, the sheriff’s office said.

A workover rig is smaller than a drilling rig and is used for well completions and maintenance.

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The incident did not cause any oil or other contamination to leave the well location, according to the North Dakota Department of Health.

This is the second oil and gas fatality OSHA has investigated in North Dakota in 2016, Brooks said.

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Ex. I – 69

Due to the large file size, this exhibit is an excerpt. The native file of this document is available upon request.

OIL AND GAS EXTRACTION WORKER FATALITIES 2014

NIOSH Fatalities in Oil and Gas Extraction (FOG) Database

Sophia Ridl, Kyla Retzer, and Ryan Hill

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

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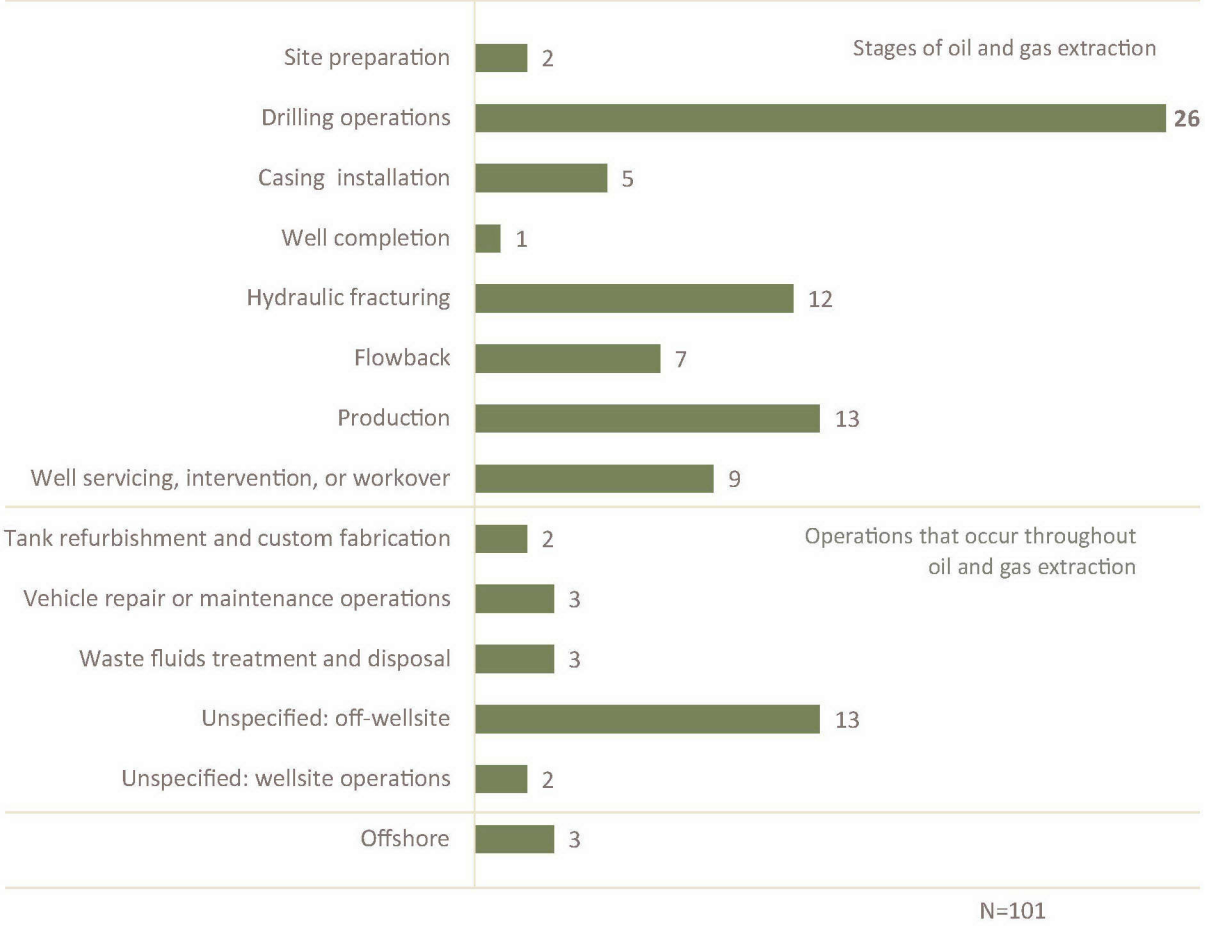
OPERATION

- The operation could be determined in 75 (85%) of the 88 incidents. Where operation is unspecified, the incidents were categorized into off-wellsite and on-wellsite operations (13 incidents accounting for 15 fatalities)
- The largest number of fatalities occurred during drilling operations (26 fatalities).
- Twenty worker fatalities occurred during completions (well completion, hydraulic fracturing, and flowback).

OPERATION
Operations are distinct stages or processes in oil and gas extraction. Each incident is assigned one operation.

FATALITIES IN FOG BY OPERATION, 2014



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ACTIVITIES

- Fatalities occurred during 43 different types of activities.
- Activities that were most commonly associated with fatalities included motor vehicle travel (including non-traditional commuting), material handling using a crane, forklift or winch truck, and rig or equipment repair or maintenance.

ACTIVITIES
Activities are components or steps within oil and gas extraction operations that may occur several times. Each incident is assigned as many activities as appropriate.

FATALITIES IN FOG BY ACTIVITY, 2014

HIGH FREQUENCY (8+ FATALITIES)

ACTIVITY	# OF FATALITIES
Motor vehicle travel	18
Material handling: crane, forklift, winch truck	12
Rig or equipment repair or maintenance	11
Commuting: non-traditional	10
Make up or break out tubulars	8
Production rig activities	8
Rigging up or down	8

MODERATE FREQUENCY (4–7 FATALITIES)

ACTIVITY	# OF FATALITIES
Tank gauging or sampling	7
Equipment install or dismantle	6
Produced and waste fluids storage	6
Wellhead or pumping unit activities	6
Making a connection	5
Separation equipment activities	5
Well control equipment activities	5
Hotwork and welding	4
Laydown or pickup tubulars	4
Pressure pumping	4
Tripping pipe in or out	4
Truck transport: crude oil hauling	4
Vacuum truck activities	4
Wellsite maintenance or construction	4

LOW FREQUENCY (1–3 FATALITIES)

ACTIVITY	# OF FATALITIES
Downhole tool and equipment activities	3
Production monitoring	3
Running casing	3
Spotting	3
Tank cleaning or maintenance	3
Truck transport: equipment or supplies hauling	3
Coiled tubing activities	2
Drilling fluid mixing and pumping	2
Non-motor vehicle travel	2
Pulling or running rods	2
Truck transport: produced or waste water hauling	2
Truck transport: unspecified cargo	2
Well cleanout	2
Well testing and logging	2
Break or rest	1
Plug drill out	1
Production tubing installation	1
Pulling or running tubing	1
Racking back tubulars	1
Snubbing	1
Truck transport: water hauling	1
Vehicle repair or maintenance activities	1

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OPERATION AND INDUSTRY GROUP

- Fatalities to servicing company workers occurred throughout most operations, with the highest number of fatalities occurring during hydraulic fracturing and production.
- Most fatalities to drilling company workers occurred during drilling operations (20 deaths). However, three employees died during casing installation and another three during flowback.
- Workers from all industry groups were killed during drilling operations.

OPERATION
Operations are distinct stages or processes in oil and gas extraction. Each incident is assigned one operation.

INDUSTRY GROUP
The industry group is based on the NAICS code of the employer. A company's NAICS code is determined by its primary business and may be different than the work being done at the time of the incident. Each fatality is assigned to one industry group.

FATALITIES IN FOG BY INDUSTRY GROUP (NAICS) AND OPERATION, 2014

OPERATION	OPERATING COMPANY (211)	DRILLING COMPANY (213111)	SERVICING COMPANY (213112)	OTHER INDUSTRY	UNKNOWN	TOTAL
Site preparation			1	1		2
Drilling operations	1	20	4		1	26
Casing installation		3	2			5
Well completion	1					1
Hydraulic fracturing	1		11			12
Flowback		3	3	1		7
Production	2		11			13
Well servicing, intervention, or workover	2		5	2		9
Tank refurbishment and custom fabrication	1		1			2
Vehicle repair or maintenance operations			2	1		3
Waste fluids treatment and disposal		1		2		3
Unspecified: off-wellsite	1		4	1	7	13
Unspecified: wellsite	1		1			2
Offshore					3	3
Total	10	27	45	8	11	101

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Ex. I – 70

Due to the large file size, this exhibit is an excerpt. The native file of this document is available upon request.

Message from the Secretary of Energy

Earlier this year, Congress and the Administration worked together to establish a Federal Task Force to analyze California's Aliso Canyon natural gas leak and make recommendations on how to reduce the likelihood of future leaks from underground natural gas storage facilities across the country. While these incidents are rare, the leak at Aliso Canyon is a reminder that failures at aging natural gas storage facilities can have damaging effects on communities, the environment, and the reliability of our energy supplies.

At the same time, the Nation's 400+ natural gas storage facilities provide essential services. They deliver gas at times of high demand to heat our homes and businesses, to power American industry, and increasingly, to provide fuel for electricity generation.

The Task Force identified three principal research areas associated with natural gas storage facilities: minimizing the risk of well failures; reducing health and environmental impacts of major leak incidents; and understanding energy reliability implications. Across these areas, the Task Force has made more than 40 recommendations that identify the need for additional actions at our Nation's natural gas storage facilities to ensure their long-term safety and reliable operation.

Key recommendations of the Task Force include:

- Gas storage operators should begin a rigorous evaluation program to baseline the status of their wells, establish risk management planning and, in most cases, phase-out old wells with single-point-of-failure designs.
- Advance preparation for possible natural gas leaks and coordinated emergency response in the case of a leak can help manage and mitigate potential health and environmental impacts of leaks when they do occur.
- Power system planners and operators need to better understand the risks that potential gas storage disruptions create for the electric system.

No community should have to go through something like the Aliso Canyon leak again. The recommendations in this report outline the steps we can take to prevent such an incident in the future. Now, it is up to industry to implement these recommendations in a timely fashion, while State and Federal officials develop regulations that enhance the safety of underground storage facilities in the United States.

Ernest J. Moniz

Secretary of Energy

SoCalGas-5.1133

Message from Task Force Co-Chairs

In April, as a part of the Administration's ongoing commitment to support State and industry efforts to ensure the safe storage of natural gas, and with the support of Congress, the Department of Energy (DOE) and the Department of Transportation's (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) announced the formation of an Interagency Task Force on Underground Natural Gas Storage Safety.

Two months earlier, along with the Secretary of Energy, we visited the Aliso Canyon site to review efforts to control the leak and to learn from experts and local officials about the impacts of the leak on the environment and community.

The Task Force includes premier scientists, engineers and technical experts from across the DOE complex, including five National Labs, DOT, the Environmental Protection Agency (EPA), the Department of Health and Human Services (HHS), the Department of Commerce (DOC), the Department of the Interior (DOI), the Federal Energy Regulatory Commission (FERC), and the Executive Office of the President. As a Task Force, we have held three national-level workshops and met with community members, industry representatives, environmental organizations, and State officials.

The Task Force established three working groups for research and analysis: (1) the physical integrity of wells at gas storage facilities, (2) the reliability of natural gas supplies from gas storage facilities, and (3) the public health and environmental impacts associated with the Aliso Canyon leak.

The "Well Integrity" working group was led by DOE's Office of Fossil Energy, with important contributions from four DOE National Labs—the National Energy Technology Laboratory, Lawrence Berkeley National Laboratory, Lawrence Livermore National Laboratory, Sandia National Laboratories, and PHMSA.

The "Reliability" working group was led by the Department of Energy's Office of Electricity Delivery and Energy Reliability with important contributions by DOE's Argonne National Laboratory, DOE's Energy Information Administration, and FERC.

The "Health and Environment" working group was led by the EPA and HHS's Centers for Disease Control and Prevention. DOC's National Oceanographic and Atmospheric Administration and PHMSA also contributed.

This final report is a synthesis of the three working group reports, which will be made available as separate technical appendices to the report.

PHMSA plans to initiate regulatory actions to help ensure the safety of natural gas storage facilities across the country, beginning with an Interim Final Rule due out by the end of this year. Moving forward, PHMSA will consider the recommendations of this Task Force in developing future regulation and safety standards as required by the PIPES Act of 2016 (P.L. 114-183).

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Natural gas provides heat to millions of American homes and is expected to provide a third of our Nation's total electric power generation this year. As co-chairs of this Task Force, we have made it a priority to support States, industry and the American public to ensure that our infrastructure is safe. The Task Force's efforts are an important step forward as we continue to work toward protecting public health and safety and making progress in reducing greenhouse gas emissions. We offer our recognition and gratitude to all those whose hard work and thoughtful analysis are assembled here.

Franklin Orr
Under Secretary for Science and Energy

Marie Therese Dominguez
Administrator, Pipeline and Hazardous Materials Safety Administration

SoCalGas-5.1135

Executive Summary

On October 23, 2015, the largest methane leak from a natural gas storage facility in United States history was discovered by the Southern California Gas Company (SoCalGas) at well SS-25 in its Aliso Canyon Storage Field in Los Angeles County. The leak continued for nearly four months until it was permanently sealed on February 17, 2016. In the interim, residents of nearby neighborhoods experienced health symptoms consistent with exposures to odorants added to the natural gas; thousands of households were displaced; and the Governor of California declared a state of emergency for the area. Approximately 90,000 metric tons of methane was released from the well, although estimates vary and the State of California is continuing its analysis. The incident also created serious energy supply challenges for the region and prompted broader public concerns about the safety of natural gas storage facilities.

Motivated by the events at Aliso Canyon, Federal officials, including many concerned members of Congress, sought to better understand and identify opportunities to improve the overall safety and environmental impacts of our Nation's natural gas storage infrastructure. To support these efforts, the Federal Government in April 2016 formed an Interagency Task Force on Natural Gas Storage Safety. Congress codified the Task Force through the Securing America's Future Energy: Protecting our Infrastructure of Pipelines and Enhancing Safety Act of 2016 (PIPES Act). Congress directed the Task Force to perform an analysis of the Aliso Canyon events and make recommendations to reduce the occurrence of similar incidents in the future. To do so, the Task Force examined three key areas: integrity of natural gas wells at storage facilities; public health and environmental effects from natural gas leaks; and vulnerability to reduced energy reliability in the case of future leaks.

Natural gas currently meets nearly 30% of U.S. energy needs, and natural gas storage facilities are essential to the functioning of a highly seasonal natural gas market. They provide quick access to large volumes of natural gas for end users during periods of high demand, such as during a cold spell in the winter or during periods of high electricity demand in the summer. The Aliso Canyon leak illustrated how the loss of a large gas storage facility can disrupt enough gas delivery service to cause major energy reliability concerns, including potential electricity blackouts. Gas storage facilities are key components of a large and complex natural gas delivery infrastructure that serve homes, offices, power plants, and industrial facilities. Smooth functioning of that infrastructure is vital to our economy, our quality of life, and our national security. Major leaks or functional disruptions elsewhere in the gas infrastructure (i.e., at pipelines, compressor stations, gas processing plants, and liquefied natural gas terminals) could have impacts similar to those of the Aliso Canyon incident, and perhaps on an even larger scale. Further, the electric power and natural gas industries have become much more interdependent in recent years, and their interdependence is expected to grow over the next decade as the U.S. becomes more reliant on gas-fired electric generation capacity.

Approximately 80% of wells in the Nation's natural gas storage fields were completed in the 1970s or earlier. They have been exposed to decades of physical and mechanical stresses and pre-date many current materials and technology standards. In addition, many of these wells were converted to gas storage from oil production and may not have piping designed for the higher overall operating pressures of natural gas. Although rare, large natural gas storage leakage events can have negative impacts on human health and communities.

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Chapter 1. Gas Storage Primer

Natural Gas Storage Basics

Why is natural gas stored underground?

Natural gas is an important commodity in the United States and the world, particularly for heating and for power generation. Underground natural gas storage is used in the transportation and delivery of gas by pipeline to end users. For example, the facilities can provide quick access to large volumes of gas for end users during periods of high demand, such as during a cold spell in the winter or a period of high electricity demand in the summer.[1]

How is natural gas stored?

Natural gas is injected down the wellbore and into a subsurface geological formation. As gas is injected, pressure builds within the formation. Higher reservoir pressures allow higher gas flow volume during the extraction (withdrawal) part of the storage cycle to help ensure suitable production gas flow rates.[2] Typically, vertical wells are used to inject and withdraw the gas, although horizontal wells are becoming more common.

A significant portion of the gas that is injected initially will remain in the subsurface and will not be extracted during a typical withdrawal cycle. This gas is commonly known as "base gas" or "cushion gas." It is a permanent inventory in a storage reservoir that is needed to maintain adequate pressure, minimize water being produced with the gas, and maintain delivery rates throughout the withdrawal season.

More about how natural gas storage fields work can be found in the Niska Gas Storage Industry Primer (2010) and from the Energy Information Administration's (EIA) *Basics of Underground Natural Gas Storage.*

Where is natural gas being stored?

Underground natural gas storage is found in three main types of storage formations: depleted oil and gas fields, aquifers, and salt caverns. These storage facilities can be found across the United States in 415 facilities, including approximately 400 active facilities, in more than 30 States (as shown in Figure 1). Most (~80%) of the existing natural gas storage in the United States is in depleted natural gas or oil fields that are located close to consumption centers.

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[1]U.S. EIA [Online], *The Basics of Underground Natural Gas Storage*, released November 16, 2015, September 2016, www.eia.gov/naturalgas/storage/basics/.

[2]Niska Gas Storage [Online], 2010, *Gas Storage Industry Primer*, September 2016, www.niskapartners.com/wp-content/uploads/2010/04/GasStorageIndustryPrimer.pdf.

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Ex. I – 71

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What is SCADA?

7 minute read

SCADA Explained

Supervisory control and data acquisition (SCADA) is a system of software and hardware elements that allows industrial organizations to:

- Control industrial processes locally or at remote locations
- Monitor, gather, and process real-time data
- Directly interact with devices such as sensors, valves, pumps, motors, and more through human-machine interface (HMI) software
- Record events into a log file

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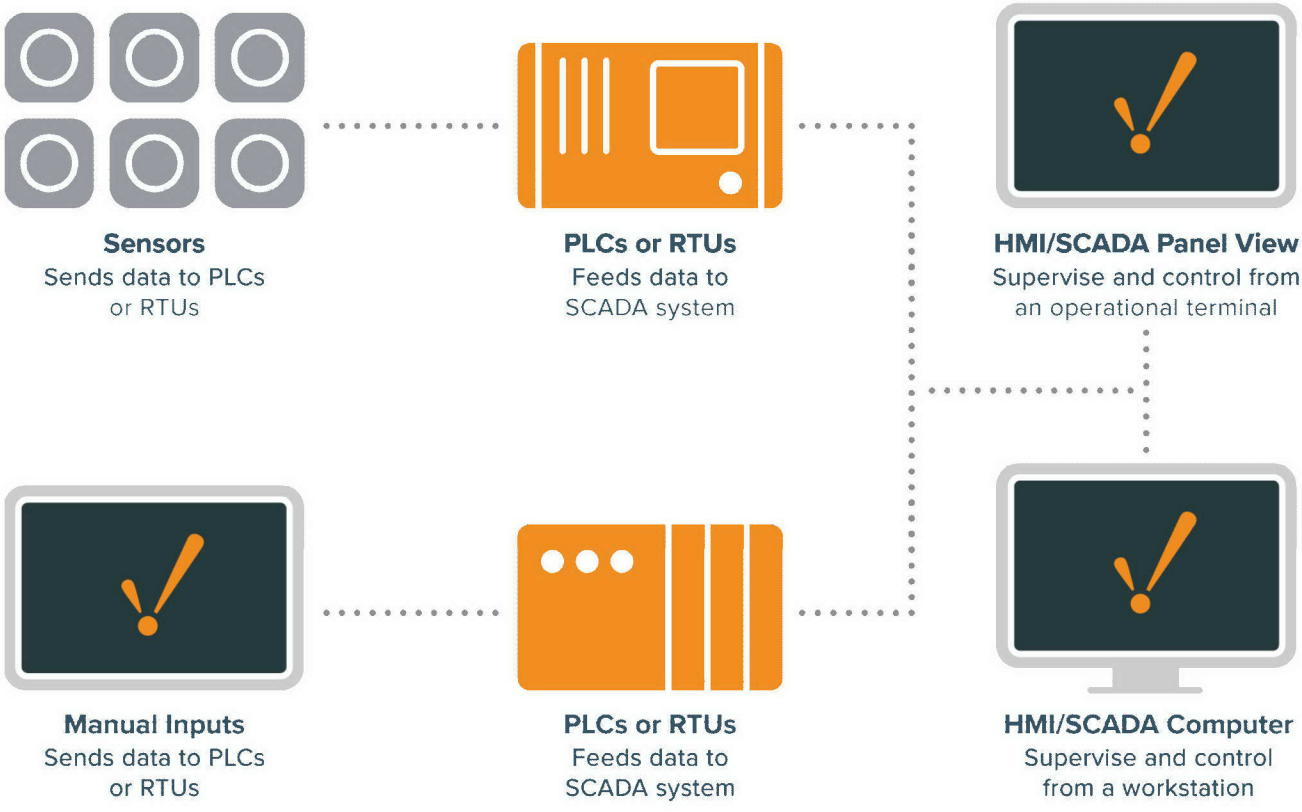
SCADA systems are crucial for industrial organizations since they help to maintain efficiency, process data for smarter decisions, and communicate system issues to help mitigate downtime.

The basic SCADA architecture begins with programmable logic controllers (PLCs) or remote terminal units (RTUs). PLCs and RTUs are microcomputers that communicate with an array of objects such as factory machines, HMIs, sensors, and end devices, and then route the information from those objects to computers with SCADA software. The SCADA software processes, distributes, and displays the data, helping operators and other employees analyze the data and make important decisions.

For example, the SCADA system quickly notifies an operator that a batch of product is showing a high incidence of errors. The operator pauses the operation and views the SCADA system data via an HMI to determine the cause of the issue. The operator reviews the data and discovers that Machine 4 was malfunctioning. The SCADA system's ability to notify the operator of an issue helps him to resolve it and prevent further loss of product.

A Basic SCADA Diagram



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Who Uses SCADA?

SCADA systems are used by industrial organizations and companies in the public and private sectors to control and maintain efficiency, distribute data for smarter decisions, and communicate system issues to help mitigate downtime. SCADA systems work well in many different types of enterprises because they can range from simple configurations to large, complex installations. SCADA systems are the backbone of many modern industries, including:

- Energy
- Food and beverage
- Manufacturing
- Oil and gas
- Power
- Recycling
- Transportation
- Water and waste water
- And many more

Virtually anywhere you look in today's world, there is some type of SCADA system running behind the scenes: maintaining the refrigeration systems at the local supermarket, ensuring production and safety at a refinery, achieving quality standards at a waste water treatment plant, or even tracking your energy use at home, to give a few examples.

Effective SCADA systems can result in significant savings of time and money. Numerous case studies have been published highlighting the benefits and savings of using a modern SCADA software solution such as Ignition.

The Birth of SCADA

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DOE's Office of Scientific and Technical Information (OSTI), Office of Science [Public domain], via Wikimedia Commons

To understand the origins of SCADA, we must understand the problems industrial organizations are trying to solve. Before the concept of SCADA was introduced in the mid-20th century, many manufacturing floors, industrial plants, and remote sites relied on personnel to manually control and monitor equipment via push buttons and analog dials.

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As industrial floors and remotes site began to scale out in size, solutions were needed to control equipment over long distances. Industrial organizations started to utilize relays and timers to provide some level of supervisory control without having to send people to remote locations to interact with each device.

While relays and timers solved many problems by providing limited automation functionality, more issues began to arise as organizations continued to scale out. Relays and timers were difficult to reconfigure, fault-find and the control panels took up racks upon racks of space. A more efficient and fully automated system of control and monitoring was needed.

In the early 1950s, computers were first developed and used for industrial control purposes. Supervisory control began to become popular among the major utilities, oil and gas pipelines, and other industrial markets at that time. In the 1960s, telemetry was established for monitoring, which allowed for automated communications to transmit measurements and other data from remotes sites to monitoring equipment. The term "SCADA" was coined in the early 1970s, and the rise of microprocessors and PLCs during that decade increased enterprises' ability to monitor and control automated processes more than ever before.

The Evolution of SCADA

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The first iteration of SCADA started off with mainframe computers. Networks as we know them today were not available and each SCADA system stood on its own. These systems were what would now be referred to as monolithic SCADA systems.

In the 80s and 90s, SCADA continued to evolve thanks to smaller computer systems, Local Area Networking (LAN) technology, and PC-based HMI software. SCADA systems soon were able to be connected to other similar systems. Many of the LAN protocols used in these systems were proprietary, which gave vendors control of how to optimize data transfer. Unfortunately, these systems were incapable of communicating with systems from other vendors. These systems were called distributed SCADA systems.

In the 1990s and early 2000s, building upon the distributed system model, SCADA adopted an incremental change by embracing an open system architecture and communications protocols that were not vendor-specific. This iteration of SCADA, called a networked SCADA system, took advantage of communications technologies such as Ethernet. Networked SCADA systems allowed systems from other vendors to communicate with each other, alleviating the limitations imposed by older SCADA systems, and allowed organizations to connect more devices to the network.

While SCADA systems have undergone substantial evolutionary changes, many industrial organizations continued to struggle with industrial data access from the enterprise level. By the late 1990s to the early 2000s, a technological boom occurred and personal computing and IT technologies accelerated in development. Structured query language (SQL) databases became the standard for IT databases but were not adopted by SCADA developers. This resulted in a rift between the fields of controls and IT, and SCADA technology became antiquated over time.

Traditional SCADA systems still use proprietary technology to handle data. Whether it is a data historian, a data connector, or other means of data transfer, the solution is messy and incredibly expensive. Modern SCADA systems aim to solve this problem by leveraging the best of controls and IT technology.

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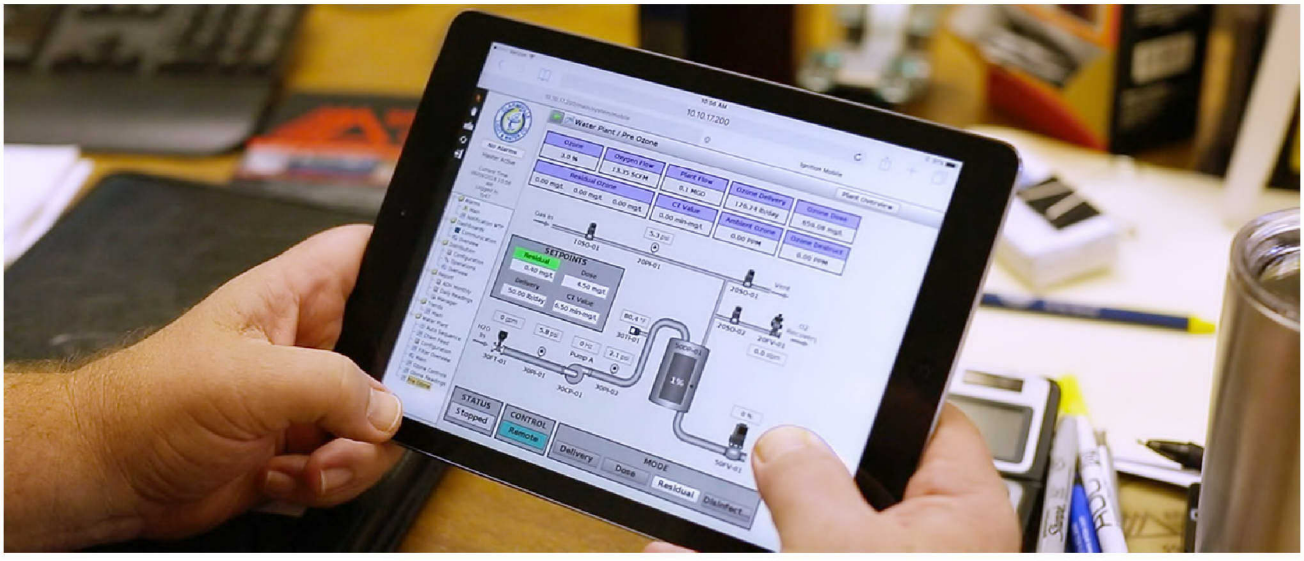

Modern SCADA Systems

Modern SCADA systems allow real-time data from the plant floor to be accessed from anywhere in the world. This access to real-time information allows governments, businesses, and individuals to make data-driven decisions about how to improve their processes. Without SCADA software, it would be extremely difficult if not impossible to gather sufficient data for consistently well-informed decisions.

Also, most modern SCADA designer applications have rapid application development (RAD) capabilities that allow users to design applications relatively easily, even if they don't have extensive knowledge of software development.

The introduction of modern IT standards and practices such as SQL and web-based applications into SCADA software has greatly improved the efficiency, security, productivity, and reliability of SCADA systems.

SCADA software that utilizes the power of SQL databases provides huge advantages over antiquated SCADA software. One big advantage of using SQL databases with a SCADA system is that it makes it easier to integrate into existing MES and ERP systems, allowing data to flow seamlessly through an entire organization.

Historical data from a SCADA system can also be logged in a SQL database, which allows for easier data analysis through data trending.

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Learn About Ignition - The New SCADA

Ignition HMI/SCADA Software

Ignition by Inductive Automation® is an industrial automation software platform that many businesses and organizations have switched to for their HMI/SCADA needs.

Ignition has been installed in thousands of locations in over 100 countries since 2010. Its powerful and robust nature allows SCADA system integrators to reach the demands of their customers while costing less than other SCADA software solutions.

Here are a few reasons why more enterprises are choosing Ignition:

- Ignition uses modern IT practices that make it compatible with current SCADA system components.
- Its unique licensing model lets users pay a flat fee based on the number of servers. Other SCADA vendors typically charge per client or per tag, but Ignition offers unlimited clients and tags.
- Ignition is web-deployable: it can be downloaded and installed in a few minutes, and clients can be launched or updated instantly.

Inductive Automation's motto of "Dream It, Do It" is a perfect embodiment of what Ignition can do. While its bold claims may sound too good to be true, one demonstration of the software proves how powerful it really is. Once you see what's possible, you'll begin to imagine how the software can fit your SCADA needs and open up new possibilities.

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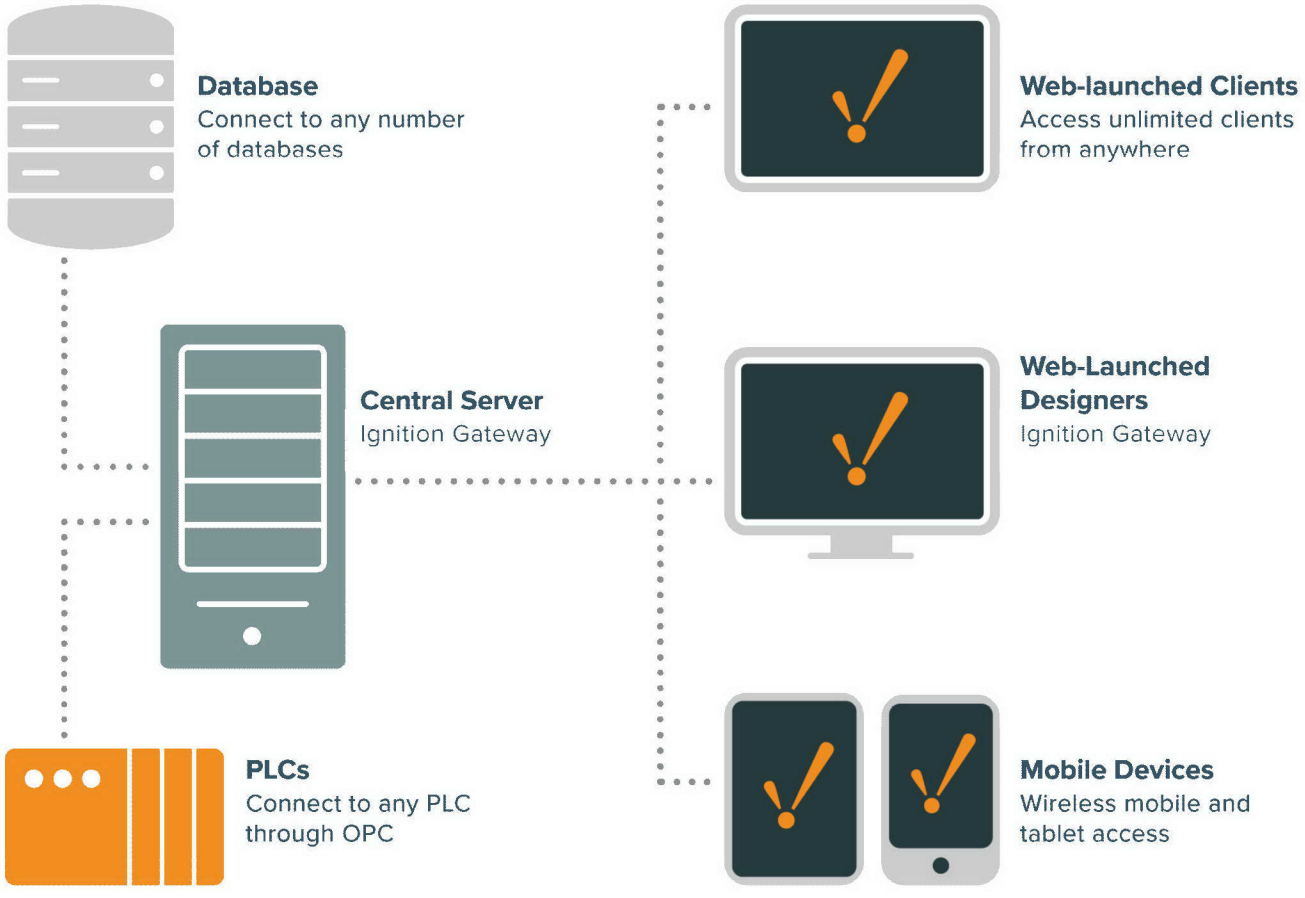
Ignition SCADA Architecture



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Cirrus Link Solutions (/ignition/modules#cirrus-link-solutions)
Sepasoft (/ignition/modules#sepasoft)

IGNITION ONBOARD

Onboard Program (/onboard/about)
Onboard Devices (/onboard)

Support

GET HELP

Support Portal (/support)
User Manual (https://support.inductiveautomation.com/hc/en-us/categories/115001...)
Knowledge Base (https://support.inductiveautomation.com/hc/en-us)
Forum (https://forum.inductiveautomation.com)
Support Policy (https://support.inductiveautomation.com/hc/en-us/articles/...)
Website Help (/website-help)

TRAINING

Inductive University (https://www.inductiveuniversity.com)
Training Schedule (/training)
Become Ignition Certified (/resources/training/certifications)
Upload Test (/resources/upload)

About

COMPANY

About Home (/about)
Who We Are (/about/who-we-are)
Customers (/about/customers)
Founder's Message (/about/founders-message)
Careers (/about/careers)

COMMUNICATION

Blog (/blog/)
Upcoming Events (/events)
News Room (/news)
Contact Us (/about/contact)

Download the free Ignition trial (/downloads)

(https://www.linkedin.com/company/inductive-automation) connect with us

Inductive Automation · 90 Blue Ravine, Folsom CA, 95630 (https://www.google.com/maps/place/90+Blue+Ravine,+Folsom,+CA+95630) · 1-800-266-7798 (toll-free) (tel:+1-800-266-7798) · 1-916-456-1045 (int'l) (tel:+1-916-456-1045) · Email Us (mailto:info@inductiveautomation.com)

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Brand Resources (https://company-36882.frontify.com/d/PvUNchzTCkyj/inductive-automation-brand-guidelines)

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Ex. I – 72

PACIFIC GAS & ELECTRIC COMPANY
GUIDE TO RECORD RETENTION

GAS SUPPLY

RECORD TITLE	FORM NUMBER	RETENTION JUSTIFICATION	RETENTION PERIOD
Analysis Gas Produced & Purchased		FERC 22I	Gas Production - 6 years (including btu & sulfur content)
As-Built Records Of Facilities		FERC 36A	Life of Facility
Chart - Gas Purchase		GSIP 457-1	4 years
Contracts			See Accounting & Corporate Records
Correspondence - All Types		FERC 63A	Retain for the period prescribed for the item to which it relates where necessary to a proper explanation of same.
Emergency Curtailment Procedures		FERC 29B	Destroy at option after expiration or supersession
Emergency Shutdown Procedures		FERC 29B	Destroy at option after expiration or supersession
Engineering Records Drawings & Support Data		FERC 36A	Records pertinent to the constructed facility retain until superseded or 6 years after the facility is retired. If construction of facility does not result, destroy at option after a complete accounting of expenses incurred.
Gas Measuring Records		FERC 22N	Gas Production - retain 1 year, except where basic chart information is transferred to another record, the charts need only be retained 6 months provided the record containing the basic date is retained one year.
Gas Produced & Purchased Records		FERC 22H	Gas Production - 6 years
Gas Sent Out And Holder Stock Records		FERC 22H	Gas Production - 6 years
Gas Well Test Report	61-6084	GSIP 459-1	3 years after the gas well is abandoned
Logs – Boiler		FERC 22A	Gas Production - 3 years Retention included related documents
Logs - Gas Generation & Output		FERC 22B	Gas Production - 6 years Retention includes related documents.
Logs - Gas Machine		FERC 22A	Gas Production - 3 years Retention includes related documents
Logs - Temperature & Atmospheric Pressure		FERC 22C	Gas Production - 3 years
Maps - Underground Storage Of Natural Gas		FERC 23.1C	1 year after reservoir, field, or relevant storage area is abandoned.
Meter Test Records		FERC 23M	Gas Production - 1 year after meter is retired

Note: Retention periods shown are only valid as of the date of this report and may not reflect lawful requirements or regulatory changes placed into effect since the report was printed.

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PACIFIC GAS & ELECTRIC COMPANY
GUIDE TO RECORD RETENTION

GAS SUPPLY

RECORD TITLE	FORM NUMBER	RETENTION JUSTIFICATION	RETENTION PERIOD
Record Of General Inspection & Operating Tests		FERC 22J	Gas Production - 3 years
Report Of Coal/Coke/Oil		FERC 22D	Gas Production - 3 years
Residual Report		FERC 22E	Gas Production - 3 years
Routine Maintenance Completion Report	62-3423	Gas Supply	6 years
Test Of Heating Value At Stations & Outlying Points		FERC 22G	Gas Production - 6 years
Weekly Report Heating Value & Specific Gravity	62-3903	FERC 22J	3 years
Well Records - Gas Production		FERC 22K	Retain one year after field or relevant production area is abandoned. (including clearing, bailing, shooting, etc., records; rock pressure; open flow; production; gas analysis reports, etc.)
Well Records - Underground Storage Of Natural Gas		FERC 23.1A	Well records, reports and logs which includes data relating to pressures, injected volumes, withdrawn volumes, core analysis, daily volumes of gas injected into and withdrawn from reservoir, and cushion and working gas volumes for each reservoir. Retain 1 year after reservoir, field, or relevant storage area is abandoned.

Note: Retention periods shown are only valid as of the date of this report and may not reflect lawful requirements or regulatory changes placed into effect since the report was printed.

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Ex. I – 73

TIMOTHY L. HOWER, P. E.

Senior Technical Advisor

MHA Petroleum Consultants
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Denver, Colorado 80202 USA
Phone: +1 303 277 0270
Mobile: +1 303 204 0220
e-mail: thower@mhausa.com

EDUCATION

- B. S., Petroleum Engineering, Penn State University, 1981
- M. S., Petroleum Engineering, Penn State University, 1983

PROFESSIONAL PROFILE

In excess of thirty-six years of petroleum engineering evaluation experience including:

- Supervision/Project Management of technical studies including
  - Independent Expert on major international unitization and equity redetermination projects, mergers and acquisitions, arbitrations, and joint venture field development programs.
  - Integrated geological modeling, reservoir characterization and numerical simulation studies conducted worldwide.
  - Evaluation, assessment and field development planning for shale gas and shale oil reservoirs in the US, Europe, China, South Africa and Australia.
  - Reserve valuations, equity studies and acquisition due diligence of major oil and gas assets located in the domestic US and worldwide.
  - Assessment and evaluation of enhanced oil recovery (EOR) projects, including waterflooding, CO_2 injection, miscible and immiscible natural gas injection.
- Evaluation and optimization of underground gas storage projects, including Compressed Air Energy Storage (CAES) projects located in the U.S., Europe and Australia. Conducted industry training courses on reservoir engineering of underground gas storage reservoirs, and co-authored an industry textbook on gas storage reservoir management.
- Unconventional gas reservoir development (coalbed methane, shales, tight gas). Authored and presented industry training courses on coalbed methane and tight gas reservoirs.
- Black oil, compositional, and unconventional reservoir simulation studies (North/South America, Europe, Africa, Australia, New Zealand and China).
- Design and implementation of pressure transient testing programs for reservoir characterization and evaluation.

- Development and instruction of reservoir engineering, enhanced oil recovery (EOR), production optimization and reservoir simulation industry training courses offered through OGCI-Petroskills.
- Manager of software client support and instruction of training courses for the ECLIPSE suite of reservoir simulation software products.
- Expert witness testimony and testimony before various regulatory commissions, the London High Courts, the London Court of International Aribtration, the High Court of New Zealand, and the Supreme Court of South Australia.

Registered Professional Engineer: Colorado, Wyoming U.S.A.

WORK EXPERIENCE

MHA PETROLEUM CONSULTANTS, a Sproule Company, Denver, Colorado:
(July, 1997 – July 2019) **President and CEO**
(July 2019 – Present) **Senior Technical Advisor**
Responsible for the day to day operations of an organization of approximately 25 people with active engineering projects throughout the world. In charge of staff development, staff recruitment, development of new business and new business contacts, as well as maintaining relationships with the company's existing client base. Project Manager of numerous engineering consulting projects worldwide. Instruction and development of industry training courses.

ENRON OIL & GAS COMPANY, Denver, Colorado and Houston, Texas:
(October, 1995 to June, 1997) **Engineering Manager**
In charge of a staff of reservoir, production engineers, and support personnel. Responsible for property evaluations, exploration and exploitation drilling programs, secondary recovery design and implementation, reservoir simulation studies, reserve and acquisition evaluations, and annual budgeting and forecasting for EOG's largest division.

INTERA Petroleum Division, Denver, Colorado:
(October, 1990 to September, 1995) **Sr. Manager, E&P Studies; Consulting Engineer**
Manager of the North American consulting group which included a staff of more than 30 geologists, geophysicists, petrophysicists and engineers. Responsible for staff development, staff recruitment, and profit/loss for Intera's largest global consulting group. Provided engineering, simulation and software support services for clients in North and South America, Europe, Africa, Australia and China.

CNG Development Company, Pittsburgh, Pennsylvania:
(October, 1988 to September, 1990) **Staff Engineer**
Management of oil and gas properties in conventional and unconventional (tight sands, shales, and coalbed) reservoirs. Production forecasting, field optimization, reserve estimates, formation evaluation, and depletion and drainage studies.

TENNECO OIL Exploration and Production, Denver, Colorado:
(June, 1983 to September, 1988) **Senior Reservoir Engineer**
Responsible for management of oil and gas properties in the Rocky Mountain Region. Unitization studies for several enhanced recovery projects in North Dakota. Lead engineer for Tenneco's significant interests in the San Juan Basin of New Mexico.

PROFESSIONAL MEMBERSHIPS

- Elected in 2015 as a Society of Petroleum Engineers (SPE) Distinguished Member.
- C. Drew Stahl Distinguished Alumni Achievement Award presented by the Pennsylvania State University, April 2011.
- Chairman – Denver Section of the SPE; 2001/2002.
- SPE *Henry Matson Technical Service Award,* May 2000, for innovative contributions in the field of engineering in gas reservoirs.
- Chairman; SPE Reprint Series on Layered Reservoirs
- Editor; SPE Reprint Series on Reservoir Management
- Professional Engineering Registration Committee
- General Chairman, 1993 SPE Low Permeability Reservoirs Symposium
- Program Chairman, SPE Low Permeability Reservoirs Symposium (1995, 1998, 2000)
- SPE Gas Technology Committee; SPE Reprint Series Committee
- SPE Distinguished Lecturer Selection Committee
- General Chairman; 2005 SPE Rocky Mountain Technical Conference

PUBLICATIONS

1. Sipeki, J. and Hower, T.L., "Impact of Operator's Best Practices, Completion Design and Well Density on Projected Ultimate Recoveries of Horizontal Bakken Wells in Williams County, North Dakota", to be presented at the 2013 Unconventional Resources Technology Conference (URTeC), Denver, Colorado, 12-14 August.

2. Aldrich, J., Hower T.L., and Sipeki, J., "Assessing and Advancing a CBM Resource Play Towards Commerciality – A Case Study From the UK; PEDL 159 Solway Basin", presented at the AAPG 2012 International Convention, Singapore, September 2012.

3. "Certification of Reserves and Resources for CSG Assets", workshop presented at the Asia Pacific CBM Forum, 8 May 2011, Brisbane.

4. "Modeling Unconventional Gas Reservoirs", workshop presented 20-21 February 2010, Adelaide, Australia.

5. "Performance Evaluation of CSG Reservoirs", workshop presented 17-19 February 2010, Brisbane, Australia.

6. "Reservoir Aspects of Unconventional Gas Resources: Coalbed Methane, Shales and Tight Gas", workshop presented at the SMi Unconventional Gas Conference, London, April, 2009

7. "Coalbed Methane Geology, Engineering and Reserves", workshop presented January, 2009, Kuala Lumpur, Malaysia.

8. "Coalbed Methane – Progressing from Resource to Reserves", workshop presented at the SMi Unconventional Gas Conference, London, March, 2008

9. "Coalbed Methane Reserves Workshop", Brisbane, Australia, 2008

10. "Recent Developments in Forecasting Coal Seam Methane Production", presentation for the Brisbane, Australia SPE Section, 15 February 2005.

11. "A U.S. Perspective. Forecast for the Future – Reliability of Supply and Deliverability of Coal Seam Methane Resources", presentation at the December 2003 Australian CBM Conference in Brisbane.

12. Hower, T.L., "Coalbed Methane Reservoir Simulation: An Evolving Science," paper SPE 84424 presented at the 2003 SPE Annual Technical Conference and Exhibition, Denver, Colorado, 5-8 October.

13. Hower, T.L., Jones, J.E., Goldstein, D., Harbridge, W.: "Development of the Wyodak Coalbed Methane Resource in the Powder River Basin," paper 84428 presented at the 2003 SPE Annual Technical Conference and Exhibition, Denver, Colorado, 5-8.

14. Gas Reservoir Management, Applied Reservoir Engineering, Reservoir Engineering for Others; technical training manuals for OGCI/Petroskills industry training courses; 2001/2002.

15. *Principles of Reservoir Engineering* and *Reservoir Engineering Mechanisms,* technical training manuals for British Petroleum Corp., Sunbury, UK; 1999.

16. *Managing Water-Drive Gas Reservoirs,* co-author of the textbook published by the Gas Research Institute, Chicago, Ill, 1993.

17. *Gas Reservoir Management* and *Gas Reservoir Modeling,* technical training manuals for Amoco Production Company, Houston, Texas, 1993.

18. Hower, T.L., Fugate, M.W., and Owens, R.W.: "Improved Performance in Aquifer Gas Storage Fields Through Reservoir Management", paper SPE 26172 presented at the 1993 Gas Technology Symposium, 28-30 June, 1993, Calgary, Alberta.

19. Hower, T.L., and Owens, R.W.: "Reservoir Management of a Gulf Coast Water-Drive Gas Field", presented at the 1992 International Gas Research Conference, 16-19 November, Orlando, Florida.

20. Hower, T.L., Lewis, D.R., and Owens, R.W.: "Recovery Optimization in a Multi-reservoir Offshore Gas Field with Water Influx", paper SPE 24865 presented at the 1992 SPE Annual Technical Conference and Exhibition, 4-7 October, Washington, D.C.

21. Hower, T.L., and Decker, M.K.: "Identifying Recompletion Candidates in Stratified Gas Reservoirs", presented at the 1992 Mid-Continent Gas Symposium, 13-14 April, Amarillo, Texas.

22. Hower, T.L. and Jones, R.E.: "Predicting Recovery of Gas Reservoirs Under Water-Drive Conditions", paper SPE 22937 presented at the 1991 SPE Annual Technical Conference and Exhibition, 6-9 October, Dallas.

23. Hower, T.L.: "Using Depletion Ratios to Select and Evaluate Drilling Locations in Naturally Fractured Gas Reservoirs", paper SPE 20758 presented at the 1990 SPE Annual Technical Conference and Exhibition, 23-26 September, New Orleans.

Ex. I – 74

Charles E. Stinson, PE

Petroleum Engineering and Project Development

Underground Gas Storage - Pipelines & Facilities - Gas Production

Petroleum Engineer with over 40 years of broad experience in the natural gas industry, upstream and downstream, involving ventures both regulated and non-regulated, domestic and Canadian. This includes extensive experience in the permitting, development and operations of underground storage facilities in Oregon and California, both as an employee of the operating companies (1978 to 2011) as well as a professional engineering consultant (2011 to present).

Areas of Expertise

Twenty-five years in management and executive roles with operational and fiscal responsibility for activities including:

- Underground Storage Development & Ops
- Natural Gas Gathering & Processing
- Distribution Facilities Design
- Gas & Oil Exploration & Production
- Transmission Pipeline Construction
- Natural Gas Marketing
- Producing Property Acquisitions
- Supply Resource Management
- Gas Facility Operations & Maint.
- Regulatory Compliance

Positions Held

Beginning his professional career as a field petroleum engineer, Mr. Stinson's experience allowed him to advance to positions in senior management with multiple technical staff working under his direction. Following are the senior management positions achieved during his corporate career:

- Vice President, Engineering & Operations – NW Natural Gas Storage LLC
- Vice President, Engineering & Operations – Gill Ranch Storage LLC
- Managing Director & Chief Engineer – NW Natural, a local gas distribution co. in Oregon
- President – Canor Energy Ltd, Canadian oil & gas exploration company
- Vice President & General Manager – Oregon Natural Gas Development Co.
- President – Westar Marketing Company, gas marketing subsidiary of NW Natural

Professional Registration

Registered Petroleum Engineer in the State of Oregon, #11,498, February 1982

Professional Affiliations

Society of Petroleum Engineers
Northwest Energy Association (past chairman and director)
American Gas Association Underground Storage Committee (past chairman)
Western Energy Institute (past chairman of Operating Section)

Education

B. S. Applied Mathematics, University of Colorado

CS Energy Ventures
cstinson@csenergyventures.com

Noteworthy Accomplishments in Gas Storage

American Gas Association Underground Storage Committee – Mr. Stinson served on the AGA UGS committee for over 20 years, including one year as its chairman. This committee included operators of the majority of gas storage fields in the U.S. and served as a platform for them to share emerging technologies, current best practices, development and operating challenges, regulatory changes, and a host of other issues facing their companies. As a result of committee meetings held at various operating company sites, Mr. Stinson has toured over 30 gas storage fields in 13 states.

Gill Ranch Storage Project – A 20 Bcf underground gas storage project located in Central California, jointly owned by Gill Ranch Storage LLC and PG&E. Mr. Stinson had overall accountability for the project development, including all aspects of the project screening & selection, design, permitting, and construction. The project sought and received a mitigated negative environmental declaration from the California Public Utility Commission and completed the certificate of convenience and necessity in a period of 16 months allowing the construction to proceed and achieve the target startup date in October 2010.

Mist Gas Storage Field – Mr. Stinson has been instrumental in the development of the Mist Gas Storage Field over the past 35 years. Development initially kicked off in 1985, and its first underground gas storage operation commenced in 1989. Since that time, it has undergone multiple expansions and currently has 8 reservoirs accounting for over 20 Bcf of working gas capacity. All phases of this development were completed under Mr. Stinson's management and direction.

South Mist Feeder Loop & Pipeline Extension – These two projects comprised 97 miles of 24" gas transmission pipeline, built to expand the takeaway capacity of the Mist Gas Storage Field described above. As Director of Project Development, Mr. Stinson had overall management responsibility for the design, permitting and construction of these projects. The permitting was very contentious, and ultimately the approved permit was challenged to the Oregon Supreme Court. It was upheld by virtue of the project team's diligence and strict compliance with the intent of the law. The last phase of these projects went operational in 2004. Together they have operated continuously without issue.

Private Property Storage Evaluation – Mr. Stinson performed an assessment of the underground storage potential of a nearly depleted natural gas reservoir. The property owner commissioned this study of a gas field located wholly on their property in Northern California. This study included not only an analysis of the physical attributes of the gas reservoir, but also the current market conditions for storage development and the need for additional storage capacity in California.

Pacific Gas & Electric CAES Project – As a member of the Compressed Air Energy Storage (CAES) project team, Mr. Stinson headed up the subsurface team in providing expertise and guidance in the selection of suitable reservoirs for testing and potential development. Mr. Stinson was designated as the Compression Test Manager for the reservoir testing program performed in early 2015. The CAES project was designed to test the feasibility of storing sufficient volumes of air in an underground depleted natural gas reservoir to provide 300 MW of electric power during periods of peak demand. The project is available for commercial development.

Gas Storage Facility Risk Assessments– Mr. Stinson headed up teams of gas storage professionals to perform risk assessments for two gas storage facilities in the western U.S. in compliance with new regulations for underground gas storage.

Litigation Support - Mr. Stinson has provided expert witness services in two litigations involving underground gas storage facilities, one in California and the other in the Midwest.

CS Energy Ventures
cstinson@csenergyventures.com