| | | |
|---|---|---|
| 129 | 2.7610 | 0.0108 |
| 130 | 2.7717 | 0.0107 |
| 131 | 2.7824 | 0.0107 |
| 132 | 2.7930 | 0.0106 |
| 133 | 2.8036 | 0.0106 |
| 134 | 2.8142 | 0.0106 |
| 135 | 2.8247 | 0.0105 |
| 136 | 2.8352 | 0.0105 |
| 137 | 2.8456 | 0.0104 |
| 138 | 2.8560 | 0.0104 |
| 139 | 2.8664 | 0.0104 |
| 140 | 2.8767 | 0.0103 |
| 141 | 2.8870 | 0.0103 |
| 142 | 2.8973 | 0.0103 |
| 143 | 2.9075 | 0.0102 |
| 144 | 2.9177 | 0.0102 |
| 145 | 2.9279 | 0.0102 |
| 146 | 2.9380 | 0.0101 |
| 147 | 2.9481 | 0.0101 |
| 148 | 2.9581 | 0.0101 |
| 149 | 2.9681 | 0.0100 |
| 150 | 2.9781 | 0.0100 |
| 151 | 2.9881 | 0.0099 |
| 152 | 2.9980 | 0.0099 |
| 153 | 3.0079 | 0.0099 |
| 154 | 3.0177 | 0.0099 |
| 155 | 3.0275 | 0.0098 |
| 156 | 3.0373 | 0.0098 |
| 157 | 3.0471 | 0.0098 |
| 158 | 3.0568 | 0.0097 |
| 159 | 3.0665 | 0.0097 |
| 160 | 3.0762 | 0.0097 |
| 161 | 3.0858 | 0.0096 |
| 162 | 3.0954 | 0.0096 |
| 163 | 3.1050 | 0.0096 |
| 164 | 3.1145 | 0.0095 |
| 165 | 3.1241 | 0.0095 |
| 166 | 3.1335 | 0.0095 |
| 167 | 3.1430 | 0.0095 |
| 168 | 3.1524 | 0.0094 |
| 169 | 3.1618 | 0.0094 |
| 170 | 3.1712 | 0.0094 |
| 171 | 3.1806 | 0.0094 |
| 172 | 3.1899 | 0.0093 |
| 173 | 3.1992 | 0.0093 |
| 174 | 3.2085 | 0.0093 |
| 175 | 3.2177 | 0.0092 |
| 176 | 3.2269 | 0.0092 |
| 177 | 3.2361 | 0.0092 |
| 178 | 3.2453 | 0.0092 |
| 179 | 3.2544 | 0.0091 |
| 180 | 3.2635 | 0.0091 |
| 181 | 3.2726 | 0.0091 |
| 182 | 3.2817 | 0.0091 |
| 183 | 3.2907 | 0.0090 |
| 184 | 3.2997 | 0.0090 |
| 185 | 3.3087 | 0.0090 |
| 186 | 3.3177 | 0.0090 |
| 187 | 3.3266 | 0.0089 |
| 188 | 3.3355 | 0.0089 |
| 189 | 3.3444 | 0.0089 |
| 190 | 3.3533 | 0.0089 |
| 191 | 3.3622 | 0.0088 |
| 192 | 3.3710 | 0.0088 |
| 193 | 3.3798 | 0.0088 |
| 194 | 3.3886 | 0.0088 |
| 195 | 3.3973 | 0.0088 |
| 196 | 3.4061 | 0.0087 |
| 197 | 3.4148 | 0.0087 |

| | | |
|---|---|---|
| 198 | 3.4235 | 0.0087 |
| 199 | 3.4321 | 0.0087 |
| 200 | 3.4408 | 0.0086 |
| 201 | 3.4494 | 0.0086 |
| 202 | 3.4580 | 0.0086 |
| 203 | 3.4666 | 0.0086 |
| 204 | 3.4751 | 0.0086 |
| 205 | 3.4837 | 0.0085 |
| 206 | 3.4922 | 0.0085 |
| 207 | 3.5007 | 0.0085 |
| 208 | 3.5092 | 0.0085 |
| 209 | 3.5176 | 0.0085 |
| 210 | 3.5261 | 0.0084 |
| 211 | 3.5345 | 0.0084 |
| 212 | 3.5429 | 0.0084 |
| 213 | 3.5513 | 0.0084 |
| 214 | 3.5596 | 0.0084 |
| 215 | 3.5680 | 0.0083 |
| 216 | 3.5763 | 0.0083 |
| 217 | 3.5846 | 0.0083 |
| 218 | 3.5929 | 0.0083 |
| 219 | 3.6011 | 0.0083 |
| 220 | 3.6094 | 0.0082 |
| 221 | 3.6176 | 0.0082 |
| 222 | 3.6258 | 0.0082 |
| 223 | 3.6340 | 0.0082 |
| 224 | 3.6422 | 0.0082 |
| 225 | 3.6503 | 0.0082 |
| 226 | 3.6585 | 0.0081 |
| 227 | 3.6666 | 0.0081 |
| 228 | 3.6747 | 0.0081 |
| 229 | 3.6828 | 0.0081 |
| 230 | 3.6908 | 0.0081 |
| 231 | 3.6989 | 0.0080 |
| 232 | 3.7069 | 0.0080 |
| 233 | 3.7149 | 0.0080 |
| 234 | 3.7229 | 0.0080 |
| 235 | 3.7309 | 0.0080 |
| 236 | 3.7389 | 0.0080 |
| 237 | 3.7468 | 0.0079 |
| 238 | 3.7547 | 0.0079 |
| 239 | 3.7626 | 0.0079 |
| 240 | 3.7705 | 0.0079 |
| 241 | 3.7784 | 0.0079 |
| 242 | 3.7863 | 0.0079 |
| 243 | 3.7941 | 0.0078 |
| 244 | 3.8020 | 0.0078 |
| 245 | 3.8098 | 0.0078 |
| 246 | 3.8176 | 0.0078 |
| 247 | 3.8253 | 0.0078 |
| 248 | 3.8331 | 0.0078 |
| 249 | 3.8409 | 0.0078 |
| 250 | 3.8486 | 0.0077 |
| 251 | 3.8563 | 0.0077 |
| 252 | 3.8640 | 0.0077 |
| 253 | 3.8717 | 0.0077 |
| 254 | 3.8794 | 0.0077 |
| 255 | 3.8870 | 0.0077 |
| 256 | 3.8947 | 0.0076 |
| 257 | 3.9023 | 0.0076 |
| 258 | 3.9099 | 0.0076 |
| 259 | 3.9175 | 0.0076 |
| 260 | 3.9251 | 0.0076 |
| 261 | 3.9327 | 0.0076 |
| 262 | 3.9402 | 0.0076 |
| 263 | 3.9478 | 0.0075 |
| 264 | 3.9553 | 0.0075 |
| 265 | 3.9628 | 0.0075 |
| 266 | 3.9703 | 0.0075 |

| | | |
|---|---|---|
| 267 | 3.9778 | 0.0075 |
| 268 | 3.9853 | 0.0075 |
| 269 | 3.9927 | 0.0075 |
| 270 | 4.0002 | 0.0074 |
| 271 | 4.0076 | 0.0074 |
| 272 | 4.0150 | 0.0074 |
| 273 | 4.0224 | 0.0074 |
| 274 | 4.0298 | 0.0074 |
| 275 | 4.0372 | 0.0074 |
| 276 | 4.0446 | 0.0074 |
| 277 | 4.0519 | 0.0073 |
| 278 | 4.0593 | 0.0073 |
| 279 | 4.0666 | 0.0073 |
| 280 | 4.0739 | 0.0073 |
| 281 | 4.0812 | 0.0073 |
| 282 | 4.0885 | 0.0073 |
| 283 | 4.0957 | 0.0073 |
| 284 | 4.1030 | 0.0073 |
| 285 | 4.1102 | 0.0072 |
| 286 | 4.1175 | 0.0072 |
| 287 | 4.1247 | 0.0072 |
| 288 | 4.1319 | 0.0072 |

| Unit Period (number) | Unit Rainfall (In) | Unit Soil-Loss (In) | Effective Rainfall (In) |
|---|---|---|---|
| 1 | 0.0072 | 0.0072 | 0.0000 |
| 2 | 0.0072 | 0.0072 | 0.0000 |
| 3 | 0.0072 | 0.0072 | 0.0000 |
| 4 | 0.0073 | 0.0073 | 0.0000 |
| 5 | 0.0073 | 0.0073 | 0.0000 |
| 6 | 0.0073 | 0.0073 | 0.0000 |
| 7 | 0.0073 | 0.0073 | 0.0000 |
| 8 | 0.0073 | 0.0073 | 0.0000 |
| 9 | 0.0074 | 0.0074 | 0.0000 |
| 10 | 0.0074 | 0.0074 | 0.0000 |
| 11 | 0.0074 | 0.0074 | 0.0000 |
| 12 | 0.0074 | 0.0074 | 0.0000 |
| 13 | 0.0074 | 0.0074 | 0.0000 |
| 14 | 0.0075 | 0.0075 | 0.0000 |
| 15 | 0.0075 | 0.0075 | 0.0000 |
| 16 | 0.0075 | 0.0075 | 0.0000 |
| 17 | 0.0075 | 0.0075 | 0.0000 |
| 18 | 0.0075 | 0.0075 | 0.0000 |
| 19 | 0.0076 | 0.0076 | 0.0000 |
| 20 | 0.0076 | 0.0076 | 0.0000 |
| 21 | 0.0076 | 0.0076 | 0.0000 |
| 22 | 0.0076 | 0.0076 | 0.0000 |
| 23 | 0.0077 | 0.0077 | 0.0000 |
| 24 | 0.0077 | 0.0077 | 0.0000 |
| 25 | 0.0077 | 0.0077 | 0.0000 |
| 26 | 0.0077 | 0.0077 | 0.0000 |
| 27 | 0.0078 | 0.0078 | 0.0000 |
| 28 | 0.0078 | 0.0078 | 0.0000 |
| 29 | 0.0078 | 0.0078 | 0.0000 |
| 30 | 0.0078 | 0.0078 | 0.0000 |
| 31 | 0.0078 | 0.0078 | 0.0000 |
| 32 | 0.0079 | 0.0079 | 0.0000 |
| 33 | 0.0079 | 0.0079 | 0.0000 |
| 34 | 0.0079 | 0.0079 | 0.0000 |
| 35 | 0.0079 | 0.0079 | 0.0000 |
| 36 | 0.0080 | 0.0080 | 0.0000 |
| 37 | 0.0080 | 0.0080 | 0.0000 |
| 38 | 0.0080 | 0.0080 | 0.0000 |
| 39 | 0.0080 | 0.0080 | 0.0000 |
| 40 | 0.0081 | 0.0081 | 0.0000 |
| 41 | 0.0081 | 0.0081 | 0.0000 |
| 42 | 0.0081 | 0.0081 | 0.0000 |

| | | | |
|---|---|---|---|
| 43 | 0.0082 | 0.0082 | 0.0000 |
| 44 | 0.0082 | 0.0082 | 0.0000 |
| 45 | 0.0082 | 0.0082 | 0.0000 |
| 46 | 0.0082 | 0.0082 | 0.0000 |
| 47 | 0.0083 | 0.0083 | 0.0000 |
| 48 | 0.0083 | 0.0083 | 0.0000 |
| 49 | 0.0083 | 0.0083 | 0.0000 |
| 50 | 0.0083 | 0.0083 | 0.0000 |
| 51 | 0.0084 | 0.0084 | 0.0000 |
| 52 | 0.0084 | 0.0084 | 0.0000 |
| 53 | 0.0084 | 0.0084 | 0.0000 |
| 54 | 0.0085 | 0.0085 | 0.0000 |
| 55 | 0.0085 | 0.0085 | 0.0000 |
| 56 | 0.0085 | 0.0085 | 0.0000 |
| 57 | 0.0086 | 0.0086 | 0.0000 |
| 58 | 0.0086 | 0.0086 | 0.0000 |
| 59 | 0.0086 | 0.0086 | 0.0000 |
| 60 | 0.0086 | 0.0086 | 0.0000 |
| 61 | 0.0087 | 0.0087 | 0.0000 |
| 62 | 0.0087 | 0.0087 | 0.0000 |
| 63 | 0.0088 | 0.0088 | 0.0000 |
| 64 | 0.0088 | 0.0088 | 0.0000 |
| 65 | 0.0088 | 0.0088 | 0.0000 |
| 66 | 0.0088 | 0.0088 | 0.0000 |
| 67 | 0.0089 | 0.0089 | 0.0000 |
| 68 | 0.0089 | 0.0089 | 0.0000 |
| 69 | 0.0090 | 0.0090 | 0.0000 |
| 70 | 0.0090 | 0.0090 | 0.0000 |
| 71 | 0.0090 | 0.0090 | 0.0000 |
| 72 | 0.0091 | 0.0091 | 0.0000 |
| 73 | 0.0091 | 0.0091 | 0.0000 |
| 74 | 0.0091 | 0.0091 | 0.0000 |
| 75 | 0.0092 | 0.0092 | 0.0000 |
| 76 | 0.0092 | 0.0092 | 0.0000 |
| 77 | 0.0093 | 0.0093 | 0.0000 |
| 78 | 0.0093 | 0.0093 | 0.0000 |
| 79 | 0.0094 | 0.0094 | 0.0000 |
| 80 | 0.0094 | 0.0094 | 0.0000 |
| 81 | 0.0094 | 0.0094 | 0.0000 |
| 82 | 0.0095 | 0.0095 | 0.0000 |
| 83 | 0.0095 | 0.0095 | 0.0000 |
| 84 | 0.0095 | 0.0095 | 0.0000 |
| 85 | 0.0096 | 0.0096 | 0.0000 |
| 86 | 0.0096 | 0.0096 | 0.0000 |
| 87 | 0.0097 | 0.0097 | 0.0000 |
| 88 | 0.0097 | 0.0097 | 0.0000 |
| 89 | 0.0098 | 0.0098 | 0.0000 |
| 90 | 0.0098 | 0.0098 | 0.0000 |
| 91 | 0.0099 | 0.0099 | 0.0000 |
| 92 | 0.0099 | 0.0099 | 0.0000 |
| 93 | 0.0100 | 0.0100 | 0.0000 |
| 94 | 0.0100 | 0.0100 | 0.0000 |
| 95 | 0.0101 | 0.0101 | 0.0000 |
| 96 | 0.0101 | 0.0101 | 0.0000 |
| 97 | 0.0102 | 0.0102 | 0.0000 |
| 98 | 0.0102 | 0.0102 | 0.0000 |
| 99 | 0.0103 | 0.0103 | 0.0000 |
| 100 | 0.0103 | 0.0103 | 0.0000 |
| 101 | 0.0104 | 0.0104 | 0.0000 |
| 102 | 0.0104 | 0.0104 | 0.0000 |
| 103 | 0.0105 | 0.0105 | 0.0000 |
| 104 | 0.0106 | 0.0106 | 0.0000 |
| 105 | 0.0106 | 0.0106 | 0.0000 |
| 106 | 0.0107 | 0.0107 | 0.0000 |
| 107 | 0.0108 | 0.0108 | 0.0000 |
| 108 | 0.0108 | 0.0108 | 0.0000 |
| 109 | 0.0109 | 0.0109 | 0.0000 |
| 110 | 0.0109 | 0.0109 | 0.0000 |
| 111 | 0.0110 | 0.0110 | 0.0000 |

| | | | |
|---|---|---|---|
| 112 | 0.0111 | 0.0111 | 0.0000 |
| 113 | 0.0112 | 0.0112 | 0.0000 |
| 114 | 0.0112 | 0.0112 | 0.0000 |
| 115 | 0.0113 | 0.0113 | 0.0000 |
| 116 | 0.0114 | 0.0114 | 0.0000 |
| 117 | 0.0115 | 0.0115 | 0.0000 |
| 118 | 0.0115 | 0.0115 | 0.0000 |
| 119 | 0.0116 | 0.0116 | 0.0000 |
| 120 | 0.0117 | 0.0117 | 0.0000 |
| 121 | 0.0118 | 0.0118 | 0.0000 |
| 122 | 0.0118 | 0.0118 | 0.0000 |
| 123 | 0.0119 | 0.0119 | 0.0000 |
| 124 | 0.0120 | 0.0120 | 0.0000 |
| 125 | 0.0121 | 0.0121 | 0.0000 |
| 126 | 0.0122 | 0.0122 | 0.0000 |
| 127 | 0.0123 | 0.0123 | 0.0000 |
| 128 | 0.0124 | 0.0124 | 0.0000 |
| 129 | 0.0125 | 0.0125 | 0.0000 |
| 130 | 0.0125 | 0.0125 | 0.0000 |
| 131 | 0.0127 | 0.0127 | 0.0000 |
| 132 | 0.0127 | 0.0127 | 0.0000 |
| 133 | 0.0129 | 0.0129 | 0.0000 |
| 134 | 0.0130 | 0.0130 | 0.0000 |
| 135 | 0.0131 | 0.0131 | 0.0000 |
| 136 | 0.0132 | 0.0132 | 0.0000 |
| 137 | 0.0133 | 0.0133 | 0.0000 |
| 138 | 0.0134 | 0.0134 | 0.0000 |
| 139 | 0.0136 | 0.0136 | 0.0000 |
| 140 | 0.0137 | 0.0137 | 0.0000 |
| 141 | 0.0138 | 0.0138 | 0.0000 |
| 142 | 0.0139 | 0.0139 | 0.0000 |
| 143 | 0.0141 | 0.0141 | 0.0000 |
| 144 | 0.0142 | 0.0142 | 0.0000 |
| 145 | 0.0152 | 0.0152 | 0.0000 |
| 146 | 0.0153 | 0.0153 | 0.0000 |
| 147 | 0.0155 | 0.0155 | 0.0000 |
| 148 | 0.0156 | 0.0156 | 0.0000 |
| 149 | 0.0158 | 0.0158 | 0.0000 |
| 150 | 0.0159 | 0.0159 | 0.0000 |
| 151 | 0.0162 | 0.0162 | 0.0000 |
| 152 | 0.0163 | 0.0163 | 0.0000 |
| 153 | 0.0165 | 0.0165 | 0.0000 |
| 154 | 0.0167 | 0.0167 | 0.0000 |
| 155 | 0.0169 | 0.0169 | 0.0000 |
| 156 | 0.0171 | 0.0171 | 0.0000 |
| 157 | 0.0174 | 0.0174 | 0.0000 |
| 158 | 0.0175 | 0.0175 | 0.0000 |
| 159 | 0.0179 | 0.0179 | 0.0000 |
| 160 | 0.0180 | 0.0180 | 0.0000 |
| 161 | 0.0184 | 0.0184 | 0.0000 |
| 162 | 0.0186 | 0.0186 | 0.0000 |
| 163 | 0.0190 | 0.0190 | 0.0000 |
| 164 | 0.0192 | 0.0192 | 0.0000 |
| 165 | 0.0196 | 0.0196 | 0.0000 |
| 166 | 0.0198 | 0.0198 | 0.0000 |
| 167 | 0.0203 | 0.0203 | 0.0000 |
| 168 | 0.0206 | 0.0206 | 0.0000 |
| 169 | 0.0211 | 0.0211 | 0.0000 |
| 170 | 0.0214 | 0.0214 | 0.0000 |
| 171 | 0.0220 | 0.0220 | 0.0000 |
| 172 | 0.0223 | 0.0223 | 0.0000 |
| 173 | 0.0230 | 0.0230 | 0.0000 |
| 174 | 0.0234 | 0.0234 | 0.0000 |
| 175 | 0.0242 | 0.0242 | 0.0000 |
| 176 | 0.0247 | 0.0247 | 0.0000 |
| 177 | 0.0256 | 0.0256 | 0.0000 |
| 178 | 0.0262 | 0.0262 | 0.0000 |
| 179 | 0.0274 | 0.0274 | 0.0000 |
| 180 | 0.0280 | 0.0280 | 0.0000 |

| | | | |
|---|---|---|---|
| 181 | 0.0295 | 0.0295 | 0.0000 |
| 182 | 0.0303 | 0.0303 | 0.0000 |
| 183 | 0.0322 | 0.0322 | 0.0000 |
| 184 | 0.0333 | 0.0333 | 0.0000 |
| 185 | 0.0273 | 0.0273 | 0.0000 |
| 186 | 0.0289 | 0.0289 | 0.0000 |
| 187 | 0.0328 | 0.0328 | 0.0000 |
| 188 | 0.0354 | 0.0354 | 0.0000 |
| 189 | 0.0426 | 0.0426 | 0.0000 |
| 190 | 0.0481 | 0.0481 | 0.0000 |
| 191 | 0.0687 | 0.0687 | 0.0000 |
| 192 | 0.0945 | 0.0819 | 0.0126 |
| 193 | 0.2958 | 0.0819 | 0.2139 |
| 194 | 0.0560 | 0.0560 | 0.0000 |
| 195 | 0.0385 | 0.0385 | 0.0000 |
| 196 | 0.0307 | 0.0307 | 0.0000 |
| 197 | 0.0345 | 0.0345 | 0.0000 |
| 198 | 0.0312 | 0.0312 | 0.0000 |
| 199 | 0.0287 | 0.0287 | 0.0000 |
| 200 | 0.0267 | 0.0267 | 0.0000 |
| 201 | 0.0251 | 0.0251 | 0.0000 |
| 202 | 0.0238 | 0.0238 | 0.0000 |
| 203 | 0.0227 | 0.0227 | 0.0000 |
| 204 | 0.0217 | 0.0217 | 0.0000 |
| 205 | 0.0208 | 0.0208 | 0.0000 |
| 206 | 0.0201 | 0.0201 | 0.0000 |
| 207 | 0.0194 | 0.0194 | 0.0000 |
| 208 | 0.0188 | 0.0188 | 0.0000 |
| 209 | 0.0182 | 0.0182 | 0.0000 |
| 210 | 0.0177 | 0.0177 | 0.0000 |
| 211 | 0.0172 | 0.0172 | 0.0000 |
| 212 | 0.0168 | 0.0168 | 0.0000 |
| 213 | 0.0164 | 0.0164 | 0.0000 |
| 214 | 0.0160 | 0.0160 | 0.0000 |
| 215 | 0.0157 | 0.0157 | 0.0000 |
| 216 | 0.0154 | 0.0154 | 0.0000 |
| 217 | 0.0143 | 0.0143 | 0.0000 |
| 218 | 0.0140 | 0.0140 | 0.0000 |
| 219 | 0.0138 | 0.0138 | 0.0000 |
| 220 | 0.0135 | 0.0135 | 0.0000 |
| 221 | 0.0133 | 0.0133 | 0.0000 |
| 222 | 0.0130 | 0.0130 | 0.0000 |
| 223 | 0.0128 | 0.0128 | 0.0000 |
| 224 | 0.0126 | 0.0126 | 0.0000 |
| 225 | 0.0124 | 0.0124 | 0.0000 |
| 226 | 0.0122 | 0.0122 | 0.0000 |
| 227 | 0.0120 | 0.0120 | 0.0000 |
| 228 | 0.0119 | 0.0119 | 0.0000 |
| 229 | 0.0117 | 0.0117 | 0.0000 |
| 230 | 0.0116 | 0.0116 | 0.0000 |
| 231 | 0.0114 | 0.0114 | 0.0000 |
| 232 | 0.0113 | 0.0113 | 0.0000 |
| 233 | 0.0111 | 0.0111 | 0.0000 |
| 234 | 0.0110 | 0.0110 | 0.0000 |
| 235 | 0.0108 | 0.0108 | 0.0000 |
| 236 | 0.0107 | 0.0107 | 0.0000 |
| 237 | 0.0106 | 0.0106 | 0.0000 |
| 238 | 0.0105 | 0.0105 | 0.0000 |
| 239 | 0.0104 | 0.0104 | 0.0000 |
| 240 | 0.0103 | 0.0103 | 0.0000 |
| 241 | 0.0102 | 0.0102 | 0.0000 |
| 242 | 0.0101 | 0.0101 | 0.0000 |
| 243 | 0.0099 | 0.0099 | 0.0000 |
| 244 | 0.0099 | 0.0099 | 0.0000 |
| 245 | 0.0098 | 0.0098 | 0.0000 |
| 246 | 0.0097 | 0.0097 | 0.0000 |
| 247 | 0.0096 | 0.0096 | 0.0000 |
| 248 | 0.0095 | 0.0095 | 0.0000 |
| 249 | 0.0094 | 0.0094 | 0.0000 |

| | | | |
|---|---|---|---|
| 250 | 0.0093 | 0.0093 | 0.0000 |
| 251 | 0.0092 | 0.0092 | 0.0000 |
| 252 | 0.0092 | 0.0092 | 0.0000 |
| 253 | 0.0091 | 0.0091 | 0.0000 |
| 254 | 0.0090 | 0.0090 | 0.0000 |
| 255 | 0.0089 | 0.0089 | 0.0000 |
| 256 | 0.0089 | 0.0089 | 0.0000 |
| 257 | 0.0088 | 0.0088 | 0.0000 |
| 258 | 0.0087 | 0.0087 | 0.0000 |
| 259 | 0.0087 | 0.0087 | 0.0000 |
| 260 | 0.0086 | 0.0086 | 0.0000 |
| 261 | 0.0085 | 0.0085 | 0.0000 |
| 262 | 0.0085 | 0.0085 | 0.0000 |
| 263 | 0.0084 | 0.0084 | 0.0000 |
| 264 | 0.0084 | 0.0084 | 0.0000 |
| 265 | 0.0083 | 0.0083 | 0.0000 |
| 266 | 0.0082 | 0.0082 | 0.0000 |
| 267 | 0.0082 | 0.0082 | 0.0000 |
| 268 | 0.0081 | 0.0081 | 0.0000 |
| 269 | 0.0081 | 0.0081 | 0.0000 |
| 270 | 0.0080 | 0.0080 | 0.0000 |
| 271 | 0.0080 | 0.0080 | 0.0000 |
| 272 | 0.0079 | 0.0079 | 0.0000 |
| 273 | 0.0079 | 0.0079 | 0.0000 |
| 274 | 0.0078 | 0.0078 | 0.0000 |
| 275 | 0.0078 | 0.0078 | 0.0000 |
| 276 | 0.0077 | 0.0077 | 0.0000 |
| 277 | 0.0077 | 0.0077 | 0.0000 |
| 278 | 0.0076 | 0.0076 | 0.0000 |
| 279 | 0.0076 | 0.0076 | 0.0000 |
| 280 | 0.0076 | 0.0076 | 0.0000 |
| 281 | 0.0075 | 0.0075 | 0.0000 |
| 282 | 0.0075 | 0.0075 | 0.0000 |
| 283 | 0.0074 | 0.0074 | 0.0000 |
| 284 | 0.0074 | 0.0074 | 0.0000 |
| 285 | 0.0073 | 0.0073 | 0.0000 |
| 286 | 0.0073 | 0.0073 | 0.0000 |
| 287 | 0.0073 | 0.0073 | 0.0000 |
| 288 | 0.0072 | 0.0072 | 0.0000 |

---

---

Total soil rain loss = 3.91(In)
Total effective rainfall = 0.23(In)
Peak flow rate in flood hydrograph = 2.91(CFS)

---

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

---

Hydrograph in 5 Minute intervals ((CFS))

---

| Time(h+m) | Volume Ac.Ft | Q(CFS) | 0 | 2.5 | 5.0 | 7.5 | 10.0 |
|---|---|---|---|---|---|---|---|
| 0+ 5 | 0.0000 | 0.00 | Q | \| | \| | \| | \| |
| 0+10 | 0.0000 | 0.00 | Q | \| | \| | \| | \| |
| 0+15 | 0.0000 | 0.00 | Q | \| | \| | \| | \| |
| 0+20 | 0.0000 | 0.00 | Q | \| | \| | \| | \| |
| 0+25 | 0.0000 | 0.00 | Q | \| | \| | \| | \| |
| 0+30 | 0.0000 | 0.00 | Q | \| | \| | \| | \| |
| 0+35 | 0.0000 | 0.00 | Q | \| | \| | \| | \| |
| 0+40 | 0.0000 | 0.00 | Q | \| | \| | \| | \| |
| 0+45 | 0.0000 | 0.00 | Q | \| | \| | \| | \| |
| 0+50 | 0.0000 | 0.00 | Q | \| | \| | \| | \| |
| 0+55 | 0.0000 | 0.00 | Q | \| | \| | \| | \| |
| 1+ 0 | 0.0000 | 0.00 | Q | \| | \| | \| | \| |
| 1+ 5 | 0.0000 | 0.00 | Q | \| | \| | \| | \| |
| 1+10 | 0.0000 | 0.00 | Q | \| | \| | \| | \| |
| 1+15 | 0.0000 | 0.00 | Q | \| | \| | \| | \| |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1+20 | 0.0000 | 0.00 | Q | | | | |
| 1+25 | 0.0000 | 0.00 | Q | | | | |
| 1+30 | 0.0000 | 0.00 | Q | | | | |
| 1+35 | 0.0000 | 0.00 | Q | | | | |
| 1+40 | 0.0000 | 0.00 | Q | | | | |
| 1+45 | 0.0000 | 0.00 | Q | | | | |
| 1+50 | 0.0000 | 0.00 | Q | | | | |
| 1+55 | 0.0000 | 0.00 | Q | | | | |
| 2+ 0 | 0.0000 | 0.00 | Q | | | | |
| 2+ 5 | 0.0000 | 0.00 | Q | | | | |
| 2+10 | 0.0000 | 0.00 | Q | | | | |
| 2+15 | 0.0000 | 0.00 | Q | | | | |
| 2+20 | 0.0000 | 0.00 | Q | | | | |
| 2+25 | 0.0000 | 0.00 | Q | | | | |
| 2+30 | 0.0000 | 0.00 | Q | | | | |
| 2+35 | 0.0000 | 0.00 | Q | | | | |
| 2+40 | 0.0000 | 0.00 | Q | | | | |
| 2+45 | 0.0000 | 0.00 | Q | | | | |
| 2+50 | 0.0000 | 0.00 | Q | | | | |
| 2+55 | 0.0000 | 0.00 | Q | | | | |
| 3+ 0 | 0.0000 | 0.00 | Q | | | | |
| 3+ 5 | 0.0000 | 0.00 | Q | | | | |
| 3+10 | 0.0000 | 0.00 | Q | | | | |
| 3+15 | 0.0000 | 0.00 | Q | | | | |
| 3+20 | 0.0000 | 0.00 | Q | | | | |
| 3+25 | 0.0000 | 0.00 | Q | | | | |
| 3+30 | 0.0000 | 0.00 | Q | | | | |
| 3+35 | 0.0000 | 0.00 | Q | | | | |
| 3+40 | 0.0000 | 0.00 | Q | | | | |
| 3+45 | 0.0000 | 0.00 | Q | | | | |
| 3+50 | 0.0000 | 0.00 | Q | | | | |
| 3+55 | 0.0000 | 0.00 | Q | | | | |
| 4+ 0 | 0.0000 | 0.00 | Q | | | | |
| 4+ 5 | 0.0000 | 0.00 | Q | | | | |
| 4+10 | 0.0000 | 0.00 | Q | | | | |
| 4+15 | 0.0000 | 0.00 | Q | | | | |
| 4+20 | 0.0000 | 0.00 | Q | | | | |
| 4+25 | 0.0000 | 0.00 | Q | | | | |
| 4+30 | 0.0000 | 0.00 | Q | | | | |
| 4+35 | 0.0000 | 0.00 | Q | | | | |
| 4+40 | 0.0000 | 0.00 | Q | | | | |
| 4+45 | 0.0000 | 0.00 | Q | | | | |
| 4+50 | 0.0000 | 0.00 | Q | | | | |
| 4+55 | 0.0000 | 0.00 | Q | | | | |
| 5+ 0 | 0.0000 | 0.00 | Q | | | | |
| 5+ 5 | 0.0000 | 0.00 | Q | | | | |
| 5+10 | 0.0000 | 0.00 | Q | | | | |
| 5+15 | 0.0000 | 0.00 | Q | | | | |
| 5+20 | 0.0000 | 0.00 | Q | | | | |
| 5+25 | 0.0000 | 0.00 | Q | | | | |
| 5+30 | 0.0000 | 0.00 | Q | | | | |
| 5+35 | 0.0000 | 0.00 | Q | | | | |
| 5+40 | 0.0000 | 0.00 | Q | | | | |
| 5+45 | 0.0000 | 0.00 | Q | | | | |
| 5+50 | 0.0000 | 0.00 | Q | | | | |
| 5+55 | 0.0000 | 0.00 | Q | | | | |
| 6+ 0 | 0.0000 | 0.00 | Q | | | | |
| 6+ 5 | 0.0000 | 0.00 | Q | | | | |
| 6+10 | 0.0000 | 0.00 | Q | | | | |
| 6+15 | 0.0000 | 0.00 | Q | | | | |
| 6+20 | 0.0000 | 0.00 | Q | | | | |
| 6+25 | 0.0000 | 0.00 | Q | | | | |
| 6+30 | 0.0000 | 0.00 | Q | | | | |
| 6+35 | 0.0000 | 0.00 | Q | | | | |
| 6+40 | 0.0000 | 0.00 | Q | | | | |
| 6+45 | 0.0000 | 0.00 | Q | | | | |
| 6+50 | 0.0000 | 0.00 | Q | | | | |
| 6+55 | 0.0000 | 0.00 | Q | | | | |
| 7+ 0 | 0.0000 | 0.00 | Q | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 7+ 5 | 0.0000 | 0.00 | Q | | | | |
| 7+10 | 0.0000 | 0.00 | Q | | | | |
| 7+15 | 0.0000 | 0.00 | Q | | | | |
| 7+20 | 0.0000 | 0.00 | Q | | | | |
| 7+25 | 0.0000 | 0.00 | Q | | | | |
| 7+30 | 0.0000 | 0.00 | Q | | | | |
| 7+35 | 0.0000 | 0.00 | Q | | | | |
| 7+40 | 0.0000 | 0.00 | Q | | | | |
| 7+45 | 0.0000 | 0.00 | Q | | | | |
| 7+50 | 0.0000 | 0.00 | Q | | | | |
| 7+55 | 0.0000 | 0.00 | Q | | | | |
| 8+ 0 | 0.0000 | 0.00 | Q | | | | |
| 8+ 5 | 0.0000 | 0.00 | Q | | | | |
| 8+10 | 0.0000 | 0.00 | Q | | | | |
| 8+15 | 0.0000 | 0.00 | Q | | | | |
| 8+20 | 0.0000 | 0.00 | Q | | | | |
| 8+25 | 0.0000 | 0.00 | Q | | | | |
| 8+30 | 0.0000 | 0.00 | Q | | | | |
| 8+35 | 0.0000 | 0.00 | Q | | | | |
| 8+40 | 0.0000 | 0.00 | Q | | | | |
| 8+45 | 0.0000 | 0.00 | Q | | | | |
| 8+50 | 0.0000 | 0.00 | Q | | | | |
| 8+55 | 0.0000 | 0.00 | Q | | | | |
| 9+ 0 | 0.0000 | 0.00 | Q | | | | |
| 9+ 5 | 0.0000 | 0.00 | Q | | | | |
| 9+10 | 0.0000 | 0.00 | Q | | | | |
| 9+15 | 0.0000 | 0.00 | Q | | | | |
| 9+20 | 0.0000 | 0.00 | Q | | | | |
| 9+25 | 0.0000 | 0.00 | Q | | | | |
| 9+30 | 0.0000 | 0.00 | Q | | | | |
| 9+35 | 0.0000 | 0.00 | Q | | | | |
| 9+40 | 0.0000 | 0.00 | Q | | | | |
| 9+45 | 0.0000 | 0.00 | Q | | | | |
| 9+50 | 0.0000 | 0.00 | Q | | | | |
| 9+55 | 0.0000 | 0.00 | Q | | | | |
| 10+ 0 | 0.0000 | 0.00 | Q | | | | |
| 10+ 5 | 0.0000 | 0.00 | Q | | | | |
| 10+10 | 0.0000 | 0.00 | Q | | | | |
| 10+15 | 0.0000 | 0.00 | Q | | | | |
| 10+20 | 0.0000 | 0.00 | Q | | | | |
| 10+25 | 0.0000 | 0.00 | Q | | | | |
| 10+30 | 0.0000 | 0.00 | Q | | | | |
| 10+35 | 0.0000 | 0.00 | Q | | | | |
| 10+40 | 0.0000 | 0.00 | Q | | | | |
| 10+45 | 0.0000 | 0.00 | Q | | | | |
| 10+50 | 0.0000 | 0.00 | Q | | | | |
| 10+55 | 0.0000 | 0.00 | Q | | | | |
| 11+ 0 | 0.0000 | 0.00 | Q | | | | |
| 11+ 5 | 0.0000 | 0.00 | Q | | | | |
| 11+10 | 0.0000 | 0.00 | Q | | | | |
| 11+15 | 0.0000 | 0.00 | Q | | | | |
| 11+20 | 0.0000 | 0.00 | Q | | | | |
| 11+25 | 0.0000 | 0.00 | Q | | | | |
| 11+30 | 0.0000 | 0.00 | Q | | | | |
| 11+35 | 0.0000 | 0.00 | Q | | | | |
| 11+40 | 0.0000 | 0.00 | Q | | | | |
| 11+45 | 0.0000 | 0.00 | Q | | | | |
| 11+50 | 0.0000 | 0.00 | Q | | | | |
| 11+55 | 0.0000 | 0.00 | Q | | | | |
| 12+ 0 | 0.0000 | 0.00 | Q | | | | |
| 12+ 5 | 0.0000 | 0.00 | Q | | | | |
| 12+10 | 0.0000 | 0.00 | Q | | | | |
| 12+15 | 0.0000 | 0.00 | Q | | | | |
| 12+20 | 0.0000 | 0.00 | Q | | | | |
| 12+25 | 0.0000 | 0.00 | Q | | | | |
| 12+30 | 0.0000 | 0.00 | Q | | | | |
| 12+35 | 0.0000 | 0.00 | Q | | | | |
| 12+40 | 0.0000 | 0.00 | Q | | | | |
| 12+45 | 0.0000 | 0.00 | Q | | | | |

```
12+50       0.0000      0.00  Q        |        |        |        |
12+55       0.0000      0.00  Q        |        |        |        |
13+ 0       0.0000      0.00  Q        |        |        |        |
13+ 5       0.0000      0.00  Q        |        |        |        |
13+10       0.0000      0.00  Q        |        |        |        |
13+15       0.0000      0.00  Q        |        |        |        |
13+20       0.0000      0.00  Q        |        |        |        |
13+25       0.0000      0.00  Q        |        |        |        |
13+30       0.0000      0.00  Q        |        |        |        |
13+35       0.0000      0.00  Q        |        |        |        |
13+40       0.0000      0.00  Q        |        |        |        |
13+45       0.0000      0.00  Q        |        |        |        |
13+50       0.0000      0.00  Q        |        |        |        |
13+55       0.0000      0.00  Q        |        |        |        |
14+ 0       0.0000      0.00  Q        |        |        |        |
14+ 5       0.0000      0.00  Q        |        |        |        |
14+10       0.0000      0.00  Q        |        |        |        |
14+15       0.0000      0.00  Q        |        |        |        |
14+20       0.0000      0.00  Q        |        |        |        |
14+25       0.0000      0.00  Q        |        |        |        |
14+30       0.0000      0.00  Q        |        |        |        |
14+35       0.0000      0.00  Q        |        |        |        |
14+40       0.0000      0.00  Q        |        |        |        |
14+45       0.0000      0.00  Q        |        |        |        |
14+50       0.0000      0.00  Q        |        |        |        |
14+55       0.0000      0.00  Q        |        |        |        |
15+ 0       0.0000      0.00  Q        |        |        |        |
15+ 5       0.0000      0.00  Q        |        |        |        |
15+10       0.0000      0.00  Q        |        |        |        |
15+15       0.0000      0.00  Q        |        |        |        |
15+20       0.0000      0.00  Q        |        |        |        |
15+25       0.0000      0.00  Q        |        |        |        |
15+30       0.0000      0.00  Q        |        |        |        |
15+35       0.0000      0.00  Q        |        |        |        |
15+40       0.0000      0.00  Q        |        |        |        |
15+45       0.0000      0.00  Q        |        |        |        |
15+50       0.0000      0.00  Q        |        |        |        |
15+55       0.0000      0.00  Q        |        |        |        |
16+ 0       0.0001      0.02  Q        |        |        |        |
16+ 5       0.0032      0.44  |Q       |        |        |        |
16+10       0.0124      1.35  |   VQ   |        |        |        |
16+15       0.0285      2.33  |       Q|        |        |        |
16+20       0.0486      2.91  |        |Q   V   |        |        |
16+25       0.0657      2.48  |       Q|        | V      |        |
16+30       0.0763      1.54  |     Q  |        |    V   |        |
16+35       0.0830      0.98  |  Q     |        |       V|        |
16+40       0.0877      0.68  | Q      |        |        V        |
16+45       0.0915      0.55  | Q      |        |        | V      |
16+50       0.0946      0.45  |Q       |        |        |  V     |
16+55       0.0972      0.39  |Q       |        |        |   V    |
17+ 0       0.0995      0.33  |Q       |        |        |   V    |
17+ 5       0.1013      0.27  |Q       |        |        |    V   |
17+10       0.1031      0.25  Q        |        |        |    V   |
17+15       0.1045      0.21  Q        |        |        |    V   |
17+20       0.1058      0.18  Q        |        |        |     V  |
17+25       0.1068      0.15  Q        |        |        |     V  |
17+30       0.1077      0.13  Q        |        |        |     V  |
17+35       0.1086      0.13  Q        |        |        |      V |
17+40       0.1095      0.12  Q        |        |        |      V |
17+45       0.1102      0.10  Q        |        |        |      V |
17+50       0.1108      0.09  Q        |        |        |      V |
17+55       0.1114      0.08  Q        |        |        |      V |
18+ 0       0.1119      0.07  Q        |        |        |       V|
18+ 5       0.1123      0.06  Q        |        |        |       V|
18+10       0.1127      0.06  Q        |        |        |       V|
18+15       0.1130      0.05  Q        |        |        |       V|
18+20       0.1133      0.04  Q        |        |        |       V|
18+25       0.1136      0.04  Q        |        |        |       V|
18+30       0.1139      0.04  Q        |        |        |       V|
```

```
18+35      0.1142     0.04  Q        |        |        |        V|
18+40      0.1143     0.02  Q        |        |        |         V
18+45      0.1143     0.00  Q        |        |        |         V
18+50      0.1143     0.00  Q        |        |        |         V
18+55      0.1143     0.00  Q        |        |        |         V
19+ 0      0.1143     0.00  Q        |        |        |         V
19+ 5      0.1143     0.00  Q        |        |        |         V
19+10      0.1143     0.00  Q        |        |        |         V
19+15      0.1143     0.00  Q        |        |        |         V
19+20      0.1143     0.00  Q        |        |        |         V
19+25      0.1143     0.00  Q        |        |        |         V
19+30      0.1143     0.00  Q        |        |        |         V
19+35      0.1143     0.00  Q        |        |        |         V
19+40      0.1143     0.00  Q        |        |        |         V
19+45      0.1143     0.00  Q        |        |        |         V
19+50      0.1143     0.00  Q        |        |        |         V
19+55      0.1143     0.00  Q        |        |        |         V
20+ 0      0.1143     0.00  Q        |        |        |         V
20+ 5      0.1143     0.00  Q        |        |        |         V
20+10      0.1143     0.00  Q        |        |        |         V
20+15      0.1143     0.00  Q        |        |        |         V
20+20      0.1143     0.00  Q        |        |        |         V
20+25      0.1143     0.00  Q        |        |        |         V
20+30      0.1143     0.00  Q        |        |        |         V
20+35      0.1143     0.00  Q        |        |        |         V
20+40      0.1143     0.00  Q        |        |        |         V
20+45      0.1143     0.00  Q        |        |        |         V
20+50      0.1143     0.00  Q        |        |        |         V
20+55      0.1143     0.00  Q        |        |        |         V
21+ 0      0.1143     0.00  Q        |        |        |         V
21+ 5      0.1143     0.00  Q        |        |        |         V
21+10      0.1143     0.00  Q        |        |        |         V
21+15      0.1143     0.00  Q        |        |        |         V
21+20      0.1143     0.00  Q        |        |        |         V
21+25      0.1143     0.00  Q        |        |        |         V
21+30      0.1143     0.00  Q        |        |        |         V
21+35      0.1143     0.00  Q        |        |        |         V
21+40      0.1143     0.00  Q        |        |        |         V
21+45      0.1143     0.00  Q        |        |        |         V
21+50      0.1143     0.00  Q        |        |        |         V
21+55      0.1143     0.00  Q        |        |        |         V
22+ 0      0.1143     0.00  Q        |        |        |         V
22+ 5      0.1143     0.00  Q        |        |        |         V
22+10      0.1143     0.00  Q        |        |        |         V
22+15      0.1143     0.00  Q        |        |        |         V
22+20      0.1143     0.00  Q        |        |        |         V
22+25      0.1143     0.00  Q        |        |        |         V
22+30      0.1143     0.00  Q        |        |        |         V
22+35      0.1143     0.00  Q        |        |        |         V
22+40      0.1143     0.00  Q        |        |        |         V
22+45      0.1143     0.00  Q        |        |        |         V
22+50      0.1143     0.00  Q        |        |        |         V
22+55      0.1143     0.00  Q        |        |        |         V
23+ 0      0.1143     0.00  Q        |        |        |         V
23+ 5      0.1143     0.00  Q        |        |        |         V
23+10      0.1143     0.00  Q        |        |        |         V
23+15      0.1143     0.00  Q        |        |        |         V
23+20      0.1143     0.00  Q        |        |        |         V
23+25      0.1143     0.00  Q        |        |        |         V
23+30      0.1143     0.00  Q        |        |        |         V
23+35      0.1143     0.00  Q        |        |        |         V
23+40      0.1143     0.00  Q        |        |        |         V
23+45      0.1143     0.00  Q        |        |        |         V
23+50      0.1143     0.00  Q        |        |        |         V
23+55      0.1143     0.00  Q        |        |        |         V
24+ 0      0.1143     0.00  Q        |        |        |         V
24+ 5      0.1143     0.00  Q        |        |        |         V
24+10      0.1143     0.00  Q        |        |        |         V
24+15      0.1143     0.00  Q        |        |        |         V
```

```
24+20       0.1143      0.00  Q        |         |         |         V
24+25       0.1143      0.00  Q        |         |         |         V
24+30       0.1143      0.00  Q        |         |         |         V
24+35       0.1143      0.00  Q        |         |         |         V
24+40       0.1143      0.00  Q        |         |         |         V
24+45       0.1143      0.00  Q        |         |         |         V
24+50       0.1143      0.00  Q        |         |         |         V
24+55       0.1143      0.00  Q        |         |         |         V
25+ 0       0.1143      0.00  Q        |         |         |         V
25+ 5       0.1143      0.00  Q        |         |         |         V
25+10       0.1143      0.00  Q        |         |         |         V
25+15       0.1143      0.00  Q        |         |         |         V
25+20       0.1143      0.00  Q        |         |         |         V
25+25       0.1143      0.00  Q        |         |         |         V
25+30       0.1143      0.00  Q        |         |         |         V
25+35       0.1143      0.00  Q        |         |         |         V
25+40       0.1143      0.00  Q        |         |         |         V
25+45       0.1143      0.00  Q        |         |         |         V
25+50       0.1143      0.00  Q        |         |         |         V
25+55       0.1143      0.00  Q        |         |         |         V
26+ 0       0.1143      0.00  Q        |         |         |         V
26+ 5       0.1143      0.00  Q        |         |         |         V
26+10       0.1143      0.00  Q        |         |         |         V
26+15       0.1143      0.00  Q        |         |         |         V
26+20       0.1143      0.00  Q        |         |         |         V
26+25       0.1143      0.00  Q        |         |         |         V
26+30       0.1143      0.00  Q        |         |         |         V
26+35       0.1143      0.00  Q        |         |         |         V
-------------------------------------------------------------------
```

U n i t  H y d r o g r a p h  A n a l y s i s



Study date 08/04/23

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------

San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6320

---

225038 - 18313 VALLEY BLVD - SB ANIMAL CARE CENTER
EXISITNG CONDITIONS
10-YEAR, 24-HOUR STORM
BY: JTS DATE: 08-04-23

---

Storm Event Year = 10

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

| Sub-Area (Ac.) | Duration (hours) | Isohyetal (In) |
|---|---|---|
| Rainfall data for year 10 | | |
| 6.07 | 1 | 0.92 |
| Rainfall data for year 2 | | |
| 6.07 | 6 | 1.62 |
| Rainfall data for year 2 | | |
| 6.07 | 24 | 3.01 |
| Rainfall data for year 100 | | |
| 6.07 | 1 | 1.32 |
| Rainfall data for year 100 | | |
| 6.07 | 6 | 3.50 |
| Rainfall data for year 100 | | |
| 6.07 | 24 | 7.80 |

---

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

******** Area-averaged max loss rate, Fm ********

| SCS curve No.(AMCII) | SCS curve NO.(AMC 2) | Area (Ac.) | Area Fraction | Fp(Fig C6) (In/Hr) | Ap (dec.) | Fm (In/Hr) |
|---|---|---|---|---|---|---|
| 50.0 | 50.0 | 6.07 | 1.000 | 0.810 | 1.000 | 0.810 |

Area-averaged adjusted loss rate Fm (In/Hr) = 0.810

********* Area-Averaged low loss rate fraction, Yb **********

| Area (Ac.) | Area Fract | SCS CN (AMC2) | SCS CN (AMC2) | S | Pervious Yield Fr |
|---|---|---|---|---|---|
| 6.07 | 1.000 | 50.0 | 50.0 | 10.00 | 0.137 |

Area-averaged catchment yield fraction, Y = 0.137
Area-averaged low loss fraction, Yb = 0.863
User entry of time of concentration = 0.413 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area = 6.07(Ac.)
Catchment Lag time = 0.330 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 25.2220
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.810(In/Hr)
Average low loss rate fraction (Yb) = 0.863 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.340(In)
Computed peak 30-minute rainfall = 0.697(In)
Specified peak 1-hour rainfall = 0.920(In)
Computed peak 3-hour rainfall = 1.653(In)
Specified peak 6-hour rainfall = 2.393(In)
Specified peak 24-hour rainfall = 4.981(In)

Rainfall depth area reduction factors:
Using a total area of 6.07(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.340(In)
30-minute factor = 1.000 Adjusted rainfall = 0.697(In)
1-hour factor = 1.000 Adjusted rainfall = 0.920(In)
3-hour factor = 1.000 Adjusted rainfall = 1.653(In)
6-hour factor = 1.000 Adjusted rainfall = 2.393(In)
24-hour factor = 1.000 Adjusted rainfall = 4.981(In)

U n i t H y d r o g r a p h

| Interval Number | 'S' Graph Mean values | Unit Hydrograph ((CFS)) |
|---|---|---|
| | (K = 73.41 (CFS)) | |
| 1 | 2.324 | 1.706 |
| 2 | 10.093 | 5.703 |
| 3 | 23.919 | 10.149 |
| 4 | 41.556 | 12.948 |
| 5 | 56.822 | 11.206 |
| 6 | 66.261 | 6.929 |
| 7 | 72.283 | 4.421 |
| 8 | 76.395 | 3.018 |
| 9 | 79.725 | 2.445 |
| 10 | 82.460 | 2.008 |
| 11 | 84.803 | 1.720 |
| 12 | 86.782 | 1.453 |
| 13 | 88.416 | 1.200 |
| 14 | 89.927 | 1.109 |
| 15 | 91.192 | 0.929 |
| 16 | 92.298 | 0.812 |
| 17 | 93.217 | 0.674 |
| 18 | 94.024 | 0.592 |
| 19 | 94.798 | 0.569 |
| 20 | 95.552 | 0.553 |
| 21 | 96.175 | 0.458 |
| 22 | 96.728 | 0.406 |
| 23 | 97.215 | 0.357 |
| 24 | 97.667 | 0.332 |
| 25 | 98.051 | 0.282 |

| | | |
|---|---|---|
| 26 | 98.402 | 0.257 |
| 27 | 98.684 | 0.207 |
| 28 | 98.936 | 0.185 |
| 29 | 99.188 | 0.185 |
| 30 | 99.440 | 0.185 |
| 31 | 99.693 | 0.185 |
| 32 | 100.000 | 0.093 |

| Peak Unit Number | Adjusted mass rainfall (In) | Unit rainfall (In) |
|---|---|---|
| 1 | 0.3404 | 0.3404 |
| 2 | 0.4492 | 0.1088 |
| 3 | 0.5283 | 0.0791 |
| 4 | 0.5927 | 0.0644 |
| 5 | 0.6480 | 0.0553 |
| 6 | 0.6970 | 0.0490 |
| 7 | 0.7414 | 0.0443 |
| 8 | 0.7820 | 0.0407 |
| 9 | 0.8198 | 0.0377 |
| 10 | 0.8551 | 0.0353 |
| 11 | 0.8883 | 0.0332 |
| 12 | 0.9197 | 0.0315 |
| 13 | 0.9599 | 0.0402 |
| 14 | 0.9986 | 0.0387 |
| 15 | 1.0361 | 0.0375 |
| 16 | 1.0724 | 0.0363 |
| 17 | 1.1077 | 0.0353 |
| 18 | 1.1420 | 0.0343 |
| 19 | 1.1755 | 0.0334 |
| 20 | 1.2081 | 0.0326 |
| 21 | 1.2400 | 0.0319 |
| 22 | 1.2711 | 0.0312 |
| 23 | 1.3017 | 0.0305 |
| 24 | 1.3316 | 0.0299 |
| 25 | 1.3609 | 0.0293 |
| 26 | 1.3897 | 0.0288 |
| 27 | 1.4180 | 0.0283 |
| 28 | 1.4458 | 0.0278 |
| 29 | 1.4731 | 0.0273 |
| 30 | 1.5000 | 0.0269 |
| 31 | 1.5265 | 0.0265 |
| 32 | 1.5526 | 0.0261 |
| 33 | 1.5783 | 0.0257 |
| 34 | 1.6037 | 0.0254 |
| 35 | 1.6287 | 0.0250 |
| 36 | 1.6534 | 0.0247 |
| 37 | 1.6777 | 0.0244 |
| 38 | 1.7018 | 0.0240 |
| 39 | 1.7255 | 0.0238 |
| 40 | 1.7490 | 0.0235 |
| 41 | 1.7722 | 0.0232 |
| 42 | 1.7951 | 0.0229 |
| 43 | 1.8178 | 0.0227 |
| 44 | 1.8403 | 0.0224 |
| 45 | 1.8625 | 0.0222 |
| 46 | 1.8844 | 0.0220 |
| 47 | 1.9062 | 0.0218 |
| 48 | 1.9277 | 0.0215 |
| 49 | 1.9491 | 0.0213 |
| 50 | 1.9702 | 0.0211 |
| 51 | 1.9911 | 0.0209 |
| 52 | 2.0119 | 0.0207 |
| 53 | 2.0324 | 0.0206 |
| 54 | 2.0528 | 0.0204 |
| 55 | 2.0730 | 0.0202 |
| 56 | 2.0930 | 0.0200 |
| 57 | 2.1129 | 0.0199 |
| 58 | 2.1326 | 0.0197 |
| 59 | 2.1521 | 0.0195 |

| | | |
|---|---|---|
| 60 | 2.1715 | 0.0194 |
| 61 | 2.1907 | 0.0192 |
| 62 | 2.2098 | 0.0191 |
| 63 | 2.2288 | 0.0189 |
| 64 | 2.2476 | 0.0188 |
| 65 | 2.2663 | 0.0187 |
| 66 | 2.2848 | 0.0185 |
| 67 | 2.3032 | 0.0184 |
| 68 | 2.3215 | 0.0183 |
| 69 | 2.3397 | 0.0182 |
| 70 | 2.3577 | 0.0180 |
| 71 | 2.3756 | 0.0179 |
| 72 | 2.3934 | 0.0178 |
| 73 | 2.4109 | 0.0175 |
| 74 | 2.4283 | 0.0174 |
| 75 | 2.4456 | 0.0173 |
| 76 | 2.4628 | 0.0172 |
| 77 | 2.4799 | 0.0171 |
| 78 | 2.4968 | 0.0170 |
| 79 | 2.5137 | 0.0169 |
| 80 | 2.5305 | 0.0168 |
| 81 | 2.5472 | 0.0167 |
| 82 | 2.5637 | 0.0166 |
| 83 | 2.5802 | 0.0165 |
| 84 | 2.5966 | 0.0164 |
| 85 | 2.6129 | 0.0163 |
| 86 | 2.6291 | 0.0162 |
| 87 | 2.6452 | 0.0161 |
| 88 | 2.6613 | 0.0160 |
| 89 | 2.6772 | 0.0159 |
| 90 | 2.6931 | 0.0159 |
| 91 | 2.7088 | 0.0158 |
| 92 | 2.7245 | 0.0157 |
| 93 | 2.7401 | 0.0156 |
| 94 | 2.7557 | 0.0155 |
| 95 | 2.7711 | 0.0155 |
| 96 | 2.7865 | 0.0154 |
| 97 | 2.8018 | 0.0153 |
| 98 | 2.8171 | 0.0152 |
| 99 | 2.8322 | 0.0152 |
| 100 | 2.8473 | 0.0151 |
| 101 | 2.8623 | 0.0150 |
| 102 | 2.8773 | 0.0149 |
| 103 | 2.8921 | 0.0149 |
| 104 | 2.9070 | 0.0148 |
| 105 | 2.9217 | 0.0147 |
| 106 | 2.9364 | 0.0147 |
| 107 | 2.9510 | 0.0146 |
| 108 | 2.9655 | 0.0145 |
| 109 | 2.9800 | 0.0145 |
| 110 | 2.9944 | 0.0144 |
| 111 | 3.0088 | 0.0144 |
| 112 | 3.0231 | 0.0143 |
| 113 | 3.0373 | 0.0142 |
| 114 | 3.0515 | 0.0142 |
| 115 | 3.0656 | 0.0141 |
| 116 | 3.0797 | 0.0141 |
| 117 | 3.0937 | 0.0140 |
| 118 | 3.1077 | 0.0139 |
| 119 | 3.1215 | 0.0139 |
| 120 | 3.1354 | 0.0138 |
| 121 | 3.1492 | 0.0138 |
| 122 | 3.1629 | 0.0137 |
| 123 | 3.1766 | 0.0137 |
| 124 | 3.1902 | 0.0136 |
| 125 | 3.2038 | 0.0136 |
| 126 | 3.2173 | 0.0135 |
| 127 | 3.2308 | 0.0135 |
| 128 | 3.2442 | 0.0134 |

| | | |
|---|---|---|
| 129 | 3.2576 | 0.0134 |
| 130 | 3.2709 | 0.0133 |
| 131 | 3.2842 | 0.0133 |
| 132 | 3.2974 | 0.0132 |
| 133 | 3.3106 | 0.0132 |
| 134 | 3.3237 | 0.0131 |
| 135 | 3.3368 | 0.0131 |
| 136 | 3.3499 | 0.0130 |
| 137 | 3.3629 | 0.0130 |
| 138 | 3.3758 | 0.0130 |
| 139 | 3.3887 | 0.0129 |
| 140 | 3.4016 | 0.0129 |
| 141 | 3.4144 | 0.0128 |
| 142 | 3.4272 | 0.0128 |
| 143 | 3.4399 | 0.0127 |
| 144 | 3.4526 | 0.0127 |
| 145 | 3.4653 | 0.0127 |
| 146 | 3.4779 | 0.0126 |
| 147 | 3.4905 | 0.0126 |
| 148 | 3.5030 | 0.0125 |
| 149 | 3.5155 | 0.0125 |
| 150 | 3.5279 | 0.0125 |
| 151 | 3.5404 | 0.0124 |
| 152 | 3.5527 | 0.0124 |
| 153 | 3.5651 | 0.0123 |
| 154 | 3.5774 | 0.0123 |
| 155 | 3.5896 | 0.0123 |
| 156 | 3.6018 | 0.0122 |
| 157 | 3.6140 | 0.0122 |
| 158 | 3.6262 | 0.0122 |
| 159 | 3.6383 | 0.0121 |
| 160 | 3.6504 | 0.0121 |
| 161 | 3.6624 | 0.0120 |
| 162 | 3.6744 | 0.0120 |
| 163 | 3.6864 | 0.0120 |
| 164 | 3.6983 | 0.0119 |
| 165 | 3.7102 | 0.0119 |
| 166 | 3.7221 | 0.0119 |
| 167 | 3.7339 | 0.0118 |
| 168 | 3.7458 | 0.0118 |
| 169 | 3.7575 | 0.0118 |
| 170 | 3.7693 | 0.0117 |
| 171 | 3.7810 | 0.0117 |
| 172 | 3.7926 | 0.0117 |
| 173 | 3.8043 | 0.0116 |
| 174 | 3.8159 | 0.0116 |
| 175 | 3.8275 | 0.0116 |
| 176 | 3.8390 | 0.0115 |
| 177 | 3.8505 | 0.0115 |
| 178 | 3.8620 | 0.0115 |
| 179 | 3.8735 | 0.0115 |
| 180 | 3.8849 | 0.0114 |
| 181 | 3.8963 | 0.0114 |
| 182 | 3.9076 | 0.0114 |
| 183 | 3.9190 | 0.0113 |
| 184 | 3.9303 | 0.0113 |
| 185 | 3.9416 | 0.0113 |
| 186 | 3.9528 | 0.0112 |
| 187 | 3.9640 | 0.0112 |
| 188 | 3.9752 | 0.0112 |
| 189 | 3.9864 | 0.0112 |
| 190 | 3.9975 | 0.0111 |
| 191 | 4.0086 | 0.0111 |
| 192 | 4.0197 | 0.0111 |
| 193 | 4.0308 | 0.0111 |
| 194 | 4.0418 | 0.0110 |
| 195 | 4.0528 | 0.0110 |
| 196 | 4.0638 | 0.0110 |
| 197 | 4.0747 | 0.0109 |

| | | |
|---|---|---|
| 198 | 4.0856 | 0.0109 |
| 199 | 4.0965 | 0.0109 |
| 200 | 4.1074 | 0.0109 |
| 201 | 4.1182 | 0.0108 |
| 202 | 4.1291 | 0.0108 |
| 203 | 4.1399 | 0.0108 |
| 204 | 4.1506 | 0.0108 |
| 205 | 4.1614 | 0.0107 |
| 206 | 4.1721 | 0.0107 |
| 207 | 4.1828 | 0.0107 |
| 208 | 4.1935 | 0.0107 |
| 209 | 4.2041 | 0.0106 |
| 210 | 4.2147 | 0.0106 |
| 211 | 4.2253 | 0.0106 |
| 212 | 4.2359 | 0.0106 |
| 213 | 4.2464 | 0.0106 |
| 214 | 4.2570 | 0.0105 |
| 215 | 4.2675 | 0.0105 |
| 216 | 4.2780 | 0.0105 |
| 217 | 4.2884 | 0.0105 |
| 218 | 4.2988 | 0.0104 |
| 219 | 4.3093 | 0.0104 |
| 220 | 4.3197 | 0.0104 |
| 221 | 4.3300 | 0.0104 |
| 222 | 4.3404 | 0.0103 |
| 223 | 4.3507 | 0.0103 |
| 224 | 4.3610 | 0.0103 |
| 225 | 4.3713 | 0.0103 |
| 226 | 4.3815 | 0.0103 |
| 227 | 4.3918 | 0.0102 |
| 228 | 4.4020 | 0.0102 |
| 229 | 4.4122 | 0.0102 |
| 230 | 4.4224 | 0.0102 |
| 231 | 4.4325 | 0.0102 |
| 232 | 4.4426 | 0.0101 |
| 233 | 4.4528 | 0.0101 |
| 234 | 4.4628 | 0.0101 |
| 235 | 4.4729 | 0.0101 |
| 236 | 4.4830 | 0.0101 |
| 237 | 4.4930 | 0.0100 |
| 238 | 4.5030 | 0.0100 |
| 239 | 4.5130 | 0.0100 |
| 240 | 4.5230 | 0.0100 |
| 241 | 4.5329 | 0.0100 |
| 242 | 4.5429 | 0.0099 |
| 243 | 4.5528 | 0.0099 |
| 244 | 4.5627 | 0.0099 |
| 245 | 4.5726 | 0.0099 |
| 246 | 4.5824 | 0.0099 |
| 247 | 4.5922 | 0.0098 |
| 248 | 4.6021 | 0.0098 |
| 249 | 4.6119 | 0.0098 |
| 250 | 4.6216 | 0.0098 |
| 251 | 4.6314 | 0.0098 |
| 252 | 4.6412 | 0.0097 |
| 253 | 4.6509 | 0.0097 |
| 254 | 4.6606 | 0.0097 |
| 255 | 4.6703 | 0.0097 |
| 256 | 4.6800 | 0.0097 |
| 257 | 4.6896 | 0.0097 |
| 258 | 4.6992 | 0.0096 |
| 259 | 4.7089 | 0.0096 |
| 260 | 4.7185 | 0.0096 |
| 261 | 4.7281 | 0.0096 |
| 262 | 4.7376 | 0.0096 |
| 263 | 4.7472 | 0.0096 |
| 264 | 4.7567 | 0.0095 |
| 265 | 4.7662 | 0.0095 |
| 266 | 4.7757 | 0.0095 |

| | | |
|---|---|---|
| 267 | 4.7852 | 0.0095 |
| 268 | 4.7947 | 0.0095 |
| 269 | 4.8041 | 0.0094 |
| 270 | 4.8135 | 0.0094 |
| 271 | 4.8230 | 0.0094 |
| 272 | 4.8324 | 0.0094 |
| 273 | 4.8417 | 0.0094 |
| 274 | 4.8511 | 0.0094 |
| 275 | 4.8605 | 0.0094 |
| 276 | 4.8698 | 0.0093 |
| 277 | 4.8791 | 0.0093 |
| 278 | 4.8884 | 0.0093 |
| 279 | 4.8977 | 0.0093 |
| 280 | 4.9070 | 0.0093 |
| 281 | 4.9162 | 0.0093 |
| 282 | 4.9255 | 0.0092 |
| 283 | 4.9347 | 0.0092 |
| 284 | 4.9439 | 0.0092 |
| 285 | 4.9531 | 0.0092 |
| 286 | 4.9623 | 0.0092 |
| 287 | 4.9715 | 0.0092 |
| 288 | 4.9806 | 0.0091 |

| Unit Period (number) | Unit Rainfall (In) | Unit Soil-Loss (In) | Effective Rainfall (In) |
|---|---|---|---|
| 1 | 0.0091 | 0.0079 | 0.0013 |
| 2 | 0.0092 | 0.0079 | 0.0013 |
| 3 | 0.0092 | 0.0079 | 0.0013 |
| 4 | 0.0092 | 0.0079 | 0.0013 |
| 5 | 0.0092 | 0.0080 | 0.0013 |
| 6 | 0.0093 | 0.0080 | 0.0013 |
| 7 | 0.0093 | 0.0080 | 0.0013 |
| 8 | 0.0093 | 0.0080 | 0.0013 |
| 9 | 0.0093 | 0.0081 | 0.0013 |
| 10 | 0.0094 | 0.0081 | 0.0013 |
| 11 | 0.0094 | 0.0081 | 0.0013 |
| 12 | 0.0094 | 0.0081 | 0.0013 |
| 13 | 0.0094 | 0.0081 | 0.0013 |
| 14 | 0.0094 | 0.0082 | 0.0013 |
| 15 | 0.0095 | 0.0082 | 0.0013 |
| 16 | 0.0095 | 0.0082 | 0.0013 |
| 17 | 0.0095 | 0.0082 | 0.0013 |
| 18 | 0.0096 | 0.0082 | 0.0013 |
| 19 | 0.0096 | 0.0083 | 0.0013 |
| 20 | 0.0096 | 0.0083 | 0.0013 |
| 21 | 0.0096 | 0.0083 | 0.0013 |
| 22 | 0.0097 | 0.0083 | 0.0013 |
| 23 | 0.0097 | 0.0084 | 0.0013 |
| 24 | 0.0097 | 0.0084 | 0.0013 |
| 25 | 0.0097 | 0.0084 | 0.0013 |
| 26 | 0.0098 | 0.0084 | 0.0013 |
| 27 | 0.0098 | 0.0085 | 0.0013 |
| 28 | 0.0098 | 0.0085 | 0.0013 |
| 29 | 0.0099 | 0.0085 | 0.0014 |
| 30 | 0.0099 | 0.0085 | 0.0014 |
| 31 | 0.0099 | 0.0086 | 0.0014 |
| 32 | 0.0099 | 0.0086 | 0.0014 |
| 33 | 0.0100 | 0.0086 | 0.0014 |
| 34 | 0.0100 | 0.0086 | 0.0014 |
| 35 | 0.0100 | 0.0087 | 0.0014 |
| 36 | 0.0101 | 0.0087 | 0.0014 |
| 37 | 0.0101 | 0.0087 | 0.0014 |
| 38 | 0.0101 | 0.0087 | 0.0014 |
| 39 | 0.0102 | 0.0088 | 0.0014 |
| 40 | 0.0102 | 0.0088 | 0.0014 |
| 41 | 0.0102 | 0.0088 | 0.0014 |
| 42 | 0.0102 | 0.0088 | 0.0014 |

| | | | |
|---|---|---|---|
| 43 | 0.0103 | 0.0089 | 0.0014 |
| 44 | 0.0103 | 0.0089 | 0.0014 |
| 45 | 0.0103 | 0.0089 | 0.0014 |
| 46 | 0.0104 | 0.0089 | 0.0014 |
| 47 | 0.0104 | 0.0090 | 0.0014 |
| 48 | 0.0104 | 0.0090 | 0.0014 |
| 49 | 0.0105 | 0.0090 | 0.0014 |
| 50 | 0.0105 | 0.0091 | 0.0014 |
| 51 | 0.0106 | 0.0091 | 0.0014 |
| 52 | 0.0106 | 0.0091 | 0.0015 |
| 53 | 0.0106 | 0.0092 | 0.0015 |
| 54 | 0.0106 | 0.0092 | 0.0015 |
| 55 | 0.0107 | 0.0092 | 0.0015 |
| 56 | 0.0107 | 0.0092 | 0.0015 |
| 57 | 0.0108 | 0.0093 | 0.0015 |
| 58 | 0.0108 | 0.0093 | 0.0015 |
| 59 | 0.0108 | 0.0094 | 0.0015 |
| 60 | 0.0109 | 0.0094 | 0.0015 |
| 61 | 0.0109 | 0.0094 | 0.0015 |
| 62 | 0.0109 | 0.0094 | 0.0015 |
| 63 | 0.0110 | 0.0095 | 0.0015 |
| 64 | 0.0110 | 0.0095 | 0.0015 |
| 65 | 0.0111 | 0.0096 | 0.0015 |
| 66 | 0.0111 | 0.0096 | 0.0015 |
| 67 | 0.0112 | 0.0096 | 0.0015 |
| 68 | 0.0112 | 0.0097 | 0.0015 |
| 69 | 0.0112 | 0.0097 | 0.0015 |
| 70 | 0.0113 | 0.0097 | 0.0015 |
| 71 | 0.0113 | 0.0098 | 0.0016 |
| 72 | 0.0114 | 0.0098 | 0.0016 |
| 73 | 0.0114 | 0.0099 | 0.0016 |
| 74 | 0.0115 | 0.0099 | 0.0016 |
| 75 | 0.0115 | 0.0099 | 0.0016 |
| 76 | 0.0115 | 0.0100 | 0.0016 |
| 77 | 0.0116 | 0.0100 | 0.0016 |
| 78 | 0.0116 | 0.0100 | 0.0016 |
| 79 | 0.0117 | 0.0101 | 0.0016 |
| 80 | 0.0117 | 0.0101 | 0.0016 |
| 81 | 0.0118 | 0.0102 | 0.0016 |
| 82 | 0.0118 | 0.0102 | 0.0016 |
| 83 | 0.0119 | 0.0103 | 0.0016 |
| 84 | 0.0119 | 0.0103 | 0.0016 |
| 85 | 0.0120 | 0.0104 | 0.0017 |
| 86 | 0.0120 | 0.0104 | 0.0017 |
| 87 | 0.0121 | 0.0104 | 0.0017 |
| 88 | 0.0122 | 0.0105 | 0.0017 |
| 89 | 0.0122 | 0.0105 | 0.0017 |
| 90 | 0.0123 | 0.0106 | 0.0017 |
| 91 | 0.0123 | 0.0106 | 0.0017 |
| 92 | 0.0124 | 0.0107 | 0.0017 |
| 93 | 0.0125 | 0.0107 | 0.0017 |
| 94 | 0.0125 | 0.0108 | 0.0017 |
| 95 | 0.0126 | 0.0108 | 0.0017 |
| 96 | 0.0126 | 0.0109 | 0.0017 |
| 97 | 0.0127 | 0.0110 | 0.0017 |
| 98 | 0.0127 | 0.0110 | 0.0018 |
| 99 | 0.0128 | 0.0111 | 0.0018 |
| 100 | 0.0129 | 0.0111 | 0.0018 |
| 101 | 0.0130 | 0.0112 | 0.0018 |
| 102 | 0.0130 | 0.0112 | 0.0018 |
| 103 | 0.0131 | 0.0113 | 0.0018 |
| 104 | 0.0131 | 0.0113 | 0.0018 |
| 105 | 0.0132 | 0.0114 | 0.0018 |
| 106 | 0.0133 | 0.0115 | 0.0018 |
| 107 | 0.0134 | 0.0115 | 0.0018 |
| 108 | 0.0134 | 0.0116 | 0.0018 |
| 109 | 0.0135 | 0.0117 | 0.0019 |
| 110 | 0.0136 | 0.0117 | 0.0019 |
| 111 | 0.0137 | 0.0118 | 0.0019 |

| | | | |
|---|---|---|---|
| 112 | 0.0137 | 0.0118 | 0.0019 |
| 113 | 0.0138 | 0.0119 | 0.0019 |
| 114 | 0.0139 | 0.0120 | 0.0019 |
| 115 | 0.0140 | 0.0121 | 0.0019 |
| 116 | 0.0141 | 0.0121 | 0.0019 |
| 117 | 0.0142 | 0.0122 | 0.0019 |
| 118 | 0.0142 | 0.0123 | 0.0020 |
| 119 | 0.0144 | 0.0124 | 0.0020 |
| 120 | 0.0144 | 0.0124 | 0.0020 |
| 121 | 0.0145 | 0.0125 | 0.0020 |
| 122 | 0.0146 | 0.0126 | 0.0020 |
| 123 | 0.0147 | 0.0127 | 0.0020 |
| 124 | 0.0148 | 0.0128 | 0.0020 |
| 125 | 0.0149 | 0.0129 | 0.0021 |
| 126 | 0.0150 | 0.0130 | 0.0021 |
| 127 | 0.0152 | 0.0131 | 0.0021 |
| 128 | 0.0152 | 0.0131 | 0.0021 |
| 129 | 0.0154 | 0.0133 | 0.0021 |
| 130 | 0.0155 | 0.0133 | 0.0021 |
| 131 | 0.0156 | 0.0135 | 0.0021 |
| 132 | 0.0157 | 0.0135 | 0.0022 |
| 133 | 0.0159 | 0.0137 | 0.0022 |
| 134 | 0.0159 | 0.0138 | 0.0022 |
| 135 | 0.0161 | 0.0139 | 0.0022 |
| 136 | 0.0162 | 0.0140 | 0.0022 |
| 137 | 0.0164 | 0.0141 | 0.0023 |
| 138 | 0.0165 | 0.0142 | 0.0023 |
| 139 | 0.0167 | 0.0144 | 0.0023 |
| 140 | 0.0168 | 0.0145 | 0.0023 |
| 141 | 0.0170 | 0.0146 | 0.0023 |
| 142 | 0.0171 | 0.0147 | 0.0023 |
| 143 | 0.0173 | 0.0149 | 0.0024 |
| 144 | 0.0174 | 0.0150 | 0.0024 |
| 145 | 0.0178 | 0.0154 | 0.0024 |
| 146 | 0.0179 | 0.0155 | 0.0025 |
| 147 | 0.0182 | 0.0157 | 0.0025 |
| 148 | 0.0183 | 0.0158 | 0.0025 |
| 149 | 0.0185 | 0.0160 | 0.0025 |
| 150 | 0.0187 | 0.0161 | 0.0026 |
| 151 | 0.0189 | 0.0163 | 0.0026 |
| 152 | 0.0191 | 0.0165 | 0.0026 |
| 153 | 0.0194 | 0.0167 | 0.0027 |
| 154 | 0.0195 | 0.0169 | 0.0027 |
| 155 | 0.0199 | 0.0171 | 0.0027 |
| 156 | 0.0200 | 0.0173 | 0.0028 |
| 157 | 0.0204 | 0.0176 | 0.0028 |
| 158 | 0.0206 | 0.0177 | 0.0028 |
| 159 | 0.0209 | 0.0181 | 0.0029 |
| 160 | 0.0211 | 0.0182 | 0.0029 |
| 161 | 0.0215 | 0.0186 | 0.0030 |
| 162 | 0.0218 | 0.0188 | 0.0030 |
| 163 | 0.0222 | 0.0192 | 0.0031 |
| 164 | 0.0224 | 0.0194 | 0.0031 |
| 165 | 0.0229 | 0.0198 | 0.0032 |
| 166 | 0.0232 | 0.0200 | 0.0032 |
| 167 | 0.0238 | 0.0205 | 0.0033 |
| 168 | 0.0240 | 0.0207 | 0.0033 |
| 169 | 0.0247 | 0.0213 | 0.0034 |
| 170 | 0.0250 | 0.0216 | 0.0034 |
| 171 | 0.0257 | 0.0222 | 0.0035 |
| 172 | 0.0261 | 0.0225 | 0.0036 |
| 173 | 0.0269 | 0.0232 | 0.0037 |
| 174 | 0.0273 | 0.0236 | 0.0038 |
| 175 | 0.0283 | 0.0244 | 0.0039 |
| 176 | 0.0288 | 0.0248 | 0.0040 |
| 177 | 0.0299 | 0.0258 | 0.0041 |
| 178 | 0.0305 | 0.0263 | 0.0042 |
| 179 | 0.0319 | 0.0275 | 0.0044 |
| 180 | 0.0326 | 0.0281 | 0.0045 |

| | | | |
|---|---|---|---|
| 181 | 0.0343 | 0.0296 | 0.0047 |
| 182 | 0.0353 | 0.0304 | 0.0048 |
| 183 | 0.0375 | 0.0323 | 0.0051 |
| 184 | 0.0387 | 0.0334 | 0.0053 |
| 185 | 0.0315 | 0.0271 | 0.0043 |
| 186 | 0.0332 | 0.0287 | 0.0046 |
| 187 | 0.0377 | 0.0325 | 0.0052 |
| 188 | 0.0407 | 0.0351 | 0.0056 |
| 189 | 0.0490 | 0.0423 | 0.0067 |
| 190 | 0.0553 | 0.0477 | 0.0076 |
| 191 | 0.0791 | 0.0675 | 0.0116 |
| 192 | 0.1088 | 0.0675 | 0.0413 |
| 193 | 0.3404 | 0.0675 | 0.2729 |
| 194 | 0.0644 | 0.0556 | 0.0089 |
| 195 | 0.0443 | 0.0382 | 0.0061 |
| 196 | 0.0353 | 0.0304 | 0.0048 |
| 197 | 0.0402 | 0.0346 | 0.0055 |
| 198 | 0.0363 | 0.0313 | 0.0050 |
| 199 | 0.0334 | 0.0288 | 0.0046 |
| 200 | 0.0312 | 0.0269 | 0.0043 |
| 201 | 0.0293 | 0.0253 | 0.0040 |
| 202 | 0.0278 | 0.0240 | 0.0038 |
| 203 | 0.0265 | 0.0228 | 0.0036 |
| 204 | 0.0254 | 0.0219 | 0.0035 |
| 205 | 0.0244 | 0.0210 | 0.0033 |
| 206 | 0.0235 | 0.0202 | 0.0032 |
| 207 | 0.0227 | 0.0196 | 0.0031 |
| 208 | 0.0220 | 0.0190 | 0.0030 |
| 209 | 0.0213 | 0.0184 | 0.0029 |
| 210 | 0.0207 | 0.0179 | 0.0028 |
| 211 | 0.0202 | 0.0174 | 0.0028 |
| 212 | 0.0197 | 0.0170 | 0.0027 |
| 213 | 0.0192 | 0.0166 | 0.0026 |
| 214 | 0.0188 | 0.0162 | 0.0026 |
| 215 | 0.0184 | 0.0159 | 0.0025 |
| 216 | 0.0180 | 0.0156 | 0.0025 |
| 217 | 0.0175 | 0.0151 | 0.0024 |
| 218 | 0.0172 | 0.0148 | 0.0024 |
| 219 | 0.0169 | 0.0146 | 0.0023 |
| 220 | 0.0166 | 0.0143 | 0.0023 |
| 221 | 0.0163 | 0.0141 | 0.0022 |
| 222 | 0.0160 | 0.0138 | 0.0022 |
| 223 | 0.0158 | 0.0136 | 0.0022 |
| 224 | 0.0155 | 0.0134 | 0.0021 |
| 225 | 0.0153 | 0.0132 | 0.0021 |
| 226 | 0.0151 | 0.0130 | 0.0021 |
| 227 | 0.0149 | 0.0128 | 0.0020 |
| 228 | 0.0147 | 0.0127 | 0.0020 |
| 229 | 0.0145 | 0.0125 | 0.0020 |
| 230 | 0.0143 | 0.0123 | 0.0020 |
| 231 | 0.0141 | 0.0122 | 0.0019 |
| 232 | 0.0139 | 0.0120 | 0.0019 |
| 233 | 0.0138 | 0.0119 | 0.0019 |
| 234 | 0.0136 | 0.0118 | 0.0019 |
| 235 | 0.0135 | 0.0116 | 0.0019 |
| 236 | 0.0133 | 0.0115 | 0.0018 |
| 237 | 0.0132 | 0.0114 | 0.0018 |
| 238 | 0.0130 | 0.0113 | 0.0018 |
| 239 | 0.0129 | 0.0111 | 0.0018 |
| 240 | 0.0128 | 0.0110 | 0.0018 |
| 241 | 0.0127 | 0.0109 | 0.0017 |
| 242 | 0.0125 | 0.0108 | 0.0017 |
| 243 | 0.0124 | 0.0107 | 0.0017 |
| 244 | 0.0123 | 0.0106 | 0.0017 |
| 245 | 0.0122 | 0.0105 | 0.0017 |
| 246 | 0.0121 | 0.0104 | 0.0017 |
| 247 | 0.0120 | 0.0103 | 0.0016 |
| 248 | 0.0119 | 0.0102 | 0.0016 |
| 249 | 0.0118 | 0.0102 | 0.0016 |

| | | | |
|---|---|---|---|
| 250 | 0.0117 | 0.0101 | 0.0016 |
| 251 | 0.0116 | 0.0100 | 0.0016 |
| 252 | 0.0115 | 0.0099 | 0.0016 |
| 253 | 0.0114 | 0.0098 | 0.0016 |
| 254 | 0.0113 | 0.0098 | 0.0016 |
| 255 | 0.0112 | 0.0097 | 0.0015 |
| 256 | 0.0111 | 0.0096 | 0.0015 |
| 257 | 0.0111 | 0.0095 | 0.0015 |
| 258 | 0.0110 | 0.0095 | 0.0015 |
| 259 | 0.0109 | 0.0094 | 0.0015 |
| 260 | 0.0108 | 0.0093 | 0.0015 |
| 261 | 0.0107 | 0.0093 | 0.0015 |
| 262 | 0.0107 | 0.0092 | 0.0015 |
| 263 | 0.0106 | 0.0091 | 0.0015 |
| 264 | 0.0105 | 0.0091 | 0.0014 |
| 265 | 0.0105 | 0.0090 | 0.0014 |
| 266 | 0.0104 | 0.0090 | 0.0014 |
| 267 | 0.0103 | 0.0089 | 0.0014 |
| 268 | 0.0103 | 0.0088 | 0.0014 |
| 269 | 0.0102 | 0.0088 | 0.0014 |
| 270 | 0.0101 | 0.0087 | 0.0014 |
| 271 | 0.0101 | 0.0087 | 0.0014 |
| 272 | 0.0100 | 0.0086 | 0.0014 |
| 273 | 0.0100 | 0.0086 | 0.0014 |
| 274 | 0.0099 | 0.0085 | 0.0014 |
| 275 | 0.0098 | 0.0085 | 0.0014 |
| 276 | 0.0098 | 0.0084 | 0.0013 |
| 277 | 0.0097 | 0.0084 | 0.0013 |
| 278 | 0.0097 | 0.0083 | 0.0013 |
| 279 | 0.0096 | 0.0083 | 0.0013 |
| 280 | 0.0096 | 0.0083 | 0.0013 |
| 281 | 0.0095 | 0.0082 | 0.0013 |
| 282 | 0.0095 | 0.0082 | 0.0013 |
| 283 | 0.0094 | 0.0081 | 0.0013 |
| 284 | 0.0094 | 0.0081 | 0.0013 |
| 285 | 0.0093 | 0.0080 | 0.0013 |
| 286 | 0.0093 | 0.0080 | 0.0013 |
| 287 | 0.0092 | 0.0080 | 0.0013 |
| 288 | 0.0092 | 0.0079 | 0.0013 |

---

---

Total soil rain loss = 4.04(In)
Total effective rainfall = 0.94(In)
Peak flow rate in flood hydrograph = 4.34(CFS)

---

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

---

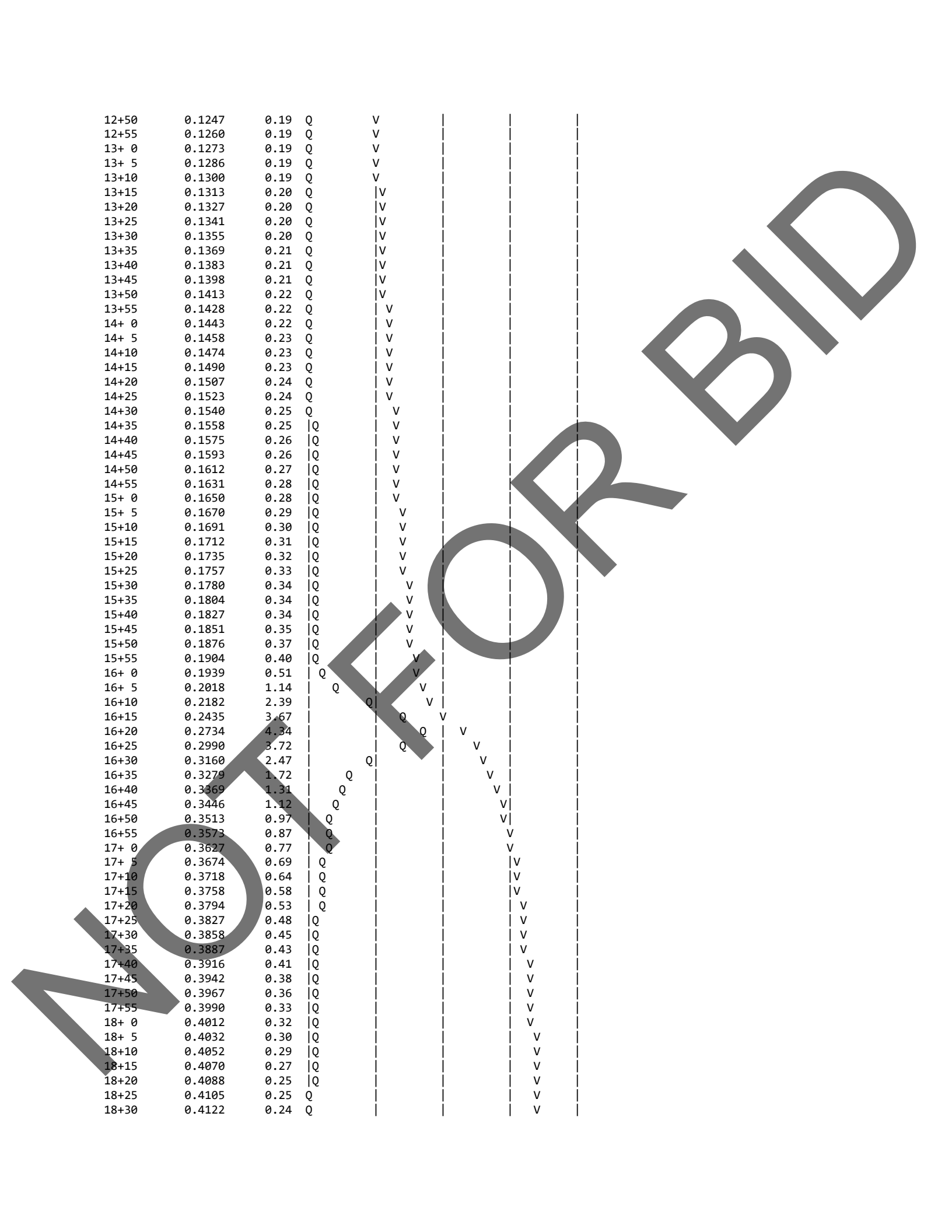
Hydrograph in 5 Minute intervals ((CFS))

---

| Time(h+m) | Volume Ac.Ft | Q(CFS) | 0 | 2.5 | 5.0 | 7.5 | 10.0 |
|---|---|---|---|---|---|---|---|
| 0+ 5 | 0.0000 | 0.00 | Q | \| | \| | \| | \| |
| 0+10 | 0.0001 | 0.01 | Q | \| | \| | \| | \| |
| 0+15 | 0.0002 | 0.02 | Q | \| | \| | \| | \| |
| 0+20 | 0.0005 | 0.04 | Q | \| | \| | \| | \| |
| 0+25 | 0.0009 | 0.05 | Q | \| | \| | \| | \| |
| 0+30 | 0.0013 | 0.06 | Q | \| | \| | \| | \| |
| 0+35 | 0.0017 | 0.07 | Q | \| | \| | \| | \| |
| 0+40 | 0.0022 | 0.07 | Q | \| | \| | \| | \| |
| 0+45 | 0.0027 | 0.07 | Q | \| | \| | \| | \| |
| 0+50 | 0.0033 | 0.08 | Q | \| | \| | \| | \| |
| 0+55 | 0.0038 | 0.08 | Q | \| | \| | \| | \| |
| 1+ 0 | 0.0044 | 0.08 | Q | \| | \| | \| | \| |
| 1+ 5 | 0.0050 | 0.08 | Q | \| | \| | \| | \| |
| 1+10 | 0.0055 | 0.08 | Q | \| | \| | \| | \| |
| 1+15 | 0.0061 | 0.09 | Q | \| | \| | \| | \| |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1+20 | 0.0067 | 0.09 | Q | | | | |
| 1+25 | 0.0073 | 0.09 | Q | | | | |
| 1+30 | 0.0080 | 0.09 | Q | | | | |
| 1+35 | 0.0086 | 0.09 | Q | | | | |
| 1+40 | 0.0092 | 0.09 | Q | | | | |
| 1+45 | 0.0098 | 0.09 | Q | | | | |
| 1+50 | 0.0105 | 0.09 | Q | | | | |
| 1+55 | 0.0111 | 0.09 | Q | | | | |
| 2+ 0 | 0.0118 | 0.09 | Q | | | | |
| 2+ 5 | 0.0124 | 0.09 | QV | | | | |
| 2+10 | 0.0131 | 0.10 | QV | | | | |
| 2+15 | 0.0138 | 0.10 | QV | | | | |
| 2+20 | 0.0144 | 0.10 | QV | | | | |
| 2+25 | 0.0151 | 0.10 | QV | | | | |
| 2+30 | 0.0158 | 0.10 | QV | | | | |
| 2+35 | 0.0164 | 0.10 | QV | | | | |
| 2+40 | 0.0171 | 0.10 | QV | | | | |
| 2+45 | 0.0178 | 0.10 | QV | | | | |
| 2+50 | 0.0185 | 0.10 | QV | | | | |
| 2+55 | 0.0192 | 0.10 | QV | | | | |
| 3+ 0 | 0.0198 | 0.10 | QV | | | | |
| 3+ 5 | 0.0205 | 0.10 | QV | | | | |
| 3+10 | 0.0212 | 0.10 | QV | | | | |
| 3+15 | 0.0219 | 0.10 | QV | | | | |
| 3+20 | 0.0226 | 0.10 | QV | | | | |
| 3+25 | 0.0233 | 0.10 | QV | | | | |
| 3+30 | 0.0240 | 0.10 | Q V | | | | |
| 3+35 | 0.0247 | 0.10 | Q V | | | | |
| 3+40 | 0.0254 | 0.10 | Q V | | | | |
| 3+45 | 0.0261 | 0.10 | Q V | | | | |
| 3+50 | 0.0268 | 0.10 | Q V | | | | |
| 3+55 | 0.0275 | 0.10 | Q V | | | | |
| 4+ 0 | 0.0282 | 0.10 | Q V | | | | |
| 4+ 5 | 0.0289 | 0.10 | Q V | | | | |
| 4+10 | 0.0297 | 0.10 | Q V | | | | |
| 4+15 | 0.0304 | 0.10 | Q V | | | | |
| 4+20 | 0.0311 | 0.10 | Q V | | | | |
| 4+25 | 0.0318 | 0.10 | Q V | | | | |
| 4+30 | 0.0325 | 0.11 | Q V | | | | |
| 4+35 | 0.0333 | 0.11 | Q V | | | | |
| 4+40 | 0.0340 | 0.11 | Q V | | | | |
| 4+45 | 0.0347 | 0.11 | Q V | | | | |
| 4+50 | 0.0355 | 0.11 | Q V | | | | |
| 4+55 | 0.0362 | 0.11 | Q V | | | | |
| 5+ 0 | 0.0369 | 0.11 | Q V | | | | |
| 5+ 5 | 0.0377 | 0.11 | Q V | | | | |
| 5+10 | 0.0384 | 0.11 | Q V | | | | |
| 5+15 | 0.0392 | 0.11 | Q V | | | | |
| 5+20 | 0.0399 | 0.11 | Q V | | | | |
| 5+25 | 0.0407 | 0.11 | Q V | | | | |
| 5+30 | 0.0414 | 0.11 | Q V | | | | |
| 5+35 | 0.0422 | 0.11 | Q V | | | | |
| 5+40 | 0.0430 | 0.11 | Q V | | | | |
| 5+45 | 0.0437 | 0.11 | Q V | | | | |
| 5+50 | 0.0445 | 0.11 | Q V | | | | |
| 5+55 | 0.0452 | 0.11 | Q V | | | | |
| 6+ 0 | 0.0460 | 0.11 | Q V | | | | |
| 6+ 5 | 0.0468 | 0.11 | Q V | | | | |
| 6+10 | 0.0476 | 0.11 | Q V | | | | |
| 6+15 | 0.0484 | 0.11 | Q V | | | | |
| 6+20 | 0.0491 | 0.11 | Q V | | | | |
| 6+25 | 0.0499 | 0.11 | Q V | | | | |
| 6+30 | 0.0507 | 0.11 | Q V | | | | |
| 6+35 | 0.0515 | 0.12 | Q V | | | | |
| 6+40 | 0.0523 | 0.12 | Q V | | | | |
| 6+45 | 0.0531 | 0.12 | Q V | | | | |
| 6+50 | 0.0539 | 0.12 | Q V | | | | |
| 6+55 | 0.0547 | 0.12 | Q V | | | | |
| 7+ 0 | 0.0555 | 0.12 | Q V | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 7+ 5 | 0.0563 | 0.12 | Q | V | \| | \| | \| | \| |
| 7+10 | 0.0571 | 0.12 | Q | V | \| | \| | \| | \| |
| 7+15 | 0.0580 | 0.12 | Q | V | \| | \| | \| | \| |
| 7+20 | 0.0588 | 0.12 | Q | V | \| | \| | \| | \| |
| 7+25 | 0.0596 | 0.12 | Q | V | \| | \| | \| | \| |
| 7+30 | 0.0604 | 0.12 | Q | V | \| | \| | \| | \| |
| 7+35 | 0.0613 | 0.12 | Q | V | \| | \| | \| | \| |
| 7+40 | 0.0621 | 0.12 | Q | V | \| | \| | \| | \| |
| 7+45 | 0.0629 | 0.12 | Q | V | \| | \| | \| | \| |
| 7+50 | 0.0638 | 0.12 | Q | V | \| | \| | \| | \| |
| 7+55 | 0.0646 | 0.12 | Q | V | \| | \| | \| | \| |
| 8+ 0 | 0.0655 | 0.12 | Q | V | \| | \| | \| | \| |
| 8+ 5 | 0.0663 | 0.12 | Q | V | \| | \| | \| | \| |
| 8+10 | 0.0672 | 0.12 | Q | V | \| | \| | \| | \| |
| 8+15 | 0.0681 | 0.13 | Q | V | \| | \| | \| | \| |
| 8+20 | 0.0689 | 0.13 | Q | V | \| | \| | \| | \| |
| 8+25 | 0.0698 | 0.13 | Q | V | \| | \| | \| | \| |
| 8+30 | 0.0707 | 0.13 | Q | V | \| | \| | \| | \| |
| 8+35 | 0.0716 | 0.13 | Q | V | \| | \| | \| | \| |
| 8+40 | 0.0725 | 0.13 | Q | V | \| | \| | \| | \| |
| 8+45 | 0.0733 | 0.13 | Q | V | \| | \| | \| | \| |
| 8+50 | 0.0742 | 0.13 | Q | V | \| | \| | \| | \| |
| 8+55 | 0.0751 | 0.13 | Q | V | \| | \| | \| | \| |
| 9+ 0 | 0.0760 | 0.13 | Q | V | \| | \| | \| | \| |
| 9+ 5 | 0.0770 | 0.13 | Q | V | \| | \| | \| | \| |
| 9+10 | 0.0779 | 0.13 | Q | V | \| | \| | \| | \| |
| 9+15 | 0.0788 | 0.13 | Q | V | \| | \| | \| | \| |
| 9+20 | 0.0797 | 0.13 | Q | V | \| | \| | \| | \| |
| 9+25 | 0.0806 | 0.13 | Q | V | \| | \| | \| | \| |
| 9+30 | 0.0816 | 0.14 | Q | V | \| | \| | \| | \| |
| 9+35 | 0.0825 | 0.14 | Q | V | \| | \| | \| | \| |
| 9+40 | 0.0834 | 0.14 | Q | V | \| | \| | \| | \| |
| 9+45 | 0.0844 | 0.14 | Q | V | \| | \| | \| | \| |
| 9+50 | 0.0854 | 0.14 | Q | V | \| | \| | \| | \| |
| 9+55 | 0.0863 | 0.14 | Q | V | \| | \| | \| | \| |
| 10+ 0 | 0.0873 | 0.14 | Q | V | \| | \| | \| | \| |
| 10+ 5 | 0.0883 | 0.14 | Q | V | \| | \| | \| | \| |
| 10+10 | 0.0892 | 0.14 | Q | V | \| | \| | \| | \| |
| 10+15 | 0.0902 | 0.14 | Q | V | \| | \| | \| | \| |
| 10+20 | 0.0912 | 0.14 | Q | V | \| | \| | \| | \| |
| 10+25 | 0.0922 | 0.14 | Q | V | \| | \| | \| | \| |
| 10+30 | 0.0932 | 0.15 | Q | V | \| | \| | \| | \| |
| 10+35 | 0.0942 | 0.15 | Q | V | \| | \| | \| | \| |
| 10+40 | 0.0952 | 0.15 | Q | V | \| | \| | \| | \| |
| 10+45 | 0.0963 | 0.15 | Q | V | \| | \| | \| | \| |
| 10+50 | 0.0973 | 0.15 | Q | V | \| | \| | \| | \| |
| 10+55 | 0.0983 | 0.15 | Q | V | \| | \| | \| | \| |
| 11+ 0 | 0.0994 | 0.15 | Q | V | \| | \| | \| | \| |
| 11+ 5 | 0.1004 | 0.15 | Q | V | \| | \| | \| | \| |
| 11+10 | 0.1015 | 0.15 | Q | V | \| | \| | \| | \| |
| 11+15 | 0.1026 | 0.16 | Q | V | \| | \| | \| | \| |
| 11+20 | 0.1036 | 0.16 | Q | V | \| | \| | \| | \| |
| 11+25 | 0.1047 | 0.16 | Q | V | \| | \| | \| | \| |
| 11+30 | 0.1058 | 0.16 | Q | V | \| | \| | \| | \| |
| 11+35 | 0.1069 | 0.16 | Q | V | \| | \| | \| | \| |
| 11+40 | 0.1080 | 0.16 | Q | V | \| | \| | \| | \| |
| 11+45 | 0.1091 | 0.16 | Q | V | \| | \| | \| | \| |
| 11+50 | 0.1103 | 0.16 | Q | V | \| | \| | \| | \| |
| 11+55 | 0.1114 | 0.17 | Q | V | \| | \| | \| | \| |
| 12+ 0 | 0.1126 | 0.17 | Q | V | \| | \| | \| | \| |
| 12+ 5 | 0.1137 | 0.17 | Q | V | \| | \| | \| | \| |
| 12+10 | 0.1149 | 0.17 | Q | V | \| | \| | \| | \| |
| 12+15 | 0.1161 | 0.17 | Q | V | \| | \| | \| | \| |
| 12+20 | 0.1173 | 0.17 | Q | V | \| | \| | \| | \| |
| 12+25 | 0.1185 | 0.18 | Q | V | \| | \| | \| | \| |
| 12+30 | 0.1197 | 0.18 | Q | V | \| | \| | \| | \| |
| 12+35 | 0.1209 | 0.18 | Q | V | \| | \| | \| | \| |
| 12+40 | 0.1222 | 0.18 | Q | V | \| | \| | \| | \| |
| 12+45 | 0.1234 | 0.18 | Q | V | \| | \| | \| | \| |


12+50 0.1247 0.19
12+55 0.1260 0.19
13+ 0 0.1273 0.19
13+ 5 0.1286 0.19
13+10 0.1300 0.19
13+15 0.1313 0.20
13+20 0.1327 0.20
13+25 0.1341 0.20
13+30 0.1355 0.20
13+35 0.1369 0.21
13+40 0.1383 0.21
13+45 0.1398 0.21
13+50 0.1413 0.22
13+55 0.1428 0.22
14+ 0 0.1443 0.22
14+ 5 0.1458 0.23
14+10 0.1474 0.23
14+15 0.1490 0.23
14+20 0.1507 0.24
14+25 0.1523 0.24
14+30 0.1540 0.25
14+35 0.1558 0.25
14+40 0.1575 0.26
14+45 0.1593 0.26
14+50 0.1612 0.27
14+55 0.1631 0.28
15+ 0 0.1650 0.28
15+ 5 0.1670 0.29
15+10 0.1691 0.30
15+15 0.1712 0.31
15+20 0.1735 0.32
15+25 0.1757 0.33
15+30 0.1780 0.34
15+35 0.1804 0.34
15+40 0.1827 0.34
15+45 0.1851 0.35
15+50 0.1876 0.37
15+55 0.1904 0.40
16+ 0 0.1939 0.51
16+ 5 0.2018 1.14
16+10 0.2182 2.39
16+15 0.2435 3.67
16+20 0.2734 4.34
16+25 0.2990 3.72
16+30 0.3160 2.47
16+35 0.3279 1.72
16+40 0.3369 1.31
16+45 0.3446 1.12
16+50 0.3513 0.97
16+55 0.3573 0.87
17+ 0 0.3627 0.77
17+ 5 0.3674 0.69
17+10 0.3718 0.64
17+15 0.3758 0.58
17+20 0.3794 0.53
17+25 0.3827 0.48
17+30 0.3858 0.45
17+35 0.3887 0.43
17+40 0.3916 0.41
17+45 0.3942 0.38
17+50 0.3967 0.36
17+55 0.3990 0.33
18+ 0 0.4012 0.32
18+ 5 0.4032 0.30
18+10 0.4052 0.29
18+15 0.4070 0.27
18+20 0.4088 0.25
18+25 0.4105 0.25
18+30 0.4122 0.24

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 18+35 | 0.4138 | 0.24 | Q | \| | \| | \| | V \| |
| 18+40 | 0.4152 | 0.20 | Q | \| | \| | \| | V \| |
| 18+45 | 0.4164 | 0.18 | Q | \| | \| | \| | V \| |
| 18+50 | 0.4176 | 0.17 | Q | \| | \| | \| | V \| |
| 18+55 | 0.4188 | 0.17 | Q | \| | \| | \| | V \| |
| 19+ 0 | 0.4199 | 0.17 | Q | \| | \| | \| | V \| |
| 19+ 5 | 0.4210 | 0.16 | Q | \| | \| | \| | V \| |
| 19+10 | 0.4221 | 0.16 | Q | \| | \| | \| | V \| |
| 19+15 | 0.4232 | 0.16 | Q | \| | \| | \| | V \| |
| 19+20 | 0.4243 | 0.15 | Q | \| | \| | \| | V \| |
| 19+25 | 0.4253 | 0.15 | Q | \| | \| | \| | V \| |
| 19+30 | 0.4263 | 0.15 | Q | \| | \| | \| | V \| |
| 19+35 | 0.4273 | 0.15 | Q | \| | \| | \| | V \| |
| 19+40 | 0.4283 | 0.15 | Q | \| | \| | \| | V \| |
| 19+45 | 0.4293 | 0.14 | Q | \| | \| | \| | V \| |
| 19+50 | 0.4303 | 0.14 | Q | \| | \| | \| | V \| |
| 19+55 | 0.4313 | 0.14 | Q | \| | \| | \| | V \| |
| 20+ 0 | 0.4322 | 0.14 | Q | \| | \| | \| | V \| |
| 20+ 5 | 0.4332 | 0.14 | Q | \| | \| | \| | V \| |
| 20+10 | 0.4341 | 0.14 | Q | \| | \| | \| | V \| |
| 20+15 | 0.4350 | 0.13 | Q | \| | \| | \| | V \| |
| 20+20 | 0.4359 | 0.13 | Q | \| | \| | \| | V \| |
| 20+25 | 0.4368 | 0.13 | Q | \| | \| | \| | V \| |
| 20+30 | 0.4377 | 0.13 | Q | \| | \| | \| | V \| |
| 20+35 | 0.4386 | 0.13 | Q | \| | \| | \| | V \| |
| 20+40 | 0.4395 | 0.13 | Q | \| | \| | \| | V \| |
| 20+45 | 0.4403 | 0.13 | Q | \| | \| | \| | V \| |
| 20+50 | 0.4412 | 0.12 | Q | \| | \| | \| | V \| |
| 20+55 | 0.4421 | 0.12 | Q | \| | \| | \| | V \| |
| 21+ 0 | 0.4429 | 0.12 | Q | \| | \| | \| | V \| |
| 21+ 5 | 0.4437 | 0.12 | Q | \| | \| | \| | V \| |
| 21+10 | 0.4446 | 0.12 | Q | \| | \| | \| | V \| |
| 21+15 | 0.4454 | 0.12 | Q | \| | \| | \| | V \| |
| 21+20 | 0.4462 | 0.12 | Q | \| | \| | \| | V \| |
| 21+25 | 0.4470 | 0.12 | Q | \| | \| | \| | V \| |
| 21+30 | 0.4478 | 0.12 | Q | \| | \| | \| | V \| |
| 21+35 | 0.4486 | 0.12 | Q | \| | \| | \| | V \| |
| 21+40 | 0.4494 | 0.11 | Q | \| | \| | \| | V \| |
| 21+45 | 0.4501 | 0.11 | Q | \| | \| | \| | V \| |
| 21+50 | 0.4509 | 0.11 | Q | \| | \| | \| | V \| |
| 21+55 | 0.4517 | 0.11 | Q | \| | \| | \| | V \| |
| 22+ 0 | 0.4525 | 0.11 | Q | \| | \| | \| | V \| |
| 22+ 5 | 0.4532 | 0.11 | Q | \| | \| | \| | V \| |
| 22+10 | 0.4540 | 0.11 | Q | \| | \| | \| | V \| |
| 22+15 | 0.4547 | 0.11 | Q | \| | \| | \| | V \| |
| 22+20 | 0.4554 | 0.11 | Q | \| | \| | \| | V \| |
| 22+25 | 0.4562 | 0.11 | Q | \| | \| | \| | V \| |
| 22+30 | 0.4569 | 0.11 | Q | \| | \| | \| | V \| |
| 22+35 | 0.4576 | 0.11 | Q | \| | \| | \| | V \| |
| 22+40 | 0.4584 | 0.10 | Q | \| | \| | \| | V \| |
| 22+45 | 0.4591 | 0.10 | Q | \| | \| | \| | V \| |
| 22+50 | 0.4598 | 0.10 | Q | \| | \| | \| | V \| |
| 22+55 | 0.4605 | 0.10 | Q | \| | \| | \| | V \| |
| 23+ 0 | 0.4612 | 0.10 | Q | \| | \| | \| | V \| |
| 23+ 5 | 0.4619 | 0.10 | Q | \| | \| | \| | V\| |
| 23+10 | 0.4626 | 0.10 | Q | \| | \| | \| | V\| |
| 23+15 | 0.4633 | 0.10 | Q | \| | \| | \| | V\| |
| 23+20 | 0.4640 | 0.10 | Q | \| | \| | \| | V\| |
| 23+25 | 0.4647 | 0.10 | Q | \| | \| | \| | V\| |
| 23+30 | 0.4653 | 0.10 | Q | \| | \| | \| | V\| |
| 23+35 | 0.4660 | 0.10 | Q | \| | \| | \| | V\| |
| 23+40 | 0.4667 | 0.10 | Q | \| | \| | \| | V\| |
| 23+45 | 0.4674 | 0.10 | Q | \| | \| | \| | V\| |
| 23+50 | 0.4680 | 0.10 | Q | \| | \| | \| | V\| |
| 23+55 | 0.4687 | 0.10 | Q | \| | \| | \| | V\| |
| 24+ 0 | 0.4693 | 0.10 | Q | \| | \| | \| | V\| |
| 24+ 5 | 0.4700 | 0.09 | Q | \| | \| | \| | V\| |
| 24+10 | 0.4706 | 0.09 | Q | \| | \| | \| | V\| |
| 24+15 | 0.4711 | 0.07 | Q | \| | \| | \| | V\| |

```
24+20       0.4714      0.06  Q        |         |         |         V|
24+25       0.4717      0.04  Q        |         |         |         V|
24+30       0.4719      0.03  Q        |         |         |         V|
24+35       0.4721      0.03  Q        |         |         |         V|
24+40       0.4723      0.02  Q        |         |         |         V|
24+45       0.4724      0.02  Q        |         |         |         V|
24+50       0.4725      0.02  Q        |         |         |         V|
24+55       0.4726      0.01  Q        |         |         |         V|
25+ 0       0.4727      0.01  Q        |         |         |         V|
25+ 5       0.4728      0.01  Q        |         |         |         V|
25+10       0.4729      0.01  Q        |         |         |         V|
25+15       0.4729      0.01  Q        |         |         |         V|
25+20       0.4730      0.01  Q        |         |         |         V|
25+25       0.4730      0.01  Q        |         |         |         V|
25+30       0.4730      0.01  Q        |         |         |         V|
25+35       0.4731      0.00  Q        |         |         |         V|
25+40       0.4731      0.00  Q        |         |         |         V|
25+45       0.4731      0.00  Q        |         |         |         V|
25+50       0.4731      0.00  Q        |         |         |         V|
25+55       0.4732      0.00  Q        |         |         |         V|
26+ 0       0.4732      0.00  Q        |         |         |         V|
26+ 5       0.4732      0.00  Q        |         |         |         V|
26+10       0.4732      0.00  Q        |         |         |         V|
26+15       0.4732      0.00  Q        |         |         |         V|
26+20       0.4732      0.00  Q        |         |         |         V|
26+25       0.4732      0.00  Q        |         |         |         V|
26+30       0.4732      0.00  Q        |         |         |         V|
26+35       0.4732      0.00  Q        |         |         |         V|
-------------------------------------------------------------------
```

U n i t  H y d r o g r a p h  A n a l y s i s



Study date 08/04/23

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------

San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6320

---

225038 - 18313 VALLEY BLVD - SB ANIMAL CARE CENTER
EXISITNG CONDITIONS
25-YEAR, 24-HOUR STORM
BY: JTS DATE: 08-04-23

---

Storm Event Year = 25

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

| Sub-Area (Ac.) | Duration (hours) | Isohyetal (In) |
|---|---|---|
| Rainfall data for year 10 | | |
| 6.07 | 1 | 0.92 |
| Rainfall data for year 2 | | |
| 6.07 | 6 | 1.62 |
| Rainfall data for year 2 | | |
| 6.07 | 24 | 3.01 |
| Rainfall data for year 100 | | |
| 6.07 | 1 | 1.32 |
| Rainfall data for year 100 | | |
| 6.07 | 6 | 3.50 |
| Rainfall data for year 100 | | |
| 6.07 | 24 | 7.80 |

---

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

******** Area-averaged max loss rate, Fm ********

| SCS curve No.(AMCII) | SCS curve NO.(AMC 2) | Area (Ac.) | Area Fraction | Fp(Fig C6) (In/Hr) | Ap (dec.) | Fm (In/Hr) |
|---|---|---|---|---|---|---|
| 50.0 | 50.0 | 6.07 | 1.000 | 0.810 | 1.000 | 0.810 |

Area-averaged adjusted loss rate Fm (In/Hr) = 0.810

********* Area-Averaged low loss rate fraction, Yb **********

| Area (Ac.) | Area Fract | SCS CN (AMC2) | SCS CN (AMC2) | S | Pervious Yield Fr |
|---|---|---|---|---|---|
| 6.07 | 1.000 | 50.0 | 50.0 | 10.00 | 0.196 |

Area-averaged catchment yield fraction, Y = 0.196
Area-averaged low loss fraction, Yb = 0.804
User entry of time of concentration = 0.413 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area = 6.07(Ac.)
Catchment Lag time = 0.330 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 25.2220
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.810(In/Hr)
Average low loss rate fraction (Yb) = 0.804 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.399(In)
Computed peak 30-minute rainfall = 0.818(In)
Specified peak 1-hour rainfall = 1.079(In)
Computed peak 3-hour rainfall = 1.951(In)
Specified peak 6-hour rainfall = 2.834(In)
Specified peak 24-hour rainfall = 6.103(In)

Rainfall depth area reduction factors:
Using a total area of 6.07(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.399(In)
30-minute factor = 1.000 Adjusted rainfall = 0.818(In)
1-hour factor = 1.000 Adjusted rainfall = 1.079(In)
3-hour factor = 1.000 Adjusted rainfall = 1.951(In)
6-hour factor = 1.000 Adjusted rainfall = 2.834(In)
24-hour factor = 1.000 Adjusted rainfall = 6.103(In)
---

U n i t H y d r o g r a p h
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

| Interval Number | 'S' Graph Mean values | Unit Hydrograph ((CFS)) |
|---|---|---|
| (K = | 73.41 (CFS)) | |
| 1 | 2.324 | 1.706 |
| 2 | 10.093 | 5.703 |
| 3 | 23.919 | 10.149 |
| 4 | 41.556 | 12.948 |
| 5 | 56.822 | 11.206 |
| 6 | 66.261 | 6.929 |
| 7 | 72.283 | 4.421 |
| 8 | 76.395 | 3.018 |
| 9 | 79.725 | 2.445 |
| 10 | 82.460 | 2.008 |
| 11 | 84.803 | 1.720 |
| 12 | 86.782 | 1.453 |
| 13 | 88.416 | 1.200 |
| 14 | 89.927 | 1.109 |
| 15 | 91.192 | 0.929 |
| 16 | 92.298 | 0.812 |
| 17 | 93.217 | 0.674 |
| 18 | 94.024 | 0.592 |
| 19 | 94.798 | 0.569 |
| 20 | 95.552 | 0.553 |
| 21 | 96.175 | 0.458 |
| 22 | 96.728 | 0.406 |
| 23 | 97.215 | 0.357 |
| 24 | 97.667 | 0.332 |
| 25 | 98.051 | 0.282 |

| | | |
|---|---|---|
| 26 | 98.402 | 0.257 |
| 27 | 98.684 | 0.207 |
| 28 | 98.936 | 0.185 |
| 29 | 99.188 | 0.185 |
| 30 | 99.440 | 0.185 |
| 31 | 99.693 | 0.185 |
| 32 | 100.000 | 0.093 |

| Peak Unit Number | Adjusted mass rainfall (In) | Unit rainfall (In) |
|---|---|---|
| 1 | 0.3993 | 0.3993 |
| 2 | 0.5269 | 0.1276 |
| 3 | 0.6196 | 0.0928 |
| 4 | 0.6952 | 0.0756 |
| 5 | 0.7601 | 0.0649 |
| 6 | 0.8176 | 0.0575 |
| 7 | 0.8696 | 0.0520 |
| 8 | 0.9173 | 0.0477 |
| 9 | 0.9616 | 0.0443 |
| 10 | 1.0030 | 0.0414 |
| 11 | 1.0420 | 0.0390 |
| 12 | 1.0789 | 0.0369 |
| 13 | 1.1264 | 0.0476 |
| 14 | 1.1723 | 0.0459 |
| 15 | 1.2168 | 0.0444 |
| 16 | 1.2598 | 0.0431 |
| 17 | 1.3017 | 0.0419 |
| 18 | 1.3424 | 0.0407 |
| 19 | 1.3821 | 0.0397 |
| 20 | 1.4209 | 0.0387 |
| 21 | 1.4587 | 0.0379 |
| 22 | 1.4958 | 0.0370 |
| 23 | 1.5320 | 0.0363 |
| 24 | 1.5676 | 0.0356 |
| 25 | 1.6025 | 0.0349 |
| 26 | 1.6367 | 0.0342 |
| 27 | 1.6704 | 0.0336 |
| 28 | 1.7034 | 0.0331 |
| 29 | 1.7359 | 0.0325 |
| 30 | 1.7680 | 0.0320 |
| 31 | 1.7995 | 0.0315 |
| 32 | 1.8305 | 0.0311 |
| 33 | 1.8612 | 0.0306 |
| 34 | 1.8914 | 0.0302 |
| 35 | 1.9211 | 0.0298 |
| 36 | 1.9505 | 0.0294 |
| 37 | 1.9795 | 0.0290 |
| 38 | 2.0082 | 0.0287 |
| 39 | 2.0365 | 0.0283 |
| 40 | 2.0645 | 0.0280 |
| 41 | 2.0921 | 0.0277 |
| 42 | 2.1195 | 0.0273 |
| 43 | 2.1465 | 0.0270 |
| 44 | 2.1733 | 0.0268 |
| 45 | 2.1997 | 0.0265 |
| 46 | 2.2260 | 0.0262 |
| 47 | 2.2519 | 0.0259 |
| 48 | 2.2776 | 0.0257 |
| 49 | 2.3030 | 0.0254 |
| 50 | 2.3282 | 0.0252 |
| 51 | 2.3532 | 0.0250 |
| 52 | 2.3780 | 0.0248 |
| 53 | 2.4025 | 0.0245 |
| 54 | 2.4268 | 0.0243 |
| 55 | 2.4509 | 0.0241 |
| 56 | 2.4748 | 0.0239 |
| 57 | 2.4986 | 0.0237 |
| 58 | 2.5221 | 0.0235 |
| 59 | 2.5454 | 0.0233 |

| | | |
|---|---|---|
| 60 | 2.5686 | 0.0232 |
| 61 | 2.5916 | 0.0230 |
| 62 | 2.6144 | 0.0228 |
| 63 | 2.6370 | 0.0226 |
| 64 | 2.6595 | 0.0225 |
| 65 | 2.6818 | 0.0223 |
| 66 | 2.7039 | 0.0222 |
| 67 | 2.7259 | 0.0220 |
| 68 | 2.7478 | 0.0218 |
| 69 | 2.7695 | 0.0217 |
| 70 | 2.7910 | 0.0216 |
| 71 | 2.8125 | 0.0214 |
| 72 | 2.8337 | 0.0213 |
| 73 | 2.8554 | 0.0217 |
| 74 | 2.8770 | 0.0216 |
| 75 | 2.8985 | 0.0214 |
| 76 | 2.9198 | 0.0213 |
| 77 | 2.9410 | 0.0212 |
| 78 | 2.9621 | 0.0211 |
| 79 | 2.9830 | 0.0210 |
| 80 | 3.0039 | 0.0208 |
| 81 | 3.0246 | 0.0207 |
| 82 | 3.0452 | 0.0206 |
| 83 | 3.0657 | 0.0205 |
| 84 | 3.0861 | 0.0204 |
| 85 | 3.1063 | 0.0203 |
| 86 | 3.1265 | 0.0202 |
| 87 | 3.1466 | 0.0201 |
| 88 | 3.1665 | 0.0200 |
| 89 | 3.1864 | 0.0199 |
| 90 | 3.2062 | 0.0198 |
| 91 | 3.2258 | 0.0197 |
| 92 | 3.2454 | 0.0196 |
| 93 | 3.2649 | 0.0195 |
| 94 | 3.2842 | 0.0194 |
| 95 | 3.3035 | 0.0193 |
| 96 | 3.3227 | 0.0192 |
| 97 | 3.3418 | 0.0191 |
| 98 | 3.3609 | 0.0190 |
| 99 | 3.3798 | 0.0189 |
| 100 | 3.3986 | 0.0188 |
| 101 | 3.4174 | 0.0188 |
| 102 | 3.4361 | 0.0187 |
| 103 | 3.4547 | 0.0186 |
| 104 | 3.4732 | 0.0185 |
| 105 | 3.4916 | 0.0184 |
| 106 | 3.5100 | 0.0184 |
| 107 | 3.5283 | 0.0183 |
| 108 | 3.5465 | 0.0182 |
| 109 | 3.5646 | 0.0181 |
| 110 | 3.5827 | 0.0181 |
| 111 | 3.6007 | 0.0180 |
| 112 | 3.6186 | 0.0179 |
| 113 | 3.6364 | 0.0178 |
| 114 | 3.6542 | 0.0178 |
| 115 | 3.6719 | 0.0177 |
| 116 | 3.6895 | 0.0176 |
| 117 | 3.7071 | 0.0176 |
| 118 | 3.7246 | 0.0175 |
| 119 | 3.7420 | 0.0174 |
| 120 | 3.7594 | 0.0174 |
| 121 | 3.7767 | 0.0173 |
| 122 | 3.7940 | 0.0172 |
| 123 | 3.8111 | 0.0172 |
| 124 | 3.8282 | 0.0171 |
| 125 | 3.8453 | 0.0171 |
| 126 | 3.8623 | 0.0170 |
| 127 | 3.8792 | 0.0169 |
| 128 | 3.8961 | 0.0169 |

| | | |
|---|---|---|
| 129 | 3.9129 | 0.0168 |
| 130 | 3.9297 | 0.0168 |
| 131 | 3.9464 | 0.0167 |
| 132 | 3.9630 | 0.0166 |
| 133 | 3.9796 | 0.0166 |
| 134 | 3.9961 | 0.0165 |
| 135 | 4.0126 | 0.0165 |
| 136 | 4.0290 | 0.0164 |
| 137 | 4.0454 | 0.0164 |
| 138 | 4.0617 | 0.0163 |
| 139 | 4.0780 | 0.0163 |
| 140 | 4.0942 | 0.0162 |
| 141 | 4.1103 | 0.0162 |
| 142 | 4.1264 | 0.0161 |
| 143 | 4.1425 | 0.0161 |
| 144 | 4.1585 | 0.0160 |
| 145 | 4.1744 | 0.0160 |
| 146 | 4.1903 | 0.0159 |
| 147 | 4.2062 | 0.0159 |
| 148 | 4.2220 | 0.0158 |
| 149 | 4.2378 | 0.0158 |
| 150 | 4.2535 | 0.0157 |
| 151 | 4.2692 | 0.0157 |
| 152 | 4.2848 | 0.0156 |
| 153 | 4.3004 | 0.0156 |
| 154 | 4.3159 | 0.0155 |
| 155 | 4.3314 | 0.0155 |
| 156 | 4.3468 | 0.0154 |
| 157 | 4.3622 | 0.0154 |
| 158 | 4.3776 | 0.0154 |
| 159 | 4.3929 | 0.0153 |
| 160 | 4.4081 | 0.0153 |
| 161 | 4.4234 | 0.0152 |
| 162 | 4.4385 | 0.0152 |
| 163 | 4.4537 | 0.0151 |
| 164 | 4.4688 | 0.0151 |
| 165 | 4.4838 | 0.0151 |
| 166 | 4.4989 | 0.0150 |
| 167 | 4.5138 | 0.0150 |
| 168 | 4.5288 | 0.0149 |
| 169 | 4.5437 | 0.0149 |
| 170 | 4.5585 | 0.0149 |
| 171 | 4.5733 | 0.0148 |
| 172 | 4.5881 | 0.0148 |
| 173 | 4.6029 | 0.0147 |
| 174 | 4.6176 | 0.0147 |
| 175 | 4.6322 | 0.0147 |
| 176 | 4.6469 | 0.0146 |
| 177 | 4.6614 | 0.0146 |
| 178 | 4.6760 | 0.0146 |
| 179 | 4.6905 | 0.0145 |
| 180 | 4.7050 | 0.0145 |
| 181 | 4.7195 | 0.0144 |
| 182 | 4.7339 | 0.0144 |
| 183 | 4.7482 | 0.0144 |
| 184 | 4.7626 | 0.0143 |
| 185 | 4.7769 | 0.0143 |
| 186 | 4.7912 | 0.0143 |
| 187 | 4.8054 | 0.0142 |
| 188 | 4.8196 | 0.0142 |
| 189 | 4.8338 | 0.0142 |
| 190 | 4.8479 | 0.0141 |
| 191 | 4.8620 | 0.0141 |
| 192 | 4.8761 | 0.0141 |
| 193 | 4.8901 | 0.0140 |
| 194 | 4.9041 | 0.0140 |
| 195 | 4.9181 | 0.0140 |
| 196 | 4.9320 | 0.0139 |
| 197 | 4.9459 | 0.0139 |

| | | |
|---|---|---|
| 198 | 4.9598 | 0.0139 |
| 199 | 4.9737 | 0.0138 |
| 200 | 4.9875 | 0.0138 |
| 201 | 5.0013 | 0.0138 |
| 202 | 5.0150 | 0.0138 |
| 203 | 5.0287 | 0.0137 |
| 204 | 5.0424 | 0.0137 |
| 205 | 5.0561 | 0.0137 |
| 206 | 5.0697 | 0.0136 |
| 207 | 5.0833 | 0.0136 |
| 208 | 5.0969 | 0.0136 |
| 209 | 5.1104 | 0.0135 |
| 210 | 5.1240 | 0.0135 |
| 211 | 5.1374 | 0.0135 |
| 212 | 5.1509 | 0.0135 |
| 213 | 5.1643 | 0.0134 |
| 214 | 5.1777 | 0.0134 |
| 215 | 5.1911 | 0.0134 |
| 216 | 5.2045 | 0.0133 |
| 217 | 5.2178 | 0.0133 |
| 218 | 5.2311 | 0.0133 |
| 219 | 5.2443 | 0.0133 |
| 220 | 5.2576 | 0.0132 |
| 221 | 5.2708 | 0.0132 |
| 222 | 5.2840 | 0.0132 |
| 223 | 5.2971 | 0.0132 |
| 224 | 5.3102 | 0.0131 |
| 225 | 5.3234 | 0.0131 |
| 226 | 5.3364 | 0.0131 |
| 227 | 5.3495 | 0.0131 |
| 228 | 5.3625 | 0.0130 |
| 229 | 5.3755 | 0.0130 |
| 230 | 5.3885 | 0.0130 |
| 231 | 5.4014 | 0.0130 |
| 232 | 5.4144 | 0.0129 |
| 233 | 5.4273 | 0.0129 |
| 234 | 5.4401 | 0.0129 |
| 235 | 5.4530 | 0.0129 |
| 236 | 5.4658 | 0.0128 |
| 237 | 5.4786 | 0.0128 |
| 238 | 5.4914 | 0.0128 |
| 239 | 5.5042 | 0.0128 |
| 240 | 5.5169 | 0.0127 |
| 241 | 5.5296 | 0.0127 |
| 242 | 5.5423 | 0.0127 |
| 243 | 5.5550 | 0.0127 |
| 244 | 5.5676 | 0.0126 |
| 245 | 5.5802 | 0.0126 |
| 246 | 5.5928 | 0.0126 |
| 247 | 5.6054 | 0.0126 |
| 248 | 5.6179 | 0.0125 |
| 249 | 5.6304 | 0.0125 |
| 250 | 5.6429 | 0.0125 |
| 251 | 5.6554 | 0.0125 |
| 252 | 5.6679 | 0.0125 |
| 253 | 5.6803 | 0.0124 |
| 254 | 5.6927 | 0.0124 |
| 255 | 5.7051 | 0.0124 |
| 256 | 5.7175 | 0.0124 |
| 257 | 5.7298 | 0.0123 |
| 258 | 5.7422 | 0.0123 |
| 259 | 5.7545 | 0.0123 |
| 260 | 5.7667 | 0.0123 |
| 261 | 5.7790 | 0.0123 |
| 262 | 5.7912 | 0.0122 |
| 263 | 5.8035 | 0.0122 |
| 264 | 5.8157 | 0.0122 |
| 265 | 5.8278 | 0.0122 |
| 266 | 5.8400 | 0.0122 |

| | | |
|---|---|---|
| 267 | 5.8521 | 0.0121 |
| 268 | 5.8643 | 0.0121 |
| 269 | 5.8764 | 0.0121 |
| 270 | 5.8884 | 0.0121 |
| 271 | 5.9005 | 0.0121 |
| 272 | 5.9125 | 0.0120 |
| 273 | 5.9246 | 0.0120 |
| 274 | 5.9366 | 0.0120 |
| 275 | 5.9485 | 0.0120 |
| 276 | 5.9605 | 0.0120 |
| 277 | 5.9724 | 0.0119 |
| 278 | 5.9844 | 0.0119 |
| 279 | 5.9963 | 0.0119 |
| 280 | 6.0081 | 0.0119 |
| 281 | 6.0200 | 0.0119 |
| 282 | 6.0319 | 0.0118 |
| 283 | 6.0437 | 0.0118 |
| 284 | 6.0555 | 0.0118 |
| 285 | 6.0673 | 0.0118 |
| 286 | 6.0790 | 0.0118 |
| 287 | 6.0908 | 0.0118 |
| 288 | 6.1025 | 0.0117 |

| Unit Period (number) | Unit Rainfall (In) | Unit Soil-Loss (In) | Effective Rainfall (In) |
|---|---|---|---|
| 1 | 0.0117 | 0.0094 | 0.0023 |
| 2 | 0.0118 | 0.0095 | 0.0023 |
| 3 | 0.0118 | 0.0095 | 0.0023 |
| 4 | 0.0118 | 0.0095 | 0.0023 |
| 5 | 0.0118 | 0.0095 | 0.0023 |
| 6 | 0.0119 | 0.0095 | 0.0023 |
| 7 | 0.0119 | 0.0096 | 0.0023 |
| 8 | 0.0119 | 0.0096 | 0.0023 |
| 9 | 0.0120 | 0.0096 | 0.0023 |
| 10 | 0.0120 | 0.0096 | 0.0023 |
| 11 | 0.0120 | 0.0097 | 0.0024 |
| 12 | 0.0120 | 0.0097 | 0.0024 |
| 13 | 0.0121 | 0.0097 | 0.0024 |
| 14 | 0.0121 | 0.0097 | 0.0024 |
| 15 | 0.0121 | 0.0098 | 0.0024 |
| 16 | 0.0122 | 0.0098 | 0.0024 |
| 17 | 0.0122 | 0.0098 | 0.0024 |
| 18 | 0.0122 | 0.0098 | 0.0024 |
| 19 | 0.0123 | 0.0099 | 0.0024 |
| 20 | 0.0123 | 0.0099 | 0.0024 |
| 21 | 0.0123 | 0.0099 | 0.0024 |
| 22 | 0.0123 | 0.0099 | 0.0024 |
| 23 | 0.0124 | 0.0100 | 0.0024 |
| 24 | 0.0124 | 0.0100 | 0.0024 |
| 25 | 0.0125 | 0.0100 | 0.0024 |
| 26 | 0.0125 | 0.0100 | 0.0024 |
| 27 | 0.0125 | 0.0101 | 0.0024 |
| 28 | 0.0125 | 0.0101 | 0.0025 |
| 29 | 0.0126 | 0.0101 | 0.0025 |
| 30 | 0.0126 | 0.0101 | 0.0025 |
| 31 | 0.0127 | 0.0102 | 0.0025 |
| 32 | 0.0127 | 0.0102 | 0.0025 |
| 33 | 0.0127 | 0.0102 | 0.0025 |
| 34 | 0.0128 | 0.0103 | 0.0025 |
| 35 | 0.0128 | 0.0103 | 0.0025 |
| 36 | 0.0128 | 0.0103 | 0.0025 |
| 37 | 0.0129 | 0.0104 | 0.0025 |
| 38 | 0.0129 | 0.0104 | 0.0025 |
| 39 | 0.0130 | 0.0104 | 0.0025 |
| 40 | 0.0130 | 0.0104 | 0.0025 |
| 41 | 0.0130 | 0.0105 | 0.0025 |
| 42 | 0.0131 | 0.0105 | 0.0026 |

| | | | |
|---|---|---|---|
| 43 | 0.0131 | 0.0105 | 0.0026 |
| 44 | 0.0131 | 0.0106 | 0.0026 |
| 45 | 0.0132 | 0.0106 | 0.0026 |
| 46 | 0.0132 | 0.0106 | 0.0026 |
| 47 | 0.0133 | 0.0107 | 0.0026 |
| 48 | 0.0133 | 0.0107 | 0.0026 |
| 49 | 0.0133 | 0.0107 | 0.0026 |
| 50 | 0.0134 | 0.0108 | 0.0026 |
| 51 | 0.0134 | 0.0108 | 0.0026 |
| 52 | 0.0135 | 0.0108 | 0.0026 |
| 53 | 0.0135 | 0.0109 | 0.0026 |
| 54 | 0.0135 | 0.0109 | 0.0026 |
| 55 | 0.0136 | 0.0109 | 0.0027 |
| 56 | 0.0136 | 0.0110 | 0.0027 |
| 57 | 0.0137 | 0.0110 | 0.0027 |
| 58 | 0.0137 | 0.0110 | 0.0027 |
| 59 | 0.0138 | 0.0111 | 0.0027 |
| 60 | 0.0138 | 0.0111 | 0.0027 |
| 61 | 0.0139 | 0.0112 | 0.0027 |
| 62 | 0.0139 | 0.0112 | 0.0027 |
| 63 | 0.0140 | 0.0112 | 0.0027 |
| 64 | 0.0140 | 0.0113 | 0.0027 |
| 65 | 0.0141 | 0.0113 | 0.0028 |
| 66 | 0.0141 | 0.0113 | 0.0028 |
| 67 | 0.0142 | 0.0114 | 0.0028 |
| 68 | 0.0142 | 0.0114 | 0.0028 |
| 69 | 0.0143 | 0.0115 | 0.0028 |
| 70 | 0.0143 | 0.0115 | 0.0028 |
| 71 | 0.0144 | 0.0116 | 0.0028 |
| 72 | 0.0144 | 0.0116 | 0.0028 |
| 73 | 0.0145 | 0.0116 | 0.0028 |
| 74 | 0.0145 | 0.0117 | 0.0028 |
| 75 | 0.0146 | 0.0117 | 0.0029 |
| 76 | 0.0146 | 0.0118 | 0.0029 |
| 77 | 0.0147 | 0.0118 | 0.0029 |
| 78 | 0.0147 | 0.0119 | 0.0029 |
| 79 | 0.0148 | 0.0119 | 0.0029 |
| 80 | 0.0149 | 0.0120 | 0.0029 |
| 81 | 0.0149 | 0.0120 | 0.0029 |
| 82 | 0.0150 | 0.0120 | 0.0029 |
| 83 | 0.0151 | 0.0121 | 0.0029 |
| 84 | 0.0151 | 0.0121 | 0.0030 |
| 85 | 0.0152 | 0.0122 | 0.0030 |
| 86 | 0.0152 | 0.0122 | 0.0030 |
| 87 | 0.0153 | 0.0123 | 0.0030 |
| 88 | 0.0154 | 0.0124 | 0.0030 |
| 89 | 0.0154 | 0.0124 | 0.0030 |
| 90 | 0.0155 | 0.0125 | 0.0030 |
| 91 | 0.0156 | 0.0125 | 0.0030 |
| 92 | 0.0156 | 0.0126 | 0.0031 |
| 93 | 0.0157 | 0.0126 | 0.0031 |
| 94 | 0.0158 | 0.0127 | 0.0031 |
| 95 | 0.0159 | 0.0128 | 0.0031 |
| 96 | 0.0159 | 0.0128 | 0.0031 |
| 97 | 0.0160 | 0.0129 | 0.0031 |
| 98 | 0.0161 | 0.0129 | 0.0031 |
| 99 | 0.0162 | 0.0130 | 0.0032 |
| 100 | 0.0162 | 0.0130 | 0.0032 |
| 101 | 0.0163 | 0.0131 | 0.0032 |
| 102 | 0.0164 | 0.0132 | 0.0032 |
| 103 | 0.0165 | 0.0133 | 0.0032 |
| 104 | 0.0165 | 0.0133 | 0.0032 |
| 105 | 0.0166 | 0.0134 | 0.0033 |
| 106 | 0.0167 | 0.0134 | 0.0033 |
| 107 | 0.0168 | 0.0135 | 0.0033 |
| 108 | 0.0169 | 0.0136 | 0.0033 |
| 109 | 0.0170 | 0.0137 | 0.0033 |
| 110 | 0.0171 | 0.0137 | 0.0033 |
| 111 | 0.0172 | 0.0138 | 0.0034 |

| | | | |
|---|---|---|---|
| 112 | 0.0172 | 0.0139 | 0.0034 |
| 113 | 0.0174 | 0.0140 | 0.0034 |
| 114 | 0.0174 | 0.0140 | 0.0034 |
| 115 | 0.0176 | 0.0141 | 0.0034 |
| 116 | 0.0176 | 0.0142 | 0.0034 |
| 117 | 0.0178 | 0.0143 | 0.0035 |
| 118 | 0.0178 | 0.0144 | 0.0035 |
| 119 | 0.0180 | 0.0145 | 0.0035 |
| 120 | 0.0181 | 0.0145 | 0.0035 |
| 121 | 0.0182 | 0.0146 | 0.0036 |
| 122 | 0.0183 | 0.0147 | 0.0036 |
| 123 | 0.0184 | 0.0148 | 0.0036 |
| 124 | 0.0185 | 0.0149 | 0.0036 |
| 125 | 0.0187 | 0.0150 | 0.0037 |
| 126 | 0.0188 | 0.0151 | 0.0037 |
| 127 | 0.0189 | 0.0152 | 0.0037 |
| 128 | 0.0190 | 0.0153 | 0.0037 |
| 129 | 0.0192 | 0.0154 | 0.0038 |
| 130 | 0.0193 | 0.0155 | 0.0038 |
| 131 | 0.0195 | 0.0157 | 0.0038 |
| 132 | 0.0196 | 0.0157 | 0.0038 |
| 133 | 0.0198 | 0.0159 | 0.0039 |
| 134 | 0.0199 | 0.0160 | 0.0039 |
| 135 | 0.0201 | 0.0161 | 0.0039 |
| 136 | 0.0202 | 0.0162 | 0.0039 |
| 137 | 0.0204 | 0.0164 | 0.0040 |
| 138 | 0.0205 | 0.0165 | 0.0040 |
| 139 | 0.0207 | 0.0167 | 0.0041 |
| 140 | 0.0208 | 0.0168 | 0.0041 |
| 141 | 0.0211 | 0.0170 | 0.0041 |
| 142 | 0.0212 | 0.0171 | 0.0041 |
| 143 | 0.0214 | 0.0173 | 0.0042 |
| 144 | 0.0216 | 0.0174 | 0.0042 |
| 145 | 0.0213 | 0.0171 | 0.0042 |
| 146 | 0.0214 | 0.0172 | 0.0042 |
| 147 | 0.0217 | 0.0175 | 0.0042 |
| 148 | 0.0218 | 0.0176 | 0.0043 |
| 149 | 0.0222 | 0.0178 | 0.0043 |
| 150 | 0.0223 | 0.0179 | 0.0044 |
| 151 | 0.0226 | 0.0182 | 0.0044 |
| 152 | 0.0228 | 0.0183 | 0.0045 |
| 153 | 0.0232 | 0.0186 | 0.0045 |
| 154 | 0.0233 | 0.0188 | 0.0046 |
| 155 | 0.0237 | 0.0191 | 0.0046 |
| 156 | 0.0239 | 0.0192 | 0.0047 |
| 157 | 0.0243 | 0.0196 | 0.0048 |
| 158 | 0.0245 | 0.0197 | 0.0048 |
| 159 | 0.0250 | 0.0201 | 0.0049 |
| 160 | 0.0252 | 0.0203 | 0.0049 |
| 161 | 0.0257 | 0.0207 | 0.0050 |
| 162 | 0.0259 | 0.0209 | 0.0051 |
| 163 | 0.0265 | 0.0213 | 0.0052 |
| 164 | 0.0268 | 0.0215 | 0.0052 |
| 165 | 0.0273 | 0.0220 | 0.0053 |
| 166 | 0.0277 | 0.0222 | 0.0054 |
| 167 | 0.0283 | 0.0228 | 0.0055 |
| 168 | 0.0287 | 0.0230 | 0.0056 |
| 169 | 0.0294 | 0.0236 | 0.0057 |
| 170 | 0.0298 | 0.0240 | 0.0058 |
| 171 | 0.0306 | 0.0246 | 0.0060 |
| 172 | 0.0311 | 0.0250 | 0.0061 |
| 173 | 0.0320 | 0.0258 | 0.0063 |
| 174 | 0.0325 | 0.0262 | 0.0064 |
| 175 | 0.0336 | 0.0271 | 0.0066 |
| 176 | 0.0342 | 0.0275 | 0.0067 |
| 177 | 0.0356 | 0.0286 | 0.0070 |
| 178 | 0.0363 | 0.0292 | 0.0071 |
| 179 | 0.0379 | 0.0305 | 0.0074 |
| 180 | 0.0387 | 0.0312 | 0.0076 |

| | | | |
|---|---|---|---|
| 181 | 0.0407 | 0.0328 | 0.0080 |
| 182 | 0.0419 | 0.0337 | 0.0082 |
| 183 | 0.0444 | 0.0357 | 0.0087 |
| 184 | 0.0459 | 0.0369 | 0.0090 |
| 185 | 0.0369 | 0.0297 | 0.0072 |
| 186 | 0.0390 | 0.0314 | 0.0076 |
| 187 | 0.0443 | 0.0356 | 0.0087 |
| 188 | 0.0477 | 0.0384 | 0.0093 |
| 189 | 0.0575 | 0.0463 | 0.0112 |
| 190 | 0.0649 | 0.0522 | 0.0127 |
| 191 | 0.0928 | 0.0675 | 0.0253 |
| 192 | 0.1276 | 0.0675 | 0.0601 |
| 193 | 0.3993 | 0.0675 | 0.3318 |
| 194 | 0.0756 | 0.0608 | 0.0148 |
| 195 | 0.0520 | 0.0418 | 0.0102 |
| 196 | 0.0414 | 0.0333 | 0.0081 |
| 197 | 0.0476 | 0.0383 | 0.0093 |
| 198 | 0.0431 | 0.0347 | 0.0084 |
| 199 | 0.0397 | 0.0319 | 0.0078 |
| 200 | 0.0370 | 0.0298 | 0.0072 |
| 201 | 0.0349 | 0.0281 | 0.0068 |
| 202 | 0.0331 | 0.0266 | 0.0065 |
| 203 | 0.0315 | 0.0254 | 0.0062 |
| 204 | 0.0302 | 0.0243 | 0.0059 |
| 205 | 0.0290 | 0.0233 | 0.0057 |
| 206 | 0.0280 | 0.0225 | 0.0055 |
| 207 | 0.0270 | 0.0218 | 0.0053 |
| 208 | 0.0262 | 0.0211 | 0.0051 |
| 209 | 0.0254 | 0.0205 | 0.0050 |
| 210 | 0.0248 | 0.0199 | 0.0048 |
| 211 | 0.0241 | 0.0194 | 0.0047 |
| 212 | 0.0235 | 0.0189 | 0.0046 |
| 213 | 0.0230 | 0.0185 | 0.0045 |
| 214 | 0.0225 | 0.0181 | 0.0044 |
| 215 | 0.0220 | 0.0177 | 0.0043 |
| 216 | 0.0216 | 0.0173 | 0.0042 |
| 217 | 0.0217 | 0.0175 | 0.0042 |
| 218 | 0.0213 | 0.0172 | 0.0042 |
| 219 | 0.0210 | 0.0169 | 0.0041 |
| 220 | 0.0206 | 0.0166 | 0.0040 |
| 221 | 0.0203 | 0.0163 | 0.0040 |
| 222 | 0.0200 | 0.0161 | 0.0039 |
| 223 | 0.0197 | 0.0158 | 0.0038 |
| 224 | 0.0194 | 0.0156 | 0.0038 |
| 225 | 0.0191 | 0.0154 | 0.0037 |
| 226 | 0.0188 | 0.0152 | 0.0037 |
| 227 | 0.0186 | 0.0150 | 0.0036 |
| 228 | 0.0184 | 0.0148 | 0.0036 |
| 229 | 0.0181 | 0.0146 | 0.0035 |
| 230 | 0.0179 | 0.0144 | 0.0035 |
| 231 | 0.0177 | 0.0142 | 0.0035 |
| 232 | 0.0175 | 0.0141 | 0.0034 |
| 233 | 0.0173 | 0.0139 | 0.0034 |
| 234 | 0.0171 | 0.0138 | 0.0033 |
| 235 | 0.0169 | 0.0136 | 0.0033 |
| 236 | 0.0168 | 0.0135 | 0.0033 |
| 237 | 0.0166 | 0.0133 | 0.0032 |
| 238 | 0.0164 | 0.0132 | 0.0032 |
| 239 | 0.0163 | 0.0131 | 0.0032 |
| 240 | 0.0161 | 0.0130 | 0.0031 |
| 241 | 0.0160 | 0.0128 | 0.0031 |
| 242 | 0.0158 | 0.0127 | 0.0031 |
| 243 | 0.0157 | 0.0126 | 0.0031 |
| 244 | 0.0155 | 0.0125 | 0.0030 |
| 245 | 0.0154 | 0.0124 | 0.0030 |
| 246 | 0.0153 | 0.0123 | 0.0030 |
| 247 | 0.0151 | 0.0122 | 0.0030 |
| 248 | 0.0150 | 0.0121 | 0.0029 |
| 249 | 0.0149 | 0.0120 | 0.0029 |

| | | | |
|---|---|---|---|
| 250 | 0.0148 | 0.0119 | 0.0029 |
| 251 | 0.0147 | 0.0118 | 0.0029 |
| 252 | 0.0146 | 0.0117 | 0.0028 |
| 253 | 0.0144 | 0.0116 | 0.0028 |
| 254 | 0.0143 | 0.0115 | 0.0028 |
| 255 | 0.0142 | 0.0115 | 0.0028 |
| 256 | 0.0141 | 0.0114 | 0.0028 |
| 257 | 0.0140 | 0.0113 | 0.0027 |
| 258 | 0.0139 | 0.0112 | 0.0027 |
| 259 | 0.0138 | 0.0111 | 0.0027 |
| 260 | 0.0138 | 0.0111 | 0.0027 |
| 261 | 0.0137 | 0.0110 | 0.0027 |
| 262 | 0.0136 | 0.0109 | 0.0027 |
| 263 | 0.0135 | 0.0108 | 0.0026 |
| 264 | 0.0134 | 0.0108 | 0.0026 |
| 265 | 0.0133 | 0.0107 | 0.0026 |
| 266 | 0.0132 | 0.0106 | 0.0026 |
| 267 | 0.0132 | 0.0106 | 0.0026 |
| 268 | 0.0131 | 0.0105 | 0.0026 |
| 269 | 0.0130 | 0.0105 | 0.0025 |
| 270 | 0.0129 | 0.0104 | 0.0025 |
| 271 | 0.0129 | 0.0103 | 0.0025 |
| 272 | 0.0128 | 0.0103 | 0.0025 |
| 273 | 0.0127 | 0.0102 | 0.0025 |
| 274 | 0.0126 | 0.0102 | 0.0025 |
| 275 | 0.0126 | 0.0101 | 0.0025 |
| 276 | 0.0125 | 0.0101 | 0.0024 |
| 277 | 0.0124 | 0.0100 | 0.0024 |
| 278 | 0.0124 | 0.0100 | 0.0024 |
| 279 | 0.0123 | 0.0099 | 0.0024 |
| 280 | 0.0122 | 0.0098 | 0.0024 |
| 281 | 0.0122 | 0.0098 | 0.0024 |
| 282 | 0.0121 | 0.0097 | 0.0024 |
| 283 | 0.0121 | 0.0097 | 0.0024 |
| 284 | 0.0120 | 0.0097 | 0.0023 |
| 285 | 0.0119 | 0.0096 | 0.0023 |
| 286 | 0.0119 | 0.0096 | 0.0023 |
| 287 | 0.0118 | 0.0095 | 0.0023 |
| 288 | 0.0118 | 0.0095 | 0.0023 |

---

---

Total soil rain loss = 4.61(In)
Total effective rainfall = 1.49(In)
Peak flow rate in flood hydrograph = 5.59(CFS)

---

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

---

Hydrograph in 5 Minute intervals ((CFS))

---

| Time(h+m) | Volume Ac.Ft | Q(CFS) | 0 | 2.5 | 5.0 | 7.5 | 10.0 |
|---|---|---|---|---|---|---|---|
| 0+ 5 | 0.0000 | 0.00 | Q | \| | \| | \| | \| |
| 0+10 | 0.0001 | 0.02 | Q | \| | \| | \| | \| |
| 0+15 | 0.0004 | 0.04 | Q | \| | \| | \| | \| |
| 0+20 | 0.0009 | 0.07 | Q | \| | \| | \| | \| |
| 0+25 | 0.0016 | 0.10 | Q | \| | \| | \| | \| |
| 0+30 | 0.0023 | 0.11 | Q | \| | \| | \| | \| |
| 0+35 | 0.0032 | 0.12 | Q | \| | \| | \| | \| |
| 0+40 | 0.0041 | 0.13 | Q | \| | \| | \| | \| |
| 0+45 | 0.0050 | 0.14 | Q | \| | \| | \| | \| |
| 0+50 | 0.0060 | 0.14 | Q | \| | \| | \| | \| |
| 0+55 | 0.0070 | 0.14 | Q | \| | \| | \| | \| |
| 1+ 0 | 0.0080 | 0.15 | Q | \| | \| | \| | \| |
| 1+ 5 | 0.0090 | 0.15 | Q | \| | \| | \| | \| |
| 1+10 | 0.0101 | 0.15 | Q | \| | \| | \| | \| |
| 1+15 | 0.0112 | 0.16 | Q | \| | \| | \| | \| |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1+20 | 0.0123 | 0.16 | Q | | | | |
| 1+25 | 0.0134 | 0.16 | Q | | | | |
| 1+30 | 0.0145 | 0.16 | Q | | | | |
| 1+35 | 0.0157 | 0.16 | Q | | | | |
| 1+40 | 0.0168 | 0.17 | Q | | | | |
| 1+45 | 0.0180 | 0.17 | Q | | | | |
| 1+50 | 0.0191 | 0.17 | QV | | | | |
| 1+55 | 0.0203 | 0.17 | QV | | | | |
| 2+ 0 | 0.0215 | 0.17 | QV | | | | |
| 2+ 5 | 0.0227 | 0.17 | QV | | | | |
| 2+10 | 0.0239 | 0.17 | QV | | | | |
| 2+15 | 0.0251 | 0.17 | QV | | | | |
| 2+20 | 0.0263 | 0.18 | QV | | | | |
| 2+25 | 0.0275 | 0.18 | QV | | | | |
| 2+30 | 0.0287 | 0.18 | QV | | | | |
| 2+35 | 0.0299 | 0.18 | QV | | | | |
| 2+40 | 0.0312 | 0.18 | QV | | | | |
| 2+45 | 0.0324 | 0.18 | QV | | | | |
| 2+50 | 0.0337 | 0.18 | QV | | | | |
| 2+55 | 0.0349 | 0.18 | QV | | | | |
| 3+ 0 | 0.0361 | 0.18 | QV | | | | |
| 3+ 5 | 0.0374 | 0.18 | QV | | | | |
| 3+10 | 0.0386 | 0.18 | Q V | | | | |
| 3+15 | 0.0399 | 0.18 | Q V | | | | |
| 3+20 | 0.0412 | 0.18 | Q V | | | | |
| 3+25 | 0.0424 | 0.18 | Q V | | | | |
| 3+30 | 0.0437 | 0.18 | Q V | | | | |
| 3+35 | 0.0450 | 0.18 | Q V | | | | |
| 3+40 | 0.0462 | 0.19 | Q V | | | | |
| 3+45 | 0.0475 | 0.19 | Q V | | | | |
| 3+50 | 0.0488 | 0.19 | Q V | | | | |
| 3+55 | 0.0501 | 0.19 | Q V | | | | |
| 4+ 0 | 0.0514 | 0.19 | Q V | | | | |
| 4+ 5 | 0.0527 | 0.19 | Q V | | | | |
| 4+10 | 0.0540 | 0.19 | Q V | | | | |
| 4+15 | 0.0553 | 0.19 | Q V | | | | |
| 4+20 | 0.0566 | 0.19 | Q V | | | | |
| 4+25 | 0.0579 | 0.19 | Q V | | | | |
| 4+30 | 0.0592 | 0.19 | Q V | | | | |
| 4+35 | 0.0605 | 0.19 | Q V | | | | |
| 4+40 | 0.0618 | 0.19 | Q V | | | | |
| 4+45 | 0.0632 | 0.19 | Q V | | | | |
| 4+50 | 0.0645 | 0.19 | Q V | | | | |
| 4+55 | 0.0658 | 0.19 | Q V | | | | |
| 5+ 0 | 0.0672 | 0.19 | Q V | | | | |
| 5+ 5 | 0.0685 | 0.19 | Q V | | | | |
| 5+10 | 0.0699 | 0.20 | Q V | | | | |
| 5+15 | 0.0712 | 0.20 | Q V | | | | |
| 5+20 | 0.0726 | 0.20 | Q V | | | | |
| 5+25 | 0.0739 | 0.20 | Q V | | | | |
| 5+30 | 0.0753 | 0.20 | Q V | | | | |
| 5+35 | 0.0767 | 0.20 | Q V | | | | |
| 5+40 | 0.0780 | 0.20 | Q V | | | | |
| 5+45 | 0.0794 | 0.20 | Q V | | | | |
| 5+50 | 0.0808 | 0.20 | Q V | | | | |
| 5+55 | 0.0822 | 0.20 | Q V | | | | |
| 6+ 0 | 0.0836 | 0.20 | Q V | | | | |
| 6+ 5 | 0.0850 | 0.20 | Q V | | | | |
| 6+10 | 0.0864 | 0.20 | Q V | | | | |
| 6+15 | 0.0878 | 0.20 | Q V | | | | |
| 6+20 | 0.0892 | 0.21 | Q V | | | | |
| 6+25 | 0.0906 | 0.21 | Q V | | | | |
| 6+30 | 0.0920 | 0.21 | Q V | | | | |
| 6+35 | 0.0935 | 0.21 | Q V | | | | |
| 6+40 | 0.0949 | 0.21 | Q V | | | | |
| 6+45 | 0.0964 | 0.21 | Q V | | | | |
| 6+50 | 0.0978 | 0.21 | Q V | | | | |
| 6+55 | 0.0993 | 0.21 | Q V | | | | |
| 7+ 0 | 0.1007 | 0.21 | Q V | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 7+ 5 | 0.1022 | 0.21 | Q | V | \| | \| | \| | \| |
| 7+10 | 0.1036 | 0.21 | Q | V | \| | \| | \| | \| |
| 7+15 | 0.1051 | 0.21 | Q | V | \| | \| | \| | \| |
| 7+20 | 0.1066 | 0.21 | Q | V | \| | \| | \| | \| |
| 7+25 | 0.1081 | 0.22 | Q | V | \| | \| | \| | \| |
| 7+30 | 0.1096 | 0.22 | Q | V | \| | \| | \| | \| |
| 7+35 | 0.1111 | 0.22 | Q | V | \| | \| | \| | \| |
| 7+40 | 0.1126 | 0.22 | Q | V | \| | \| | \| | \| |
| 7+45 | 0.1141 | 0.22 | Q | V | \| | \| | \| | \| |
| 7+50 | 0.1156 | 0.22 | Q | V | \| | \| | \| | \| |
| 7+55 | 0.1171 | 0.22 | Q | V | \| | \| | \| | \| |
| 8+ 0 | 0.1187 | 0.22 | Q | V | \| | \| | \| | \| |
| 8+ 5 | 0.1202 | 0.22 | Q | V | \| | \| | \| | \| |
| 8+10 | 0.1217 | 0.22 | Q | V | \| | \| | \| | \| |
| 8+15 | 0.1233 | 0.23 | Q | V | \| | \| | \| | \| |
| 8+20 | 0.1249 | 0.23 | Q | V | \| | \| | \| | \| |
| 8+25 | 0.1264 | 0.23 | Q | V | \| | \| | \| | \| |
| 8+30 | 0.1280 | 0.23 | Q | V | \| | \| | \| | \| |
| 8+35 | 0.1296 | 0.23 | Q | V | \| | \| | \| | \| |
| 8+40 | 0.1312 | 0.23 | Q | V | \| | \| | \| | \| |
| 8+45 | 0.1328 | 0.23 | Q | V | \| | \| | \| | \| |
| 8+50 | 0.1344 | 0.23 | Q | V | \| | \| | \| | \| |
| 8+55 | 0.1360 | 0.23 | Q | V | \| | \| | \| | \| |
| 9+ 0 | 0.1376 | 0.24 | Q | V | \| | \| | \| | \| |
| 9+ 5 | 0.1392 | 0.24 | Q | V | \| | \| | \| | \| |
| 9+10 | 0.1409 | 0.24 | Q | V | \| | \| | \| | \| |
| 9+15 | 0.1425 | 0.24 | Q | V | \| | \| | \| | \| |
| 9+20 | 0.1442 | 0.24 | Q | V | \| | \| | \| | \| |
| 9+25 | 0.1458 | 0.24 | Q | V | \| | \| | \| | \| |
| 9+30 | 0.1475 | 0.24 | Q | V | \| | \| | \| | \| |
| 9+35 | 0.1492 | 0.24 | Q | V | \| | \| | \| | \| |
| 9+40 | 0.1508 | 0.25 | Q | V | \| | \| | \| | \| |
| 9+45 | 0.1525 | 0.25 | Q | V | \| | \| | \| | \| |
| 9+50 | 0.1543 | 0.25 | Q | V | \| | \| | \| | \| |
| 9+55 | 0.1560 | 0.25 | Q | V | \| | \| | \| | \| |
| 10+ 0 | 0.1577 | 0.25 | \|Q | V | \| | \| | \| | \| |
| 10+ 5 | 0.1594 | 0.25 | \|Q | V | \| | \| | \| | \| |
| 10+10 | 0.1612 | 0.25 | \|Q | V | \| | \| | \| | \| |
| 10+15 | 0.1629 | 0.25 | \|Q | V | \| | \| | \| | \| |
| 10+20 | 0.1647 | 0.26 | \|Q | V | \| | \| | \| | \| |
| 10+25 | 0.1665 | 0.26 | \|Q | V | \| | \| | \| | \| |
| 10+30 | 0.1683 | 0.26 | \|Q | V | \| | \| | \| | \| |
| 10+35 | 0.1701 | 0.26 | \|Q | V | \| | \| | \| | \| |
| 10+40 | 0.1719 | 0.26 | \|Q | V | \| | \| | \| | \| |
| 10+45 | 0.1737 | 0.26 | \|Q | V | \| | \| | \| | \| |
| 10+50 | 0.1755 | 0.27 | \|Q | V | \| | \| | \| | \| |
| 10+55 | 0.1774 | 0.27 | \|Q | V | \| | \| | \| | \| |
| 11+ 0 | 0.1792 | 0.27 | \|Q | V | \| | \| | \| | \| |
| 11+ 5 | 0.1811 | 0.27 | \|Q | V | \| | \| | \| | \| |
| 11+10 | 0.1830 | 0.27 | \|Q | V | \| | \| | \| | \| |
| 11+15 | 0.1849 | 0.28 | \|Q | V | \| | \| | \| | \| |
| 11+20 | 0.1868 | 0.28 | \|Q | V | \| | \| | \| | \| |
| 11+25 | 0.1887 | 0.28 | \|Q | V | \| | \| | \| | \| |
| 11+30 | 0.1907 | 0.28 | \|Q | V | \| | \| | \| | \| |
| 11+35 | 0.1926 | 0.28 | \|Q | V | \| | \| | \| | \| |
| 11+40 | 0.1946 | 0.29 | \|Q | V | \| | \| | \| | \| |
| 11+45 | 0.1966 | 0.29 | \|Q | V | \| | \| | \| | \| |
| 11+50 | 0.1986 | 0.29 | \|Q | V | \| | \| | \| | \| |
| 11+55 | 0.2006 | 0.29 | \|Q | V | \| | \| | \| | \| |
| 12+ 0 | 0.2026 | 0.30 | \|Q | V | \| | \| | \| | \| |
| 12+ 5 | 0.2047 | 0.30 | \|Q | V | \| | \| | \| | \| |
| 12+10 | 0.2067 | 0.30 | \|Q | \|V | \| | \| | \| | \| |
| 12+15 | 0.2088 | 0.30 | \|Q | \|V | \| | \| | \| | \| |
| 12+20 | 0.2109 | 0.30 | \|Q | \|V | \| | \| | \| | \| |
| 12+25 | 0.2130 | 0.30 | \|Q | \|V | \| | \| | \| | \| |
| 12+30 | 0.2151 | 0.31 | \|Q | \|V | \| | \| | \| | \| |
| 12+35 | 0.2172 | 0.31 | \|Q | \|V | \| | \| | \| | \| |
| 12+40 | 0.2193 | 0.31 | \|Q | \|V | \| | \| | \| | \| |
| 12+45 | 0.2215 | 0.31 | \|Q | \|V | \| | \| | \| | \| |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 12+50 | 0.2237 | 0.32 | Q | V | | | |
| 12+55 | 0.2259 | 0.32 | Q | V | | | |
| 13+ 0 | 0.2281 | 0.32 | Q | V | | | |
| 13+ 5 | 0.2304 | 0.33 | Q | V | | | |
| 13+10 | 0.2326 | 0.33 | Q | V | | | |
| 13+15 | 0.2349 | 0.33 | Q | V | | | |
| 13+20 | 0.2373 | 0.34 | Q | V | | | |
| 13+25 | 0.2396 | 0.34 | Q | V | | | |
| 13+30 | 0.2420 | 0.35 | Q | V | | | |
| 13+35 | 0.2444 | 0.35 | Q | V | | | |
| 13+40 | 0.2469 | 0.36 | Q | V | | | |
| 13+45 | 0.2493 | 0.36 | Q | V | | | |
| 13+50 | 0.2519 | 0.37 | Q | V | | | |
| 13+55 | 0.2544 | 0.37 | Q | V | | | |
| 14+ 0 | 0.2570 | 0.38 | Q | V | | | |
| 14+ 5 | 0.2596 | 0.38 | Q | V | | | |
| 14+10 | 0.2623 | 0.39 | Q | V | | | |
| 14+15 | 0.2650 | 0.40 | Q | V | | | |
| 14+20 | 0.2678 | 0.40 | Q | V | | | |
| 14+25 | 0.2706 | 0.41 | Q | V | | | |
| 14+30 | 0.2735 | 0.42 | Q | V | | | |
| 14+35 | 0.2765 | 0.43 | Q | V | | | |
| 14+40 | 0.2795 | 0.44 | Q | V | | | |
| 14+45 | 0.2825 | 0.45 | Q | V | | | |
| 14+50 | 0.2857 | 0.46 | Q | V | | | |
| 14+55 | 0.2889 | 0.47 | Q | V | | | |
| 15+ 0 | 0.2922 | 0.48 | Q | V | | | |
| 15+ 5 | 0.2956 | 0.49 | Q | V | | | |
| 15+10 | 0.2991 | 0.51 | Q | V | | | |
| 15+15 | 0.3027 | 0.52 | Q | V | | | |
| 15+20 | 0.3064 | 0.54 | Q | V | | | |
| 15+25 | 0.3103 | 0.56 | Q | V | | | |
| 15+30 | 0.3142 | 0.57 | Q | V | | | |
| 15+35 | 0.3181 | 0.57 | Q | V | | | |
| 15+40 | 0.3220 | 0.57 | Q | V | | | |
| 15+45 | 0.3260 | 0.58 | Q | V | | | |
| 15+50 | 0.3302 | 0.61 | Q | V | | | |
| 15+55 | 0.3349 | 0.68 | Q | V | | | |
| 16+ 0 | 0.3409 | 0.87 | Q | V | | | |
| 16+ 5 | 0.3527 | 1.71 | Q | V | | | |
| 16+10 | 0.3752 | 3.27 | Q | V | | | |
| 16+15 | 0.4085 | 4.83 | Q | V | | | |
| 16+20 | 0.4470 | 5.59 | Q | V | | | |
| 16+25 | 0.4799 | 4.79 | Q | V | | | |
| 16+30 | 0.5023 | 3.24 | Q | V | | | |
| 16+35 | 0.5182 | 2.32 | Q | V | | | |
| 16+40 | 0.5306 | 1.80 | Q | V | | | |
| 16+45 | 0.5414 | 1.56 | Q | V | | | |
| 16+50 | 0.5509 | 1.38 | Q | V | | | |
| 16+55 | 0.5594 | 1.24 | Q | V | | | |
| 17+ 0 | 0.5671 | 1.11 | Q | V | | | |
| 17+ 5 | 0.5740 | 1.00 | Q | V | | | |
| 17+10 | 0.5804 | 0.94 | Q | V | | | |
| 17+15 | 0.5863 | 0.85 | Q | V | | | |
| 17+20 | 0.5917 | 0.79 | Q | V | | | |
| 17+25 | 0.5967 | 0.72 | Q | V | | | |
| 17+30 | 0.6013 | 0.68 | Q | V | | | |
| 17+35 | 0.6058 | 0.65 | Q | V | | | |
| 17+40 | 0.6101 | 0.63 | Q | V | | | |
| 17+45 | 0.6141 | 0.58 | Q | V | | | |
| 17+50 | 0.6179 | 0.55 | Q | V | | | |
| 17+55 | 0.6215 | 0.52 | Q | V | | | |
| 18+ 0 | 0.6249 | 0.50 | Q | V | | | |
| 18+ 5 | 0.6281 | 0.47 | Q | V | | | |
| 18+10 | 0.6312 | 0.45 | Q | V | | | |
| 18+15 | 0.6342 | 0.43 | Q | V | | | |
| 18+20 | 0.6370 | 0.41 | Q | V | | | |
| 18+25 | 0.6398 | 0.40 | Q | V | | | |
| 18+30 | 0.6425 | 0.40 | Q | V | | | |

```
18+35       0.6452      0.38  |Q       |        |        |   V     |
18+40       0.6475      0.34  |Q       |        |        |   V     |
18+45       0.6496      0.31  |Q       |        |        |   V     |
18+50       0.6517      0.30  |Q       |        |        |   V     |
18+55       0.6538      0.30  |Q       |        |        |   V     |
19+ 0       0.6558      0.29  |Q       |        |        |   V     |
19+ 5       0.6577      0.29  |Q       |        |        |   V     |
19+10       0.6597      0.28  |Q       |        |        |    V    |
19+15       0.6616      0.28  |Q       |        |        |    V    |
19+20       0.6635      0.27  |Q       |        |        |    V    |
19+25       0.6653      0.27  |Q       |        |        |    V    |
19+30       0.6671      0.27  |Q       |        |        |    V    |
19+35       0.6689      0.26  |Q       |        |        |    V    |
19+40       0.6707      0.26  |Q       |        |        |    V    |
19+45       0.6725      0.26  |Q       |        |        |    V    |
19+50       0.6742      0.25  |Q       |        |        |    V    |
19+55       0.6759      0.25  Q       |        |        |    V    |
20+ 0       0.6776      0.25  Q       |        |        |     V   |
20+ 5       0.6793      0.24  Q       |        |        |     V   |
20+10       0.6810      0.24  Q       |        |        |     V   |
20+15       0.6826      0.24  Q       |        |        |     V   |
20+20       0.6843      0.24  Q       |        |        |     V   |
20+25       0.6859      0.23  Q       |        |        |     V   |
20+30       0.6875      0.23  Q       |        |        |     V   |
20+35       0.6891      0.23  Q       |        |        |     V   |
20+40       0.6906      0.23  Q       |        |        |     V   |
20+45       0.6922      0.23  Q       |        |        |     V   |
20+50       0.6937      0.22  Q       |        |        |     V   |
20+55       0.6952      0.22  Q       |        |        |     V   |
21+ 0       0.6968      0.22  Q       |        |        |      V  |
21+ 5       0.6983      0.22  Q       |        |        |      V  |
21+10       0.6997      0.22  Q       |        |        |      V  |
21+15       0.7012      0.21  Q       |        |        |      V  |
21+20       0.7027      0.21  Q       |        |        |      V  |
21+25       0.7041      0.21  Q       |        |        |      V  |
21+30       0.7056      0.21  Q       |        |        |      V  |
21+35       0.7070      0.21  Q       |        |        |      V  |
21+40       0.7084      0.21  Q       |        |        |      V  |
21+45       0.7098      0.20  Q       |        |        |      V  |
21+50       0.7112      0.20  Q       |        |        |      V  |
21+55       0.7126      0.20  Q       |        |        |      V  |
22+ 0       0.7140      0.20  Q       |        |        |      V  |
22+ 5       0.7154      0.20  Q       |        |        |       V |
22+10       0.7167      0.20  Q       |        |        |       V |
22+15       0.7181      0.20  Q       |        |        |       V |
22+20       0.7194      0.19  Q       |        |        |       V |
22+25       0.7208      0.19  Q       |        |        |       V |
22+30       0.7221      0.19  Q       |        |        |       V |
22+35       0.7234      0.19  Q       |        |        |       V |
22+40       0.7247      0.19  Q       |        |        |       V |
22+45       0.7260      0.19  Q       |        |        |       V |
22+50       0.7273      0.19  Q       |        |        |       V |
22+55       0.7286      0.19  Q       |        |        |       V |
23+ 0       0.7299      0.19  Q       |        |        |       V |
23+ 5       0.7311      0.18  Q       |        |        |       V |
23+10       0.7324      0.18  Q       |        |        |       V |
23+15       0.7336      0.18  Q       |        |        |        V|
23+20       0.7349      0.18  Q       |        |        |        V|
23+25       0.7361      0.18  Q       |        |        |        V|
23+30       0.7374      0.18  Q       |        |        |        V|
23+35       0.7386      0.18  Q       |        |        |        V|
23+40       0.7398      0.18  Q       |        |        |        V|
23+45       0.7410      0.18  Q       |        |        |        V|
23+50       0.7423      0.18  Q       |        |        |        V|
23+55       0.7435      0.17  Q       |        |        |        V|
24+ 0       0.7447      0.17  Q       |        |        |        V|
24+ 5       0.7458      0.17  Q       |        |        |        V|
24+10       0.7469      0.16  Q       |        |        |        V|
24+15       0.7478      0.13  Q       |        |        |        V|
```

```
24+20       0.7485      0.10  Q        |         |         |         V|
24+25       0.7490      0.07  Q        |         |         |         V|
24+30       0.7494      0.06  Q        |         |         |         V|
24+35       0.7497      0.05  Q        |         |         |         V|
24+40       0.7500      0.04  Q        |         |         |         V|
24+45       0.7503      0.04  Q        |         |         |         V|
24+50       0.7505      0.03  Q        |         |         |         V|
24+55       0.7506      0.03  Q        |         |         |         V|
25+ 0       0.7508      0.02  Q        |         |         |         V|
25+ 5       0.7509      0.02  Q        |         |         |         V|
25+10       0.7511      0.02  Q        |         |         |         V|
25+15       0.7512      0.01  Q        |         |         |         V|
25+20       0.7512      0.01  Q        |         |         |         V|
25+25       0.7513      0.01  Q        |         |         |         V|
25+30       0.7514      0.01  Q        |         |         |         V|
25+35       0.7515      0.01  Q        |         |         |         V|
25+40       0.7515      0.01  Q        |         |         |         V|
25+45       0.7515      0.01  Q        |         |         |         V|
25+50       0.7516      0.01  Q        |         |         |         V|
25+55       0.7516      0.00  Q        |         |         |         V|
26+ 0       0.7516      0.00  Q        |         |         |         V|
26+ 5       0.7517      0.00  Q        |         |         |         V|
26+10       0.7517      0.00  Q        |         |         |         V|
26+15       0.7517      0.00  Q        |         |         |         V|
26+20       0.7517      0.00  Q        |         |         |         V|
26+25       0.7517      0.00  Q        |         |         |         V|
26+30       0.7517      0.00  Q        |         |         |         V|
26+35       0.7517      0.00  Q        |         |         |         V|
-------------------------------------------------------------------
```

U n i t  H y d r o g r a p h  A n a l y s i s



Study date 08/04/23

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------

San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6320

---

225038 - 18313 VALLEY BLVD - SB ANIMAL CARE CENTER
EXISITNG CONDITIONS
100-YEAR, 24-HOUR STORM
BY: JTS DATE: 08-04-23

---

Storm Event Year = 100

Antecedent Moisture Condition = 3

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

| Sub-Area (Ac.) | Duration (hours) | Isohyetal (In) |
|---|---|---|
| Rainfall data for year 10 | | |
| 6.07 | 1 | 0.92 |
| Rainfall data for year 2 | | |
| 6.07 | 6 | 1.62 |
| Rainfall data for year 2 | | |
| 6.07 | 24 | 3.01 |
| Rainfall data for year 100 | | |
| 6.07 | 1 | 1.32 |
| Rainfall data for year 100 | | |
| 6.07 | 6 | 3.50 |
| Rainfall data for year 100 | | |
| 6.07 | 24 | 7.80 |

---

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

******** Area-averaged max loss rate, Fm ********

| SCS curve No.(AMCII) | SCS curve NO.(AMC 3) | Area (Ac.) | Area Fraction | Fp(Fig C6) (In/Hr) | Ap (dec.) | Fm (In/Hr) |
|---|---|---|---|---|---|---|
| 50.0 | 70.0 | 6.07 | 1.000 | 0.532 | 1.000 | 0.532 |

Area-averaged adjusted loss rate Fm (In/Hr) = 0.532

********* Area-Averaged low loss rate fraction, Yb **********

| Area (Ac.) | Area Fract | SCS CN (AMC2) | SCS CN (AMC3) | S | Pervious Yield Fr |
|---|---|---|---|---|---|
| 6.07 | 1.000 | 50.0 | 70.0 | 4.29 | 0.550 |

Area-averaged catchment yield fraction, Y = 0.550
Area-averaged low loss fraction, Yb = 0.450
User entry of time of concentration = 0.413 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area = 6.07(Ac.)
Catchment Lag time = 0.330 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 25.2220
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.532(In/Hr)
Average low loss rate fraction (Yb) = 0.450 (decimal)
VALLEY UNDEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.489(In)
Computed peak 30-minute rainfall = 1.000(In)
Specified peak 1-hour rainfall = 1.320(In)
Computed peak 3-hour rainfall = 2.400(In)
Specified peak 6-hour rainfall = 3.500(In)
Specified peak 24-hour rainfall = 7.800(In)

Rainfall depth area reduction factors:
Using a total area of 6.07(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.488(In)
30-minute factor = 1.000 Adjusted rainfall = 1.000(In)
1-hour factor = 1.000 Adjusted rainfall = 1.320(In)
3-hour factor = 1.000 Adjusted rainfall = 2.400(In)
6-hour factor = 1.000 Adjusted rainfall = 3.500(In)
24-hour factor = 1.000 Adjusted rainfall = 7.800(In)

U n i t H y d r o g r a p h

| Interval Number | 'S' Graph Mean values | Unit Hydrograph ((CFS)) |
|---|---|---|
| | (K = 73.41 (CFS)) | |
| 1 | 2.324 | 1.706 |
| 2 | 10.093 | 5.703 |
| 3 | 23.919 | 10.149 |
| 4 | 41.556 | 12.948 |
| 5 | 56.822 | 11.206 |
| 6 | 66.261 | 6.929 |
| 7 | 72.283 | 4.421 |
| 8 | 76.395 | 3.018 |
| 9 | 79.725 | 2.445 |
| 10 | 82.460 | 2.008 |
| 11 | 84.803 | 1.720 |
| 12 | 86.782 | 1.453 |
| 13 | 88.416 | 1.200 |
| 14 | 89.927 | 1.109 |
| 15 | 91.192 | 0.929 |
| 16 | 92.298 | 0.812 |
| 17 | 93.217 | 0.674 |
| 18 | 94.024 | 0.592 |
| 19 | 94.798 | 0.569 |
| 20 | 95.552 | 0.553 |
| 21 | 96.175 | 0.458 |
| 22 | 96.728 | 0.406 |
| 23 | 97.215 | 0.357 |
| 24 | 97.667 | 0.332 |
| 25 | 98.051 | 0.282 |

| | | |
|---|---|---|
| 26 | 98.402 | 0.257 |
| 27 | 98.684 | 0.207 |
| 28 | 98.936 | 0.185 |
| 29 | 99.188 | 0.185 |
| 30 | 99.440 | 0.185 |
| 31 | 99.693 | 0.185 |
| 32 | 100.000 | 0.093 |

| Peak Unit Number | Adjusted mass rainfall (In) | Unit rainfall (In) |
|---|---|---|
| 1 | 0.4884 | 0.4884 |
| 2 | 0.6445 | 0.1560 |
| 3 | 0.7579 | 0.1135 |
| 4 | 0.8504 | 0.0924 |
| 5 | 0.9297 | 0.0794 |
| 6 | 1.0001 | 0.0703 |
| 7 | 1.0637 | 0.0636 |
| 8 | 1.1221 | 0.0584 |
| 9 | 1.1762 | 0.0541 |
| 10 | 1.2268 | 0.0506 |
| 11 | 1.2745 | 0.0477 |
| 12 | 1.3196 | 0.0451 |
| 13 | 1.3784 | 0.0588 |
| 14 | 1.4352 | 0.0568 |
| 15 | 1.4901 | 0.0549 |
| 16 | 1.5434 | 0.0533 |
| 17 | 1.5952 | 0.0518 |
| 18 | 1.6456 | 0.0504 |
| 19 | 1.6948 | 0.0492 |
| 20 | 1.7428 | 0.0480 |
| 21 | 1.7897 | 0.0469 |
| 22 | 1.8356 | 0.0459 |
| 23 | 1.8806 | 0.0450 |
| 24 | 1.9246 | 0.0441 |
| 25 | 1.9679 | 0.0433 |
| 26 | 2.0104 | 0.0425 |
| 27 | 2.0521 | 0.0417 |
| 28 | 2.0931 | 0.0410 |
| 29 | 2.1335 | 0.0404 |
| 30 | 2.1733 | 0.0397 |
| 31 | 2.2124 | 0.0391 |
| 32 | 2.2510 | 0.0386 |
| 33 | 2.2890 | 0.0380 |
| 34 | 2.3265 | 0.0375 |
| 35 | 2.3635 | 0.0370 |
| 36 | 2.4001 | 0.0365 |
| 37 | 2.4361 | 0.0361 |
| 38 | 2.4717 | 0.0356 |
| 39 | 2.5069 | 0.0352 |
| 40 | 2.5417 | 0.0348 |
| 41 | 2.5761 | 0.0344 |
| 42 | 2.6101 | 0.0340 |
| 43 | 2.6438 | 0.0336 |
| 44 | 2.6770 | 0.0333 |
| 45 | 2.7100 | 0.0329 |
| 46 | 2.7426 | 0.0326 |
| 47 | 2.7749 | 0.0323 |
| 48 | 2.8069 | 0.0320 |
| 49 | 2.8385 | 0.0317 |
| 50 | 2.8699 | 0.0314 |
| 51 | 2.9010 | 0.0311 |
| 52 | 2.9318 | 0.0308 |
| 53 | 2.9624 | 0.0306 |
| 54 | 2.9927 | 0.0303 |
| 55 | 3.0227 | 0.0300 |
| 56 | 3.0525 | 0.0298 |
| 57 | 3.0821 | 0.0295 |
| 58 | 3.1114 | 0.0293 |
| 59 | 3.1405 | 0.0291 |

| | | |
|---|---|---|
| 60 | 3.1693 | 0.0289 |
| 61 | 3.1980 | 0.0286 |
| 62 | 3.2264 | 0.0284 |
| 63 | 3.2546 | 0.0282 |
| 64 | 3.2826 | 0.0280 |
| 65 | 3.3104 | 0.0278 |
| 66 | 3.3381 | 0.0276 |
| 67 | 3.3655 | 0.0274 |
| 68 | 3.3927 | 0.0272 |
| 69 | 3.4198 | 0.0271 |
| 70 | 3.4467 | 0.0269 |
| 71 | 3.4734 | 0.0267 |
| 72 | 3.4999 | 0.0265 |
| 73 | 3.5280 | 0.0280 |
| 74 | 3.5558 | 0.0279 |
| 75 | 3.5835 | 0.0277 |
| 76 | 3.6110 | 0.0275 |
| 77 | 3.6384 | 0.0274 |
| 78 | 3.6657 | 0.0272 |
| 79 | 3.6928 | 0.0271 |
| 80 | 3.7197 | 0.0269 |
| 81 | 3.7465 | 0.0268 |
| 82 | 3.7732 | 0.0267 |
| 83 | 3.7997 | 0.0265 |
| 84 | 3.8261 | 0.0264 |
| 85 | 3.8524 | 0.0263 |
| 86 | 3.8785 | 0.0261 |
| 87 | 3.9045 | 0.0260 |
| 88 | 3.9304 | 0.0259 |
| 89 | 3.9562 | 0.0258 |
| 90 | 3.9818 | 0.0256 |
| 91 | 4.0073 | 0.0255 |
| 92 | 4.0327 | 0.0254 |
| 93 | 4.0580 | 0.0253 |
| 94 | 4.0832 | 0.0252 |
| 95 | 4.1082 | 0.0251 |
| 96 | 4.1332 | 0.0249 |
| 97 | 4.1580 | 0.0248 |
| 98 | 4.1827 | 0.0247 |
| 99 | 4.2073 | 0.0246 |
| 100 | 4.2319 | 0.0245 |
| 101 | 4.2563 | 0.0244 |
| 102 | 4.2806 | 0.0243 |
| 103 | 4.3048 | 0.0242 |
| 104 | 4.3289 | 0.0241 |
| 105 | 4.3529 | 0.0240 |
| 106 | 4.3768 | 0.0239 |
| 107 | 4.4007 | 0.0238 |
| 108 | 4.4244 | 0.0237 |
| 109 | 4.4480 | 0.0236 |
| 110 | 4.4716 | 0.0235 |
| 111 | 4.4950 | 0.0235 |
| 112 | 4.5184 | 0.0234 |
| 113 | 4.5417 | 0.0233 |
| 114 | 4.5648 | 0.0232 |
| 115 | 4.5880 | 0.0231 |
| 116 | 4.6110 | 0.0230 |
| 117 | 4.6339 | 0.0229 |
| 118 | 4.6568 | 0.0229 |
| 119 | 4.6795 | 0.0228 |
| 120 | 4.7022 | 0.0227 |
| 121 | 4.7248 | 0.0226 |
| 122 | 4.7474 | 0.0225 |
| 123 | 4.7698 | 0.0225 |
| 124 | 4.7922 | 0.0224 |
| 125 | 4.8145 | 0.0223 |
| 126 | 4.8367 | 0.0222 |
| 127 | 4.8589 | 0.0222 |
| 128 | 4.8810 | 0.0221 |

| | | |
|---|---|---|
| 129 | 4.9030 | 0.0220 |
| 130 | 4.9249 | 0.0219 |
| 131 | 4.9468 | 0.0219 |
| 132 | 4.9686 | 0.0218 |
| 133 | 4.9903 | 0.0217 |
| 134 | 5.0119 | 0.0217 |
| 135 | 5.0335 | 0.0216 |
| 136 | 5.0551 | 0.0215 |
| 137 | 5.0765 | 0.0215 |
| 138 | 5.0979 | 0.0214 |
| 139 | 5.1192 | 0.0213 |
| 140 | 5.1405 | 0.0213 |
| 141 | 5.1617 | 0.0212 |
| 142 | 5.1828 | 0.0211 |
| 143 | 5.2039 | 0.0211 |
| 144 | 5.2249 | 0.0210 |
| 145 | 5.2458 | 0.0209 |
| 146 | 5.2667 | 0.0209 |
| 147 | 5.2875 | 0.0208 |
| 148 | 5.3083 | 0.0208 |
| 149 | 5.3290 | 0.0207 |
| 150 | 5.3496 | 0.0206 |
| 151 | 5.3702 | 0.0206 |
| 152 | 5.3908 | 0.0205 |
| 153 | 5.4112 | 0.0205 |
| 154 | 5.4316 | 0.0204 |
| 155 | 5.4520 | 0.0204 |
| 156 | 5.4723 | 0.0203 |
| 157 | 5.4926 | 0.0203 |
| 158 | 5.5128 | 0.0202 |
| 159 | 5.5329 | 0.0201 |
| 160 | 5.5530 | 0.0201 |
| 161 | 5.5730 | 0.0200 |
| 162 | 5.5930 | 0.0200 |
| 163 | 5.6129 | 0.0199 |
| 164 | 5.6328 | 0.0199 |
| 165 | 5.6526 | 0.0198 |
| 166 | 5.6724 | 0.0198 |
| 167 | 5.6922 | 0.0197 |
| 168 | 5.7118 | 0.0197 |
| 169 | 5.7315 | 0.0196 |
| 170 | 5.7510 | 0.0196 |
| 171 | 5.7706 | 0.0195 |
| 172 | 5.7901 | 0.0195 |
| 173 | 5.8095 | 0.0194 |
| 174 | 5.8289 | 0.0194 |
| 175 | 5.8482 | 0.0193 |
| 176 | 5.8675 | 0.0193 |
| 177 | 5.8868 | 0.0192 |
| 178 | 5.9060 | 0.0192 |
| 179 | 5.9251 | 0.0192 |
| 180 | 5.9442 | 0.0191 |
| 181 | 5.9633 | 0.0191 |
| 182 | 5.9823 | 0.0190 |
| 183 | 6.0013 | 0.0190 |
| 184 | 6.0202 | 0.0189 |
| 185 | 6.0391 | 0.0189 |
| 186 | 6.0580 | 0.0188 |
| 187 | 6.0768 | 0.0188 |
| 188 | 6.0956 | 0.0188 |
| 189 | 6.1143 | 0.0187 |
| 190 | 6.1330 | 0.0187 |
| 191 | 6.1516 | 0.0186 |
| 192 | 6.1702 | 0.0186 |
| 193 | 6.1887 | 0.0186 |
| 194 | 6.2073 | 0.0185 |
| 195 | 6.2257 | 0.0185 |
| 196 | 6.2442 | 0.0184 |
| 197 | 6.2626 | 0.0184 |

| | | |
|---|---|---|
| 198 | 6.2809 | 0.0184 |
| 199 | 6.2992 | 0.0183 |
| 200 | 6.3175 | 0.0183 |
| 201 | 6.3358 | 0.0182 |
| 202 | 6.3540 | 0.0182 |
| 203 | 6.3721 | 0.0182 |
| 204 | 6.3903 | 0.0181 |
| 205 | 6.4083 | 0.0181 |
| 206 | 6.4264 | 0.0181 |
| 207 | 6.4444 | 0.0180 |
| 208 | 6.4624 | 0.0180 |
| 209 | 6.4803 | 0.0179 |
| 210 | 6.4982 | 0.0179 |
| 211 | 6.5161 | 0.0179 |
| 212 | 6.5339 | 0.0178 |
| 213 | 6.5517 | 0.0178 |
| 214 | 6.5695 | 0.0178 |
| 215 | 6.5872 | 0.0177 |
| 216 | 6.6049 | 0.0177 |
| 217 | 6.6226 | 0.0177 |
| 218 | 6.6402 | 0.0176 |
| 219 | 6.6578 | 0.0176 |
| 220 | 6.6754 | 0.0176 |
| 221 | 6.6929 | 0.0175 |
| 222 | 6.7104 | 0.0175 |
| 223 | 6.7278 | 0.0175 |
| 224 | 6.7453 | 0.0174 |
| 225 | 6.7626 | 0.0174 |
| 226 | 6.7800 | 0.0174 |
| 227 | 6.7973 | 0.0173 |
| 228 | 6.8146 | 0.0173 |
| 229 | 6.8319 | 0.0173 |
| 230 | 6.8491 | 0.0172 |
| 231 | 6.8663 | 0.0172 |
| 232 | 6.8835 | 0.0172 |
| 233 | 6.9006 | 0.0171 |
| 234 | 6.9177 | 0.0171 |
| 235 | 6.9348 | 0.0171 |
| 236 | 6.9518 | 0.0170 |
| 237 | 6.9689 | 0.0170 |
| 238 | 6.9858 | 0.0170 |
| 239 | 7.0028 | 0.0170 |
| 240 | 7.0197 | 0.0169 |
| 241 | 7.0366 | 0.0169 |
| 242 | 7.0535 | 0.0169 |
| 243 | 7.0703 | 0.0168 |
| 244 | 7.0871 | 0.0168 |
| 245 | 7.1039 | 0.0168 |
| 246 | 7.1206 | 0.0167 |
| 247 | 7.1373 | 0.0167 |
| 248 | 7.1540 | 0.0167 |
| 249 | 7.1707 | 0.0167 |
| 250 | 7.1873 | 0.0166 |
| 251 | 7.2039 | 0.0166 |
| 252 | 7.2205 | 0.0166 |
| 253 | 7.2371 | 0.0165 |
| 254 | 7.2536 | 0.0165 |
| 255 | 7.2701 | 0.0165 |
| 256 | 7.2865 | 0.0165 |
| 257 | 7.3030 | 0.0164 |
| 258 | 7.3194 | 0.0164 |
| 259 | 7.3358 | 0.0164 |
| 260 | 7.3521 | 0.0164 |
| 261 | 7.3685 | 0.0163 |
| 262 | 7.3848 | 0.0163 |
| 263 | 7.4011 | 0.0163 |
| 264 | 7.4173 | 0.0163 |
| 265 | 7.4335 | 0.0162 |
| 266 | 7.4497 | 0.0162 |

| | | |
|---|---|---|
| 267 | 7.4659 | 0.0162 |
| 268 | 7.4821 | 0.0162 |
| 269 | 7.4982 | 0.0161 |
| 270 | 7.5143 | 0.0161 |
| 271 | 7.5304 | 0.0161 |
| 272 | 7.5464 | 0.0161 |
| 273 | 7.5625 | 0.0160 |
| 274 | 7.5785 | 0.0160 |
| 275 | 7.5944 | 0.0160 |
| 276 | 7.6104 | 0.0160 |
| 277 | 7.6263 | 0.0159 |
| 278 | 7.6422 | 0.0159 |
| 279 | 7.6581 | 0.0159 |
| 280 | 7.6739 | 0.0159 |
| 281 | 7.6898 | 0.0158 |
| 282 | 7.7056 | 0.0158 |
| 283 | 7.7214 | 0.0158 |
| 284 | 7.7371 | 0.0158 |
| 285 | 7.7529 | 0.0157 |
| 286 | 7.7686 | 0.0157 |
| 287 | 7.7843 | 0.0157 |
| 288 | 7.7999 | 0.0157 |

| Unit Period (number) | Unit Rainfall (In) | Unit Soil-Loss (In) | Effective Rainfall (In) |
|---|---|---|---|
| 1 | 0.0157 | 0.0070 | 0.0086 |
| 2 | 0.0157 | 0.0071 | 0.0086 |
| 3 | 0.0157 | 0.0071 | 0.0087 |
| 4 | 0.0158 | 0.0071 | 0.0087 |
| 5 | 0.0158 | 0.0071 | 0.0087 |
| 6 | 0.0158 | 0.0071 | 0.0087 |
| 7 | 0.0159 | 0.0071 | 0.0087 |
| 8 | 0.0159 | 0.0072 | 0.0088 |
| 9 | 0.0160 | 0.0072 | 0.0088 |
| 10 | 0.0160 | 0.0072 | 0.0088 |
| 11 | 0.0160 | 0.0072 | 0.0088 |
| 12 | 0.0161 | 0.0072 | 0.0088 |
| 13 | 0.0161 | 0.0072 | 0.0089 |
| 14 | 0.0161 | 0.0073 | 0.0089 |
| 15 | 0.0162 | 0.0073 | 0.0089 |
| 16 | 0.0162 | 0.0073 | 0.0089 |
| 17 | 0.0163 | 0.0073 | 0.0089 |
| 18 | 0.0163 | 0.0073 | 0.0090 |
| 19 | 0.0163 | 0.0073 | 0.0090 |
| 20 | 0.0164 | 0.0074 | 0.0090 |
| 21 | 0.0164 | 0.0074 | 0.0090 |
| 22 | 0.0164 | 0.0074 | 0.0090 |
| 23 | 0.0165 | 0.0074 | 0.0091 |
| 24 | 0.0165 | 0.0074 | 0.0091 |
| 25 | 0.0166 | 0.0075 | 0.0091 |
| 26 | 0.0166 | 0.0075 | 0.0091 |
| 27 | 0.0167 | 0.0075 | 0.0092 |
| 28 | 0.0167 | 0.0075 | 0.0092 |
| 29 | 0.0167 | 0.0075 | 0.0092 |
| 30 | 0.0168 | 0.0075 | 0.0092 |
| 31 | 0.0168 | 0.0076 | 0.0093 |
| 32 | 0.0169 | 0.0076 | 0.0093 |
| 33 | 0.0169 | 0.0076 | 0.0093 |
| 34 | 0.0170 | 0.0076 | 0.0093 |
| 35 | 0.0170 | 0.0076 | 0.0094 |
| 36 | 0.0170 | 0.0077 | 0.0094 |
| 37 | 0.0171 | 0.0077 | 0.0094 |
| 38 | 0.0171 | 0.0077 | 0.0094 |
| 39 | 0.0172 | 0.0077 | 0.0095 |
| 40 | 0.0172 | 0.0077 | 0.0095 |
| 41 | 0.0173 | 0.0078 | 0.0095 |
| 42 | 0.0173 | 0.0078 | 0.0095 |

| | | | |
|---|---|---|---|
| 43 | 0.0174 | 0.0078 | 0.0096 |
| 44 | 0.0174 | 0.0078 | 0.0096 |
| 45 | 0.0175 | 0.0079 | 0.0096 |
| 46 | 0.0175 | 0.0079 | 0.0096 |
| 47 | 0.0176 | 0.0079 | 0.0097 |
| 48 | 0.0176 | 0.0079 | 0.0097 |
| 49 | 0.0177 | 0.0080 | 0.0097 |
| 50 | 0.0177 | 0.0080 | 0.0098 |
| 51 | 0.0178 | 0.0080 | 0.0098 |
| 52 | 0.0178 | 0.0080 | 0.0098 |
| 53 | 0.0179 | 0.0081 | 0.0099 |
| 54 | 0.0179 | 0.0081 | 0.0099 |
| 55 | 0.0180 | 0.0081 | 0.0099 |
| 56 | 0.0181 | 0.0081 | 0.0099 |
| 57 | 0.0181 | 0.0082 | 0.0100 |
| 58 | 0.0182 | 0.0082 | 0.0100 |
| 59 | 0.0182 | 0.0082 | 0.0100 |
| 60 | 0.0183 | 0.0082 | 0.0101 |
| 61 | 0.0184 | 0.0083 | 0.0101 |
| 62 | 0.0184 | 0.0083 | 0.0101 |
| 63 | 0.0185 | 0.0083 | 0.0102 |
| 64 | 0.0185 | 0.0083 | 0.0102 |
| 65 | 0.0186 | 0.0084 | 0.0102 |
| 66 | 0.0186 | 0.0084 | 0.0103 |
| 67 | 0.0187 | 0.0084 | 0.0103 |
| 68 | 0.0188 | 0.0084 | 0.0103 |
| 69 | 0.0188 | 0.0085 | 0.0104 |
| 70 | 0.0189 | 0.0085 | 0.0104 |
| 71 | 0.0190 | 0.0085 | 0.0104 |
| 72 | 0.0190 | 0.0086 | 0.0105 |
| 73 | 0.0191 | 0.0086 | 0.0105 |
| 74 | 0.0192 | 0.0086 | 0.0105 |
| 75 | 0.0192 | 0.0087 | 0.0106 |
| 76 | 0.0193 | 0.0087 | 0.0106 |
| 77 | 0.0194 | 0.0087 | 0.0107 |
| 78 | 0.0194 | 0.0087 | 0.0107 |
| 79 | 0.0195 | 0.0088 | 0.0107 |
| 80 | 0.0196 | 0.0088 | 0.0108 |
| 81 | 0.0197 | 0.0088 | 0.0108 |
| 82 | 0.0197 | 0.0089 | 0.0109 |
| 83 | 0.0198 | 0.0089 | 0.0109 |
| 84 | 0.0199 | 0.0089 | 0.0109 |
| 85 | 0.0200 | 0.0090 | 0.0110 |
| 86 | 0.0200 | 0.0090 | 0.0110 |
| 87 | 0.0201 | 0.0091 | 0.0111 |
| 88 | 0.0202 | 0.0091 | 0.0111 |
| 89 | 0.0203 | 0.0091 | 0.0112 |
| 90 | 0.0204 | 0.0092 | 0.0112 |
| 91 | 0.0205 | 0.0092 | 0.0113 |
| 92 | 0.0205 | 0.0092 | 0.0113 |
| 93 | 0.0206 | 0.0093 | 0.0114 |
| 94 | 0.0207 | 0.0093 | 0.0114 |
| 95 | 0.0208 | 0.0094 | 0.0115 |
| 96 | 0.0209 | 0.0094 | 0.0115 |
| 97 | 0.0210 | 0.0094 | 0.0116 |
| 98 | 0.0211 | 0.0095 | 0.0116 |
| 99 | 0.0212 | 0.0095 | 0.0117 |
| 100 | 0.0213 | 0.0096 | 0.0117 |
| 101 | 0.0214 | 0.0096 | 0.0118 |
| 102 | 0.0215 | 0.0096 | 0.0118 |
| 103 | 0.0216 | 0.0097 | 0.0119 |
| 104 | 0.0217 | 0.0097 | 0.0119 |
| 105 | 0.0218 | 0.0098 | 0.0120 |
| 106 | 0.0219 | 0.0098 | 0.0120 |
| 107 | 0.0220 | 0.0099 | 0.0121 |
| 108 | 0.0221 | 0.0099 | 0.0122 |
| 109 | 0.0222 | 0.0100 | 0.0122 |
| 110 | 0.0223 | 0.0100 | 0.0123 |
| 111 | 0.0225 | 0.0101 | 0.0124 |

| | | | |
|---|---|---|---|
| 112 | 0.0225 | 0.0101 | 0.0124 |
| 113 | 0.0227 | 0.0102 | 0.0125 |
| 114 | 0.0228 | 0.0102 | 0.0125 |
| 115 | 0.0229 | 0.0103 | 0.0126 |
| 116 | 0.0230 | 0.0104 | 0.0127 |
| 117 | 0.0232 | 0.0104 | 0.0128 |
| 118 | 0.0233 | 0.0105 | 0.0128 |
| 119 | 0.0235 | 0.0105 | 0.0129 |
| 120 | 0.0235 | 0.0106 | 0.0130 |
| 121 | 0.0237 | 0.0107 | 0.0131 |
| 122 | 0.0238 | 0.0107 | 0.0131 |
| 123 | 0.0240 | 0.0108 | 0.0132 |
| 124 | 0.0241 | 0.0108 | 0.0133 |
| 125 | 0.0243 | 0.0109 | 0.0134 |
| 126 | 0.0244 | 0.0110 | 0.0134 |
| 127 | 0.0246 | 0.0111 | 0.0135 |
| 128 | 0.0247 | 0.0111 | 0.0136 |
| 129 | 0.0249 | 0.0112 | 0.0137 |
| 130 | 0.0251 | 0.0113 | 0.0138 |
| 131 | 0.0253 | 0.0114 | 0.0139 |
| 132 | 0.0254 | 0.0114 | 0.0140 |
| 133 | 0.0256 | 0.0115 | 0.0141 |
| 134 | 0.0258 | 0.0116 | 0.0142 |
| 135 | 0.0260 | 0.0117 | 0.0143 |
| 136 | 0.0261 | 0.0118 | 0.0144 |
| 137 | 0.0264 | 0.0119 | 0.0145 |
| 138 | 0.0265 | 0.0119 | 0.0146 |
| 139 | 0.0268 | 0.0121 | 0.0148 |
| 140 | 0.0269 | 0.0121 | 0.0148 |
| 141 | 0.0272 | 0.0122 | 0.0150 |
| 142 | 0.0274 | 0.0123 | 0.0151 |
| 143 | 0.0277 | 0.0125 | 0.0152 |
| 144 | 0.0279 | 0.0125 | 0.0153 |
| 145 | 0.0265 | 0.0119 | 0.0146 |
| 146 | 0.0267 | 0.0120 | 0.0147 |
| 147 | 0.0271 | 0.0122 | 0.0149 |
| 148 | 0.0272 | 0.0123 | 0.0150 |
| 149 | 0.0276 | 0.0124 | 0.0152 |
| 150 | 0.0278 | 0.0125 | 0.0153 |
| 151 | 0.0282 | 0.0127 | 0.0155 |
| 152 | 0.0284 | 0.0128 | 0.0156 |
| 153 | 0.0289 | 0.0130 | 0.0159 |
| 154 | 0.0291 | 0.0131 | 0.0160 |
| 155 | 0.0295 | 0.0133 | 0.0163 |
| 156 | 0.0298 | 0.0134 | 0.0164 |
| 157 | 0.0303 | 0.0136 | 0.0167 |
| 158 | 0.0306 | 0.0137 | 0.0168 |
| 159 | 0.0311 | 0.0140 | 0.0171 |
| 160 | 0.0314 | 0.0141 | 0.0173 |
| 161 | 0.0320 | 0.0144 | 0.0176 |
| 162 | 0.0323 | 0.0145 | 0.0178 |
| 163 | 0.0329 | 0.0148 | 0.0181 |
| 164 | 0.0333 | 0.0150 | 0.0183 |
| 165 | 0.0340 | 0.0153 | 0.0187 |
| 166 | 0.0344 | 0.0155 | 0.0189 |
| 167 | 0.0352 | 0.0158 | 0.0194 |
| 168 | 0.0356 | 0.0160 | 0.0196 |
| 169 | 0.0365 | 0.0164 | 0.0201 |
| 170 | 0.0370 | 0.0166 | 0.0204 |
| 171 | 0.0380 | 0.0171 | 0.0209 |
| 172 | 0.0386 | 0.0173 | 0.0212 |
| 173 | 0.0397 | 0.0179 | 0.0219 |
| 174 | 0.0404 | 0.0182 | 0.0222 |
| 175 | 0.0417 | 0.0188 | 0.0230 |
| 176 | 0.0425 | 0.0191 | 0.0234 |
| 177 | 0.0441 | 0.0198 | 0.0243 |
| 178 | 0.0450 | 0.0202 | 0.0247 |
| 179 | 0.0469 | 0.0211 | 0.0258 |
| 180 | 0.0480 | 0.0216 | 0.0264 |

| | | | |
|---|---|---|---|
| 181 | 0.0504 | 0.0227 | 0.0278 |
| 182 | 0.0518 | 0.0233 | 0.0285 |
| 183 | 0.0549 | 0.0247 | 0.0302 |
| 184 | 0.0568 | 0.0255 | 0.0312 |
| 185 | 0.0451 | 0.0203 | 0.0248 |
| 186 | 0.0477 | 0.0214 | 0.0262 |
| 187 | 0.0541 | 0.0243 | 0.0298 |
| 188 | 0.0584 | 0.0262 | 0.0321 |
| 189 | 0.0703 | 0.0316 | 0.0387 |
| 190 | 0.0794 | 0.0357 | 0.0437 |
| 191 | 0.1135 | 0.0444 | 0.0691 |
| 192 | 0.1560 | 0.0444 | 0.1117 |
| 193 | 0.4884 | 0.0444 | 0.4440 |
| 194 | 0.0924 | 0.0416 | 0.0509 |
| 195 | 0.0636 | 0.0286 | 0.0350 |
| 196 | 0.0506 | 0.0228 | 0.0279 |
| 197 | 0.0588 | 0.0264 | 0.0324 |
| 198 | 0.0533 | 0.0240 | 0.0293 |
| 199 | 0.0492 | 0.0221 | 0.0271 |
| 200 | 0.0459 | 0.0206 | 0.0253 |
| 201 | 0.0433 | 0.0194 | 0.0238 |
| 202 | 0.0410 | 0.0185 | 0.0226 |
| 203 | 0.0391 | 0.0176 | 0.0215 |
| 204 | 0.0375 | 0.0169 | 0.0206 |
| 205 | 0.0361 | 0.0162 | 0.0198 |
| 206 | 0.0348 | 0.0156 | 0.0191 |
| 207 | 0.0336 | 0.0151 | 0.0185 |
| 208 | 0.0326 | 0.0147 | 0.0179 |
| 209 | 0.0317 | 0.0142 | 0.0174 |
| 210 | 0.0308 | 0.0139 | 0.0170 |
| 211 | 0.0300 | 0.0135 | 0.0165 |
| 212 | 0.0293 | 0.0132 | 0.0161 |
| 213 | 0.0286 | 0.0129 | 0.0158 |
| 214 | 0.0280 | 0.0126 | 0.0154 |
| 215 | 0.0274 | 0.0123 | 0.0151 |
| 216 | 0.0269 | 0.0121 | 0.0148 |
| 217 | 0.0280 | 0.0126 | 0.0154 |
| 218 | 0.0275 | 0.0124 | 0.0152 |
| 219 | 0.0271 | 0.0122 | 0.0149 |
| 220 | 0.0267 | 0.0120 | 0.0147 |
| 221 | 0.0263 | 0.0118 | 0.0145 |
| 222 | 0.0259 | 0.0116 | 0.0142 |
| 223 | 0.0255 | 0.0115 | 0.0140 |
| 224 | 0.0252 | 0.0113 | 0.0139 |
| 225 | 0.0248 | 0.0112 | 0.0137 |
| 226 | 0.0245 | 0.0110 | 0.0135 |
| 227 | 0.0242 | 0.0109 | 0.0133 |
| 228 | 0.0239 | 0.0108 | 0.0132 |
| 229 | 0.0236 | 0.0106 | 0.0130 |
| 230 | 0.0234 | 0.0105 | 0.0129 |
| 231 | 0.0231 | 0.0104 | 0.0127 |
| 232 | 0.0229 | 0.0103 | 0.0126 |
| 233 | 0.0226 | 0.0102 | 0.0124 |
| 234 | 0.0224 | 0.0101 | 0.0123 |
| 235 | 0.0222 | 0.0100 | 0.0122 |
| 236 | 0.0219 | 0.0099 | 0.0121 |
| 237 | 0.0217 | 0.0098 | 0.0120 |
| 238 | 0.0215 | 0.0097 | 0.0118 |
| 239 | 0.0213 | 0.0096 | 0.0117 |
| 240 | 0.0211 | 0.0095 | 0.0116 |
| 241 | 0.0209 | 0.0094 | 0.0115 |
| 242 | 0.0208 | 0.0093 | 0.0114 |
| 243 | 0.0206 | 0.0093 | 0.0113 |
| 244 | 0.0204 | 0.0092 | 0.0112 |
| 245 | 0.0203 | 0.0091 | 0.0111 |
| 246 | 0.0201 | 0.0090 | 0.0111 |
| 247 | 0.0199 | 0.0090 | 0.0110 |
| 248 | 0.0198 | 0.0089 | 0.0109 |
| 249 | 0.0196 | 0.0088 | 0.0108 |

| | | | |
|---|---|---|---|
| 250 | 0.0195 | 0.0088 | 0.0107 |
| 251 | 0.0193 | 0.0087 | 0.0106 |
| 252 | 0.0192 | 0.0086 | 0.0106 |
| 253 | 0.0191 | 0.0086 | 0.0105 |
| 254 | 0.0189 | 0.0085 | 0.0104 |
| 255 | 0.0188 | 0.0085 | 0.0104 |
| 256 | 0.0187 | 0.0084 | 0.0103 |
| 257 | 0.0186 | 0.0083 | 0.0102 |
| 258 | 0.0184 | 0.0083 | 0.0101 |
| 259 | 0.0183 | 0.0082 | 0.0101 |
| 260 | 0.0182 | 0.0082 | 0.0100 |
| 261 | 0.0181 | 0.0081 | 0.0100 |
| 262 | 0.0180 | 0.0081 | 0.0099 |
| 263 | 0.0179 | 0.0080 | 0.0098 |
| 264 | 0.0178 | 0.0080 | 0.0098 |
| 265 | 0.0177 | 0.0079 | 0.0097 |
| 266 | 0.0176 | 0.0079 | 0.0097 |
| 267 | 0.0175 | 0.0078 | 0.0096 |
| 268 | 0.0174 | 0.0078 | 0.0096 |
| 269 | 0.0173 | 0.0078 | 0.0095 |
| 270 | 0.0172 | 0.0077 | 0.0094 |
| 271 | 0.0171 | 0.0077 | 0.0094 |
| 272 | 0.0170 | 0.0076 | 0.0093 |
| 273 | 0.0169 | 0.0076 | 0.0093 |
| 274 | 0.0168 | 0.0076 | 0.0092 |
| 275 | 0.0167 | 0.0075 | 0.0092 |
| 276 | 0.0166 | 0.0075 | 0.0092 |
| 277 | 0.0165 | 0.0074 | 0.0091 |
| 278 | 0.0165 | 0.0074 | 0.0091 |
| 279 | 0.0164 | 0.0074 | 0.0090 |
| 280 | 0.0163 | 0.0073 | 0.0090 |
| 281 | 0.0162 | 0.0073 | 0.0089 |
| 282 | 0.0162 | 0.0073 | 0.0089 |
| 283 | 0.0161 | 0.0072 | 0.0088 |
| 284 | 0.0160 | 0.0072 | 0.0088 |
| 285 | 0.0159 | 0.0072 | 0.0088 |
| 286 | 0.0159 | 0.0071 | 0.0087 |
| 287 | 0.0158 | 0.0071 | 0.0087 |
| 288 | 0.0157 | 0.0071 | 0.0086 |

---

---

Total soil rain loss = 3.30(In)
Total effective rainfall = 4.50(In)
Peak flow rate in flood hydrograph = 9.02(CFS)

---

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

---

Hydrograph in 5 Minute intervals ((CFS))

---

| Time(h+m) | Volume Ac.Ft | Q(CFS) | 0 | 2.5 | 5.0 | 7.5 | 10.0 |
|---|---|---|---|---|---|---|---|
| 0+ 5 | 0.0001 | 0.01 | Q | \| | \| | \| | \| |
| 0+10 | 0.0005 | 0.06 | Q | \| | \| | \| | \| |
| 0+15 | 0.0016 | 0.15 | Q | \| | \| | \| | \| |
| 0+20 | 0.0034 | 0.26 | VQ | \| | \| | \| | \| |
| 0+25 | 0.0059 | 0.36 | VQ | \| | \| | \| | \| |
| 0+30 | 0.0088 | 0.42 | VQ | \| | \| | \| | \| |
| 0+35 | 0.0120 | 0.46 | VQ | \| | \| | \| | \| |
| 0+40 | 0.0153 | 0.49 | VQ | \| | \| | \| | \| |
| 0+45 | 0.0188 | 0.51 | V Q | \| | \| | \| | \| |
| 0+50 | 0.0225 | 0.53 | V Q | \| | \| | \| | \| |
| 0+55 | 0.0262 | 0.54 | V Q | \| | \| | \| | \| |
| 1+ 0 | 0.0300 | 0.56 | V Q | \| | \| | \| | \| |
| 1+ 5 | 0.0340 | 0.57 | V Q | \| | \| | \| | \| |
| 1+10 | 0.0380 | 0.58 | V Q | \| | \| | \| | \| |
| 1+15 | 0.0420 | 0.59 | V Q | \| | \| | \| | \| |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1+20 | 0.0461 | 0.60 | V Q | \| | \| | \| | \| |
| 1+25 | 0.0503 | 0.61 | V Q | \| | \| | \| | \| |
| 1+30 | 0.0545 | 0.61 | V Q | \| | \| | \| | \| |
| 1+35 | 0.0588 | 0.62 | \|VQ | \| | \| | \| | \| |
| 1+40 | 0.0631 | 0.62 | \|VQ | \| | \| | \| | \| |
| 1+45 | 0.0674 | 0.63 | \|VQ | \| | \| | \| | \| |
| 1+50 | 0.0718 | 0.63 | \|VQ | \| | \| | \| | \| |
| 1+55 | 0.0762 | 0.64 | \|VQ | \| | \| | \| | \| |
| 2+ 0 | 0.0806 | 0.64 | \|VQ | \| | \| | \| | \| |
| 2+ 5 | 0.0851 | 0.65 | \|VQ | \| | \| | \| | \| |
| 2+10 | 0.0896 | 0.65 | \|VQ | \| | \| | \| | \| |
| 2+15 | 0.0941 | 0.65 | \|VQ | \| | \| | \| | \| |
| 2+20 | 0.0986 | 0.66 | \|VQ | \| | \| | \| | \| |
| 2+25 | 0.1032 | 0.66 | \|VQ | \| | \| | \| | \| |
| 2+30 | 0.1077 | 0.66 | \|VQ | \| | \| | \| | \| |
| 2+35 | 0.1123 | 0.67 | \|VQ | \| | \| | \| | \| |
| 2+40 | 0.1169 | 0.67 | \| Q | \| | \| | \| | \| |
| 2+45 | 0.1216 | 0.67 | \| Q | \| | \| | \| | \| |
| 2+50 | 0.1262 | 0.67 | \| Q | \| | \| | \| | \| |
| 2+55 | 0.1309 | 0.68 | \| Q | \| | \| | \| | \| |
| 3+ 0 | 0.1355 | 0.68 | \| Q | \| | \| | \| | \| |
| 3+ 5 | 0.1402 | 0.68 | \| Q | \| | \| | \| | \| |
| 3+10 | 0.1449 | 0.68 | \| Q | \| | \| | \| | \| |
| 3+15 | 0.1496 | 0.68 | \| Q | \| | \| | \| | \| |
| 3+20 | 0.1543 | 0.68 | \| Q | \| | \| | \| | \| |
| 3+25 | 0.1590 | 0.69 | \| Q | \| | \| | \| | \| |
| 3+30 | 0.1638 | 0.69 | \| Q | \| | \| | \| | \| |
| 3+35 | 0.1685 | 0.69 | \| Q | \| | \| | \| | \| |
| 3+40 | 0.1733 | 0.69 | \| QV | \| | \| | \| | \| |
| 3+45 | 0.1781 | 0.69 | \| QV | \| | \| | \| | \| |
| 3+50 | 0.1829 | 0.70 | \| QV | \| | \| | \| | \| |
| 3+55 | 0.1877 | 0.70 | \| QV | \| | \| | \| | \| |
| 4+ 0 | 0.1925 | 0.70 | \| QV | \| | \| | \| | \| |
| 4+ 5 | 0.1973 | 0.70 | \| QV | \| | \| | \| | \| |
| 4+10 | 0.2022 | 0.70 | \| QV | \| | \| | \| | \| |
| 4+15 | 0.2070 | 0.71 | \| QV | \| | \| | \| | \| |
| 4+20 | 0.2119 | 0.71 | \| QV | \| | \| | \| | \| |
| 4+25 | 0.2168 | 0.71 | \| QV | \| | \| | \| | \| |
| 4+30 | 0.2217 | 0.71 | \| QV | \| | \| | \| | \| |
| 4+35 | 0.2266 | 0.71 | \| QV | \| | \| | \| | \| |
| 4+40 | 0.2315 | 0.72 | \| Q V | \| | \| | \| | \| |
| 4+45 | 0.2365 | 0.72 | \| Q V | \| | \| | \| | \| |
| 4+50 | 0.2414 | 0.72 | \| Q V | \| | \| | \| | \| |
| 4+55 | 0.2464 | 0.72 | \| Q V | \| | \| | \| | \| |
| 5+ 0 | 0.2514 | 0.72 | \| Q V | \| | \| | \| | \| |
| 5+ 5 | 0.2564 | 0.73 | \| Q V | \| | \| | \| | \| |
| 5+10 | 0.2614 | 0.73 | \| Q V | \| | \| | \| | \| |
| 5+15 | 0.2664 | 0.73 | \| Q V | \| | \| | \| | \| |
| 5+20 | 0.2715 | 0.73 | \| Q V | \| | \| | \| | \| |
| 5+25 | 0.2766 | 0.74 | \| Q V | \| | \| | \| | \| |
| 5+30 | 0.2816 | 0.74 | \| Q V | \| | \| | \| | \| |
| 5+35 | 0.2867 | 0.74 | \| Q  V | \| | \| | \| | \| |
| 5+40 | 0.2919 | 0.74 | \| Q  V | \| | \| | \| | \| |
| 5+45 | 0.2970 | 0.75 | \| Q  V | \| | \| | \| | \| |
| 5+50 | 0.3021 | 0.75 | \| Q  V | \| | \| | \| | \| |
| 5+55 | 0.3073 | 0.75 | \|  Q V | \| | \| | \| | \| |
| 6+ 0 | 0.3125 | 0.75 | \|  Q V | \| | \| | \| | \| |
| 6+ 5 | 0.3177 | 0.76 | \|  Q V | \| | \| | \| | \| |
| 6+10 | 0.3229 | 0.76 | \|  Q V | \| | \| | \| | \| |
| 6+15 | 0.3282 | 0.76 | \|  Q V | \| | \| | \| | \| |
| 6+20 | 0.3334 | 0.76 | \|  Q V | \| | \| | \| | \| |
| 6+25 | 0.3387 | 0.77 | \|  Q V | \| | \| | \| | \| |
| 6+30 | 0.3440 | 0.77 | \|  Q  V | \| | \| | \| | \| |
| 6+35 | 0.3493 | 0.77 | \|  Q  V | \| | \| | \| | \| |
| 6+40 | 0.3546 | 0.77 | \|  Q  V | \| | \| | \| | \| |
| 6+45 | 0.3600 | 0.78 | \|  Q  V | \| | \| | \| | \| |
| 6+50 | 0.3653 | 0.78 | \|  Q  V | \| | \| | \| | \| |
| 6+55 | 0.3707 | 0.78 | \|  Q  V | \| | \| | \| | \| |
| 7+ 0 | 0.3761 | 0.79 | \|  Q  V | \| | \| | \| | \| |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 7+ 5 | 0.3815 | 0.79 | Q V | | | | |
| 7+10 | 0.3870 | 0.79 | Q V | | | | |
| 7+15 | 0.3925 | 0.79 | Q V | | | | |
| 7+20 | 0.3979 | 0.80 | Q V | | | | |
| 7+25 | 0.4035 | 0.80 | Q V | | | | |
| 7+30 | 0.4090 | 0.80 | Q V | | | | |
| 7+35 | 0.4145 | 0.81 | Q V | | | | |
| 7+40 | 0.4201 | 0.81 | Q V | | | | |
| 7+45 | 0.4257 | 0.81 | Q V | | | | |
| 7+50 | 0.4313 | 0.82 | Q V | | | | |
| 7+55 | 0.4370 | 0.82 | Q V | | | | |
| 8+ 0 | 0.4426 | 0.82 | Q V | | | | |
| 8+ 5 | 0.4483 | 0.83 | Q V | | | | |
| 8+10 | 0.4540 | 0.83 | Q V | | | | |
| 8+15 | 0.4598 | 0.83 | Q V | | | | |
| 8+20 | 0.4655 | 0.84 | Q V | | | | |
| 8+25 | 0.4713 | 0.84 | Q V | | | | |
| 8+30 | 0.4771 | 0.84 | Q V | | | | |
| 8+35 | 0.4830 | 0.85 | Q V | | | | |
| 8+40 | 0.4888 | 0.85 | Q V | | | | |
| 8+45 | 0.4947 | 0.86 | Q V | | | | |
| 8+50 | 0.5006 | 0.86 | Q V | | | | |
| 8+55 | 0.5066 | 0.86 | Q V | | | | |
| 9+ 0 | 0.5126 | 0.87 | Q V | | | | |
| 9+ 5 | 0.5186 | 0.87 | Q V | | | | |
| 9+10 | 0.5246 | 0.88 | Q V | | | | |
| 9+15 | 0.5306 | 0.88 | Q V | | | | |
| 9+20 | 0.5367 | 0.88 | Q V | | | | |
| 9+25 | 0.5428 | 0.89 | Q V | | | | |
| 9+30 | 0.5490 | 0.89 | Q V | | | | |
| 9+35 | 0.5552 | 0.90 | Q V | | | | |
| 9+40 | 0.5614 | 0.90 | Q V | | | | |
| 9+45 | 0.5676 | 0.91 | Q V | | | | |
| 9+50 | 0.5739 | 0.91 | Q V | | | | |
| 9+55 | 0.5802 | 0.92 | Q V | | | | |
| 10+ 0 | 0.5865 | 0.92 | Q V | | | | |
| 10+ 5 | 0.5929 | 0.93 | Q V | | | | |
| 10+10 | 0.5993 | 0.93 | Q V | | | | |
| 10+15 | 0.6058 | 0.94 | Q V | | | | |
| 10+20 | 0.6123 | 0.94 | Q V | | | | |
| 10+25 | 0.6188 | 0.95 | Q V | | | | |
| 10+30 | 0.6253 | 0.95 | Q V | | | | |
| 10+35 | 0.6319 | 0.96 | Q V | | | | |
| 10+40 | 0.6386 | 0.96 | Q V | | | | |
| 10+45 | 0.6453 | 0.97 | Q V | | | | |
| 10+50 | 0.6520 | 0.98 | Q V | | | | |
| 10+55 | 0.6587 | 0.98 | Q V | | | | |
| 11+ 0 | 0.6655 | 0.99 | Q V | | | | |
| 11+ 5 | 0.6724 | 0.99 | Q V | | | | |
| 11+10 | 0.6793 | 1.00 | Q V | | | | |
| 11+15 | 0.6862 | 1.01 | Q V | | | | |
| 11+20 | 0.6932 | 1.01 | Q V | | | | |
| 11+25 | 0.7002 | 1.02 | Q V | | | | |
| 11+30 | 0.7073 | 1.03 | Q V | | | | |
| 11+35 | 0.7144 | 1.04 | Q V | | | | |
| 11+40 | 0.7216 | 1.04 | Q V | | | | |
| 11+45 | 0.7289 | 1.05 | Q V | | | | |
| 11+50 | 0.7362 | 1.06 | Q V | | | | |
| 11+55 | 0.7435 | 1.07 | Q V | | | | |
| 12+ 0 | 0.7509 | 1.07 | Q V | | | | |
| 12+ 5 | 0.7584 | 1.08 | Q V | | | | |
| 12+10 | 0.7658 | 1.09 | Q V | | | | |
| 12+15 | 0.7733 | 1.09 | Q V | | | | |
| 12+20 | 0.7808 | 1.08 | Q V | | | | |
| 12+25 | 0.7882 | 1.08 | Q V | | | | |
| 12+30 | 0.7957 | 1.09 | Q V | | | | |
| 12+35 | 0.8032 | 1.09 | Q V | | | | |
| 12+40 | 0.8108 | 1.10 | Q V | | | | |
| 12+45 | 0.8184 | 1.11 | Q V | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 12+50 | 0.8261 | 1.12 | Q | V | | | |
| 12+55 | 0.8339 | 1.13 | Q | V | | | |
| 13+ 0 | 0.8417 | 1.14 | Q | V | | | |
| 13+ 5 | 0.8497 | 1.15 | Q | V | | | |
| 13+10 | 0.8577 | 1.16 | Q | V | | | |
| 13+15 | 0.8657 | 1.17 | Q | V | | | |
| 13+20 | 0.8739 | 1.19 | Q | V | | | |
| 13+25 | 0.8822 | 1.20 | Q | V | | | |
| 13+30 | 0.8906 | 1.22 | Q | V | | | |
| 13+35 | 0.8991 | 1.23 | Q | V | | | |
| 13+40 | 0.9077 | 1.25 | Q | V | | | |
| 13+45 | 0.9164 | 1.26 | Q | V | | | |
| 13+50 | 0.9252 | 1.28 | Q | V | | | |
| 13+55 | 0.9341 | 1.30 | Q | V | | | |
| 14+ 0 | 0.9432 | 1.32 | Q | V | | | |
| 14+ 5 | 0.9525 | 1.34 | Q | V | | | |
| 14+10 | 0.9618 | 1.36 | Q | V | | | |
| 14+15 | 0.9714 | 1.38 | Q | V | | | |
| 14+20 | 0.9811 | 1.41 | Q | V | | | |
| 14+25 | 0.9910 | 1.43 | Q | V | | | |
| 14+30 | 1.0010 | 1.46 | Q | V | | | |
| 14+35 | 1.0113 | 1.49 | Q | V | | | |
| 14+40 | 1.0218 | 1.52 | Q | V | | | |
| 14+45 | 1.0325 | 1.56 | Q | V | | | |
| 14+50 | 1.0435 | 1.59 | Q | V | | | |
| 14+55 | 1.0547 | 1.63 | Q | V | | | |
| 15+ 0 | 1.0662 | 1.67 | Q | V | | | |
| 15+ 5 | 1.0781 | 1.72 | Q | V | | | |
| 15+10 | 1.0903 | 1.77 | Q | V | | | |
| 15+15 | 1.1028 | 1.83 | Q | V | | | |
| 15+20 | 1.1159 | 1.89 | Q | V | | | |
| 15+25 | 1.1293 | 1.94 | Q | V | | | |
| 15+30 | 1.1429 | 1.98 | Q | V | | | |
| 15+35 | 1.1565 | 1.98 | Q | V | | | |
| 15+40 | 1.1701 | 1.98 | Q | V | | | |
| 15+45 | 1.1839 | 2.01 | Q | V | | | |
| 15+50 | 1.1985 | 2.12 | Q | V | | | |
| 15+55 | 1.2146 | 2.33 | Q | V | | | |
| 16+ 0 | 1.2334 | 2.73 | Q | V | | | |
| 16+ 5 | 1.2607 | 3.97 | Q | V | | | |
| 16+10 | 1.3026 | 6.08 | Q | V Q | | | |
| 16+15 | 1.3584 | 8.10 | | V | Q | | |
| 16+20 | 1.4205 | 9.02 | | V | Q | | |
| 16+25 | 1.4750 | 7.91 | | V | Q | | |
| 16+30 | 1.5153 | 5.85 | | Q V | | | |
| 16+35 | 1.5468 | 4.57 | Q | V | | | |
| 16+40 | 1.5732 | 3.84 | Q | V | | | |
| 16+45 | 1.5971 | 3.47 | Q | V | | | |
| 16+50 | 1.6189 | 3.17 | Q | V | | | |
| 16+55 | 1.6390 | 2.92 | Q | V | | | |
| 17+ 0 | 1.6576 | 2.70 | Q | V | | | |
| 17+ 5 | 1.6748 | 2.50 | Q | V | | | |
| 17+10 | 1.6911 | 2.37 | Q | V | | | |
| 17+15 | 1.7063 | 2.21 | Q | V | | | |
| 17+20 | 1.7207 | 2.08 | Q | V | | | |
| 17+25 | 1.7342 | 1.96 | Q | V | | | |
| 17+30 | 1.7471 | 1.87 | Q | V | | | |
| 17+35 | 1.7595 | 1.80 | Q | V | | | |
| 17+40 | 1.7715 | 1.74 | Q | V | | | |
| 17+45 | 1.7829 | 1.65 | Q | V | | | |
| 17+50 | 1.7938 | 1.59 | Q | V | | | |
| 17+55 | 1.8043 | 1.52 | Q | V | | | |
| 18+ 0 | 1.8144 | 1.47 | Q | V | | | |
| 18+ 5 | 1.8242 | 1.42 | Q | V | | | |
| 18+10 | 1.8336 | 1.37 | Q | V | | | |
| 18+15 | 1.8428 | 1.33 | Q | V | | | |
| 18+20 | 1.8518 | 1.30 | Q | V | | | |
| 18+25 | 1.8606 | 1.29 | Q | V | | | |
| 18+30 | 1.8693 | 1.26 | Q | V | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 18+35 | 1.8778 | 1.23 | Q | | | V | |
| 18+40 | 1.8859 | 1.17 | Q | | | V | |
| 18+45 | 1.8935 | 1.11 | Q | | | V | |
| 18+50 | 1.9010 | 1.09 | Q | | | V | |
| 18+55 | 1.9084 | 1.07 | Q | | | V | |
| 19+ 0 | 1.9156 | 1.06 | Q | | | V | |
| 19+ 5 | 1.9228 | 1.04 | Q | | | V | |
| 19+10 | 1.9299 | 1.02 | Q | | | V | |
| 19+15 | 1.9368 | 1.01 | Q | | | V | |
| 19+20 | 1.9437 | 1.00 | Q | | | V | |
| 19+25 | 1.9504 | 0.98 | Q | | | V | |
| 19+30 | 1.9571 | 0.97 | Q | | | V | |
| 19+35 | 1.9637 | 0.96 | Q | | | V | |
| 19+40 | 1.9703 | 0.95 | Q | | | V | |
| 19+45 | 1.9767 | 0.94 | Q | | | V | |
| 19+50 | 1.9831 | 0.93 | Q | | | V | |
| 19+55 | 1.9894 | 0.92 | Q | | | V | |
| 20+ 0 | 1.9957 | 0.91 | Q | | | V | |
| 20+ 5 | 2.0018 | 0.90 | Q | | | V | |
| 20+10 | 2.0080 | 0.89 | Q | | | V | |
| 20+15 | 2.0140 | 0.88 | Q | | | V | |
| 20+20 | 2.0200 | 0.87 | Q | | | V | |
| 20+25 | 2.0260 | 0.86 | Q | | | V | |
| 20+30 | 2.0319 | 0.86 | Q | | | V | |
| 20+35 | 2.0377 | 0.85 | Q | | | V | |
| 20+40 | 2.0435 | 0.84 | Q | | | V | |
| 20+45 | 2.0492 | 0.83 | Q | | | V | |
| 20+50 | 2.0549 | 0.83 | Q | | | V | |
| 20+55 | 2.0606 | 0.82 | Q | | | V | |
| 21+ 0 | 2.0662 | 0.81 | Q | | | V | |
| 21+ 5 | 2.0717 | 0.81 | Q | | | V | |
| 21+10 | 2.0772 | 0.80 | Q | | | V | |
| 21+15 | 2.0827 | 0.79 | Q | | | V | |
| 21+20 | 2.0881 | 0.79 | Q | | | V | |
| 21+25 | 2.0935 | 0.78 | Q | | | V | |
| 21+30 | 2.0989 | 0.78 | Q | | | V | |
| 21+35 | 2.1042 | 0.77 | Q | | | V | |
| 21+40 | 2.1095 | 0.77 | Q | | | V | |
| 21+45 | 2.1147 | 0.76 | Q | | | V | |
| 21+50 | 2.1199 | 0.76 | Q | | | V | |
| 21+55 | 2.1251 | 0.75 | Q | | | V | |
| 22+ 0 | 2.1302 | 0.75 | Q | | | V | |
| 22+ 5 | 2.1353 | 0.74 | Q | | | V | |
| 22+10 | 2.1403 | 0.74 | Q | | | V | |
| 22+15 | 2.1454 | 0.73 | Q | | | V | |
| 22+20 | 2.1504 | 0.73 | Q | | | V | |
| 22+25 | 2.1554 | 0.72 | Q | | | V | |
| 22+30 | 2.1603 | 0.72 | Q | | | V | |
| 22+35 | 2.1652 | 0.71 | Q | | | V | |
| 22+40 | 2.1701 | 0.71 | Q | | | V | |
| 22+45 | 2.1749 | 0.71 | Q | | | V | |
| 22+50 | 2.1798 | 0.70 | Q | | | V | |
| 22+55 | 2.1846 | 0.70 | Q | | | V | |
| 23+ 0 | 2.1894 | 0.69 | Q | | | V | |
| 23+ 5 | 2.1941 | 0.69 | Q | | | V | |
| 23+10 | 2.1988 | 0.69 | Q | | | V | |
| 23+15 | 2.2035 | 0.68 | Q | | | V | |
| 23+20 | 2.2082 | 0.68 | Q | | | V | |
| 23+25 | 2.2128 | 0.68 | Q | | | V | |
| 23+30 | 2.2175 | 0.67 | Q | | | V | |
| 23+35 | 2.2221 | 0.67 | Q | | | V | |
| 23+40 | 2.2266 | 0.66 | Q | | | V | |
| 23+45 | 2.2312 | 0.66 | Q | | | V | |
| 23+50 | 2.2357 | 0.66 | Q | | | V | |
| 23+55 | 2.2402 | 0.66 | Q | | | V | |
| 24+ 0 | 2.2447 | 0.65 | Q | | | V | |
| 24+ 5 | 2.2491 | 0.63 | Q | | | V | |
| 24+10 | 2.2531 | 0.58 | Q | | | V | |
| 24+15 | 2.2565 | 0.49 | Q | | | V | |

```
24+20       2.2591      0.38  |Q       |         |         |         V|
24+25       2.2610      0.28  |Q       |         |         |         V|
24+30       2.2625      0.22  Q        |         |         |         V|
24+35       2.2638      0.18  Q        |         |         |         V|
24+40       2.2648      0.15  Q        |         |         |         V|
24+45       2.2657      0.13  Q        |         |         |         V|
24+50       2.2665      0.11  Q        |         |         |         V|
24+55       2.2672      0.10  Q        |         |         |         V|
25+ 0       2.2678      0.09  Q        |         |         |         V|
25+ 5       2.2683      0.07  Q        |         |         |         V|
25+10       2.2687      0.06  Q        |         |         |         V|
25+15       2.2691      0.06  Q        |         |         |         V|
25+20       2.2695      0.05  Q        |         |         |         V|
25+25       2.2698      0.04  Q        |         |         |         V|
25+30       2.2700      0.04  Q        |         |         |         V|
25+35       2.2702      0.03  Q        |         |         |         V|
25+40       2.2704      0.03  Q        |         |         |         V|
25+45       2.2706      0.02  Q        |         |         |         V|
25+50       2.2707      0.02  Q        |         |         |         V|
25+55       2.2709      0.02  Q        |         |         |         V|
26+ 0       2.2709      0.01  Q        |         |         |         V|
26+ 5       2.2710      0.01  Q        |         |         |         V|
26+10       2.2711      0.01  Q        |         |         |         V|
26+15       2.2711      0.01  Q        |         |         |         V|
26+20       2.2712      0.01  Q        |         |         |         V|
26+25       2.2712      0.00  Q        |         |         |         V|
26+30       2.2712      0.00  Q        |         |         |         V|
26+35       2.2712      0.00  Q        |         |         |         V
-------------------------------------------------------------------
```

# ATTACHMENT 3

Developed Conditions
Rational Method Calculations

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2019 Version 9.1
Rational Hydrology Study Date: 08/04/23

---

225038 - 18313 VALLEY BLVD - SB ANIMAL CARE CENTER
DEVELOPED CONDITIONS
10-YEAR, 1-HOUR STORM
BY: JTS DATE: 08-04-23

---

Program License Serial Number 6320

---

********* Hydrology Study Control Information **********

---

Rational hydrology study storm event year is 10.0
Computed rainfall intensity:
Storm year = 10.00 1 hour rainfall = 0.920 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

Process from Point/Station 0.000 to Point/Station 1.000
**** INITIAL AREA EVALUATION ****

---

Soil classification AP and SCS values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2) = 32.00
Pervious ratio(Ap) = 0.2800 Max loss rate(Fm)= 0.274(In/Hr)
Initial subarea data:
Initial area flow distance = 211.760(Ft.)
Top (of initial area) elevation = 1112.490(Ft.)
Bottom (of initial area) elevation = 1110.550(Ft.)
Difference in elevation = 1.940(Ft.)
Slope = 0.00916 s(%)= 0.92
TC = k(0.344)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 7.481 min.
Rainfall intensity = 3.209(In/Hr) for a 10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.823
Subarea runoff = 1.506(CFS)
Total initial stream area = 0.570(Ac.)
Pervious area fraction = 0.280
Initial area Fm value = 0.274(In/Hr)

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

Process from Point/Station 1.000 to Point/Station 2.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****

---

Upstream point/station elevation = 1110.550(Ft.)
Downstream point/station elevation = 1104.850(Ft.)
Pipe length = 339.03(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 1.506(CFS)
Given pipe size = 12.00(In.)
Calculated individual pipe flow = 1.506(CFS)
Normal flow depth in pipe = 4.71(In.)
Flow top width inside pipe = 11.72(In.)
Critical Depth = 6.23(In.)
Pipe flow velocity = 5.26(Ft/s)
Travel time through pipe = 1.07 min.
Time of concentration (TC) = 8.56 min.

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.000 to Point/Station        2.000
**** SUBAREA FLOW ADDITION ****
----------------------------------------------------------------------------
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.2900     Max loss rate(Fm)=     0.284(In/Hr)
Time of concentration =     8.56 min.
Rainfall intensity =      2.960(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.815
Subarea runoff =      1.246(CFS) for    0.570(Ac.)
Total runoff =      2.751(CFS)
Effective area this stream =        1.14(Ac.)
Total Study Area (Main Stream No. 1) =        1.14(Ac.)
Area averaged Fm value =    0.279(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.000 to Point/Station        3.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
----------------------------------------------------------------------------
Upstream point/station elevation =  1104.850(Ft.)
Downstream point/station elevation =  1100.400(Ft.)
Pipe length  =   605.39(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.751(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     2.751(CFS)
Normal flow depth in pipe =    6.83(In.)
Flow top width inside pipe =   17.47(In.)
Critical Depth =    7.55(In.)
Pipe flow velocity =      4.48(Ft/s)
Travel time through pipe =    2.25 min.
Time of concentration (TC) =    10.81 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        3.000
**** SUBAREA FLOW ADDITION ****
----------------------------------------------------------------------------
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1400     Max loss rate(Fm)=     0.137(In/Hr)
Time of concentration =    10.81 min.
Rainfall intensity =      2.573(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.827
Subarea runoff =      2.014(CFS) for    1.100(Ac.)
Total runoff =      4.765(CFS)
Effective area this stream =        2.24(Ac.)
Total Study Area (Main Stream No. 1) =        2.24(Ac.)
Area averaged Fm value =    0.209(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        4.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
----------------------------------------------------------------------------
Upstream point/station elevation =  1100.400(Ft.)
Downstream point/station elevation =  1090.900(Ft.)
Pipe length  =    26.74(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     4.765(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     4.765(CFS)
Normal flow depth in pipe =    3.36(In.)
Flow top width inside pipe =   14.03(In.)
```

```
Critical Depth =   10.05(In.)
Pipe flow velocity =     20.91(Ft/s)
Travel time through pipe =    0.02 min.
Time of concentration (TC) =    10.83 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        4.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      2.240(Ac.)
Runoff from this stream =      4.765(CFS)
Time of concentration =   10.83 min.
Rainfall intensity =     2.570(In/Hr)
Area averaged loss rate (Fm) =    0.2091(In/Hr)
Area averaged Pervious ratio (Ap) = 0.2138


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        5.000 to Point/Station        6.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1700     Max loss rate(Fm)=     0.166(In/Hr)
Initial subarea data:
Initial area flow distance =   580.450(Ft.)
Top (of initial area) elevation =  1112.490(Ft.)
Bottom (of initial area) elevation =  1104.400(Ft.)
Difference in elevation =     8.090(Ft.)
Slope =    0.01394  s(%)=       1.39
TC = k(0.316)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.483 min.
Rainfall intensity =      2.783(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.846
Subarea runoff =      2.190(CFS)
Total initial stream area =      0.930(Ac.)
Pervious area fraction = 0.170
Initial area Fm value =    0.166(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.000 to Point/Station        4.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________________
Upstream point/station elevation =  1100.400(Ft.)
Downstream point/station elevation =  1098.900(Ft.)
Pipe length  =    26.74(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.190(CFS)
Given pipe size =     12.00(In.)
Calculated individual pipe flow  =     2.190(CFS)
Normal flow depth in pipe =    4.17(In.)
Flow top width inside pipe =   11.43(In.)
Critical Depth =    7.58(In.)
Pipe flow velocity =      9.03(Ft/s)
Travel time through pipe =    0.05 min.
Time of concentration (TC) =     9.53 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.000 to Point/Station        4.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      0.930(Ac.)
Runoff from this stream =      2.190(CFS)
Time of concentration =    9.53 min.
```

```
Rainfall intensity =     2.774(In/Hr)
Area averaged loss rate (Fm) =    0.1662(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1700


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        0.000 to Point/Station        7.000
**** INITIAL AREA EVALUATION ****
----------------------------------------------------------------------
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.3100     Max loss rate(Fm)=     0.303(In/Hr)
Initial subarea data:
Initial area flow distance =   446.750(Ft.)
Top (of initial area) elevation =  1112.490(Ft.)
Bottom (of initial area) elevation =  1106.400(Ft.)
Difference in elevation =     6.090(Ft.)
Slope =    0.01363  s(%)=       1.36
TC = k(0.351)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.514 min.
Rainfall intensity =      2.778(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.802
Subarea runoff =      5.300(CFS)
Total initial stream area =        2.380(Ac.)
Pervious area fraction = 0.310
Initial area Fm value =    0.303(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        7.000 to Point/Station        4.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
----------------------------------------------------------------------
Upstream point/station elevation =  1102.400(Ft.)
Downstream point/station elevation =  1098.900(Ft.)
Pipe length  =    81.95(Ft.)   Manning's N = 0.130
No. of pipes = 1  Required pipe flow  =     5.300(CFS)
Given pipe size =     12.00(In.)
NOTE: Normal flow is pressure flow in user selected pipe size.
The approximate hydraulic grade line above the pipe invert is
   178.869(Ft.)  at the headworks or inlet of the pipe(s)
 Pipe friction loss =    181.309(Ft.)
 Minor friction loss =      1.061(Ft.)  K-factor =   1.50
Pipe flow velocity =      6.75(Ft/s)
Travel time through pipe =    0.20 min.
Time of concentration (TC) =     9.72 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        7.000 to Point/Station        4.000
**** CONFLUENCE OF MINOR STREAMS ****
----------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 3
Stream flow area =      2.380(Ac.)
Runoff from this stream =      5.300(CFS)
Time of concentration =    9.72 min.
Rainfall intensity =     2.743(In/Hr)
Area averaged loss rate (Fm) =    0.3031(In/Hr)
Area averaged Pervious ratio (Ap) = 0.3100
Summary of stream data:

Stream Flow rate    Area     TC      Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1      4.77     2.240     10.83    0.209      2.570
2      2.19     0.930      9.53    0.166      2.774
3      5.30     2.380      9.72    0.303      2.743
Qmax(1) =
```

```
          1.000 *    1.000 *     4.765) +
          0.922 *    1.000 *     2.190) +
          0.929 *    1.000 *     5.300) + =      11.708
Qmax(2) =
          1.087 *    0.880 *     4.765) +
          1.000 *    1.000 *     2.190) +
          1.013 *    0.981 *     5.300) + =      12.015
Qmax(3) =
          1.073 *    0.897 *     4.765) +
          0.988 *    1.000 *     2.190) +
          1.000 *    1.000 *     5.300) + =      12.052

Total of 3 streams to confluence:
Flow rates before confluence point:
       4.765       2.190       5.300
Maximum flow rates at confluence using above data:
       11.708       12.015       12.052
Area of streams before confluence:
        2.240        0.930        2.380
Effective area values after confluence:
        5.550        5.236        5.320
Results of confluence:
Total flow rate =     12.052(CFS)
Time of concentration =     9.716 min.
Effective stream area after confluence =      5.320(Ac.)
Study area average Pervious fraction(Ap) =  0.248
Study area average soil loss rate(Fm) =    0.242(In/Hr)
Study area total (this main stream) =       5.55(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        4.000 to Point/Station        4.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.8800     Max loss rate(Fm)=     0.860(In/Hr)
Time of concentration =     9.72 min.
Rainfall intensity =      2.743(In/Hr) for a    10.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.802
Subarea runoff =      0.800(CFS) for     0.520(Ac.)
Total runoff =     12.852(CFS)
Effective area this stream =        5.84(Ac.)
Total Study Area (Main Stream No. 1) =        6.07(Ac.)
Area averaged Fm value =    0.297(In/Hr)
End of computations, Total Study Area =            6.07 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.302
Area averaged SCS curve number =  32.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2019 Version 9.1
Rational Hydrology Study Date: 08/04/23

---

225038 - 18313 VALLEY BLVD - SB ANIMAL CARE CENTER
DEVELOPED CONDITIONS
100-YEAR, 1-HOUR STORM
BY: JTS DATE: 08-04-23

---

Program License Serial Number 6320

---

********* Hydrology Study Control Information **********

---

Rational hydrology study storm event year is 100.0
10 Year storm 1 hour rainfall = 0.920(In.)
100 Year storm 1 hour rainfall = 1.320(In.)
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.320 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 3

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 0.000 to Point/Station 1.000
**** INITIAL AREA EVALUATION ****

---

Soil classification AP and SCS values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2) = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.2800 Max loss rate(Fm)= 0.220(In/Hr)
Initial subarea data:
Initial area flow distance = 211.760(Ft.)
Top (of initial area) elevation = 1112.490(Ft.)
Bottom (of initial area) elevation = 1110.550(Ft.)
Difference in elevation = 1.940(Ft.)
Slope = 0.00916 s(%)= 0.92
TC = k(0.344)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 7.481 min.
Rainfall intensity = 4.604(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.857
Subarea runoff = 2.249(CFS)
Total initial stream area = 0.570(Ac.)
Pervious area fraction = 0.280
Initial area Fm value = 0.220(In/Hr)

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 1.000 to Point/Station 2.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****

---

Upstream point/station elevation = 1110.550(Ft.)
Downstream point/station elevation = 1104.850(Ft.)
Pipe length = 339.03(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 2.249(CFS)
Given pipe size = 12.00(In.)
Calculated individual pipe flow = 2.249(CFS)
Normal flow depth in pipe = 5.91(In.)
Flow top width inside pipe = 12.00(In.)
Critical Depth = 7.70(In.)
Pipe flow velocity = 5.84(Ft/s)

```
Travel time through pipe =    0.97 min.
Time of concentration (TC) =     8.45 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.000 to Point/Station        2.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.2900     Max loss rate(Fm)=     0.228(In/Hr)
Time of concentration =     8.45 min.
Rainfall intensity =      4.280(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.853
Subarea runoff =      1.913(CFS) for    0.570(Ac.)
Total runoff =      4.161(CFS)
Effective area this stream =        1.14(Ac.)
Total Study Area (Main Stream No. 1) =        1.14(Ac.)
Area averaged Fm value =    0.224(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.000 to Point/Station        3.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
________________________________________________________________________
Upstream point/station elevation =  1104.850(Ft.)
Downstream point/station elevation =  1100.400(Ft.)
Pipe length  =   605.39(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     4.161(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     4.161(CFS)
Normal flow depth in pipe =    8.60(In.)
Flow top width inside pipe =   17.98(In.)
Critical Depth =    9.38(In.)
Pipe flow velocity =      5.00(Ft/s)
Travel time through pipe =    2.02 min.
Time of concentration (TC) =    10.47 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        3.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.1400     Max loss rate(Fm)=     0.110(In/Hr)
Time of concentration =    10.47 min.
Rainfall intensity =      3.763(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.860
Subarea runoff =      3.087(CFS) for    1.100(Ac.)
Total runoff =      7.248(CFS)
Effective area this stream =        2.24(Ac.)
Total Study Area (Main Stream No. 1) =        2.24(Ac.)
Area averaged Fm value =    0.168(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        4.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
________________________________________________________________________
Upstream point/station elevation =  1100.400(Ft.)
Downstream point/station elevation =  1090.900(Ft.)
Pipe length  =    26.74(Ft.)   Manning's N = 0.013
```

```
No. of pipes = 1  Required pipe flow  =     7.248(CFS)
Given pipe size =     18.00(In.)
Calculated individual pipe flow  =     7.248(CFS)
Normal flow depth in pipe =    4.14(In.)
Flow top width inside pipe =   15.15(In.)
Critical Depth =   12.50(In.)
Pipe flow velocity =     23.65(Ft/s)
Travel time through pipe =    0.02 min.
Time of concentration (TC) =    10.49 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        4.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      2.240(Ac.)
Runoff from this stream =      7.248(CFS)
Time of concentration =   10.49 min.
Rainfall intensity =     3.759(In/Hr)
Area averaged loss rate (Fm) =    0.1679(In/Hr)
Area averaged Pervious ratio (Ap) = 0.2138


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        5.000 to Point/Station        6.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.1700     Max loss rate(Fm)=     0.133(In/Hr)
Initial subarea data:
Initial area flow distance =   580.450(Ft.)
Top (of initial area) elevation =  1112.490(Ft.)
Bottom (of initial area) elevation =  1104.400(Ft.)
Difference in elevation =     8.090(Ft.)
Slope =    0.01394  s(%)=      1.39
TC = k(0.316)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.483 min.
Rainfall intensity =     3.993(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.870
Subarea runoff =      3.230(CFS)
Total initial stream area =        0.930(Ac.)
Pervious area fraction = 0.170
Initial area Fm value =    0.133(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.000 to Point/Station        4.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
________________________________________________________________________
Upstream point/station elevation =  1100.400(Ft.)
Downstream point/station elevation =  1098.900(Ft.)
Pipe length  =    26.74(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.230(CFS)
Given pipe size =     12.00(In.)
Calculated individual pipe flow  =     3.230(CFS)
Normal flow depth in pipe =    5.15(In.)
Flow top width inside pipe =   11.88(In.)
Critical Depth =    9.23(In.)
Pipe flow velocity =     10.03(Ft/s)
Travel time through pipe =    0.04 min.
Time of concentration (TC) =     9.53 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.000 to Point/Station        4.000
```

```
**** CONFLUENCE OF MINOR STREAMS ****
____________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      0.930(Ac.)
Runoff from this stream =      3.230(CFS)
Time of concentration =    9.53 min.
Rainfall intensity =     3.982(In/Hr)
Area averaged loss rate (Fm) =    0.1335(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1700


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        0.000 to Point/Station        7.000
**** INITIAL AREA EVALUATION ****
____________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.3100     Max loss rate(Fm)=     0.243(In/Hr)
Initial subarea data:
Initial area flow distance =   446.750(Ft.)
Top (of initial area) elevation =  1112.490(Ft.)
Bottom (of initial area) elevation =  1106.400(Ft.)
Difference in elevation =     6.090(Ft.)
Slope =    0.01363  s(%)=       1.36
TC = k(0.351)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.514 min.
Rainfall intensity =      3.985(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=kCIA) is C = 0.845
Subarea runoff =      8.015(CFS)
Total initial stream area =        2.380(Ac.)
Pervious area fraction = 0.310
Initial area Fm value =    0.243(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        7.000 to Point/Station        4.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
____________________________________________________________________
Upstream point/station elevation =  1102.400(Ft.)
Downstream point/station elevation =  1098.900(Ft.)
Pipe length  =    81.95(Ft.)   Manning's N = 0.130
No. of pipes = 1  Required pipe flow  =    8.015(CFS)
Given pipe size =     12.00(In.)
NOTE: Normal flow is pressure flow in user selected pipe size.
The approximate hydraulic grade line above the pipe invert is
   413.522(Ft.)  at the headworks or inlet of the pipe(s)
 Pipe friction loss =    414.596(Ft.)
 Minor friction loss =     2.426(Ft.)  K-factor =   1.50
Pipe flow velocity =     10.20(Ft/s)
Travel time through pipe =    0.13 min.
Time of concentration (TC) =     9.65 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        7.000 to Point/Station        4.000
**** CONFLUENCE OF MINOR STREAMS ****
____________________________________________________________________
Along Main Stream number: 1 in normal stream number 3
Stream flow area =      2.380(Ac.)
Runoff from this stream =      8.015(CFS)
Time of concentration =    9.65 min.
Rainfall intensity =     3.952(In/Hr)
Area averaged loss rate (Fm) =    0.2434(In/Hr)
Area averaged Pervious ratio (Ap) = 0.3100
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
```

```
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1      7.25     2.240     10.49    0.168      3.759
2      3.23     0.930      9.53    0.133      3.982
3      8.01     2.380      9.65    0.243      3.952
Qmax(1) =
           1.000 *    1.000 *     7.248) +
           0.942 *    1.000 *     3.230) +
           0.948 *    1.000 *     8.015) + =      17.890
Qmax(2) =
           1.062 *    0.909 *     7.248) +
           1.000 *    1.000 *     3.230) +
           1.008 *    0.988 *     8.015) + =      18.203
Qmax(3) =
           1.054 *    0.920 *     7.248) +
           0.992 *    1.000 *     3.230) +
           1.000 *    1.000 *     8.015) + =      18.247

Total of 3 streams to confluence:
Flow rates before confluence point:
       7.248       3.230       8.015
Maximum flow rates at confluence using above data:
       17.890       18.203       18.247
Area of streams before confluence:
        2.240        0.930        2.380
Effective area values after confluence:
        5.550        5.315        5.371
Results of confluence:
Total flow rate =     18.247(CFS)
Time of concentration =     9.648 min.
Effective stream area after confluence =      5.371(Ac.)
Study area average Pervious fraction(Ap) =  0.248
Study area average soil loss rate(Fm) =    0.194(In/Hr)
Study area total (this main stream) =      5.55(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       4.000 to Point/Station        4.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Adjusted SCS curve number for AMC 3 = 52.00
Pervious ratio(Ap) = 0.8800     Max loss rate(Fm)=     0.691(In/Hr)
Time of concentration =     9.65 min.
Rainfall intensity =     3.952(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.846
Subarea runoff =      1.442(CFS) for    0.520(Ac.)
Total runoff =     19.689(CFS)
Effective area this stream =        5.89(Ac.)
Total Study Area (Main Stream No. 1) =        6.07(Ac.)
Area averaged Fm value =    0.238(In/Hr)
End of computations, Total Study Area =            6.07 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.302
Area averaged SCS curve number =  32.0
```

# ATTACHMENT 4

Developed Conditions
Hydrograph Calculations

U n i t  H y d r o g r a p h  A n a l y s i s



Study date 08/04/23

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------

San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6320

---

225038 - 18313 VALLEY BLVD - SB ANIMAL CARE CENTER
DEVELOPED CONDITIONS
2-YEAR, 24-HOUR STORM
BY: JTS DATE: 08-04-23

---

Storm Event Year = 2

Antecedent Moisture Condition = 1

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

| Sub-Area (Ac.) | Duration (hours) | Isohyetal (In) |
|---|---|---|
| Rainfall data for year 10 | | |
| 6.07 | 1 | 0.92 |
| Rainfall data for year 2 | | |
| 6.07 | 6 | 1.62 |
| Rainfall data for year 2 | | |
| 6.07 | 24 | 3.01 |
| Rainfall data for year 100 | | |
| 6.07 | 1 | 1.32 |
| Rainfall data for year 100 | | |
| 6.07 | 6 | 3.50 |
| Rainfall data for year 100 | | |
| 6.07 | 24 | 7.80 |

---

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

******** Area-averaged max loss rate, Fm ********

| SCS curve No.(AMCII) | SCS curve NO.(AMC 1) | Area (Ac.) | Area Fraction | Fp(Fig C6) (In/Hr) | Ap (dec.) | Fm (In/Hr) |
|---|---|---|---|---|---|---|
| 32.0 | 16.6 | 6.07 | 1.000 | 1.000 | 0.300 | 0.300 |

Area-averaged adjusted loss rate Fm (In/Hr) = 0.300

********* Area-Averaged low loss rate fraction, Yb **********

| Area (Ac.) | Area Fract | SCS CN (AMC2) | SCS CN (AMC1) | S | Pervious Yield Fr |
|---|---|---|---|---|---|
| 1.82 | 0.300 | 32.0 | 16.6 | 15.05 | 0.000 |
| 4.25 | 0.700 | 98.0 | 98.0 | 0.20 | 0.923 |

Area-averaged catchment yield fraction, Y = 0.646
Area-averaged low loss fraction, Yb = 0.354
User entry of time of concentration = 0.161 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area = 6.07(Ac.)
Catchment Lag time = 0.129 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 64.6998
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.300(In/Hr)
Average low loss rate fraction (Yb) = 0.354 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.237(In)
Computed peak 30-minute rainfall = 0.485(In)
Specified peak 1-hour rainfall = 0.640(In)
Computed peak 3-hour rainfall = 1.131(In)
Specified peak 6-hour rainfall = 1.620(In)
Specified peak 24-hour rainfall = 3.010(In)

Rainfall depth area reduction factors:
Using a total area of 6.07(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.237(In)
30-minute factor = 1.000 Adjusted rainfall = 0.485(In)
1-hour factor = 1.000 Adjusted rainfall = 0.640(In)
3-hour factor = 1.000 Adjusted rainfall = 1.131(In)
6-hour factor = 1.000 Adjusted rainfall = 1.620(In)
24-hour factor = 1.000 Adjusted rainfall = 3.010(In)
---

U n i t H y d r o g r a p h
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

| Interval Number | 'S' Graph Mean values | Unit Hydrograph ((CFS)) |
|---|---|---|
| | (K = 73.41 (CFS)) | |
| 1 | 7.542 | 5.537 |
| 2 | 47.395 | 29.256 |
| 3 | 85.692 | 28.113 |
| 4 | 96.957 | 8.270 |
| 5 | 99.041 | 1.530 |
| 6 | 100.000 | 0.704 |

---

| Peak Unit Number | Adjusted mass rainfall (In) | Unit rainfall (In) |
|---|---|---|
| 1 | 0.2370 | 0.2370 |
| 2 | 0.3127 | 0.0757 |
| 3 | 0.3677 | 0.0551 |
| 4 | 0.4126 | 0.0448 |
| 5 | 0.4511 | 0.0385 |
| 6 | 0.4852 | 0.0341 |
| 7 | 0.5161 | 0.0309 |
| 8 | 0.5444 | 0.0283 |
| 9 | 0.5706 | 0.0263 |
| 10 | 0.5952 | 0.0246 |
| 11 | 0.6183 | 0.0231 |
| 12 | 0.6402 | 0.0219 |
| 13 | 0.6673 | 0.0271 |
| 14 | 0.6935 | 0.0261 |
| 15 | 0.7187 | 0.0252 |

| | | |
|---|---|---|
| 16 | 0.7432 | 0.0244 |
| 17 | 0.7669 | 0.0237 |
| 18 | 0.7899 | 0.0231 |
| 19 | 0.8124 | 0.0224 |
| 20 | 0.8342 | 0.0219 |
| 21 | 0.8556 | 0.0214 |
| 22 | 0.8765 | 0.0209 |
| 23 | 0.8969 | 0.0204 |
| 24 | 0.9169 | 0.0200 |
| 25 | 0.9365 | 0.0196 |
| 26 | 0.9557 | 0.0192 |
| 27 | 0.9746 | 0.0189 |
| 28 | 0.9932 | 0.0185 |
| 29 | 1.0114 | 0.0182 |
| 30 | 1.0293 | 0.0179 |
| 31 | 1.0469 | 0.0176 |
| 32 | 1.0643 | 0.0174 |
| 33 | 1.0814 | 0.0171 |
| 34 | 1.0983 | 0.0169 |
| 35 | 1.1149 | 0.0166 |
| 36 | 1.1313 | 0.0164 |
| 37 | 1.1475 | 0.0162 |
| 38 | 1.1634 | 0.0160 |
| 39 | 1.1792 | 0.0158 |
| 40 | 1.1948 | 0.0156 |
| 41 | 1.2101 | 0.0154 |
| 42 | 1.2253 | 0.0152 |
| 43 | 1.2404 | 0.0150 |
| 44 | 1.2552 | 0.0149 |
| 45 | 1.2699 | 0.0147 |
| 46 | 1.2845 | 0.0145 |
| 47 | 1.2988 | 0.0144 |
| 48 | 1.3131 | 0.0142 |
| 49 | 1.3272 | 0.0141 |
| 50 | 1.3411 | 0.0140 |
| 51 | 1.3550 | 0.0138 |
| 52 | 1.3687 | 0.0137 |
| 53 | 1.3822 | 0.0136 |
| 54 | 1.3957 | 0.0134 |
| 55 | 1.4090 | 0.0133 |
| 56 | 1.4222 | 0.0132 |
| 57 | 1.4353 | 0.0131 |
| 58 | 1.4483 | 0.0130 |
| 59 | 1.4612 | 0.0129 |
| 60 | 1.4740 | 0.0128 |
| 61 | 1.4867 | 0.0127 |
| 62 | 1.4992 | 0.0126 |
| 63 | 1.5117 | 0.0125 |
| 64 | 1.5241 | 0.0124 |
| 65 | 1.5364 | 0.0123 |
| 66 | 1.5486 | 0.0122 |
| 67 | 1.5607 | 0.0121 |
| 68 | 1.5727 | 0.0120 |
| 69 | 1.5846 | 0.0119 |
| 70 | 1.5965 | 0.0119 |
| 71 | 1.6083 | 0.0118 |
| 72 | 1.6200 | 0.0117 |
| 73 | 1.6300 | 0.0100 |
| 74 | 1.6399 | 0.0099 |
| 75 | 1.6498 | 0.0099 |
| 76 | 1.6596 | 0.0098 |
| 77 | 1.6693 | 0.0097 |
| 78 | 1.6790 | 0.0097 |
| 79 | 1.6886 | 0.0096 |
| 80 | 1.6981 | 0.0095 |
| 81 | 1.7075 | 0.0095 |
| 82 | 1.7169 | 0.0094 |
| 83 | 1.7262 | 0.0093 |
| 84 | 1.7355 | 0.0093 |

| | | |
|---|---|---|
| 85 | 1.7447 | 0.0092 |
| 86 | 1.7538 | 0.0091 |
| 87 | 1.7629 | 0.0091 |
| 88 | 1.7720 | 0.0090 |
| 89 | 1.7809 | 0.0090 |
| 90 | 1.7898 | 0.0089 |
| 91 | 1.7987 | 0.0089 |
| 92 | 1.8075 | 0.0088 |
| 93 | 1.8163 | 0.0088 |
| 94 | 1.8250 | 0.0087 |
| 95 | 1.8336 | 0.0087 |
| 96 | 1.8422 | 0.0086 |
| 97 | 1.8508 | 0.0086 |
| 98 | 1.8593 | 0.0085 |
| 99 | 1.8677 | 0.0085 |
| 100 | 1.8761 | 0.0084 |
| 101 | 1.8845 | 0.0084 |
| 102 | 1.8928 | 0.0083 |
| 103 | 1.9011 | 0.0083 |
| 104 | 1.9093 | 0.0082 |
| 105 | 1.9175 | 0.0082 |
| 106 | 1.9256 | 0.0081 |
| 107 | 1.9337 | 0.0081 |
| 108 | 1.9418 | 0.0081 |
| 109 | 1.9498 | 0.0080 |
| 110 | 1.9578 | 0.0080 |
| 111 | 1.9657 | 0.0079 |
| 112 | 1.9736 | 0.0079 |
| 113 | 1.9815 | 0.0079 |
| 114 | 1.9893 | 0.0078 |
| 115 | 1.9971 | 0.0078 |
| 116 | 2.0048 | 0.0077 |
| 117 | 2.0125 | 0.0077 |
| 118 | 2.0202 | 0.0077 |
| 119 | 2.0278 | 0.0076 |
| 120 | 2.0354 | 0.0076 |
| 121 | 2.0430 | 0.0076 |
| 122 | 2.0505 | 0.0075 |
| 123 | 2.0580 | 0.0075 |
| 124 | 2.0654 | 0.0075 |
| 125 | 2.0729 | 0.0074 |
| 126 | 2.0803 | 0.0074 |
| 127 | 2.0876 | 0.0074 |
| 128 | 2.0950 | 0.0073 |
| 129 | 2.1023 | 0.0073 |
| 130 | 2.1095 | 0.0073 |
| 131 | 2.1168 | 0.0072 |
| 132 | 2.1240 | 0.0072 |
| 133 | 2.1311 | 0.0072 |
| 134 | 2.1383 | 0.0071 |
| 135 | 2.1454 | 0.0071 |
| 136 | 2.1525 | 0.0071 |
| 137 | 2.1596 | 0.0071 |
| 138 | 2.1666 | 0.0070 |
| 139 | 2.1736 | 0.0070 |
| 140 | 2.1806 | 0.0070 |
| 141 | 2.1875 | 0.0069 |
| 142 | 2.1944 | 0.0069 |
| 143 | 2.2013 | 0.0069 |
| 144 | 2.2082 | 0.0069 |
| 145 | 2.2150 | 0.0068 |
| 146 | 2.2218 | 0.0068 |
| 147 | 2.2286 | 0.0068 |
| 148 | 2.2354 | 0.0068 |
| 149 | 2.2421 | 0.0067 |
| 150 | 2.2488 | 0.0067 |
| 151 | 2.2555 | 0.0067 |
| 152 | 2.2622 | 0.0067 |
| 153 | 2.2688 | 0.0066 |

| | | |
|---|---|---|
| 154 | 2.2754 | 0.0066 |
| 155 | 2.2820 | 0.0066 |
| 156 | 2.2886 | 0.0066 |
| 157 | 2.2951 | 0.0065 |
| 158 | 2.3017 | 0.0065 |
| 159 | 2.3082 | 0.0065 |
| 160 | 2.3146 | 0.0065 |
| 161 | 2.3211 | 0.0065 |
| 162 | 2.3275 | 0.0064 |
| 163 | 2.3339 | 0.0064 |
| 164 | 2.3403 | 0.0064 |
| 165 | 2.3467 | 0.0064 |
| 166 | 2.3530 | 0.0063 |
| 167 | 2.3594 | 0.0063 |
| 168 | 2.3657 | 0.0063 |
| 169 | 2.3719 | 0.0063 |
| 170 | 2.3782 | 0.0063 |
| 171 | 2.3845 | 0.0062 |
| 172 | 2.3907 | 0.0062 |
| 173 | 2.3969 | 0.0062 |
| 174 | 2.4031 | 0.0062 |
| 175 | 2.4092 | 0.0062 |
| 176 | 2.4154 | 0.0061 |
| 177 | 2.4215 | 0.0061 |
| 178 | 2.4276 | 0.0061 |
| 179 | 2.4337 | 0.0061 |
| 180 | 2.4397 | 0.0061 |
| 181 | 2.4458 | 0.0060 |
| 182 | 2.4518 | 0.0060 |
| 183 | 2.4578 | 0.0060 |
| 184 | 2.4638 | 0.0060 |
| 185 | 2.4698 | 0.0060 |
| 186 | 2.4758 | 0.0060 |
| 187 | 2.4817 | 0.0059 |
| 188 | 2.4876 | 0.0059 |
| 189 | 2.4935 | 0.0059 |
| 190 | 2.4994 | 0.0059 |
| 191 | 2.5053 | 0.0059 |
| 192 | 2.5111 | 0.0059 |
| 193 | 2.5170 | 0.0058 |
| 194 | 2.5228 | 0.0058 |
| 195 | 2.5286 | 0.0058 |
| 196 | 2.5344 | 0.0058 |
| 197 | 2.5401 | 0.0058 |
| 198 | 2.5459 | 0.0058 |
| 199 | 2.5516 | 0.0057 |
| 200 | 2.5574 | 0.0057 |
| 201 | 2.5631 | 0.0057 |
| 202 | 2.5688 | 0.0057 |
| 203 | 2.5744 | 0.0057 |
| 204 | 2.5801 | 0.0057 |
| 205 | 2.5857 | 0.0056 |
| 206 | 2.5914 | 0.0056 |
| 207 | 2.5970 | 0.0056 |
| 208 | 2.6026 | 0.0056 |
| 209 | 2.6082 | 0.0056 |
| 210 | 2.6137 | 0.0056 |
| 211 | 2.6193 | 0.0056 |
| 212 | 2.6248 | 0.0055 |
| 213 | 2.6304 | 0.0055 |
| 214 | 2.6359 | 0.0055 |
| 215 | 2.6414 | 0.0055 |
| 216 | 2.6468 | 0.0055 |
| 217 | 2.6523 | 0.0055 |
| 218 | 2.6578 | 0.0055 |
| 219 | 2.6632 | 0.0054 |
| 220 | 2.6686 | 0.0054 |
| 221 | 2.6741 | 0.0054 |
| 222 | 2.6795 | 0.0054 |

| | | | |
|---|---|---|---|
| 223 | 2.6848 | 0.0054 | |
| 224 | 2.6902 | 0.0054 | |
| 225 | 2.6956 | 0.0054 | |
| 226 | 2.7009 | 0.0053 | |
| 227 | 2.7063 | 0.0053 | |
| 228 | 2.7116 | 0.0053 | |
| 229 | 2.7169 | 0.0053 | |
| 230 | 2.7222 | 0.0053 | |
| 231 | 2.7275 | 0.0053 | |
| 232 | 2.7327 | 0.0053 | |
| 233 | 2.7380 | 0.0053 | |
| 234 | 2.7432 | 0.0052 | |
| 235 | 2.7485 | 0.0052 | |
| 236 | 2.7537 | 0.0052 | |
| 237 | 2.7589 | 0.0052 | |
| 238 | 2.7641 | 0.0052 | |
| 239 | 2.7693 | 0.0052 | |
| 240 | 2.7745 | 0.0052 | |
| 241 | 2.7796 | 0.0052 | |
| 242 | 2.7848 | 0.0051 | |
| 243 | 2.7899 | 0.0051 | |
| 244 | 2.7950 | 0.0051 | |
| 245 | 2.8001 | 0.0051 | |
| 246 | 2.8052 | 0.0051 | |
| 247 | 2.8103 | 0.0051 | |
| 248 | 2.8154 | 0.0051 | |
| 249 | 2.8205 | 0.0051 | |
| 250 | 2.8255 | 0.0051 | |
| 251 | 2.8306 | 0.0050 | |
| 252 | 2.8356 | 0.0050 | |
| 253 | 2.8406 | 0.0050 | |
| 254 | 2.8456 | 0.0050 | |
| 255 | 2.8506 | 0.0050 | |
| 256 | 2.8556 | 0.0050 | |
| 257 | 2.8606 | 0.0050 | |
| 258 | 2.8656 | 0.0050 | |
| 259 | 2.8705 | 0.0050 | |
| 260 | 2.8755 | 0.0049 | |
| 261 | 2.8804 | 0.0049 | |
| 262 | 2.8854 | 0.0049 | |
| 263 | 2.8903 | 0.0049 | |
| 264 | 2.8952 | 0.0049 | |
| 265 | 2.9001 | 0.0049 | |
| 266 | 2.9050 | 0.0049 | |
| 267 | 2.9098 | 0.0049 | |
| 268 | 2.9147 | 0.0049 | |
| 269 | 2.9196 | 0.0049 | |
| 270 | 2.9244 | 0.0048 | |
| 271 | 2.9292 | 0.0048 | |
| 272 | 2.9341 | 0.0048 | |
| 273 | 2.9389 | 0.0048 | |
| 274 | 2.9437 | 0.0048 | |
| 275 | 2.9485 | 0.0048 | |
| 276 | 2.9533 | 0.0048 | |
| 277 | 2.9580 | 0.0048 | |
| 278 | 2.9628 | 0.0048 | |
| 279 | 2.9676 | 0.0048 | |
| 280 | 2.9723 | 0.0047 | |
| 281 | 2.9771 | 0.0047 | |
| 282 | 2.9818 | 0.0047 | |
| 283 | 2.9865 | 0.0047 | |
| 284 | 2.9912 | 0.0047 | |
| 285 | 2.9959 | 0.0047 | |
| 286 | 3.0006 | 0.0047 | |
| 287 | 3.0053 | 0.0047 | |
| 288 | 3.0100 | 0.0047 | |

| Unit Period | Unit Rainfall | Unit Soil-Loss | Effective Rainfall |
|---|---|---|---|

| (number) | (In) | (In) | (In) |
|---|---|---|---|
| 1 | 0.0047 | 0.0017 | 0.0030 |
| 2 | 0.0047 | 0.0017 | 0.0030 |
| 3 | 0.0047 | 0.0017 | 0.0030 |
| 4 | 0.0047 | 0.0017 | 0.0030 |
| 5 | 0.0047 | 0.0017 | 0.0031 |
| 6 | 0.0047 | 0.0017 | 0.0031 |
| 7 | 0.0048 | 0.0017 | 0.0031 |
| 8 | 0.0048 | 0.0017 | 0.0031 |
| 9 | 0.0048 | 0.0017 | 0.0031 |
| 10 | 0.0048 | 0.0017 | 0.0031 |
| 11 | 0.0048 | 0.0017 | 0.0031 |
| 12 | 0.0048 | 0.0017 | 0.0031 |
| 13 | 0.0048 | 0.0017 | 0.0031 |
| 14 | 0.0049 | 0.0017 | 0.0031 |
| 15 | 0.0049 | 0.0017 | 0.0032 |
| 16 | 0.0049 | 0.0017 | 0.0032 |
| 17 | 0.0049 | 0.0017 | 0.0032 |
| 18 | 0.0049 | 0.0017 | 0.0032 |
| 19 | 0.0049 | 0.0017 | 0.0032 |
| 20 | 0.0049 | 0.0018 | 0.0032 |
| 21 | 0.0050 | 0.0018 | 0.0032 |
| 22 | 0.0050 | 0.0018 | 0.0032 |
| 23 | 0.0050 | 0.0018 | 0.0032 |
| 24 | 0.0050 | 0.0018 | 0.0032 |
| 25 | 0.0050 | 0.0018 | 0.0033 |
| 26 | 0.0050 | 0.0018 | 0.0033 |
| 27 | 0.0051 | 0.0018 | 0.0033 |
| 28 | 0.0051 | 0.0018 | 0.0033 |
| 29 | 0.0051 | 0.0018 | 0.0033 |
| 30 | 0.0051 | 0.0018 | 0.0033 |
| 31 | 0.0051 | 0.0018 | 0.0033 |
| 32 | 0.0051 | 0.0018 | 0.0033 |
| 33 | 0.0052 | 0.0018 | 0.0033 |
| 34 | 0.0052 | 0.0018 | 0.0033 |
| 35 | 0.0052 | 0.0018 | 0.0034 |
| 36 | 0.0052 | 0.0018 | 0.0034 |
| 37 | 0.0052 | 0.0019 | 0.0034 |
| 38 | 0.0053 | 0.0019 | 0.0034 |
| 39 | 0.0053 | 0.0019 | 0.0034 |
| 40 | 0.0053 | 0.0019 | 0.0034 |
| 41 | 0.0053 | 0.0019 | 0.0034 |
| 42 | 0.0053 | 0.0019 | 0.0034 |
| 43 | 0.0054 | 0.0019 | 0.0035 |
| 44 | 0.0054 | 0.0019 | 0.0035 |
| 45 | 0.0054 | 0.0019 | 0.0035 |
| 46 | 0.0054 | 0.0019 | 0.0035 |
| 47 | 0.0054 | 0.0019 | 0.0035 |
| 48 | 0.0055 | 0.0019 | 0.0035 |
| 49 | 0.0055 | 0.0019 | 0.0035 |
| 50 | 0.0055 | 0.0019 | 0.0036 |
| 51 | 0.0055 | 0.0020 | 0.0036 |
| 52 | 0.0055 | 0.0020 | 0.0036 |
| 53 | 0.0056 | 0.0020 | 0.0036 |
| 54 | 0.0056 | 0.0020 | 0.0036 |
| 55 | 0.0056 | 0.0020 | 0.0036 |
| 56 | 0.0056 | 0.0020 | 0.0036 |
| 57 | 0.0057 | 0.0020 | 0.0037 |
| 58 | 0.0057 | 0.0020 | 0.0037 |
| 59 | 0.0057 | 0.0020 | 0.0037 |
| 60 | 0.0057 | 0.0020 | 0.0037 |
| 61 | 0.0058 | 0.0020 | 0.0037 |
| 62 | 0.0058 | 0.0020 | 0.0037 |
| 63 | 0.0058 | 0.0021 | 0.0037 |
| 64 | 0.0058 | 0.0021 | 0.0038 |
| 65 | 0.0059 | 0.0021 | 0.0038 |
| 66 | 0.0059 | 0.0021 | 0.0038 |
| 67 | 0.0059 | 0.0021 | 0.0038 |

| | | | |
|---|---|---|---|
| 68 | 0.0059 | 0.0021 | 0.0038 |
| 69 | 0.0060 | 0.0021 | 0.0038 |
| 70 | 0.0060 | 0.0021 | 0.0039 |
| 71 | 0.0060 | 0.0021 | 0.0039 |
| 72 | 0.0060 | 0.0021 | 0.0039 |
| 73 | 0.0061 | 0.0021 | 0.0039 |
| 74 | 0.0061 | 0.0022 | 0.0039 |
| 75 | 0.0061 | 0.0022 | 0.0040 |
| 76 | 0.0061 | 0.0022 | 0.0040 |
| 77 | 0.0062 | 0.0022 | 0.0040 |
| 78 | 0.0062 | 0.0022 | 0.0040 |
| 79 | 0.0062 | 0.0022 | 0.0040 |
| 80 | 0.0063 | 0.0022 | 0.0040 |
| 81 | 0.0063 | 0.0022 | 0.0041 |
| 82 | 0.0063 | 0.0022 | 0.0041 |
| 83 | 0.0064 | 0.0023 | 0.0041 |
| 84 | 0.0064 | 0.0023 | 0.0041 |
| 85 | 0.0064 | 0.0023 | 0.0042 |
| 86 | 0.0065 | 0.0023 | 0.0042 |
| 87 | 0.0065 | 0.0023 | 0.0042 |
| 88 | 0.0065 | 0.0023 | 0.0042 |
| 89 | 0.0066 | 0.0023 | 0.0042 |
| 90 | 0.0066 | 0.0023 | 0.0043 |
| 91 | 0.0066 | 0.0023 | 0.0043 |
| 92 | 0.0067 | 0.0024 | 0.0043 |
| 93 | 0.0067 | 0.0024 | 0.0043 |
| 94 | 0.0067 | 0.0024 | 0.0044 |
| 95 | 0.0068 | 0.0024 | 0.0044 |
| 96 | 0.0068 | 0.0024 | 0.0044 |
| 97 | 0.0069 | 0.0024 | 0.0044 |
| 98 | 0.0069 | 0.0024 | 0.0045 |
| 99 | 0.0069 | 0.0025 | 0.0045 |
| 100 | 0.0070 | 0.0025 | 0.0045 |
| 101 | 0.0070 | 0.0025 | 0.0045 |
| 102 | 0.0071 | 0.0025 | 0.0046 |
| 103 | 0.0071 | 0.0025 | 0.0046 |
| 104 | 0.0071 | 0.0025 | 0.0046 |
| 105 | 0.0072 | 0.0026 | 0.0047 |
| 106 | 0.0072 | 0.0026 | 0.0047 |
| 107 | 0.0073 | 0.0026 | 0.0047 |
| 108 | 0.0073 | 0.0026 | 0.0047 |
| 109 | 0.0074 | 0.0026 | 0.0048 |
| 110 | 0.0074 | 0.0026 | 0.0048 |
| 111 | 0.0075 | 0.0027 | 0.0048 |
| 112 | 0.0075 | 0.0027 | 0.0049 |
| 113 | 0.0076 | 0.0027 | 0.0049 |
| 114 | 0.0076 | 0.0027 | 0.0049 |
| 115 | 0.0077 | 0.0027 | 0.0050 |
| 116 | 0.0077 | 0.0027 | 0.0050 |
| 117 | 0.0078 | 0.0028 | 0.0051 |
| 118 | 0.0079 | 0.0028 | 0.0051 |
| 119 | 0.0079 | 0.0028 | 0.0051 |
| 120 | 0.0080 | 0.0028 | 0.0052 |
| 121 | 0.0081 | 0.0029 | 0.0052 |
| 122 | 0.0081 | 0.0029 | 0.0052 |
| 123 | 0.0082 | 0.0029 | 0.0053 |
| 124 | 0.0082 | 0.0029 | 0.0053 |
| 125 | 0.0083 | 0.0029 | 0.0054 |
| 126 | 0.0084 | 0.0030 | 0.0054 |
| 127 | 0.0085 | 0.0030 | 0.0055 |
| 128 | 0.0085 | 0.0030 | 0.0055 |
| 129 | 0.0086 | 0.0030 | 0.0056 |
| 130 | 0.0087 | 0.0031 | 0.0056 |
| 131 | 0.0088 | 0.0031 | 0.0057 |
| 132 | 0.0088 | 0.0031 | 0.0057 |
| 133 | 0.0089 | 0.0032 | 0.0058 |
| 134 | 0.0090 | 0.0032 | 0.0058 |
| 135 | 0.0091 | 0.0032 | 0.0059 |
| 136 | 0.0091 | 0.0032 | 0.0059 |

| | | | |
|---|---|---|---|
| 137 | 0.0093 | 0.0033 | 0.0060 |
| 138 | 0.0093 | 0.0033 | 0.0060 |
| 139 | 0.0095 | 0.0033 | 0.0061 |
| 140 | 0.0095 | 0.0034 | 0.0062 |
| 141 | 0.0097 | 0.0034 | 0.0062 |
| 142 | 0.0097 | 0.0034 | 0.0063 |
| 143 | 0.0099 | 0.0035 | 0.0064 |
| 144 | 0.0099 | 0.0035 | 0.0064 |
| 145 | 0.0117 | 0.0041 | 0.0076 |
| 146 | 0.0118 | 0.0042 | 0.0076 |
| 147 | 0.0119 | 0.0042 | 0.0077 |
| 148 | 0.0120 | 0.0043 | 0.0078 |
| 149 | 0.0122 | 0.0043 | 0.0079 |
| 150 | 0.0123 | 0.0043 | 0.0079 |
| 151 | 0.0125 | 0.0044 | 0.0081 |
| 152 | 0.0126 | 0.0045 | 0.0081 |
| 153 | 0.0128 | 0.0045 | 0.0083 |
| 154 | 0.0129 | 0.0046 | 0.0083 |
| 155 | 0.0131 | 0.0046 | 0.0085 |
| 156 | 0.0132 | 0.0047 | 0.0085 |
| 157 | 0.0134 | 0.0048 | 0.0087 |
| 158 | 0.0136 | 0.0048 | 0.0088 |
| 159 | 0.0138 | 0.0049 | 0.0089 |
| 160 | 0.0140 | 0.0049 | 0.0090 |
| 161 | 0.0142 | 0.0050 | 0.0092 |
| 162 | 0.0144 | 0.0051 | 0.0093 |
| 163 | 0.0147 | 0.0052 | 0.0095 |
| 164 | 0.0149 | 0.0053 | 0.0096 |
| 165 | 0.0152 | 0.0054 | 0.0098 |
| 166 | 0.0154 | 0.0054 | 0.0099 |
| 167 | 0.0158 | 0.0056 | 0.0102 |
| 168 | 0.0160 | 0.0056 | 0.0103 |
| 169 | 0.0164 | 0.0058 | 0.0106 |
| 170 | 0.0166 | 0.0059 | 0.0107 |
| 171 | 0.0171 | 0.0061 | 0.0111 |
| 172 | 0.0174 | 0.0061 | 0.0112 |
| 173 | 0.0179 | 0.0063 | 0.0116 |
| 174 | 0.0182 | 0.0064 | 0.0118 |
| 175 | 0.0189 | 0.0067 | 0.0122 |
| 176 | 0.0192 | 0.0068 | 0.0124 |
| 177 | 0.0200 | 0.0071 | 0.0129 |
| 178 | 0.0204 | 0.0072 | 0.0132 |
| 179 | 0.0214 | 0.0076 | 0.0138 |
| 180 | 0.0219 | 0.0077 | 0.0141 |
| 181 | 0.0231 | 0.0082 | 0.0149 |
| 182 | 0.0237 | 0.0084 | 0.0153 |
| 183 | 0.0252 | 0.0089 | 0.0163 |
| 184 | 0.0261 | 0.0092 | 0.0169 |
| 185 | 0.0219 | 0.0078 | 0.0141 |
| 186 | 0.0231 | 0.0082 | 0.0149 |
| 187 | 0.0263 | 0.0093 | 0.0170 |
| 188 | 0.0283 | 0.0100 | 0.0183 |
| 189 | 0.0341 | 0.0121 | 0.0220 |
| 190 | 0.0385 | 0.0136 | 0.0249 |
| 191 | 0.0551 | 0.0195 | 0.0356 |
| 192 | 0.0757 | 0.0250 | 0.0507 |
| 193 | 0.2370 | 0.0250 | 0.2120 |
| 194 | 0.0448 | 0.0159 | 0.0290 |
| 195 | 0.0309 | 0.0109 | 0.0199 |
| 196 | 0.0246 | 0.0087 | 0.0159 |
| 197 | 0.0271 | 0.0096 | 0.0175 |
| 198 | 0.0244 | 0.0087 | 0.0158 |
| 199 | 0.0224 | 0.0079 | 0.0145 |
| 200 | 0.0209 | 0.0074 | 0.0135 |
| 201 | 0.0196 | 0.0069 | 0.0127 |
| 202 | 0.0185 | 0.0066 | 0.0120 |
| 203 | 0.0176 | 0.0062 | 0.0114 |
| 204 | 0.0169 | 0.0060 | 0.0109 |
| 205 | 0.0162 | 0.0057 | 0.0104 |

| | | | |
|---|---|---|---|
| 206 | 0.0156 | 0.0055 | 0.0101 |
| 207 | 0.0150 | 0.0053 | 0.0097 |
| 208 | 0.0145 | 0.0051 | 0.0094 |
| 209 | 0.0141 | 0.0050 | 0.0091 |
| 210 | 0.0137 | 0.0048 | 0.0089 |
| 211 | 0.0133 | 0.0047 | 0.0086 |
| 212 | 0.0130 | 0.0046 | 0.0084 |
| 213 | 0.0127 | 0.0045 | 0.0082 |
| 214 | 0.0124 | 0.0044 | 0.0080 |
| 215 | 0.0121 | 0.0043 | 0.0078 |
| 216 | 0.0119 | 0.0042 | 0.0077 |
| 217 | 0.0100 | 0.0035 | 0.0065 |
| 218 | 0.0098 | 0.0035 | 0.0063 |
| 219 | 0.0096 | 0.0034 | 0.0062 |
| 220 | 0.0094 | 0.0033 | 0.0061 |
| 221 | 0.0092 | 0.0033 | 0.0059 |
| 222 | 0.0090 | 0.0032 | 0.0058 |
| 223 | 0.0089 | 0.0031 | 0.0057 |
| 224 | 0.0087 | 0.0031 | 0.0056 |
| 225 | 0.0086 | 0.0030 | 0.0055 |
| 226 | 0.0084 | 0.0030 | 0.0054 |
| 227 | 0.0083 | 0.0029 | 0.0053 |
| 228 | 0.0081 | 0.0029 | 0.0053 |
| 229 | 0.0080 | 0.0028 | 0.0052 |
| 230 | 0.0079 | 0.0028 | 0.0051 |
| 231 | 0.0078 | 0.0028 | 0.0050 |
| 232 | 0.0077 | 0.0027 | 0.0050 |
| 233 | 0.0076 | 0.0027 | 0.0049 |
| 234 | 0.0075 | 0.0026 | 0.0048 |
| 235 | 0.0074 | 0.0026 | 0.0048 |
| 236 | 0.0073 | 0.0026 | 0.0047 |
| 237 | 0.0072 | 0.0025 | 0.0046 |
| 238 | 0.0071 | 0.0025 | 0.0046 |
| 239 | 0.0070 | 0.0025 | 0.0045 |
| 240 | 0.0069 | 0.0024 | 0.0045 |
| 241 | 0.0068 | 0.0024 | 0.0044 |
| 242 | 0.0068 | 0.0024 | 0.0044 |
| 243 | 0.0067 | 0.0024 | 0.0043 |
| 244 | 0.0066 | 0.0023 | 0.0043 |
| 245 | 0.0065 | 0.0023 | 0.0042 |
| 246 | 0.0065 | 0.0023 | 0.0042 |
| 247 | 0.0064 | 0.0023 | 0.0041 |
| 248 | 0.0063 | 0.0022 | 0.0041 |
| 249 | 0.0063 | 0.0022 | 0.0041 |
| 250 | 0.0062 | 0.0022 | 0.0040 |
| 251 | 0.0062 | 0.0022 | 0.0040 |
| 252 | 0.0061 | 0.0022 | 0.0039 |
| 253 | 0.0060 | 0.0021 | 0.0039 |
| 254 | 0.0060 | 0.0021 | 0.0039 |
| 255 | 0.0059 | 0.0021 | 0.0038 |
| 256 | 0.0059 | 0.0021 | 0.0038 |
| 257 | 0.0058 | 0.0021 | 0.0038 |
| 258 | 0.0058 | 0.0020 | 0.0037 |
| 259 | 0.0057 | 0.0020 | 0.0037 |
| 260 | 0.0057 | 0.0020 | 0.0037 |
| 261 | 0.0056 | 0.0020 | 0.0036 |
| 262 | 0.0056 | 0.0020 | 0.0036 |
| 263 | 0.0056 | 0.0020 | 0.0036 |
| 264 | 0.0055 | 0.0020 | 0.0036 |
| 265 | 0.0055 | 0.0019 | 0.0035 |
| 266 | 0.0054 | 0.0019 | 0.0035 |
| 267 | 0.0054 | 0.0019 | 0.0035 |
| 268 | 0.0053 | 0.0019 | 0.0035 |
| 269 | 0.0053 | 0.0019 | 0.0034 |
| 270 | 0.0053 | 0.0019 | 0.0034 |
| 271 | 0.0052 | 0.0019 | 0.0034 |
| 272 | 0.0052 | 0.0018 | 0.0034 |
| 273 | 0.0052 | 0.0018 | 0.0033 |
| 274 | 0.0051 | 0.0018 | 0.0033 |

| | | | |
|---|---|---|---|
| 275 | 0.0051 | 0.0018 | 0.0033 |
| 276 | 0.0051 | 0.0018 | 0.0033 |
| 277 | 0.0050 | 0.0018 | 0.0032 |
| 278 | 0.0050 | 0.0018 | 0.0032 |
| 279 | 0.0050 | 0.0018 | 0.0032 |
| 280 | 0.0049 | 0.0017 | 0.0032 |
| 281 | 0.0049 | 0.0017 | 0.0032 |
| 282 | 0.0049 | 0.0017 | 0.0031 |
| 283 | 0.0048 | 0.0017 | 0.0031 |
| 284 | 0.0048 | 0.0017 | 0.0031 |
| 285 | 0.0048 | 0.0017 | 0.0031 |
| 286 | 0.0047 | 0.0017 | 0.0031 |
| 287 | 0.0047 | 0.0017 | 0.0031 |
| 288 | 0.0047 | 0.0017 | 0.0030 |

---

---

Total soil rain loss = 1.00(In)
Total effective rainfall = 2.01(In)
Peak flow rate in flood hydrograph = 8.13(CFS)

---

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

---

Hydrograph in 5 Minute intervals ((CFS))

---

| Time(h+m) | Volume Ac.Ft | Q(CFS) | 0 | 2.5 | 5.0 | 7.5 | 10.0 |
|---|---|---|---|---|---|---|---|
| 0+ 5 | 0.0001 | 0.02 | Q | | | | |
| 0+10 | 0.0008 | 0.11 | Q | | | | |
| 0+15 | 0.0021 | 0.19 | Q | | | | |
| 0+20 | 0.0036 | 0.22 | Q | | | | |
| 0+25 | 0.0052 | 0.22 | Q | | | | |
| 0+30 | 0.0067 | 0.22 | Q | | | | |
| 0+35 | 0.0082 | 0.22 | Q | | | | |
| 0+40 | 0.0098 | 0.23 | Q | | | | |
| 0+45 | 0.0114 | 0.23 | Q | | | | |
| 0+50 | 0.0129 | 0.23 | Q | | | | |
| 0+55 | 0.0145 | 0.23 | Q | | | | |
| 1+ 0 | 0.0160 | 0.23 | Q | | | | |
| 1+ 5 | 0.0176 | 0.23 | Q | | | | |
| 1+10 | 0.0192 | 0.23 | Q | | | | |
| 1+15 | 0.0208 | 0.23 | Q | | | | |
| 1+20 | 0.0224 | 0.23 | Q | | | | |
| 1+25 | 0.0240 | 0.23 | Q | | | | |
| 1+30 | 0.0256 | 0.23 | QV | | | | |
| 1+35 | 0.0272 | 0.23 | QV | | | | |
| 1+40 | 0.0288 | 0.23 | QV | | | | |
| 1+45 | 0.0304 | 0.23 | QV | | | | |
| 1+50 | 0.0320 | 0.24 | QV | | | | |
| 1+55 | 0.0336 | 0.24 | QV | | | | |
| 2+ 0 | 0.0353 | 0.24 | QV | | | | |
| 2+ 5 | 0.0369 | 0.24 | QV | | | | |
| 2+10 | 0.0385 | 0.24 | QV | | | | |
| 2+15 | 0.0402 | 0.24 | QV | | | | |
| 2+20 | 0.0418 | 0.24 | QV | | | | |
| 2+25 | 0.0435 | 0.24 | QV | | | | |
| 2+30 | 0.0452 | 0.24 | QV | | | | |
| 2+35 | 0.0468 | 0.24 | QV | | | | |
| 2+40 | 0.0485 | 0.24 | QV | | | | |
| 2+45 | 0.0502 | 0.24 | QV | | | | |
| 2+50 | 0.0519 | 0.24 | Q V | | | | |
| 2+55 | 0.0535 | 0.25 | Q V | | | | |
| 3+ 0 | 0.0552 | 0.25 | Q V | | | | |
| 3+ 5 | 0.0569 | 0.25 | Q V | | | | |
| 3+10 | 0.0587 | 0.25 | Q V | | | | |
| 3+15 | 0.0604 | 0.25 | Q V | | | | |
| 3+20 | 0.0621 | 0.25 | Q V | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3+25 | 0.0638 | 0.25 | \|QV | \| | \| | \| | \| |
| 3+30 | 0.0655 | 0.25 | \|QV | \| | \| | \| | \| |
| 3+35 | 0.0673 | 0.25 | \|QV | \| | \| | \| | \| |
| 3+40 | 0.0690 | 0.25 | \|QV | \| | \| | \| | \| |
| 3+45 | 0.0708 | 0.25 | \|QV | \| | \| | \| | \| |
| 3+50 | 0.0725 | 0.26 | \|QV | \| | \| | \| | \| |
| 3+55 | 0.0743 | 0.26 | \|QV | \| | \| | \| | \| |
| 4+ 0 | 0.0761 | 0.26 | \|Q V | \| | \| | \| | \| |
| 4+ 5 | 0.0779 | 0.26 | \|Q V | \| | \| | \| | \| |
| 4+10 | 0.0796 | 0.26 | \|Q V | \| | \| | \| | \| |
| 4+15 | 0.0814 | 0.26 | \|Q V | \| | \| | \| | \| |
| 4+20 | 0.0832 | 0.26 | \|Q V | \| | \| | \| | \| |
| 4+25 | 0.0850 | 0.26 | \|Q V | \| | \| | \| | \| |
| 4+30 | 0.0869 | 0.26 | \|Q V | \| | \| | \| | \| |
| 4+35 | 0.0887 | 0.26 | \|Q V | \| | \| | \| | \| |
| 4+40 | 0.0905 | 0.27 | \|Q V | \| | \| | \| | \| |
| 4+45 | 0.0923 | 0.27 | \|Q V | \| | \| | \| | \| |
| 4+50 | 0.0942 | 0.27 | \|Q V | \| | \| | \| | \| |
| 4+55 | 0.0960 | 0.27 | \|Q V | \| | \| | \| | \| |
| 5+ 0 | 0.0979 | 0.27 | \|Q V | \| | \| | \| | \| |
| 5+ 5 | 0.0998 | 0.27 | \|Q V | \| | \| | \| | \| |
| 5+10 | 0.1016 | 0.27 | \|Q  V | \| | \| | \| | \| |
| 5+15 | 0.1035 | 0.27 | \|Q  V | \| | \| | \| | \| |
| 5+20 | 0.1054 | 0.27 | \|Q  V | \| | \| | \| | \| |
| 5+25 | 0.1073 | 0.28 | \|Q  V | \| | \| | \| | \| |
| 5+30 | 0.1092 | 0.28 | \|Q  V | \| | \| | \| | \| |
| 5+35 | 0.1111 | 0.28 | \|Q  V | \| | \| | \| | \| |
| 5+40 | 0.1130 | 0.28 | \|Q  V | \| | \| | \| | \| |
| 5+45 | 0.1150 | 0.28 | \|Q  V | \| | \| | \| | \| |
| 5+50 | 0.1169 | 0.28 | \|Q  V | \| | \| | \| | \| |
| 5+55 | 0.1189 | 0.28 | \|Q  V | \| | \| | \| | \| |
| 6+ 0 | 0.1208 | 0.28 | \|Q  V | \| | \| | \| | \| |
| 6+ 5 | 0.1228 | 0.29 | \|Q  V | \| | \| | \| | \| |
| 6+10 | 0.1248 | 0.29 | \|Q  V | \| | \| | \| | \| |
| 6+15 | 0.1267 | 0.29 | \|Q   V | \| | \| | \| | \| |
| 6+20 | 0.1287 | 0.29 | \|Q   V | \| | \| | \| | \| |
| 6+25 | 0.1307 | 0.29 | \|Q   V | \| | \| | \| | \| |
| 6+30 | 0.1327 | 0.29 | \|Q   V | \| | \| | \| | \| |
| 6+35 | 0.1348 | 0.29 | \|Q   V | \| | \| | \| | \| |
| 6+40 | 0.1368 | 0.29 | \|Q   V | \| | \| | \| | \| |
| 6+45 | 0.1388 | 0.30 | \|Q   V | \| | \| | \| | \| |
| 6+50 | 0.1409 | 0.30 | \|Q   V | \| | \| | \| | \| |
| 6+55 | 0.1430 | 0.30 | \|Q   V | \| | \| | \| | \| |
| 7+ 0 | 0.1450 | 0.30 | \|Q   V | \| | \| | \| | \| |
| 7+ 5 | 0.1471 | 0.30 | \|Q   V | \| | \| | \| | \| |
| 7+10 | 0.1492 | 0.30 | \|Q   V | \| | \| | \| | \| |
| 7+15 | 0.1513 | 0.31 | \|Q   V | \| | \| | \| | \| |
| 7+20 | 0.1534 | 0.31 | \|Q    V | \| | \| | \| | \| |
| 7+25 | 0.1555 | 0.31 | \|Q    V | \| | \| | \| | \| |
| 7+30 | 0.1577 | 0.31 | \|Q    V | \| | \| | \| | \| |
| 7+35 | 0.1598 | 0.31 | \|Q    V | \| | \| | \| | \| |
| 7+40 | 0.1620 | 0.31 | \|Q    V | \| | \| | \| | \| |
| 7+45 | 0.1642 | 0.32 | \|Q    V | \| | \| | \| | \| |
| 7+50 | 0.1663 | 0.32 | \|Q    V | \| | \| | \| | \| |
| 7+55 | 0.1685 | 0.32 | \|Q    V | \| | \| | \| | \| |
| 8+ 0 | 0.1707 | 0.32 | \|Q    V | \| | \| | \| | \| |
| 8+ 5 | 0.1730 | 0.32 | \|Q    V | \| | \| | \| | \| |
| 8+10 | 0.1752 | 0.32 | \|Q    V | \| | \| | \| | \| |
| 8+15 | 0.1774 | 0.33 | \|Q     V | \| | \| | \| | \| |
| 8+20 | 0.1797 | 0.33 | \|Q     V | \| | \| | \| | \| |
| 8+25 | 0.1820 | 0.33 | \|Q     V | \| | \| | \| | \| |
| 8+30 | 0.1843 | 0.33 | \|Q     V | \| | \| | \| | \| |
| 8+35 | 0.1866 | 0.33 | \|Q     V | \| | \| | \| | \| |
| 8+40 | 0.1889 | 0.34 | \|Q     V | \| | \| | \| | \| |
| 8+45 | 0.1912 | 0.34 | \|Q     V | \| | \| | \| | \| |
| 8+50 | 0.1935 | 0.34 | \|Q     V | \| | \| | \| | \| |
| 8+55 | 0.1959 | 0.34 | \|Q     V | \| | \| | \| | \| |
| 9+ 0 | 0.1983 | 0.34 | \|Q     V | \| | \| | \| | \| |
| 9+ 5 | 0.2007 | 0.35 | \|Q     V | \| | \| | \| | \| |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9+10 | 0.2031 | 0.35 | \|Q V \| | \| | \| | \| |
| 9+15 | 0.2055 | 0.35 | \|Q V \| | \| | \| | \| |
| 9+20 | 0.2079 | 0.35 | \|Q V \| | \| | \| | \| |
| 9+25 | 0.2104 | 0.36 | \|Q V \| | \| | \| | \| |
| 9+30 | 0.2128 | 0.36 | \|Q V \| | \| | \| | \| |
| 9+35 | 0.2153 | 0.36 | \|Q V \| | \| | \| | \| |
| 9+40 | 0.2178 | 0.36 | \|Q V \| | \| | \| | \| |
| 9+45 | 0.2203 | 0.37 | \|Q V \| | \| | \| | \| |
| 9+50 | 0.2229 | 0.37 | \|Q V \| | \| | \| | \| |
| 9+55 | 0.2254 | 0.37 | \|Q V \| | \| | \| | \| |
| 10+ 0 | 0.2280 | 0.37 | \|Q V \| | \| | \| | \| |
| 10+ 5 | 0.2306 | 0.38 | \|Q V\| | \| | \| | \| |
| 10+10 | 0.2332 | 0.38 | \|Q V\| | \| | \| | \| |
| 10+15 | 0.2359 | 0.38 | \|Q V\| | \| | \| | \| |
| 10+20 | 0.2385 | 0.39 | \|Q V\| | \| | \| | \| |
| 10+25 | 0.2412 | 0.39 | \|Q V\| | \| | \| | \| |
| 10+30 | 0.2439 | 0.39 | \|Q V\| | \| | \| | \| |
| 10+35 | 0.2466 | 0.40 | \|Q V\| | \| | \| | \| |
| 10+40 | 0.2494 | 0.40 | \|Q V\| | \| | \| | \| |
| 10+45 | 0.2521 | 0.40 | \|Q V\| | \| | \| | \| |
| 10+50 | 0.2549 | 0.41 | \|Q V | \| | \| | \| |
| 10+55 | 0.2577 | 0.41 | \|Q V | \| | \| | \| |
| 11+ 0 | 0.2606 | 0.41 | \|Q V | \| | \| | \| |
| 11+ 5 | 0.2634 | 0.42 | \|Q V | \| | \| | \| |
| 11+10 | 0.2663 | 0.42 | \|Q V | \| | \| | \| |
| 11+15 | 0.2692 | 0.42 | \|Q V | \| | \| | \| |
| 11+20 | 0.2722 | 0.43 | \|Q V | \| | \| | \| |
| 11+25 | 0.2752 | 0.43 | \|Q V | \| | \| | \| |
| 11+30 | 0.2782 | 0.44 | \|Q V | \| | \| | \| |
| 11+35 | 0.2812 | 0.44 | \|Q \|V | \| | \| | \| |
| 11+40 | 0.2843 | 0.44 | \|Q \|V | \| | \| | \| |
| 11+45 | 0.2873 | 0.45 | \|Q \|V | \| | \| | \| |
| 11+50 | 0.2905 | 0.45 | \|Q \|V | \| | \| | \| |
| 11+55 | 0.2936 | 0.46 | \|Q \|V | \| | \| | \| |
| 12+ 0 | 0.2968 | 0.46 | \|Q \|V | \| | \| | \| |
| 12+ 5 | 0.3001 | 0.47 | \|Q \|V | \| | \| | \| |
| 12+10 | 0.3036 | 0.51 | \| Q \|V | \| | \| | \| |
| 12+15 | 0.3074 | 0.54 | \| Q \| V | \| | \| | \| |
| 12+20 | 0.3112 | 0.56 | \| Q \| V | \| | \| | \| |
| 12+25 | 0.3151 | 0.57 | \| Q \| V | \| | \| | \| |
| 12+30 | 0.3191 | 0.57 | \| Q \| V | \| | \| | \| |
| 12+35 | 0.3231 | 0.58 | \| Q \| V | \| | \| | \| |
| 12+40 | 0.3271 | 0.59 | \| Q \| V | \| | \| | \| |
| 12+45 | 0.3312 | 0.59 | \| Q \|  V | \| | \| | \| |
| 12+50 | 0.3353 | 0.60 | \| Q \|  V | \| | \| | \| |
| 12+55 | 0.3395 | 0.61 | \| Q \|  V | \| | \| | \| |
| 13+ 0 | 0.3438 | 0.62 | \| Q \|  V | \| | \| | \| |
| 13+ 5 | 0.3480 | 0.62 | \| Q \|  V | \| | \| | \| |
| 13+10 | 0.3524 | 0.63 | \| Q \|  V | \| | \| | \| |
| 13+15 | 0.3568 | 0.64 | \| Q \|   V | \| | \| | \| |
| 13+20 | 0.3613 | 0.65 | \| Q \|   V | \| | \| | \| |
| 13+25 | 0.3658 | 0.66 | \| Q \|   V | \| | \| | \| |
| 13+30 | 0.3704 | 0.67 | \| Q \|   V | \| | \| | \| |
| 13+35 | 0.3751 | 0.68 | \| Q \|   V | \| | \| | \| |
| 13+40 | 0.3798 | 0.69 | \| Q \|   V | \| | \| | \| |
| 13+45 | 0.3846 | 0.70 | \| Q \|    V | \| | \| | \| |
| 13+50 | 0.3895 | 0.71 | \| Q \|    V | \| | \| | \| |
| 13+55 | 0.3945 | 0.72 | \| Q \|    V | \| | \| | \| |
| 14+ 0 | 0.3996 | 0.74 | \| Q \|    V | \| | \| | \| |
| 14+ 5 | 0.4047 | 0.75 | \|  Q \|    V | \| | \| | \| |
| 14+10 | 0.4100 | 0.77 | \|  Q \|     V | \| | \| | \| |
| 14+15 | 0.4154 | 0.78 | \|  Q \|     V | \| | \| | \| |
| 14+20 | 0.4209 | 0.80 | \|  Q \|     V | \| | \| | \| |
| 14+25 | 0.4265 | 0.82 | \|  Q \|     V | \| | \| | \| |
| 14+30 | 0.4323 | 0.83 | \|  Q \|      V | \| | \| | \| |
| 14+35 | 0.4381 | 0.85 | \|  Q \|      V | \| | \| | \| |
| 14+40 | 0.4442 | 0.88 | \|  Q \|      V | \| | \| | \| |
| 14+45 | 0.4504 | 0.90 | \|  Q \|      V | \| | \| | \| |
| 14+50 | 0.4568 | 0.93 | \|  Q \|       V | \| | \| | \| |


14+55 0.4634 0.96
15+ 0 0.4702 0.99
15+ 5 0.4772 1.02
15+10 0.4845 1.06
15+15 0.4921 1.10
15+20 0.5001 1.16
15+25 0.5083 1.19
15+30 0.5161 1.14
15+35 0.5237 1.10
15+40 0.5318 1.17
15+45 0.5407 1.29
15+50 0.5508 1.47
15+55 0.5628 1.73
16+ 0 0.5782 2.24
16+ 5 0.6051 3.91
16+10 0.6611 8.13
16+15 0.7122 7.41
16+20 0.7352 3.34
16+25 0.7470 1.72
16+30 0.7567 1.40
16+35 0.7651 1.22
16+40 0.7728 1.13
16+45 0.7800 1.04
16+50 0.7867 0.97
16+55 0.7930 0.91
17+ 0 0.7990 0.87
17+ 5 0.8047 0.82
17+10 0.8101 0.79
17+15 0.8153 0.76
17+20 0.8203 0.73
17+25 0.8252 0.71
17+30 0.8299 0.68
17+35 0.8345 0.66
17+40 0.8389 0.64
17+45 0.8432 0.63
17+50 0.8474 0.61
17+55 0.8515 0.60
18+ 0 0.8555 0.58
18+ 5 0.8594 0.56
18+10 0.8630 0.52
18+15 0.8663 0.48
18+20 0.8695 0.46
18+25 0.8726 0.45
18+30 0.8757 0.44
18+35 0.8787 0.43
18+40 0.8816 0.43
18+45 0.8845 0.42
18+50 0.8873 0.41
18+55 0.8901 0.40
19+ 0 0.8928 0.40
19+ 5 0.8955 0.39
19+10 0.8981 0.38
19+15 0.9007 0.38
19+20 0.9033 0.37
19+25 0.9058 0.37
19+30 0.9083 0.36
19+35 0.9108 0.36
19+40 0.9132 0.35
19+45 0.9156 0.35
19+50 0.9180 0.34
19+55 0.9203 0.34
20+ 0 0.9226 0.33
20+ 5 0.9249 0.33
20+10 0.9271 0.33
20+15 0.9294 0.32
20+20 0.9316 0.32
20+25 0.9337 0.32
20+30 0.9359 0.31
20+35 0.9380 0.31

```
  20+40       0.9401      0.31  |Q       |        |        |      V  |
  20+45       0.9422      0.30  |Q       |        |        |      V  |
  20+50       0.9443      0.30  |Q       |        |        |      V  |
  20+55       0.9463      0.30  |Q       |        |        |      V  |
  21+ 0       0.9484      0.29  |Q       |        |        |      V  |
  21+ 5       0.9504      0.29  |Q       |        |        |      V  |
  21+10       0.9523      0.29  |Q       |        |        |      V  |
  21+15       0.9543      0.29  |Q       |        |        |      V  |
  21+20       0.9563      0.28  |Q       |        |        |      V  |
  21+25       0.9582      0.28  |Q       |        |        |      V  |
  21+30       0.9601      0.28  |Q       |        |        |      V  |
  21+35       0.9620      0.28  |Q       |        |        |      V  |
  21+40       0.9639      0.27  |Q       |        |        |       V |
  21+45       0.9658      0.27  |Q       |        |        |       V |
  21+50       0.9676      0.27  |Q       |        |        |       V |
  21+55       0.9695      0.27  |Q       |        |        |       V |
  22+ 0       0.9713      0.26  |Q       |        |        |       V |
  22+ 5       0.9731      0.26  |Q       |        |        |       V |
  22+10       0.9749      0.26  |Q       |        |        |       V |
  22+15       0.9767      0.26  |Q       |        |        |       V |
  22+20       0.9784      0.26  |Q       |        |        |       V |
  22+25       0.9802      0.25  |Q       |        |        |       V |
  22+30       0.9819      0.25  |Q       |        |        |       V |
  22+35       0.9837      0.25  |Q       |        |        |       V |
  22+40       0.9854      0.25  Q        |        |        |       V |
  22+45       0.9871      0.25  Q        |        |        |       V |
  22+50       0.9888      0.25  Q        |        |        |        V|
  22+55       0.9905      0.24  Q        |        |        |        V|
  23+ 0       0.9921      0.24  Q        |        |        |        V|
  23+ 5       0.9938      0.24  Q        |        |        |        V|
  23+10       0.9954      0.24  Q        |        |        |        V|
  23+15       0.9971      0.24  Q        |        |        |        V|
  23+20       0.9987      0.24  Q        |        |        |        V|
  23+25       1.0003      0.23  Q        |        |        |        V|
  23+30       1.0019      0.23  Q        |        |        |        V|
  23+35       1.0035      0.23  Q        |        |        |        V|
  23+40       1.0051      0.23  Q        |        |        |        V|
  23+45       1.0067      0.23  Q        |        |        |        V|
  23+50       1.0083      0.23  Q        |        |        |        V|
  23+55       1.0098      0.23  Q        |        |        |        V|
  24+ 0       1.0114      0.22  Q        |        |        |        V|
  24+ 5       1.0128      0.21  Q        |        |        |        V|
  24+10       1.0136      0.12  Q        |        |        |        V|
  24+15       1.0138      0.03  Q        |        |        |        V|
  24+20       1.0139      0.01  Q        |        |        |        V|
  24+25       1.0139      0.00  Q        |        |        |         V
-------------------------------------------------------------------
```

U n i t  H y d r o g r a p h  A n a l y s i s



Study date 08/04/23

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------

San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6320

---

225038 - 18313 VALLEY BLVD - SB ANIMAL CARE CENTER
DEVELOPED CONDITIONS
10-YEAR, 24-HOUR STORM
BY: JTS DATE: 08-04-23

---

Storm Event Year = 10

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

| Sub-Area (Ac.) | Duration (hours) | Isohyetal (In) |
|---|---|---|
| Rainfall data for year 10 | | |
| 6.07 | 1 | 0.92 |
| Rainfall data for year 2 | | |
| 6.07 | 6 | 1.62 |
| Rainfall data for year 2 | | |
| 6.07 | 24 | 3.01 |
| Rainfall data for year 100 | | |
| 6.07 | 1 | 1.32 |
| Rainfall data for year 100 | | |
| 6.07 | 6 | 3.50 |
| Rainfall data for year 100 | | |
| 6.07 | 24 | 7.80 |

---

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

******** Area-averaged max loss rate, Fm ********

| SCS curve No.(AMCII) | SCS curve NO.(AMC 2) | Area (Ac.) | Area Fraction | Fp(Fig C6) (In/Hr) | Ap (dec.) | Fm (In/Hr) |
|---|---|---|---|---|---|---|
| 32.0 | 32.0 | 6.07 | 1.000 | 0.978 | 0.300 | 0.293 |

Area-averaged adjusted loss rate Fm (In/Hr) = 0.293

********* Area-Averaged low loss rate fraction, Yb **********

| Area (Ac.) | Area Fract | SCS CN (AMC2) | SCS CN (AMC2) | S | Pervious Yield Fr |
|---|---|---|---|---|---|
| 1.82 | 0.300 | 32.0 | 32.0 | 21.25 | 0.005 |
| 4.25 | 0.700 | 98.0 | 98.0 | 0.20 | 0.952 |

Area-averaged catchment yield fraction, Y = 0.668
Area-averaged low loss fraction, Yb = 0.332
User entry of time of concentration = 0.161 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area = 6.07(Ac.)
Catchment Lag time = 0.129 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 64.6998
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.293(In/Hr)
Average low loss rate fraction (Yb) = 0.332 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.340(In)
Computed peak 30-minute rainfall = 0.697(In)
Specified peak 1-hour rainfall = 0.920(In)
Computed peak 3-hour rainfall = 1.653(In)
Specified peak 6-hour rainfall = 2.393(In)
Specified peak 24-hour rainfall = 4.981(In)

Rainfall depth area reduction factors:
Using a total area of 6.07(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.340(In)
30-minute factor = 1.000 Adjusted rainfall = 0.697(In)
1-hour factor = 1.000 Adjusted rainfall = 0.920(In)
3-hour factor = 1.000 Adjusted rainfall = 1.653(In)
6-hour factor = 1.000 Adjusted rainfall = 2.393(In)
24-hour factor = 1.000 Adjusted rainfall = 4.981(In)

U n i t H y d r o g r a p h

| Interval Number | 'S' Graph Mean values | Unit Hydrograph ((CFS)) |
|---|---|---|
| | (K = 73.41 (CFS)) | |
| 1 | 7.542 | 5.537 |
| 2 | 47.395 | 29.256 |
| 3 | 85.692 | 28.113 |
| 4 | 96.957 | 8.270 |
| 5 | 99.041 | 1.530 |
| 6 | 100.000 | 0.704 |

| Peak Unit Number | Adjusted mass rainfall (In) | Unit rainfall (In) |
|---|---|---|
| 1 | 0.3404 | 0.3404 |
| 2 | 0.4492 | 0.1088 |
| 3 | 0.5283 | 0.0791 |
| 4 | 0.5927 | 0.0644 |
| 5 | 0.6480 | 0.0553 |
| 6 | 0.6970 | 0.0490 |
| 7 | 0.7414 | 0.0443 |
| 8 | 0.7820 | 0.0407 |
| 9 | 0.8198 | 0.0377 |
| 10 | 0.8551 | 0.0353 |
| 11 | 0.8883 | 0.0332 |
| 12 | 0.9197 | 0.0315 |
| 13 | 0.9599 | 0.0402 |
| 14 | 0.9986 | 0.0387 |
| 15 | 1.0361 | 0.0375 |

| | | |
|---|---|---|
| 16 | 1.0724 | 0.0363 |
| 17 | 1.1077 | 0.0353 |
| 18 | 1.1420 | 0.0343 |
| 19 | 1.1755 | 0.0334 |
| 20 | 1.2081 | 0.0326 |
| 21 | 1.2400 | 0.0319 |
| 22 | 1.2711 | 0.0312 |
| 23 | 1.3017 | 0.0305 |
| 24 | 1.3316 | 0.0299 |
| 25 | 1.3609 | 0.0293 |
| 26 | 1.3897 | 0.0288 |
| 27 | 1.4180 | 0.0283 |
| 28 | 1.4458 | 0.0278 |
| 29 | 1.4731 | 0.0273 |
| 30 | 1.5000 | 0.0269 |
| 31 | 1.5265 | 0.0265 |
| 32 | 1.5526 | 0.0261 |
| 33 | 1.5783 | 0.0257 |
| 34 | 1.6037 | 0.0254 |
| 35 | 1.6287 | 0.0250 |
| 36 | 1.6534 | 0.0247 |
| 37 | 1.6777 | 0.0244 |
| 38 | 1.7018 | 0.0240 |
| 39 | 1.7255 | 0.0238 |
| 40 | 1.7490 | 0.0235 |
| 41 | 1.7722 | 0.0232 |
| 42 | 1.7951 | 0.0229 |
| 43 | 1.8178 | 0.0227 |
| 44 | 1.8403 | 0.0224 |
| 45 | 1.8625 | 0.0222 |
| 46 | 1.8844 | 0.0220 |
| 47 | 1.9062 | 0.0218 |
| 48 | 1.9277 | 0.0215 |
| 49 | 1.9491 | 0.0213 |
| 50 | 1.9702 | 0.0211 |
| 51 | 1.9911 | 0.0209 |
| 52 | 2.0119 | 0.0207 |
| 53 | 2.0324 | 0.0206 |
| 54 | 2.0528 | 0.0204 |
| 55 | 2.0730 | 0.0202 |
| 56 | 2.0930 | 0.0200 |
| 57 | 2.1129 | 0.0199 |
| 58 | 2.1326 | 0.0197 |
| 59 | 2.1521 | 0.0195 |
| 60 | 2.1715 | 0.0194 |
| 61 | 2.1907 | 0.0192 |
| 62 | 2.2098 | 0.0191 |
| 63 | 2.2288 | 0.0189 |
| 64 | 2.2476 | 0.0188 |
| 65 | 2.2663 | 0.0187 |
| 66 | 2.2848 | 0.0185 |
| 67 | 2.3032 | 0.0184 |
| 68 | 2.3215 | 0.0183 |
| 69 | 2.3397 | 0.0182 |
| 70 | 2.3577 | 0.0180 |
| 71 | 2.3756 | 0.0179 |
| 72 | 2.3934 | 0.0178 |
| 73 | 2.4109 | 0.0175 |
| 74 | 2.4283 | 0.0174 |
| 75 | 2.4456 | 0.0173 |
| 76 | 2.4628 | 0.0172 |
| 77 | 2.4799 | 0.0171 |
| 78 | 2.4968 | 0.0170 |
| 79 | 2.5137 | 0.0169 |
| 80 | 2.5305 | 0.0168 |
| 81 | 2.5472 | 0.0167 |
| 82 | 2.5637 | 0.0166 |
| 83 | 2.5802 | 0.0165 |
| 84 | 2.5966 | 0.0164 |

| | | |
|---|---|---|
| 85 | 2.6129 | 0.0163 |
| 86 | 2.6291 | 0.0162 |
| 87 | 2.6452 | 0.0161 |
| 88 | 2.6613 | 0.0160 |
| 89 | 2.6772 | 0.0159 |
| 90 | 2.6931 | 0.0159 |
| 91 | 2.7088 | 0.0158 |
| 92 | 2.7245 | 0.0157 |
| 93 | 2.7401 | 0.0156 |
| 94 | 2.7557 | 0.0155 |
| 95 | 2.7711 | 0.0155 |
| 96 | 2.7865 | 0.0154 |
| 97 | 2.8018 | 0.0153 |
| 98 | 2.8171 | 0.0152 |
| 99 | 2.8322 | 0.0152 |
| 100 | 2.8473 | 0.0151 |
| 101 | 2.8623 | 0.0150 |
| 102 | 2.8773 | 0.0149 |
| 103 | 2.8921 | 0.0149 |
| 104 | 2.9070 | 0.0148 |
| 105 | 2.9217 | 0.0147 |
| 106 | 2.9364 | 0.0147 |
| 107 | 2.9510 | 0.0146 |
| 108 | 2.9655 | 0.0145 |
| 109 | 2.9800 | 0.0145 |
| 110 | 2.9944 | 0.0144 |
| 111 | 3.0088 | 0.0144 |
| 112 | 3.0231 | 0.0143 |
| 113 | 3.0373 | 0.0142 |
| 114 | 3.0515 | 0.0142 |
| 115 | 3.0656 | 0.0141 |
| 116 | 3.0797 | 0.0141 |
| 117 | 3.0937 | 0.0140 |
| 118 | 3.1077 | 0.0139 |
| 119 | 3.1215 | 0.0139 |
| 120 | 3.1354 | 0.0138 |
| 121 | 3.1492 | 0.0138 |
| 122 | 3.1629 | 0.0137 |
| 123 | 3.1766 | 0.0137 |
| 124 | 3.1902 | 0.0136 |
| 125 | 3.2038 | 0.0136 |
| 126 | 3.2173 | 0.0135 |
| 127 | 3.2308 | 0.0135 |
| 128 | 3.2442 | 0.0134 |
| 129 | 3.2576 | 0.0134 |
| 130 | 3.2709 | 0.0133 |
| 131 | 3.2842 | 0.0133 |
| 132 | 3.2974 | 0.0132 |
| 133 | 3.3106 | 0.0132 |
| 134 | 3.3237 | 0.0131 |
| 135 | 3.3368 | 0.0131 |
| 136 | 3.3499 | 0.0130 |
| 137 | 3.3629 | 0.0130 |
| 138 | 3.3758 | 0.0130 |
| 139 | 3.3887 | 0.0129 |
| 140 | 3.4016 | 0.0129 |
| 141 | 3.4144 | 0.0128 |
| 142 | 3.4272 | 0.0128 |
| 143 | 3.4399 | 0.0127 |
| 144 | 3.4526 | 0.0127 |
| 145 | 3.4653 | 0.0127 |
| 146 | 3.4779 | 0.0126 |
| 147 | 3.4905 | 0.0126 |
| 148 | 3.5030 | 0.0125 |
| 149 | 3.5155 | 0.0125 |
| 150 | 3.5279 | 0.0125 |
| 151 | 3.5404 | 0.0124 |
| 152 | 3.5527 | 0.0124 |
| 153 | 3.5651 | 0.0123 |

| | | |
|---|---|---|
| 154 | 3.5774 | 0.0123 |
| 155 | 3.5896 | 0.0123 |
| 156 | 3.6018 | 0.0122 |
| 157 | 3.6140 | 0.0122 |
| 158 | 3.6262 | 0.0122 |
| 159 | 3.6383 | 0.0121 |
| 160 | 3.6504 | 0.0121 |
| 161 | 3.6624 | 0.0120 |
| 162 | 3.6744 | 0.0120 |
| 163 | 3.6864 | 0.0120 |
| 164 | 3.6983 | 0.0119 |
| 165 | 3.7102 | 0.0119 |
| 166 | 3.7221 | 0.0119 |
| 167 | 3.7339 | 0.0118 |
| 168 | 3.7458 | 0.0118 |
| 169 | 3.7575 | 0.0118 |
| 170 | 3.7693 | 0.0117 |
| 171 | 3.7810 | 0.0117 |
| 172 | 3.7926 | 0.0117 |
| 173 | 3.8043 | 0.0116 |
| 174 | 3.8159 | 0.0116 |
| 175 | 3.8275 | 0.0116 |
| 176 | 3.8390 | 0.0115 |
| 177 | 3.8505 | 0.0115 |
| 178 | 3.8620 | 0.0115 |
| 179 | 3.8735 | 0.0115 |
| 180 | 3.8849 | 0.0114 |
| 181 | 3.8963 | 0.0114 |
| 182 | 3.9076 | 0.0114 |
| 183 | 3.9190 | 0.0113 |
| 184 | 3.9303 | 0.0113 |
| 185 | 3.9416 | 0.0113 |
| 186 | 3.9528 | 0.0112 |
| 187 | 3.9640 | 0.0112 |
| 188 | 3.9752 | 0.0112 |
| 189 | 3.9864 | 0.0112 |
| 190 | 3.9975 | 0.0111 |
| 191 | 4.0086 | 0.0111 |
| 192 | 4.0197 | 0.0111 |
| 193 | 4.0308 | 0.0111 |
| 194 | 4.0418 | 0.0110 |
| 195 | 4.0528 | 0.0110 |
| 196 | 4.0638 | 0.0110 |
| 197 | 4.0747 | 0.0109 |
| 198 | 4.0856 | 0.0109 |
| 199 | 4.0965 | 0.0109 |
| 200 | 4.1074 | 0.0109 |
| 201 | 4.1182 | 0.0108 |
| 202 | 4.1291 | 0.0108 |
| 203 | 4.1399 | 0.0108 |
| 204 | 4.1506 | 0.0108 |
| 205 | 4.1614 | 0.0107 |
| 206 | 4.1721 | 0.0107 |
| 207 | 4.1828 | 0.0107 |
| 208 | 4.1935 | 0.0107 |
| 209 | 4.2041 | 0.0106 |
| 210 | 4.2147 | 0.0106 |
| 211 | 4.2253 | 0.0106 |
| 212 | 4.2359 | 0.0106 |
| 213 | 4.2464 | 0.0106 |
| 214 | 4.2570 | 0.0105 |
| 215 | 4.2675 | 0.0105 |
| 216 | 4.2780 | 0.0105 |
| 217 | 4.2884 | 0.0105 |
| 218 | 4.2988 | 0.0104 |
| 219 | 4.3093 | 0.0104 |
| 220 | 4.3197 | 0.0104 |
| 221 | 4.3300 | 0.0104 |
| 222 | 4.3404 | 0.0103 |

| | | | |
|---|---|---|---|
| 223 | 4.3507 | 0.0103 | |
| 224 | 4.3610 | 0.0103 | |
| 225 | 4.3713 | 0.0103 | |
| 226 | 4.3815 | 0.0103 | |
| 227 | 4.3918 | 0.0102 | |
| 228 | 4.4020 | 0.0102 | |
| 229 | 4.4122 | 0.0102 | |
| 230 | 4.4224 | 0.0102 | |
| 231 | 4.4325 | 0.0102 | |
| 232 | 4.4426 | 0.0101 | |
| 233 | 4.4528 | 0.0101 | |
| 234 | 4.4628 | 0.0101 | |
| 235 | 4.4729 | 0.0101 | |
| 236 | 4.4830 | 0.0101 | |
| 237 | 4.4930 | 0.0100 | |
| 238 | 4.5030 | 0.0100 | |
| 239 | 4.5130 | 0.0100 | |
| 240 | 4.5230 | 0.0100 | |
| 241 | 4.5329 | 0.0100 | |
| 242 | 4.5429 | 0.0099 | |
| 243 | 4.5528 | 0.0099 | |
| 244 | 4.5627 | 0.0099 | |
| 245 | 4.5726 | 0.0099 | |
| 246 | 4.5824 | 0.0099 | |
| 247 | 4.5922 | 0.0098 | |
| 248 | 4.6021 | 0.0098 | |
| 249 | 4.6119 | 0.0098 | |
| 250 | 4.6216 | 0.0098 | |
| 251 | 4.6314 | 0.0098 | |
| 252 | 4.6412 | 0.0097 | |
| 253 | 4.6509 | 0.0097 | |
| 254 | 4.6606 | 0.0097 | |
| 255 | 4.6703 | 0.0097 | |
| 256 | 4.6800 | 0.0097 | |
| 257 | 4.6896 | 0.0097 | |
| 258 | 4.6992 | 0.0096 | |
| 259 | 4.7089 | 0.0096 | |
| 260 | 4.7185 | 0.0096 | |
| 261 | 4.7281 | 0.0096 | |
| 262 | 4.7376 | 0.0096 | |
| 263 | 4.7472 | 0.0096 | |
| 264 | 4.7567 | 0.0095 | |
| 265 | 4.7662 | 0.0095 | |
| 266 | 4.7757 | 0.0095 | |
| 267 | 4.7852 | 0.0095 | |
| 268 | 4.7947 | 0.0095 | |
| 269 | 4.8041 | 0.0094 | |
| 270 | 4.8135 | 0.0094 | |
| 271 | 4.8230 | 0.0094 | |
| 272 | 4.8324 | 0.0094 | |
| 273 | 4.8417 | 0.0094 | |
| 274 | 4.8511 | 0.0094 | |
| 275 | 4.8605 | 0.0094 | |
| 276 | 4.8698 | 0.0093 | |
| 277 | 4.8791 | 0.0093 | |
| 278 | 4.8884 | 0.0093 | |
| 279 | 4.8977 | 0.0093 | |
| 280 | 4.9070 | 0.0093 | |
| 281 | 4.9162 | 0.0093 | |
| 282 | 4.9255 | 0.0092 | |
| 283 | 4.9347 | 0.0092 | |
| 284 | 4.9439 | 0.0092 | |
| 285 | 4.9531 | 0.0092 | |
| 286 | 4.9623 | 0.0092 | |
| 287 | 4.9715 | 0.0092 | |
| 288 | 4.9806 | 0.0091 | |

| Unit Period | Unit Rainfall | Unit Soil-Loss | Effective Rainfall |
|---|---|---|---|

| (number) | (In) | (In) | (In) |
|---|---|---|---|
| 1 | 0.0091 | 0.0030 | 0.0061 |
| 2 | 0.0092 | 0.0030 | 0.0061 |
| 3 | 0.0092 | 0.0031 | 0.0061 |
| 4 | 0.0092 | 0.0031 | 0.0062 |
| 5 | 0.0092 | 0.0031 | 0.0062 |
| 6 | 0.0093 | 0.0031 | 0.0062 |
| 7 | 0.0093 | 0.0031 | 0.0062 |
| 8 | 0.0093 | 0.0031 | 0.0062 |
| 9 | 0.0093 | 0.0031 | 0.0062 |
| 10 | 0.0094 | 0.0031 | 0.0062 |
| 11 | 0.0094 | 0.0031 | 0.0063 |
| 12 | 0.0094 | 0.0031 | 0.0063 |
| 13 | 0.0094 | 0.0031 | 0.0063 |
| 14 | 0.0094 | 0.0031 | 0.0063 |
| 15 | 0.0095 | 0.0031 | 0.0063 |
| 16 | 0.0095 | 0.0032 | 0.0063 |
| 17 | 0.0095 | 0.0032 | 0.0064 |
| 18 | 0.0096 | 0.0032 | 0.0064 |
| 19 | 0.0096 | 0.0032 | 0.0064 |
| 20 | 0.0096 | 0.0032 | 0.0064 |
| 21 | 0.0096 | 0.0032 | 0.0064 |
| 22 | 0.0097 | 0.0032 | 0.0065 |
| 23 | 0.0097 | 0.0032 | 0.0065 |
| 24 | 0.0097 | 0.0032 | 0.0065 |
| 25 | 0.0097 | 0.0032 | 0.0065 |
| 26 | 0.0098 | 0.0032 | 0.0065 |
| 27 | 0.0098 | 0.0033 | 0.0065 |
| 28 | 0.0098 | 0.0033 | 0.0066 |
| 29 | 0.0099 | 0.0033 | 0.0066 |
| 30 | 0.0099 | 0.0033 | 0.0066 |
| 31 | 0.0099 | 0.0033 | 0.0066 |
| 32 | 0.0099 | 0.0033 | 0.0066 |
| 33 | 0.0100 | 0.0033 | 0.0067 |
| 34 | 0.0100 | 0.0033 | 0.0067 |
| 35 | 0.0100 | 0.0033 | 0.0067 |
| 36 | 0.0101 | 0.0033 | 0.0067 |
| 37 | 0.0101 | 0.0033 | 0.0067 |
| 38 | 0.0101 | 0.0034 | 0.0068 |
| 39 | 0.0102 | 0.0034 | 0.0068 |
| 40 | 0.0102 | 0.0034 | 0.0068 |
| 41 | 0.0102 | 0.0034 | 0.0068 |
| 42 | 0.0102 | 0.0034 | 0.0068 |
| 43 | 0.0103 | 0.0034 | 0.0069 |
| 44 | 0.0103 | 0.0034 | 0.0069 |
| 45 | 0.0103 | 0.0034 | 0.0069 |
| 46 | 0.0104 | 0.0034 | 0.0069 |
| 47 | 0.0104 | 0.0035 | 0.0070 |
| 48 | 0.0104 | 0.0035 | 0.0070 |
| 49 | 0.0105 | 0.0035 | 0.0070 |
| 50 | 0.0105 | 0.0035 | 0.0070 |
| 51 | 0.0106 | 0.0035 | 0.0070 |
| 52 | 0.0106 | 0.0035 | 0.0071 |
| 53 | 0.0106 | 0.0035 | 0.0071 |
| 54 | 0.0106 | 0.0035 | 0.0071 |
| 55 | 0.0107 | 0.0035 | 0.0071 |
| 56 | 0.0107 | 0.0036 | 0.0072 |
| 57 | 0.0108 | 0.0036 | 0.0072 |
| 58 | 0.0108 | 0.0036 | 0.0072 |
| 59 | 0.0108 | 0.0036 | 0.0072 |
| 60 | 0.0109 | 0.0036 | 0.0073 |
| 61 | 0.0109 | 0.0036 | 0.0073 |
| 62 | 0.0109 | 0.0036 | 0.0073 |
| 63 | 0.0110 | 0.0037 | 0.0074 |
| 64 | 0.0110 | 0.0037 | 0.0074 |
| 65 | 0.0111 | 0.0037 | 0.0074 |
| 66 | 0.0111 | 0.0037 | 0.0074 |
| 67 | 0.0112 | 0.0037 | 0.0075 |

| | | | |
|---|---|---|---|
| 68 | 0.0112 | 0.0037 | 0.0075 |
| 69 | 0.0112 | 0.0037 | 0.0075 |
| 70 | 0.0113 | 0.0037 | 0.0075 |
| 71 | 0.0113 | 0.0038 | 0.0076 |
| 72 | 0.0114 | 0.0038 | 0.0076 |
| 73 | 0.0114 | 0.0038 | 0.0076 |
| 74 | 0.0115 | 0.0038 | 0.0077 |
| 75 | 0.0115 | 0.0038 | 0.0077 |
| 76 | 0.0115 | 0.0038 | 0.0077 |
| 77 | 0.0116 | 0.0039 | 0.0078 |
| 78 | 0.0116 | 0.0039 | 0.0078 |
| 79 | 0.0117 | 0.0039 | 0.0078 |
| 80 | 0.0117 | 0.0039 | 0.0078 |
| 81 | 0.0118 | 0.0039 | 0.0079 |
| 82 | 0.0118 | 0.0039 | 0.0079 |
| 83 | 0.0119 | 0.0039 | 0.0080 |
| 84 | 0.0119 | 0.0040 | 0.0080 |
| 85 | 0.0120 | 0.0040 | 0.0080 |
| 86 | 0.0120 | 0.0040 | 0.0080 |
| 87 | 0.0121 | 0.0040 | 0.0081 |
| 88 | 0.0122 | 0.0040 | 0.0081 |
| 89 | 0.0122 | 0.0041 | 0.0082 |
| 90 | 0.0123 | 0.0041 | 0.0082 |
| 91 | 0.0123 | 0.0041 | 0.0082 |
| 92 | 0.0124 | 0.0041 | 0.0083 |
| 93 | 0.0125 | 0.0041 | 0.0083 |
| 94 | 0.0125 | 0.0041 | 0.0083 |
| 95 | 0.0126 | 0.0042 | 0.0084 |
| 96 | 0.0126 | 0.0042 | 0.0084 |
| 97 | 0.0127 | 0.0042 | 0.0085 |
| 98 | 0.0127 | 0.0042 | 0.0085 |
| 99 | 0.0128 | 0.0043 | 0.0086 |
| 100 | 0.0129 | 0.0043 | 0.0086 |
| 101 | 0.0130 | 0.0043 | 0.0087 |
| 102 | 0.0130 | 0.0043 | 0.0087 |
| 103 | 0.0131 | 0.0043 | 0.0087 |
| 104 | 0.0131 | 0.0044 | 0.0088 |
| 105 | 0.0132 | 0.0044 | 0.0088 |
| 106 | 0.0133 | 0.0044 | 0.0089 |
| 107 | 0.0134 | 0.0044 | 0.0089 |
| 108 | 0.0134 | 0.0045 | 0.0090 |
| 109 | 0.0135 | 0.0045 | 0.0090 |
| 110 | 0.0136 | 0.0045 | 0.0091 |
| 111 | 0.0137 | 0.0045 | 0.0091 |
| 112 | 0.0137 | 0.0046 | 0.0092 |
| 113 | 0.0138 | 0.0046 | 0.0092 |
| 114 | 0.0139 | 0.0046 | 0.0093 |
| 115 | 0.0140 | 0.0046 | 0.0094 |
| 116 | 0.0141 | 0.0047 | 0.0094 |
| 117 | 0.0142 | 0.0047 | 0.0095 |
| 118 | 0.0142 | 0.0047 | 0.0095 |
| 119 | 0.0144 | 0.0048 | 0.0096 |
| 120 | 0.0144 | 0.0048 | 0.0096 |
| 121 | 0.0145 | 0.0048 | 0.0097 |
| 122 | 0.0146 | 0.0048 | 0.0098 |
| 123 | 0.0147 | 0.0049 | 0.0099 |
| 124 | 0.0148 | 0.0049 | 0.0099 |
| 125 | 0.0149 | 0.0050 | 0.0100 |
| 126 | 0.0150 | 0.0050 | 0.0100 |
| 127 | 0.0152 | 0.0050 | 0.0101 |
| 128 | 0.0152 | 0.0051 | 0.0102 |
| 129 | 0.0154 | 0.0051 | 0.0103 |
| 130 | 0.0155 | 0.0051 | 0.0103 |
| 131 | 0.0156 | 0.0052 | 0.0104 |
| 132 | 0.0157 | 0.0052 | 0.0105 |
| 133 | 0.0159 | 0.0053 | 0.0106 |
| 134 | 0.0159 | 0.0053 | 0.0107 |
| 135 | 0.0161 | 0.0053 | 0.0108 |
| 136 | 0.0162 | 0.0054 | 0.0108 |

| | | | |
|---|---|---|---|
| 137 | 0.0164 | 0.0054 | 0.0109 |
| 138 | 0.0165 | 0.0055 | 0.0110 |
| 139 | 0.0167 | 0.0055 | 0.0111 |
| 140 | 0.0168 | 0.0056 | 0.0112 |
| 141 | 0.0170 | 0.0056 | 0.0113 |
| 142 | 0.0171 | 0.0057 | 0.0114 |
| 143 | 0.0173 | 0.0057 | 0.0116 |
| 144 | 0.0174 | 0.0058 | 0.0116 |
| 145 | 0.0178 | 0.0059 | 0.0119 |
| 146 | 0.0179 | 0.0059 | 0.0120 |
| 147 | 0.0182 | 0.0060 | 0.0121 |
| 148 | 0.0183 | 0.0061 | 0.0122 |
| 149 | 0.0185 | 0.0062 | 0.0124 |
| 150 | 0.0187 | 0.0062 | 0.0125 |
| 151 | 0.0189 | 0.0063 | 0.0127 |
| 152 | 0.0191 | 0.0063 | 0.0128 |
| 153 | 0.0194 | 0.0064 | 0.0130 |
| 154 | 0.0195 | 0.0065 | 0.0131 |
| 155 | 0.0199 | 0.0066 | 0.0133 |
| 156 | 0.0200 | 0.0066 | 0.0134 |
| 157 | 0.0204 | 0.0068 | 0.0136 |
| 158 | 0.0206 | 0.0068 | 0.0137 |
| 159 | 0.0209 | 0.0069 | 0.0140 |
| 160 | 0.0211 | 0.0070 | 0.0141 |
| 161 | 0.0215 | 0.0071 | 0.0144 |
| 162 | 0.0218 | 0.0072 | 0.0145 |
| 163 | 0.0222 | 0.0074 | 0.0148 |
| 164 | 0.0224 | 0.0074 | 0.0150 |
| 165 | 0.0229 | 0.0076 | 0.0153 |
| 166 | 0.0232 | 0.0077 | 0.0155 |
| 167 | 0.0238 | 0.0079 | 0.0159 |
| 168 | 0.0240 | 0.0080 | 0.0161 |
| 169 | 0.0247 | 0.0082 | 0.0165 |
| 170 | 0.0250 | 0.0083 | 0.0167 |
| 171 | 0.0257 | 0.0085 | 0.0172 |
| 172 | 0.0261 | 0.0087 | 0.0174 |
| 173 | 0.0269 | 0.0089 | 0.0180 |
| 174 | 0.0273 | 0.0091 | 0.0183 |
| 175 | 0.0283 | 0.0094 | 0.0189 |
| 176 | 0.0288 | 0.0096 | 0.0192 |
| 177 | 0.0299 | 0.0099 | 0.0200 |
| 178 | 0.0305 | 0.0101 | 0.0204 |
| 179 | 0.0319 | 0.0106 | 0.0213 |
| 180 | 0.0326 | 0.0108 | 0.0218 |
| 181 | 0.0343 | 0.0114 | 0.0229 |
| 182 | 0.0353 | 0.0117 | 0.0236 |
| 183 | 0.0375 | 0.0124 | 0.0250 |
| 184 | 0.0387 | 0.0129 | 0.0259 |
| 185 | 0.0315 | 0.0104 | 0.0210 |
| 186 | 0.0332 | 0.0110 | 0.0222 |
| 187 | 0.0377 | 0.0125 | 0.0252 |
| 188 | 0.0407 | 0.0135 | 0.0272 |
| 189 | 0.0490 | 0.0163 | 0.0328 |
| 190 | 0.0553 | 0.0184 | 0.0370 |
| 191 | 0.0791 | 0.0244 | 0.0546 |
| 192 | 0.1088 | 0.0244 | 0.0843 |
| 193 | 0.3404 | 0.0244 | 0.3160 |
| 194 | 0.0644 | 0.0214 | 0.0430 |
| 195 | 0.0443 | 0.0147 | 0.0296 |
| 196 | 0.0353 | 0.0117 | 0.0236 |
| 197 | 0.0402 | 0.0133 | 0.0268 |
| 198 | 0.0363 | 0.0121 | 0.0243 |
| 199 | 0.0334 | 0.0111 | 0.0223 |
| 200 | 0.0312 | 0.0103 | 0.0208 |
| 201 | 0.0293 | 0.0097 | 0.0196 |
| 202 | 0.0278 | 0.0092 | 0.0186 |
| 203 | 0.0265 | 0.0088 | 0.0177 |
| 204 | 0.0254 | 0.0084 | 0.0169 |
| 205 | 0.0244 | 0.0081 | 0.0163 |

| | | | |
|---|---|---|---|
| 206 | 0.0235 | 0.0078 | 0.0157 |
| 207 | 0.0227 | 0.0075 | 0.0152 |
| 208 | 0.0220 | 0.0073 | 0.0147 |
| 209 | 0.0213 | 0.0071 | 0.0143 |
| 210 | 0.0207 | 0.0069 | 0.0139 |
| 211 | 0.0202 | 0.0067 | 0.0135 |
| 212 | 0.0197 | 0.0065 | 0.0132 |
| 213 | 0.0192 | 0.0064 | 0.0129 |
| 214 | 0.0188 | 0.0062 | 0.0126 |
| 215 | 0.0184 | 0.0061 | 0.0123 |
| 216 | 0.0180 | 0.0060 | 0.0121 |
| 217 | 0.0175 | 0.0058 | 0.0117 |
| 218 | 0.0172 | 0.0057 | 0.0115 |
| 219 | 0.0169 | 0.0056 | 0.0113 |
| 220 | 0.0166 | 0.0055 | 0.0111 |
| 221 | 0.0163 | 0.0054 | 0.0109 |
| 222 | 0.0160 | 0.0053 | 0.0107 |
| 223 | 0.0158 | 0.0052 | 0.0105 |
| 224 | 0.0155 | 0.0052 | 0.0104 |
| 225 | 0.0153 | 0.0051 | 0.0102 |
| 226 | 0.0151 | 0.0050 | 0.0101 |
| 227 | 0.0149 | 0.0049 | 0.0099 |
| 228 | 0.0147 | 0.0049 | 0.0098 |
| 229 | 0.0145 | 0.0048 | 0.0097 |
| 230 | 0.0143 | 0.0047 | 0.0096 |
| 231 | 0.0141 | 0.0047 | 0.0094 |
| 232 | 0.0139 | 0.0046 | 0.0093 |
| 233 | 0.0138 | 0.0046 | 0.0092 |
| 234 | 0.0136 | 0.0045 | 0.0091 |
| 235 | 0.0135 | 0.0045 | 0.0090 |
| 236 | 0.0133 | 0.0044 | 0.0089 |
| 237 | 0.0132 | 0.0044 | 0.0088 |
| 238 | 0.0130 | 0.0043 | 0.0087 |
| 239 | 0.0129 | 0.0043 | 0.0086 |
| 240 | 0.0128 | 0.0042 | 0.0085 |
| 241 | 0.0127 | 0.0042 | 0.0085 |
| 242 | 0.0125 | 0.0042 | 0.0084 |
| 243 | 0.0124 | 0.0041 | 0.0083 |
| 244 | 0.0123 | 0.0041 | 0.0082 |
| 245 | 0.0122 | 0.0040 | 0.0081 |
| 246 | 0.0121 | 0.0040 | 0.0081 |
| 247 | 0.0120 | 0.0040 | 0.0080 |
| 248 | 0.0119 | 0.0039 | 0.0079 |
| 249 | 0.0118 | 0.0039 | 0.0079 |
| 250 | 0.0117 | 0.0039 | 0.0078 |
| 251 | 0.0116 | 0.0038 | 0.0077 |
| 252 | 0.0115 | 0.0038 | 0.0077 |
| 253 | 0.0114 | 0.0038 | 0.0076 |
| 254 | 0.0113 | 0.0038 | 0.0076 |
| 255 | 0.0112 | 0.0037 | 0.0075 |
| 256 | 0.0111 | 0.0037 | 0.0074 |
| 257 | 0.0111 | 0.0037 | 0.0074 |
| 258 | 0.0110 | 0.0036 | 0.0073 |
| 259 | 0.0109 | 0.0036 | 0.0073 |
| 260 | 0.0108 | 0.0036 | 0.0072 |
| 261 | 0.0107 | 0.0036 | 0.0072 |
| 262 | 0.0107 | 0.0035 | 0.0071 |
| 263 | 0.0106 | 0.0035 | 0.0071 |
| 264 | 0.0105 | 0.0035 | 0.0070 |
| 265 | 0.0105 | 0.0035 | 0.0070 |
| 266 | 0.0104 | 0.0034 | 0.0069 |
| 267 | 0.0103 | 0.0034 | 0.0069 |
| 268 | 0.0103 | 0.0034 | 0.0069 |
| 269 | 0.0102 | 0.0034 | 0.0068 |
| 270 | 0.0101 | 0.0034 | 0.0068 |
| 271 | 0.0101 | 0.0033 | 0.0067 |
| 272 | 0.0100 | 0.0033 | 0.0067 |
| 273 | 0.0100 | 0.0033 | 0.0067 |
| 274 | 0.0099 | 0.0033 | 0.0066 |

| | | | |
|---|---|---|---|
| 275 | 0.0098 | 0.0033 | 0.0066 |
| 276 | 0.0098 | 0.0032 | 0.0065 |
| 277 | 0.0097 | 0.0032 | 0.0065 |
| 278 | 0.0097 | 0.0032 | 0.0065 |
| 279 | 0.0096 | 0.0032 | 0.0064 |
| 280 | 0.0096 | 0.0032 | 0.0064 |
| 281 | 0.0095 | 0.0032 | 0.0064 |
| 282 | 0.0095 | 0.0031 | 0.0063 |
| 283 | 0.0094 | 0.0031 | 0.0063 |
| 284 | 0.0094 | 0.0031 | 0.0063 |
| 285 | 0.0093 | 0.0031 | 0.0062 |
| 286 | 0.0093 | 0.0031 | 0.0062 |
| 287 | 0.0092 | 0.0031 | 0.0062 |
| 288 | 0.0092 | 0.0030 | 0.0061 |

---

---

Total soil rain loss = 1.55(In)
Total effective rainfall = 3.43(In)
Peak flow rate in flood hydrograph = 12.38(CFS)

---

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

---

Hydrograph in 5 Minute intervals ((CFS))

---

| Time(h+m) | Volume Ac.Ft | Q(CFS) | 0 | 5.0 | 10.0 | 15.0 | 20.0 |
|---|---|---|---|---|---|---|---|
| 0+ 5 | 0.0002 | 0.03 | Q | | | | |
| 0+10 | 0.0017 | 0.21 | Q | | | | |
| 0+15 | 0.0044 | 0.39 | Q | | | | |
| 0+20 | 0.0074 | 0.44 | Q | | | | |
| 0+25 | 0.0104 | 0.45 | Q | | | | |
| 0+30 | 0.0136 | 0.45 | Q | | | | |
| 0+35 | 0.0167 | 0.45 | Q | | | | |
| 0+40 | 0.0198 | 0.45 | Q | | | | |
| 0+45 | 0.0229 | 0.46 | Q | | | | |
| 0+50 | 0.0261 | 0.46 | Q | | | | |
| 0+55 | 0.0292 | 0.46 | Q | | | | |
| 1+ 0 | 0.0324 | 0.46 | Q | | | | |
| 1+ 5 | 0.0356 | 0.46 | Q | | | | |
| 1+10 | 0.0388 | 0.46 | Q | | | | |
| 1+15 | 0.0419 | 0.46 | Q | | | | |
| 1+20 | 0.0451 | 0.46 | QV | | | | |
| 1+25 | 0.0484 | 0.47 | QV | | | | |
| 1+30 | 0.0516 | 0.47 | QV | | | | |
| 1+35 | 0.0548 | 0.47 | QV | | | | |
| 1+40 | 0.0580 | 0.47 | QV | | | | |
| 1+45 | 0.0613 | 0.47 | QV | | | | |
| 1+50 | 0.0645 | 0.47 | QV | | | | |
| 1+55 | 0.0678 | 0.47 | QV | | | | |
| 2+ 0 | 0.0710 | 0.47 | QV | | | | |
| 2+ 5 | 0.0743 | 0.48 | QV | | | | |
| 2+10 | 0.0776 | 0.48 | QV | | | | |
| 2+15 | 0.0809 | 0.48 | QV | | | | |
| 2+20 | 0.0842 | 0.48 | QV | | | | |
| 2+25 | 0.0875 | 0.48 | Q V | | | | |
| 2+30 | 0.0908 | 0.48 | Q V | | | | |
| 2+35 | 0.0942 | 0.48 | Q V | | | | |
| 2+40 | 0.0975 | 0.49 | Q V | | | | |
| 2+45 | 0.1008 | 0.49 | Q V | | | | |
| 2+50 | 0.1042 | 0.49 | Q V | | | | |
| 2+55 | 0.1076 | 0.49 | Q V | | | | |
| 3+ 0 | 0.1110 | 0.49 | Q V | | | | |
| 3+ 5 | 0.1143 | 0.49 | Q V | | | | |
| 3+10 | 0.1178 | 0.49 | Q V | | | | |
| 3+15 | 0.1212 | 0.50 | Q V | | | | |
| 3+20 | 0.1246 | 0.50 | Q V | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3+25 | 0.1280 | 0.50 | Q V | \| | \| | \| | \| |
| 3+30 | 0.1315 | 0.50 | Q V | \| | \| | \| | \| |
| 3+35 | 0.1349 | 0.50 | \|Q V | \| | \| | \| | \| |
| 3+40 | 0.1384 | 0.50 | \|Q V | \| | \| | \| | \| |
| 3+45 | 0.1419 | 0.50 | \|Q V | \| | \| | \| | \| |
| 3+50 | 0.1453 | 0.51 | \|Q V | \| | \| | \| | \| |
| 3+55 | 0.1488 | 0.51 | \|Q V | \| | \| | \| | \| |
| 4+ 0 | 0.1523 | 0.51 | \|Q V | \| | \| | \| | \| |
| 4+ 5 | 0.1559 | 0.51 | \|Q V | \| | \| | \| | \| |
| 4+10 | 0.1594 | 0.51 | \|Q V | \| | \| | \| | \| |
| 4+15 | 0.1629 | 0.51 | \|Q V | \| | \| | \| | \| |
| 4+20 | 0.1665 | 0.52 | \|Q V | \| | \| | \| | \| |
| 4+25 | 0.1701 | 0.52 | \|Q V | \| | \| | \| | \| |
| 4+30 | 0.1736 | 0.52 | \|Q V | \| | \| | \| | \| |
| 4+35 | 0.1772 | 0.52 | \|Q V | \| | \| | \| | \| |
| 4+40 | 0.1808 | 0.52 | \|Q V | \| | \| | \| | \| |
| 4+45 | 0.1844 | 0.52 | \|Q V | \| | \| | \| | \| |
| 4+50 | 0.1881 | 0.53 | \|Q V | \| | \| | \| | \| |
| 4+55 | 0.1917 | 0.53 | \|Q V | \| | \| | \| | \| |
| 5+ 0 | 0.1954 | 0.53 | \|Q V | \| | \| | \| | \| |
| 5+ 5 | 0.1990 | 0.53 | \|Q V | \| | \| | \| | \| |
| 5+10 | 0.2027 | 0.53 | \|Q V | \| | \| | \| | \| |
| 5+15 | 0.2064 | 0.54 | \|Q V | \| | \| | \| | \| |
| 5+20 | 0.2101 | 0.54 | \|Q V | \| | \| | \| | \| |
| 5+25 | 0.2138 | 0.54 | \|Q V | \| | \| | \| | \| |
| 5+30 | 0.2176 | 0.54 | \|Q V | \| | \| | \| | \| |
| 5+35 | 0.2213 | 0.54 | \|Q V | \| | \| | \| | \| |
| 5+40 | 0.2251 | 0.55 | \|Q V | \| | \| | \| | \| |
| 5+45 | 0.2288 | 0.55 | \|Q V | \| | \| | \| | \| |
| 5+50 | 0.2326 | 0.55 | \|Q V | \| | \| | \| | \| |
| 5+55 | 0.2364 | 0.55 | \|Q V | \| | \| | \| | \| |
| 6+ 0 | 0.2402 | 0.55 | \|Q V | \| | \| | \| | \| |
| 6+ 5 | 0.2441 | 0.56 | \|Q V | \| | \| | \| | \| |
| 6+10 | 0.2479 | 0.56 | \|Q V | \| | \| | \| | \| |
| 6+15 | 0.2518 | 0.56 | \|Q V | \| | \| | \| | \| |
| 6+20 | 0.2557 | 0.56 | \|Q V | \| | \| | \| | \| |
| 6+25 | 0.2596 | 0.57 | \|Q V | \| | \| | \| | \| |
| 6+30 | 0.2635 | 0.57 | \|Q V | \| | \| | \| | \| |
| 6+35 | 0.2674 | 0.57 | \|Q V | \| | \| | \| | \| |
| 6+40 | 0.2713 | 0.57 | \|Q V | \| | \| | \| | \| |
| 6+45 | 0.2753 | 0.57 | \|Q V | \| | \| | \| | \| |
| 6+50 | 0.2793 | 0.58 | \|Q V | \| | \| | \| | \| |
| 6+55 | 0.2833 | 0.58 | \|Q V | \| | \| | \| | \| |
| 7+ 0 | 0.2873 | 0.58 | \|Q V | \| | \| | \| | \| |
| 7+ 5 | 0.2913 | 0.58 | \|Q V | \| | \| | \| | \| |
| 7+10 | 0.2953 | 0.59 | \|Q V | \| | \| | \| | \| |
| 7+15 | 0.2994 | 0.59 | \|Q V | \| | \| | \| | \| |
| 7+20 | 0.3035 | 0.59 | \|Q V | \| | \| | \| | \| |
| 7+25 | 0.3076 | 0.59 | \|Q V | \| | \| | \| | \| |
| 7+30 | 0.3117 | 0.60 | \|Q V | \| | \| | \| | \| |
| 7+35 | 0.3158 | 0.60 | \|Q V | \| | \| | \| | \| |
| 7+40 | 0.3200 | 0.60 | \|Q V | \| | \| | \| | \| |
| 7+45 | 0.3241 | 0.61 | \|Q V | \| | \| | \| | \| |
| 7+50 | 0.3283 | 0.61 | \|Q V | \| | \| | \| | \| |
| 7+55 | 0.3325 | 0.61 | \|Q V | \| | \| | \| | \| |
| 8+ 0 | 0.3368 | 0.61 | \|Q V | \| | \| | \| | \| |
| 8+ 5 | 0.3410 | 0.62 | \|Q V | \| | \| | \| | \| |
| 8+10 | 0.3453 | 0.62 | \|Q V | \| | \| | \| | \| |
| 8+15 | 0.3496 | 0.62 | \|Q V | \| | \| | \| | \| |
| 8+20 | 0.3539 | 0.63 | \|Q V | \| | \| | \| | \| |
| 8+25 | 0.3582 | 0.63 | \|Q V | \| | \| | \| | \| |
| 8+30 | 0.3626 | 0.63 | \|Q V | \| | \| | \| | \| |
| 8+35 | 0.3670 | 0.64 | \|Q V | \| | \| | \| | \| |
| 8+40 | 0.3714 | 0.64 | \|Q V | \| | \| | \| | \| |
| 8+45 | 0.3758 | 0.64 | \|Q V | \| | \| | \| | \| |
| 8+50 | 0.3803 | 0.65 | \|Q V | \| | \| | \| | \| |
| 8+55 | 0.3847 | 0.65 | \|Q V | \| | \| | \| | \| |
| 9+ 0 | 0.3892 | 0.65 | \|Q V | \| | \| | \| | \| |
| 9+ 5 | 0.3938 | 0.66 | \|Q V\| | \| | \| | \| | \| |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9+10 | 0.3983 | 0.66 | Q | V | | | |
| 9+15 | 0.4029 | 0.66 | Q | V | | | |
| 9+20 | 0.4075 | 0.67 | Q | V | | | |
| 9+25 | 0.4121 | 0.67 | Q | V | | | |
| 9+30 | 0.4168 | 0.68 | Q | V | | | |
| 9+35 | 0.4214 | 0.68 | Q | V | | | |
| 9+40 | 0.4261 | 0.68 | Q | V | | | |
| 9+45 | 0.4309 | 0.69 | Q | V | | | |
| 9+50 | 0.4356 | 0.69 | Q | V | | | |
| 9+55 | 0.4404 | 0.70 | Q | V | | | |
| 10+ 0 | 0.4453 | 0.70 | Q | V | | | |
| 10+ 5 | 0.4501 | 0.71 | Q | V | | | |
| 10+10 | 0.4550 | 0.71 | Q | V | | | |
| 10+15 | 0.4599 | 0.71 | Q | V | | | |
| 10+20 | 0.4649 | 0.72 | Q | V | | | |
| 10+25 | 0.4699 | 0.72 | Q | V | | | |
| 10+30 | 0.4749 | 0.73 | Q | V | | | |
| 10+35 | 0.4800 | 0.73 | Q | V | | | |
| 10+40 | 0.4851 | 0.74 | Q | V | | | |
| 10+45 | 0.4902 | 0.74 | Q | V | | | |
| 10+50 | 0.4953 | 0.75 | Q | V | | | |
| 10+55 | 0.5005 | 0.76 | Q | V | | | |
| 11+ 0 | 0.5058 | 0.76 | Q | V | | | |
| 11+ 5 | 0.5111 | 0.77 | Q | V | | | |
| 11+10 | 0.5164 | 0.77 | Q | V | | | |
| 11+15 | 0.5218 | 0.78 | Q | V | | | |
| 11+20 | 0.5272 | 0.79 | Q | V | | | |
| 11+25 | 0.5326 | 0.79 | Q | V | | | |
| 11+30 | 0.5381 | 0.80 | Q | V | | | |
| 11+35 | 0.5437 | 0.81 | Q | V | | | |
| 11+40 | 0.5493 | 0.81 | Q | V | | | |
| 11+45 | 0.5549 | 0.82 | Q | V | | | |
| 11+50 | 0.5606 | 0.83 | Q | V | | | |
| 11+55 | 0.5664 | 0.83 | Q | V | | | |
| 12+ 0 | 0.5721 | 0.84 | Q | V | | | |
| 12+ 5 | 0.5780 | 0.85 | Q | V | | | |
| 12+10 | 0.5839 | 0.86 | Q | V | | | |
| 12+15 | 0.5900 | 0.87 | Q | V | | | |
| 12+20 | 0.5960 | 0.88 | Q | V | | | |
| 12+25 | 0.6022 | 0.89 | Q | V | | | |
| 12+30 | 0.6084 | 0.90 | Q | V | | | |
| 12+35 | 0.6147 | 0.91 | Q | V | | | |
| 12+40 | 0.6210 | 0.92 | Q | V | | | |
| 12+45 | 0.6274 | 0.93 | Q | V | | | |
| 12+50 | 0.6339 | 0.94 | Q | V | | | |
| 12+55 | 0.6405 | 0.95 | Q | V | | | |
| 13+ 0 | 0.6471 | 0.97 | Q | V | | | |
| 13+ 5 | 0.6539 | 0.98 | Q | V | | | |
| 13+10 | 0.6607 | 0.99 | Q | V | | | |
| 13+15 | 0.6676 | 1.00 | Q | V | | | |
| 13+20 | 0.6746 | 1.02 | Q | V | | | |
| 13+25 | 0.6817 | 1.03 | Q | V | | | |
| 13+30 | 0.6889 | 1.04 | Q | V | | | |
| 13+35 | 0.6962 | 1.06 | Q | V | | | |
| 13+40 | 0.7036 | 1.08 | Q | V | | | |
| 13+45 | 0.7111 | 1.09 | Q | V | | | |
| 13+50 | 0.7188 | 1.11 | Q | V | | | |
| 13+55 | 0.7265 | 1.13 | Q | V | | | |
| 14+ 0 | 0.7344 | 1.15 | Q | V | | | |
| 14+ 5 | 0.7425 | 1.17 | Q | V | | | |
| 14+10 | 0.7507 | 1.19 | Q | V | | | |
| 14+15 | 0.7591 | 1.22 | Q | V | | | |
| 14+20 | 0.7676 | 1.24 | Q | V | | | |
| 14+25 | 0.7764 | 1.27 | Q | V | | | |
| 14+30 | 0.7853 | 1.30 | Q | V | | | |
| 14+35 | 0.7944 | 1.33 | Q | V | | | |
| 14+40 | 0.8038 | 1.36 | Q | V | | | |
| 14+45 | 0.8134 | 1.40 | Q | V | | | |
| 14+50 | 0.8233 | 1.44 | Q | V | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 14+55 | 0.8335 | 1.48 | Q | | V | | |
| 15+ 0 | 0.8440 | 1.53 | Q | | V | | |
| 15+ 5 | 0.8548 | 1.58 | Q | | V | | |
| 15+10 | 0.8661 | 1.64 | Q | | V | | |
| 15+15 | 0.8778 | 1.70 | Q | | V | | |
| 15+20 | 0.8900 | 1.78 | Q | | V | | |
| 15+25 | 0.9026 | 1.82 | Q | | V | | |
| 15+30 | 0.9145 | 1.72 | Q | | V | | |
| 15+35 | 0.9258 | 1.65 | Q | | V | | |
| 15+40 | 0.9378 | 1.74 | Q | | V | | |
| 15+45 | 0.9511 | 1.92 | Q | | V | | |
| 15+50 | 0.9661 | 2.18 | Q | | V | | |
| 15+55 | 0.9839 | 2.58 | Q | | V | | |
| 16+ 0 | 1.0076 | 3.44 | Q | | V | | |
| 16+ 5 | 1.0497 | 6.13 | | Q | V | | |
| 16+10 | 1.1350 | 12.38 | | | Q V | | |
| 16+15 | 1.2116 | 11.11 | | | Q V | | |
| 16+20 | 1.2459 | 4.99 | | Q | V | | |
| 16+25 | 1.2636 | 2.57 | Q | | V | | |
| 16+30 | 1.2782 | 2.12 | Q | | V | | |
| 16+35 | 1.2910 | 1.86 | Q | | V | | |
| 16+40 | 1.3029 | 1.73 | Q | | V | | |
| 16+45 | 1.3140 | 1.60 | Q | | V | | |
| 16+50 | 1.3243 | 1.50 | Q | | V | | |
| 16+55 | 1.3341 | 1.42 | Q | | V | | |
| 17+ 0 | 1.3433 | 1.34 | Q | | V | | |
| 17+ 5 | 1.3521 | 1.28 | Q | | V | | |
| 17+10 | 1.3606 | 1.23 | Q | | V | | |
| 17+15 | 1.3687 | 1.18 | Q | | V | | |
| 17+20 | 1.3766 | 1.14 | Q | | V | | |
| 17+25 | 1.3841 | 1.10 | Q | | V | | |
| 17+30 | 1.3915 | 1.07 | Q | | V | | |
| 17+35 | 1.3986 | 1.04 | Q | | V | | |
| 17+40 | 1.4056 | 1.01 | Q | | V | | |
| 17+45 | 1.4123 | 0.98 | Q | | V | | |
| 17+50 | 1.4189 | 0.96 | Q | | V | | |
| 17+55 | 1.4254 | 0.94 | Q | | V | | |
| 18+ 0 | 1.4317 | 0.92 | Q | | V | | |
| 18+ 5 | 1.4379 | 0.90 | Q | | V | | |
| 18+10 | 1.4439 | 0.87 | Q | | V | | |
| 18+15 | 1.4498 | 0.85 | Q | | V | | |
| 18+20 | 1.4556 | 0.84 | Q | | V | | |
| 18+25 | 1.4612 | 0.82 | Q | | V | | |
| 18+30 | 1.4668 | 0.81 | Q | | V | | |
| 18+35 | 1.4723 | 0.79 | Q | | V | | |
| 18+40 | 1.4776 | 0.78 | Q | | V | | |
| 18+45 | 1.4829 | 0.77 | Q | | V | | |
| 18+50 | 1.4882 | 0.76 | Q | | V | | |
| 18+55 | 1.4933 | 0.75 | Q | | V | | |
| 19+ 0 | 1.4984 | 0.74 | Q | | V | | |
| 19+ 5 | 1.5034 | 0.73 | Q | | V | | |
| 19+10 | 1.5083 | 0.72 | Q | | V | | |
| 19+15 | 1.5132 | 0.71 | Q | | V | | |
| 19+20 | 1.5180 | 0.70 | Q | | V | | |
| 19+25 | 1.5227 | 0.69 | Q | | V | | |
| 19+30 | 1.5274 | 0.68 | Q | | V | | |
| 19+35 | 1.5321 | 0.67 | Q | | V | | |
| 19+40 | 1.5367 | 0.67 | Q | | V | | |
| 19+45 | 1.5412 | 0.66 | Q | | V | | |
| 19+50 | 1.5457 | 0.65 | Q | | V | | |
| 19+55 | 1.5501 | 0.64 | Q | | V | | |
| 20+ 0 | 1.5545 | 0.64 | Q | | V | | |
| 20+ 5 | 1.5589 | 0.63 | Q | | V | | |
| 20+10 | 1.5632 | 0.62 | Q | | V | | |
| 20+15 | 1.5674 | 0.62 | Q | | V | | |
| 20+20 | 1.5716 | 0.61 | Q | | V | | |
| 20+25 | 1.5758 | 0.61 | Q | | V | | |
| 20+30 | 1.5800 | 0.60 | Q | | V | | |
| 20+35 | 1.5841 | 0.60 | Q | | V | | |

```
  20+40       1.5881      0.59  |Q       |        |        |     V   |
  20+45       1.5922      0.59  |Q       |        |        |     V   |
  20+50       1.5962      0.58  |Q       |        |        |     V   |
  20+55       1.6001      0.58  |Q       |        |        |     V   |
  21+ 0       1.6041      0.57  |Q       |        |        |      V  |
  21+ 5       1.6080      0.57  |Q       |        |        |      V  |
  21+10       1.6118      0.56  |Q       |        |        |      V  |
  21+15       1.6157      0.56  |Q       |        |        |      V  |
  21+20       1.6195      0.55  |Q       |        |        |      V  |
  21+25       1.6233      0.55  |Q       |        |        |      V  |
  21+30       1.6270      0.54  |Q       |        |        |      V  |
  21+35       1.6307      0.54  |Q       |        |        |      V  |
  21+40       1.6344      0.54  |Q       |        |        |      V  |
  21+45       1.6381      0.53  |Q       |        |        |      V  |
  21+50       1.6417      0.53  |Q       |        |        |      V  |
  21+55       1.6454      0.53  |Q       |        |        |      V  |
  22+ 0       1.6490      0.52  |Q       |        |        |       V |
  22+ 5       1.6525      0.52  |Q       |        |        |       V |
  22+10       1.6561      0.52  |Q       |        |        |       V |
  22+15       1.6596      0.51  |Q       |        |        |       V |
  22+20       1.6631      0.51  |Q       |        |        |       V |
  22+25       1.6666      0.51  |Q       |        |        |       V |
  22+30       1.6700      0.50  |Q       |        |        |       V |
  22+35       1.6735      0.50  Q        |        |        |       V |
  22+40       1.6769      0.50  Q        |        |        |       V |
  22+45       1.6803      0.49  Q        |        |        |       V |
  22+50       1.6837      0.49  Q        |        |        |       V |
  22+55       1.6870      0.49  Q        |        |        |       V |
  23+ 0       1.6904      0.48  Q        |        |        |       V |
  23+ 5       1.6937      0.48  Q        |        |        |       V |
  23+10       1.6970      0.48  Q        |        |        |       V |
  23+15       1.7002      0.48  Q        |        |        |       V |
  23+20       1.7035      0.47  Q        |        |        |       V |
  23+25       1.7068      0.47  Q        |        |        |       V |
  23+30       1.7100      0.47  Q        |        |        |       V |
  23+35       1.7132      0.47  Q        |        |        |       V |
  23+40       1.7164      0.46  Q        |        |        |       V |
  23+45       1.7196      0.46  Q        |        |        |       V |
  23+50       1.7227      0.46  Q        |        |        |       V |
  23+55       1.7259      0.46  Q        |        |        |       V |
  24+ 0       1.7290      0.45  Q        |        |        |       V |
  24+ 5       1.7319      0.42  Q        |        |        |       V |
  24+10       1.7335      0.24  Q        |        |        |       V |
  24+15       1.7339      0.06  Q        |        |        |       V |
  24+20       1.7340      0.01  Q        |        |        |       V |
  24+25       1.7341      0.00  Q        |        |        |        V
-------------------------------------------------------------------
```

U n i t  H y d r o g r a p h  A n a l y s i s



Study date 08/04/23

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------

San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6320

---

225038 - 18313 VALLEY BLVD - SB ANIMAL CARE CENTER
DEVELOPED CONDITIONS
25-YEAR, 24-HOUR STORM
BY: JTS DATE: 08-04-23

---

Storm Event Year = 25

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

| Sub-Area (Ac.) | Duration (hours) | Isohyetal (In) |
|---|---|---|
| Rainfall data for year 10 | | |
| 6.07 | 1 | 0.92 |
| Rainfall data for year 2 | | |
| 6.07 | 6 | 1.62 |
| Rainfall data for year 2 | | |
| 6.07 | 24 | 3.01 |
| Rainfall data for year 100 | | |
| 6.07 | 1 | 1.32 |
| Rainfall data for year 100 | | |
| 6.07 | 6 | 3.50 |
| Rainfall data for year 100 | | |
| 6.07 | 24 | 7.80 |

---

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

******** Area-averaged max loss rate, Fm ********

| SCS curve No.(AMCII) | SCS curve NO.(AMC 2) | Area (Ac.) | Area Fraction | Fp(Fig C6) (In/Hr) | Ap (dec.) | Fm (In/Hr) |
|---|---|---|---|---|---|---|
| 32.0 | 32.0 | 6.07 | 1.000 | 0.978 | 0.300 | 0.293 |

Area-averaged adjusted loss rate Fm (In/Hr) = 0.293

********* Area-Averaged low loss rate fraction, Yb **********

| Area (Ac.) | Area Fract | SCS CN (AMC2) | SCS CN (AMC2) | S | Pervious Yield Fr |
|---|---|---|---|---|---|
| 1.82 | 0.300 | 32.0 | 32.0 | 21.25 | 0.024 |
| 4.25 | 0.700 | 98.0 | 98.0 | 0.20 | 0.961 |

Area-averaged catchment yield fraction, Y = 0.680
Area-averaged low loss fraction, Yb = 0.320
User entry of time of concentration = 0.161 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area = 6.07(Ac.)
Catchment Lag time = 0.129 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 64.6998
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.293(In/Hr)
Average low loss rate fraction (Yb) = 0.320 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.399(In)
Computed peak 30-minute rainfall = 0.818(In)
Specified peak 1-hour rainfall = 1.079(In)
Computed peak 3-hour rainfall = 1.951(In)
Specified peak 6-hour rainfall = 2.834(In)
Specified peak 24-hour rainfall = 6.103(In)

Rainfall depth area reduction factors:
Using a total area of 6.07(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.399(In)
30-minute factor = 1.000 Adjusted rainfall = 0.818(In)
1-hour factor = 1.000 Adjusted rainfall = 1.079(In)
3-hour factor = 1.000 Adjusted rainfall = 1.951(In)
6-hour factor = 1.000 Adjusted rainfall = 2.834(In)
24-hour factor = 1.000 Adjusted rainfall = 6.103(In)

U n i t H y d r o g r a p h

| Interval Number | 'S' Graph Mean values | Unit Hydrograph ((CFS)) |
|---|---|---|
| | (K = 73.41 (CFS)) | |
| 1 | 7.542 | 5.537 |
| 2 | 47.395 | 29.256 |
| 3 | 85.692 | 28.113 |
| 4 | 96.957 | 8.270 |
| 5 | 99.041 | 1.530 |
| 6 | 100.000 | 0.704 |

| Peak Unit Number | Adjusted mass rainfall (In) | Unit rainfall (In) |
|---|---|---|
| 1 | 0.3993 | 0.3993 |
| 2 | 0.5269 | 0.1276 |
| 3 | 0.6196 | 0.0928 |
| 4 | 0.6952 | 0.0756 |
| 5 | 0.7601 | 0.0649 |
| 6 | 0.8176 | 0.0575 |
| 7 | 0.8696 | 0.0520 |
| 8 | 0.9173 | 0.0477 |
| 9 | 0.9616 | 0.0443 |
| 10 | 1.0030 | 0.0414 |
| 11 | 1.0420 | 0.0390 |
| 12 | 1.0789 | 0.0369 |
| 13 | 1.1264 | 0.0476 |
| 14 | 1.1723 | 0.0459 |
| 15 | 1.2168 | 0.0444 |

| | | |
|---|---|---|
| 16 | 1.2598 | 0.0431 |
| 17 | 1.3017 | 0.0419 |
| 18 | 1.3424 | 0.0407 |
| 19 | 1.3821 | 0.0397 |
| 20 | 1.4209 | 0.0387 |
| 21 | 1.4587 | 0.0379 |
| 22 | 1.4958 | 0.0370 |
| 23 | 1.5320 | 0.0363 |
| 24 | 1.5676 | 0.0356 |
| 25 | 1.6025 | 0.0349 |
| 26 | 1.6367 | 0.0342 |
| 27 | 1.6704 | 0.0336 |
| 28 | 1.7034 | 0.0331 |
| 29 | 1.7359 | 0.0325 |
| 30 | 1.7680 | 0.0320 |
| 31 | 1.7995 | 0.0315 |
| 32 | 1.8305 | 0.0311 |
| 33 | 1.8612 | 0.0306 |
| 34 | 1.8914 | 0.0302 |
| 35 | 1.9211 | 0.0298 |
| 36 | 1.9505 | 0.0294 |
| 37 | 1.9795 | 0.0290 |
| 38 | 2.0082 | 0.0287 |
| 39 | 2.0365 | 0.0283 |
| 40 | 2.0645 | 0.0280 |
| 41 | 2.0921 | 0.0277 |
| 42 | 2.1195 | 0.0273 |
| 43 | 2.1465 | 0.0270 |
| 44 | 2.1733 | 0.0268 |
| 45 | 2.1997 | 0.0265 |
| 46 | 2.2260 | 0.0262 |
| 47 | 2.2519 | 0.0259 |
| 48 | 2.2776 | 0.0257 |
| 49 | 2.3030 | 0.0254 |
| 50 | 2.3282 | 0.0252 |
| 51 | 2.3532 | 0.0250 |
| 52 | 2.3780 | 0.0248 |
| 53 | 2.4025 | 0.0245 |
| 54 | 2.4268 | 0.0243 |
| 55 | 2.4509 | 0.0241 |
| 56 | 2.4748 | 0.0239 |
| 57 | 2.4986 | 0.0237 |
| 58 | 2.5221 | 0.0235 |
| 59 | 2.5454 | 0.0233 |
| 60 | 2.5686 | 0.0232 |
| 61 | 2.5916 | 0.0230 |
| 62 | 2.6144 | 0.0228 |
| 63 | 2.6370 | 0.0226 |
| 64 | 2.6595 | 0.0225 |
| 65 | 2.6818 | 0.0223 |
| 66 | 2.7039 | 0.0222 |
| 67 | 2.7259 | 0.0220 |
| 68 | 2.7478 | 0.0218 |
| 69 | 2.7695 | 0.0217 |
| 70 | 2.7910 | 0.0216 |
| 71 | 2.8125 | 0.0214 |
| 72 | 2.8337 | 0.0213 |
| 73 | 2.8554 | 0.0217 |
| 74 | 2.8770 | 0.0216 |
| 75 | 2.8985 | 0.0214 |
| 76 | 2.9198 | 0.0213 |
| 77 | 2.9410 | 0.0212 |
| 78 | 2.9621 | 0.0211 |
| 79 | 2.9830 | 0.0210 |
| 80 | 3.0039 | 0.0208 |
| 81 | 3.0246 | 0.0207 |
| 82 | 3.0452 | 0.0206 |
| 83 | 3.0657 | 0.0205 |
| 84 | 3.0861 | 0.0204 |

| | | |
|---|---|---|
| 85 | 3.1063 | 0.0203 |
| 86 | 3.1265 | 0.0202 |
| 87 | 3.1466 | 0.0201 |
| 88 | 3.1665 | 0.0200 |
| 89 | 3.1864 | 0.0199 |
| 90 | 3.2062 | 0.0198 |
| 91 | 3.2258 | 0.0197 |
| 92 | 3.2454 | 0.0196 |
| 93 | 3.2649 | 0.0195 |
| 94 | 3.2842 | 0.0194 |
| 95 | 3.3035 | 0.0193 |
| 96 | 3.3227 | 0.0192 |
| 97 | 3.3418 | 0.0191 |
| 98 | 3.3609 | 0.0190 |
| 99 | 3.3798 | 0.0189 |
| 100 | 3.3986 | 0.0188 |
| 101 | 3.4174 | 0.0188 |
| 102 | 3.4361 | 0.0187 |
| 103 | 3.4547 | 0.0186 |
| 104 | 3.4732 | 0.0185 |
| 105 | 3.4916 | 0.0184 |
| 106 | 3.5100 | 0.0184 |
| 107 | 3.5283 | 0.0183 |
| 108 | 3.5465 | 0.0182 |
| 109 | 3.5646 | 0.0181 |
| 110 | 3.5827 | 0.0181 |
| 111 | 3.6007 | 0.0180 |
| 112 | 3.6186 | 0.0179 |
| 113 | 3.6364 | 0.0178 |
| 114 | 3.6542 | 0.0178 |
| 115 | 3.6719 | 0.0177 |
| 116 | 3.6895 | 0.0176 |
| 117 | 3.7071 | 0.0176 |
| 118 | 3.7246 | 0.0175 |
| 119 | 3.7420 | 0.0174 |
| 120 | 3.7594 | 0.0174 |
| 121 | 3.7767 | 0.0173 |
| 122 | 3.7940 | 0.0172 |
| 123 | 3.8111 | 0.0172 |
| 124 | 3.8282 | 0.0171 |
| 125 | 3.8453 | 0.0171 |
| 126 | 3.8623 | 0.0170 |
| 127 | 3.8792 | 0.0169 |
| 128 | 3.8961 | 0.0169 |
| 129 | 3.9129 | 0.0168 |
| 130 | 3.9297 | 0.0168 |
| 131 | 3.9464 | 0.0167 |
| 132 | 3.9630 | 0.0166 |
| 133 | 3.9796 | 0.0166 |
| 134 | 3.9961 | 0.0165 |
| 135 | 4.0126 | 0.0165 |
| 136 | 4.0290 | 0.0164 |
| 137 | 4.0454 | 0.0164 |
| 138 | 4.0617 | 0.0163 |
| 139 | 4.0780 | 0.0163 |
| 140 | 4.0942 | 0.0162 |
| 141 | 4.1103 | 0.0162 |
| 142 | 4.1264 | 0.0161 |
| 143 | 4.1425 | 0.0161 |
| 144 | 4.1585 | 0.0160 |
| 145 | 4.1744 | 0.0160 |
| 146 | 4.1903 | 0.0159 |
| 147 | 4.2062 | 0.0159 |
| 148 | 4.2220 | 0.0158 |
| 149 | 4.2378 | 0.0158 |
| 150 | 4.2535 | 0.0157 |
| 151 | 4.2692 | 0.0157 |
| 152 | 4.2848 | 0.0156 |
| 153 | 4.3004 | 0.0156 |

| | | |
|---|---|---|
| 154 | 4.3159 | 0.0155 |
| 155 | 4.3314 | 0.0155 |
| 156 | 4.3468 | 0.0154 |
| 157 | 4.3622 | 0.0154 |
| 158 | 4.3776 | 0.0154 |
| 159 | 4.3929 | 0.0153 |
| 160 | 4.4081 | 0.0153 |
| 161 | 4.4234 | 0.0152 |
| 162 | 4.4385 | 0.0152 |
| 163 | 4.4537 | 0.0151 |
| 164 | 4.4688 | 0.0151 |
| 165 | 4.4838 | 0.0151 |
| 166 | 4.4989 | 0.0150 |
| 167 | 4.5138 | 0.0150 |
| 168 | 4.5288 | 0.0149 |
| 169 | 4.5437 | 0.0149 |
| 170 | 4.5585 | 0.0149 |
| 171 | 4.5733 | 0.0148 |
| 172 | 4.5881 | 0.0148 |
| 173 | 4.6029 | 0.0147 |
| 174 | 4.6176 | 0.0147 |
| 175 | 4.6322 | 0.0147 |
| 176 | 4.6469 | 0.0146 |
| 177 | 4.6614 | 0.0146 |
| 178 | 4.6760 | 0.0146 |
| 179 | 4.6905 | 0.0145 |
| 180 | 4.7050 | 0.0145 |
| 181 | 4.7195 | 0.0144 |
| 182 | 4.7339 | 0.0144 |
| 183 | 4.7482 | 0.0144 |
| 184 | 4.7626 | 0.0143 |
| 185 | 4.7769 | 0.0143 |
| 186 | 4.7912 | 0.0143 |
| 187 | 4.8054 | 0.0142 |
| 188 | 4.8196 | 0.0142 |
| 189 | 4.8338 | 0.0142 |
| 190 | 4.8479 | 0.0141 |
| 191 | 4.8620 | 0.0141 |
| 192 | 4.8761 | 0.0141 |
| 193 | 4.8901 | 0.0140 |
| 194 | 4.9041 | 0.0140 |
| 195 | 4.9181 | 0.0140 |
| 196 | 4.9320 | 0.0139 |
| 197 | 4.9459 | 0.0139 |
| 198 | 4.9598 | 0.0139 |
| 199 | 4.9737 | 0.0138 |
| 200 | 4.9875 | 0.0138 |
| 201 | 5.0013 | 0.0138 |
| 202 | 5.0150 | 0.0138 |
| 203 | 5.0287 | 0.0137 |
| 204 | 5.0424 | 0.0137 |
| 205 | 5.0561 | 0.0137 |
| 206 | 5.0697 | 0.0136 |
| 207 | 5.0833 | 0.0136 |
| 208 | 5.0969 | 0.0136 |
| 209 | 5.1104 | 0.0135 |
| 210 | 5.1240 | 0.0135 |
| 211 | 5.1374 | 0.0135 |
| 212 | 5.1509 | 0.0135 |
| 213 | 5.1643 | 0.0134 |
| 214 | 5.1777 | 0.0134 |
| 215 | 5.1911 | 0.0134 |
| 216 | 5.2045 | 0.0133 |
| 217 | 5.2178 | 0.0133 |
| 218 | 5.2311 | 0.0133 |
| 219 | 5.2443 | 0.0133 |
| 220 | 5.2576 | 0.0132 |
| 221 | 5.2708 | 0.0132 |
| 222 | 5.2840 | 0.0132 |

| | | | |
|---|---|---|---|
| 223 | 5.2971 | 0.0132 | |
| 224 | 5.3102 | 0.0131 | |
| 225 | 5.3234 | 0.0131 | |
| 226 | 5.3364 | 0.0131 | |
| 227 | 5.3495 | 0.0131 | |
| 228 | 5.3625 | 0.0130 | |
| 229 | 5.3755 | 0.0130 | |
| 230 | 5.3885 | 0.0130 | |
| 231 | 5.4014 | 0.0130 | |
| 232 | 5.4144 | 0.0129 | |
| 233 | 5.4273 | 0.0129 | |
| 234 | 5.4401 | 0.0129 | |
| 235 | 5.4530 | 0.0129 | |
| 236 | 5.4658 | 0.0128 | |
| 237 | 5.4786 | 0.0128 | |
| 238 | 5.4914 | 0.0128 | |
| 239 | 5.5042 | 0.0128 | |
| 240 | 5.5169 | 0.0127 | |
| 241 | 5.5296 | 0.0127 | |
| 242 | 5.5423 | 0.0127 | |
| 243 | 5.5550 | 0.0127 | |
| 244 | 5.5676 | 0.0126 | |
| 245 | 5.5802 | 0.0126 | |
| 246 | 5.5928 | 0.0126 | |
| 247 | 5.6054 | 0.0126 | |
| 248 | 5.6179 | 0.0125 | |
| 249 | 5.6304 | 0.0125 | |
| 250 | 5.6429 | 0.0125 | |
| 251 | 5.6554 | 0.0125 | |
| 252 | 5.6679 | 0.0125 | |
| 253 | 5.6803 | 0.0124 | |
| 254 | 5.6927 | 0.0124 | |
| 255 | 5.7051 | 0.0124 | |
| 256 | 5.7175 | 0.0124 | |
| 257 | 5.7298 | 0.0123 | |
| 258 | 5.7422 | 0.0123 | |
| 259 | 5.7545 | 0.0123 | |
| 260 | 5.7667 | 0.0123 | |
| 261 | 5.7790 | 0.0123 | |
| 262 | 5.7912 | 0.0122 | |
| 263 | 5.8035 | 0.0122 | |
| 264 | 5.8157 | 0.0122 | |
| 265 | 5.8278 | 0.0122 | |
| 266 | 5.8400 | 0.0122 | |
| 267 | 5.8521 | 0.0121 | |
| 268 | 5.8643 | 0.0121 | |
| 269 | 5.8764 | 0.0121 | |
| 270 | 5.8884 | 0.0121 | |
| 271 | 5.9005 | 0.0121 | |
| 272 | 5.9125 | 0.0120 | |
| 273 | 5.9246 | 0.0120 | |
| 274 | 5.9366 | 0.0120 | |
| 275 | 5.9485 | 0.0120 | |
| 276 | 5.9605 | 0.0120 | |
| 277 | 5.9724 | 0.0119 | |
| 278 | 5.9844 | 0.0119 | |
| 279 | 5.9963 | 0.0119 | |
| 280 | 6.0081 | 0.0119 | |
| 281 | 6.0200 | 0.0119 | |
| 282 | 6.0319 | 0.0118 | |
| 283 | 6.0437 | 0.0118 | |
| 284 | 6.0555 | 0.0118 | |
| 285 | 6.0673 | 0.0118 | |
| 286 | 6.0790 | 0.0118 | |
| 287 | 6.0908 | 0.0118 | |
| 288 | 6.1025 | 0.0117 | |

| Unit Period | Unit Rainfall | Unit Soil-Loss | Effective Rainfall |
|---|---|---|---|

| (number) | (In) | (In) | (In) |
|---|---|---|---|
| 1 | 0.0117 | 0.0038 | 0.0080 |
| 2 | 0.0118 | 0.0038 | 0.0080 |
| 3 | 0.0118 | 0.0038 | 0.0080 |
| 4 | 0.0118 | 0.0038 | 0.0080 |
| 5 | 0.0118 | 0.0038 | 0.0081 |
| 6 | 0.0119 | 0.0038 | 0.0081 |
| 7 | 0.0119 | 0.0038 | 0.0081 |
| 8 | 0.0119 | 0.0038 | 0.0081 |
| 9 | 0.0120 | 0.0038 | 0.0081 |
| 10 | 0.0120 | 0.0038 | 0.0081 |
| 11 | 0.0120 | 0.0038 | 0.0082 |
| 12 | 0.0120 | 0.0039 | 0.0082 |
| 13 | 0.0121 | 0.0039 | 0.0082 |
| 14 | 0.0121 | 0.0039 | 0.0082 |
| 15 | 0.0121 | 0.0039 | 0.0083 |
| 16 | 0.0122 | 0.0039 | 0.0083 |
| 17 | 0.0122 | 0.0039 | 0.0083 |
| 18 | 0.0122 | 0.0039 | 0.0083 |
| 19 | 0.0123 | 0.0039 | 0.0083 |
| 20 | 0.0123 | 0.0039 | 0.0084 |
| 21 | 0.0123 | 0.0039 | 0.0084 |
| 22 | 0.0123 | 0.0040 | 0.0084 |
| 23 | 0.0124 | 0.0040 | 0.0084 |
| 24 | 0.0124 | 0.0040 | 0.0084 |
| 25 | 0.0125 | 0.0040 | 0.0085 |
| 26 | 0.0125 | 0.0040 | 0.0085 |
| 27 | 0.0125 | 0.0040 | 0.0085 |
| 28 | 0.0125 | 0.0040 | 0.0085 |
| 29 | 0.0126 | 0.0040 | 0.0086 |
| 30 | 0.0126 | 0.0040 | 0.0086 |
| 31 | 0.0127 | 0.0041 | 0.0086 |
| 32 | 0.0127 | 0.0041 | 0.0086 |
| 33 | 0.0127 | 0.0041 | 0.0087 |
| 34 | 0.0128 | 0.0041 | 0.0087 |
| 35 | 0.0128 | 0.0041 | 0.0087 |
| 36 | 0.0128 | 0.0041 | 0.0087 |
| 37 | 0.0129 | 0.0041 | 0.0088 |
| 38 | 0.0129 | 0.0041 | 0.0088 |
| 39 | 0.0130 | 0.0041 | 0.0088 |
| 40 | 0.0130 | 0.0042 | 0.0088 |
| 41 | 0.0130 | 0.0042 | 0.0089 |
| 42 | 0.0131 | 0.0042 | 0.0089 |
| 43 | 0.0131 | 0.0042 | 0.0089 |
| 44 | 0.0131 | 0.0042 | 0.0089 |
| 45 | 0.0132 | 0.0042 | 0.0090 |
| 46 | 0.0132 | 0.0042 | 0.0090 |
| 47 | 0.0133 | 0.0042 | 0.0090 |
| 48 | 0.0133 | 0.0043 | 0.0090 |
| 49 | 0.0133 | 0.0043 | 0.0091 |
| 50 | 0.0134 | 0.0043 | 0.0091 |
| 51 | 0.0134 | 0.0043 | 0.0091 |
| 52 | 0.0135 | 0.0043 | 0.0092 |
| 53 | 0.0135 | 0.0043 | 0.0092 |
| 54 | 0.0135 | 0.0043 | 0.0092 |
| 55 | 0.0136 | 0.0044 | 0.0092 |
| 56 | 0.0136 | 0.0044 | 0.0093 |
| 57 | 0.0137 | 0.0044 | 0.0093 |
| 58 | 0.0137 | 0.0044 | 0.0093 |
| 59 | 0.0138 | 0.0044 | 0.0094 |
| 60 | 0.0138 | 0.0044 | 0.0094 |
| 61 | 0.0139 | 0.0044 | 0.0094 |
| 62 | 0.0139 | 0.0045 | 0.0095 |
| 63 | 0.0140 | 0.0045 | 0.0095 |
| 64 | 0.0140 | 0.0045 | 0.0095 |
| 65 | 0.0141 | 0.0045 | 0.0096 |
| 66 | 0.0141 | 0.0045 | 0.0096 |
| 67 | 0.0142 | 0.0045 | 0.0096 |

| | | | |
|---|---|---|---|
| 68 | 0.0142 | 0.0045 | 0.0097 |
| 69 | 0.0143 | 0.0046 | 0.0097 |
| 70 | 0.0143 | 0.0046 | 0.0097 |
| 71 | 0.0144 | 0.0046 | 0.0098 |
| 72 | 0.0144 | 0.0046 | 0.0098 |
| 73 | 0.0145 | 0.0046 | 0.0098 |
| 74 | 0.0145 | 0.0046 | 0.0099 |
| 75 | 0.0146 | 0.0047 | 0.0099 |
| 76 | 0.0146 | 0.0047 | 0.0099 |
| 77 | 0.0147 | 0.0047 | 0.0100 |
| 78 | 0.0147 | 0.0047 | 0.0100 |
| 79 | 0.0148 | 0.0047 | 0.0101 |
| 80 | 0.0149 | 0.0048 | 0.0101 |
| 81 | 0.0149 | 0.0048 | 0.0102 |
| 82 | 0.0150 | 0.0048 | 0.0102 |
| 83 | 0.0151 | 0.0048 | 0.0102 |
| 84 | 0.0151 | 0.0048 | 0.0103 |
| 85 | 0.0152 | 0.0049 | 0.0103 |
| 86 | 0.0152 | 0.0049 | 0.0104 |
| 87 | 0.0153 | 0.0049 | 0.0104 |
| 88 | 0.0154 | 0.0049 | 0.0104 |
| 89 | 0.0154 | 0.0049 | 0.0105 |
| 90 | 0.0155 | 0.0050 | 0.0105 |
| 91 | 0.0156 | 0.0050 | 0.0106 |
| 92 | 0.0156 | 0.0050 | 0.0106 |
| 93 | 0.0157 | 0.0050 | 0.0107 |
| 94 | 0.0158 | 0.0050 | 0.0107 |
| 95 | 0.0159 | 0.0051 | 0.0108 |
| 96 | 0.0159 | 0.0051 | 0.0108 |
| 97 | 0.0160 | 0.0051 | 0.0109 |
| 98 | 0.0161 | 0.0051 | 0.0109 |
| 99 | 0.0162 | 0.0052 | 0.0110 |
| 100 | 0.0162 | 0.0052 | 0.0110 |
| 101 | 0.0163 | 0.0052 | 0.0111 |
| 102 | 0.0164 | 0.0052 | 0.0111 |
| 103 | 0.0165 | 0.0053 | 0.0112 |
| 104 | 0.0165 | 0.0053 | 0.0112 |
| 105 | 0.0166 | 0.0053 | 0.0113 |
| 106 | 0.0167 | 0.0053 | 0.0114 |
| 107 | 0.0168 | 0.0054 | 0.0114 |
| 108 | 0.0169 | 0.0054 | 0.0115 |
| 109 | 0.0170 | 0.0054 | 0.0116 |
| 110 | 0.0171 | 0.0055 | 0.0116 |
| 111 | 0.0172 | 0.0055 | 0.0117 |
| 112 | 0.0172 | 0.0055 | 0.0117 |
| 113 | 0.0174 | 0.0056 | 0.0118 |
| 114 | 0.0174 | 0.0056 | 0.0119 |
| 115 | 0.0176 | 0.0056 | 0.0119 |
| 116 | 0.0176 | 0.0056 | 0.0120 |
| 117 | 0.0178 | 0.0057 | 0.0121 |
| 118 | 0.0178 | 0.0057 | 0.0121 |
| 119 | 0.0180 | 0.0058 | 0.0122 |
| 120 | 0.0181 | 0.0058 | 0.0123 |
| 121 | 0.0182 | 0.0058 | 0.0124 |
| 122 | 0.0183 | 0.0059 | 0.0124 |
| 123 | 0.0184 | 0.0059 | 0.0125 |
| 124 | 0.0185 | 0.0059 | 0.0126 |
| 125 | 0.0187 | 0.0060 | 0.0127 |
| 126 | 0.0188 | 0.0060 | 0.0128 |
| 127 | 0.0189 | 0.0061 | 0.0129 |
| 128 | 0.0190 | 0.0061 | 0.0129 |
| 129 | 0.0192 | 0.0061 | 0.0131 |
| 130 | 0.0193 | 0.0062 | 0.0131 |
| 131 | 0.0195 | 0.0062 | 0.0132 |
| 132 | 0.0196 | 0.0063 | 0.0133 |
| 133 | 0.0198 | 0.0063 | 0.0134 |
| 134 | 0.0199 | 0.0064 | 0.0135 |
| 135 | 0.0201 | 0.0064 | 0.0136 |
| 136 | 0.0202 | 0.0065 | 0.0137 |

| | | | |
|---|---|---|---|
| 137 | 0.0204 | 0.0065 | 0.0139 |
| 138 | 0.0205 | 0.0066 | 0.0139 |
| 139 | 0.0207 | 0.0066 | 0.0141 |
| 140 | 0.0208 | 0.0067 | 0.0142 |
| 141 | 0.0211 | 0.0067 | 0.0143 |
| 142 | 0.0212 | 0.0068 | 0.0144 |
| 143 | 0.0214 | 0.0069 | 0.0146 |
| 144 | 0.0216 | 0.0069 | 0.0147 |
| 145 | 0.0213 | 0.0068 | 0.0145 |
| 146 | 0.0214 | 0.0069 | 0.0146 |
| 147 | 0.0217 | 0.0069 | 0.0148 |
| 148 | 0.0218 | 0.0070 | 0.0149 |
| 149 | 0.0222 | 0.0071 | 0.0151 |
| 150 | 0.0223 | 0.0071 | 0.0152 |
| 151 | 0.0226 | 0.0072 | 0.0154 |
| 152 | 0.0228 | 0.0073 | 0.0155 |
| 153 | 0.0232 | 0.0074 | 0.0157 |
| 154 | 0.0233 | 0.0075 | 0.0159 |
| 155 | 0.0237 | 0.0076 | 0.0161 |
| 156 | 0.0239 | 0.0077 | 0.0163 |
| 157 | 0.0243 | 0.0078 | 0.0165 |
| 158 | 0.0245 | 0.0079 | 0.0167 |
| 159 | 0.0250 | 0.0080 | 0.0170 |
| 160 | 0.0252 | 0.0081 | 0.0171 |
| 161 | 0.0257 | 0.0082 | 0.0175 |
| 162 | 0.0259 | 0.0083 | 0.0176 |
| 163 | 0.0265 | 0.0085 | 0.0180 |
| 164 | 0.0268 | 0.0086 | 0.0182 |
| 165 | 0.0273 | 0.0088 | 0.0186 |
| 166 | 0.0277 | 0.0088 | 0.0188 |
| 167 | 0.0283 | 0.0091 | 0.0192 |
| 168 | 0.0287 | 0.0092 | 0.0195 |
| 169 | 0.0294 | 0.0094 | 0.0200 |
| 170 | 0.0298 | 0.0095 | 0.0203 |
| 171 | 0.0306 | 0.0098 | 0.0208 |
| 172 | 0.0311 | 0.0099 | 0.0211 |
| 173 | 0.0320 | 0.0102 | 0.0218 |
| 174 | 0.0325 | 0.0104 | 0.0221 |
| 175 | 0.0336 | 0.0108 | 0.0229 |
| 176 | 0.0342 | 0.0110 | 0.0233 |
| 177 | 0.0356 | 0.0114 | 0.0242 |
| 178 | 0.0363 | 0.0116 | 0.0247 |
| 179 | 0.0379 | 0.0121 | 0.0257 |
| 180 | 0.0387 | 0.0124 | 0.0263 |
| 181 | 0.0407 | 0.0130 | 0.0277 |
| 182 | 0.0419 | 0.0134 | 0.0285 |
| 183 | 0.0444 | 0.0142 | 0.0302 |
| 184 | 0.0459 | 0.0147 | 0.0312 |
| 185 | 0.0369 | 0.0118 | 0.0251 |
| 186 | 0.0390 | 0.0125 | 0.0265 |
| 187 | 0.0443 | 0.0142 | 0.0301 |
| 188 | 0.0477 | 0.0153 | 0.0324 |
| 189 | 0.0575 | 0.0184 | 0.0391 |
| 190 | 0.0649 | 0.0208 | 0.0441 |
| 191 | 0.0928 | 0.0244 | 0.0683 |
| 192 | 0.1276 | 0.0244 | 0.1031 |
| 193 | 0.3993 | 0.0244 | 0.3749 |
| 194 | 0.0756 | 0.0242 | 0.0514 |
| 195 | 0.0520 | 0.0166 | 0.0354 |
| 196 | 0.0414 | 0.0132 | 0.0281 |
| 197 | 0.0476 | 0.0152 | 0.0323 |
| 198 | 0.0431 | 0.0138 | 0.0293 |
| 199 | 0.0397 | 0.0127 | 0.0270 |
| 200 | 0.0370 | 0.0119 | 0.0252 |
| 201 | 0.0349 | 0.0112 | 0.0237 |
| 202 | 0.0331 | 0.0106 | 0.0225 |
| 203 | 0.0315 | 0.0101 | 0.0214 |
| 204 | 0.0302 | 0.0097 | 0.0205 |
| 205 | 0.0290 | 0.0093 | 0.0197 |

| | | | |
|---|---|---|---|
| 206 | 0.0280 | 0.0090 | 0.0190 |
| 207 | 0.0270 | 0.0087 | 0.0184 |
| 208 | 0.0262 | 0.0084 | 0.0178 |
| 209 | 0.0254 | 0.0081 | 0.0173 |
| 210 | 0.0248 | 0.0079 | 0.0168 |
| 211 | 0.0241 | 0.0077 | 0.0164 |
| 212 | 0.0235 | 0.0075 | 0.0160 |
| 213 | 0.0230 | 0.0074 | 0.0156 |
| 214 | 0.0225 | 0.0072 | 0.0153 |
| 215 | 0.0220 | 0.0070 | 0.0150 |
| 216 | 0.0216 | 0.0069 | 0.0147 |
| 217 | 0.0217 | 0.0069 | 0.0148 |
| 218 | 0.0213 | 0.0068 | 0.0145 |
| 219 | 0.0210 | 0.0067 | 0.0142 |
| 220 | 0.0206 | 0.0066 | 0.0140 |
| 221 | 0.0203 | 0.0065 | 0.0138 |
| 222 | 0.0200 | 0.0064 | 0.0136 |
| 223 | 0.0197 | 0.0063 | 0.0134 |
| 224 | 0.0194 | 0.0062 | 0.0132 |
| 225 | 0.0191 | 0.0061 | 0.0130 |
| 226 | 0.0188 | 0.0060 | 0.0128 |
| 227 | 0.0186 | 0.0060 | 0.0126 |
| 228 | 0.0184 | 0.0059 | 0.0125 |
| 229 | 0.0181 | 0.0058 | 0.0123 |
| 230 | 0.0179 | 0.0057 | 0.0122 |
| 231 | 0.0177 | 0.0057 | 0.0120 |
| 232 | 0.0175 | 0.0056 | 0.0119 |
| 233 | 0.0173 | 0.0055 | 0.0118 |
| 234 | 0.0171 | 0.0055 | 0.0116 |
| 235 | 0.0169 | 0.0054 | 0.0115 |
| 236 | 0.0168 | 0.0054 | 0.0114 |
| 237 | 0.0166 | 0.0053 | 0.0113 |
| 238 | 0.0164 | 0.0053 | 0.0112 |
| 239 | 0.0163 | 0.0052 | 0.0111 |
| 240 | 0.0161 | 0.0052 | 0.0110 |
| 241 | 0.0160 | 0.0051 | 0.0108 |
| 242 | 0.0158 | 0.0051 | 0.0107 |
| 243 | 0.0157 | 0.0050 | 0.0107 |
| 244 | 0.0155 | 0.0050 | 0.0106 |
| 245 | 0.0154 | 0.0049 | 0.0105 |
| 246 | 0.0153 | 0.0049 | 0.0104 |
| 247 | 0.0151 | 0.0048 | 0.0103 |
| 248 | 0.0150 | 0.0048 | 0.0102 |
| 249 | 0.0149 | 0.0048 | 0.0101 |
| 250 | 0.0148 | 0.0047 | 0.0100 |
| 251 | 0.0147 | 0.0047 | 0.0100 |
| 252 | 0.0146 | 0.0047 | 0.0099 |
| 253 | 0.0144 | 0.0046 | 0.0098 |
| 254 | 0.0143 | 0.0046 | 0.0098 |
| 255 | 0.0142 | 0.0046 | 0.0097 |
| 256 | 0.0141 | 0.0045 | 0.0096 |
| 257 | 0.0140 | 0.0045 | 0.0095 |
| 258 | 0.0139 | 0.0045 | 0.0095 |
| 259 | 0.0138 | 0.0044 | 0.0094 |
| 260 | 0.0138 | 0.0044 | 0.0094 |
| 261 | 0.0137 | 0.0044 | 0.0093 |
| 262 | 0.0136 | 0.0043 | 0.0092 |
| 263 | 0.0135 | 0.0043 | 0.0092 |
| 264 | 0.0134 | 0.0043 | 0.0091 |
| 265 | 0.0133 | 0.0043 | 0.0091 |
| 266 | 0.0132 | 0.0042 | 0.0090 |
| 267 | 0.0132 | 0.0042 | 0.0089 |
| 268 | 0.0131 | 0.0042 | 0.0089 |
| 269 | 0.0130 | 0.0042 | 0.0088 |
| 270 | 0.0129 | 0.0041 | 0.0088 |
| 271 | 0.0129 | 0.0041 | 0.0087 |
| 272 | 0.0128 | 0.0041 | 0.0087 |
| 273 | 0.0127 | 0.0041 | 0.0086 |
| 274 | 0.0126 | 0.0040 | 0.0086 |

| | | | |
|---|---|---|---|
| 275 | 0.0126 | 0.0040 | 0.0085 |
| 276 | 0.0125 | 0.0040 | 0.0085 |
| 277 | 0.0124 | 0.0040 | 0.0085 |
| 278 | 0.0124 | 0.0040 | 0.0084 |
| 279 | 0.0123 | 0.0039 | 0.0084 |
| 280 | 0.0122 | 0.0039 | 0.0083 |
| 281 | 0.0122 | 0.0039 | 0.0083 |
| 282 | 0.0121 | 0.0039 | 0.0082 |
| 283 | 0.0121 | 0.0039 | 0.0082 |
| 284 | 0.0120 | 0.0038 | 0.0082 |
| 285 | 0.0119 | 0.0038 | 0.0081 |
| 286 | 0.0119 | 0.0038 | 0.0081 |
| 287 | 0.0118 | 0.0038 | 0.0080 |
| 288 | 0.0118 | 0.0038 | 0.0080 |

---

---

Total soil rain loss = 1.83(In)
Total effective rainfall = 4.27(In)
Peak flow rate in flood hydrograph = 14.81(CFS)

---

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

---

Hydrograph in 5 Minute intervals ((CFS))

---

| Time(h+m) | Volume Ac.Ft | Q(CFS) | 0 | 5.0 | 10.0 | 15.0 | 20.0 |
|---|---|---|---|---|---|---|---|
| 0+ 5 | 0.0003 | 0.04 | Q | | | | |
| 0+10 | 0.0022 | 0.28 | Q | | | | |
| 0+15 | 0.0057 | 0.50 | VQ | | | | |
| 0+20 | 0.0096 | 0.57 | VQ | | | | |
| 0+25 | 0.0136 | 0.58 | VQ | | | | |
| 0+30 | 0.0177 | 0.59 | VQ | | | | |
| 0+35 | 0.0218 | 0.59 | VQ | | | | |
| 0+40 | 0.0258 | 0.59 | VQ | | | | |
| 0+45 | 0.0299 | 0.59 | VQ | | | | |
| 0+50 | 0.0340 | 0.60 | VQ | | | | |
| 0+55 | 0.0381 | 0.60 | VQ | | | | |
| 1+ 0 | 0.0423 | 0.60 | VQ | | | | |
| 1+ 5 | 0.0464 | 0.60 | VQ | | | | |
| 1+10 | 0.0506 | 0.60 | VQ | | | | |
| 1+15 | 0.0547 | 0.60 | \|Q | | | | |
| 1+20 | 0.0589 | 0.60 | \|Q | | | | |
| 1+25 | 0.0630 | 0.61 | \|Q | | | | |
| 1+30 | 0.0672 | 0.61 | \|Q | | | | |
| 1+35 | 0.0714 | 0.61 | \|Q | | | | |
| 1+40 | 0.0756 | 0.61 | \|Q | | | | |
| 1+45 | 0.0799 | 0.61 | \|Q | | | | |
| 1+50 | 0.0841 | 0.61 | \|Q | | | | |
| 1+55 | 0.0883 | 0.62 | \|Q | | | | |
| 2+ 0 | 0.0926 | 0.62 | \|Q | | | | |
| 2+ 5 | 0.0968 | 0.62 | \|Q | | | | |
| 2+10 | 0.1011 | 0.62 | \|Q | | | | |
| 2+15 | 0.1054 | 0.62 | \|Q | | | | |
| 2+20 | 0.1097 | 0.62 | \|QV | | | | |
| 2+25 | 0.1140 | 0.63 | \|QV | | | | |
| 2+30 | 0.1183 | 0.63 | \|QV | | | | |
| 2+35 | 0.1226 | 0.63 | \|QV | | | | |
| 2+40 | 0.1270 | 0.63 | \|QV | | | | |
| 2+45 | 0.1313 | 0.63 | \|QV | | | | |
| 2+50 | 0.1357 | 0.63 | \|QV | | | | |
| 2+55 | 0.1401 | 0.64 | \|QV | | | | |
| 3+ 0 | 0.1445 | 0.64 | \|QV | | | | |
| 3+ 5 | 0.1489 | 0.64 | \|QV | | | | |
| 3+10 | 0.1533 | 0.64 | \|QV | | | | |
| 3+15 | 0.1577 | 0.64 | \|QV | | | | |
| 3+20 | 0.1622 | 0.65 | \|Q V | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3+25 | 0.1666 | 0.65 | \|Q V | \| | \| | \| | \| |
| 3+30 | 0.1711 | 0.65 | \|Q V | \| | \| | \| | \| |
| 3+35 | 0.1756 | 0.65 | \|Q V | \| | \| | \| | \| |
| 3+40 | 0.1801 | 0.65 | \|Q V | \| | \| | \| | \| |
| 3+45 | 0.1846 | 0.65 | \|Q V | \| | \| | \| | \| |
| 3+50 | 0.1891 | 0.66 | \|Q V | \| | \| | \| | \| |
| 3+55 | 0.1936 | 0.66 | \|Q V | \| | \| | \| | \| |
| 4+ 0 | 0.1982 | 0.66 | \|Q V | \| | \| | \| | \| |
| 4+ 5 | 0.2027 | 0.66 | \|Q V | \| | \| | \| | \| |
| 4+10 | 0.2073 | 0.66 | \|Q V | \| | \| | \| | \| |
| 4+15 | 0.2119 | 0.67 | \|Q V | \| | \| | \| | \| |
| 4+20 | 0.2165 | 0.67 | \|Q V | \| | \| | \| | \| |
| 4+25 | 0.2211 | 0.67 | \|Q V | \| | \| | \| | \| |
| 4+30 | 0.2258 | 0.67 | \|Q V | \| | \| | \| | \| |
| 4+35 | 0.2304 | 0.68 | \|Q V | \| | \| | \| | \| |
| 4+40 | 0.2351 | 0.68 | \|Q V | \| | \| | \| | \| |
| 4+45 | 0.2398 | 0.68 | \|Q V | \| | \| | \| | \| |
| 4+50 | 0.2445 | 0.68 | \|Q V | \| | \| | \| | \| |
| 4+55 | 0.2492 | 0.68 | \|Q V | \| | \| | \| | \| |
| 5+ 0 | 0.2539 | 0.69 | \|Q V | \| | \| | \| | \| |
| 5+ 5 | 0.2586 | 0.69 | \|Q V | \| | \| | \| | \| |
| 5+10 | 0.2634 | 0.69 | \|Q V | \| | \| | \| | \| |
| 5+15 | 0.2682 | 0.69 | \|Q V | \| | \| | \| | \| |
| 5+20 | 0.2730 | 0.70 | \|Q V | \| | \| | \| | \| |
| 5+25 | 0.2778 | 0.70 | \|Q V | \| | \| | \| | \| |
| 5+30 | 0.2826 | 0.70 | \|Q V | \| | \| | \| | \| |
| 5+35 | 0.2874 | 0.70 | \|Q V | \| | \| | \| | \| |
| 5+40 | 0.2923 | 0.71 | \|Q V | \| | \| | \| | \| |
| 5+45 | 0.2972 | 0.71 | \|Q V | \| | \| | \| | \| |
| 5+50 | 0.3021 | 0.71 | \|Q V | \| | \| | \| | \| |
| 5+55 | 0.3070 | 0.71 | \|Q V | \| | \| | \| | \| |
| 6+ 0 | 0.3119 | 0.72 | \|Q V | \| | \| | \| | \| |
| 6+ 5 | 0.3168 | 0.72 | \|Q V | \| | \| | \| | \| |
| 6+10 | 0.3218 | 0.72 | \|Q V | \| | \| | \| | \| |
| 6+15 | 0.3268 | 0.72 | \|Q V | \| | \| | \| | \| |
| 6+20 | 0.3318 | 0.73 | \|Q V | \| | \| | \| | \| |
| 6+25 | 0.3368 | 0.73 | \|Q V | \| | \| | \| | \| |
| 6+30 | 0.3418 | 0.73 | \|Q V | \| | \| | \| | \| |
| 6+35 | 0.3469 | 0.73 | \|Q V | \| | \| | \| | \| |
| 6+40 | 0.3520 | 0.74 | \|Q V | \| | \| | \| | \| |
| 6+45 | 0.3571 | 0.74 | \|Q V | \| | \| | \| | \| |
| 6+50 | 0.3622 | 0.74 | \|Q V | \| | \| | \| | \| |
| 6+55 | 0.3673 | 0.75 | \|Q V | \| | \| | \| | \| |
| 7+ 0 | 0.3725 | 0.75 | \|Q V | \| | \| | \| | \| |
| 7+ 5 | 0.3777 | 0.75 | \|Q V | \| | \| | \| | \| |
| 7+10 | 0.3829 | 0.76 | \|Q V | \| | \| | \| | \| |
| 7+15 | 0.3881 | 0.76 | \|Q V | \| | \| | \| | \| |
| 7+20 | 0.3934 | 0.76 | \|Q V | \| | \| | \| | \| |
| 7+25 | 0.3986 | 0.76 | \|Q V | \| | \| | \| | \| |
| 7+30 | 0.4039 | 0.77 | \|Q V | \| | \| | \| | \| |
| 7+35 | 0.4092 | 0.77 | \|Q V | \| | \| | \| | \| |
| 7+40 | 0.4146 | 0.77 | \|Q V | \| | \| | \| | \| |
| 7+45 | 0.4199 | 0.78 | \|Q V | \| | \| | \| | \| |
| 7+50 | 0.4253 | 0.78 | \|Q V | \| | \| | \| | \| |
| 7+55 | 0.4307 | 0.79 | \|Q V | \| | \| | \| | \| |
| 8+ 0 | 0.4361 | 0.79 | \|Q V | \| | \| | \| | \| |
| 8+ 5 | 0.4416 | 0.79 | \|Q V | \| | \| | \| | \| |
| 8+10 | 0.4471 | 0.80 | \|Q V | \| | \| | \| | \| |
| 8+15 | 0.4526 | 0.80 | \|Q V | \| | \| | \| | \| |
| 8+20 | 0.4581 | 0.80 | \|Q V | \| | \| | \| | \| |
| 8+25 | 0.4637 | 0.81 | \|Q V | \| | \| | \| | \| |
| 8+30 | 0.4693 | 0.81 | \|Q V | \| | \| | \| | \| |
| 8+35 | 0.4749 | 0.82 | \|Q V | \| | \| | \| | \| |
| 8+40 | 0.4805 | 0.82 | \|Q V | \| | \| | \| | \| |
| 8+45 | 0.4862 | 0.82 | \|Q V | \| | \| | \| | \| |
| 8+50 | 0.4919 | 0.83 | \|Q V\| | \| | \| | \| | \| |
| 8+55 | 0.4976 | 0.83 | \|Q V\| | \| | \| | \| | \| |
| 9+ 0 | 0.5034 | 0.84 | \|Q V\| | \| | \| | \| | \| |
| 9+ 5 | 0.5092 | 0.84 | \|Q V\| | \| | \| | \| | \| |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9+10 | 0.5150 | 0.84 | Q | V | | | |
| 9+15 | 0.5208 | 0.85 | Q | V | | | |
| 9+20 | 0.5267 | 0.85 | Q | V | | | |
| 9+25 | 0.5326 | 0.86 | Q | V | | | |
| 9+30 | 0.5386 | 0.86 | Q | V | | | |
| 9+35 | 0.5445 | 0.87 | Q | V | | | |
| 9+40 | 0.5505 | 0.87 | Q | V | | | |
| 9+45 | 0.5566 | 0.88 | Q | V | | | |
| 9+50 | 0.5627 | 0.88 | Q | V | | | |
| 9+55 | 0.5688 | 0.89 | Q | V | | | |
| 10+ 0 | 0.5749 | 0.89 | Q | V | | | |
| 10+ 5 | 0.5811 | 0.90 | Q | V | | | |
| 10+10 | 0.5874 | 0.90 | Q | V | | | |
| 10+15 | 0.5936 | 0.91 | Q | V | | | |
| 10+20 | 0.5999 | 0.92 | Q | V | | | |
| 10+25 | 0.6063 | 0.92 | Q | V | | | |
| 10+30 | 0.6127 | 0.93 | Q | V | | | |
| 10+35 | 0.6191 | 0.93 | Q | V | | | |
| 10+40 | 0.6256 | 0.94 | Q | V | | | |
| 10+45 | 0.6321 | 0.95 | Q | V | | | |
| 10+50 | 0.6387 | 0.95 | Q | V | | | |
| 10+55 | 0.6453 | 0.96 | Q | V | | | |
| 11+ 0 | 0.6519 | 0.97 | Q | V | | | |
| 11+ 5 | 0.6586 | 0.97 | Q | V | | | |
| 11+10 | 0.6654 | 0.98 | Q | V | | | |
| 11+15 | 0.6722 | 0.99 | Q | V | | | |
| 11+20 | 0.6791 | 1.00 | Q | V | | | |
| 11+25 | 0.6860 | 1.00 | Q | V | | | |
| 11+30 | 0.6929 | 1.01 | Q | V | | | |
| 11+35 | 0.6999 | 1.02 | Q | V | | | |
| 11+40 | 0.7070 | 1.03 | Q | V | | | |
| 11+45 | 0.7142 | 1.04 | Q | V | | | |
| 11+50 | 0.7214 | 1.04 | Q | V | | | |
| 11+55 | 0.7286 | 1.05 | Q | V | | | |
| 12+ 0 | 0.7359 | 1.06 | Q | V | | | |
| 12+ 5 | 0.7433 | 1.07 | Q | V | | | |
| 12+10 | 0.7507 | 1.07 | Q | V | | | |
| 12+15 | 0.7580 | 1.07 | Q | V | | | |
| 12+20 | 0.7654 | 1.08 | Q | V | | | |
| 12+25 | 0.7729 | 1.09 | Q | V | | | |
| 12+30 | 0.7805 | 1.10 | Q | V | | | |
| 12+35 | 0.7881 | 1.11 | Q | V | | | |
| 12+40 | 0.7958 | 1.12 | Q | V | | | |
| 12+45 | 0.8036 | 1.13 | Q | V | | | |
| 12+50 | 0.8115 | 1.15 | Q | V | | | |
| 12+55 | 0.8195 | 1.16 | Q | V | | | |
| 13+ 0 | 0.8276 | 1.17 | Q | V | | | |
| 13+ 5 | 0.8357 | 1.19 | Q | V | | | |
| 13+10 | 0.8440 | 1.20 | Q | V | | | |
| 13+15 | 0.8524 | 1.22 | Q | V | | | |
| 13+20 | 0.8609 | 1.23 | Q | V | | | |
| 13+25 | 0.8695 | 1.25 | Q | V | | | |
| 13+30 | 0.8782 | 1.27 | Q | V | | | |
| 13+35 | 0.8871 | 1.29 | Q | V | | | |
| 13+40 | 0.8961 | 1.31 | Q | V | | | |
| 13+45 | 0.9052 | 1.33 | Q | V | | | |
| 13+50 | 0.9145 | 1.35 | Q | V | | | |
| 13+55 | 0.9239 | 1.37 | Q | V | | | |
| 14+ 0 | 0.9335 | 1.39 | Q | V | | | |
| 14+ 5 | 0.9433 | 1.42 | Q | V | | | |
| 14+10 | 0.9533 | 1.45 | Q | V | | | |
| 14+15 | 0.9634 | 1.47 | Q | V | | | |
| 14+20 | 0.9738 | 1.50 | Q | V | | | |
| 14+25 | 0.9843 | 1.54 | Q | V | | | |
| 14+30 | 0.9952 | 1.57 | Q | V | | | |
| 14+35 | 1.0062 | 1.61 | Q | V | | | |
| 14+40 | 1.0176 | 1.65 | Q | V | | | |
| 14+45 | 1.0292 | 1.69 | Q | V | | | |
| 14+50 | 1.0412 | 1.74 | Q | V | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 14+55 | 1.0535 | 1.79 | Q | | V | | |
| 15+ 0 | 1.0662 | 1.84 | Q | | V | | |
| 15+ 5 | 1.0793 | 1.91 | Q | | V | | |
| 15+10 | 1.0929 | 1.98 | Q | | V | | |
| 15+15 | 1.1070 | 2.05 | Q | | V | | |
| 15+20 | 1.1218 | 2.14 | Q | | V | | |
| 15+25 | 1.1369 | 2.20 | Q | | V | | |
| 15+30 | 1.1512 | 2.07 | Q | | V | | |
| 15+35 | 1.1648 | 1.97 | Q | | V | | |
| 15+40 | 1.1791 | 2.08 | Q | | V | | |
| 15+45 | 1.1949 | 2.29 | Q | | V | | |
| 15+50 | 1.2129 | 2.61 | Q | | V | | |
| 15+55 | 1.2342 | 3.10 | Q | | V | | |
| 16+ 0 | 1.2632 | 4.20 | Q | | V | | |
| 16+ 5 | 1.3146 | 7.46 | Q | | V | | |
| 16+10 | 1.4166 | 14.81 | Q | | V | Q | |
| 16+15 | 1.5076 | 13.23 | Q | | QV | | |
| 16+20 | 1.5486 | 5.94 | Q | | V | | |
| 16+25 | 1.5697 | 3.07 | Q | | V | | |
| 16+30 | 1.5871 | 2.53 | Q | | V | | |
| 16+35 | 1.6026 | 2.24 | Q | | V | | |
| 16+40 | 1.6169 | 2.09 | Q | | V | | |
| 16+45 | 1.6303 | 1.94 | Q | | V | | |
| 16+50 | 1.6428 | 1.82 | Q | | V | | |
| 16+55 | 1.6546 | 1.71 | Q | | V | | |
| 17+ 0 | 1.6658 | 1.63 | Q | | V | | |
| 17+ 5 | 1.6765 | 1.55 | Q | | V | | |
| 17+10 | 1.6868 | 1.49 | Q | | V | | |
| 17+15 | 1.6966 | 1.43 | Q | | V | | |
| 17+20 | 1.7061 | 1.38 | Q | | V | | |
| 17+25 | 1.7153 | 1.34 | Q | | V | | |
| 17+30 | 1.7242 | 1.30 | Q | | V | | |
| 17+35 | 1.7329 | 1.26 | Q | | V | | |
| 17+40 | 1.7413 | 1.22 | Q | | V | | |
| 17+45 | 1.7496 | 1.19 | Q | | V | | |
| 17+50 | 1.7576 | 1.16 | Q | | V | | |
| 17+55 | 1.7654 | 1.14 | Q | | V | | |
| 18+ 0 | 1.7731 | 1.11 | Q | | V | | |
| 18+ 5 | 1.7806 | 1.09 | Q | | V | | |
| 18+10 | 1.7881 | 1.08 | Q | | V | | |
| 18+15 | 1.7955 | 1.07 | Q | | V | | |
| 18+20 | 1.8027 | 1.06 | Q | | V | | |
| 18+25 | 1.8099 | 1.04 | Q | | V | | |
| 18+30 | 1.8170 | 1.02 | Q | | V | | |
| 18+35 | 1.8239 | 1.01 | Q | | V | | |
| 18+40 | 1.8307 | 0.99 | Q | | V | | |
| 18+45 | 1.8374 | 0.98 | Q | | V | | |
| 18+50 | 1.8441 | 0.96 | Q | | V | | |
| 18+55 | 1.8506 | 0.95 | Q | | V | | |
| 19+ 0 | 1.8571 | 0.94 | Q | | V | | |
| 19+ 5 | 1.8634 | 0.92 | Q | | V | | |
| 19+10 | 1.8697 | 0.91 | Q | | V | | |
| 19+15 | 1.8759 | 0.90 | Q | | V | | |
| 19+20 | 1.8820 | 0.89 | Q | | V | | |
| 19+25 | 1.8881 | 0.88 | Q | | V | | |
| 19+30 | 1.8941 | 0.87 | Q | | V | | |
| 19+35 | 1.9000 | 0.86 | Q | | V | | |
| 19+40 | 1.9059 | 0.85 | Q | | V | | |
| 19+45 | 1.9117 | 0.84 | Q | | V | | |
| 19+50 | 1.9174 | 0.83 | Q | | V | | |
| 19+55 | 1.9231 | 0.82 | Q | | V | | |
| 20+ 0 | 1.9287 | 0.82 | Q | | V | | |
| 20+ 5 | 1.9343 | 0.81 | Q | | V | | |
| 20+10 | 1.9398 | 0.80 | Q | | V | | |
| 20+15 | 1.9453 | 0.79 | Q | | V | | |
| 20+20 | 1.9507 | 0.79 | Q | | V | | |
| 20+25 | 1.9561 | 0.78 | Q | | V | | |
| 20+30 | 1.9614 | 0.77 | Q | | V | | |
| 20+35 | 1.9667 | 0.77 | Q | | V | | |

```
  20+40       1.9719      0.76  |Q       |        |        |     V   |
  20+45       1.9771      0.75  |Q       |        |        |     V   |
  20+50       1.9822      0.75  |Q       |        |        |     V   |
  20+55       1.9873      0.74  |Q       |        |        |     V   |
  21+ 0       1.9924      0.74  |Q       |        |        |     V   |
  21+ 5       1.9974      0.73  |Q       |        |        |     V   |
  21+10       2.0024      0.72  |Q       |        |        |      V  |
  21+15       2.0074      0.72  |Q       |        |        |      V  |
  21+20       2.0123      0.71  |Q       |        |        |      V  |
  21+25       2.0172      0.71  |Q       |        |        |      V  |
  21+30       2.0220      0.70  |Q       |        |        |      V  |
  21+35       2.0268      0.70  |Q       |        |        |      V  |
  21+40       2.0316      0.69  |Q       |        |        |      V  |
  21+45       2.0364      0.69  |Q       |        |        |      V  |
  21+50       2.0411      0.68  |Q       |        |        |      V  |
  21+55       2.0458      0.68  |Q       |        |        |      V  |
  22+ 0       2.0504      0.68  |Q       |        |        |      V  |
  22+ 5       2.0551      0.67  |Q       |        |        |       V |
  22+10       2.0597      0.67  |Q       |        |        |       V |
  22+15       2.0642      0.66  |Q       |        |        |       V |
  22+20       2.0688      0.66  |Q       |        |        |       V |
  22+25       2.0733      0.66  |Q       |        |        |       V |
  22+30       2.0778      0.65  |Q       |        |        |       V |
  22+35       2.0822      0.65  |Q       |        |        |       V |
  22+40       2.0867      0.64  |Q       |        |        |       V |
  22+45       2.0911      0.64  |Q       |        |        |       V |
  22+50       2.0955      0.64  |Q       |        |        |       V |
  22+55       2.0998      0.63  |Q       |        |        |       V |
  23+ 0       2.1042      0.63  |Q       |        |        |       V |
  23+ 5       2.1085      0.63  |Q       |        |        |       V|
  23+10       2.1128      0.62  |Q       |        |        |       V|
  23+15       2.1170      0.62  |Q       |        |        |       V|
  23+20       2.1213      0.62  |Q       |        |        |       V|
  23+25       2.1255      0.61  |Q       |        |        |       V|
  23+30       2.1297      0.61  |Q       |        |        |       V|
  23+35       2.1339      0.61  |Q       |        |        |       V|
  23+40       2.1380      0.60  |Q       |        |        |       V|
  23+45       2.1422      0.60  |Q       |        |        |       V|
  23+50       2.1463      0.60  |Q       |        |        |       V|
  23+55       2.1504      0.59  |Q       |        |        |       V|
  24+ 0       2.1545      0.59  |Q       |        |        |       V|
  24+ 5       2.1582      0.55  |Q       |        |        |       V|
  24+10       2.1603      0.31  Q       |        |        |       V|
  24+15       2.1609      0.08  Q       |        |        |       V|
  24+20       2.1610      0.02  Q       |        |        |       V|
  24+25       2.1611      0.01  Q       |        |        |       V|
-------------------------------------------------------------------
```

U n i t  H y d r o g r a p h  A n a l y s i s



Study date 08/04/23

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
----------

San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6320

---

225038 - 18313 VALLEY BLVD - SB ANIMAL CARE CENTER
DEVELOPED CONDITIONS
100-YEAR, 24-HOUR STORM
BY: JTS DATE: 08-04-23

---

Storm Event Year = 100

Antecedent Moisture Condition = 3

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

| Sub-Area (Ac.) | Duration (hours) | Isohyetal (In) |
|---|---|---|
| Rainfall data for year 10 | | |
| 6.07 | 1 | 0.92 |
| Rainfall data for year 2 | | |
| 6.07 | 6 | 1.62 |
| Rainfall data for year 2 | | |
| 6.07 | 24 | 3.01 |
| Rainfall data for year 100 | | |
| 6.07 | 1 | 1.32 |
| Rainfall data for year 100 | | |
| 6.07 | 6 | 3.50 |
| Rainfall data for year 100 | | |
| 6.07 | 24 | 7.80 |

---

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

******** Area-averaged max loss rate, Fm ********

| SCS curve No.(AMCII) | SCS curve NO.(AMC 3) | Area (Ac.) | Area Fraction | Fp(Fig C6) (In/Hr) | Ap (dec.) | Fm (In/Hr) |
|---|---|---|---|---|---|---|
| 32.0 | 52.0 | 6.07 | 1.000 | 0.785 | 0.300 | 0.236 |

Area-averaged adjusted loss rate Fm (In/Hr) = 0.236

********* Area-Averaged low loss rate fraction, Yb **********

| Area (Ac.) | Area Fract | SCS CN (AMC2) | SCS CN (AMC3) | S | Pervious Yield Fr |
|---|---|---|---|---|---|
| 1.82 | 0.300 | 32.0 | 52.0 | 9.23 | 0.299 |
| 4.25 | 0.700 | 98.0 | 98.0 | 0.20 | 0.969 |

Area-averaged catchment yield fraction, Y = 0.768
Area-averaged low loss fraction, Yb = 0.232
User entry of time of concentration = 0.161 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area = 6.07(Ac.)
Catchment Lag time = 0.129 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 64.6998
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.236(In/Hr)
Average low loss rate fraction (Yb) = 0.232 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.489(In)
Computed peak 30-minute rainfall = 1.000(In)
Specified peak 1-hour rainfall = 1.320(In)
Computed peak 3-hour rainfall = 2.400(In)
Specified peak 6-hour rainfall = 3.500(In)
Specified peak 24-hour rainfall = 7.800(In)

Rainfall depth area reduction factors:
Using a total area of 6.07(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.488(In)
30-minute factor = 1.000 Adjusted rainfall = 1.000(In)
1-hour factor = 1.000 Adjusted rainfall = 1.320(In)
3-hour factor = 1.000 Adjusted rainfall = 2.400(In)
6-hour factor = 1.000 Adjusted rainfall = 3.500(In)
24-hour factor = 1.000 Adjusted rainfall = 7.800(In)
---

U n i t H y d r o g r a p h
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

| Interval Number | 'S' Graph Mean values | Unit Hydrograph ((CFS)) |
|---|---|---|
| | (K = 73.41 (CFS)) | |
| 1 | 7.542 | 5.537 |
| 2 | 47.395 | 29.256 |
| 3 | 85.692 | 28.113 |
| 4 | 96.957 | 8.270 |
| 5 | 99.041 | 1.530 |
| 6 | 100.000 | 0.704 |

---

| Peak Unit Number | Adjusted mass rainfall (In) | Unit rainfall (In) |
|---|---|---|
| 1 | 0.4884 | 0.4884 |
| 2 | 0.6445 | 0.1560 |
| 3 | 0.7579 | 0.1135 |
| 4 | 0.8504 | 0.0924 |
| 5 | 0.9297 | 0.0794 |
| 6 | 1.0001 | 0.0703 |
| 7 | 1.0637 | 0.0636 |
| 8 | 1.1221 | 0.0584 |
| 9 | 1.1762 | 0.0541 |
| 10 | 1.2268 | 0.0506 |
| 11 | 1.2745 | 0.0477 |
| 12 | 1.3196 | 0.0451 |
| 13 | 1.3784 | 0.0588 |
| 14 | 1.4352 | 0.0568 |
| 15 | 1.4901 | 0.0549 |

| | | |
|---|---|---|
| 16 | 1.5434 | 0.0533 |
| 17 | 1.5952 | 0.0518 |
| 18 | 1.6456 | 0.0504 |
| 19 | 1.6948 | 0.0492 |
| 20 | 1.7428 | 0.0480 |
| 21 | 1.7897 | 0.0469 |
| 22 | 1.8356 | 0.0459 |
| 23 | 1.8806 | 0.0450 |
| 24 | 1.9246 | 0.0441 |
| 25 | 1.9679 | 0.0433 |
| 26 | 2.0104 | 0.0425 |
| 27 | 2.0521 | 0.0417 |
| 28 | 2.0931 | 0.0410 |
| 29 | 2.1335 | 0.0404 |
| 30 | 2.1733 | 0.0397 |
| 31 | 2.2124 | 0.0391 |
| 32 | 2.2510 | 0.0386 |
| 33 | 2.2890 | 0.0380 |
| 34 | 2.3265 | 0.0375 |
| 35 | 2.3635 | 0.0370 |
| 36 | 2.4001 | 0.0365 |
| 37 | 2.4361 | 0.0361 |
| 38 | 2.4717 | 0.0356 |
| 39 | 2.5069 | 0.0352 |
| 40 | 2.5417 | 0.0348 |
| 41 | 2.5761 | 0.0344 |
| 42 | 2.6101 | 0.0340 |
| 43 | 2.6438 | 0.0336 |
| 44 | 2.6770 | 0.0333 |
| 45 | 2.7100 | 0.0329 |
| 46 | 2.7426 | 0.0326 |
| 47 | 2.7749 | 0.0323 |
| 48 | 2.8069 | 0.0320 |
| 49 | 2.8385 | 0.0317 |
| 50 | 2.8699 | 0.0314 |
| 51 | 2.9010 | 0.0311 |
| 52 | 2.9318 | 0.0308 |
| 53 | 2.9624 | 0.0306 |
| 54 | 2.9927 | 0.0303 |
| 55 | 3.0227 | 0.0300 |
| 56 | 3.0525 | 0.0298 |
| 57 | 3.0821 | 0.0295 |
| 58 | 3.1114 | 0.0293 |
| 59 | 3.1405 | 0.0291 |
| 60 | 3.1693 | 0.0289 |
| 61 | 3.1980 | 0.0286 |
| 62 | 3.2264 | 0.0284 |
| 63 | 3.2546 | 0.0282 |
| 64 | 3.2826 | 0.0280 |
| 65 | 3.3104 | 0.0278 |
| 66 | 3.3381 | 0.0276 |
| 67 | 3.3655 | 0.0274 |
| 68 | 3.3927 | 0.0272 |
| 69 | 3.4198 | 0.0271 |
| 70 | 3.4467 | 0.0269 |
| 71 | 3.4734 | 0.0267 |
| 72 | 3.4999 | 0.0265 |
| 73 | 3.5280 | 0.0280 |
| 74 | 3.5558 | 0.0279 |
| 75 | 3.5835 | 0.0277 |
| 76 | 3.6110 | 0.0275 |
| 77 | 3.6384 | 0.0274 |
| 78 | 3.6657 | 0.0272 |
| 79 | 3.6928 | 0.0271 |
| 80 | 3.7197 | 0.0269 |
| 81 | 3.7465 | 0.0268 |
| 82 | 3.7732 | 0.0267 |
| 83 | 3.7997 | 0.0265 |
| 84 | 3.8261 | 0.0264 |

| | | |
|---|---|---|
| 85 | 3.8524 | 0.0263 |
| 86 | 3.8785 | 0.0261 |
| 87 | 3.9045 | 0.0260 |
| 88 | 3.9304 | 0.0259 |
| 89 | 3.9562 | 0.0258 |
| 90 | 3.9818 | 0.0256 |
| 91 | 4.0073 | 0.0255 |
| 92 | 4.0327 | 0.0254 |
| 93 | 4.0580 | 0.0253 |
| 94 | 4.0832 | 0.0252 |
| 95 | 4.1082 | 0.0251 |
| 96 | 4.1332 | 0.0249 |
| 97 | 4.1580 | 0.0248 |
| 98 | 4.1827 | 0.0247 |
| 99 | 4.2073 | 0.0246 |
| 100 | 4.2319 | 0.0245 |
| 101 | 4.2563 | 0.0244 |
| 102 | 4.2806 | 0.0243 |
| 103 | 4.3048 | 0.0242 |
| 104 | 4.3289 | 0.0241 |
| 105 | 4.3529 | 0.0240 |
| 106 | 4.3768 | 0.0239 |
| 107 | 4.4007 | 0.0238 |
| 108 | 4.4244 | 0.0237 |
| 109 | 4.4480 | 0.0236 |
| 110 | 4.4716 | 0.0235 |
| 111 | 4.4950 | 0.0235 |
| 112 | 4.5184 | 0.0234 |
| 113 | 4.5417 | 0.0233 |
| 114 | 4.5648 | 0.0232 |
| 115 | 4.5880 | 0.0231 |
| 116 | 4.6110 | 0.0230 |
| 117 | 4.6339 | 0.0229 |
| 118 | 4.6568 | 0.0229 |
| 119 | 4.6795 | 0.0228 |
| 120 | 4.7022 | 0.0227 |
| 121 | 4.7248 | 0.0226 |
| 122 | 4.7474 | 0.0225 |
| 123 | 4.7698 | 0.0225 |
| 124 | 4.7922 | 0.0224 |
| 125 | 4.8145 | 0.0223 |
| 126 | 4.8367 | 0.0222 |
| 127 | 4.8589 | 0.0222 |
| 128 | 4.8810 | 0.0221 |
| 129 | 4.9030 | 0.0220 |
| 130 | 4.9249 | 0.0219 |
| 131 | 4.9468 | 0.0219 |
| 132 | 4.9686 | 0.0218 |
| 133 | 4.9903 | 0.0217 |
| 134 | 5.0119 | 0.0217 |
| 135 | 5.0335 | 0.0216 |
| 136 | 5.0551 | 0.0215 |
| 137 | 5.0765 | 0.0215 |
| 138 | 5.0979 | 0.0214 |
| 139 | 5.1192 | 0.0213 |
| 140 | 5.1405 | 0.0213 |
| 141 | 5.1617 | 0.0212 |
| 142 | 5.1828 | 0.0211 |
| 143 | 5.2039 | 0.0211 |
| 144 | 5.2249 | 0.0210 |
| 145 | 5.2458 | 0.0209 |
| 146 | 5.2667 | 0.0209 |
| 147 | 5.2875 | 0.0208 |
| 148 | 5.3083 | 0.0208 |
| 149 | 5.3290 | 0.0207 |
| 150 | 5.3496 | 0.0206 |
| 151 | 5.3702 | 0.0206 |
| 152 | 5.3908 | 0.0205 |
| 153 | 5.4112 | 0.0205 |

| | | |
|---|---|---|
| 154 | 5.4316 | 0.0204 |
| 155 | 5.4520 | 0.0204 |
| 156 | 5.4723 | 0.0203 |
| 157 | 5.4926 | 0.0203 |
| 158 | 5.5128 | 0.0202 |
| 159 | 5.5329 | 0.0201 |
| 160 | 5.5530 | 0.0201 |
| 161 | 5.5730 | 0.0200 |
| 162 | 5.5930 | 0.0200 |
| 163 | 5.6129 | 0.0199 |
| 164 | 5.6328 | 0.0199 |
| 165 | 5.6526 | 0.0198 |
| 166 | 5.6724 | 0.0198 |
| 167 | 5.6922 | 0.0197 |
| 168 | 5.7118 | 0.0197 |
| 169 | 5.7315 | 0.0196 |
| 170 | 5.7510 | 0.0196 |
| 171 | 5.7706 | 0.0195 |
| 172 | 5.7901 | 0.0195 |
| 173 | 5.8095 | 0.0194 |
| 174 | 5.8289 | 0.0194 |
| 175 | 5.8482 | 0.0193 |
| 176 | 5.8675 | 0.0193 |
| 177 | 5.8868 | 0.0192 |
| 178 | 5.9060 | 0.0192 |
| 179 | 5.9251 | 0.0192 |
| 180 | 5.9442 | 0.0191 |
| 181 | 5.9633 | 0.0191 |
| 182 | 5.9823 | 0.0190 |
| 183 | 6.0013 | 0.0190 |
| 184 | 6.0202 | 0.0189 |
| 185 | 6.0391 | 0.0189 |
| 186 | 6.0580 | 0.0188 |
| 187 | 6.0768 | 0.0188 |
| 188 | 6.0956 | 0.0188 |
| 189 | 6.1143 | 0.0187 |
| 190 | 6.1330 | 0.0187 |
| 191 | 6.1516 | 0.0186 |
| 192 | 6.1702 | 0.0186 |
| 193 | 6.1887 | 0.0186 |
| 194 | 6.2073 | 0.0185 |
| 195 | 6.2257 | 0.0185 |
| 196 | 6.2442 | 0.0184 |
| 197 | 6.2626 | 0.0184 |
| 198 | 6.2809 | 0.0184 |
| 199 | 6.2992 | 0.0183 |
| 200 | 6.3175 | 0.0183 |
| 201 | 6.3358 | 0.0182 |
| 202 | 6.3540 | 0.0182 |
| 203 | 6.3721 | 0.0182 |
| 204 | 6.3903 | 0.0181 |
| 205 | 6.4083 | 0.0181 |
| 206 | 6.4264 | 0.0181 |
| 207 | 6.4444 | 0.0180 |
| 208 | 6.4624 | 0.0180 |
| 209 | 6.4803 | 0.0179 |
| 210 | 6.4982 | 0.0179 |
| 211 | 6.5161 | 0.0179 |
| 212 | 6.5339 | 0.0178 |
| 213 | 6.5517 | 0.0178 |
| 214 | 6.5695 | 0.0178 |
| 215 | 6.5872 | 0.0177 |
| 216 | 6.6049 | 0.0177 |
| 217 | 6.6226 | 0.0177 |
| 218 | 6.6402 | 0.0176 |
| 219 | 6.6578 | 0.0176 |
| 220 | 6.6754 | 0.0176 |
| 221 | 6.6929 | 0.0175 |
| 222 | 6.7104 | 0.0175 |

| | | | |
|---|---|---|---|
| 223 | 6.7278 | 0.0175 | |
| 224 | 6.7453 | 0.0174 | |
| 225 | 6.7626 | 0.0174 | |
| 226 | 6.7800 | 0.0174 | |
| 227 | 6.7973 | 0.0173 | |
| 228 | 6.8146 | 0.0173 | |
| 229 | 6.8319 | 0.0173 | |
| 230 | 6.8491 | 0.0172 | |
| 231 | 6.8663 | 0.0172 | |
| 232 | 6.8835 | 0.0172 | |
| 233 | 6.9006 | 0.0171 | |
| 234 | 6.9177 | 0.0171 | |
| 235 | 6.9348 | 0.0171 | |
| 236 | 6.9518 | 0.0170 | |
| 237 | 6.9689 | 0.0170 | |
| 238 | 6.9858 | 0.0170 | |
| 239 | 7.0028 | 0.0170 | |
| 240 | 7.0197 | 0.0169 | |
| 241 | 7.0366 | 0.0169 | |
| 242 | 7.0535 | 0.0169 | |
| 243 | 7.0703 | 0.0168 | |
| 244 | 7.0871 | 0.0168 | |
| 245 | 7.1039 | 0.0168 | |
| 246 | 7.1206 | 0.0167 | |
| 247 | 7.1373 | 0.0167 | |
| 248 | 7.1540 | 0.0167 | |
| 249 | 7.1707 | 0.0167 | |
| 250 | 7.1873 | 0.0166 | |
| 251 | 7.2039 | 0.0166 | |
| 252 | 7.2205 | 0.0166 | |
| 253 | 7.2371 | 0.0165 | |
| 254 | 7.2536 | 0.0165 | |
| 255 | 7.2701 | 0.0165 | |
| 256 | 7.2865 | 0.0165 | |
| 257 | 7.3030 | 0.0164 | |
| 258 | 7.3194 | 0.0164 | |
| 259 | 7.3358 | 0.0164 | |
| 260 | 7.3521 | 0.0164 | |
| 261 | 7.3685 | 0.0163 | |
| 262 | 7.3848 | 0.0163 | |
| 263 | 7.4011 | 0.0163 | |
| 264 | 7.4173 | 0.0163 | |
| 265 | 7.4335 | 0.0162 | |
| 266 | 7.4497 | 0.0162 | |
| 267 | 7.4659 | 0.0162 | |
| 268 | 7.4821 | 0.0162 | |
| 269 | 7.4982 | 0.0161 | |
| 270 | 7.5143 | 0.0161 | |
| 271 | 7.5304 | 0.0161 | |
| 272 | 7.5464 | 0.0161 | |
| 273 | 7.5625 | 0.0160 | |
| 274 | 7.5785 | 0.0160 | |
| 275 | 7.5944 | 0.0160 | |
| 276 | 7.6104 | 0.0160 | |
| 277 | 7.6263 | 0.0159 | |
| 278 | 7.6422 | 0.0159 | |
| 279 | 7.6581 | 0.0159 | |
| 280 | 7.6739 | 0.0159 | |
| 281 | 7.6898 | 0.0158 | |
| 282 | 7.7056 | 0.0158 | |
| 283 | 7.7214 | 0.0158 | |
| 284 | 7.7371 | 0.0158 | |
| 285 | 7.7529 | 0.0157 | |
| 286 | 7.7686 | 0.0157 | |
| 287 | 7.7843 | 0.0157 | |
| 288 | 7.7999 | 0.0157 | |

| Unit Period | Unit Rainfall | Unit Soil-Loss | Effective Rainfall |
|---|---|---|---|

| (number) | (In) | (In) | (In) |
|---|---|---|---|
| 1 | 0.0157 | 0.0036 | 0.0120 |
| 2 | 0.0157 | 0.0036 | 0.0121 |
| 3 | 0.0157 | 0.0036 | 0.0121 |
| 4 | 0.0158 | 0.0037 | 0.0121 |
| 5 | 0.0158 | 0.0037 | 0.0121 |
| 6 | 0.0158 | 0.0037 | 0.0122 |
| 7 | 0.0159 | 0.0037 | 0.0122 |
| 8 | 0.0159 | 0.0037 | 0.0122 |
| 9 | 0.0160 | 0.0037 | 0.0123 |
| 10 | 0.0160 | 0.0037 | 0.0123 |
| 11 | 0.0160 | 0.0037 | 0.0123 |
| 12 | 0.0161 | 0.0037 | 0.0123 |
| 13 | 0.0161 | 0.0037 | 0.0124 |
| 14 | 0.0161 | 0.0037 | 0.0124 |
| 15 | 0.0162 | 0.0037 | 0.0124 |
| 16 | 0.0162 | 0.0038 | 0.0124 |
| 17 | 0.0163 | 0.0038 | 0.0125 |
| 18 | 0.0163 | 0.0038 | 0.0125 |
| 19 | 0.0163 | 0.0038 | 0.0125 |
| 20 | 0.0164 | 0.0038 | 0.0126 |
| 21 | 0.0164 | 0.0038 | 0.0126 |
| 22 | 0.0164 | 0.0038 | 0.0126 |
| 23 | 0.0165 | 0.0038 | 0.0127 |
| 24 | 0.0165 | 0.0038 | 0.0127 |
| 25 | 0.0166 | 0.0038 | 0.0127 |
| 26 | 0.0166 | 0.0038 | 0.0128 |
| 27 | 0.0167 | 0.0039 | 0.0128 |
| 28 | 0.0167 | 0.0039 | 0.0128 |
| 29 | 0.0167 | 0.0039 | 0.0129 |
| 30 | 0.0168 | 0.0039 | 0.0129 |
| 31 | 0.0168 | 0.0039 | 0.0129 |
| 32 | 0.0169 | 0.0039 | 0.0130 |
| 33 | 0.0169 | 0.0039 | 0.0130 |
| 34 | 0.0170 | 0.0039 | 0.0130 |
| 35 | 0.0170 | 0.0039 | 0.0131 |
| 36 | 0.0170 | 0.0039 | 0.0131 |
| 37 | 0.0171 | 0.0040 | 0.0131 |
| 38 | 0.0171 | 0.0040 | 0.0132 |
| 39 | 0.0172 | 0.0040 | 0.0132 |
| 40 | 0.0172 | 0.0040 | 0.0132 |
| 41 | 0.0173 | 0.0040 | 0.0133 |
| 42 | 0.0173 | 0.0040 | 0.0133 |
| 43 | 0.0174 | 0.0040 | 0.0134 |
| 44 | 0.0174 | 0.0040 | 0.0134 |
| 45 | 0.0175 | 0.0041 | 0.0134 |
| 46 | 0.0175 | 0.0041 | 0.0135 |
| 47 | 0.0176 | 0.0041 | 0.0135 |
| 48 | 0.0176 | 0.0041 | 0.0135 |
| 49 | 0.0177 | 0.0041 | 0.0136 |
| 50 | 0.0177 | 0.0041 | 0.0136 |
| 51 | 0.0178 | 0.0041 | 0.0137 |
| 52 | 0.0178 | 0.0041 | 0.0137 |
| 53 | 0.0179 | 0.0041 | 0.0138 |
| 54 | 0.0179 | 0.0042 | 0.0138 |
| 55 | 0.0180 | 0.0042 | 0.0138 |
| 56 | 0.0181 | 0.0042 | 0.0139 |
| 57 | 0.0181 | 0.0042 | 0.0139 |
| 58 | 0.0182 | 0.0042 | 0.0140 |
| 59 | 0.0182 | 0.0042 | 0.0140 |
| 60 | 0.0183 | 0.0042 | 0.0140 |
| 61 | 0.0184 | 0.0043 | 0.0141 |
| 62 | 0.0184 | 0.0043 | 0.0141 |
| 63 | 0.0185 | 0.0043 | 0.0142 |
| 64 | 0.0185 | 0.0043 | 0.0142 |
| 65 | 0.0186 | 0.0043 | 0.0143 |
| 66 | 0.0186 | 0.0043 | 0.0143 |
| 67 | 0.0187 | 0.0043 | 0.0144 |

| | | | |
|---|---|---|---|
| 68 | 0.0188 | 0.0043 | 0.0144 |
| 69 | 0.0188 | 0.0044 | 0.0145 |
| 70 | 0.0189 | 0.0044 | 0.0145 |
| 71 | 0.0190 | 0.0044 | 0.0146 |
| 72 | 0.0190 | 0.0044 | 0.0146 |
| 73 | 0.0191 | 0.0044 | 0.0147 |
| 74 | 0.0192 | 0.0044 | 0.0147 |
| 75 | 0.0192 | 0.0045 | 0.0148 |
| 76 | 0.0193 | 0.0045 | 0.0148 |
| 77 | 0.0194 | 0.0045 | 0.0149 |
| 78 | 0.0194 | 0.0045 | 0.0149 |
| 79 | 0.0195 | 0.0045 | 0.0150 |
| 80 | 0.0196 | 0.0045 | 0.0150 |
| 81 | 0.0197 | 0.0046 | 0.0151 |
| 82 | 0.0197 | 0.0046 | 0.0152 |
| 83 | 0.0198 | 0.0046 | 0.0152 |
| 84 | 0.0199 | 0.0046 | 0.0153 |
| 85 | 0.0200 | 0.0046 | 0.0154 |
| 86 | 0.0200 | 0.0046 | 0.0154 |
| 87 | 0.0201 | 0.0047 | 0.0155 |
| 88 | 0.0202 | 0.0047 | 0.0155 |
| 89 | 0.0203 | 0.0047 | 0.0156 |
| 90 | 0.0204 | 0.0047 | 0.0156 |
| 91 | 0.0205 | 0.0047 | 0.0157 |
| 92 | 0.0205 | 0.0048 | 0.0158 |
| 93 | 0.0206 | 0.0048 | 0.0159 |
| 94 | 0.0207 | 0.0048 | 0.0159 |
| 95 | 0.0208 | 0.0048 | 0.0160 |
| 96 | 0.0209 | 0.0048 | 0.0160 |
| 97 | 0.0210 | 0.0049 | 0.0161 |
| 98 | 0.0211 | 0.0049 | 0.0162 |
| 99 | 0.0212 | 0.0049 | 0.0163 |
| 100 | 0.0213 | 0.0049 | 0.0163 |
| 101 | 0.0214 | 0.0050 | 0.0164 |
| 102 | 0.0215 | 0.0050 | 0.0165 |
| 103 | 0.0216 | 0.0050 | 0.0166 |
| 104 | 0.0217 | 0.0050 | 0.0166 |
| 105 | 0.0218 | 0.0051 | 0.0167 |
| 106 | 0.0219 | 0.0051 | 0.0168 |
| 107 | 0.0220 | 0.0051 | 0.0169 |
| 108 | 0.0221 | 0.0051 | 0.0170 |
| 109 | 0.0222 | 0.0052 | 0.0171 |
| 110 | 0.0223 | 0.0052 | 0.0171 |
| 111 | 0.0225 | 0.0052 | 0.0173 |
| 112 | 0.0225 | 0.0052 | 0.0173 |
| 113 | 0.0227 | 0.0053 | 0.0174 |
| 114 | 0.0228 | 0.0053 | 0.0175 |
| 115 | 0.0229 | 0.0053 | 0.0176 |
| 116 | 0.0230 | 0.0053 | 0.0177 |
| 117 | 0.0232 | 0.0054 | 0.0178 |
| 118 | 0.0233 | 0.0054 | 0.0179 |
| 119 | 0.0235 | 0.0054 | 0.0180 |
| 120 | 0.0235 | 0.0055 | 0.0181 |
| 121 | 0.0237 | 0.0055 | 0.0182 |
| 122 | 0.0238 | 0.0055 | 0.0183 |
| 123 | 0.0240 | 0.0056 | 0.0184 |
| 124 | 0.0241 | 0.0056 | 0.0185 |
| 125 | 0.0243 | 0.0056 | 0.0187 |
| 126 | 0.0244 | 0.0057 | 0.0188 |
| 127 | 0.0246 | 0.0057 | 0.0189 |
| 128 | 0.0247 | 0.0057 | 0.0190 |
| 129 | 0.0249 | 0.0058 | 0.0192 |
| 130 | 0.0251 | 0.0058 | 0.0192 |
| 131 | 0.0253 | 0.0059 | 0.0194 |
| 132 | 0.0254 | 0.0059 | 0.0195 |
| 133 | 0.0256 | 0.0059 | 0.0197 |
| 134 | 0.0258 | 0.0060 | 0.0198 |
| 135 | 0.0260 | 0.0060 | 0.0200 |
| 136 | 0.0261 | 0.0061 | 0.0201 |

| | | | |
|---|---|---|---|
| 137 | 0.0264 | 0.0061 | 0.0203 |
| 138 | 0.0265 | 0.0061 | 0.0204 |
| 139 | 0.0268 | 0.0062 | 0.0206 |
| 140 | 0.0269 | 0.0062 | 0.0207 |
| 141 | 0.0272 | 0.0063 | 0.0209 |
| 142 | 0.0274 | 0.0063 | 0.0210 |
| 143 | 0.0277 | 0.0064 | 0.0213 |
| 144 | 0.0279 | 0.0065 | 0.0214 |
| 145 | 0.0265 | 0.0062 | 0.0204 |
| 146 | 0.0267 | 0.0062 | 0.0205 |
| 147 | 0.0271 | 0.0063 | 0.0208 |
| 148 | 0.0272 | 0.0063 | 0.0209 |
| 149 | 0.0276 | 0.0064 | 0.0212 |
| 150 | 0.0278 | 0.0064 | 0.0214 |
| 151 | 0.0282 | 0.0065 | 0.0217 |
| 152 | 0.0284 | 0.0066 | 0.0218 |
| 153 | 0.0289 | 0.0067 | 0.0222 |
| 154 | 0.0291 | 0.0067 | 0.0223 |
| 155 | 0.0295 | 0.0068 | 0.0227 |
| 156 | 0.0298 | 0.0069 | 0.0229 |
| 157 | 0.0303 | 0.0070 | 0.0233 |
| 158 | 0.0306 | 0.0071 | 0.0235 |
| 159 | 0.0311 | 0.0072 | 0.0239 |
| 160 | 0.0314 | 0.0073 | 0.0241 |
| 161 | 0.0320 | 0.0074 | 0.0246 |
| 162 | 0.0323 | 0.0075 | 0.0248 |
| 163 | 0.0329 | 0.0076 | 0.0253 |
| 164 | 0.0333 | 0.0077 | 0.0256 |
| 165 | 0.0340 | 0.0079 | 0.0261 |
| 166 | 0.0344 | 0.0080 | 0.0264 |
| 167 | 0.0352 | 0.0082 | 0.0270 |
| 168 | 0.0356 | 0.0083 | 0.0274 |
| 169 | 0.0365 | 0.0085 | 0.0281 |
| 170 | 0.0370 | 0.0086 | 0.0284 |
| 171 | 0.0380 | 0.0088 | 0.0292 |
| 172 | 0.0386 | 0.0089 | 0.0296 |
| 173 | 0.0397 | 0.0092 | 0.0305 |
| 174 | 0.0404 | 0.0094 | 0.0310 |
| 175 | 0.0417 | 0.0097 | 0.0321 |
| 176 | 0.0425 | 0.0098 | 0.0326 |
| 177 | 0.0441 | 0.0102 | 0.0339 |
| 178 | 0.0450 | 0.0104 | 0.0345 |
| 179 | 0.0469 | 0.0109 | 0.0360 |
| 180 | 0.0480 | 0.0111 | 0.0369 |
| 181 | 0.0504 | 0.0117 | 0.0387 |
| 182 | 0.0518 | 0.0120 | 0.0398 |
| 183 | 0.0549 | 0.0127 | 0.0422 |
| 184 | 0.0568 | 0.0132 | 0.0436 |
| 185 | 0.0451 | 0.0105 | 0.0347 |
| 186 | 0.0477 | 0.0110 | 0.0366 |
| 187 | 0.0541 | 0.0125 | 0.0416 |
| 188 | 0.0584 | 0.0135 | 0.0448 |
| 189 | 0.0703 | 0.0163 | 0.0540 |
| 190 | 0.0794 | 0.0184 | 0.0610 |
| 191 | 0.1135 | 0.0196 | 0.0938 |
| 192 | 0.1560 | 0.0196 | 0.1364 |
| 193 | 0.4884 | 0.0196 | 0.4688 |
| 194 | 0.0924 | 0.0196 | 0.0728 |
| 195 | 0.0636 | 0.0147 | 0.0489 |
| 196 | 0.0506 | 0.0117 | 0.0389 |
| 197 | 0.0588 | 0.0136 | 0.0452 |
| 198 | 0.0533 | 0.0123 | 0.0409 |
| 199 | 0.0492 | 0.0114 | 0.0378 |
| 200 | 0.0459 | 0.0106 | 0.0353 |
| 201 | 0.0433 | 0.0100 | 0.0332 |
| 202 | 0.0410 | 0.0095 | 0.0315 |
| 203 | 0.0391 | 0.0091 | 0.0301 |
| 204 | 0.0375 | 0.0087 | 0.0288 |
| 205 | 0.0361 | 0.0084 | 0.0277 |

| | | | |
|---|---|---|---|
| 206 | 0.0348 | 0.0081 | 0.0267 |
| 207 | 0.0336 | 0.0078 | 0.0258 |
| 208 | 0.0326 | 0.0076 | 0.0251 |
| 209 | 0.0317 | 0.0073 | 0.0243 |
| 210 | 0.0308 | 0.0071 | 0.0237 |
| 211 | 0.0300 | 0.0070 | 0.0231 |
| 212 | 0.0293 | 0.0068 | 0.0225 |
| 213 | 0.0286 | 0.0066 | 0.0220 |
| 214 | 0.0280 | 0.0065 | 0.0215 |
| 215 | 0.0274 | 0.0064 | 0.0211 |
| 216 | 0.0269 | 0.0062 | 0.0207 |
| 217 | 0.0280 | 0.0065 | 0.0215 |
| 218 | 0.0275 | 0.0064 | 0.0212 |
| 219 | 0.0271 | 0.0063 | 0.0208 |
| 220 | 0.0267 | 0.0062 | 0.0205 |
| 221 | 0.0263 | 0.0061 | 0.0202 |
| 222 | 0.0259 | 0.0060 | 0.0199 |
| 223 | 0.0255 | 0.0059 | 0.0196 |
| 224 | 0.0252 | 0.0058 | 0.0193 |
| 225 | 0.0248 | 0.0058 | 0.0191 |
| 226 | 0.0245 | 0.0057 | 0.0188 |
| 227 | 0.0242 | 0.0056 | 0.0186 |
| 228 | 0.0239 | 0.0055 | 0.0184 |
| 229 | 0.0236 | 0.0055 | 0.0182 |
| 230 | 0.0234 | 0.0054 | 0.0180 |
| 231 | 0.0231 | 0.0054 | 0.0178 |
| 232 | 0.0229 | 0.0053 | 0.0176 |
| 233 | 0.0226 | 0.0052 | 0.0174 |
| 234 | 0.0224 | 0.0052 | 0.0172 |
| 235 | 0.0222 | 0.0051 | 0.0170 |
| 236 | 0.0219 | 0.0051 | 0.0169 |
| 237 | 0.0217 | 0.0050 | 0.0167 |
| 238 | 0.0215 | 0.0050 | 0.0165 |
| 239 | 0.0213 | 0.0049 | 0.0164 |
| 240 | 0.0211 | 0.0049 | 0.0162 |
| 241 | 0.0209 | 0.0049 | 0.0161 |
| 242 | 0.0208 | 0.0048 | 0.0160 |
| 243 | 0.0206 | 0.0048 | 0.0158 |
| 244 | 0.0204 | 0.0047 | 0.0157 |
| 245 | 0.0203 | 0.0047 | 0.0156 |
| 246 | 0.0201 | 0.0047 | 0.0154 |
| 247 | 0.0199 | 0.0046 | 0.0153 |
| 248 | 0.0198 | 0.0046 | 0.0152 |
| 249 | 0.0196 | 0.0045 | 0.0151 |
| 250 | 0.0195 | 0.0045 | 0.0150 |
| 251 | 0.0193 | 0.0045 | 0.0149 |
| 252 | 0.0192 | 0.0044 | 0.0148 |
| 253 | 0.0191 | 0.0044 | 0.0146 |
| 254 | 0.0189 | 0.0044 | 0.0145 |
| 255 | 0.0188 | 0.0044 | 0.0144 |
| 256 | 0.0187 | 0.0043 | 0.0144 |
| 257 | 0.0186 | 0.0043 | 0.0143 |
| 258 | 0.0184 | 0.0043 | 0.0142 |
| 259 | 0.0183 | 0.0042 | 0.0141 |
| 260 | 0.0182 | 0.0042 | 0.0140 |
| 261 | 0.0181 | 0.0042 | 0.0139 |
| 262 | 0.0180 | 0.0042 | 0.0138 |
| 263 | 0.0179 | 0.0041 | 0.0137 |
| 264 | 0.0178 | 0.0041 | 0.0136 |
| 265 | 0.0177 | 0.0041 | 0.0136 |
| 266 | 0.0176 | 0.0041 | 0.0135 |
| 267 | 0.0175 | 0.0040 | 0.0134 |
| 268 | 0.0174 | 0.0040 | 0.0133 |
| 269 | 0.0173 | 0.0040 | 0.0133 |
| 270 | 0.0172 | 0.0040 | 0.0132 |
| 271 | 0.0171 | 0.0040 | 0.0131 |
| 272 | 0.0170 | 0.0039 | 0.0130 |
| 273 | 0.0169 | 0.0039 | 0.0130 |
| 274 | 0.0168 | 0.0039 | 0.0129 |

| | | | |
|---|---|---|---|
| 275 | 0.0167 | 0.0039 | 0.0128 |
| 276 | 0.0166 | 0.0039 | 0.0128 |
| 277 | 0.0165 | 0.0038 | 0.0127 |
| 278 | 0.0165 | 0.0038 | 0.0127 |
| 279 | 0.0164 | 0.0038 | 0.0126 |
| 280 | 0.0163 | 0.0038 | 0.0125 |
| 281 | 0.0162 | 0.0038 | 0.0125 |
| 282 | 0.0162 | 0.0037 | 0.0124 |
| 283 | 0.0161 | 0.0037 | 0.0124 |
| 284 | 0.0160 | 0.0037 | 0.0123 |
| 285 | 0.0159 | 0.0037 | 0.0122 |
| 286 | 0.0159 | 0.0037 | 0.0122 |
| 287 | 0.0158 | 0.0037 | 0.0121 |
| 288 | 0.0157 | 0.0036 | 0.0121 |

---

---

Total soil rain loss = 1.69(In)
Total effective rainfall = 6.11(In)
Peak flow rate in flood hydrograph = 18.86(CFS)

---

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

---

Hydrograph in 5 Minute intervals ((CFS))

---

| Time(h+m) | Volume Ac.Ft | Q(CFS) | 0 | 5.0 | 10.0 | 15.0 | 20.0 |
|---|---|---|---|---|---|---|---|
| 0+ 5 | 0.0005 | 0.07 | Q | | | | |
| 0+10 | 0.0033 | 0.42 | Q | | | | |
| 0+15 | 0.0086 | 0.76 | VQ | | | | |
| 0+20 | 0.0145 | 0.86 | VQ | | | | |
| 0+25 | 0.0205 | 0.88 | VQ | | | | |
| 0+30 | 0.0267 | 0.89 | VQ | | | | |
| 0+35 | 0.0328 | 0.89 | VQ | | | | |
| 0+40 | 0.0390 | 0.89 | VQ | | | | |
| 0+45 | 0.0451 | 0.90 | VQ | | | | |
| 0+50 | 0.0513 | 0.90 | VQ | | | | |
| 0+55 | 0.0575 | 0.90 | VQ | | | | |
| 1+ 0 | 0.0637 | 0.90 | VQ | | | | |
| 1+ 5 | 0.0700 | 0.90 | VQ | | | | |
| 1+10 | 0.0762 | 0.91 | VQ | | | | |
| 1+15 | 0.0825 | 0.91 | \|Q | | | | |
| 1+20 | 0.0887 | 0.91 | \|Q | | | | |
| 1+25 | 0.0950 | 0.91 | \|Q | | | | |
| 1+30 | 0.1013 | 0.91 | \|Q | | | | |
| 1+35 | 0.1076 | 0.92 | \|Q | | | | |
| 1+40 | 0.1140 | 0.92 | \|Q | | | | |
| 1+45 | 0.1203 | 0.92 | \|Q | | | | |
| 1+50 | 0.1267 | 0.92 | \|Q | | | | |
| 1+55 | 0.1331 | 0.93 | \|Q | | | | |
| 2+ 0 | 0.1395 | 0.93 | \|Q | | | | |
| 2+ 5 | 0.1459 | 0.93 | \|Q | | | | |
| 2+10 | 0.1523 | 0.93 | \|Q | | | | |
| 2+15 | 0.1587 | 0.94 | \|QV | | | | |
| 2+20 | 0.1652 | 0.94 | \|QV | | | | |
| 2+25 | 0.1717 | 0.94 | \|QV | | | | |
| 2+30 | 0.1782 | 0.94 | \|QV | | | | |
| 2+35 | 0.1847 | 0.94 | \|QV | | | | |
| 2+40 | 0.1912 | 0.95 | \|QV | | | | |
| 2+45 | 0.1977 | 0.95 | \|QV | | | | |
| 2+50 | 0.2043 | 0.95 | \|QV | | | | |
| 2+55 | 0.2109 | 0.95 | \|QV | | | | |
| 3+ 0 | 0.2175 | 0.96 | \|QV | | | | |
| 3+ 5 | 0.2241 | 0.96 | \|QV | | | | |
| 3+10 | 0.2307 | 0.96 | \|QV | | | | |
| 3+15 | 0.2373 | 0.97 | \|Q V | | | | |
| 3+20 | 0.2440 | 0.97 | \|Q V | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3+25 | 0.2507 | 0.97 | Q V | | | | |
| 3+30 | 0.2574 | 0.97 | Q V | | | | |
| 3+35 | 0.2641 | 0.98 | Q V | | | | |
| 3+40 | 0.2709 | 0.98 | Q V | | | | |
| 3+45 | 0.2776 | 0.98 | Q V | | | | |
| 3+50 | 0.2844 | 0.98 | Q V | | | | |
| 3+55 | 0.2912 | 0.99 | Q V | | | | |
| 4+ 0 | 0.2980 | 0.99 | Q V | | | | |
| 4+ 5 | 0.3048 | 0.99 | Q V | | | | |
| 4+10 | 0.3117 | 1.00 | Q V | | | | |
| 4+15 | 0.3186 | 1.00 | Q V | | | | |
| 4+20 | 0.3255 | 1.00 | Q V | | | | |
| 4+25 | 0.3324 | 1.00 | Q V | | | | |
| 4+30 | 0.3393 | 1.01 | Q V | | | | |
| 4+35 | 0.3463 | 1.01 | Q V | | | | |
| 4+40 | 0.3533 | 1.01 | Q V | | | | |
| 4+45 | 0.3603 | 1.02 | Q V | | | | |
| 4+50 | 0.3673 | 1.02 | Q V | | | | |
| 4+55 | 0.3743 | 1.02 | Q V | | | | |
| 5+ 0 | 0.3814 | 1.03 | Q V | | | | |
| 5+ 5 | 0.3885 | 1.03 | Q V | | | | |
| 5+10 | 0.3956 | 1.03 | Q V | | | | |
| 5+15 | 0.4027 | 1.04 | Q V | | | | |
| 5+20 | 0.4099 | 1.04 | Q V | | | | |
| 5+25 | 0.4171 | 1.04 | Q V | | | | |
| 5+30 | 0.4243 | 1.05 | Q V | | | | |
| 5+35 | 0.4315 | 1.05 | Q V | | | | |
| 5+40 | 0.4388 | 1.05 | Q V | | | | |
| 5+45 | 0.4461 | 1.06 | Q V | | | | |
| 5+50 | 0.4534 | 1.06 | Q V | | | | |
| 5+55 | 0.4607 | 1.06 | Q V | | | | |
| 6+ 0 | 0.4680 | 1.07 | Q V | | | | |
| 6+ 5 | 0.4754 | 1.07 | Q V | | | | |
| 6+10 | 0.4828 | 1.07 | Q V | | | | |
| 6+15 | 0.4902 | 1.08 | Q V | | | | |
| 6+20 | 0.4977 | 1.08 | Q V | | | | |
| 6+25 | 0.5052 | 1.09 | Q V | | | | |
| 6+30 | 0.5127 | 1.09 | Q V | | | | |
| 6+35 | 0.5202 | 1.09 | Q V | | | | |
| 6+40 | 0.5278 | 1.10 | Q V | | | | |
| 6+45 | 0.5354 | 1.10 | Q V | | | | |
| 6+50 | 0.5430 | 1.11 | Q V | | | | |
| 6+55 | 0.5507 | 1.11 | Q V | | | | |
| 7+ 0 | 0.5583 | 1.11 | Q V | | | | |
| 7+ 5 | 0.5660 | 1.12 | Q V | | | | |
| 7+10 | 0.5738 | 1.12 | Q V | | | | |
| 7+15 | 0.5815 | 1.13 | Q V | | | | |
| 7+20 | 0.5893 | 1.13 | Q V | | | | |
| 7+25 | 0.5972 | 1.14 | Q V | | | | |
| 7+30 | 0.6050 | 1.14 | Q V | | | | |
| 7+35 | 0.6129 | 1.15 | Q V | | | | |
| 7+40 | 0.6209 | 1.15 | Q V | | | | |
| 7+45 | 0.6288 | 1.16 | Q V | | | | |
| 7+50 | 0.6368 | 1.16 | Q V | | | | |
| 7+55 | 0.6448 | 1.17 | Q V | | | | |
| 8+ 0 | 0.6529 | 1.17 | Q V | | | | |
| 8+ 5 | 0.6610 | 1.18 | Q V | | | | |
| 8+10 | 0.6691 | 1.18 | Q V | | | | |
| 8+15 | 0.6773 | 1.19 | Q V | | | | |
| 8+20 | 0.6855 | 1.19 | Q V | | | | |
| 8+25 | 0.6937 | 1.20 | Q V | | | | |
| 8+30 | 0.7020 | 1.20 | Q V | | | | |
| 8+35 | 0.7103 | 1.21 | Q V | | | | |
| 8+40 | 0.7187 | 1.21 | Q V | | | | |
| 8+45 | 0.7271 | 1.22 | Q V | | | | |
| 8+50 | 0.7355 | 1.22 | Q V | | | | |
| 8+55 | 0.7440 | 1.23 | Q V | | | | |
| 9+ 0 | 0.7525 | 1.24 | Q V | | | | |
| 9+ 5 | 0.7610 | 1.24 | Q V | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9+10 | 0.7696 | 1.25 | Q | V | | | |
| 9+15 | 0.7783 | 1.25 | Q | V | | | |
| 9+20 | 0.7870 | 1.26 | Q | V | | | |
| 9+25 | 0.7957 | 1.27 | Q | V | | | |
| 9+30 | 0.8045 | 1.27 | Q | V | | | |
| 9+35 | 0.8133 | 1.28 | Q | V | | | |
| 9+40 | 0.8222 | 1.29 | Q | V | | | |
| 9+45 | 0.8311 | 1.29 | Q | V | | | |
| 9+50 | 0.8401 | 1.30 | Q | V | | | |
| 9+55 | 0.8491 | 1.31 | Q | V | | | |
| 10+ 0 | 0.8581 | 1.32 | Q | V | | | |
| 10+ 5 | 0.8673 | 1.32 | Q | V | | | |
| 10+10 | 0.8764 | 1.33 | Q | V | | | |
| 10+15 | 0.8857 | 1.34 | Q | V | | | |
| 10+20 | 0.8950 | 1.35 | Q | V | | | |
| 10+25 | 0.9043 | 1.36 | Q | V | | | |
| 10+30 | 0.9137 | 1.36 | Q | V | | | |
| 10+35 | 0.9231 | 1.37 | Q | V | | | |
| 10+40 | 0.9327 | 1.38 | Q | V | | | |
| 10+45 | 0.9422 | 1.39 | Q | V | | | |
| 10+50 | 0.9519 | 1.40 | Q | V | | | |
| 10+55 | 0.9616 | 1.41 | Q | V | | | |
| 11+ 0 | 0.9713 | 1.42 | Q | V | | | |
| 11+ 5 | 0.9812 | 1.43 | Q | V | | | |
| 11+10 | 0.9911 | 1.44 | Q | V | | | |
| 11+15 | 1.0010 | 1.45 | Q | V | | | |
| 11+20 | 1.0111 | 1.46 | Q | V | | | |
| 11+25 | 1.0212 | 1.47 | Q | V | | | |
| 11+30 | 1.0314 | 1.48 | Q | V | | | |
| 11+35 | 1.0417 | 1.49 | Q | V | | | |
| 11+40 | 1.0520 | 1.50 | Q | V | | | |
| 11+45 | 1.0625 | 1.51 | Q | V | | | |
| 11+50 | 1.0730 | 1.53 | Q | V | | | |
| 11+55 | 1.0836 | 1.54 | Q | V | | | |
| 12+ 0 | 1.0943 | 1.55 | Q | V | | | |
| 12+ 5 | 1.1050 | 1.56 | Q | V | | | |
| 12+10 | 1.1156 | 1.53 | Q | V | | | |
| 12+15 | 1.1260 | 1.51 | Q | V | | | |
| 12+20 | 1.1364 | 1.52 | Q | V | | | |
| 12+25 | 1.1470 | 1.53 | Q | V | | | |
| 12+30 | 1.1576 | 1.55 | Q | V | | | |
| 12+35 | 1.1684 | 1.56 | Q | V | | | |
| 12+40 | 1.1792 | 1.58 | Q | V | | | |
| 12+45 | 1.1902 | 1.60 | Q | V | | | |
| 12+50 | 1.2013 | 1.61 | Q | V | | | |
| 12+55 | 1.2126 | 1.63 | Q | V | | | |
| 13+ 0 | 1.2239 | 1.65 | Q | V | | | |
| 13+ 5 | 1.2354 | 1.67 | Q | V | | | |
| 13+10 | 1.2471 | 1.69 | Q | V | | | |
| 13+15 | 1.2589 | 1.71 | Q | V | | | |
| 13+20 | 1.2708 | 1.74 | Q | V | | | |
| 13+25 | 1.2830 | 1.76 | Q | V | | | |
| 13+30 | 1.2952 | 1.78 | Q | V | | | |
| 13+35 | 1.3077 | 1.81 | Q | V | | | |
| 13+40 | 1.3203 | 1.84 | Q | V | | | |
| 13+45 | 1.3332 | 1.86 | Q | V | | | |
| 13+50 | 1.3462 | 1.89 | Q | V | | | |
| 13+55 | 1.3595 | 1.92 | Q | V | | | |
| 14+ 0 | 1.3730 | 1.96 | Q | V | | | |
| 14+ 5 | 1.3867 | 1.99 | Q | V | | | |
| 14+10 | 1.4007 | 2.03 | Q | V | | | |
| 14+15 | 1.4149 | 2.07 | Q | V | | | |
| 14+20 | 1.4295 | 2.11 | Q | V | | | |
| 14+25 | 1.4443 | 2.15 | Q | V | | | |
| 14+30 | 1.4595 | 2.20 | Q | V | | | |
| 14+35 | 1.4750 | 2.25 | Q | V | | | |
| 14+40 | 1.4909 | 2.31 | Q | V | | | |
| 14+45 | 1.5072 | 2.37 | Q | V | | | |
| 14+50 | 1.5240 | 2.43 | Q | V | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 14+55 | 1.5412 | 2.50 | Q | | V | | | |
| 15+ 0 | 1.5590 | 2.58 | Q | | V | | | |
| 15+ 5 | 1.5774 | 2.67 | Q | | V | | | |
| 15+10 | 1.5964 | 2.77 | Q | | V | | | |
| 15+15 | 1.6162 | 2.87 | Q | | V | | | |
| 15+20 | 1.6368 | 3.00 | Q | | V | | | |
| 15+25 | 1.6580 | 3.07 | Q | | V | | | |
| 15+30 | 1.6778 | 2.88 | Q | | V | | | |
| 15+35 | 1.6966 | 2.73 | Q | | V | | | |
| 15+40 | 1.7164 | 2.88 | Q | | V | | | |
| 15+45 | 1.7382 | 3.17 | Q | | V | | | |
| 15+50 | 1.7630 | 3.60 | Q | | V | | | |
| 15+55 | 1.7925 | 4.28 | Q | | V | | | |
| 16+ 0 | 1.8322 | 5.76 | Q | | V | | | |
| 16+ 5 | 1.9000 | 9.84 | Q | | V | | | |
| 16+10 | 2.0299 | 18.86 | Q | | V | | Q | |
| 16+15 | 2.1462 | 16.89 | Q | | V | Q | | |
| 16+20 | 2.2003 | 7.84 | Q | | V | | | |
| 16+25 | 2.2290 | 4.18 | Q | | V | | | |
| 16+30 | 2.2530 | 3.49 | Q | | V | | | |
| 16+35 | 2.2746 | 3.12 | Q | | V | | | |
| 16+40 | 2.2947 | 2.92 | Q | | V | | | |
| 16+45 | 2.3133 | 2.71 | Q | | V | | | |
| 16+50 | 2.3309 | 2.55 | Q | | V | | | |
| 16+55 | 2.3474 | 2.40 | Q | | V | | | |
| 17+ 0 | 2.3631 | 2.28 | Q | | V | | | |
| 17+ 5 | 2.3781 | 2.18 | Q | | V | | | |
| 17+10 | 2.3925 | 2.09 | Q | | V | | | |
| 17+15 | 2.4064 | 2.01 | Q | | V | | | |
| 17+20 | 2.4197 | 1.94 | Q | | V | | | |
| 17+25 | 2.4326 | 1.88 | Q | | V | | | |
| 17+30 | 2.4452 | 1.82 | Q | | V | | | |
| 17+35 | 2.4574 | 1.77 | Q | | V | | | |
| 17+40 | 2.4693 | 1.72 | Q | | V | | | |
| 17+45 | 2.4808 | 1.68 | Q | | V | | | |
| 17+50 | 2.4921 | 1.64 | Q | | V | | | |
| 17+55 | 2.5032 | 1.60 | Q | | V | | | |
| 18+ 0 | 2.5140 | 1.57 | Q | | V | | | |
| 18+ 5 | 2.5246 | 1.54 | Q | | V | | | |
| 18+10 | 2.5353 | 1.55 | Q | | V | | | |
| 18+15 | 2.5460 | 1.56 | Q | | V | | | |
| 18+20 | 2.5566 | 1.54 | Q | | V | | | |
| 18+25 | 2.5671 | 1.52 | Q | | V | | | |
| 18+30 | 2.5774 | 1.50 | Q | | V | | | |
| 18+35 | 2.5875 | 1.47 | Q | | V | | | |
| 18+40 | 2.5975 | 1.45 | Q | | V | | | |
| 18+45 | 2.6074 | 1.43 | Q | | V | | | |
| 18+50 | 2.6171 | 1.41 | Q | | V | | | |
| 18+55 | 2.6267 | 1.39 | Q | | V | | | |
| 19+ 0 | 2.6362 | 1.38 | Q | | V | | | |
| 19+ 5 | 2.6456 | 1.36 | Q | | V | | | |
| 19+10 | 2.6548 | 1.34 | Q | | V | | | |
| 19+15 | 2.6640 | 1.33 | Q | | V | | | |
| 19+20 | 2.6730 | 1.31 | Q | | V | | | |
| 19+25 | 2.6819 | 1.30 | Q | | V | | | |
| 19+30 | 2.6908 | 1.28 | Q | | V | | | |
| 19+35 | 2.6995 | 1.27 | Q | | V | | | |
| 19+40 | 2.7082 | 1.26 | Q | | V | | | |
| 19+45 | 2.7168 | 1.25 | Q | | V | | | |
| 19+50 | 2.7253 | 1.23 | Q | | V | | | |
| 19+55 | 2.7337 | 1.22 | Q | | V | | | |
| 20+ 0 | 2.7420 | 1.21 | Q | | V | | | |
| 20+ 5 | 2.7503 | 1.20 | Q | | V | | | |
| 20+10 | 2.7584 | 1.19 | Q | | V | | | |
| 20+15 | 2.7666 | 1.18 | Q | | V | | | |
| 20+20 | 2.7746 | 1.17 | Q | | V | | | |
| 20+25 | 2.7826 | 1.16 | Q | | V | | | |
| 20+30 | 2.7905 | 1.15 | Q | | V | | | |
| 20+35 | 2.7983 | 1.14 | Q | | V | | | |

```
  20+40       2.8061      1.13  | Q      |        |        |     V   |
  20+45       2.8138      1.12  | Q      |        |        |     V   |
  20+50       2.8215      1.11  | Q      |        |        |     V   |
  20+55       2.8291      1.10  | Q      |        |        |     V   |
  21+ 0       2.8366      1.10  | Q      |        |        |     V   |
  21+ 5       2.8441      1.09  | Q      |        |        |     V   |
  21+10       2.8516      1.08  | Q      |        |        |     V   |
  21+15       2.8590      1.07  | Q      |        |        |      V  |
  21+20       2.8663      1.07  | Q      |        |        |      V  |
  21+25       2.8736      1.06  | Q      |        |        |      V  |
  21+30       2.8808      1.05  | Q      |        |        |      V  |
  21+35       2.8880      1.04  | Q      |        |        |      V  |
  21+40       2.8952      1.04  | Q      |        |        |      V  |
  21+45       2.9023      1.03  | Q      |        |        |      V  |
  21+50       2.9093      1.02  | Q      |        |        |      V  |
  21+55       2.9163      1.02  | Q      |        |        |      V  |
  22+ 0       2.9233      1.01  | Q      |        |        |      V  |
  22+ 5       2.9302      1.01  | Q      |        |        |      V  |
  22+10       2.9371      1.00  |Q       |        |        |       V |
  22+15       2.9439      0.99  |Q       |        |        |       V |
  22+20       2.9507      0.99  |Q       |        |        |       V |
  22+25       2.9575      0.98  |Q       |        |        |       V |
  22+30       2.9642      0.98  |Q       |        |        |       V |
  22+35       2.9709      0.97  |Q       |        |        |       V |
  22+40       2.9776      0.97  |Q       |        |        |       V |
  22+45       2.9842      0.96  |Q       |        |        |       V |
  22+50       2.9908      0.96  |Q       |        |        |       V |
  22+55       2.9973      0.95  |Q       |        |        |       V |
  23+ 0       3.0039      0.95  |Q       |        |        |       V |
  23+ 5       3.0103      0.94  |Q       |        |        |       V |
  23+10       3.0168      0.94  |Q       |        |        |        V|
  23+15       3.0232      0.93  |Q       |        |        |        V|
  23+20       3.0296      0.93  |Q       |        |        |        V|
  23+25       3.0359      0.92  |Q       |        |        |        V|
  23+30       3.0423      0.92  |Q       |        |        |        V|
  23+35       3.0486      0.91  |Q       |        |        |        V|
  23+40       3.0548      0.91  |Q       |        |        |        V|
  23+45       3.0611      0.91  |Q       |        |        |        V|
  23+50       3.0673      0.90  |Q       |        |        |        V|
  23+55       3.0734      0.90  |Q       |        |        |        V|
  24+ 0       3.0796      0.89  |Q       |        |        |        V|
  24+ 5       3.0852      0.82  |Q       |        |        |        V|
  24+10       3.0885      0.47  Q       |        |        |        V|
  24+15       3.0893      0.13  Q       |        |        |        V|
  24+20       3.0895      0.03  Q       |        |        |        V|
  24+25       3.0896      0.01  Q       |        |        |        V|
-------------------------------------------------------------------
```

# ATTACHMENT 5

Basin Routing

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
            Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2018
                        Study date: 08/04/23

------------------------------------------------------------------------


225038 - 18313 VALLEY BLVD - SB ANIMAL CARE CENTER
ROUTE
2-YEAR, 24-HOUR STORM
BY: JTS  DATE: 08-04-23
------------------------------------------------------------------------


Program License Serial Number 6320

------------------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: devhyd2.rte
*****************************HYDROGRAPH DATA*****************************
                Number of intervals =   293
                Time interval =    5.0 (Min.)
                Maximum/Peak flow rate =        8.135 (CFS)
                Total volume =       1.014 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*************************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       0.000 to Point/Station       0.000
**** RETARDING BASIN ROUTING ****
____________________________________________________________________________

Program computation of outflow v. depth




CALCULATED OUTFLOW DATA AT DEPTH =    0.50(Ft.))
Total outflow at this depth =      0.00(CFS)


CALCULATED OUTFLOW DATA AT DEPTH =    1.50(Ft.))
Total outflow at this depth =      0.00(CFS)


CALCULATED OUTFLOW DATA AT DEPTH =    2.50(Ft.))
Total outflow at this depth =      0.00(CFS)


CALCULATED OUTFLOW DATA AT DEPTH =    3.50(Ft.))
Pipe length  =    50.00(Ft.)   Elevation difference =   0.50(Ft.)
Manning's N = 0.013   No. of pipes = 1
Given pipe size =      8.00(In.)
 NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is      1.500(Ft.)
Pipe friction loss =      0.962(Ft.)
Minor friction loss =      0.537(Ft.)     K-factor =   1.50
Calculated flow rate through pipe(s) =      1.677(CFS)
```

Total outflow at this depth = 1.68(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 4.50(Ft.))
Pipe length = 50.00(Ft.) Elevation difference = 0.50(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 8.00(In.)
NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 2.500(Ft.)
Pipe friction loss = 1.604(Ft.)
Minor friction loss = 0.895(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 2.164(CFS)

Total outflow at this depth = 2.16(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 5.50(Ft.))
Pipe length = 50.00(Ft.) Elevation difference = 0.50(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 8.00(In.)
NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 3.500(Ft.)
Pipe friction loss = 2.246(Ft.)
Minor friction loss = 1.254(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 2.561(CFS)

Total outflow at this depth = 2.56(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 6.50(Ft.))
Pipe length = 50.00(Ft.) Elevation difference = 0.50(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 8.00(In.)
NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 4.500(Ft.)
Pipe friction loss = 2.887(Ft.)
Minor friction loss = 1.612(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 2.904(CFS)

Total outflow at this depth = 2.90(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 7.50(Ft.))
Pipe length = 50.00(Ft.) Elevation difference = 0.50(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 8.00(In.)
NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 5.500(Ft.)
Pipe friction loss = 3.529(Ft.)
Minor friction loss = 1.970(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 3.210(CFS)

Total outflow at this depth = 3.21(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 8.50(Ft.))
Pipe length = 50.00(Ft.) Elevation difference = 0.50(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 8.00(In.)
NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 6.500(Ft.)
Pipe friction loss = 4.170(Ft.)
Minor friction loss = 2.328(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 3.490(CFS)

Total outflow at this depth = 3.49(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 9.50(Ft.))
Pipe length = 50.00(Ft.) Elevation difference = 0.50(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 8.00(In.)
NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 7.500(Ft.)
Pipe friction loss = 4.812(Ft.)
Minor friction loss = 2.686(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 3.749(CFS)

Total outflow at this depth = 3.75(CFS)

---

Total number of inflow hydrograph intervals = 293
Hydrograph time unit = 5.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)

---

---

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

---

---

Depth vs. Storage and Depth vs. Discharge data:

| Basin Depth (Ft.) | Storage (Ac.Ft) | Outflow (CFS) | (S-O*dt/2) (Ac.Ft) | (S+O*dt/2) (Ac.Ft) |
|---|---|---|---|---|
| 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 0.500 | 0.020 | 0.000 | 0.020 | 0.020 |
| 1.500 | 0.083 | 0.000 | 0.083 | 0.083 |
| 2.500 | 0.162 | 0.000 | 0.162 | 0.162 |
| 3.500 | 0.247 | 1.677 | 0.241 | 0.253 |
| 4.500 | 0.336 | 2.164 | 0.329 | 0.343 |
| 5.500 | 0.424 | 2.561 | 0.415 | 0.433 |
| 6.500 | 0.510 | 2.904 | 0.500 | 0.520 |
| 7.500 | 0.588 | 3.210 | 0.577 | 0.599 |
| 8.500 | 0.651 | 3.490 | 0.639 | 0.663 |
| 9.500 | 0.692 | 3.749 | 0.679 | 0.705 |

---

Hydrograph Detention Basin Routing

---

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

---

| Time (Hours) | Inflow (CFS) | Outflow (CFS) | Storage (Ac.Ft) | .0 | 2.0 | 4.07 | 6.10 | 8.13 | Depth (Ft.) |
|---|---|---|---|---|---|---|---|---|---|
| 0.083 | 0.02 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 0.167 | 0.11 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.01 |
| 0.250 | 0.19 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.04 |
| 0.333 | 0.22 | 0.00 | 0.003 | O | \| | \| | \| | \| | 0.07 |
| 0.417 | 0.22 | 0.00 | 0.004 | O | \| | \| | \| | \| | 0.11 |
| 0.500 | 0.22 | 0.00 | 0.006 | O | \| | \| | \| | \| | 0.15 |
| 0.583 | 0.22 | 0.00 | 0.007 | O | \| | \| | \| | \| | 0.19 |
| 0.667 | 0.23 | 0.00 | 0.009 | O | \| | \| | \| | \| | 0.23 |
| 0.750 | 0.23 | 0.00 | 0.011 | O | \| | \| | \| | \| | 0.26 |
| 0.833 | 0.23 | 0.00 | 0.012 | O | \| | \| | \| | \| | 0.30 |
| 0.917 | 0.23 | 0.00 | 0.014 | O | \| | \| | \| | \| | 0.34 |
| 1.000 | 0.23 | 0.00 | 0.015 | O | \| | \| | \| | \| | 0.38 |
| 1.083 | 0.23 | 0.00 | 0.017 | O | \| | \| | \| | \| | 0.42 |
| 1.167 | 0.23 | 0.00 | 0.018 | O | \| | \| | \| | \| | 0.46 |
| 1.250 | 0.23 | 0.00 | 0.020 | O | \| | \| | \| | \| | 0.50 |
| 1.333 | 0.23 | 0.00 | 0.022 | O | \| | \| | \| | \| | 0.53 |
| 1.417 | 0.23 | 0.00 | 0.023 | O | \| | \| | \| | \| | 0.55 |
| 1.500 | 0.23 | 0.00 | 0.025 | O | \| | \| | \| | \| | 0.58 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1.583 | 0.23 | 0.00 | 0.026 | O | \| | \| | \| | \| | 0.60 |
| 1.667 | 0.23 | 0.00 | 0.028 | O | \| | \| | \| | \| | 0.63 |
| 1.750 | 0.23 | 0.00 | 0.030 | O | \| | \| | \| | \| | 0.65 |
| 1.833 | 0.24 | 0.00 | 0.031 | O | \| | \| | \| | \| | 0.68 |
| 1.917 | 0.24 | 0.00 | 0.033 | O | \| | \| | \| | \| | 0.70 |
| 2.000 | 0.24 | 0.00 | 0.034 | O | \| | \| | \| | \| | 0.73 |
| 2.083 | 0.24 | 0.00 | 0.036 | O | \| | \| | \| | \| | 0.76 |
| 2.167 | 0.24 | 0.00 | 0.038 | O | \| | \| | \| | \| | 0.78 |
| 2.250 | 0.24 | 0.00 | 0.039 | O | \| | \| | \| | \| | 0.81 |
| 2.333 | 0.24 | 0.00 | 0.041 | O | \| | \| | \| | \| | 0.83 |
| 2.417 | 0.24 | 0.00 | 0.043 | O | \| | \| | \| | \| | 0.86 |
| 2.500 | 0.24 | 0.00 | 0.044 | O | \| | \| | \| | \| | 0.89 |
| 2.583 | 0.24 | 0.00 | 0.046 | O | \| | \| | \| | \| | 0.91 |
| 2.667 | 0.24 | 0.00 | 0.048 | O | \| | \| | \| | \| | 0.94 |
| 2.750 | 0.24 | 0.00 | 0.049 | O | \| | \| | \| | \| | 0.97 |
| 2.833 | 0.24 | 0.00 | 0.051 | O | \| | \| | \| | \| | 0.99 |
| 2.917 | 0.25 | 0.00 | 0.053 | O | \| | \| | \| | \| | 1.02 |
| 3.000 | 0.25 | 0.00 | 0.054 | O | \| | \| | \| | \| | 1.05 |
| 3.083 | 0.25 | 0.00 | 0.056 | O | \| | \| | \| | \| | 1.07 |
| 3.167 | 0.25 | 0.00 | 0.058 | O | \| | \| | \| | \| | 1.10 |
| 3.250 | 0.25 | 0.00 | 0.060 | O | \| | \| | \| | \| | 1.13 |
| 3.333 | 0.25 | 0.00 | 0.061 | O | \| | \| | \| | \| | 1.15 |
| 3.417 | 0.25 | 0.00 | 0.063 | O | \| | \| | \| | \| | 1.18 |
| 3.500 | 0.25 | 0.00 | 0.065 | O | \| | \| | \| | \| | 1.21 |
| 3.583 | 0.25 | 0.00 | 0.066 | O | \| | \| | \| | \| | 1.24 |
| 3.667 | 0.25 | 0.00 | 0.068 | O | \| | \| | \| | \| | 1.26 |
| 3.750 | 0.25 | 0.00 | 0.070 | OI | \| | \| | \| | \| | 1.29 |
| 3.833 | 0.26 | 0.00 | 0.072 | OI | \| | \| | \| | \| | 1.32 |
| 3.917 | 0.26 | 0.00 | 0.073 | OI | \| | \| | \| | \| | 1.35 |
| 4.000 | 0.26 | 0.00 | 0.075 | OI | \| | \| | \| | \| | 1.38 |
| 4.083 | 0.26 | 0.00 | 0.077 | OI | \| | \| | \| | \| | 1.40 |
| 4.167 | 0.26 | 0.00 | 0.079 | OI | \| | \| | \| | \| | 1.43 |
| 4.250 | 0.26 | 0.00 | 0.081 | OI | \| | \| | \| | \| | 1.46 |
| 4.333 | 0.26 | 0.00 | 0.082 | OI | \| | \| | \| | \| | 1.49 |
| 4.417 | 0.26 | 0.00 | 0.084 | OI | \| | \| | \| | \| | 1.51 |
| 4.500 | 0.26 | 0.00 | 0.086 | OI | \| | \| | \| | \| | 1.54 |
| 4.583 | 0.26 | 0.00 | 0.088 | OI | \| | \| | \| | \| | 1.56 |
| 4.667 | 0.27 | 0.00 | 0.090 | OI | \| | \| | \| | \| | 1.58 |
| 4.750 | 0.27 | 0.00 | 0.091 | OI | \| | \| | \| | \| | 1.61 |
| 4.833 | 0.27 | 0.00 | 0.093 | OI | \| | \| | \| | \| | 1.63 |
| 4.917 | 0.27 | 0.00 | 0.095 | OI | \| | \| | \| | \| | 1.65 |
| 5.000 | 0.27 | 0.00 | 0.097 | OI | \| | \| | \| | \| | 1.68 |
| 5.083 | 0.27 | 0.00 | 0.099 | OI | \| | \| | \| | \| | 1.70 |
| 5.167 | 0.27 | 0.00 | 0.101 | OI | \| | \| | \| | \| | 1.72 |
| 5.250 | 0.27 | 0.00 | 0.103 | OI | \| | \| | \| | \| | 1.75 |
| 5.333 | 0.27 | 0.00 | 0.104 | OI | \| | \| | \| | \| | 1.77 |
| 5.417 | 0.28 | 0.00 | 0.106 | OI | \| | \| | \| | \| | 1.80 |
| 5.500 | 0.28 | 0.00 | 0.108 | OI | \| | \| | \| | \| | 1.82 |
| 5.583 | 0.28 | 0.00 | 0.110 | OI | \| | \| | \| | \| | 1.84 |
| 5.667 | 0.28 | 0.00 | 0.112 | OI | \| | \| | \| | \| | 1.87 |
| 5.750 | 0.28 | 0.00 | 0.114 | OI | \| | \| | \| | \| | 1.89 |
| 5.833 | 0.28 | 0.00 | 0.116 | OI | \| | \| | \| | \| | 1.92 |
| 5.917 | 0.28 | 0.00 | 0.118 | OI | \| | \| | \| | \| | 1.94 |
| 6.000 | 0.28 | 0.00 | 0.120 | OI | \| | \| | \| | \| | 1.97 |
| 6.083 | 0.29 | 0.00 | 0.122 | OI | \| | \| | \| | \| | 1.99 |
| 6.167 | 0.29 | 0.00 | 0.124 | OI | \| | \| | \| | \| | 2.02 |
| 6.250 | 0.29 | 0.00 | 0.126 | OI | \| | \| | \| | \| | 2.04 |
| 6.333 | 0.29 | 0.00 | 0.128 | OI | \| | \| | \| | \| | 2.07 |
| 6.417 | 0.29 | 0.00 | 0.130 | OI | \| | \| | \| | \| | 2.09 |
| 6.500 | 0.29 | 0.00 | 0.132 | OI | \| | \| | \| | \| | 2.12 |
| 6.583 | 0.29 | 0.00 | 0.134 | OI | \| | \| | \| | \| | 2.14 |
| 6.667 | 0.29 | 0.00 | 0.136 | OI | \| | \| | \| | \| | 2.17 |
| 6.750 | 0.30 | 0.00 | 0.138 | OI | \| | \| | \| | \| | 2.19 |
| 6.833 | 0.30 | 0.00 | 0.140 | OI | \| | \| | \| | \| | 2.22 |
| 6.917 | 0.30 | 0.00 | 0.142 | OI | \| | \| | \| | \| | 2.25 |
| 7.000 | 0.30 | 0.00 | 0.144 | OI | \| | \| | \| | \| | 2.27 |
| 7.083 | 0.30 | 0.00 | 0.146 | OI | \| | \| | \| | \| | 2.30 |
| 7.167 | 0.30 | 0.00 | 0.148 | OI | \| | \| | \| | \| | 2.32 |
| 7.250 | 0.31 | 0.00 | 0.150 | OI | \| | \| | \| | \| | 2.35 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 7.333 | 0.31 | 0.00 | 0.152 | OI | | | | | 2.38 |
| 7.417 | 0.31 | 0.00 | 0.154 | OI | | | | | 2.40 |
| 7.500 | 0.31 | 0.00 | 0.157 | OI | | | | | 2.43 |
| 7.583 | 0.31 | 0.00 | 0.159 | OI | | | | | 2.46 |
| 7.667 | 0.31 | 0.00 | 0.161 | OI | | | | | 2.49 |
| 7.750 | 0.32 | 0.02 | 0.163 | OI | | | | | 2.51 |
| 7.833 | 0.32 | 0.06 | 0.165 | OI | | | | | 2.53 |
| 7.917 | 0.32 | 0.09 | 0.167 | OI | | | | | 2.55 |
| 8.000 | 0.32 | 0.12 | 0.168 | OI | | | | | 2.57 |
| 8.083 | 0.32 | 0.15 | 0.169 | OI | | | | | 2.59 |
| 8.167 | 0.32 | 0.17 | 0.171 | OI | | | | | 2.60 |
| 8.250 | 0.33 | 0.19 | 0.172 | OI | | | | | 2.61 |
| 8.333 | 0.33 | 0.21 | 0.172 | OI | | | | | 2.62 |
| 8.417 | 0.33 | 0.22 | 0.173 | OI | | | | | 2.63 |
| 8.500 | 0.33 | 0.24 | 0.174 | OI | | | | | 2.64 |
| 8.583 | 0.33 | 0.25 | 0.175 | OI | | | | | 2.65 |
| 8.667 | 0.34 | 0.26 | 0.175 | \|O | | | | | 2.65 |
| 8.750 | 0.34 | 0.27 | 0.176 | \|O | | | | | 2.66 |
| 8.833 | 0.34 | 0.28 | 0.176 | \|O | | | | | 2.67 |
| 8.917 | 0.34 | 0.29 | 0.176 | \|O | | | | | 2.67 |
| 9.000 | 0.34 | 0.29 | 0.177 | \|O | | | | | 2.67 |
| 9.083 | 0.35 | 0.30 | 0.177 | \|O | | | | | 2.68 |
| 9.167 | 0.35 | 0.31 | 0.178 | \|O | | | | | 2.68 |
| 9.250 | 0.35 | 0.31 | 0.178 | \|O | | | | | 2.69 |
| 9.333 | 0.35 | 0.32 | 0.178 | \|O | | | | | 2.69 |
| 9.417 | 0.36 | 0.32 | 0.178 | \|O | | | | | 2.69 |
| 9.500 | 0.36 | 0.33 | 0.179 | \|O | | | | | 2.69 |
| 9.583 | 0.36 | 0.33 | 0.179 | \|O | | | | | 2.70 |
| 9.667 | 0.36 | 0.33 | 0.179 | \|O | | | | | 2.70 |
| 9.750 | 0.37 | 0.34 | 0.179 | \|O | | | | | 2.70 |
| 9.833 | 0.37 | 0.34 | 0.179 | \|O | | | | | 2.70 |
| 9.917 | 0.37 | 0.35 | 0.180 | \|O | | | | | 2.71 |
| 10.000 | 0.37 | 0.35 | 0.180 | \|O | | | | | 2.71 |
| 10.083 | 0.38 | 0.35 | 0.180 | \|O | | | | | 2.71 |
| 10.167 | 0.38 | 0.36 | 0.180 | \|O | | | | | 2.71 |
| 10.250 | 0.38 | 0.36 | 0.180 | \|O | | | | | 2.71 |
| 10.333 | 0.39 | 0.36 | 0.180 | \|O | | | | | 2.72 |
| 10.417 | 0.39 | 0.37 | 0.181 | \|O | | | | | 2.72 |
| 10.500 | 0.39 | 0.37 | 0.181 | \|O | | | | | 2.72 |
| 10.583 | 0.40 | 0.37 | 0.181 | \|O | | | | | 2.72 |
| 10.667 | 0.40 | 0.37 | 0.181 | \|O | | | | | 2.72 |
| 10.750 | 0.40 | 0.38 | 0.181 | \|O | | | | | 2.73 |
| 10.833 | 0.41 | 0.38 | 0.181 | \|O | | | | | 2.73 |
| 10.917 | 0.41 | 0.38 | 0.181 | \|O | | | | | 2.73 |
| 11.000 | 0.41 | 0.39 | 0.182 | \|O | | | | | 2.73 |
| 11.083 | 0.42 | 0.39 | 0.182 | \|O | | | | | 2.73 |
| 11.167 | 0.42 | 0.39 | 0.182 | \|O | | | | | 2.74 |
| 11.250 | 0.42 | 0.40 | 0.182 | \|O | | | | | 2.74 |
| 11.333 | 0.43 | 0.40 | 0.182 | \|O | | | | | 2.74 |
| 11.417 | 0.43 | 0.41 | 0.183 | \|O | | | | | 2.74 |
| 11.500 | 0.44 | 0.41 | 0.183 | \|O | | | | | 2.74 |
| 11.583 | 0.44 | 0.41 | 0.183 | \|O | | | | | 2.75 |
| 11.667 | 0.44 | 0.42 | 0.183 | \|O | | | | | 2.75 |
| 11.750 | 0.45 | 0.42 | 0.183 | \|O | | | | | 2.75 |
| 11.833 | 0.45 | 0.42 | 0.184 | \|O | | | | | 2.75 |
| 11.917 | 0.46 | 0.43 | 0.184 | \|O | | | | | 2.76 |
| 12.000 | 0.46 | 0.43 | 0.184 | \|O | | | | | 2.76 |
| 12.083 | 0.47 | 0.44 | 0.184 | \|O | | | | | 2.76 |
| 12.167 | 0.51 | 0.44 | 0.185 | \|OI | | | | | 2.77 |
| 12.250 | 0.54 | 0.45 | 0.185 | \|OI | | | | | 2.77 |
| 12.333 | 0.56 | 0.47 | 0.186 | \|OI | | | | | 2.78 |
| 12.417 | 0.57 | 0.48 | 0.186 | \|OI | | | | | 2.79 |
| 12.500 | 0.57 | 0.49 | 0.187 | \|OI | | | | | 2.79 |
| 12.583 | 0.58 | 0.50 | 0.187 | \|OI | | | | | 2.80 |
| 12.667 | 0.59 | 0.51 | 0.188 | \| O | | | | | 2.81 |
| 12.750 | 0.59 | 0.52 | 0.188 | \| O | | | | | 2.81 |
| 12.833 | 0.60 | 0.53 | 0.189 | \| O | | | | | 2.82 |
| 12.917 | 0.61 | 0.54 | 0.189 | \| O | | | | | 2.82 |
| 13.000 | 0.62 | 0.55 | 0.190 | \| O | | | | | 2.83 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 13.083 | 0.62 | 0.56 | 0.190 | O | | | | 2.83 |
| 13.167 | 0.63 | 0.57 | 0.191 | O | | | | 2.84 |
| 13.250 | 0.64 | 0.58 | 0.191 | O | | | | 2.84 |
| 13.333 | 0.65 | 0.58 | 0.192 | O | | | | 2.85 |
| 13.417 | 0.66 | 0.59 | 0.192 | O | | | | 2.85 |
| 13.500 | 0.67 | 0.60 | 0.193 | O | | | | 2.86 |
| 13.583 | 0.68 | 0.61 | 0.193 | O | | | | 2.86 |
| 13.667 | 0.69 | 0.62 | 0.193 | O | | | | 2.87 |
| 13.750 | 0.70 | 0.63 | 0.194 | O | | | | 2.88 |
| 13.833 | 0.71 | 0.64 | 0.194 | O | | | | 2.88 |
| 13.917 | 0.72 | 0.65 | 0.195 | O | | | | 2.89 |
| 14.000 | 0.74 | 0.66 | 0.195 | O | | | | 2.89 |
| 14.083 | 0.75 | 0.67 | 0.196 | O | | | | 2.90 |
| 14.167 | 0.77 | 0.68 | 0.197 | OI | | | | 2.91 |
| 14.250 | 0.78 | 0.69 | 0.197 | OI | | | | 2.91 |
| 14.333 | 0.80 | 0.71 | 0.198 | OI | | | | 2.92 |
| 14.417 | 0.82 | 0.72 | 0.198 | OI | | | | 2.93 |
| 14.500 | 0.83 | 0.73 | 0.199 | OI | | | | 2.94 |
| 14.583 | 0.85 | 0.75 | 0.200 | OI | | | | 2.95 |
| 14.667 | 0.88 | 0.76 | 0.201 | OI | | | | 2.95 |
| 14.750 | 0.90 | 0.78 | 0.201 | O | | | | 2.96 |
| 14.833 | 0.93 | 0.80 | 0.202 | O | | | | 2.97 |
| 14.917 | 0.96 | 0.81 | 0.203 | O | | | | 2.99 |
| 15.000 | 0.99 | 0.83 | 0.204 | O | | | | 3.00 |
| 15.083 | 1.02 | 0.86 | 0.205 | OI | | | | 3.01 |
| 15.167 | 1.06 | 0.88 | 0.207 | OI | | | | 3.02 |
| 15.250 | 1.10 | 0.91 | 0.208 | OI | | | | 3.04 |
| 15.333 | 1.16 | 0.93 | 0.209 | OI | | | | 3.06 |
| 15.417 | 1.19 | 0.96 | 0.211 | OI | | | | 3.08 |
| 15.500 | 1.14 | 0.99 | 0.212 | OI | | | | 3.09 |
| 15.583 | 1.10 | 1.01 | 0.213 | OI | | | | 3.10 |
| 15.667 | 1.17 | 1.02 | 0.214 | O | | | | 3.11 |
| 15.750 | 1.29 | 1.05 | 0.215 | OI | | | | 3.13 |
| 15.833 | 1.47 | 1.09 | 0.217 | OI | | | | 3.15 |
| 15.917 | 1.73 | 1.16 | 0.221 | O I | | | | 3.19 |
| 16.000 | 2.24 | 1.26 | 0.226 | O I | | | | 3.25 |
| 16.083 | 3.91 | 1.49 | 0.238 | O | I | | | 3.39 |
| 16.167 | 8.13 | 1.79 | 0.268 | O | | | I | 3.73 |
| 16.250 | 7.41 | 2.01 | 0.308 | O | | | I | 4.19 |
| 16.333 | 3.34 | 2.14 | 0.331 | O I | | | | 4.44 |
| 16.417 | 1.72 | 2.15 | 0.334 | I O | | | | 4.47 |
| 16.500 | 1.40 | 2.13 | 0.330 | I O | | | | 4.43 |
| 16.583 | 1.22 | 2.10 | 0.324 | I O | | | | 4.37 |
| 16.667 | 1.13 | 2.07 | 0.318 | I O | | | | 4.30 |
| 16.750 | 1.04 | 2.03 | 0.311 | I O | | | | 4.22 |
| 16.833 | 0.97 | 1.99 | 0.304 | I O | | | | 4.14 |
| 16.917 | 0.91 | 1.95 | 0.297 | I O | | | | 4.06 |
| 17.000 | 0.87 | 1.91 | 0.290 | I O | | | | 3.98 |
| 17.083 | 0.82 | 1.87 | 0.283 | I O | | | | 3.90 |
| 17.167 | 0.79 | 1.83 | 0.276 | I O | | | | 3.82 |
| 17.250 | 0.76 | 1.79 | 0.269 | I O | | | | 3.74 |
| 17.333 | 0.73 | 1.76 | 0.261 | I O | | | | 3.66 |
| 17.417 | 0.71 | 1.72 | 0.254 | I O | | | | 3.58 |
| 17.500 | 0.68 | 1.68 | 0.247 | I O | | | | 3.51 |
| 17.583 | 0.66 | 1.56 | 0.241 | I O | | | | 3.43 |
| 17.667 | 0.64 | 1.44 | 0.235 | I O | | | | 3.36 |
| 17.750 | 0.63 | 1.34 | 0.230 | I O | | | | 3.30 |
| 17.833 | 0.61 | 1.25 | 0.225 | I O | | | | 3.24 |
| 17.917 | 0.60 | 1.17 | 0.221 | I O | | | | 3.20 |
| 18.000 | 0.58 | 1.09 | 0.217 | I O | | | | 3.15 |
| 18.083 | 0.56 | 1.03 | 0.214 | I O | | | | 3.11 |
| 18.167 | 0.52 | 0.97 | 0.211 | IO | | | | 3.08 |
| 18.250 | 0.48 | 0.91 | 0.208 | I O | | | | 3.04 |
| 18.333 | 0.46 | 0.85 | 0.205 | I O | | | | 3.01 |
| 18.417 | 0.45 | 0.80 | 0.203 | I O | | | | 2.98 |
| 18.500 | 0.44 | 0.76 | 0.200 | IO | | | | 2.95 |
| 18.583 | 0.43 | 0.72 | 0.198 | IO | | | | 2.93 |
| 18.667 | 0.43 | 0.68 | 0.196 | IO | | | | 2.91 |
| 18.750 | 0.42 | 0.65 | 0.195 | IO | | | | 2.89 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 18.833 | 0.41 | 0.62 | 0.193 | IO | | | | | 2.87 |
| 18.917 | 0.40 | 0.59 | 0.192 | IO | | | | | 2.85 |
| 19.000 | 0.40 | 0.57 | 0.191 | IO | | | | | 2.84 |
| 19.083 | 0.39 | 0.54 | 0.190 | IO | | | | | 2.82 |
| 19.167 | 0.38 | 0.52 | 0.189 | IO | | | | | 2.81 |
| 19.250 | 0.38 | 0.51 | 0.188 | O | | | | | 2.80 |
| 19.333 | 0.37 | 0.49 | 0.187 | O | | | | | 2.79 |
| 19.417 | 0.37 | 0.47 | 0.186 | O | | | | | 2.78 |
| 19.500 | 0.36 | 0.46 | 0.185 | O | | | | | 2.77 |
| 19.583 | 0.36 | 0.45 | 0.185 | O | | | | | 2.77 |
| 19.667 | 0.35 | 0.44 | 0.184 | O | | | | | 2.76 |
| 19.750 | 0.35 | 0.42 | 0.184 | O | | | | | 2.75 |
| 19.833 | 0.34 | 0.41 | 0.183 | O | | | | | 2.75 |
| 19.917 | 0.34 | 0.41 | 0.183 | O | | | | | 2.74 |
| 20.000 | 0.33 | 0.40 | 0.182 | O | | | | | 2.74 |
| 20.083 | 0.33 | 0.39 | 0.182 | O | | | | | 2.73 |
| 20.167 | 0.33 | 0.38 | 0.181 | O | | | | | 2.73 |
| 20.250 | 0.32 | 0.37 | 0.181 | O | | | | | 2.72 |
| 20.333 | 0.32 | 0.37 | 0.181 | O | | | | | 2.72 |
| 20.417 | 0.32 | 0.36 | 0.180 | O | | | | | 2.72 |
| 20.500 | 0.31 | 0.35 | 0.180 | O | | | | | 2.71 |
| 20.583 | 0.31 | 0.35 | 0.180 | O | | | | | 2.71 |
| 20.667 | 0.31 | 0.34 | 0.179 | O | | | | | 2.71 |
| 20.750 | 0.30 | 0.34 | 0.179 | O | | | | | 2.70 |
| 20.833 | 0.30 | 0.33 | 0.179 | O | | | | | 2.70 |
| 20.917 | 0.30 | 0.33 | 0.179 | O | | | | | 2.70 |
| 21.000 | 0.29 | 0.33 | 0.178 | O | | | | | 2.69 |
| 21.083 | 0.29 | 0.32 | 0.178 | O | | | | | 2.69 |
| 21.167 | 0.29 | 0.32 | 0.178 | O | | | | | 2.69 |
| 21.250 | 0.29 | 0.31 | 0.178 | O | | | | | 2.69 |
| 21.333 | 0.28 | 0.31 | 0.178 | O | | | | | 2.68 |
| 21.417 | 0.28 | 0.31 | 0.178 | O | | | | | 2.68 |
| 21.500 | 0.28 | 0.30 | 0.177 | O | | | | | 2.68 |
| 21.583 | 0.28 | 0.30 | 0.177 | O | | | | | 2.68 |
| 21.667 | 0.27 | 0.30 | 0.177 | O | | | | | 2.68 |
| 21.750 | 0.27 | 0.29 | 0.177 | O | | | | | 2.67 |
| 21.833 | 0.27 | 0.29 | 0.177 | O | | | | | 2.67 |
| 21.917 | 0.27 | 0.29 | 0.177 | O | | | | | 2.67 |
| 22.000 | 0.26 | 0.28 | 0.176 | O | | | | | 2.67 |
| 22.083 | 0.26 | 0.28 | 0.176 | O | | | | | 2.67 |
| 22.167 | 0.26 | 0.28 | 0.176 | O | | | | | 2.67 |
| 22.250 | 0.26 | 0.28 | 0.176 | O | | | | | 2.67 |
| 22.333 | 0.26 | 0.27 | 0.176 | O | | | | | 2.66 |
| 22.417 | 0.25 | 0.27 | 0.176 | O | | | | | 2.66 |
| 22.500 | 0.25 | 0.27 | 0.176 | IO | | | | | 2.66 |
| 22.583 | 0.25 | 0.27 | 0.176 | IO | | | | | 2.66 |
| 22.667 | 0.25 | 0.27 | 0.175 | IO | | | | | 2.66 |
| 22.750 | 0.25 | 0.26 | 0.175 | IO | | | | | 2.66 |
| 22.833 | 0.25 | 0.26 | 0.175 | IO | | | | | 2.66 |
| 22.917 | 0.24 | 0.26 | 0.175 | IO | | | | | 2.65 |
| 23.000 | 0.24 | 0.26 | 0.175 | IO | | | | | 2.65 |
| 23.083 | 0.24 | 0.26 | 0.175 | IO | | | | | 2.65 |
| 23.167 | 0.24 | 0.25 | 0.175 | O | | | | | 2.65 |
| 23.250 | 0.24 | 0.25 | 0.175 | O | | | | | 2.65 |
| 23.333 | 0.24 | 0.25 | 0.175 | O | | | | | 2.65 |
| 23.417 | 0.23 | 0.25 | 0.175 | O | | | | | 2.65 |
| 23.500 | 0.23 | 0.25 | 0.174 | O | | | | | 2.65 |
| 23.583 | 0.23 | 0.24 | 0.174 | O | | | | | 2.65 |
| 23.667 | 0.23 | 0.24 | 0.174 | O | | | | | 2.64 |
| 23.750 | 0.23 | 0.24 | 0.174 | O | | | | | 2.64 |
| 23.833 | 0.23 | 0.24 | 0.174 | O | | | | | 2.64 |
| 23.917 | 0.23 | 0.24 | 0.174 | O | | | | | 2.64 |
| 24.000 | 0.22 | 0.24 | 0.174 | O | | | | | 2.64 |
| 24.083 | 0.21 | 0.23 | 0.174 | O | | | | | 2.64 |
| 24.167 | 0.12 | 0.22 | 0.173 | O | | | | | 2.63 |
| 24.250 | 0.03 | 0.21 | 0.172 | O | | | | | 2.62 |
| 24.333 | 0.01 | 0.18 | 0.171 | O | | | | | 2.61 |
| 24.417 | 0.00 | 0.16 | 0.170 | O | | | | | 2.59 |
| 24.500 | 0.00 | 0.14 | 0.169 | O | | | | | 2.58 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 24.583 | 0.00 | 0.12 | 0.168 | O | \| | \| | \| | \| | 2.57 |
| 24.667 | 0.00 | 0.11 | 0.167 | O | \| | \| | \| | \| | 2.56 |
| 24.750 | 0.00 | 0.09 | 0.167 | O | \| | \| | \| | \| | 2.56 |
| 24.833 | 0.00 | 0.08 | 0.166 | O | \| | \| | \| | \| | 2.55 |
| 24.917 | 0.00 | 0.07 | 0.166 | O | \| | \| | \| | \| | 2.54 |
| 25.000 | 0.00 | 0.06 | 0.165 | O | \| | \| | \| | \| | 2.54 |
| 25.083 | 0.00 | 0.05 | 0.165 | O | \| | \| | \| | \| | 2.53 |
| 25.167 | 0.00 | 0.05 | 0.164 | O | \| | \| | \| | \| | 2.53 |
| 25.250 | 0.00 | 0.04 | 0.164 | O | \| | \| | \| | \| | 2.52 |
| 25.333 | 0.00 | 0.04 | 0.164 | O | \| | \| | \| | \| | 2.52 |
| 25.417 | 0.00 | 0.03 | 0.164 | O | \| | \| | \| | \| | 2.52 |
| 25.500 | 0.00 | 0.03 | 0.163 | O | \| | \| | \| | \| | 2.52 |
| 25.583 | 0.00 | 0.02 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 25.667 | 0.00 | 0.02 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 25.750 | 0.00 | 0.02 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 25.833 | 0.00 | 0.02 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 25.917 | 0.00 | 0.01 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 26.000 | 0.00 | 0.01 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 26.083 | 0.00 | 0.01 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 26.167 | 0.00 | 0.01 | 0.162 | O | \| | \| | \| | \| | 2.51 |
| 26.250 | 0.00 | 0.01 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 26.333 | 0.00 | 0.01 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 26.417 | 0.00 | 0.01 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 26.500 | 0.00 | 0.01 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 26.583 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 26.667 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 26.750 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 26.833 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 26.917 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.000 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.083 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.167 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.250 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.333 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.417 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.500 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.583 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |

Remaining water in basin = 0.16 (Ac.Ft)

**********HYDROGRAPH DATA**********

Number of intervals = 331
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 2.152 (CFS)
Total volume = 0.852 (Ac.Ft)

Status of hydrographs being held in storage

| | Stream 1 | Stream 2 | Stream 3 | Stream 4 | Stream 5 |
|---|---|---|---|---|---|
| Peak (CFS) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Vol (Ac.Ft) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

**********

---

```
                    FLOOD HYDROGRAPH ROUTING PROGRAM
            Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2018
                        Study date: 08/04/23

------------------------------------------------------------------------


225038 - 18313 VALLEY BLVD - SB ANIMAL CARE CENTER
ROUTE
10-YEAR, 24-HOUR STORM
BY: JTS  DATE: 08-04-23
------------------------------------------------------------------------


Program License Serial Number 6320

------------------------------------------------------------------------
******************** HYDROGRAPH INFORMATION **********************

                From study/file name: devhyd10.rte
*****************************HYDROGRAPH DATA*****************************
                Number of intervals =   293
                Time interval =    5.0 (Min.)
                Maximum/Peak flow rate =       12.384 (CFS)
                Total volume =       1.734 (Ac.Ft)
        Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
        Peak (CFS)      0.000     0.000     0.000     0.000     0.000
        Vol (Ac.Ft)      0.000     0.000     0.000     0.000     0.000
*************************************************************************



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       0.000 to Point/Station       0.000
**** RETARDING BASIN ROUTING ****
________________________________________________________________________

Program computation of outflow v. depth




CALCULATED OUTFLOW DATA AT DEPTH =    0.50(Ft.))
Total outflow at this depth =      0.00(CFS)


CALCULATED OUTFLOW DATA AT DEPTH =    1.50(Ft.))
Total outflow at this depth =      0.00(CFS)


CALCULATED OUTFLOW DATA AT DEPTH =    2.50(Ft.))
Total outflow at this depth =      0.00(CFS)


CALCULATED OUTFLOW DATA AT DEPTH =    3.50(Ft.))
Pipe length  =    50.00(Ft.)   Elevation difference =   0.50(Ft.)
Manning's N = 0.013   No. of pipes = 1
Given pipe size =      8.00(In.)
 NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is      1.500(Ft.)
Pipe friction loss =      0.962(Ft.)
Minor friction loss =      0.537(Ft.)     K-factor =   1.50
Calculated flow rate through pipe(s) =      1.677(CFS)
```

Total outflow at this depth = 1.68(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 4.50(Ft.))
Pipe length = 50.00(Ft.) Elevation difference = 0.50(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 8.00(In.)
NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 2.500(Ft.)
Pipe friction loss = 1.604(Ft.)
Minor friction loss = 0.895(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 2.164(CFS)

Total outflow at this depth = 2.16(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 5.50(Ft.))
Pipe length = 50.00(Ft.) Elevation difference = 0.50(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 8.00(In.)
NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 3.500(Ft.)
Pipe friction loss = 2.246(Ft.)
Minor friction loss = 1.254(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 2.561(CFS)

Total outflow at this depth = 2.56(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 6.50(Ft.))
Pipe length = 50.00(Ft.) Elevation difference = 0.50(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 8.00(In.)
NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 4.500(Ft.)
Pipe friction loss = 2.887(Ft.)
Minor friction loss = 1.612(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 2.904(CFS)

Total outflow at this depth = 2.90(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 7.50(Ft.))
Pipe length = 50.00(Ft.) Elevation difference = 0.50(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 8.00(In.)
NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 5.500(Ft.)
Pipe friction loss = 3.529(Ft.)
Minor friction loss = 1.970(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 3.210(CFS)

Total outflow at this depth = 3.21(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 8.50(Ft.))
Pipe length = 50.00(Ft.) Elevation difference = 0.50(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 8.00(In.)
NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 6.500(Ft.)
Pipe friction loss = 4.170(Ft.)
Minor friction loss = 2.328(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 3.490(CFS)

Total outflow at this depth = 3.49(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 9.50(Ft.))
Pipe length = 50.00(Ft.) Elevation difference = 0.50(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 8.00(In.)
NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 7.500(Ft.)
Pipe friction loss = 4.812(Ft.)
Minor friction loss = 2.686(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 3.749(CFS)

Total outflow at this depth = 3.75(CFS)

---
Total number of inflow hydrograph intervals = 293
Hydrograph time unit = 5.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)
---
---
Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)
---
---
Depth vs. Storage and Depth vs. Discharge data:

| Basin Depth (Ft.) | Storage (Ac.Ft) | Outflow (CFS) | (S-O*dt/2) (Ac.Ft) | (S+O*dt/2) (Ac.Ft) |
|---|---|---|---|---|
| 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 0.500 | 0.020 | 0.000 | 0.020 | 0.020 |
| 1.500 | 0.083 | 0.000 | 0.083 | 0.083 |
| 2.500 | 0.162 | 0.000 | 0.162 | 0.162 |
| 3.500 | 0.247 | 1.677 | 0.241 | 0.253 |
| 4.500 | 0.336 | 2.164 | 0.329 | 0.343 |
| 5.500 | 0.424 | 2.561 | 0.415 | 0.433 |
| 6.500 | 0.510 | 2.904 | 0.500 | 0.520 |
| 7.500 | 0.588 | 3.210 | 0.577 | 0.599 |
| 8.500 | 0.651 | 3.490 | 0.639 | 0.663 |
| 9.500 | 0.692 | 3.749 | 0.679 | 0.705 |

---
Hydrograph Detention Basin Routing
---

Graph values: 'I'= unit inflow; 'O'=outflow at time shown
---

| Time (Hours) | Inflow (CFS) | Outflow (CFS) | Storage (Ac.Ft) | 0 | 3.1 | 6.19 | 9.29 | 12.38 | Depth (Ft.) |
|---|---|---|---|---|---|---|---|---|---|
| 0.083 | 0.03 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 0.167 | 0.21 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.02 |
| 0.250 | 0.39 | 0.00 | 0.003 | O | \| | \| | \| | \| | 0.08 |
| 0.333 | 0.44 | 0.00 | 0.006 | OI | \| | \| | \| | \| | 0.15 |
| 0.417 | 0.45 | 0.00 | 0.009 | OI | \| | \| | \| | \| | 0.22 |
| 0.500 | 0.45 | 0.00 | 0.012 | OI | \| | \| | \| | \| | 0.30 |
| 0.583 | 0.45 | 0.00 | 0.015 | OI | \| | \| | \| | \| | 0.38 |
| 0.667 | 0.45 | 0.00 | 0.018 | OI | \| | \| | \| | \| | 0.46 |
| 0.750 | 0.46 | 0.00 | 0.021 | OI | \| | \| | \| | \| | 0.52 |
| 0.833 | 0.46 | 0.00 | 0.025 | OI | \| | \| | \| | \| | 0.57 |
| 0.917 | 0.46 | 0.00 | 0.028 | OI | \| | \| | \| | \| | 0.62 |
| 1.000 | 0.46 | 0.00 | 0.031 | OI | \| | \| | \| | \| | 0.67 |
| 1.083 | 0.46 | 0.00 | 0.034 | OI | \| | \| | \| | \| | 0.72 |
| 1.167 | 0.46 | 0.00 | 0.037 | OI | \| | \| | \| | \| | 0.77 |
| 1.250 | 0.46 | 0.00 | 0.040 | OI | \| | \| | \| | \| | 0.82 |
| 1.333 | 0.46 | 0.00 | 0.044 | OI | \| | \| | \| | \| | 0.87 |
| 1.417 | 0.47 | 0.00 | 0.047 | OI | \| | \| | \| | \| | 0.92 |
| 1.500 | 0.47 | 0.00 | 0.050 | OI | \| | \| | \| | \| | 0.98 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1.583 | 0.47 | 0.00 | 0.053 | OI | | | | | 1.03 |
| 1.667 | 0.47 | 0.00 | 0.056 | OI | | | | | 1.08 |
| 1.750 | 0.47 | 0.00 | 0.060 | OI | | | | | 1.13 |
| 1.833 | 0.47 | 0.00 | 0.063 | OI | | | | | 1.18 |
| 1.917 | 0.47 | 0.00 | 0.066 | OI | | | | | 1.23 |
| 2.000 | 0.47 | 0.00 | 0.069 | OI | | | | | 1.28 |
| 2.083 | 0.48 | 0.00 | 0.073 | OI | | | | | 1.34 |
| 2.167 | 0.48 | 0.00 | 0.076 | OI | | | | | 1.39 |
| 2.250 | 0.48 | 0.00 | 0.079 | OI | | | | | 1.44 |
| 2.333 | 0.48 | 0.00 | 0.083 | OI | | | | | 1.49 |
| 2.417 | 0.48 | 0.00 | 0.086 | OI | | | | | 1.54 |
| 2.500 | 0.48 | 0.00 | 0.089 | OI | | | | | 1.58 |
| 2.583 | 0.48 | 0.00 | 0.092 | OI | | | | | 1.62 |
| 2.667 | 0.49 | 0.00 | 0.096 | OI | | | | | 1.66 |
| 2.750 | 0.49 | 0.00 | 0.099 | OI | | | | | 1.70 |
| 2.833 | 0.49 | 0.00 | 0.103 | OI | | | | | 1.75 |
| 2.917 | 0.49 | 0.00 | 0.106 | OI | | | | | 1.79 |
| 3.000 | 0.49 | 0.00 | 0.109 | OI | | | | | 1.83 |
| 3.083 | 0.49 | 0.00 | 0.113 | OI | | | | | 1.88 |
| 3.167 | 0.49 | 0.00 | 0.116 | OI | | | | | 1.92 |
| 3.250 | 0.50 | 0.00 | 0.119 | OI | | | | | 1.96 |
| 3.333 | 0.50 | 0.00 | 0.123 | OI | | | | | 2.00 |
| 3.417 | 0.50 | 0.00 | 0.126 | OI | | | | | 2.05 |
| 3.500 | 0.50 | 0.00 | 0.130 | OI | | | | | 2.09 |
| 3.583 | 0.50 | 0.00 | 0.133 | OI | | | | | 2.14 |
| 3.667 | 0.50 | 0.00 | 0.137 | OI | | | | | 2.18 |
| 3.750 | 0.50 | 0.00 | 0.140 | OI | | | | | 2.22 |
| 3.833 | 0.51 | 0.00 | 0.144 | OI | | | | | 2.27 |
| 3.917 | 0.51 | 0.00 | 0.147 | OI | | | | | 2.31 |
| 4.000 | 0.51 | 0.00 | 0.151 | OI | | | | | 2.36 |
| 4.083 | 0.51 | 0.00 | 0.154 | OI | | | | | 2.40 |
| 4.167 | 0.51 | 0.00 | 0.158 | OI | | | | | 2.44 |
| 4.250 | 0.51 | 0.00 | 0.161 | OI | | | | | 2.49 |
| 4.333 | 0.52 | 0.05 | 0.165 | OI | | | | | 2.53 |
| 4.417 | 0.52 | 0.11 | 0.168 | OI | | | | | 2.57 |
| 4.500 | 0.52 | 0.16 | 0.170 | OI | | | | | 2.60 |
| 4.583 | 0.52 | 0.21 | 0.173 | OI | | | | | 2.62 |
| 4.667 | 0.52 | 0.25 | 0.175 | OI | | | | | 2.65 |
| 4.750 | 0.52 | 0.28 | 0.176 | OI | | | | | 2.67 |
| 4.833 | 0.53 | 0.31 | 0.178 | OI | | | | | 2.69 |
| 4.917 | 0.53 | 0.34 | 0.179 | OI | | | | | 2.70 |
| 5.000 | 0.53 | 0.36 | 0.180 | OI | | | | | 2.72 |
| 5.083 | 0.53 | 0.39 | 0.182 | OI | | | | | 2.73 |
| 5.167 | 0.53 | 0.40 | 0.183 | \|O | | | | | 2.74 |
| 5.250 | 0.54 | 0.42 | 0.183 | \|O | | | | | 2.75 |
| 5.333 | 0.54 | 0.44 | 0.184 | \|O | | | | | 2.76 |
| 5.417 | 0.54 | 0.45 | 0.185 | \|O | | | | | 2.77 |
| 5.500 | 0.54 | 0.46 | 0.185 | \|O | | | | | 2.77 |
| 5.583 | 0.54 | 0.47 | 0.186 | \|O | | | | | 2.78 |
| 5.667 | 0.55 | 0.48 | 0.186 | \|O | | | | | 2.79 |
| 5.750 | 0.55 | 0.49 | 0.187 | \|O | | | | | 2.79 |
| 5.833 | 0.55 | 0.50 | 0.187 | \|O | | | | | 2.80 |
| 5.917 | 0.55 | 0.50 | 0.188 | \|O | | | | | 2.80 |
| 6.000 | 0.55 | 0.51 | 0.188 | \|O | | | | | 2.80 |
| 6.083 | 0.56 | 0.52 | 0.188 | \|O | | | | | 2.81 |
| 6.167 | 0.56 | 0.52 | 0.188 | \|O | | | | | 2.81 |
| 6.250 | 0.56 | 0.53 | 0.189 | \|O | | | | | 2.81 |
| 6.333 | 0.56 | 0.53 | 0.189 | \|O | | | | | 2.82 |
| 6.417 | 0.57 | 0.53 | 0.189 | \|O | | | | | 2.82 |
| 6.500 | 0.57 | 0.54 | 0.189 | \|O | | | | | 2.82 |
| 6.583 | 0.57 | 0.54 | 0.190 | \|O | | | | | 2.82 |
| 6.667 | 0.57 | 0.55 | 0.190 | \|O | | | | | 2.83 |
| 6.750 | 0.57 | 0.55 | 0.190 | \|O | | | | | 2.83 |
| 6.833 | 0.58 | 0.55 | 0.190 | \|O | | | | | 2.83 |
| 6.917 | 0.58 | 0.56 | 0.190 | \|O | | | | | 2.83 |
| 7.000 | 0.58 | 0.56 | 0.190 | \|O | | | | | 2.83 |
| 7.083 | 0.58 | 0.56 | 0.191 | \|O | | | | | 2.84 |
| 7.167 | 0.59 | 0.57 | 0.191 | \|O | | | | | 2.84 |
| 7.250 | 0.59 | 0.57 | 0.191 | \|O | | | | | 2.84 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 7.333 | 0.59 | 0.57 | 0.191 | O | | | | | 2.84 |
| 7.417 | 0.59 | 0.57 | 0.191 | O | | | | | 2.84 |
| 7.500 | 0.60 | 0.58 | 0.191 | O | | | | | 2.84 |
| 7.583 | 0.60 | 0.58 | 0.191 | O | | | | | 2.85 |
| 7.667 | 0.60 | 0.58 | 0.192 | O | | | | | 2.85 |
| 7.750 | 0.61 | 0.59 | 0.192 | O | | | | | 2.85 |
| 7.833 | 0.61 | 0.59 | 0.192 | O | | | | | 2.85 |
| 7.917 | 0.61 | 0.59 | 0.192 | O | | | | | 2.85 |
| 8.000 | 0.61 | 0.59 | 0.192 | O | | | | | 2.85 |
| 8.083 | 0.62 | 0.60 | 0.192 | O | | | | | 2.86 |
| 8.167 | 0.62 | 0.60 | 0.192 | O | | | | | 2.86 |
| 8.250 | 0.62 | 0.60 | 0.193 | O | | | | | 2.86 |
| 8.333 | 0.63 | 0.61 | 0.193 | O | | | | | 2.86 |
| 8.417 | 0.63 | 0.61 | 0.193 | O | | | | | 2.86 |
| 8.500 | 0.63 | 0.61 | 0.193 | O | | | | | 2.86 |
| 8.583 | 0.64 | 0.61 | 0.193 | O | | | | | 2.87 |
| 8.667 | 0.64 | 0.62 | 0.193 | O | | | | | 2.87 |
| 8.750 | 0.64 | 0.62 | 0.193 | O | | | | | 2.87 |
| 8.833 | 0.65 | 0.62 | 0.194 | O | | | | | 2.87 |
| 8.917 | 0.65 | 0.63 | 0.194 | O | | | | | 2.87 |
| 9.000 | 0.65 | 0.63 | 0.194 | O | | | | | 2.88 |
| 9.083 | 0.66 | 0.63 | 0.194 | O | | | | | 2.88 |
| 9.167 | 0.66 | 0.64 | 0.194 | O | | | | | 2.88 |
| 9.250 | 0.66 | 0.64 | 0.194 | O | | | | | 2.88 |
| 9.333 | 0.67 | 0.64 | 0.195 | O | | | | | 2.88 |
| 9.417 | 0.67 | 0.65 | 0.195 | O | | | | | 2.89 |
| 9.500 | 0.68 | 0.65 | 0.195 | O | | | | | 2.89 |
| 9.583 | 0.68 | 0.65 | 0.195 | O | | | | | 2.89 |
| 9.667 | 0.68 | 0.66 | 0.195 | O | | | | | 2.89 |
| 9.750 | 0.69 | 0.66 | 0.195 | O | | | | | 2.89 |
| 9.833 | 0.69 | 0.66 | 0.196 | O | | | | | 2.90 |
| 9.917 | 0.70 | 0.67 | 0.196 | O | | | | | 2.90 |
| 10.000 | 0.70 | 0.67 | 0.196 | O | | | | | 2.90 |
| 10.083 | 0.71 | 0.68 | 0.196 | O | | | | | 2.90 |
| 10.167 | 0.71 | 0.68 | 0.196 | O | | | | | 2.91 |
| 10.250 | 0.71 | 0.68 | 0.197 | O | | | | | 2.91 |
| 10.333 | 0.72 | 0.69 | 0.197 | O | | | | | 2.91 |
| 10.417 | 0.72 | 0.69 | 0.197 | O | | | | | 2.91 |
| 10.500 | 0.73 | 0.70 | 0.197 | O | | | | | 2.92 |
| 10.583 | 0.73 | 0.70 | 0.198 | O | | | | | 2.92 |
| 10.667 | 0.74 | 0.71 | 0.198 | O | | | | | 2.92 |
| 10.750 | 0.74 | 0.71 | 0.198 | O | | | | | 2.92 |
| 10.833 | 0.75 | 0.72 | 0.198 | O | | | | | 2.93 |
| 10.917 | 0.76 | 0.72 | 0.198 | O | | | | | 2.93 |
| 11.000 | 0.76 | 0.72 | 0.199 | O | | | | | 2.93 |
| 11.083 | 0.77 | 0.73 | 0.199 | O | | | | | 2.94 |
| 11.167 | 0.77 | 0.73 | 0.199 | O | | | | | 2.94 |
| 11.250 | 0.78 | 0.74 | 0.200 | OI | | | | | 2.94 |
| 11.333 | 0.79 | 0.75 | 0.200 | OI | | | | | 2.94 |
| 11.417 | 0.79 | 0.75 | 0.200 | OI | | | | | 2.95 |
| 11.500 | 0.80 | 0.76 | 0.200 | OI | | | | | 2.95 |
| 11.583 | 0.81 | 0.76 | 0.201 | OI | | | | | 2.95 |
| 11.667 | 0.81 | 0.77 | 0.201 | OI | | | | | 2.96 |
| 11.750 | 0.82 | 0.77 | 0.201 | O | | | | | 2.96 |
| 11.833 | 0.83 | 0.78 | 0.202 | O | | | | | 2.97 |
| 11.917 | 0.83 | 0.79 | 0.202 | O | | | | | 2.97 |
| 12.000 | 0.84 | 0.79 | 0.202 | O | | | | | 2.97 |
| 12.083 | 0.85 | 0.80 | 0.203 | O | | | | | 2.98 |
| 12.167 | 0.86 | 0.81 | 0.203 | O | | | | | 2.98 |
| 12.250 | 0.87 | 0.81 | 0.203 | O | | | | | 2.99 |
| 12.333 | 0.88 | 0.82 | 0.204 | O | | | | | 2.99 |
| 12.417 | 0.89 | 0.83 | 0.204 | O | | | | | 3.00 |
| 12.500 | 0.90 | 0.84 | 0.205 | O | | | | | 3.00 |
| 12.583 | 0.91 | 0.85 | 0.205 | O | | | | | 3.01 |
| 12.667 | 0.92 | 0.86 | 0.205 | O | | | | | 3.01 |
| 12.750 | 0.93 | 0.87 | 0.206 | O | | | | | 3.02 |
| 12.833 | 0.94 | 0.87 | 0.206 | O | | | | | 3.02 |
| 12.917 | 0.95 | 0.88 | 0.207 | O | | | | | 3.03 |
| 13.000 | 0.97 | 0.89 | 0.207 | O | | | | | 3.03 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 13.083 | 0.98 | 0.90 | 0.208 | O | | | | 3.04 |
| 13.167 | 0.99 | 0.91 | 0.208 | O | | | | 3.04 |
| 13.250 | 1.00 | 0.92 | 0.209 | O | | | | 3.05 |
| 13.333 | 1.02 | 0.93 | 0.209 | O | | | | 3.06 |
| 13.417 | 1.03 | 0.95 | 0.210 | O | | | | 3.06 |
| 13.500 | 1.04 | 0.96 | 0.211 | O | | | | 3.07 |
| 13.583 | 1.06 | 0.97 | 0.211 | O | | | | 3.08 |
| 13.667 | 1.08 | 0.98 | 0.212 | O | | | | 3.09 |
| 13.750 | 1.09 | 1.00 | 0.212 | O | | | | 3.09 |
| 13.833 | 1.11 | 1.01 | 0.213 | O | | | | 3.10 |
| 13.917 | 1.13 | 1.02 | 0.214 | O | | | | 3.11 |
| 14.000 | 1.15 | 1.04 | 0.215 | O | | | | 3.12 |
| 14.083 | 1.17 | 1.05 | 0.215 | OI | | | | 3.13 |
| 14.167 | 1.19 | 1.07 | 0.216 | OI | | | | 3.14 |
| 14.250 | 1.22 | 1.09 | 0.217 | OI | | | | 3.15 |
| 14.333 | 1.24 | 1.10 | 0.218 | OI | | | | 3.16 |
| 14.417 | 1.27 | 1.12 | 0.219 | OI | | | | 3.17 |
| 14.500 | 1.30 | 1.14 | 0.220 | OI | | | | 3.18 |
| 14.583 | 1.33 | 1.17 | 0.221 | O | | | | 3.19 |
| 14.667 | 1.36 | 1.19 | 0.222 | O | | | | 3.21 |
| 14.750 | 1.40 | 1.21 | 0.223 | O | | | | 3.22 |
| 14.833 | 1.44 | 1.24 | 0.225 | O | | | | 3.24 |
| 14.917 | 1.48 | 1.27 | 0.226 | O | | | | 3.25 |
| 15.000 | 1.53 | 1.30 | 0.228 | O | | | | 3.27 |
| 15.083 | 1.58 | 1.33 | 0.229 | OI | | | | 3.29 |
| 15.167 | 1.64 | 1.36 | 0.231 | OI | | | | 3.31 |
| 15.250 | 1.70 | 1.40 | 0.233 | OI | | | | 3.34 |
| 15.333 | 1.78 | 1.44 | 0.235 | OI | | | | 3.36 |
| 15.417 | 1.82 | 1.49 | 0.238 | OI | | | | 3.39 |
| 15.500 | 1.72 | 1.53 | 0.239 | OI | | | | 3.41 |
| 15.583 | 1.65 | 1.55 | 0.240 | OI | | | | 3.42 |
| 15.667 | 1.74 | 1.57 | 0.241 | O | | | | 3.43 |
| 15.750 | 1.92 | 1.60 | 0.243 | O | | | | 3.45 |
| 15.833 | 2.18 | 1.66 | 0.246 | OI | | | | 3.49 |
| 15.917 | 2.58 | 1.70 | 0.251 | O I | | | | 3.54 |
| 16.000 | 3.44 | 1.75 | 0.260 | O | I | | | 3.64 |
| 16.083 | 6.13 | 1.86 | 0.280 | O | | I | | 3.87 |
| 16.167 | 12.38 | 2.13 | 0.330 | O | | | I | 4.44 |
| 16.250 | 11.11 | 2.43 | 0.395 | O | | | I | 5.18 |
| 16.333 | 4.99 | 2.60 | 0.434 | O | I | | | 5.61 |
| 16.417 | 2.57 | 2.63 | 0.442 | O | | | | 5.70 |
| 16.500 | 2.12 | 2.62 | 0.440 | IO | | | | 5.68 |
| 16.583 | 1.86 | 2.61 | 0.435 | I O | | | | 5.63 |
| 16.667 | 1.73 | 2.58 | 0.430 | I O | | | | 5.57 |
| 16.750 | 1.60 | 2.56 | 0.424 | I O | | | | 5.49 |
| 16.833 | 1.50 | 2.53 | 0.417 | I O | | | | 5.42 |
| 16.917 | 1.42 | 2.50 | 0.409 | I O | | | | 5.34 |
| 17.000 | 1.34 | 2.46 | 0.402 | I O | | | | 5.25 |
| 17.083 | 1.28 | 2.43 | 0.394 | I O | | | | 5.16 |
| 17.167 | 1.23 | 2.39 | 0.386 | I O | | | | 5.07 |
| 17.250 | 1.18 | 2.35 | 0.378 | I O | | | | 4.98 |
| 17.333 | 1.14 | 2.32 | 0.370 | I O | | | | 4.89 |
| 17.417 | 1.10 | 2.28 | 0.362 | I O | | | | 4.79 |
| 17.500 | 1.07 | 2.24 | 0.354 | I O | | | | 4.70 |
| 17.583 | 1.04 | 2.21 | 0.346 | I O | | | | 4.61 |
| 17.667 | 1.01 | 2.17 | 0.338 | I O | | | | 4.52 |
| 17.750 | 0.98 | 2.13 | 0.330 | I O | | | | 4.43 |
| 17.833 | 0.96 | 2.09 | 0.322 | I O | | | | 4.34 |
| 17.917 | 0.94 | 2.04 | 0.314 | I O | | | | 4.25 |
| 18.000 | 0.92 | 2.00 | 0.307 | I O | | | | 4.17 |
| 18.083 | 0.90 | 1.96 | 0.299 | I O | | | | 4.09 |
| 18.167 | 0.87 | 1.92 | 0.292 | I O | | | | 4.00 |
| 18.250 | 0.85 | 1.88 | 0.285 | I O | | | | 3.92 |
| 18.333 | 0.84 | 1.85 | 0.278 | I O | | | | 3.85 |
| 18.417 | 0.82 | 1.81 | 0.271 | I O | | | | 3.77 |
| 18.500 | 0.81 | 1.77 | 0.264 | I O | | | | 3.69 |
| 18.583 | 0.79 | 1.73 | 0.258 | I O | | | | 3.62 |
| 18.667 | 0.78 | 1.70 | 0.251 | I O | | | | 3.55 |
| 18.750 | 0.77 | 1.64 | 0.245 | I O | | | | 3.48 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 18.833 | 0.76 | 1.53 | 0.239 | I O | | | | 3.41 |
| 18.917 | 0.75 | 1.43 | 0.234 | I O | | | | 3.35 |
| 19.000 | 0.74 | 1.34 | 0.230 | I O | | | | 3.30 |
| 19.083 | 0.73 | 1.26 | 0.226 | I O | | | | 3.25 |
| 19.167 | 0.72 | 1.19 | 0.223 | I O | | | | 3.21 |
| 19.250 | 0.71 | 1.13 | 0.219 | IO | | | | 3.18 |
| 19.333 | 0.70 | 1.08 | 0.217 | IO | | | | 3.14 |
| 19.417 | 0.69 | 1.03 | 0.214 | IO | | | | 3.11 |
| 19.500 | 0.68 | 0.99 | 0.212 | IO | | | | 3.09 |
| 19.583 | 0.67 | 0.95 | 0.210 | IO | | | | 3.06 |
| 19.667 | 0.67 | 0.91 | 0.208 | IO | | | | 3.04 |
| 19.750 | 0.66 | 0.88 | 0.207 | IO | | | | 3.02 |
| 19.833 | 0.65 | 0.85 | 0.205 | IO | | | | 3.01 |
| 19.917 | 0.64 | 0.83 | 0.204 | IO | | | | 2.99 |
| 20.000 | 0.64 | 0.80 | 0.203 | IO | | | | 2.98 |
| 20.083 | 0.63 | 0.78 | 0.202 | IO | | | | 2.97 |
| 20.167 | 0.62 | 0.76 | 0.201 | O | | | | 2.95 |
| 20.250 | 0.62 | 0.74 | 0.200 | O | | | | 2.94 |
| 20.333 | 0.61 | 0.73 | 0.199 | O | | | | 2.93 |
| 20.417 | 0.61 | 0.71 | 0.198 | O | | | | 2.92 |
| 20.500 | 0.60 | 0.70 | 0.197 | O | | | | 2.92 |
| 20.583 | 0.60 | 0.69 | 0.197 | O | | | | 2.91 |
| 20.667 | 0.59 | 0.67 | 0.196 | O | | | | 2.90 |
| 20.750 | 0.59 | 0.66 | 0.196 | O | | | | 2.90 |
| 20.833 | 0.58 | 0.65 | 0.195 | O | | | | 2.89 |
| 20.917 | 0.58 | 0.64 | 0.195 | O | | | | 2.88 |
| 21.000 | 0.57 | 0.63 | 0.194 | O | | | | 2.88 |
| 21.083 | 0.57 | 0.63 | 0.194 | O | | | | 2.87 |
| 21.167 | 0.56 | 0.62 | 0.193 | O | | | | 2.87 |
| 21.250 | 0.56 | 0.61 | 0.193 | O | | | | 2.86 |
| 21.333 | 0.55 | 0.60 | 0.193 | O | | | | 2.86 |
| 21.417 | 0.55 | 0.60 | 0.192 | O | | | | 2.86 |
| 21.500 | 0.54 | 0.59 | 0.192 | O | | | | 2.85 |
| 21.583 | 0.54 | 0.58 | 0.192 | O | | | | 2.85 |
| 21.667 | 0.54 | 0.58 | 0.191 | O | | | | 2.85 |
| 21.750 | 0.53 | 0.57 | 0.191 | O | | | | 2.84 |
| 21.833 | 0.53 | 0.57 | 0.191 | O | | | | 2.84 |
| 21.917 | 0.53 | 0.56 | 0.191 | O | | | | 2.84 |
| 22.000 | 0.52 | 0.56 | 0.190 | O | | | | 2.83 |
| 22.083 | 0.52 | 0.55 | 0.190 | O | | | | 2.83 |
| 22.167 | 0.52 | 0.55 | 0.190 | O | | | | 2.83 |
| 22.250 | 0.51 | 0.54 | 0.190 | O | | | | 2.82 |
| 22.333 | 0.51 | 0.54 | 0.189 | O | | | | 2.82 |
| 22.417 | 0.51 | 0.54 | 0.189 | O | | | | 2.82 |
| 22.500 | 0.50 | 0.53 | 0.189 | O | | | | 2.82 |
| 22.583 | 0.50 | 0.53 | 0.189 | O | | | | 2.81 |
| 22.667 | 0.50 | 0.52 | 0.189 | O | | | | 2.81 |
| 22.750 | 0.49 | 0.52 | 0.188 | O | | | | 2.81 |
| 22.833 | 0.49 | 0.52 | 0.188 | O | | | | 2.81 |
| 22.917 | 0.49 | 0.51 | 0.188 | O | | | | 2.81 |
| 23.000 | 0.48 | 0.51 | 0.188 | O | | | | 2.80 |
| 23.083 | 0.48 | 0.51 | 0.188 | O | | | | 2.80 |
| 23.167 | 0.48 | 0.50 | 0.187 | O | | | | 2.80 |
| 23.250 | 0.48 | 0.50 | 0.187 | O | | | | 2.80 |
| 23.333 | 0.47 | 0.50 | 0.187 | O | | | | 2.80 |
| 23.417 | 0.47 | 0.49 | 0.187 | O | | | | 2.79 |
| 23.500 | 0.47 | 0.49 | 0.187 | O | | | | 2.79 |
| 23.583 | 0.47 | 0.49 | 0.187 | O | | | | 2.79 |
| 23.667 | 0.46 | 0.48 | 0.187 | O | | | | 2.79 |
| 23.750 | 0.46 | 0.48 | 0.186 | O | | | | 2.79 |
| 23.833 | 0.46 | 0.48 | 0.186 | O | | | | 2.79 |
| 23.917 | 0.46 | 0.48 | 0.186 | O | | | | 2.78 |
| 24.000 | 0.45 | 0.47 | 0.186 | O | | | | 2.78 |
| 24.083 | 0.42 | 0.47 | 0.186 | O | | | | 2.78 |
| 24.167 | 0.24 | 0.45 | 0.185 | IO | | | | 2.77 |
| 24.250 | 0.06 | 0.41 | 0.183 | IO | | | | 2.75 |
| 24.333 | 0.01 | 0.37 | 0.181 | O | | | | 2.72 |
| 24.417 | 0.00 | 0.32 | 0.178 | O | | | | 2.69 |
| 24.500 | 0.00 | 0.28 | 0.176 | O | | | | 2.67 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 24.583 | 0.00 | 0.24 | 0.174 | O | \| | \| | \| | \| | 2.65 |
| 24.667 | 0.00 | 0.21 | 0.173 | O | \| | \| | \| | \| | 2.63 |
| 24.750 | 0.00 | 0.19 | 0.171 | O | \| | \| | \| | \| | 2.61 |
| 24.833 | 0.00 | 0.16 | 0.170 | O | \| | \| | \| | \| | 2.60 |
| 24.917 | 0.00 | 0.14 | 0.169 | O | \| | \| | \| | \| | 2.58 |
| 25.000 | 0.00 | 0.12 | 0.168 | O | \| | \| | \| | \| | 2.57 |
| 25.083 | 0.00 | 0.11 | 0.167 | O | \| | \| | \| | \| | 2.56 |
| 25.167 | 0.00 | 0.09 | 0.167 | O | \| | \| | \| | \| | 2.56 |
| 25.250 | 0.00 | 0.08 | 0.166 | O | \| | \| | \| | \| | 2.55 |
| 25.333 | 0.00 | 0.07 | 0.166 | O | \| | \| | \| | \| | 2.54 |
| 25.417 | 0.00 | 0.06 | 0.165 | O | \| | \| | \| | \| | 2.54 |
| 25.500 | 0.00 | 0.05 | 0.165 | O | \| | \| | \| | \| | 2.53 |
| 25.583 | 0.00 | 0.05 | 0.164 | O | \| | \| | \| | \| | 2.53 |
| 25.667 | 0.00 | 0.04 | 0.164 | O | \| | \| | \| | \| | 2.52 |
| 25.750 | 0.00 | 0.04 | 0.164 | O | \| | \| | \| | \| | 2.52 |
| 25.833 | 0.00 | 0.03 | 0.164 | O | \| | \| | \| | \| | 2.52 |
| 25.917 | 0.00 | 0.03 | 0.163 | O | \| | \| | \| | \| | 2.52 |
| 26.000 | 0.00 | 0.02 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 26.083 | 0.00 | 0.02 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 26.167 | 0.00 | 0.02 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 26.250 | 0.00 | 0.02 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 26.333 | 0.00 | 0.01 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 26.417 | 0.00 | 0.01 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 26.500 | 0.00 | 0.01 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 26.583 | 0.00 | 0.01 | 0.162 | O | \| | \| | \| | \| | 2.51 |
| 26.667 | 0.00 | 0.01 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 26.750 | 0.00 | 0.01 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 26.833 | 0.00 | 0.01 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 26.917 | 0.00 | 0.01 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.000 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.083 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.167 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.250 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.333 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.417 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.500 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.583 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.667 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.750 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.833 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.917 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 28.000 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |

Remaining water in basin = 0.16 (Ac.Ft)

**********HYDROGRAPH DATA**********

Number of intervals = 336
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 2.631 (CFS)
Total volume = 1.572 (Ac.Ft)

Status of hydrographs being held in storage

| | Stream 1 | Stream 2 | Stream 3 | Stream 4 | Stream 5 |
|---|---|---|---|---|---|
| Peak (CFS) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Vol (Ac.Ft) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

**********

---

FLOOD HYDROGRAPH ROUTING PROGRAM

Study date: 08/04/23

---

225038 - 18313 VALLEY BLVD - SB ANIMAL CARE CENTER
ROUTE
25-YEAR, 24-HOUR STORM
BY: JTS  DATE: 08-04-23
---

Program License Serial Number 6320

---
******************** HYDROGRAPH INFORMATION **********************

From study/file name: devhyd25.rte
****************************HYDROGRAPH DATA****************************
Number of intervals =  293
Time interval =  5.0 (Min.)
Maximum/Peak flow rate =  14.811 (CFS)
Total volume =  2.161 (Ac.Ft)
Status of hydrographs being held in storage

| | Stream 1 | Stream 2 | Stream 3 | Stream 4 | Stream 5 |
|---|---|---|---|---|---|
| Peak (CFS) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Vol (Ac.Ft) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

**********

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station  0.000 to Point/Station  0.000
**** RETARDING BASIN ROUTING ****
_____

Program computation of outflow v. depth

CALCULATED OUTFLOW DATA AT DEPTH =  0.50(Ft.))
Total outflow at this depth =  0.00(CFS)

CALCULATED OUTFLOW DATA AT DEPTH =  1.50(Ft.))
Total outflow at this depth =  0.00(CFS)

CALCULATED OUTFLOW DATA AT DEPTH =  2.50(Ft.))
Total outflow at this depth =  0.00(CFS)

CALCULATED OUTFLOW DATA AT DEPTH =  3.50(Ft.))
Pipe length =  50.00(Ft.)  Elevation difference =  0.50(Ft.)
Manning's N = 0.013  No. of pipes = 1
Given pipe size =  8.00(In.)
 NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is  1.500(Ft.)
Pipe friction loss =  0.962(Ft.)
Minor friction loss =  0.537(Ft.)  K-factor =  1.50
Calculated flow rate through pipe(s) =  1.677(CFS)

Total outflow at this depth = 1.68(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 4.50(Ft.))
Pipe length = 50.00(Ft.) Elevation difference = 0.50(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 8.00(In.)
NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 2.500(Ft.)
Pipe friction loss = 1.604(Ft.)
Minor friction loss = 0.895(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 2.164(CFS)

Total outflow at this depth = 2.16(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 5.50(Ft.))
Pipe length = 50.00(Ft.) Elevation difference = 0.50(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 8.00(In.)
NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 3.500(Ft.)
Pipe friction loss = 2.246(Ft.)
Minor friction loss = 1.254(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 2.561(CFS)

Total outflow at this depth = 2.56(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 6.50(Ft.))
Pipe length = 50.00(Ft.) Elevation difference = 0.50(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 8.00(In.)
NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 4.500(Ft.)
Pipe friction loss = 2.887(Ft.)
Minor friction loss = 1.612(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 2.904(CFS)

Total outflow at this depth = 2.90(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 7.50(Ft.))
Pipe length = 50.00(Ft.) Elevation difference = 0.50(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 8.00(In.)
NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 5.500(Ft.)
Pipe friction loss = 3.529(Ft.)
Minor friction loss = 1.970(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 3.210(CFS)

Total outflow at this depth = 3.21(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 8.50(Ft.))
Pipe length = 50.00(Ft.) Elevation difference = 0.50(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 8.00(In.)
NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 6.500(Ft.)
Pipe friction loss = 4.170(Ft.)
Minor friction loss = 2.328(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 3.490(CFS)

Total outflow at this depth = 3.49(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 9.50(Ft.))
Pipe length = 50.00(Ft.) Elevation difference = 0.50(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 8.00(In.)
NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 7.500(Ft.)
Pipe friction loss = 4.812(Ft.)
Minor friction loss = 2.686(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 3.749(CFS)

Total outflow at this depth = 3.75(CFS)

---
Total number of inflow hydrograph intervals = 293
Hydrograph time unit = 5.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)
---
---
Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)
---
---
Depth vs. Storage and Depth vs. Discharge data:

| Basin Depth (Ft.) | Storage (Ac.Ft) | Outflow (CFS) | (S-O*dt/2) (Ac.Ft) | (S+O*dt/2) (Ac.Ft) |
|---|---|---|---|---|
| 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 0.500 | 0.020 | 0.000 | 0.020 | 0.020 |
| 1.500 | 0.083 | 0.000 | 0.083 | 0.083 |
| 2.500 | 0.162 | 0.000 | 0.162 | 0.162 |
| 3.500 | 0.247 | 1.677 | 0.241 | 0.253 |
| 4.500 | 0.336 | 2.164 | 0.329 | 0.343 |
| 5.500 | 0.424 | 2.561 | 0.415 | 0.433 |
| 6.500 | 0.510 | 2.904 | 0.500 | 0.520 |
| 7.500 | 0.588 | 3.210 | 0.577 | 0.599 |
| 8.500 | 0.651 | 3.490 | 0.639 | 0.663 |
| 9.500 | 0.692 | 3.749 | 0.679 | 0.705 |

---
Hydrograph Detention Basin Routing
---

Graph values: 'I'= unit inflow; 'O'=outflow at time shown
---

| Time (Hours) | Inflow (CFS) | Outflow (CFS) | Storage (Ac.Ft) | 0 | 3.7 | 7.41 | 11.11 | 14.81 | Depth (Ft.) |
|---|---|---|---|---|---|---|---|---|---|
| 0.083 | 0.04 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.00 |
| 0.167 | 0.28 | 0.00 | 0.001 | O | \| | \| | \| | \| | 0.03 |
| 0.250 | 0.50 | 0.00 | 0.004 | OI | \| | \| | \| | \| | 0.10 |
| 0.333 | 0.57 | 0.00 | 0.008 | OI | \| | \| | \| | \| | 0.19 |
| 0.417 | 0.58 | 0.00 | 0.012 | OI | \| | \| | \| | \| | 0.29 |
| 0.500 | 0.59 | 0.00 | 0.016 | OI | \| | \| | \| | \| | 0.39 |
| 0.583 | 0.59 | 0.00 | 0.020 | OI | \| | \| | \| | \| | 0.49 |
| 0.667 | 0.59 | 0.00 | 0.024 | OI | \| | \| | \| | \| | 0.56 |
| 0.750 | 0.59 | 0.00 | 0.028 | OI | \| | \| | \| | \| | 0.63 |
| 0.833 | 0.60 | 0.00 | 0.032 | OI | \| | \| | \| | \| | 0.69 |
| 0.917 | 0.60 | 0.00 | 0.036 | OI | \| | \| | \| | \| | 0.76 |
| 1.000 | 0.60 | 0.00 | 0.040 | OI | \| | \| | \| | \| | 0.82 |
| 1.083 | 0.60 | 0.00 | 0.044 | OI | \| | \| | \| | \| | 0.89 |
| 1.167 | 0.60 | 0.00 | 0.048 | OI | \| | \| | \| | \| | 0.95 |
| 1.250 | 0.60 | 0.00 | 0.053 | OI | \| | \| | \| | \| | 1.02 |
| 1.333 | 0.60 | 0.00 | 0.057 | OI | \| | \| | \| | \| | 1.08 |
| 1.417 | 0.61 | 0.00 | 0.061 | OI | \| | \| | \| | \| | 1.15 |
| 1.500 | 0.61 | 0.00 | 0.065 | OI | \| | \| | \| | \| | 1.22 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1.583 | 0.61 | 0.00 | 0.069 | OI | | | | | 1.28 |
| 1.667 | 0.61 | 0.00 | 0.074 | OI | | | | | 1.35 |
| 1.750 | 0.61 | 0.00 | 0.078 | OI | | | | | 1.42 |
| 1.833 | 0.61 | 0.00 | 0.082 | OI | | | | | 1.48 |
| 1.917 | 0.62 | 0.00 | 0.086 | OI | | | | | 1.54 |
| 2.000 | 0.62 | 0.00 | 0.090 | OI | | | | | 1.59 |
| 2.083 | 0.62 | 0.00 | 0.095 | OI | | | | | 1.65 |
| 2.167 | 0.62 | 0.00 | 0.099 | OI | | | | | 1.70 |
| 2.250 | 0.62 | 0.00 | 0.103 | OI | | | | | 1.76 |
| 2.333 | 0.62 | 0.00 | 0.108 | OI | | | | | 1.81 |
| 2.417 | 0.63 | 0.00 | 0.112 | OI | | | | | 1.87 |
| 2.500 | 0.63 | 0.00 | 0.116 | OI | | | | | 1.92 |
| 2.583 | 0.63 | 0.00 | 0.120 | OI | | | | | 1.97 |
| 2.667 | 0.63 | 0.00 | 0.125 | OI | | | | | 2.03 |
| 2.750 | 0.63 | 0.00 | 0.129 | OI | | | | | 2.08 |
| 2.833 | 0.63 | 0.00 | 0.134 | OI | | | | | 2.14 |
| 2.917 | 0.64 | 0.00 | 0.138 | OI | | | | | 2.19 |
| 3.000 | 0.64 | 0.00 | 0.142 | OI | | | | | 2.25 |
| 3.083 | 0.64 | 0.00 | 0.147 | OI | | | | | 2.31 |
| 3.167 | 0.64 | 0.00 | 0.151 | OI | | | | | 2.36 |
| 3.250 | 0.64 | 0.00 | 0.156 | OI | | | | | 2.42 |
| 3.333 | 0.65 | 0.00 | 0.160 | OI | | | | | 2.47 |
| 3.417 | 0.65 | 0.04 | 0.164 | OI | | | | | 2.53 |
| 3.500 | 0.65 | 0.12 | 0.168 | OI | | | | | 2.57 |
| 3.583 | 0.65 | 0.19 | 0.172 | OI | | | | | 2.61 |
| 3.667 | 0.65 | 0.25 | 0.175 | OI | | | | | 2.65 |
| 3.750 | 0.65 | 0.30 | 0.177 | OI | | | | | 2.68 |
| 3.833 | 0.66 | 0.34 | 0.179 | OI | | | | | 2.71 |
| 3.917 | 0.66 | 0.38 | 0.181 | OI | | | | | 2.73 |
| 4.000 | 0.66 | 0.42 | 0.183 | OI | | | | | 2.75 |
| 4.083 | 0.66 | 0.45 | 0.185 | OI | | | | | 2.77 |
| 4.167 | 0.66 | 0.48 | 0.186 | \|O | | | | | 2.78 |
| 4.250 | 0.67 | 0.50 | 0.187 | \|O | | | | | 2.80 |
| 4.333 | 0.67 | 0.52 | 0.188 | \|O | | | | | 2.81 |
| 4.417 | 0.67 | 0.54 | 0.189 | \|O | | | | | 2.82 |
| 4.500 | 0.67 | 0.56 | 0.190 | \|O | | | | | 2.83 |
| 4.583 | 0.68 | 0.57 | 0.191 | \|O | | | | | 2.84 |
| 4.667 | 0.68 | 0.59 | 0.192 | \|O | | | | | 2.85 |
| 4.750 | 0.68 | 0.60 | 0.192 | \|O | | | | | 2.86 |
| 4.833 | 0.68 | 0.61 | 0.193 | \|O | | | | | 2.86 |
| 4.917 | 0.68 | 0.62 | 0.193 | \|O | | | | | 2.87 |
| 5.000 | 0.69 | 0.63 | 0.194 | \|O | | | | | 2.87 |
| 5.083 | 0.69 | 0.63 | 0.194 | \|O | | | | | 2.88 |
| 5.167 | 0.69 | 0.64 | 0.195 | \|O | | | | | 2.88 |
| 5.250 | 0.69 | 0.65 | 0.195 | \|O | | | | | 2.89 |
| 5.333 | 0.70 | 0.65 | 0.195 | \|O | | | | | 2.89 |
| 5.417 | 0.70 | 0.66 | 0.195 | \|O | | | | | 2.89 |
| 5.500 | 0.70 | 0.66 | 0.196 | \|O | | | | | 2.90 |
| 5.583 | 0.70 | 0.67 | 0.196 | \|O | | | | | 2.90 |
| 5.667 | 0.71 | 0.67 | 0.196 | \|O | | | | | 2.90 |
| 5.750 | 0.71 | 0.68 | 0.196 | \|O | | | | | 2.90 |
| 5.833 | 0.71 | 0.68 | 0.197 | \|O | | | | | 2.91 |
| 5.917 | 0.71 | 0.69 | 0.197 | \|O | | | | | 2.91 |
| 6.000 | 0.72 | 0.69 | 0.197 | \|O | | | | | 2.91 |
| 6.083 | 0.72 | 0.69 | 0.197 | \|O | | | | | 2.91 |
| 6.167 | 0.72 | 0.70 | 0.197 | \|O | | | | | 2.92 |
| 6.250 | 0.72 | 0.70 | 0.197 | \|O | | | | | 2.92 |
| 6.333 | 0.73 | 0.70 | 0.198 | \|O | | | | | 2.92 |
| 6.417 | 0.73 | 0.71 | 0.198 | \|O | | | | | 2.92 |
| 6.500 | 0.73 | 0.71 | 0.198 | \|O | | | | | 2.92 |
| 6.583 | 0.73 | 0.71 | 0.198 | \|O | | | | | 2.92 |
| 6.667 | 0.74 | 0.71 | 0.198 | \|O | | | | | 2.93 |
| 6.750 | 0.74 | 0.72 | 0.198 | \|O | | | | | 2.93 |
| 6.833 | 0.74 | 0.72 | 0.199 | \|O | | | | | 2.93 |
| 6.917 | 0.75 | 0.72 | 0.199 | \|O | | | | | 2.93 |
| 7.000 | 0.75 | 0.73 | 0.199 | \|O | | | | | 2.93 |
| 7.083 | 0.75 | 0.73 | 0.199 | \|O | | | | | 2.94 |
| 7.167 | 0.76 | 0.73 | 0.199 | \|O | | | | | 2.94 |
| 7.250 | 0.76 | 0.74 | 0.199 | \|O | | | | | 2.94 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 7.333 | 0.76 | 0.74 | 0.199 | O | | | | | 2.94 |
| 7.417 | 0.76 | 0.74 | 0.200 | O | | | | | 2.94 |
| 7.500 | 0.77 | 0.75 | 0.200 | O | | | | | 2.94 |
| 7.583 | 0.77 | 0.75 | 0.200 | O | | | | | 2.95 |
| 7.667 | 0.77 | 0.75 | 0.200 | O | | | | | 2.95 |
| 7.750 | 0.78 | 0.75 | 0.200 | O | | | | | 2.95 |
| 7.833 | 0.78 | 0.76 | 0.200 | O | | | | | 2.95 |
| 7.917 | 0.79 | 0.76 | 0.201 | O | | | | | 2.95 |
| 8.000 | 0.79 | 0.76 | 0.201 | O | | | | | 2.96 |
| 8.083 | 0.79 | 0.77 | 0.201 | O | | | | | 2.96 |
| 8.167 | 0.80 | 0.77 | 0.201 | O | | | | | 2.96 |
| 8.250 | 0.80 | 0.77 | 0.201 | O | | | | | 2.96 |
| 8.333 | 0.80 | 0.78 | 0.201 | O | | | | | 2.96 |
| 8.417 | 0.81 | 0.78 | 0.202 | O | | | | | 2.97 |
| 8.500 | 0.81 | 0.78 | 0.202 | O | | | | | 2.97 |
| 8.583 | 0.82 | 0.79 | 0.202 | O | | | | | 2.97 |
| 8.667 | 0.82 | 0.79 | 0.202 | O | | | | | 2.97 |
| 8.750 | 0.82 | 0.80 | 0.202 | O | | | | | 2.97 |
| 8.833 | 0.83 | 0.80 | 0.203 | O | | | | | 2.98 |
| 8.917 | 0.83 | 0.80 | 0.203 | O | | | | | 2.98 |
| 9.000 | 0.84 | 0.81 | 0.203 | O | | | | | 2.98 |
| 9.083 | 0.84 | 0.81 | 0.203 | O | | | | | 2.98 |
| 9.167 | 0.84 | 0.82 | 0.203 | O | | | | | 2.99 |
| 9.250 | 0.85 | 0.82 | 0.204 | O | | | | | 2.99 |
| 9.333 | 0.85 | 0.82 | 0.204 | O | | | | | 2.99 |
| 9.417 | 0.86 | 0.83 | 0.204 | O | | | | | 2.99 |
| 9.500 | 0.86 | 0.83 | 0.204 | O | | | | | 3.00 |
| 9.583 | 0.87 | 0.84 | 0.204 | O | | | | | 3.00 |
| 9.667 | 0.87 | 0.84 | 0.205 | O | | | | | 3.00 |
| 9.750 | 0.88 | 0.84 | 0.205 | O | | | | | 3.00 |
| 9.833 | 0.88 | 0.85 | 0.205 | O | | | | | 3.01 |
| 9.917 | 0.89 | 0.85 | 0.205 | O | | | | | 3.01 |
| 10.000 | 0.89 | 0.86 | 0.206 | O | | | | | 3.01 |
| 10.083 | 0.90 | 0.86 | 0.206 | O | | | | | 3.02 |
| 10.167 | 0.90 | 0.87 | 0.206 | O | | | | | 3.02 |
| 10.250 | 0.91 | 0.87 | 0.206 | O | | | | | 3.02 |
| 10.333 | 0.92 | 0.88 | 0.207 | O | | | | | 3.02 |
| 10.417 | 0.92 | 0.88 | 0.207 | O | | | | | 3.03 |
| 10.500 | 0.93 | 0.89 | 0.207 | OI | | | | | 3.03 |
| 10.583 | 0.93 | 0.89 | 0.207 | OI | | | | | 3.03 |
| 10.667 | 0.94 | 0.90 | 0.208 | OI | | | | | 3.04 |
| 10.750 | 0.95 | 0.91 | 0.208 | OI | | | | | 3.04 |
| 10.833 | 0.95 | 0.91 | 0.208 | OI | | | | | 3.04 |
| 10.917 | 0.96 | 0.92 | 0.208 | OI | | | | | 3.05 |
| 11.000 | 0.97 | 0.92 | 0.209 | OI | | | | | 3.05 |
| 11.083 | 0.97 | 0.93 | 0.209 | O | | | | | 3.05 |
| 11.167 | 0.98 | 0.93 | 0.209 | O | | | | | 3.06 |
| 11.250 | 0.99 | 0.94 | 0.210 | O | | | | | 3.06 |
| 11.333 | 1.00 | 0.95 | 0.210 | O | | | | | 3.07 |
| 11.417 | 1.00 | 0.95 | 0.210 | O | | | | | 3.07 |
| 11.500 | 1.01 | 0.96 | 0.211 | O | | | | | 3.07 |
| 11.583 | 1.02 | 0.97 | 0.211 | O | | | | | 3.08 |
| 11.667 | 1.03 | 0.97 | 0.211 | O | | | | | 3.08 |
| 11.750 | 1.04 | 0.98 | 0.212 | O | | | | | 3.09 |
| 11.833 | 1.04 | 0.99 | 0.212 | O | | | | | 3.09 |
| 11.917 | 1.05 | 1.00 | 0.213 | O | | | | | 3.09 |
| 12.000 | 1.06 | 1.00 | 0.213 | O | | | | | 3.10 |
| 12.083 | 1.07 | 1.01 | 0.213 | O | | | | | 3.10 |
| 12.167 | 1.07 | 1.02 | 0.214 | O | | | | | 3.11 |
| 12.250 | 1.07 | 1.03 | 0.214 | O | | | | | 3.11 |
| 12.333 | 1.08 | 1.03 | 0.214 | O | | | | | 3.12 |
| 12.417 | 1.09 | 1.04 | 0.215 | O | | | | | 3.12 |
| 12.500 | 1.10 | 1.04 | 0.215 | O | | | | | 3.12 |
| 12.583 | 1.11 | 1.05 | 0.215 | O | | | | | 3.13 |
| 12.667 | 1.12 | 1.06 | 0.216 | O | | | | | 3.13 |
| 12.750 | 1.13 | 1.07 | 0.216 | O | | | | | 3.14 |
| 12.833 | 1.15 | 1.08 | 0.217 | O | | | | | 3.14 |
| 12.917 | 1.16 | 1.09 | 0.217 | O | | | | | 3.15 |
| 13.000 | 1.17 | 1.10 | 0.218 | O | | | | | 3.15 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 13.083 | 1.19 | 1.11 | 0.218 | O | | | | 3.16 |
| 13.167 | 1.20 | 1.12 | 0.219 | O | | | | 3.17 |
| 13.250 | 1.22 | 1.13 | 0.219 | O | | | | 3.17 |
| 13.333 | 1.23 | 1.14 | 0.220 | O | | | | 3.18 |
| 13.417 | 1.25 | 1.16 | 0.221 | O | | | | 3.19 |
| 13.500 | 1.27 | 1.17 | 0.221 | O | | | | 3.20 |
| 13.583 | 1.29 | 1.18 | 0.222 | O | | | | 3.21 |
| 13.667 | 1.31 | 1.20 | 0.223 | O | | | | 3.21 |
| 13.750 | 1.33 | 1.21 | 0.223 | O | | | | 3.22 |
| 13.833 | 1.35 | 1.23 | 0.224 | O | | | | 3.23 |
| 13.917 | 1.37 | 1.24 | 0.225 | O | | | | 3.24 |
| 14.000 | 1.39 | 1.26 | 0.226 | OI | | | | 3.25 |
| 14.083 | 1.42 | 1.28 | 0.227 | OI | | | | 3.26 |
| 14.167 | 1.45 | 1.30 | 0.228 | OI | | | | 3.28 |
| 14.250 | 1.47 | 1.32 | 0.229 | OI | | | | 3.29 |
| 14.333 | 1.50 | 1.34 | 0.230 | OI | | | | 3.30 |
| 14.417 | 1.54 | 1.36 | 0.231 | OI | | | | 3.31 |
| 14.500 | 1.57 | 1.39 | 0.232 | OI | | | | 3.33 |
| 14.583 | 1.61 | 1.41 | 0.234 | O | | | | 3.34 |
| 14.667 | 1.65 | 1.44 | 0.235 | O | | | | 3.36 |
| 14.750 | 1.69 | 1.47 | 0.237 | O | | | | 3.38 |
| 14.833 | 1.74 | 1.50 | 0.238 | O | | | | 3.40 |
| 14.917 | 1.79 | 1.53 | 0.240 | O | | | | 3.41 |
| 15.000 | 1.84 | 1.57 | 0.242 | O | | | | 3.44 |
| 15.083 | 1.91 | 1.61 | 0.244 | OI | | | | 3.46 |
| 15.167 | 1.98 | 1.65 | 0.246 | OI | | | | 3.48 |
| 15.250 | 2.05 | 1.68 | 0.248 | OI | | | | 3.51 |
| 15.333 | 2.14 | 1.70 | 0.251 | OI | | | | 3.54 |
| 15.417 | 2.20 | 1.72 | 0.254 | OI | | | | 3.58 |
| 15.500 | 2.07 | 1.73 | 0.257 | OI | | | | 3.61 |
| 15.583 | 1.97 | 1.74 | 0.259 | OI | | | | 3.63 |
| 15.667 | 2.08 | 1.75 | 0.261 | OI | | | | 3.66 |
| 15.750 | 2.29 | 1.77 | 0.264 | OI | | | | 3.69 |
| 15.833 | 2.61 | 1.79 | 0.268 | O I | | | | 3.74 |
| 15.917 | 3.10 | 1.83 | 0.276 | O I | | | | 3.82 |
| 16.000 | 4.20 | 1.90 | 0.288 | O | I | | | 3.96 |
| 16.083 | 7.46 | 2.05 | 0.314 | O | | I | | 4.26 |
| 16.167 | 14.81 | 2.34 | 0.376 | O | | | I | 4.95 |
| 16.250 | 13.23 | 2.69 | 0.455 | O | | | I | 5.86 |
| 16.333 | 5.94 | 2.87 | 0.502 | O | I | | | 6.41 |
| 16.417 | 3.07 | 2.92 | 0.513 | O | | | | 6.54 |
| 16.500 | 2.53 | 2.91 | 0.512 | IO | | | | 6.53 |
| 16.583 | 2.24 | 2.90 | 0.509 | I O | | | | 6.49 |
| 16.667 | 2.09 | 2.88 | 0.504 | I O | | | | 6.43 |
| 16.750 | 1.94 | 2.86 | 0.498 | I O | | | | 6.36 |
| 16.833 | 1.82 | 2.83 | 0.491 | I O | | | | 6.28 |
| 16.917 | 1.71 | 2.80 | 0.484 | I O | | | | 6.20 |
| 17.000 | 1.63 | 2.77 | 0.476 | I O | | | | 6.11 |
| 17.083 | 1.55 | 2.74 | 0.468 | I O | | | | 6.02 |
| 17.167 | 1.49 | 2.70 | 0.460 | I O | | | | 5.92 |
| 17.250 | 1.43 | 2.67 | 0.452 | I O | | | | 5.82 |
| 17.333 | 1.38 | 2.64 | 0.443 | I O | | | | 5.72 |
| 17.417 | 1.34 | 2.60 | 0.434 | I O | | | | 5.62 |
| 17.500 | 1.30 | 2.57 | 0.426 | I O | | | | 5.52 |
| 17.583 | 1.26 | 2.53 | 0.417 | I O | | | | 5.42 |
| 17.667 | 1.22 | 2.49 | 0.408 | I O | | | | 5.32 |
| 17.750 | 1.19 | 2.45 | 0.399 | I O | | | | 5.22 |
| 17.833 | 1.16 | 2.41 | 0.391 | I O | | | | 5.12 |
| 17.917 | 1.14 | 2.37 | 0.382 | I O | | | | 5.03 |
| 18.000 | 1.11 | 2.33 | 0.374 | I O | | | | 4.93 |
| 18.083 | 1.09 | 2.30 | 0.365 | I O | | | | 4.83 |
| 18.167 | 1.08 | 2.26 | 0.357 | I O | | | | 4.74 |
| 18.250 | 1.07 | 2.22 | 0.349 | I O | | | | 4.65 |
| 18.333 | 1.06 | 2.19 | 0.341 | I O | | | | 4.56 |
| 18.417 | 1.04 | 2.15 | 0.334 | I O | | | | 4.47 |
| 18.500 | 1.02 | 2.11 | 0.326 | I O | | | | 4.39 |
| 18.583 | 1.01 | 2.07 | 0.319 | I O | | | | 4.31 |
| 18.667 | 0.99 | 2.03 | 0.311 | I O | | | | 4.22 |
| 18.750 | 0.98 | 1.99 | 0.304 | I O | | | | 4.14 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 18.833 | 0.96 | 1.95 | 0.297 | \| I O | \| | \| | \| | \| | 4.07 |
| 18.917 | 0.95 | 1.92 | 0.291 | \| I O | \| | \| | \| | \| | 3.99 |
| 19.000 | 0.94 | 1.88 | 0.284 | \| I O | \| | \| | \| | \| | 3.92 |
| 19.083 | 0.92 | 1.84 | 0.278 | \|I O | \| | \| | \| | \| | 3.85 |
| 19.167 | 0.91 | 1.81 | 0.271 | \|I O | \| | \| | \| | \| | 3.77 |
| 19.250 | 0.90 | 1.78 | 0.265 | \|I O | \| | \| | \| | \| | 3.71 |
| 19.333 | 0.89 | 1.74 | 0.259 | \|I O | \| | \| | \| | \| | 3.64 |
| 19.417 | 0.88 | 1.71 | 0.254 | \|I O | \| | \| | \| | \| | 3.57 |
| 19.500 | 0.87 | 1.68 | 0.248 | \|I O | \| | \| | \| | \| | 3.51 |
| 19.583 | 0.86 | 1.59 | 0.243 | \|I O | \| | \| | \| | \| | 3.45 |
| 19.667 | 0.85 | 1.50 | 0.238 | \|I O | \| | \| | \| | \| | 3.39 |
| 19.750 | 0.84 | 1.41 | 0.234 | \|I O | \| | \| | \| | \| | 3.34 |
| 19.833 | 0.83 | 1.34 | 0.230 | \|IO | \| | \| | \| | \| | 3.30 |
| 19.917 | 0.82 | 1.28 | 0.227 | \|IO | \| | \| | \| | \| | 3.26 |
| 20.000 | 0.82 | 1.22 | 0.224 | \|IO | \| | \| | \| | \| | 3.23 |
| 20.083 | 0.81 | 1.17 | 0.221 | \|IO | \| | \| | \| | \| | 3.20 |
| 20.167 | 0.80 | 1.12 | 0.219 | \|IO | \| | \| | \| | \| | 3.17 |
| 20.250 | 0.79 | 1.08 | 0.217 | \|IO | \| | \| | \| | \| | 3.14 |
| 20.333 | 0.79 | 1.04 | 0.215 | \|IO | \| | \| | \| | \| | 3.12 |
| 20.417 | 0.78 | 1.01 | 0.213 | \|IO | \| | \| | \| | \| | 3.10 |
| 20.500 | 0.77 | 0.98 | 0.212 | \|IO | \| | \| | \| | \| | 3.08 |
| 20.583 | 0.77 | 0.95 | 0.210 | \|IO | \| | \| | \| | \| | 3.07 |
| 20.667 | 0.76 | 0.93 | 0.209 | \|IO | \| | \| | \| | \| | 3.05 |
| 20.750 | 0.75 | 0.91 | 0.208 | \|O | \| | \| | \| | \| | 3.04 |
| 20.833 | 0.75 | 0.89 | 0.207 | \|O | \| | \| | \| | \| | 3.03 |
| 20.917 | 0.74 | 0.87 | 0.206 | \|O | \| | \| | \| | \| | 3.02 |
| 21.000 | 0.74 | 0.85 | 0.205 | \|O | \| | \| | \| | \| | 3.01 |
| 21.083 | 0.73 | 0.84 | 0.204 | \|O | \| | \| | \| | \| | 3.00 |
| 21.167 | 0.72 | 0.82 | 0.204 | \|O | \| | \| | \| | \| | 2.99 |
| 21.250 | 0.72 | 0.81 | 0.203 | \|O | \| | \| | \| | \| | 2.98 |
| 21.333 | 0.71 | 0.80 | 0.202 | \|O | \| | \| | \| | \| | 2.98 |
| 21.417 | 0.71 | 0.79 | 0.202 | \|O | \| | \| | \| | \| | 2.97 |
| 21.500 | 0.70 | 0.78 | 0.201 | \|O | \| | \| | \| | \| | 2.96 |
| 21.583 | 0.70 | 0.77 | 0.201 | \|O | \| | \| | \| | \| | 2.96 |
| 21.667 | 0.69 | 0.76 | 0.200 | \|O | \| | \| | \| | \| | 2.95 |
| 21.750 | 0.69 | 0.75 | 0.200 | \|O | \| | \| | \| | \| | 2.95 |
| 21.833 | 0.68 | 0.74 | 0.200 | \|O | \| | \| | \| | \| | 2.94 |
| 21.917 | 0.68 | 0.73 | 0.199 | \|O | \| | \| | \| | \| | 2.94 |
| 22.000 | 0.68 | 0.73 | 0.199 | \|O | \| | \| | \| | \| | 2.93 |
| 22.083 | 0.67 | 0.72 | 0.199 | \|O | \| | \| | \| | \| | 2.93 |
| 22.167 | 0.67 | 0.71 | 0.198 | \|O | \| | \| | \| | \| | 2.93 |
| 22.250 | 0.66 | 0.71 | 0.198 | \|O | \| | \| | \| | \| | 2.92 |
| 22.333 | 0.66 | 0.70 | 0.198 | \|O | \| | \| | \| | \| | 2.92 |
| 22.417 | 0.66 | 0.70 | 0.197 | \|O | \| | \| | \| | \| | 2.92 |
| 22.500 | 0.65 | 0.69 | 0.197 | \|O | \| | \| | \| | \| | 2.91 |
| 22.583 | 0.65 | 0.69 | 0.197 | \|O | \| | \| | \| | \| | 2.91 |
| 22.667 | 0.64 | 0.68 | 0.197 | \|O | \| | \| | \| | \| | 2.91 |
| 22.750 | 0.64 | 0.68 | 0.196 | \|O | \| | \| | \| | \| | 2.90 |
| 22.833 | 0.64 | 0.67 | 0.196 | \|O | \| | \| | \| | \| | 2.90 |
| 22.917 | 0.63 | 0.67 | 0.196 | \|O | \| | \| | \| | \| | 2.90 |
| 23.000 | 0.63 | 0.66 | 0.196 | \|O | \| | \| | \| | \| | 2.89 |
| 23.083 | 0.63 | 0.66 | 0.195 | \|O | \| | \| | \| | \| | 2.89 |
| 23.167 | 0.62 | 0.65 | 0.195 | \|O | \| | \| | \| | \| | 2.89 |
| 23.250 | 0.62 | 0.65 | 0.195 | \|O | \| | \| | \| | \| | 2.89 |
| 23.333 | 0.62 | 0.65 | 0.195 | \|O | \| | \| | \| | \| | 2.88 |
| 23.417 | 0.61 | 0.64 | 0.195 | \|O | \| | \| | \| | \| | 2.88 |
| 23.500 | 0.61 | 0.64 | 0.194 | \|O | \| | \| | \| | \| | 2.88 |
| 23.583 | 0.61 | 0.63 | 0.194 | \|O | \| | \| | \| | \| | 2.88 |
| 23.667 | 0.60 | 0.63 | 0.194 | \|O | \| | \| | \| | \| | 2.88 |
| 23.750 | 0.60 | 0.63 | 0.194 | \|O | \| | \| | \| | \| | 2.87 |
| 23.833 | 0.60 | 0.62 | 0.194 | \|O | \| | \| | \| | \| | 2.87 |
| 23.917 | 0.59 | 0.62 | 0.193 | \|O | \| | \| | \| | \| | 2.87 |
| 24.000 | 0.59 | 0.62 | 0.193 | \|O | \| | \| | \| | \| | 2.87 |
| 24.083 | 0.55 | 0.61 | 0.193 | \|O | \| | \| | \| | \| | 2.86 |
| 24.167 | 0.31 | 0.59 | 0.192 | IO | \| | \| | \| | \| | 2.85 |
| 24.250 | 0.08 | 0.54 | 0.189 | IO | \| | \| | \| | \| | 2.82 |
| 24.333 | 0.02 | 0.48 | 0.186 | IO | \| | \| | \| | \| | 2.78 |
| 24.417 | 0.01 | 0.42 | 0.183 | O | \| | \| | \| | \| | 2.75 |
| 24.500 | 0.00 | 0.36 | 0.180 | O | \| | \| | \| | \| | 2.72 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 24.583 | 0.00 | 0.32 | 0.178 | O | \| | \| | \| | \| | 2.69 |
| 24.667 | 0.00 | 0.28 | 0.176 | O | \| | \| | \| | \| | 2.67 |
| 24.750 | 0.00 | 0.24 | 0.174 | O | \| | \| | \| | \| | 2.64 |
| 24.833 | 0.00 | 0.21 | 0.173 | O | \| | \| | \| | \| | 2.63 |
| 24.917 | 0.00 | 0.18 | 0.171 | O | \| | \| | \| | \| | 2.61 |
| 25.000 | 0.00 | 0.16 | 0.170 | O | \| | \| | \| | \| | 2.60 |
| 25.083 | 0.00 | 0.14 | 0.169 | O | \| | \| | \| | \| | 2.58 |
| 25.167 | 0.00 | 0.12 | 0.168 | O | \| | \| | \| | \| | 2.57 |
| 25.250 | 0.00 | 0.11 | 0.167 | O | \| | \| | \| | \| | 2.56 |
| 25.333 | 0.00 | 0.09 | 0.167 | O | \| | \| | \| | \| | 2.56 |
| 25.417 | 0.00 | 0.08 | 0.166 | O | \| | \| | \| | \| | 2.55 |
| 25.500 | 0.00 | 0.07 | 0.166 | O | \| | \| | \| | \| | 2.54 |
| 25.583 | 0.00 | 0.06 | 0.165 | O | \| | \| | \| | \| | 2.54 |
| 25.667 | 0.00 | 0.05 | 0.165 | O | \| | \| | \| | \| | 2.53 |
| 25.750 | 0.00 | 0.05 | 0.164 | O | \| | \| | \| | \| | 2.53 |
| 25.833 | 0.00 | 0.04 | 0.164 | O | \| | \| | \| | \| | 2.52 |
| 25.917 | 0.00 | 0.04 | 0.164 | O | \| | \| | \| | \| | 2.52 |
| 26.000 | 0.00 | 0.03 | 0.164 | O | \| | \| | \| | \| | 2.52 |
| 26.083 | 0.00 | 0.03 | 0.163 | O | \| | \| | \| | \| | 2.52 |
| 26.167 | 0.00 | 0.02 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 26.250 | 0.00 | 0.02 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 26.333 | 0.00 | 0.02 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 26.417 | 0.00 | 0.02 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 26.500 | 0.00 | 0.01 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 26.583 | 0.00 | 0.01 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 26.667 | 0.00 | 0.01 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 26.750 | 0.00 | 0.01 | 0.162 | O | \| | \| | \| | \| | 2.51 |
| 26.833 | 0.00 | 0.01 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 26.917 | 0.00 | 0.01 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.000 | 0.00 | 0.01 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.083 | 0.00 | 0.01 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.167 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.250 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.333 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.417 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.500 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.583 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.667 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.750 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.833 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.917 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 28.000 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 28.083 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 28.167 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |

Remaining water in basin = 0.16 (Ac.Ft)

**********HYDROGRAPH DATA**********

Number of intervals = 338
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 2.916 (CFS)
Total volume = 1.999 (Ac.Ft)

Status of hydrographs being held in storage

| | Stream 1 | Stream 2 | Stream 3 | Stream 4 | Stream 5 |
|---|---|---|---|---|---|
| Peak (CFS) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Vol (Ac.Ft) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

**********

---

FLOOD HYDROGRAPH ROUTING PROGRAM

Study date: 08/04/23

---

225038 - 18313 VALLEY BLVD - SB ANIMAL CARE CENTER
ROUTE
100-YEAR, 24-HOUR STORM
BY: JTS  DATE: 08-04-23
---

Program License Serial Number 6320

---
******************** HYDROGRAPH INFORMATION **********************

From study/file name: devhyd100.rte
**************************HYDROGRAPH DATA**************************
Number of intervals =  293
Time interval =  5.0 (Min.)
Maximum/Peak flow rate =  18.860 (CFS)
Total volume =  3.090 (Ac.Ft)
Status of hydrographs being held in storage

| | Stream 1 | Stream 2 | Stream 3 | Stream 4 | Stream 5 |
|---|---|---|---|---|---|
| Peak (CFS) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Vol (Ac.Ft) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

**********

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station  0.000 to Point/Station  0.000
**** RETARDING BASIN ROUTING ****
_____

Program computation of outflow v. depth

CALCULATED OUTFLOW DATA AT DEPTH =  0.50(Ft.))
Total outflow at this depth =  0.00(CFS)

CALCULATED OUTFLOW DATA AT DEPTH =  1.50(Ft.))
Total outflow at this depth =  0.00(CFS)

CALCULATED OUTFLOW DATA AT DEPTH =  2.50(Ft.))
Total outflow at this depth =  0.00(CFS)

CALCULATED OUTFLOW DATA AT DEPTH =  3.50(Ft.))
Pipe length =  50.00(Ft.)  Elevation difference =  0.50(Ft.)
Manning's N = 0.013  No. of pipes = 1
Given pipe size =  8.00(In.)
 NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is  1.500(Ft.)
Pipe friction loss =  0.962(Ft.)
Minor friction loss =  0.537(Ft.)  K-factor =  1.50
Calculated flow rate through pipe(s) =  1.677(CFS)

Total outflow at this depth = 1.68(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 4.50(Ft.))
Pipe length = 50.00(Ft.) Elevation difference = 0.50(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 8.00(In.)
NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 2.500(Ft.)
Pipe friction loss = 1.604(Ft.)
Minor friction loss = 0.895(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 2.164(CFS)

Total outflow at this depth = 2.16(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 5.50(Ft.))
Pipe length = 50.00(Ft.) Elevation difference = 0.50(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 8.00(In.)
NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 3.500(Ft.)
Pipe friction loss = 2.246(Ft.)
Minor friction loss = 1.254(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 2.561(CFS)

Total outflow at this depth = 2.56(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 6.50(Ft.))
Pipe length = 50.00(Ft.) Elevation difference = 0.50(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 8.00(In.)
NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 4.500(Ft.)
Pipe friction loss = 2.887(Ft.)
Minor friction loss = 1.612(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 2.904(CFS)

Total outflow at this depth = 2.90(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 7.50(Ft.))
Pipe length = 50.00(Ft.) Elevation difference = 0.50(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 8.00(In.)
NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 5.500(Ft.)
Pipe friction loss = 3.529(Ft.)
Minor friction loss = 1.970(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 3.210(CFS)

Total outflow at this depth = 3.21(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 8.50(Ft.))
Pipe length = 50.00(Ft.) Elevation difference = 0.50(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 8.00(In.)
NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 6.500(Ft.)
Pipe friction loss = 4.170(Ft.)
Minor friction loss = 2.328(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 3.490(CFS)

Total outflow at this depth = 3.49(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 9.50(Ft.))
Pipe length = 50.00(Ft.) Elevation difference = 0.50(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 8.00(In.)
NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 7.500(Ft.)
Pipe friction loss = 4.812(Ft.)
Minor friction loss = 2.686(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 3.749(CFS)

Total outflow at this depth = 3.75(CFS)

---

Total number of inflow hydrograph intervals = 293
Hydrograph time unit = 5.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)

---

---

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

---

---

Depth vs. Storage and Depth vs. Discharge data:

| Basin Depth (Ft.) | Storage (Ac.Ft) | Outflow (CFS) | (S-O*dt/2) (Ac.Ft) | (S+O*dt/2) (Ac.Ft) |
|---|---|---|---|---|
| 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 0.500 | 0.020 | 0.000 | 0.020 | 0.020 |
| 1.500 | 0.083 | 0.000 | 0.083 | 0.083 |
| 2.500 | 0.162 | 0.000 | 0.162 | 0.162 |
| 3.500 | 0.247 | 1.677 | 0.241 | 0.253 |
| 4.500 | 0.336 | 2.164 | 0.329 | 0.343 |
| 5.500 | 0.424 | 2.561 | 0.415 | 0.433 |
| 6.500 | 0.510 | 2.904 | 0.500 | 0.520 |
| 7.500 | 0.588 | 3.210 | 0.577 | 0.599 |
| 8.500 | 0.651 | 3.490 | 0.639 | 0.663 |
| 9.500 | 0.692 | 3.749 | 0.679 | 0.705 |

---

Hydrograph Detention Basin Routing

---

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

---

| Time (Hours) | Inflow (CFS) | Outflow (CFS) | Storage (Ac.Ft) | 0 | 4.7 | 9.43 | 14.14 | 18.86 | Depth (Ft.) |
|---|---|---|---|---|---|---|---|---|---|
| 0.083 | 0.07 | 0.00 | 0.000 | O | \| | \| | \| | \| | 0.01 |
| 0.167 | 0.42 | 0.00 | 0.002 | O | \| | \| | \| | \| | 0.05 |
| 0.250 | 0.76 | 0.00 | 0.006 | OI | \| | \| | \| | \| | 0.15 |
| 0.333 | 0.86 | 0.00 | 0.012 | OI | \| | \| | \| | \| | 0.29 |
| 0.417 | 0.88 | 0.00 | 0.018 | OI | \| | \| | \| | \| | 0.44 |
| 0.500 | 0.89 | 0.00 | 0.024 | OI | \| | \| | \| | \| | 0.56 |
| 0.583 | 0.89 | 0.00 | 0.030 | OI | \| | \| | \| | \| | 0.65 |
| 0.667 | 0.89 | 0.00 | 0.036 | OI | \| | \| | \| | \| | 0.75 |
| 0.750 | 0.90 | 0.00 | 0.042 | OI | \| | \| | \| | \| | 0.85 |
| 0.833 | 0.90 | 0.00 | 0.048 | OI | \| | \| | \| | \| | 0.95 |
| 0.917 | 0.90 | 0.00 | 0.054 | OI | \| | \| | \| | \| | 1.05 |
| 1.000 | 0.90 | 0.00 | 0.061 | OI | \| | \| | \| | \| | 1.14 |
| 1.083 | 0.90 | 0.00 | 0.067 | OI | \| | \| | \| | \| | 1.24 |
| 1.167 | 0.91 | 0.00 | 0.073 | OI | \| | \| | \| | \| | 1.34 |
| 1.250 | 0.91 | 0.00 | 0.079 | OI | \| | \| | \| | \| | 1.44 |
| 1.333 | 0.91 | 0.00 | 0.086 | OI | \| | \| | \| | \| | 1.53 |
| 1.417 | 0.91 | 0.00 | 0.092 | OI | \| | \| | \| | \| | 1.61 |
| 1.500 | 0.91 | 0.00 | 0.098 | OI | \| | \| | \| | \| | 1.69 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1.583 | 0.92 | 0.00 | 0.104 | OI | | | | | 1.77 |
| 1.667 | 0.92 | 0.00 | 0.111 | OI | | | | | 1.85 |
| 1.750 | 0.92 | 0.00 | 0.117 | OI | | | | | 1.93 |
| 1.833 | 0.92 | 0.00 | 0.123 | OI | | | | | 2.01 |
| 1.917 | 0.93 | 0.00 | 0.130 | OI | | | | | 2.09 |
| 2.000 | 0.93 | 0.00 | 0.136 | OI | | | | | 2.17 |
| 2.083 | 0.93 | 0.00 | 0.143 | OI | | | | | 2.26 |
| 2.167 | 0.93 | 0.00 | 0.149 | OI | | | | | 2.34 |
| 2.250 | 0.94 | 0.00 | 0.156 | OI | | | | | 2.42 |
| 2.333 | 0.94 | 0.00 | 0.162 | OI | | | | | 2.50 |
| 2.417 | 0.94 | 0.12 | 0.168 | OI | | | | | 2.57 |
| 2.500 | 0.94 | 0.22 | 0.173 | OI | | | | | 2.63 |
| 2.583 | 0.94 | 0.31 | 0.178 | OI | | | | | 2.69 |
| 2.667 | 0.95 | 0.40 | 0.182 | OI | | | | | 2.74 |
| 2.750 | 0.95 | 0.47 | 0.186 | OI | | | | | 2.78 |
| 2.833 | 0.95 | 0.53 | 0.189 | OI | | | | | 2.81 |
| 2.917 | 0.95 | 0.58 | 0.191 | OI | | | | | 2.85 |
| 3.000 | 0.96 | 0.63 | 0.194 | IO | | | | | 2.88 |
| 3.083 | 0.96 | 0.67 | 0.196 | IO | | | | | 2.90 |
| 3.167 | 0.96 | 0.71 | 0.198 | IO | | | | | 2.92 |
| 3.250 | 0.97 | 0.74 | 0.200 | IO | | | | | 2.94 |
| 3.333 | 0.97 | 0.77 | 0.201 | IO | | | | | 2.96 |
| 3.417 | 0.97 | 0.79 | 0.202 | IO | | | | | 2.97 |
| 3.500 | 0.97 | 0.82 | 0.203 | IO | | | | | 2.99 |
| 3.583 | 0.98 | 0.84 | 0.204 | IO | | | | | 3.00 |
| 3.667 | 0.98 | 0.86 | 0.205 | IO | | | | | 3.01 |
| 3.750 | 0.98 | 0.87 | 0.206 | IO | | | | | 3.02 |
| 3.833 | 0.98 | 0.89 | 0.207 | IO | | | | | 3.03 |
| 3.917 | 0.99 | 0.90 | 0.208 | IO | | | | | 3.04 |
| 4.000 | 0.99 | 0.91 | 0.208 | IO | | | | | 3.04 |
| 4.083 | 0.99 | 0.92 | 0.209 | IO | | | | | 3.05 |
| 4.167 | 1.00 | 0.93 | 0.209 | IO | | | | | 3.05 |
| 4.250 | 1.00 | 0.94 | 0.210 | IO | | | | | 3.06 |
| 4.333 | 1.00 | 0.95 | 0.210 | IO | | | | | 3.06 |
| 4.417 | 1.00 | 0.95 | 0.210 | IO | | | | | 3.07 |
| 4.500 | 1.01 | 0.96 | 0.211 | IO | | | | | 3.07 |
| 4.583 | 1.01 | 0.97 | 0.211 | IO | | | | | 3.08 |
| 4.667 | 1.01 | 0.97 | 0.211 | IO | | | | | 3.08 |
| 4.750 | 1.02 | 0.98 | 0.212 | IO | | | | | 3.08 |
| 4.833 | 1.02 | 0.98 | 0.212 | IO | | | | | 3.09 |
| 4.917 | 1.02 | 0.99 | 0.212 | IO | | | | | 3.09 |
| 5.000 | 1.03 | 0.99 | 0.212 | IO | | | | | 3.09 |
| 5.083 | 1.03 | 1.00 | 0.213 | IO | | | | | 3.09 |
| 5.167 | 1.03 | 1.00 | 0.213 | IO | | | | | 3.10 |
| 5.250 | 1.04 | 1.01 | 0.213 | IO | | | | | 3.10 |
| 5.333 | 1.04 | 1.01 | 0.213 | IO | | | | | 3.10 |
| 5.417 | 1.04 | 1.01 | 0.213 | IO | | | | | 3.10 |
| 5.500 | 1.05 | 1.02 | 0.214 | IO | | | | | 3.11 |
| 5.583 | 1.05 | 1.02 | 0.214 | IO | | | | | 3.11 |
| 5.667 | 1.05 | 1.03 | 0.214 | IO | | | | | 3.11 |
| 5.750 | 1.06 | 1.03 | 0.214 | IO | | | | | 3.11 |
| 5.833 | 1.06 | 1.03 | 0.214 | IO | | | | | 3.12 |
| 5.917 | 1.06 | 1.04 | 0.215 | IO | | | | | 3.12 |
| 6.000 | 1.07 | 1.04 | 0.215 | IO | | | | | 3.12 |
| 6.083 | 1.07 | 1.04 | 0.215 | IO | | | | | 3.12 |
| 6.167 | 1.07 | 1.05 | 0.215 | IO | | | | | 3.12 |
| 6.250 | 1.08 | 1.05 | 0.215 | IO | | | | | 3.13 |
| 6.333 | 1.08 | 1.05 | 0.215 | IO | | | | | 3.13 |
| 6.417 | 1.09 | 1.06 | 0.216 | IO | | | | | 3.13 |
| 6.500 | 1.09 | 1.06 | 0.216 | IO | | | | | 3.13 |
| 6.583 | 1.09 | 1.07 | 0.216 | IO | | | | | 3.14 |
| 6.667 | 1.10 | 1.07 | 0.216 | IO | | | | | 3.14 |
| 6.750 | 1.10 | 1.07 | 0.216 | IO | | | | | 3.14 |
| 6.833 | 1.11 | 1.08 | 0.217 | IO | | | | | 3.14 |
| 6.917 | 1.11 | 1.08 | 0.217 | IO | | | | | 3.15 |
| 7.000 | 1.11 | 1.09 | 0.217 | IO | | | | | 3.15 |
| 7.083 | 1.12 | 1.09 | 0.217 | IO | | | | | 3.15 |
| 7.167 | 1.12 | 1.09 | 0.217 | IO | | | | | 3.15 |
| 7.250 | 1.13 | 1.10 | 0.218 | IO | | | | | 3.15 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 7.333 | 1.13 | 1.10 | 0.218 | O | | | | | 3.16 |
| 7.417 | 1.14 | 1.11 | 0.218 | O | | | | | 3.16 |
| 7.500 | 1.14 | 1.11 | 0.218 | O | | | | | 3.16 |
| 7.583 | 1.15 | 1.11 | 0.219 | O | | | | | 3.16 |
| 7.667 | 1.15 | 1.12 | 0.219 | O | | | | | 3.17 |
| 7.750 | 1.16 | 1.12 | 0.219 | O | | | | | 3.17 |
| 7.833 | 1.16 | 1.13 | 0.219 | O | | | | | 3.17 |
| 7.917 | 1.17 | 1.13 | 0.219 | O | | | | | 3.18 |
| 8.000 | 1.17 | 1.14 | 0.220 | O | | | | | 3.18 |
| 8.083 | 1.18 | 1.14 | 0.220 | O | | | | | 3.18 |
| 8.167 | 1.18 | 1.15 | 0.220 | OI | | | | | 3.18 |
| 8.250 | 1.19 | 1.15 | 0.220 | OI | | | | | 3.19 |
| 8.333 | 1.19 | 1.16 | 0.221 | OI | | | | | 3.19 |
| 8.417 | 1.20 | 1.16 | 0.221 | OI | | | | | 3.19 |
| 8.500 | 1.20 | 1.17 | 0.221 | OI | | | | | 3.20 |
| 8.583 | 1.21 | 1.17 | 0.221 | OI | | | | | 3.20 |
| 8.667 | 1.21 | 1.18 | 0.222 | OI | | | | | 3.20 |
| 8.750 | 1.22 | 1.18 | 0.222 | O | | | | | 3.20 |
| 8.833 | 1.22 | 1.19 | 0.222 | O | | | | | 3.21 |
| 8.917 | 1.23 | 1.19 | 0.222 | O | | | | | 3.21 |
| 9.000 | 1.24 | 1.20 | 0.223 | O | | | | | 3.21 |
| 9.083 | 1.24 | 1.20 | 0.223 | O | | | | | 3.22 |
| 9.167 | 1.25 | 1.21 | 0.223 | O | | | | | 3.22 |
| 9.250 | 1.25 | 1.21 | 0.224 | O | | | | | 3.22 |
| 9.333 | 1.26 | 1.22 | 0.224 | O | | | | | 3.23 |
| 9.417 | 1.27 | 1.22 | 0.224 | O | | | | | 3.23 |
| 9.500 | 1.27 | 1.23 | 0.224 | O | | | | | 3.23 |
| 9.583 | 1.28 | 1.24 | 0.225 | O | | | | | 3.24 |
| 9.667 | 1.29 | 1.24 | 0.225 | O | | | | | 3.24 |
| 9.750 | 1.29 | 1.25 | 0.225 | O | | | | | 3.24 |
| 9.833 | 1.30 | 1.26 | 0.226 | O | | | | | 3.25 |
| 9.917 | 1.31 | 1.26 | 0.226 | O | | | | | 3.25 |
| 10.000 | 1.32 | 1.27 | 0.226 | O | | | | | 3.26 |
| 10.083 | 1.32 | 1.27 | 0.227 | O | | | | | 3.26 |
| 10.167 | 1.33 | 1.28 | 0.227 | O | | | | | 3.26 |
| 10.250 | 1.34 | 1.29 | 0.227 | O | | | | | 3.27 |
| 10.333 | 1.35 | 1.30 | 0.228 | O | | | | | 3.27 |
| 10.417 | 1.36 | 1.30 | 0.228 | O | | | | | 3.28 |
| 10.500 | 1.36 | 1.31 | 0.228 | O | | | | | 3.28 |
| 10.583 | 1.37 | 1.32 | 0.229 | O | | | | | 3.29 |
| 10.667 | 1.38 | 1.33 | 0.229 | O | | | | | 3.29 |
| 10.750 | 1.39 | 1.33 | 0.230 | O | | | | | 3.29 |
| 10.833 | 1.40 | 1.34 | 0.230 | O | | | | | 3.30 |
| 10.917 | 1.41 | 1.35 | 0.230 | O | | | | | 3.30 |
| 11.000 | 1.42 | 1.36 | 0.231 | O | | | | | 3.31 |
| 11.083 | 1.43 | 1.37 | 0.231 | O | | | | | 3.31 |
| 11.167 | 1.44 | 1.37 | 0.232 | O | | | | | 3.32 |
| 11.250 | 1.45 | 1.38 | 0.232 | O | | | | | 3.32 |
| 11.333 | 1.46 | 1.39 | 0.233 | O | | | | | 3.33 |
| 11.417 | 1.47 | 1.40 | 0.233 | O | | | | | 3.34 |
| 11.500 | 1.48 | 1.41 | 0.233 | O | | | | | 3.34 |
| 11.583 | 1.49 | 1.42 | 0.234 | O | | | | | 3.35 |
| 11.667 | 1.50 | 1.43 | 0.234 | O | | | | | 3.35 |
| 11.750 | 1.51 | 1.44 | 0.235 | O | | | | | 3.36 |
| 11.833 | 1.53 | 1.45 | 0.236 | O | | | | | 3.36 |
| 11.917 | 1.54 | 1.46 | 0.236 | O | | | | | 3.37 |
| 12.000 | 1.55 | 1.47 | 0.237 | O | | | | | 3.38 |
| 12.083 | 1.56 | 1.48 | 0.237 | O | | | | | 3.38 |
| 12.167 | 1.53 | 1.49 | 0.238 | O | | | | | 3.39 |
| 12.250 | 1.51 | 1.49 | 0.238 | O | | | | | 3.39 |
| 12.333 | 1.52 | 1.50 | 0.238 | O | | | | | 3.39 |
| 12.417 | 1.53 | 1.50 | 0.238 | O | | | | | 3.39 |
| 12.500 | 1.55 | 1.51 | 0.238 | O | | | | | 3.40 |
| 12.583 | 1.56 | 1.51 | 0.239 | O | | | | | 3.40 |
| 12.667 | 1.58 | 1.52 | 0.239 | O | | | | | 3.41 |
| 12.750 | 1.60 | 1.53 | 0.239 | O | | | | | 3.41 |
| 12.833 | 1.61 | 1.54 | 0.240 | O | | | | | 3.42 |
| 12.917 | 1.63 | 1.55 | 0.240 | O | | | | | 3.42 |
| 13.000 | 1.65 | 1.56 | 0.241 | O | | | | | 3.43 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 13.083 | 1.67 | 1.57 | 0.242 | O | | | | 3.44 |
| 13.167 | 1.69 | 1.59 | 0.242 | O | | | | 3.45 |
| 13.250 | 1.71 | 1.60 | 0.243 | O | | | | 3.46 |
| 13.333 | 1.74 | 1.62 | 0.244 | O | | | | 3.46 |
| 13.417 | 1.76 | 1.63 | 0.245 | O | | | | 3.47 |
| 13.500 | 1.78 | 1.65 | 0.246 | OI | | | | 3.48 |
| 13.583 | 1.81 | 1.67 | 0.247 | OI | | | | 3.50 |
| 13.667 | 1.84 | 1.68 | 0.248 | OI | | | | 3.51 |
| 13.750 | 1.86 | 1.69 | 0.249 | OI | | | | 3.52 |
| 13.833 | 1.89 | 1.69 | 0.250 | OI | | | | 3.54 |
| 13.917 | 1.92 | 1.70 | 0.252 | OI | | | | 3.55 |
| 14.000 | 1.96 | 1.71 | 0.253 | OI | | | | 3.57 |
| 14.083 | 1.99 | 1.72 | 0.255 | OI | | | | 3.59 |
| 14.167 | 2.03 | 1.73 | 0.257 | OI | | | | 3.61 |
| 14.250 | 2.07 | 1.74 | 0.259 | OI | | | | 3.64 |
| 14.333 | 2.11 | 1.76 | 0.261 | OI | | | | 3.66 |
| 14.417 | 2.15 | 1.77 | 0.264 | O | | | | 3.69 |
| 14.500 | 2.20 | 1.78 | 0.267 | O | | | | 3.72 |
| 14.583 | 2.25 | 1.80 | 0.270 | O | | | | 3.76 |
| 14.667 | 2.31 | 1.82 | 0.273 | O | | | | 3.79 |
| 14.750 | 2.37 | 1.84 | 0.277 | OI | | | | 3.83 |
| 14.833 | 2.43 | 1.86 | 0.280 | OI | | | | 3.87 |
| 14.917 | 2.50 | 1.88 | 0.284 | OI | | | | 3.92 |
| 15.000 | 2.58 | 1.91 | 0.289 | OI | | | | 3.97 |
| 15.083 | 2.67 | 1.93 | 0.294 | OI | | | | 4.03 |
| 15.167 | 2.77 | 1.96 | 0.299 | OI | | | | 4.08 |
| 15.250 | 2.87 | 1.99 | 0.305 | OI | | | | 4.15 |
| 15.333 | 3.00 | 2.03 | 0.311 | O I | | | | 4.22 |
| 15.417 | 3.07 | 2.07 | 0.318 | O I | | | | 4.30 |
| 15.500 | 2.88 | 2.10 | 0.324 | OI | | | | 4.37 |
| 15.583 | 2.73 | 2.13 | 0.329 | OI | | | | 4.42 |
| 15.667 | 2.88 | 2.15 | 0.333 | OI | | | | 4.47 |
| 15.750 | 3.17 | 2.18 | 0.339 | O I | | | | 4.54 |
| 15.833 | 3.60 | 2.22 | 0.348 | O I | | | | 4.63 |
| 15.917 | 4.28 | 2.27 | 0.359 | O I | | | | 4.76 |
| 16.000 | 5.76 | 2.35 | 0.378 | O I | | | | 4.98 |
| 16.083 | 9.84 | 2.52 | 0.415 | O | I | | | 5.40 |
| 16.167 | 18.86 | 2.85 | 0.495 | O | | | I | 6.33 |
| 16.250 | 16.89 | 3.25 | 0.597 | O | | | I | 7.65 |
| 16.333 | 7.84 | 3.54 | 0.659 | O | I | | | 8.70 |
| 16.417 | 4.18 | 3.65 | 0.676 | OI | | | | 9.11 |
| 16.500 | 3.49 | 3.65 | 0.677 | IO | | | | 9.14 |
| 16.583 | 3.12 | 3.64 | 0.675 | IO | | | | 9.08 |
| 16.667 | 2.92 | 3.61 | 0.671 | I O | | | | 8.98 |
| 16.750 | 2.71 | 3.58 | 0.665 | I O | | | | 8.85 |
| 16.833 | 2.55 | 3.54 | 0.659 | I O | | | | 8.69 |
| 16.917 | 2.40 | 3.49 | 0.652 | IO | | | | 8.51 |
| 17.000 | 2.28 | 3.46 | 0.644 | I O | | | | 8.39 |
| 17.083 | 2.18 | 3.42 | 0.635 | I O | | | | 8.25 |
| 17.167 | 2.09 | 3.38 | 0.627 | I O | | | | 8.11 |
| 17.250 | 2.01 | 3.34 | 0.618 | I O | | | | 7.97 |
| 17.333 | 1.94 | 3.30 | 0.608 | I O | | | | 7.82 |
| 17.417 | 1.88 | 3.26 | 0.599 | I O | | | | 7.67 |
| 17.500 | 1.82 | 3.22 | 0.589 | I O | | | | 7.52 |
| 17.583 | 1.77 | 3.18 | 0.580 | I O | | | | 7.39 |
| 17.667 | 1.72 | 3.14 | 0.570 | I O | | | | 7.27 |
| 17.750 | 1.68 | 3.10 | 0.560 | I O | | | | 7.14 |
| 17.833 | 1.64 | 3.06 | 0.550 | I O | | | | 7.02 |
| 17.917 | 1.60 | 3.02 | 0.541 | I O | | | | 6.89 |
| 18.000 | 1.57 | 2.99 | 0.531 | I O | | | | 6.77 |
| 18.083 | 1.54 | 2.95 | 0.521 | I O | | | | 6.64 |
| 18.167 | 1.55 | 2.91 | 0.512 | I O | | | | 6.52 |
| 18.250 | 1.56 | 2.87 | 0.502 | I O | | | | 6.41 |
| 18.333 | 1.54 | 2.84 | 0.493 | I O | | | | 6.31 |
| 18.417 | 1.52 | 2.80 | 0.485 | I O | | | | 6.20 |
| 18.500 | 1.50 | 2.77 | 0.476 | I O | | | | 6.10 |
| 18.583 | 1.47 | 2.73 | 0.467 | I O | | | | 6.00 |
| 18.667 | 1.45 | 2.70 | 0.458 | I O | | | | 5.90 |
| 18.750 | 1.43 | 2.66 | 0.450 | I O | | | | 5.80 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 18.833 | 1.41 | 2.63 | 0.441 | I O | | | | 5.70 |
| 18.917 | 1.39 | 2.60 | 0.433 | I O | | | | 5.61 |
| 19.000 | 1.38 | 2.56 | 0.425 | I O | | | | 5.51 |
| 19.083 | 1.36 | 2.53 | 0.417 | I O | | | | 5.42 |
| 19.167 | 1.34 | 2.49 | 0.409 | I O | | | | 5.33 |
| 19.250 | 1.33 | 2.46 | 0.401 | I O | | | | 5.24 |
| 19.333 | 1.31 | 2.42 | 0.393 | I O | | | | 5.15 |
| 19.417 | 1.30 | 2.39 | 0.386 | I O | | | | 5.06 |
| 19.500 | 1.28 | 2.35 | 0.378 | IO | | | | 4.98 |
| 19.583 | 1.27 | 2.32 | 0.371 | IO | | | | 4.90 |
| 19.667 | 1.26 | 2.29 | 0.364 | IO | | | | 4.82 |
| 19.750 | 1.25 | 2.26 | 0.357 | IO | | | | 4.74 |
| 19.833 | 1.23 | 2.23 | 0.350 | IO | | | | 4.66 |
| 19.917 | 1.22 | 2.20 | 0.343 | IO | | | | 4.58 |
| 20.000 | 1.21 | 2.17 | 0.336 | IO | | | | 4.50 |
| 20.083 | 1.20 | 2.13 | 0.330 | IO | | | | 4.43 |
| 20.167 | 1.19 | 2.10 | 0.324 | IO | | | | 4.36 |
| 20.250 | 1.18 | 2.06 | 0.317 | I O | | | | 4.29 |
| 20.333 | 1.17 | 2.03 | 0.311 | I O | | | | 4.22 |
| 20.417 | 1.16 | 2.00 | 0.305 | I O | | | | 4.16 |
| 20.500 | 1.15 | 1.97 | 0.300 | I O | | | | 4.09 |
| 20.583 | 1.14 | 1.94 | 0.294 | I O | | | | 4.03 |
| 20.667 | 1.13 | 1.91 | 0.289 | I O | | | | 3.97 |
| 20.750 | 1.12 | 1.88 | 0.284 | I O | | | | 3.91 |
| 20.833 | 1.11 | 1.85 | 0.278 | I O | | | | 3.85 |
| 20.917 | 1.10 | 1.82 | 0.273 | I O | | | | 3.80 |
| 21.000 | 1.10 | 1.79 | 0.269 | I O | | | | 3.74 |
| 21.083 | 1.09 | 1.77 | 0.264 | I O | | | | 3.69 |
| 21.167 | 1.08 | 1.74 | 0.259 | IO | | | | 3.64 |
| 21.250 | 1.07 | 1.72 | 0.255 | IO | | | | 3.59 |
| 21.333 | 1.07 | 1.69 | 0.250 | IO | | | | 3.54 |
| 21.417 | 1.06 | 1.66 | 0.246 | IO | | | | 3.49 |
| 21.500 | 1.05 | 1.58 | 0.242 | IO | | | | 3.44 |
| 21.583 | 1.04 | 1.51 | 0.239 | IO | | | | 3.40 |
| 21.667 | 1.04 | 1.45 | 0.236 | IO | | | | 3.37 |
| 21.750 | 1.03 | 1.40 | 0.233 | IO | | | | 3.33 |
| 21.833 | 1.02 | 1.35 | 0.231 | IO | | | | 3.31 |
| 21.917 | 1.02 | 1.31 | 0.228 | IO | | | | 3.28 |
| 22.000 | 1.01 | 1.27 | 0.227 | IO | | | | 3.26 |
| 22.083 | 1.01 | 1.24 | 0.225 | IO | | | | 3.24 |
| 22.167 | 1.00 | 1.21 | 0.223 | IO | | | | 3.22 |
| 22.250 | 0.99 | 1.18 | 0.222 | IO | | | | 3.20 |
| 22.333 | 0.99 | 1.16 | 0.221 | O | | | | 3.19 |
| 22.417 | 0.98 | 1.14 | 0.220 | O | | | | 3.18 |
| 22.500 | 0.98 | 1.12 | 0.219 | O | | | | 3.17 |
| 22.583 | 0.97 | 1.10 | 0.218 | O | | | | 3.15 |
| 22.667 | 0.97 | 1.08 | 0.217 | O | | | | 3.15 |
| 22.750 | 0.96 | 1.07 | 0.216 | O | | | | 3.14 |
| 22.833 | 0.96 | 1.05 | 0.215 | O | | | | 3.13 |
| 22.917 | 0.95 | 1.04 | 0.215 | O | | | | 3.12 |
| 23.000 | 0.95 | 1.03 | 0.214 | O | | | | 3.11 |
| 23.083 | 0.94 | 1.02 | 0.214 | O | | | | 3.11 |
| 23.167 | 0.94 | 1.01 | 0.213 | O | | | | 3.10 |
| 23.250 | 0.93 | 1.00 | 0.213 | O | | | | 3.10 |
| 23.333 | 0.93 | 0.99 | 0.212 | O | | | | 3.09 |
| 23.417 | 0.92 | 0.98 | 0.212 | O | | | | 3.09 |
| 23.500 | 0.92 | 0.97 | 0.211 | O | | | | 3.08 |
| 23.583 | 0.91 | 0.97 | 0.211 | O | | | | 3.08 |
| 23.667 | 0.91 | 0.96 | 0.211 | O | | | | 3.07 |
| 23.750 | 0.91 | 0.95 | 0.210 | O | | | | 3.07 |
| 23.833 | 0.90 | 0.95 | 0.210 | O | | | | 3.06 |
| 23.917 | 0.90 | 0.94 | 0.210 | O | | | | 3.06 |
| 24.000 | 0.89 | 0.93 | 0.209 | O | | | | 3.06 |
| 24.083 | 0.82 | 0.92 | 0.209 | O | | | | 3.05 |
| 24.167 | 0.47 | 0.89 | 0.207 | IO | | | | 3.03 |
| 24.250 | 0.13 | 0.81 | 0.203 | IO | | | | 2.99 |
| 24.333 | 0.03 | 0.72 | 0.199 | IO | | | | 2.93 |
| 24.417 | 0.01 | 0.63 | 0.194 | IO | | | | 2.88 |
| 24.500 | 0.00 | 0.55 | 0.190 | O | | | | 2.83 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 24.583 | 0.00 | 0.48 | 0.186 | O | \| | \| | \| | \| | 2.79 |
| 24.667 | 0.00 | 0.42 | 0.183 | O | \| | \| | \| | \| | 2.75 |
| 24.750 | 0.00 | 0.37 | 0.181 | O | \| | \| | \| | \| | 2.72 |
| 24.833 | 0.00 | 0.32 | 0.178 | O | \| | \| | \| | \| | 2.69 |
| 24.917 | 0.00 | 0.28 | 0.176 | O | \| | \| | \| | \| | 2.67 |
| 25.000 | 0.00 | 0.24 | 0.174 | O | \| | \| | \| | \| | 2.65 |
| 25.083 | 0.00 | 0.21 | 0.173 | O | \| | \| | \| | \| | 2.63 |
| 25.167 | 0.00 | 0.19 | 0.171 | O | \| | \| | \| | \| | 2.61 |
| 25.250 | 0.00 | 0.16 | 0.170 | O | \| | \| | \| | \| | 2.60 |
| 25.333 | 0.00 | 0.14 | 0.169 | O | \| | \| | \| | \| | 2.58 |
| 25.417 | 0.00 | 0.12 | 0.168 | O | \| | \| | \| | \| | 2.57 |
| 25.500 | 0.00 | 0.11 | 0.167 | O | \| | \| | \| | \| | 2.56 |
| 25.583 | 0.00 | 0.09 | 0.167 | O | \| | \| | \| | \| | 2.56 |
| 25.667 | 0.00 | 0.08 | 0.166 | O | \| | \| | \| | \| | 2.55 |
| 25.750 | 0.00 | 0.07 | 0.166 | O | \| | \| | \| | \| | 2.54 |
| 25.833 | 0.00 | 0.06 | 0.165 | O | \| | \| | \| | \| | 2.54 |
| 25.917 | 0.00 | 0.05 | 0.165 | O | \| | \| | \| | \| | 2.53 |
| 26.000 | 0.00 | 0.05 | 0.164 | O | \| | \| | \| | \| | 2.53 |
| 26.083 | 0.00 | 0.04 | 0.164 | O | \| | \| | \| | \| | 2.52 |
| 26.167 | 0.00 | 0.04 | 0.164 | O | \| | \| | \| | \| | 2.52 |
| 26.250 | 0.00 | 0.03 | 0.164 | O | \| | \| | \| | \| | 2.52 |
| 26.333 | 0.00 | 0.03 | 0.163 | O | \| | \| | \| | \| | 2.52 |
| 26.417 | 0.00 | 0.02 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 26.500 | 0.00 | 0.02 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 26.583 | 0.00 | 0.02 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 26.667 | 0.00 | 0.02 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 26.750 | 0.00 | 0.01 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 26.833 | 0.00 | 0.01 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 26.917 | 0.00 | 0.01 | 0.163 | O | \| | \| | \| | \| | 2.51 |
| 27.000 | 0.00 | 0.01 | 0.162 | O | \| | \| | \| | \| | 2.51 |
| 27.083 | 0.00 | 0.01 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.167 | 0.00 | 0.01 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.250 | 0.00 | 0.01 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.333 | 0.00 | 0.01 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.417 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.500 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.583 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.667 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.750 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.833 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 27.917 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 28.000 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 28.083 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 28.167 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 28.250 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 28.333 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |
| 28.417 | 0.00 | 0.00 | 0.162 | O | \| | \| | \| | \| | 2.50 |

Remaining water in basin = 0.16 (Ac.Ft)

**********HYDROGRAPH DATA**********

Number of intervals = 341
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 3.655 (CFS)
Total volume = 2.928 (Ac.Ft)

Status of hydrographs being held in storage

| | Stream 1 | Stream 2 | Stream 3 | Stream 4 | Stream 5 |
|---|---|---|---|---|---|
| Peak (CFS) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Vol (Ac.Ft) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

**********

---

# APPENDIX 10C

# GRADING PLANS

# SAN BERNARDINO COUNTY
# GRADING PLAN
## 18313 VALLEY BLVD.
## BLOOMINGTON,CA 92313

APN: 0260-061-18

## GENERAL GRADING NOTES:

1. ALL GRADING SHALL CONFORM TO THE LATEST CALIFORNIA BUILDING CODE (CBC) CHAPTERS 17, 18, APPENDIX–J AND ALL APPLICABLE SECTIONS.
2. A GRADING PERMIT SHALL BE OBTAINED PRIOR TO COMMENCEMENT OF ANY WORK ON THE SITE.
3. ISSUANCE OF A GRADING PERMIT DOES NOT ELIMINATE THE NEED FOR PERMITS FROM OTHER REGULATORY AGENCIES WITH REGULATORY RESPONSIBILITIES FOR CONSTRUCTION ACTIVITIES ASSOCIATED WITH THE WORK AUTHORIZED IN THIS PLAN.
4. ALL WORK UNDER THIS PERMIT SHALL BE LIMITED TO WORK WITHIN THE PROPERTY LINES. A SEPARATE CONSTRUCTION, EXCAVATION OR ENCROACHMENT PERMIT FROM THE DEPARTMENT OF PUBLIC WORKS MAY BE REQUIRED FOR ANY WORK WITHIN THE COUNTY RIGHT–OF–WAY.
5. APPROVAL OF THESE PLANS DOES NOT AUTHORIZE ANY WORK OR GRADING TO BE PERFORMED UNTIL THE EFFECTIVE PROPERTY OWNER'S PERMISSION HAS BEEN OBTAINED AND VALID GRADING PERMIT HAS BEEN ISSUED.
6. THIS PLAN IS FOR GRADING PURPOSES ONLY AND IS NOT TO BE USED FOR THE PURPOSE OF CONSTRUCTING ONSITE OR OFFSITE IMPROVEMENTS. ISSUANCE OF A PERMIT BASED ON THIS PLAN DOES NOT CONSTITUTE APPROVAL OF DRIVEWAY LOCATIONS OR SIZES, PARKING LOT STRUCTURAL SECTIONS OR LAYOUT, ADA–RELATED REQUIREMENTS, BUILDING LOCATIONS OR FOUNDATIONS, WALLS, CURBING, OFFSITE DRAINAGE FACILITIES OR OTHER ITEMS NOT RELATED DIRECTLY TO THE BASIC GRADING OPERATION. ONSITE IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE TO THE APPROVED BUILDING PERMIT PLANS. OFFSITE IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE TO PLANS APPROVED FOR THIS PURPOSE BY THE PUBLIC WORKS DEPARTMENT.
7. MAXIMUM CUT AND FILL SLOPE = 2:1 (HORIZONTAL TO VERTICAL) AND MAXIMUM VERTICAL HEIGHT = 30 FEET, UNLESS AN APPROVED GEOTECHNICAL REPORT CAN JUSTIFY A STEEPER AND TALLERSLOPE.
8. NO FILL SHALL BE PLACED ON EXISTING GROUND UNTIL THE GROUND HAS BEEN CLEARED OF WEEDS, DEBRIS, TOPSOIL AND OTHER DELETERIOUS MATERIAL.
9. FILL SLOPES SHALL NOT HAVE LESS THAN 90% RELATIVE COMPACTION, OR AS RECOMMENDED ON THE APPROVED GEOTECHNICAL REPORT.
10. IT IS THE GRADING CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT ADEQUATE COMPACTION HAS BEEN ATTAINED ON THE ENTIRE GRADING SITE, INCLUDING FILL AREAS OUTSIDE THE BUILDING PADS AND ON ALL FILLSLOPES.
11. UNLESS OTHERWISE RECOMMENDED IN AN APPROVED GEOTECHNICAL REPORT, OVER–EXCAVATION SHALL BE AT LEAST 24 INCHES MINIMUM BELOW THE BOTTOM OF FOOTINGS OR TO COMPETENT NATIVE SOIL OR BEDROCK MATERIALS, WHICHEVER IS DEEPER, AS APPROVED BY THE PROJECT'S GEOTECHNICAL ENGINEER OR GEOLOGIST.
12. EARTHWORK VOLUMES: CUT X (CY), FILL X (CY), TOTAL DISTURBED AREA X (SF)
13. EARTHWORK QUANTITIES ARE SHOWN FOR GRADING PERMIT PURPOSES ONLY, AND SAN BERNARDINO COUNTY IS NOT RESPONSIBLE FOR THEIR ACCURACY.
14. A COPY OF THE GRADING PERMIT AND APPROVED GRADING PLANS MUST BE IN THE POSSESSION OF A RESPONSIBLE PERSON AND AVAILABLE AT THE SITE AT ALL TIMES.
15. ANY ONSITE RETAINING WALLS SHOWN ON THE GRADING PLANS THAT ARE OVER 4' IN HEIGHT, MEASURED FROM TOP OF WALL TO BOTTOM OF FOOTING, ARE FOR REFERENCE ONLY. RETAINING WALLS OVER 4' IN HEIGHT ARE NOT CHECKED, PERMITTED, OR INSPECTED PER THE GRADING PERMIT. A SEPARATE RETAINING WALL PERMIT IS REQUIRED FOR ALL RETAINING WALLS OVER 4' IN HEIGHT.
16. ANY WALLS, FENCES, STRUCTURES AND/OR APPURTENANCES ADJACENT TO THIS PROJECT ARE TO BE PROTECTED IN PLACE. IF GRADING OPERATIONS DAMAGE OR ADVERSELY AFFECT SAID ITEMS IN ANY WAY, THE CONTRACTOR AND/OR DEVELOPER IS RESPONSIBLE FOR WORKING OUT AN ACCEPTABLE SOLUTION TO THE SATISFACTION OF THE AFFECTED PROPERTY OWNER(S).
17. FOR SITES WITH PROTECTED SPECIES OR TREES, THE PROPOSED GRADING MAY BE SUBJECT TO A SEPARATE PERMIT.
18. ADEQUATE FIRE ACCESS AROUND BUILDINGS (INCLUDING GARAGES) SHOULD BE PROVIDED AS APPROVED BY COUNTY FIRE.
19. EXISTING DRAINAGE COURSES SHALL NOT BE OBSTRUCTED, ALTERED, OR DIVERTED WITHOUT PRIOR APPROVAL FROM THE SAN BERNARDINO COUNTY, LAND DEVELOPMENT DIVISION. A STREAMBED ALTERATION AGREEMENT MAY ALSO BE REQUIRED FROM THE CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE.
20. DRAINAGE EASEMENTS SHALL NOT BE OBSTRUCTED, ALTERED OR DIVERTED WITHOUT PRIOR APPROVAL OF THE SAN BERNARDINO COUNTY, LAND DEVELOPMENT DIVISION.
21. SETBACKS AND BUILDING LOCATIONS SHOWN ON THIS PLAN ARE FOR REFERENCE ONLY AND MUST BE REVIEWED AND APPROVED UNDER A SEPARATE BUILDING PERMIT.
22. UTILITY AND SEPTIC IMPROVEMENTS SHOWN ON THIS PLAN ARE FOR REFERENCE ONLY AND MUST BE REVIEWED AND APPROVED UNDER A SEPARATE BUILDING PERMIT.
23. ON PROJECTS DISTURBING ONE ACRES OR MORE, THE FOLLOWING NOTE MUST BE ADDED: A NOTICE OF INTENT (NOI) HAS BEEN, OR WILL BE FILED WITH THE STATE WATER RESOURCES CONTROL BOARD (SWRCB) AND A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) HAS BEEN OR WILL BE PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF CALIFORNIA GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY (PERMIT NO. CAS000002) FOR ALL OPERATIONS ASSOCIATED WITH THESE PLANS. THE PERMITTEE SHALL KEEP A COPY OF THE SWPPP ON SITE AND AVAILABLE FOR REVIEW BY COUNTY.
24. IN CONJUNCTION WITH THE CALIFORNIA GENERAL PERMIT FOR PROPOSED DISTURBANCE OVER ONE ACRE, AN ACTIVE WASTEWATER DISCHARGE ID # (WDID) MUST BE INCLUDED ON THE FINAL GRADING PLAN.
25. FOR ENGINEERED GRADING, A FINAL GRADING CERTIFICATION WILL BE COLLECTED BY THE BUILDING INSPECTOR AT THE FINAL BUILDING INSPECTION OR PRIOR A GRADING FINAL STATUS ON THE PERMIT. THE FINAL GRADING CERTIFICATION IS TO BE COMPLETED BY THE ENGINEER OF RECORD ON THE APPROVED GRADING PLANS.
26. ALL FLOOD ZONE REQUIREMENTS MUST BE REFLECTED OR ACCOUNTED FOR ON THE GRADING PLANS. ELEVATIONS OR CONSTRUCTION NOTES MUST BE INCLUDED IN THE PLANS TO ENSURE COMPLIANCE WITH ALL APPLICABLE FIRST FLOOR ELEVATION REQUIREMENTS PER FEMA AND SAN BERNARDINO COUNTY DEVELOPMENT CODE GUIDELINES.
27. FOR NONRESIDENTIAL PROJECTS, PROVIDE FOLLOWING NOTE ON PLANS: CALIFORNIA GREEN BUILDING STANDARDS CODE 5.408.3 EXCAVATED SOIL AND LAND CLEARING DEBRIS: 100 PERCENT OF TREES, STUMPS, ROCKS AND ASSOCIATED VEGETATION AND SOILS RESULTING PRIMARILY FROM LAND CLEARING SHALL BE REUSED OR RECYCLED. FOR A PHASED PROJECT, SUCH MATERIAL MAY BE STOCKPILED ON SITE UNTIL THE STORAGE SITE IS DEVELOPED.

    EXCEPTION: REUSE, EITHER ON–OR OFF–SITE, OF VEGETATION OR SOIL CONTAMINATED BY DISEASE OR PEST INFESTATION.

    NOTES:
    1. IF CONTAMINATION BY DISEASE OR PEST INFESTATION IS SUSPECTED, CONTACT THE COUNTY AGRICULTURAL COMMISSIONER AND FOLLOW ITS DIRECTION FOR RECYCLING OR DISPOSAL OF THE MATERIAL. (WWW.CDFA.CA.GOV/EXEC/COUNTY/COUNTY_CONTACTS.HTML)

    2. FOR A MAP OF KNOWN PEST AND/OR DISEASE QUARANTINE ZONES, CONSULT WITH THE CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE. (WWW.CDFA.CA.GOV)

NOTE: ADDITIONAL REQUIREMENTS MAY BE APPLICABLE, AS DETERMINED BY THE BUILDING OFFICIAL.

## OWNER/APPLICANT:

SAN BERNARDINO COUNTY
18313 VALLEY BLVD.
BLOOMINGTON,CA 92313

## SHEET INDEX:


| | |
|---|---|
| TITLE SHEET | 1 |
| DEMOLITION PLAN | 2 |
| GRADING PLAN | 3 |
| DETAILS | 4 |
| EROSION CONTROL PLAN | 5 |
| EROSION CONTROL PLAN | 6 |


## CONSTRUCTION NOTES:

| | | QTY |
|---|---|---|
| 1 | CONSTRUCT BUILDING FOOTING AND SLAB PER ARCHITECTURAL PLANS AND SOILS REPORT RECOMMENDATIONS. | ~ |
| 2 | OVEREXCAVATE BEYOND THE PERIMETER OF PROPOSED STRUCTURES IN ACCORDANCE WITH THE SOILS REPORT RECOMMENDATIONS. | X CY. |
| 3 | CONSTRUCT 6" THICK CONCRETE PAVING (560–C–3250) OVER 12" SCARIFIED & 90% COMPACTED NATIVE PER ASTM D 1557. | X SF. |
| 4 | CONSTRUCT 3" AC OVER 4" CLASS II BASE OVER 12" SCARIFIED & 90% COMPACTED NATIVE PER ASTM D 1557. | X SF. |
| 5 | CONSTRUCT 6" TYPE "A1–6" CURB (560–C–3250) PER SPPWC STD. 120–3. SHEET X. | X LF. |
| 6 | CONSTRUCT 6" TYPE "A2–6" CURB (560–C–3250) PER SPPWC STD. 120–3. SHEET X. | X LF. |
| 7 | CONSTRUCT 4" THICK CONCRETE SIDEWALK (560–C–3250), COLOR/FINISH PER ARCH PLAN, OVER 12" SCARIFIED & 90% COMPACTED NATIVE PER ASTM D 1557. | X SF. |
| 8 | CONSTRUCT HANDICAP RAMP PER CALTRANS DETAIL A88A, SHEET X. | X EA. |
| 9 | INSTALL DETECTABLE WARNING PER CALTRANS DETAIL A88A, SEE DETAIL SHEET X. | X SF. |
| 10 | INSTALL HANDICAP PARKING SIGN PER CALTRANS DETAIL A90A, SEE DETAIL SHEET X. | X EA. |
| 11 | INSTALL WHEEL STOP PER CALTRANS DETAIL A90A, SEE DETAIL SHEET X. | X EA. |
| 12 | INSTALL HANDICAP PARKING STRIPING/SYMBOL PER CALTRANS DETAIL A90A, SHEET X. | ~ |
| 13 | INSTALL 4" WIDE WHITE STRIPING AS SHOWN. | ~ |
| 14 | CONSTRUCT TRASH ENCLOSURE, SEE ARCHITECTS PLANS. | ~ |
| 15 | CONSTRUCT BARK WALL PER ARCHITECTURAL PLANS. | ~ |
| 16 | CONSTRUCT 6' HIGH BLOCK WALL PER COUNTY STD. X. | X LF. |
| 17 | INSTALL 24" SQ. PRECAST CATCH BASIN, JENSEN MODEL: DI2424 OR EQUAL, W/ TRAFFIC GRATE (H–20), W/ INSERT FILTER PER DETAIL & STORM DRAIN SYSTEM STENCILING PER CALTRANS DETAIL STD. D71, SEE SHEET 7 & 8. | X EA. |
| 18 | INSTALL 8" HDPE DRAIN LINE. | 1 EA. |
| 19 | INSTALL 12" HDPE DRAIN LINE. | X LF. |
| 20 | INSTALL 18" HDPE DRAIN LINE. | X LF. |
| 21 | INSTALL PRECAST 18" HEADWALL, OLD CASTLE MODEL: HEADWALL OR EQUAL, SEE SHEET 8. | 1 EA. |
| 22 | INSTALL 6" – 12" RIPRAP/COBBLE. | X SF. |
| 23 | INSTALL 4" SEWER LINE PER PLAN, 2% MIN SLOPE. | X LF. |
| 24 | INSTALL 6" SEWER LINE PER PLAN, 1% MIN SLOPE. | X LF. |
| 25 | INSTALL 4" SEWER CLEAN OUT. | X EA. |
| 26 | INSTALL 6" SEWER CLEAN OUT. | X EA |
| | INSTALL X" WATER LINE PER DETAIL X. | X LF. |

## DECLARATION OF ENGINEER OF RECORD:

1. THE CIVIL ENGINEER RESPONSIBLE FOR PLAN PREPARATION SHALL SIGN THE FOLLOWING STATEMENT:

   "I CERTIFY THAT I WILL BE RESPONSIBLE FOR THIS GRADING IN ACCORDANCE WITH SECTION 7014(C) OF THE BUILDING CODE TO INCLUDE INCORPORATING ALL RECOMMENDATIONS OF THE SOILS ENGINEER, REPORT AND BE RESPONSIBLE FOR PROFESSIONAL INSPECTION AND APPROVAL OF THE GRADING. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO INSPECTION AND APPROVAL AS TO THE ESTABLISHMENTS OF LINE GRADE AND DRAINAGE OF DEVELOPMENT AREA. I WILL ALSO BE RESPONSIBLE FOR THE PREPARATION OF REVISED PLANS AND THE SUBMISSION OF "AS GRADED" GRADING PLANS UPON THE COMPLETION OF THE WORK."

   _____ _____ _____
   SUPERVISING CIVIL ENGINEER R.C.E. DATE

2. THE SOILS ENGINEER SHALL SIGN THE FOLLOWING STATEMENT:

   "I SHALL PROVIDE PROFESSIONAL INSPECTION AND APPROVAL CONCERNING THE PREPARATION OF GROUND TO RECEIVE FILLS, TESTING FOR REQUIRED COMPACTION STABILITY OF ALL FINISHED SLOPES AND INCORPORATING THE DATA SUPPLIED BY THE ENGINEERING GEOLOGIST AND THE PREPARATION OF THE SOILS GRADING REPORT."

   _____ _____ _____
   SUPERVISING SOIL ENGINEER R.C.E. DATE

3. NO GRADING IN EXCESS OF 5000 CU. YDS. SHALL BE STARTED WITHOUT FIRST NOTIFYING THE ENGINEER. A PRE–GRADING MEETING AT THE SITE IS REQUIRED BEFORE START OF GRADING WITH THE FOLLOWING PEOPLE PRESENT: OWNER, GRADING CONTRACTOR, SUPERVISING CIVIL ENGINEER, SOILS ENGINEER AND /OR GEOLOGIST, CITY CONSTRUCTION INSPECTORS OR THEIR REPRESENTATIVES.
4. THE PERMITTEE OR HIS AGENT SHALL NOTIFY THE CITY OF RIALTO WHEN THE GRADING OPERATION (EXCEEDING 5000 CU. YDS.) IS READY FOR REQUIRED INSPECTIONS AS SHOWN IN THE TESTING AND INSPECTION REQUIREMENTS OF DIVISION V.

## EARTHWORK QUANTITIES:

CONSTRUCTION MAY VARY.

CUT 142 CUBIC YARDS
FILL 142 CUBIC YARDS

EARTH WORK QUANTITIES NOTE: THE ABOVE LISTED QUANTITIES REFLECT THE ENGINEER'S ESTIMATE OF THE ACTUAL VOLUMES OF MATERIAL CUT AND FILLED. THESE QUANTITIES ARE FOR ESTIMATING AND BONDING PURPOSE ONLY. THE CONTRACTOR IS RESPONSIBLE FOR COMPUTING HIS OWN QUANTITIES FOR CONTRACT PURPOSES.

## LEGEND

| | |
|---|---|
| ASPH | ASPHALTIC CONCRETE SURFACE |
| BT | BOTTOM OF TRENCH |
| CB | CATCH BASIN |
| C&G | CURB AND GUTTER |
| CL | CENTER LINE |
| DDC | DOUBLE DETECTOR CHECK |
| DWY | DRIVEWAY |
| (E) | EXISTING |
| FF | FINISH FLOOR |
| FG | FINISH GRADE |
| FL | FLOWLINE |
| FS | FINISHED SURFACE |
| GB | GRADE BREAK |
| GW | GUY WIRE |
| INV | INVERT OF PIPE |
| MH | MANHOLE |
| N.T.S. | NOT TO SCALE |
| PP | POWER POLE |
| ST | STREET |
| TC | TOP OF CURB |
| TF | TOP OF FOOTING |
| TW | TOP OF WALL |
| TYP | TYPICAL |
| WI | WROUGHT IRON |
| WM | WATER METER |

EXISTING CONCRETE SURFACE
PROPOSED PULVERIZED ASPHALT
PROPOSED CRACK SEAL & SLURRY
PROPOSED ASPHALT
RIGHT OF WAY
PROPERTY LINE
CENTERLINE
EXISTING BLOCK OR STONE WALL
FLOWLINE
GB GRADE BREAK
FILL SLOPE
INDICATES DIRECTION OF FLOW
(1500) CONTOUR ELEVATION (FEET)
ADA PATH OF TRAVEL

## STORMWATER POLLUTION CONTROL REQUIREMENTS FOR GRADING:

1. ERODED SEDIMENTS AND OTHER POLLUTANTS MUST BE RETAINED ON SITE AND SHALL NOT BE TRANSPORTED FROM THE SITE VIA SHEET FLOW, SWALES, AREA DRAINS, NATURAL DRAINAGE COURSES, OR WIND.
2. STOCKPILES OF EARTH AND OTHER CONSTRUCTION RELATED MATERIALS MUST BE PROTECTED FROM BEING TRANSPORTED FROM THE SITE BY FORCES OF WIND OR WATER.
3. FUELS, OILS, SOLVENTS, AND OTHER TOXIC MATERIALS MUST BE STORED IN ACCORDANCE WITH THEIR LISTING AND ARE NOT TO CONTAMINATE THE SOIL AND SURFACE WATERS. ALL APPROVED STORAGE CONTAINERS ARE TO BE PROTECTED FROM THE WEATHER. SPILLS MUST BE CLEANED UP IMMEDIATELY AND DISPOSED OF IN A PROPER MANNER SPILLS MAY NOT BE WASHED OUT INTO THE DRAINAGE SYSTEM.
4. EXCESS OR WASTED CONCRETE SHALL NOT BE WASHED INTO THE PUBLIC WAY OR ANY OTHER DRAINAGE SYSTEM. PROVISIONS SHALL BE MADE TO RETAIN CONCRETE WASTES ON SITE UNTIL THEY CAN BE DISPOSED OF AS SOLID WASTE.
5. TRASH AND CONSTRUCTION – RELATED SOLID WASTES MUST BE DEPOSITED INTO A COVERED RECEPTACLE TO PREVENT CONTAMINATION OF RAINWATER AND DISPERSAL BY WIND.
6. SEDIMENTS AND OTHER MATERIALS SHALL NOT BE TRACKED FROM THE SITE BY VEHICLE TRAFFIC. THE CONSTRUCTION ENTRANCE ROADWAYS MUST BE STABILIZED SO AS INHIBIT SEDIMENTS FROM BEING DEPOSITED INTO THE PUBLIC WAY. ACCIDENTAL DEPOSITION MUST BE SWEPT UP IMMEDIATELY AND MAY NOT BE WASHED DOWN BY RAIN OR OTHER MEANS.
7. ANY SLOPES WITH DISTURBED SOILS OR DENUDED OF VEGETATION MUST BE STABILIZED SO AS TO INHIBIT EROSION BY WIND AND WATER.

## UNAUTHORIZED CHANGES & USES:

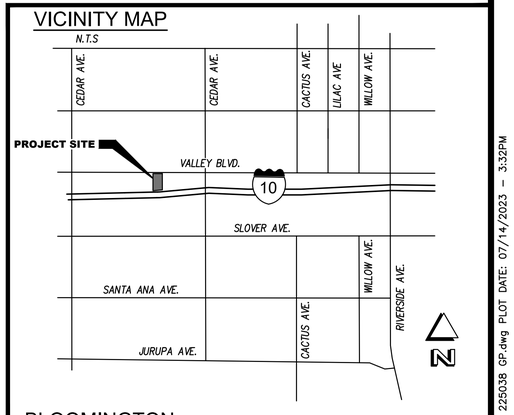
CAUTION: THE ENGINEER PREPARING THESE PLANS WILL NOT BE RESPONSIBLE FOR, OR LIABLE FOR, UNAUTHORIZED CHANGES TO, OR USES OF THESE PLANS. ALL CHANGES TO THE PLANS MUST BE IN WRITING, AND MUST BE APPROVED BY THE PREPARER OF THESE PLANS.

THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. THESE LOCATIONS ARE APPROXIMATE AND SHALL BE CONFIRMED IN THE FIELD BY THE CONTRACTOR, SO THAT ANY NECESSARY ADJUSTMENTS CAN BE MADE IN ALIGNMENT AND/OR GRADE OF THE PROPOSED IMPROVEMENTS. THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PREVENT DAMAGE TO ANY UTILITY LINES SHOWN, AND ANY OTHER LINES NOT OF RECORD OR NOT SHOWN ON THESE PLANS.

CONSTRUCTION CONTRACTOR AGREES THAT, IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. CONSTRUCTION CONTRACTOR FURTHER AGGRESS TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF DESIGN PROFESSIONAL.

## VICINITY MAP

N.T.S




BLOOMINGTON



Underground Service Alert
DIG ALERT BEFORE YOU DIG
Call: TOLL FREE
1–800–227–2600
TWO WORKING DAYS BEFORE YOU DIG

BENCHMARK:
SEE ABOVE

PREPARED BY:
BONADIMAN
JOSEPH E. BONADIMAN & ASSOCIATES, INC.
ENGINEERS · L.S. · SURVEYING · PLANNING
TEL. (909) 885-3806
201 NORTH ARROWHEAD AVE.
SAN BERNARDINO, CA 92408
FAX (909) 381-7721
www.bonadiman.com

SCALE: NONE
DATE: 07–11–23

SEAL
REGISTERED PROFESSIONAL ENGINEER
JAMES T. STANFORD
No. C–70944
Exp. 6–30–25
CIVIL
STATE OF CALIFORNIA

| DATE | BY | MARK | REVISIONS | APPR. | DATE |
|---|---|---|---|---|---|
| | | | ENGINEER | | |

DESIGNED BY: JTS DRAWN BY: JTS CHECKED BY: JTS

SAN BERNARDINO COUNTY
DEPARTMENT OF LAND USE SERVICES

GRADING PLAN

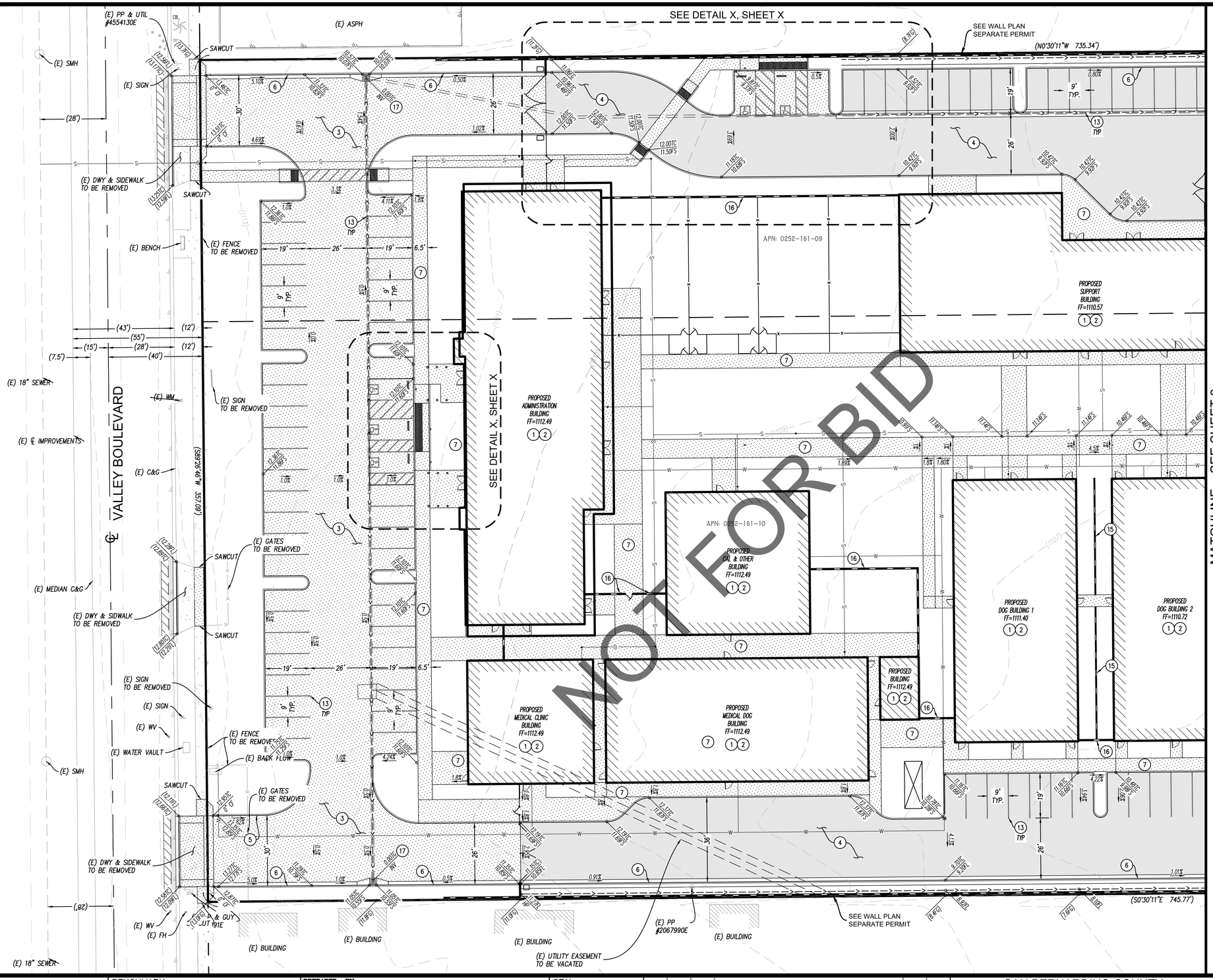
TITLE SHEET
18313 VALLEY BLVD.
BLOOMINGTON,CA 92313

ROAD NO.

FILE NO.

SHEET 1 OF X

JOB #: 184546 DRAWING NAME: 225038 GP.dwg PLOT DATE: 07/14/2023 – 3:32PM




## CONSTRUCTION NOTES:

1. CONSTRUCT BUILDING FOOTING AND SLAB PER ARCHITECTURAL PLANS AND SOILS REPORT RECOMMENDATIONS.
2. OVEREXCAVATE BEYOND THE PERIMETER OF PROPOSED STRUCTURES IN ACCORDANCE WITH THE SOILS REPORT RECOMMENDATIONS.
3. CONSTRUCT 6" THICK CONCRETE PAVING (560-C-3250) OVER 12" SCARIFIED & 90% COMPACTED NATIVE PER ASTM D 1557.
4. CONSTRUCT 3" AC OVER 4" CLASS II BASE OVER 12" SCARIFIED & 90% COMPACTED NATIVE PER ASTM D 1557.
5. CONSTRUCT 6" TYPE "A1-6" CURB (560-C-3250) PER SPPWC STD. 120-3. SHEET X.
6. CONSTRUCT 6" TYPE "A2-6" CURB (560-C-3250) PER SPPWC STD. 120-3. SHEET X.
7. CONSTRUCT 4" THICK CONCRETE SIDEWALK (560-C-3250), COLOR/FINISH PER ARCH PLAN, OVER 12" SCARIFIED & 90% COMPACTED NATIVE PER ASTM D 1557.
8. CONSTRUCT HANDICAP RAMP PER CALTRANS DETAIL A88A, SHEET X.
9. INSTALL DETECTABLE WARNING PER CALTRANS DETAIL A88A, SEE DETAIL SHEET X.
10. INSTALL HANDICAP PARKING SIGN PER CALTRANS DETAIL A90A, SEE DETAIL SHEET X.
11. INSTALL WHEEL STOP PER CALTRANS DETAIL A90A, SEE DETAIL SHEET X.
12. INSTALL HANDICAP PARKING STRIPING/SYMBOL PER CALTRANS DETAIL A90A, SHEET X.
13. INSTALL 4" WIDE WHITE STRIPING AS SHOWN.
14. CONSTRUCT TRASH ENCLOSURE, SEE ARCHITECTS PLANS.
15. CONSTRUCT BARK WALL PER ARCHITECTURAL PLANS.
16. CONSTRUCT 6' HIGH BLOCK WALL PER COUNTY STD. X.
17. INSTALL 24" SQ. PRECAST CATCH BASIN, JENSEN MODEL: DI2424 OR EQUAL, W/ TRAFFIC GRATE (H-20), W/ INSERT FILTER PER DETAIL & STORM DRAIN SYSTEM STENCILING PER CALTRANS DETAIL STD. D71, SEE SHEET 7 & 8.
18. INSTALL 8" HDPE DRAIN LINE.
19. INSTALL 12" HDPE DRAIN LINE.
20. INSTALL 18" HDPE DRAIN LINE.
21. INSTALL PRECAST 18" HEADWALL, OLD CASTLE MODEL: HEADWALL OR EQUAL, SEE SHEET 8.
22. INSTALL 6" - 12" RIPRAP/COBBLE.
23. INSTALL 4" SEWER LINE PER PLAN, 2% MIN SLOPE.
24. INSTALL 6" SEWER LINE PER PLAN, 1% MIN SLOPE.
25. INSTALL 4" SEWER CLEAN OUT.
26. INSTALL 6" SEWER CLEAN OUT.

INSTALL X" WATER LINE PER DETAIL X.

20 0 20 40 60
SCALE: 1"=20'

Underground Service Alert
CALL BEFORE YOU DIG
Call: TOLL FREE
1-800-227-2600
TWO WORKING DAYS BEFORE YOU DIG

BENCHMARK:
SEE ABOVE

PREPARED BY:
BONADIMAN
JOSEPH E. BONADIMAN & ASSOCIATES, INC.
ENGINEERS · L.S.A. · SURVEYORS · PLANNERS
TEL. (909) 885-3806
384 NORTH ARROWHEAD AVE.
SAN BERNARDINO, CA 92408
FAX (909) 381-1721
www.bonadiman.com
SCALE: NONE
DATE: 07-11-23

SEAL
REGISTERED PROFESSIONAL ENGINEER
JAMES T. STANTON
No. C-70944
Exp. 6-30-25
CIVIL
STATE OF CALIFORNIA

| DATE | BY | MARK | REVISIONS | APPR. | DATE |
|---|---|---|---|---|---|
| ENGINEER | | | | | |

DESIGNED BY: JTS DRAWN BY: JTS CHECKED BY: JTS

SAN BERNARDINO COUNTY
DEPARTMENT OF LAND USE SERVICES

GRADING PLAN

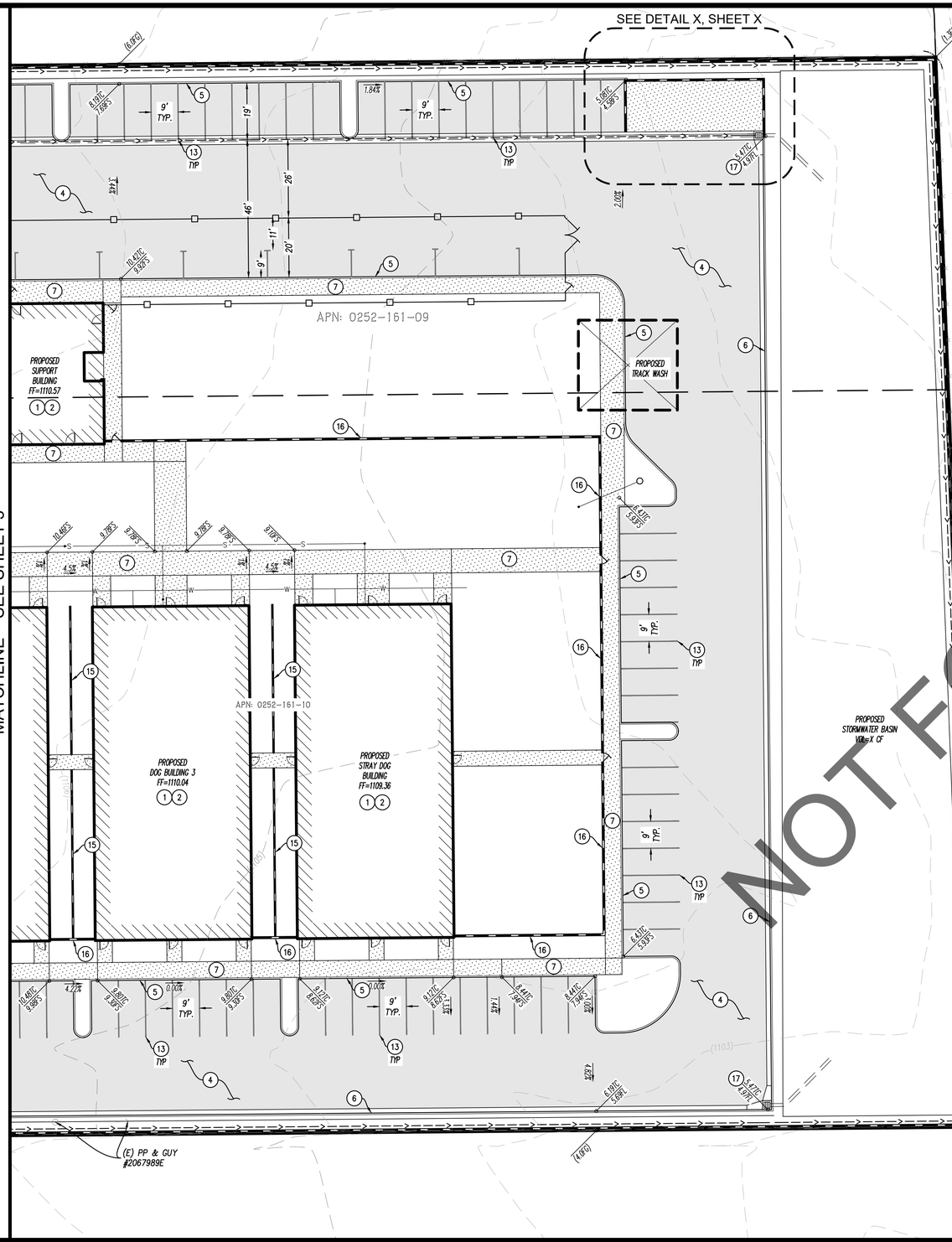
GRADING PLAN
18313 VALLEY BLVD.
BLOOMINGTON,CA 92313

ROAD NO.

FILE NO.

SHEET 2 OF X

JOB #: 184546 DRAWING NAME: 225038 GP.dwg PLOT DATE: 07/14/2023 - 3:32PM






## CONSTRUCTION NOTES:

1. CONSTRUCT BUILDING FOOTING AND SLAB PER ARCHITECTURAL PLANS AND SOILS REPORT RECOMMENDATIONS.
2. OVEREXCAVATE BEYOND THE PERIMETER OF PROPOSED STRUCTURES IN ACCORDANCE WITH THE SOILS REPORT RECOMMENDATIONS.
3. CONSTRUCT 6" THICK CONCRETE PAVING (560-C-3250) OVER 12" SCARIFIED & 90% COMPACTED NATIVE PER ASTM D 1557.
4. CONSTRUCT 3" AC OVER 4" CLASS II BASE OVER 12" SCARIFIED & 90% COMPACTED NATIVE PER ASTM D 1557.
5. CONSTRUCT 6" TYPE "A1-6" CURB (560-C-3250) PER SPPWC STD. 120-3. SHEET X.
6. CONSTRUCT 6" TYPE "A2-6" CURB (560-C-3250) PER SPPWC STD. 120-3. SHEET X.
7. CONSTRUCT 4" THICK CONCRETE SIDEWALK (560-C-3250), COLOR/FINISH PER ARCH PLAN, OVER 12" SCARIFIED & 90% COMPACTED NATIVE PER ASTM D 1557.
8. CONSTRUCT HANDICAP RAMP PER CALTRANS DETAIL A88A, SHEET X.
9. INSTALL DETECTABLE WARNING PER CALTRANS DETAIL A88A, SEE DETAIL SHEET X.
10. INSTALL HANDICAP PARKING SIGN PER CALTRANS DETAIL A90A, SEE DETAIL SHEET X.
11. INSTALL WHEEL STOP PER CALTRANS DETAIL A90A, SEE DETAIL SHEET X.
12. INSTALL HANDICAP PARKING STRIPING/SYMBOL PER CALTRANS DETAIL A90A, SHEET X.
13. INSTALL 4" WIDE WHITE STRIPING AS SHOWN.
14. CONSTRUCT TRASH ENCLOSURE, SEE ARCHITECTS PLANS.
15. CONSTRUCT BARK WALL PER ARCHITECTURAL PLANS.
16. CONSTRUCT 6' HIGH BLOCK WALL PER COUNTY STD. X.
17. INSTALL 24" SQ. PRECAST CATCH BASIN, JENSEN MODEL: DI2424 OR EQUAL, W/ TRAFFIC GRATE (H-20), W/ INSERT FILTER PER DETAIL & STORM DRAIN SYSTEM STENCILING PER CALTRANS DETAIL STD. D71, SEE SHEET 7 & 8.
18. INSTALL 8" HDPE DRAIN LINE.
19. INSTALL 12" HDPE DRAIN LINE.
20. INSTALL 18" HDPE DRAIN LINE.
21. INSTALL PRECAST 18" HEADWALL, OLD CASTLE MODEL: HEADWALL OR EQUAL, SEE SHEET 8.
22. INSTALL 6" - 12" RIPRAP/COBBLE.
23. INSTALL 4" SEWER LINE PER PLAN, 2% MIN SLOPE.
24. INSTALL 6" SEWER LINE PER PLAN, 1% MIN SLOPE.
25. INSTALL 4" SEWER CLEAN OUT.
26. INSTALL 6" SEWER CLEAN OUT.

INSTALL X" WATER LINE PER DETAIL X.

20 0 20 40 60
SCALE: 1"=20'

Underground Service Alert
DIG ALERT BEFORE YOU DIG
Call: TOLL FREE
1-800-227-2600
TWO WORKING DAYS BEFORE YOU DIG

BENCHMARK:
SEE ABOVE

PREPARED BY:
BONADIMAN
JOSEPH E. BONADIMAN & ASSOCIATES, INC.
ENGINEERS - C.I.P. - SURVEYING - PLANNING
TEL. (909) 885-3806
264 NORTH ARROWHEAD AVE.
SAN BERNARDINO, CA 92408
FAX (909) 381-1721
www.bonadiman.com
SCALE: NONE
DATE: 07-11-23

SEAL
REGISTERED PROFESSIONAL ENGINEER
JAMES T. STANTON
No. C-70944
Exp. 6-30-25
CIVIL
STATE OF CALIFORNIA

| DATE | BY | MARK | REVISIONS | APPR. | DATE |
|---|---|---|---|---|---|
| | | | | | |

ENGINEER
DESIGNED BY: JTS DRAWN BY: JTS CHECKED BY: JTS

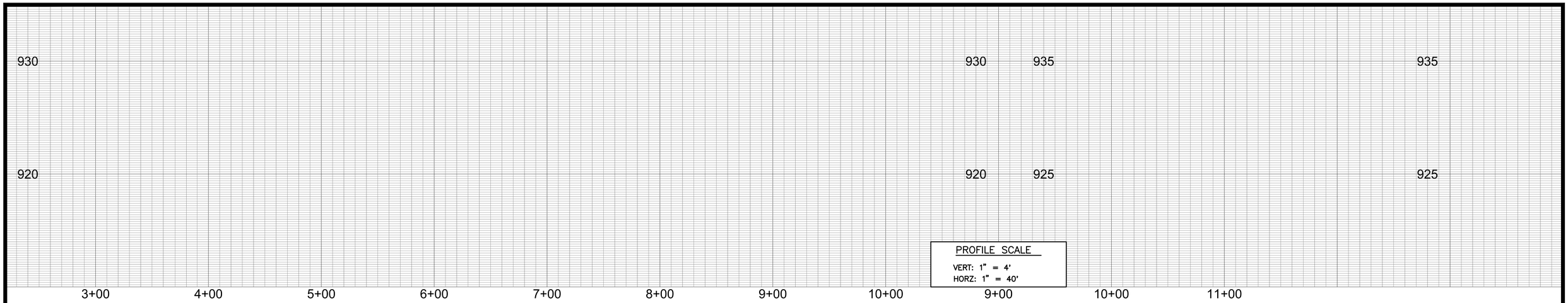
SAN BERNARDINO COUNTY
DEPARTMENT OF LAND USE SERVICES

GRADING PLAN

GRADING PLAN
18313 VALLEY BLVD.
BLOOMINGTON,CA 92313

ROAD NO.
FILE NO.
SHEET 3 OF X

JOB #: 184546 DRAWING NAME: 225038 GP.dwg PLOT DATE: 07/14/2023 - 3:32PM




## CONSTRUCTION NOTES:

(17) *INSTALL 24" SQ. PRECAST CATCH BASIN, JENSEN MODEL: DI2424 OR EQUAL, W/ TRAFFIC GRATE (H-20), W/ INSERT FILTER PER DETAIL & STORM DRAIN SYSTEM STENCILING PER CALTRANS DETAIL STD. D71, SEE SHEET 7 & 8.*

(18) *INSTALL 8" HDPE DRAIN LINE.*

(19) *INSTALL 12" HDPE DRAIN LINE.*

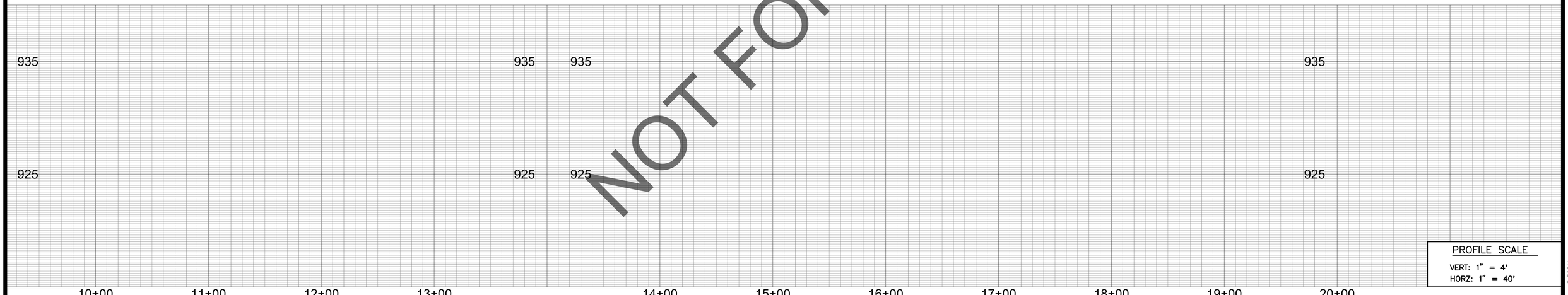
(20) *INSTALL 18" HDPE DRAIN LINE.*

(21) *INSTALL PRECAST 18" HEADWALL, OLD CASTLE MODEL: HEADWALL OR EQUAL, SEE SHEET 8.*

(22) *INSTALL 6" - 12" RIPRAP/COBBLE.*

20 0 20 40 60
SCALE: 1"=20'






Underground Service Alert
DIG ALERT BEFORE YOU DIG
Call: TOLL FREE
1-800-227-2600
TWO WORKING DAYS BEFORE YOU DIG

BENCHMARK:
*SEE ABOVE*

**PREPARED BY:**
BONADIMAN
JOSEPH E. BONADIMAN & ASSOCIATES, INC.
ENGINEERS - W.R.E. - SURVEYING - PLANNING
TEL. (909) 885-3806
264 NORTH ARROWHEAD AVE.
SAN BERNARDINO, CA 92408
FAX (909) 381-1727
www.bonadiman.com

SCALE: NONE
DATE: 07-11-23

SEAL
REGISTERED PROFESSIONAL ENGINEER
JAMES T. STANTON
No. C-70944
Exp. 6-30-25
CIVIL
STATE OF CALIFORNIA

| DATE | BY | MARK | REVISIONS | APPR. | DATE |
|---|---|---|---|---|---|
| | | | | | |

ENGINEER
DESIGNED BY: JTS DRAWN BY: JTS CHECKED BY: JTS

SAN BERNARDINO COUNTY
DEPARTMENT OF LAND USE SERVICES

GRADING PLAN

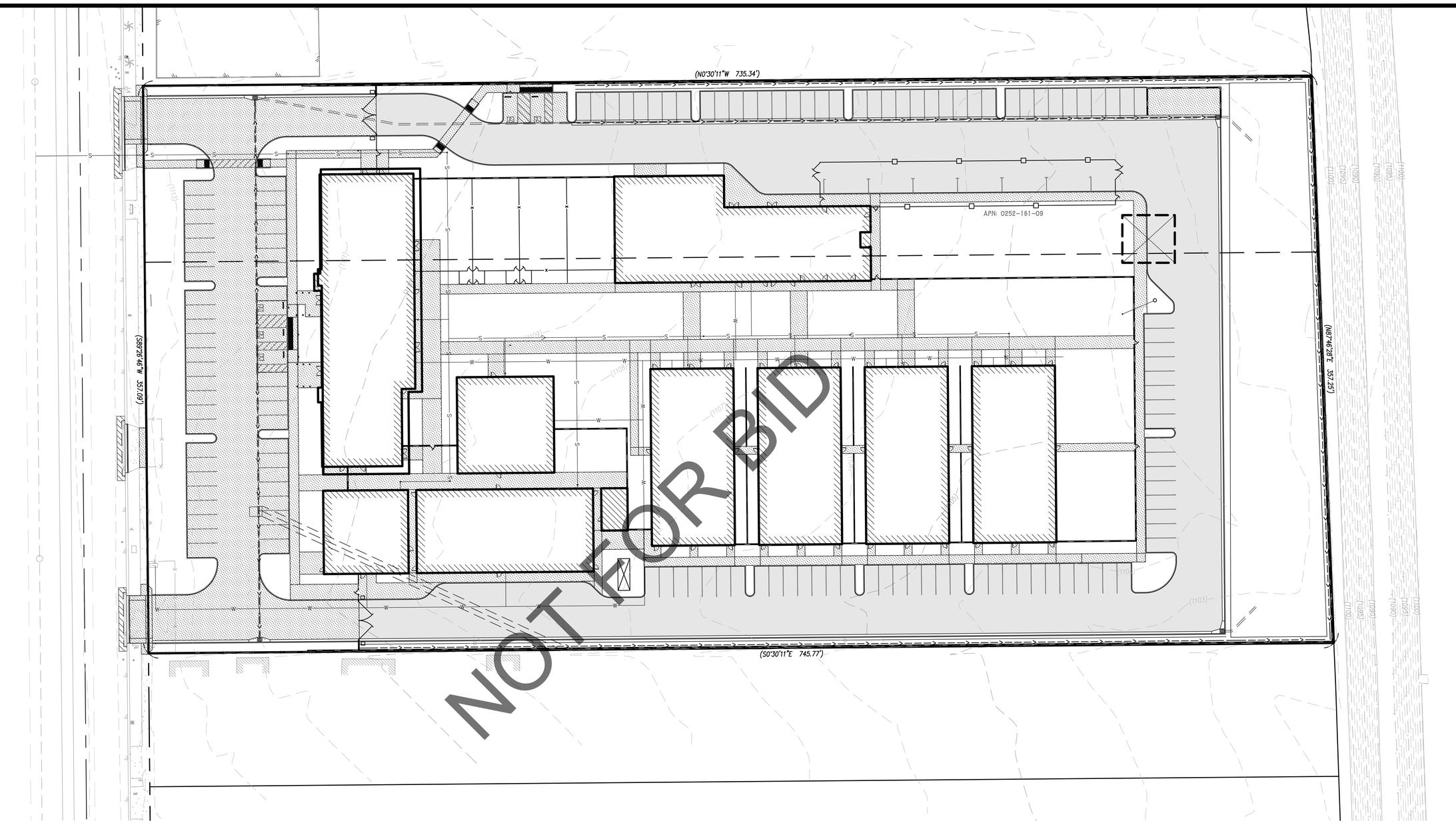
SD PLAN & PROFILE
18313 VALLEY BLVD.
BLOOMINGTON,CA 92313

ROAD NO.

FILE NO.

SHEET 4 OF X

JOB #: 184546 DRAWING NAME: 225038 GP.dwg PLOT DATE: 07/14/2023 - 3:32PM




## CONSTRUCTION NOTES:

(23) INSTALL 4" SEWER LINE PER PLAN, 2% MIN SLOPE.
(24) INSTALL 6" SEWER LINE PER PLAN, 1% MIN SLOPE.
(25) INSTALL 4" SEWER CLEAN OUT.
(26) INSTALL 6" SEWER CLEAN OUT.
INSTALL X" WATER LINE PER DETAIL X.

20 0 20 40 60
SCALE: 1"=20'

Underground Service Alert
DIG ALERT BEFORE YOU DIG
Call: TOLL FREE
1-800-227-2600
TWO WORKING DAYS BEFORE YOU DIG

BENCHMARK:
SEE ABOVE

PREPARED BY:
BONADIMAN
JOSEPH E. BONADIMAN & ASSOCIATES, INC.
ENGINEERS - L.S./L.A. - SURVEYING - PLANNING
TEL. (909) 885-3806
294 NORTH ARROWHEAD AVE.
SAN BERNARDINO, CA 92408
FAX (909) 381-1721
www.bonadiman.com
SCALE: NONE
DATE: 07-11-23

SEAL
REGISTERED PROFESSIONAL ENGINEER
JAMES T. STANTON
No. C-70944
Exp. 6-30-25
CIVIL
STATE OF CALIFORNIA

| DATE | BY | MARK | REVISIONS | APPR. | DATE |
|---|---|---|---|---|---|
| | | | | | |

DESIGNED BY: JTS DRAWN BY: JTS CHECKED BY: JTS

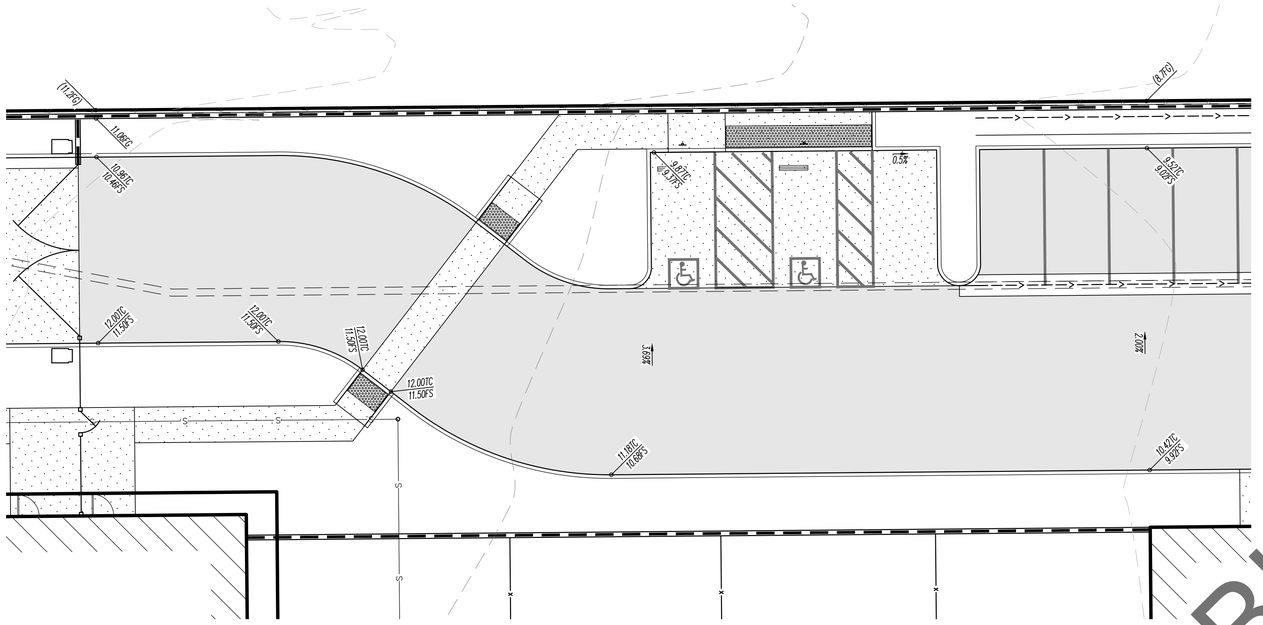
SAN BERNARDINO COUNTY
DEPARTMENT OF LAND USE SERVICES

GRADING PLAN

COMPOSITE UTILITY PLAN
18313 VALLEY BLVD.
BLOOMINGTON,CA 92313

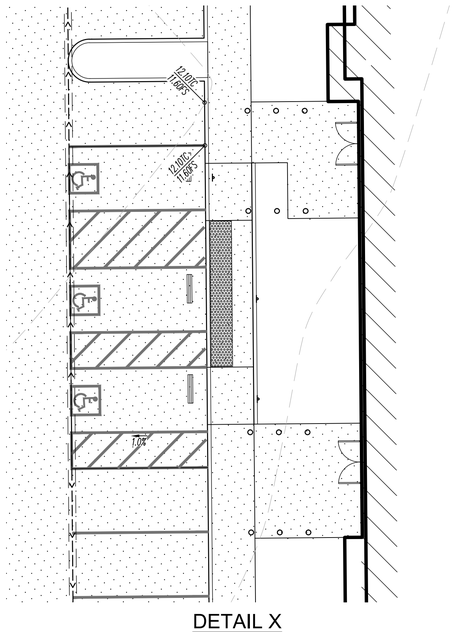
ROAD NO.
FILE NO.
SHEET 5 OF X

JOB #: 184546 DRAWING NAME: 225038 GP.dwg PLOT DATE: 07/14/2023 - 3:32PM



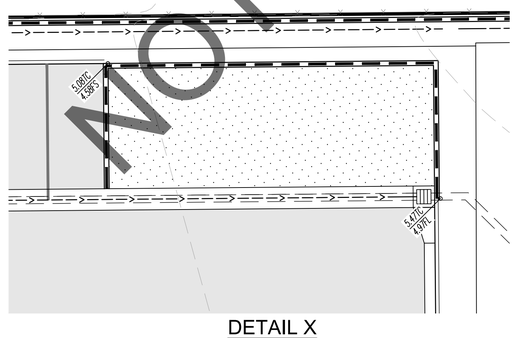

DETAIL X

*SCALE: 1" = 10'*




DETAIL X

*SCALE: 1" = 10'*




DETAIL X

*SCALE: 1" = 10'*

## CONSTRUCTION NOTES:

1. CONSTRUCT BUILDING FOOTING AND SLAB PER ARCHITECTURAL PLANS AND SOILS REPORT RECOMMENDATIONS.
2. OVEREXCAVATE BEYOND THE PERIMETER OF PROPOSED STRUCTURES IN ACCORDANCE WITH THE SOILS REPORT RECOMMENDATIONS.
3. CONSTRUCT 6" THICK CONCRETE PAVING (560-C-3250) OVER 12" SCARIFIED & 90% COMPACTED NATIVE PER ASTM D 1557.
4. CONSTRUCT 3" AC OVER 4" CLASS II BASE OVER 12" SCARIFIED & 90% COMPACTED NATIVE PER ASTM D 1557.
5. CONSTRUCT 6" TYPE "A1-6" CURB (560-C-3250) PER SPPWC STD. 120-3. SHEET X.
6. CONSTRUCT 6" TYPE "A2-6" CURB (560-C-3250) PER SPPWC STD. 120-3. SHEET X.
7. CONSTRUCT 4" THICK CONCRETE SIDEWALK (560-C-3250), COLOR/FINISH PER ARCH PLAN, OVER 12" SCARIFIED & 90% COMPACTED NATIVE PER ASTM D 1557.
8. CONSTRUCT HANDICAP RAMP PER CALTRANS DETAIL A88A, SHEET X.
9. INSTALL DETECTABLE WARNING PER CALTRANS DETAIL A88A, SEE DETAIL SHEET X.
10. INSTALL HANDICAP PARKING SIGN PER CALTRANS DETAIL A90A, SEE DETAIL SHEET X.
11. INSTALL WHEEL STOP PER CALTRANS DETAIL A90A, SEE DETAIL SHEET X.
12. INSTALL HANDICAP PARKING STRIPING/SYMBOL PER CALTRANS DETAIL A90A, SHEET X.
13. INSTALL 4" WIDE WHITE STRIPING AS SHOWN.
14. CONSTRUCT TRASH ENCLOSURE, SEE ARCHITECTS PLANS.



20 0 20 40 60

SCALE: 1"=20'

Underground Service Alert
DIAL BEFORE YOU DIG
Call: TOLL FREE
1-800-227-2600
TWO WORKING DAYS BEFORE YOU DIG

BENCHMARK:
*SEE ABOVE*

PREPARED BY:
BONADIMAN
JOSEPH E. BONADIMAN & ASSOCIATES, INC.
ENGINEERS • W.R.'S • SURVEYORS • PLANNERS
TEL. (909) 885-3806
264 NORTH ARROWHEAD AVE.
SAN BERNARDINO, CA 92408
FAX (909) 381-1721
www.bonadiman.com

SCALE: NONE
DATE: 07-11-23

SEAL
REGISTERED PROFESSIONAL ENGINEER
JAMES T. STANTON
No. C-70944
Exp. 6-30-25
CIVIL
STATE OF CALIFORNIA

| DATE | BY | MARK | REVISIONS | APPR. | DATE |
|---|---|---|---|---|---|
| | | | | | |

ENGINEER
DESIGNED BY: JTS DRAWN BY: JTS CHECKED BY: JTS

SAN BERNARDINO COUNTY
DEPARTMENT OF LAND USE SERVICES

GRADING PLAN

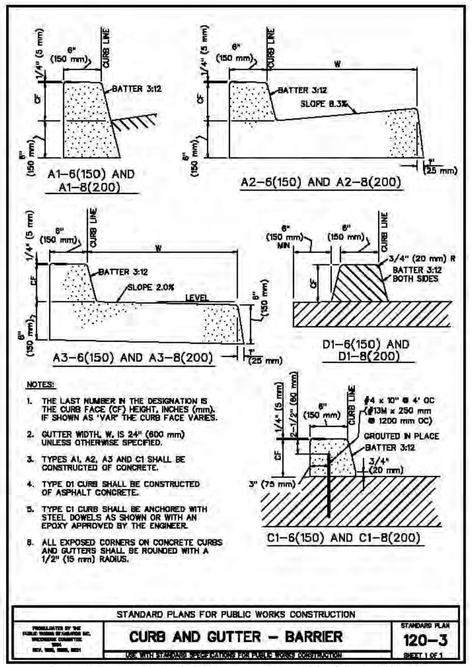
DETAILS
18313 VALLEY BLVD.
BLOOMINGTON,CA 92313

ROAD NO.

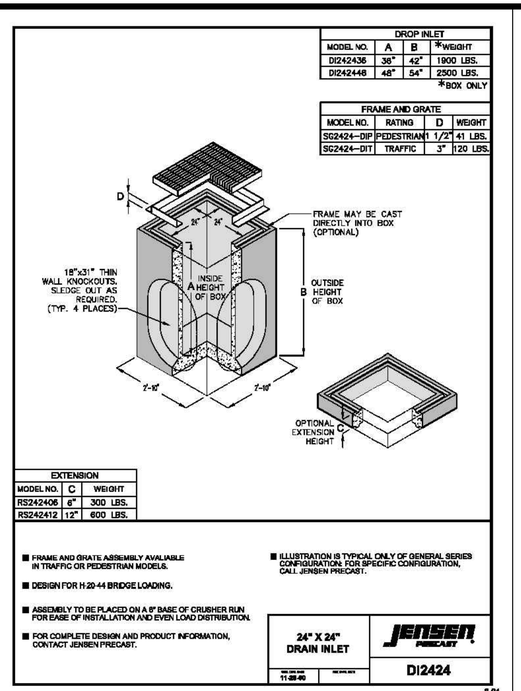
FILE NO.

SHEET 6 OF X

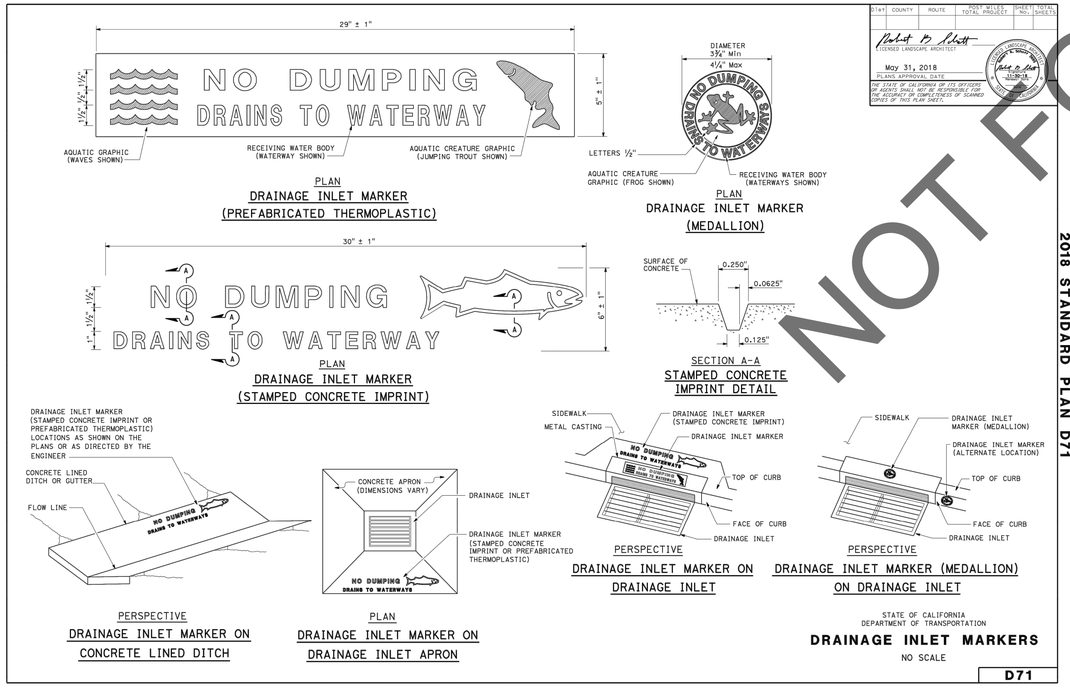
JOB #: 184546 DRAWING NAME: 225038 GP.dwg PLOT DATE: 07/14/2023 - 3:32PM

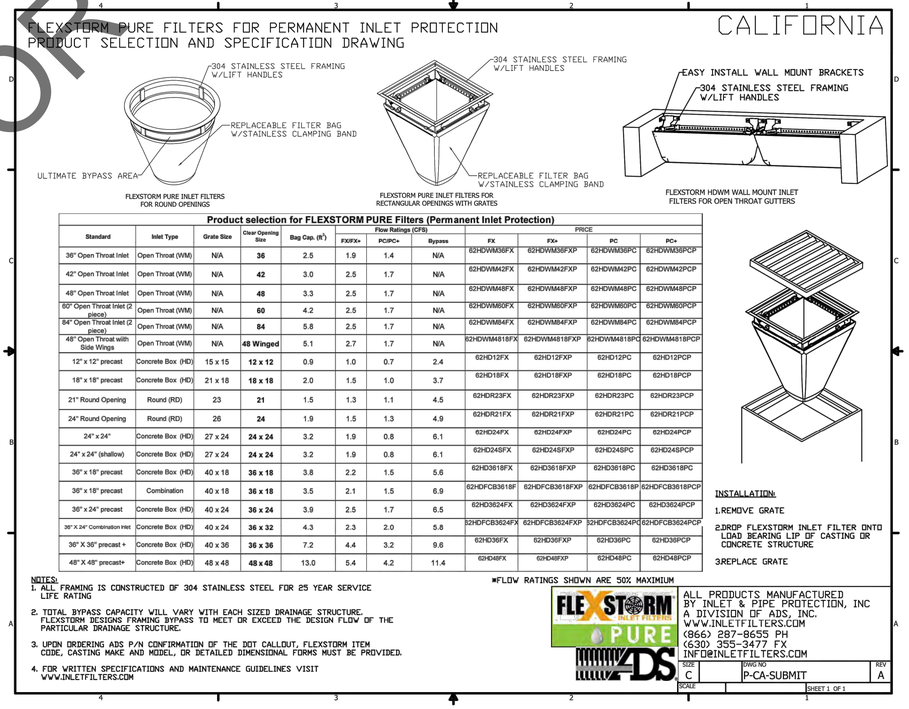







Return to Table of Contents

Underground Service Alert
CALL BEFORE YOU DIG
Call: TOLL FREE
1-800-227-2600
TWO WORKING DAYS BEFORE YOU DIG

BENCHMARK:
SEE ABOVE

PREPARED BY:
BONADIMAN
JOSEPH E. BONADIMAN & ASSOCIATES, INC.
ENGINEERS - L.S./L.A. - SURVEYING - PLANNING
TEL. (909) 885-3806
201 NORTH ARROWHEAD AVE.
SAN BERNARDINO, CA 92408
FAX (909) 381-1721
www.bonadiman.com
SCALE: NONE
DATE: 07-11-23

SEAL
REGISTERED PROFESSIONAL ENGINEER
JAMES T. STATLER
No. C-70944
Exp. 6-30-25
CIVIL
STATE OF CALIFORNIA

| DATE | BY | MARK | REVISIONS | APPR. | DATE |
|---|---|---|---|---|---|
| | | | | | |

DESIGNED BY: JTS DRAWN BY: JTS CHECKED BY: JTS

SAN BERNARDINO COUNTY
DEPARTMENT OF LAND USE SERVICES

GRADING PLAN

DETAILS
18313 VALLEY BLVD.
BLOOMINGTON,CA 92313

ROAD NO.
FILE NO.
SHEET 7 OF X

JOB #: 18454G DRAWING NAME: 225038 GP.dwg PLOT DATE: 07/14/2023 - 3:32PM

# SAN BERNARDINO COUNTY
# GRADING PLAN
## 18313 VALLEY BLVD.
## BLOOMINGTON,CA 92313

APN: 0260-061-18



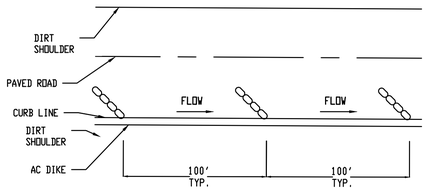
## EROSION CONTROL NOTES:

1. IN CASE OF EMERGENCY, CALL GREG DARLING AT (562) 595-4687.
2. POLLUTION AND EROSION PREVENTION MEASURES, ALSO KNOWN AS BEST MANAGEMENT PRACTICES (BMPS), MUST BE INSTALLED PRIOR TO GRADING. THESE MEASURES, INCLUDING THE PREVENTION OF SEDIMENTATION OR FLOOD DAMAGE, TO OFFSITE PROPERTY SHALL BE ADEQUATE WHETHER OR NOT AN EROSION CONTROL PERMIT IS REQUIRED.
3. ERODED SEDIMENTS AND OTHER POLLUTANTS MUST BE RETAINED ONSITE AND MAY NOT BE TRANSPORTED FROM THE SITE VIA SHEET FLOW, SWALES, AREA DRAINS, NATURAL DRAINAGE COURSES, OR WIND.
4. EROSION CONTROL DEVICES SHALL BE FUNCTIONING AT ALL TIMES. IN CASE OF FAILURE, RAPID CONSTRUCTION OF EMERGENCY DEVICES SHALL BE IMPLEMENTED.
5. STOCKPILES OF EARTH AND OTHER CONSTRUCTION-RELATED MATERIALS MUST BE PROTECTED FROM BEING TRANSPORTED FROM THE SITE BY THE FORCES OF WIND OR WATER.
6. FUELS, OILS, SOLVENTS, AND OTHER TOXIC MATERIALS MUST BE STORED IN ACCORDANCE WITH THEIR LISTING AND ARE NOT TO CONTAMINATE THE SOILS AND SURFACE WATERS. ALL APPROVED STORAGE CONTAINERS ARE TO BE PROTECTED FROM THE WEATHER. SPILLS MUST BE CLEANED UP IMMEDIATELY AND DISPOSED OF IN A PROPER MANNER. SPILLS MAY NOT BE WASHED INTO THE DRAINAGE SYSTEM.
7. EXCESS OR WASTE CONCRETE MUST BE CONTAINED ONSITE. PROVISIONS SHALL BE MADE TO RETAIN CONCRETE WASTES ONSITE UNTIL THEY CAN BE DISPOSED OF AS SOLID WASTE.
8. DEVELOPERS/CONTRACTORS ARE RESPONSIBLE TO ENSURE ALL EROSION CONTROL DEVICES AND BMPS ARE INSTALLED AND FUNCTIONING PROPERLY PER PLAN. PROPER PRECAUTION SHALL BE CONSIDERED WHEN 50% OR GREATER PROBABILITY OF PREDICTED PRECIPITATION, AND AFTER ACTUAL PRECIPITATION. A CONSTRUCTION SITE INSPECTION CHECKLIST AND INSPECTION LOG SHALL BE MAINTAINED AT THE PROJECT SITE AT ALL TIMES AND AVAILABLE FOR REVIEW BY THE BUILDING OFFICIAL.
9. TRASH AND CONSTRUCTION-RELATED SOLID WASTES MUST BE DEPOSITED INTO A COVERED RECEPTACLE TO PREVENT CONTAMINATION OF RAINWATER AND DISPERSAL BY WIND.
10. SEDIMENTS AND OTHER MATERIALS MAY NOT BE TRACKED FROM THE SITE BY VEHICLE TRAFFIC. THE CONSTRUCTION ENTRANCE ROADWAYS MUST BE STABILIZED SO AS TO INHIBIT SEDIMENTS FROM BEING DEPOSITED INTO THE PUBLIC WAY. ACCIDENTAL DEPOSITIONS MUST BE SWEPT UP IMMEDIATELY AND MAY NOT BE WASHED DOWN BY RAIN OR OTHER MEANS.
11. ANY SLOPES WITH DISTURBED SOILS OR DENUDED OF VEGETATION MUST BE STABILIZED SO AS TO INHIBIT EROSION BY WIND AND WATER.
12. ALL SILT AND DEBRIS SHALL BE REMOVED FROM ALL DEVICES WITHIN 24 HOURS AFTER EACH RAINSTORM AND BE DISPOSED OF PROPERLY.
13. ALL STORM WATER CAPTURE DEVICES SHALL BE PROTECTED AT ALL TIMES.

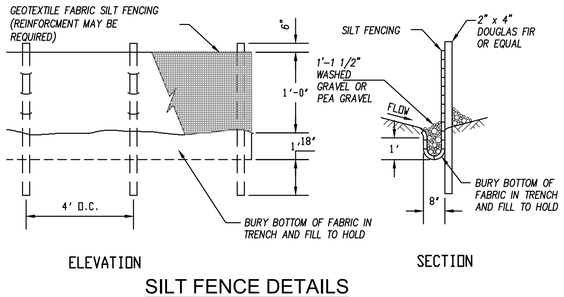

TYPICAL SECTION TYPICAL ELEVATION

NOTES: ALL CONSTRUCTED INLETS AND TEMPORARY INLETS SHALL BE GRAVELBAGGED PRIOR TO ANY ANTICIPATED RAINFALL.

### GRAVEL BAG BARRIER DETAILS
NOT TO SCALE




### GRAVEL BAG-CHECK DAM DETAIL
NOT TO SCALE




ELEVATION SECTION

### SILT FENCE DETAILS
NOT TO SCALE

## EROSION CONTROL:

EC1 – SCHEDULING
EC2 – PRESERVATION OF EXISTING VEGETATION
EC3 – HYDRAULIC MULCH
EC4 – HYDROSEEDING
EC5 – SOIL BINDERS
EC6 – STRAW MULCH
EC7 – GEOTEXTILES & MATS
EC8 – WOOD MULCHING
EC9 – EARTH DIKES AND DRAINAGE SWALES
EC10 – VELOCITY DISSIPATION DEVICES
EC11 – SLOPE DRAINS
EC12 – STREAMBANK STABILIZATION
EC13 – POLYACRYLAMIDE

## TEMPORARY SEDIMENT CONTROL:

SE1 – SILT FENCE
SE2 – SEDIMENT BASIN
SE3 – SEDIMENT TRAP
SE4 – CHECK DAM
SE5 – FIBER ROLLS
SE6 – GRAVEL BAG BERM
SE7 – STREET SWEEPING & VACUUMING
SE8 – GRAVELBAG BARRIER
SE9 – STRAW BALE BARRIER
SE10 – STORM DRAIN INLET PROTECTION

## WIND EROSION CONTROL:

WE1 – WIND EROSION CONTROL

## EQUIPMENT TRACKING CONTROL:

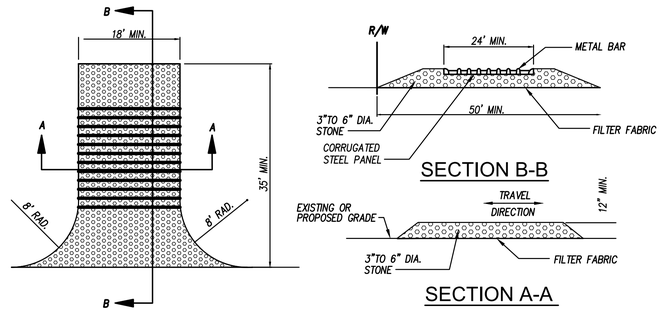
TC1 – STABILIZED CONSTRUCTION ENTRANCE/EXIT
TC2 – STABILIZED CONSTRUCTION ROADWAY
TC3 – ENTRANCE/OUTLET TIRE WASH

## WASTE MANAGEMENT& MATERIAL POLLUTION CONTROL:

WM1 – MATERIAL DELIVERY AND STORAGE
WM2 – MATERIAL USE
WM3 – STOCKPILE MANAGEMENT
WM4 – SPILL PREVENTION AND CONTROL
WM5 – SOLID WASTE MANAGEMENT
WM6 – HAZARDOUS WASTE MANAGEMENT
WM7 – CONTAMINATION SOIL MANAGEMENT
WM8 – CONCRETE WASTE MANAGEMENT
WM9 – SANITARY/SEPTIC WASTE MANAGEMENT
WM10 – LIQUID WASTE MANAGEMENT

## NON-STORMWATER MANAGEMENT:

NS1 – WATER CONSERVATION PRACTICES
NS2 – DEWATERING OPERATIONS
NS3 – PAVING AND GRINDING OPERATIONS
NS4 – TEMPORARY STREAM CROSSING
NS5 – CLEAR WATER DIVERSION
NS6 – ILLICIT CONNECTION/DISCHARGE
NS7 – POTABLE WATER/IRRIGATION
NS8 – VEHICLE AND EQUIPMENT CLEANING
NS9 – VEHICLE AND EQUIPMENT FUELING
NS10 – VEHICLE AND EQUIPMENT MAINTENANCE
NS11 – PILE DRIVING OPERATIONS
NS12 – CONCRETE CURING
NS13 – CONCRETE FINISHING
NS14 – MATERIAL AND EQUIPMENT USE
NS15 – DEMOLITION ADJACENT TO WATER
NS16 – TEMPORARY BATCH PLANTS




### STABILIZED CONSTRUCTION ENTRANCE/EXIT DETAILS
NOT TO SCALE

LEGEND:

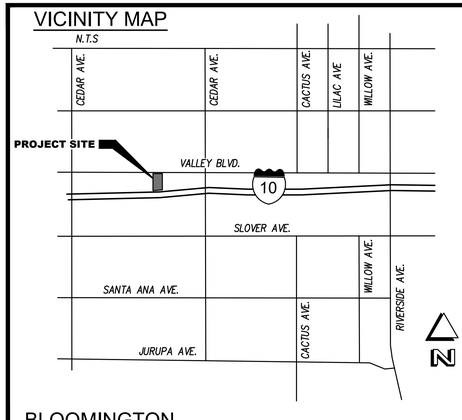
GRAVEL BAGS TO BE PLACED PER PLAN
SILT FENCE TO BE PLACED PER PLAN
STABILIZED CONSTRUCTION ENTRANCE/EXIT

## 24 HR CONTACT PERSON

NAME: X

PHONE:(XXX) XXX-XXXX

## VICINITY MAP




BLOOMINGTON

Underground Service Alert
CALL BEFORE YOU DIG
Call: TOLL FREE
1-800-227-2600
TWO WORKING DAYS BEFORE YOU DIG

BENCHMARK:
SEE ABOVE

PREPARED BY:
BONADIMAN
JOSEPH E. BONADIMAN & ASSOCIATES, INC.
ENGINEERS - W.R. - SURVEYING - PLANNING
TEL. (909) 885-3806
294 NORTH ARROWHEAD AVE.
SAN BERNARDINO, CA 92408
FAX (909) 381-1721
www.bonadiman.com

SCALE: NONE
DATE: 07-11-23

SEAL
REGISTERED PROFESSIONAL ENGINEER
JAMES T. STANTON
No. C-70944
Exp. 6-30-25
CIVIL
STATE OF CALIFORNIA

| DATE | BY | MARK | REVISIONS | APPR. | DATE |
|---|---|---|---|---|---|
| | | | | | |

DESIGNED BY: JTS DRAWN BY: JTS CHECKED BY: JTS

SAN BERNARDINO COUNTY
DEPARTMENT OF LAND USE SERVICES

GRADING PLAN

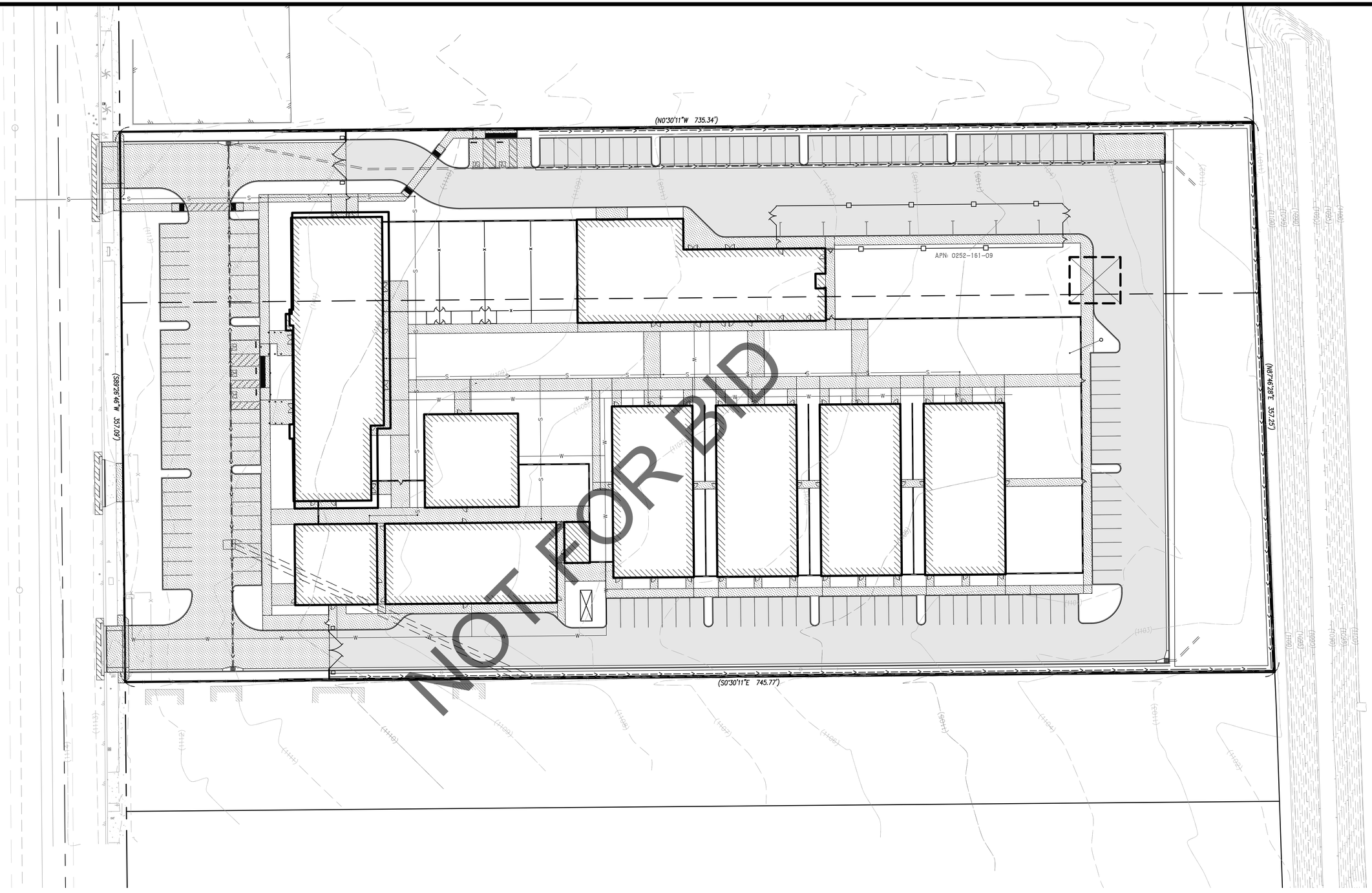
EROSION CONTROL
18313 VALLEY BLVD.
BLOOMINGTON,CA 92313

ROAD NO.

FILE NO.

SHEET 8 OF X

JOB #: 184546 DRAWING NAME: 225038 GP.dwg PLOT DATE: 07/14/2023 - 3:32PM




Underground Service Alert

CALL BEFORE YOU DIG

Call: TOLL FREE

1-800-227-2600

TWO WORKING DAYS BEFORE YOU DIG

BENCHMARK:

*SEE ABOVE*

**PREPARED BY:**

BONADIMAN

JOSEPH E. BONADIMAN & ASSOCIATES, INC.
ENGINEERS - G.I.S. - SURVEYING - PLANNING

TEL. (909) 885-3806
261 NORTH ARROWHEAD AVE.
SAN BERNARDINO, CA 92408

FAX (909) 381-1721
www.bonadiman.com

SCALE: NONE

DATE: 07-11-23

SEAL

REGISTERED PROFESSIONAL ENGINEER
JAMES T. STANTON
No. C-70944
Exp. 6-30-25
CIVIL
STATE OF CALIFORNIA

| DATE | BY | MARK | REVISIONS | APPR. | DATE |
|---|---|---|---|---|---|
| | | | | | |

ENGINEER

DESIGNED BY: JTS DRAWN BY: JTS CHECKED BY: JTS

SAN BERNARDINO COUNTY
DEPARTMENT OF LAND USE SERVICES

GRADING PLAN

EROSION CONTROL
18313 VALLEY BLVD.
BLOOMINGTON,CA 92313

ROAD NO.

FILE NO.

SHEET 9 OF X

JOB #: 184546 DRAWING NAME: 225038 GP.dwg PLOT DATE: 07/14/2023 - 3:33PM

# APPENDIX 11

# NOISE IMPACT ANALYSIS

# San Bernardino Animal Care Center

## NOISE IMPACT ANALYSIS

### COUNTY OF SAN BERNARDINO

PREPARED BY:

William Maddux
bmaddux@urbanxroads.com
(619) 788-1971

DECEMBER 8, 2023

# TABLE OF CONTENTS

**TABLE OF CONTENTS** ..... I
**APPENDICES** ..... II
**LIST OF EXHIBITS** ..... II
**LIST OF TABLES** ..... II
**LIST OF ABBREVIATED TERMS** ..... III
**EXECUTIVE SUMMARY** ..... 1
**1 INTRODUCTION** ..... 3
1.1 Site Location ..... 3
1.2 Project Description ..... 3
**2 FUNDAMENTALS** ..... 7
2.1 Range of Noise ..... 7
2.2 Noise Descriptors ..... 8
2.3 Sound Propagation ..... 8
2.4 Noise Control ..... 10
2.5 Noise Barrier Attenuation ..... 10
2.6 Land Use Compatibility With Noise ..... 10
2.7 Community Response to Noise ..... 10
2.8 Vibration ..... 11
**3 REGULATORY SETTING** ..... 15
3.1 State of California Noise Requirements ..... 15
3.2 County of San Bernardino Development Code ..... 15
3.3 Construction Noise Standards ..... 17
3.4 Construction Vibration Standards ..... 18
**4 SIGNIFICANCE CRITERIA** ..... 19
4.1 CEQA Guidelines Not Further Analyzed ..... 19
4.2 Noise-Sensitive Receivers ..... 19
4.3 Significance Criteria Summary ..... 20
**OFF-SITE** ..... 21
**NOISE- SENSITIVE[1]** ..... 21
**IF AMBIENT IS < 60 DBA CNEL** ..... 21
**≥ 5 DBA CNEL PROJECT INCREASE** ..... 21
**IF AMBIENT IS 60 - 65 DBA CNEL** ..... 21
**≥ 3 DBA CNEL PROJECT INCREASE** ..... 21
**IF AMBIENT IS > 65 DBA CNEL** ..... 21
**≥ 1.5 DBA CNEL PROJECT INCREASE** ..... 21
**5 EXISTING NOISE LEVEL MEASUREMENTS** ..... 23
5.1 Measurement Procedure and Criteria ..... 23
5.2 Noise Measurement Locations ..... 23
5.3 Noise Measurement Results ..... 24
**6 OFF-SITE TRANSPORTATION NOISE IMPACTS** ..... 27
**7 SENSITIVE RECEIVER LOCATIONS** ..... 29
**8 OPERATIONAL NOISE IMPACTS** ..... 31

8.1 Operational Noise Sources ..... 31
8.2 Reference Noise Levels ..... 31
8.2.1 Measurement Procedures ..... 31
8.3 CadnaA Noise Prediction Model ..... 34
8.4 Project Operational Noise Levels ..... 35
8.5 Project Operational Noise Level Compliance ..... 36
8.6 Project Operational Noise Level Increases ..... 36
**9 CONSTRUCTION IMPACTS ..... 39**
9.1 Construction Noise Levels ..... 39
9.2 Typical Construction Reference Noise Levels ..... 39
9.3 Construction Noise Analysis ..... 41
9.4 Construction Noise Level Compliance ..... 42
9.6 Construction Vibration Impacts ..... 43
**10 REFERENCES ..... 45**
**11 CERTIFICATION ..... 47**

## APPENDICES

**APPENDIX 3.1: COUNTY OF SAN BERNARDINO MUNICIPAL CODE**
**APPENDIX 5.1: NOISE LEVEL MEASUREMENT WORKSHEETS**
**APPENDIX 8.1: CADNAA OPERATIONAL NOISE MODEL INPUTS**
**APPENDIX 9.1: CADNAA CONSTRUCTION NOISE MODEL INPUTS**

## LIST OF EXHIBITS

**EXHIBIT 1-A: LOCATION MAP ..... 4**
**EXHIBIT 1-B: SITE PLAN ..... 5**
**EXHIBIT 2-A: TYPICAL NOISE LEVELS ..... 7**
**EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION ..... 11**
**EXHIBIT 2-C: TYPICAL LEVELS OF GROUND-BORNE VIBRATION ..... 13**
**EXHIBIT 3-A: COUNTY OF SAN BERNARDINO MOBILE NOISE LEVEL STANDARDS ..... 16**
**EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS ..... 25**
**EXHIBIT 7-A: SENSITIVE RECEIVER LOCATIONS ..... 30**
**EXHIBIT 8-A: OPERATIONAL NOISE SOURCE LOCATIONS ..... 32**
**EXHIBIT 9-A: CONSTRUCTION NOISE ACTIVITY ..... 40**

## LIST OF TABLES

**TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS ..... 1**
**TABLE 3-1: OPERATIONAL NOISE LEVEL STANDARDS ..... 17**
**TABLE 4-1: SIGNIFICANCE CRITERIA SUMMARY ..... 21**
**TABLE 5-1: 24-HOUR AMBIENT NOISE LEVEL MEASUREMENTS ..... 24**
**TABLE 8-1: REFERENCE NOISE LEVEL MEASUREMENTS ..... 33**
**TABLE 8-2: DAYTIME PROJECT OPERATIONAL NOISE LEVELS ..... 35**
**TABLE 8-3: NIGHTTIME PROJECT OPERATIONAL NOISE LEVELS ..... 36**
**TABLE 8-4: OPERATIONAL NOISE LEVEL COMPLIANCE ..... 36**
**TABLE 8-5: DAYTIME PROJECT OPERATIONAL NOISE LEVEL INCREASES ..... 38**
**TABLE 8-6: NIGHTTIME OPERATIONAL NOISE LEVEL INCREASES ..... 38**

**TABLE 9-1: CONSTRUCTION REFERENCE NOISE LEVELS ..... 41**
**TABLE 9-2: CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY..... 42**
**TABLE 9-3: CONSTRUCTION NOISE LEVEL COMPLIANCE..... 42**
**TABLE 9-4: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT ..... 43**
**TABLE 9-5: PROJECT CONSTRUCTION VIBRATION LEVELS..... 44**

## LIST OF ABBREVIATED TERMS

| | |
|---|---|
| (1) | Reference |
| ADT | Average Daily Traffic |
| ANSI | American National Standards Institute |
| Calveno | California Vehicle Noise |
| CEQA | California Environmental Quality Act |
| CNEL | Community Noise Equivalent Level |
| dBA | A-weighted decibels |
| EPA | Environmental Protection Agency |
| FHWA | Federal Highway Administration |
| FTA | Federal Transit Administration |
| INCE | Institute of Noise Control Engineering |
| $L_{eq}$ | Equivalent continuous (average) sound level |
| $L_{max}$ | Maximum level measured over the time interval |
| $L_{min}$ | Minimum level measured over the time interval |
| mph | Miles per hour |
| OPR | Office of Planning and Research |
| PPV | Peak particle velocity |
| Project | San Bernardino Animal Care Center |
| REMEL | Reference Energy Mean Emission Level |
| RMS | Root-mean-square |
| VdB | Vibration Decibels |

*This page intentionally left blank*

# EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the potential noise impacts and the necessary noise mitigation measures, if any, for San Bernardino Animal Care Center development ("Project"). The proposed Project consists of a new 14,826 square foot (sf) administrative office building, five dog housing/kennel buildings at 5,824-sf each (totaling 29,120 sf), two smaller dog housing/kennel buildings at 3,363-sf each (totaling 6,726-sf), a 2,758-sf medical clinic, a 8,896-sf support building, a 5,830-sf cat and other animal housing building, a 5,934-sf medical dog building, a 436-sf Euthanasia building, and 540-sf car wash (total of 74,391-sf). This study has been prepared to satisfy applicable County of San Bernardino standards and thresholds of significance based on guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1)

The results of this San Bernardino Animal Care Center Noise Impact Analysis are summarized below based on the significance criteria in Section 4 of this report. Table ES-1 shows the findings of significance for each potential noise and/or vibration impact under CEQA before and after any required mitigation measures.

**TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS**

| Analysis | Report Section | Significance Findings | |
|---|---|---|---|
| | | Unmitigated | Mitigated |
| Off-site Traffic | 6 | *Less Than Significant* | - |
| Operational Noise | 8 | *Less Than Significant* | - |
| Construction Noise | 9 | *Less Than Significant* | - |
| Construction Vibration | | *Less Than Significant* | - |

*This page intentionally left blank*

# 1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of San Bernardino Animal Care Center ("Project"). This noise study briefly describes the proposed Project, provides information regarding noise fundamentals, sets out the local regulatory setting, and evaluates the potential Project-related long-term stationary-source operational noise and short-term construction noise and vibration impacts.

## 1.1 SITE LOCATION

The San Bernardino Animal Care Center Project is located north of San Bernardino Freeway and south of Valley Boulevard, in the Bloomington area in the County of San Bernardino, as shown on Exhibit 1-A.

## 1.2 PROJECT DESCRIPTION

The proposed Project site is approximately 6.0-acres in size. The existing Devore Animal Shelter has currently exceeded its useful life span and is unable to accommodate the growth required due to existing facility deterioration, limited wastewater and sewage capacity, remote location, and other factors. As such, the Project is proposed to enhance services and expand capacity and additional work areas to accommodate the growth of the Animal Care Division.

The Project will include enhanced services, expanded capacity, and additional work areas to accommodate the growth of the Animal Care Division. The new facility will increase animal housing units to allow the County to serve additional municipalities in the Central Valley Region of the County. Program services will be enhanced to include a veterinary clinic; expanded pet adoption areas; animal exercise play yard; increased staffing work areas; volunteer work areas; expanded parking and other provisions to allow the Division to accommodate growth and increased demand for services. The new shelter will consist of a two-story, 14,691 square-foot (sf) administrative office building, seven dog housing/kennel buildings totaling 35,846-sf, a 2,758-sf medical clinic, 8,896-sf support building, 5830-sf cat and other animal housing building, 5,934-sf medical dog building with a 436-sf euthanasia facility, and 540-sf car wash structure (total of 74,391-sf). The preliminary Project site plan is shown on Exhibit 1-B.

The on-site Project-related noise sources are expected to include: kennels, dog yards/parks, air conditioning units, parking lot vehicle movements, an emergency generator, and trash enclosure activity. This noise analysis is intended to describe noise level impacts associated with the expected typical operational activities at the Project site.

## EXHIBIT 1-A: LOCATION MAP

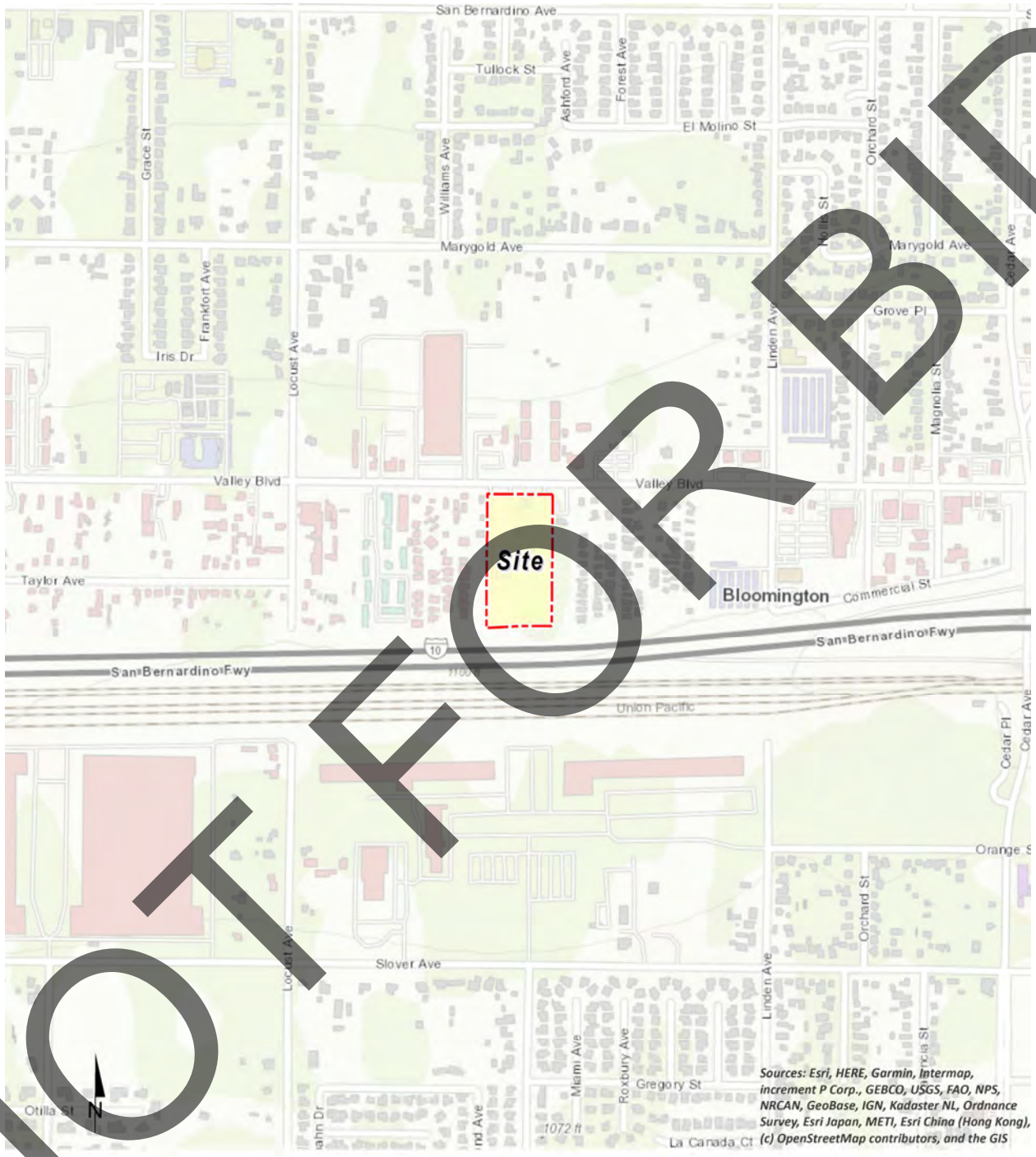
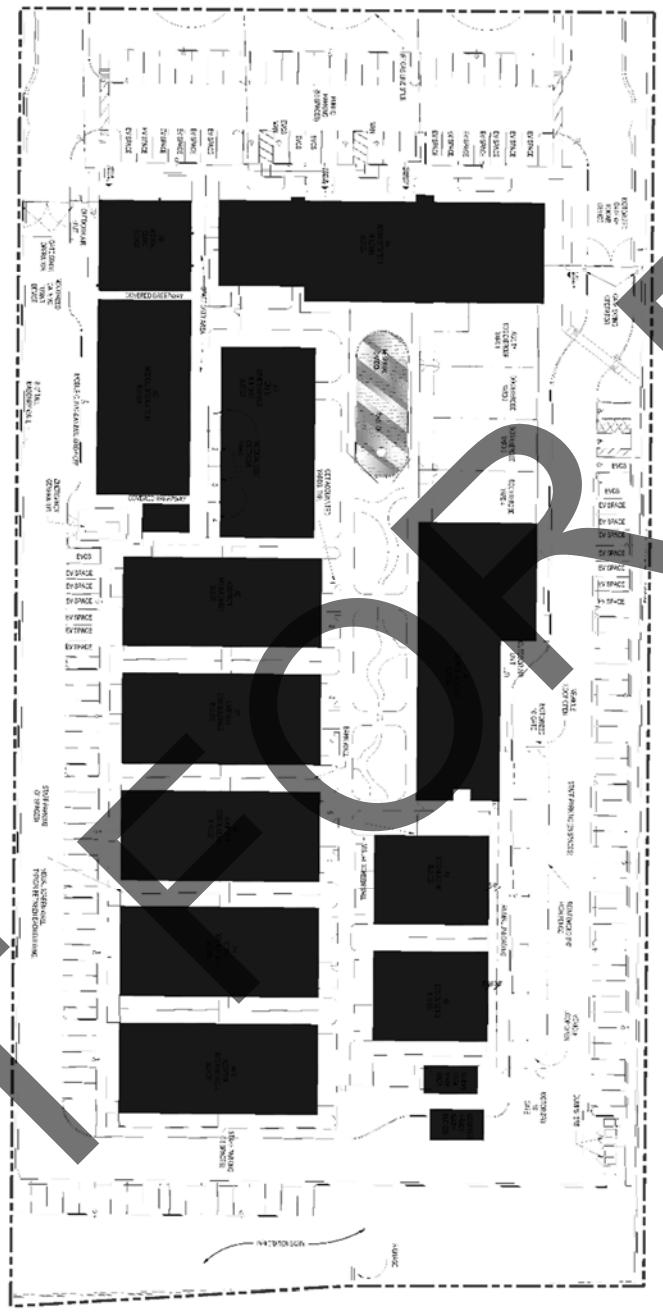


**EXHIBIT 1-B: SITE PLAN**



*This page intentionally left blank*

# 2 FUNDAMENTALS

Noise is simply defined as "unwanted sound." Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Noise is measured on a logarithmic scale of sound pressure level known as a decibel (dB). A-weighted decibels (dBA) approximate the subjective response of the human ear to broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies which are audible to the human ear. Exhibit 2-A presents a summary of the typical noise levels and their subjective loudness and effects that are described in more detail below.

**EXHIBIT 2-A: TYPICAL NOISE LEVELS**

| COMMON OUTDOOR ACTIVITIES | COMMON INDOOR ACTIVITIES | A - WEIGHTED SOUND LEVEL dBA | SUBJECTIVE LOUDNESS | EFFECTS OF NOISE |
|---|---|---|---|---|
| THRESHOLD OF PAIN | | 140 | INTOLERABLE OR DEAFENING | HEARING LOSS |
| NEAR JET ENGINE | | 130 | | |
| | | 120 | | |
| JET FLY-OVER AT 300m (1000 ft) | ROCK BAND | 110 | | |
| LOUD AUTO HORN | | 100 | VERY NOISY | |
| GAS LAWN MOWER AT 1m (3 ft) | | 90 | | |
| DIESEL TRUCK AT 15m (50 ft), at 80 km/hr (50 mph) | FOOD BLENDER AT 1m (3 ft) | 80 | | SPEECH INTERFERENCE |
| NOISY URBAN AREA, DAYTIME | VACUUM CLEANER AT 3m (10 ft) | 70 | LOUD | |
| HEAVY TRAFFIC AT 90m (300 ft) | NORMAL SPEECH AT 1m (3 ft) | 60 | | |
| QUIET URBAN DAYTIME | LARGE BUSINESS OFFICE | 50 | MODERATE | SLEEP DISTURBANCE |
| QUIET URBAN NIGHTTIME | THEATER, LARGE CONFERENCE ROOM (BACKGROUND) | 40 | | |
| QUIET SUBURBAN NIGHTTIME | LIBRARY | 30 | FAINT | NO EFFECT |
| QUIET RURAL NIGHTTIME | BEDROOM AT NIGHT, CONCERT HALL (BACKGROUND) | 20 | | |
| | BROADCAST/RECORDING STUDIO | 10 | VERY FAINT | |
| LOWEST THRESHOLD OF HUMAN HEARING | LOWEST THRESHOLD OF HUMAN HEARING | 0 | | |

## 2.1 RANGE OF NOISE

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud jet engine noises equate to 110 dBA at approximately 100 feet, which can cause serious discomfort. (2) Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

## 2.2 NOISE DESCRIPTORS

Environmental noise descriptors are generally based on averages, rather than instantaneous, noise levels. The most used figure is the equivalent level ($L_{eq}$). Equivalent sound levels are not measured directly but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level ($L_{eq}$) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period (typically one hour) and is commonly used to describe the "average" noise levels within the environment.

To describe the time-varying character of environmental noise, the statistical or percentile noise descriptors $L_{50}$, $L_{25}$, $L_8$ and $L_2$, are commonly used. The percentile noise descriptors are the noise levels equaled or exceeded during 50 percent, 25 percent, 8 percent and 2 percent of a stated time. Sound levels associated with the $L_2$ and $L_8$ typically describe transient or short-term events, while levels associated with the $L_{50}$ describe the steady state (or median) noise conditions. The relies on the percentile noise levels to describe the stationary source noise level limits. While the $L_{50}$ describes the noise levels occurring 50 percent of the time, the $L_{eq}$ accounts for the total energy (average) observed for the entire hour.

Peak hour or average noise levels, while useful, do not completely describe a given noise environment. Noise levels lower than peak hour may be disturbing if they occur during times when quiet is most desirable, namely evening and nighttime (sleeping) hours. To account for this, the Community Noise Equivalent Level (CNEL), representing a composite 24-hour noise level is utilized. The CNEL is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time-of-day corrections require the addition of 5 decibels to dBA $L_{eq}$ sound levels in the evening from 7:00 p.m. to 10:00 p.m., and the addition of 10 decibels to dBA $L_{eq}$ sound levels at night between 10:00 p.m. and 7:00 a.m. These additions are made to account for the noise sensitive time periods during the evening and night hours when sound appears louder. CNEL does not represent the actual sound level heard at any time, but rather represents the total sound exposure. The County of San Bernardino relies on the 24-hour CNEL level to assess land use compatibility with transportation related noise sources.

Sound levels used for compliance modeling, sound level limitations on equipment, and product labeling use another descriptor, known and the sound power level (Lw). Sound power is the rate at which sound energy is emitted from a source per unit time. Knowing the sound power level of a device allows for the objective comparison of the sound output of different devices, without any knowledge of the environment in which they were tested or the distance at which measurements were taken. This makes sound power levels ideal for verifying compliance with property line noise level limits.

## 2.3 SOUND PROPAGATION

When sound propagates over a distance, it changes in level and frequency content. The way noise reduces with distance depends on the following factors.

### 2.3.1 GEOMETRIC SPREADING

Sound from a localized source (i.e., a stationary point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source. (3)

### 2.3.2 GROUND ABSORPTION

The propagation path of noise from a highway to a receiver is usually very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually sufficiently accurate for distances of less than 200 ft. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receiver such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance from a line source. (4)

### 2.3.3 ATMOSPHERIC EFFECTS

Receivers located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects. (3)

### 2.3.4 SHIELDING

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Shielding by trees and other such vegetation typically only has an “out of sight, out of mind” effect. That is, the perception of noise impact tends to decrease when vegetation blocks the line-of-sight to nearest residents. However, for vegetation to provide a substantial, or even noticeable, noise reduction, the vegetation area must be at least 15 feet in height, 100 feet wide and dense enough to completely obstruct the line-of sight between the source and the receiver. This size of vegetation may provide up to 5 dBA of noise reduction. The Federal Highway Administration (FHWA) does not consider the planting of vegetation to be a noise abatement measure. (4)

### 2.3.5 REFLECTION

Field studies conducted by the FHWA have shown that the reflection from barriers and buildings does not substantially increase noise levels. (4) If all the noise striking a structure was reflected back to a given receiving point, the increase would be theoretically limited to 3 dBA. Further, not all the acoustical energy is reflected back to same point. Some of the energy would go over the structure, some is reflected to points other than the given receiving point, some is scattered by ground coverings (e.g., grass and other plants), and some is blocked by intervening structures and/or obstacles (e.g., the noise source itself). Additionally, some of the reflected energy is lost due to the longer path that the noise must travel. FHWA measurements made to quantify reflective increases in traffic noise have not shown an increase of greater than 1-2 dBA; an increase that is not perceptible to the average human ear.

## 2.4 NOISE CONTROL

Noise control is the process of obtaining an acceptable noise environment for an observation point or receiver by controlling the noise source, transmission path, receiver, or all three. This concept is known as the source-path-receiver concept. In general, noise control measures can be applied to these three elements.

## 2.5 NOISE BARRIER ATTENUATION

Effective noise barriers can reduce noise levels by up to 10 to 15 dBA, cutting the loudness of traffic noise in half. A noise barrier is most effective when placed close to the noise source or receiver. Noise barriers, however, do have limitations. For a noise barrier to work, it must be high enough and long enough to block the path of the noise source. (4)

## 2.6 LAND USE COMPATIBILITY WITH NOISE

Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are more sensitive to noise intrusion than are commercial or industrial developments and related activities. As ambient noise levels affect the perceived amenity or livability of a development, so too can the mismanagement of noise impacts impair the economic health and growth potential of a community by reducing the area's desirability as a place to live, shop and work. For this reason, land use compatibility with the noise environment is an important consideration in the planning and design process. The FHWA encourages State and Local government to regulate land development in such a way that noise-sensitive land uses are either prohibited from being located adjacent to a highway, or that the developments are planned, designed, and constructed in such a way that noise impacts are minimized. (5)

## 2.7 COMMUNITY RESPONSE TO NOISE

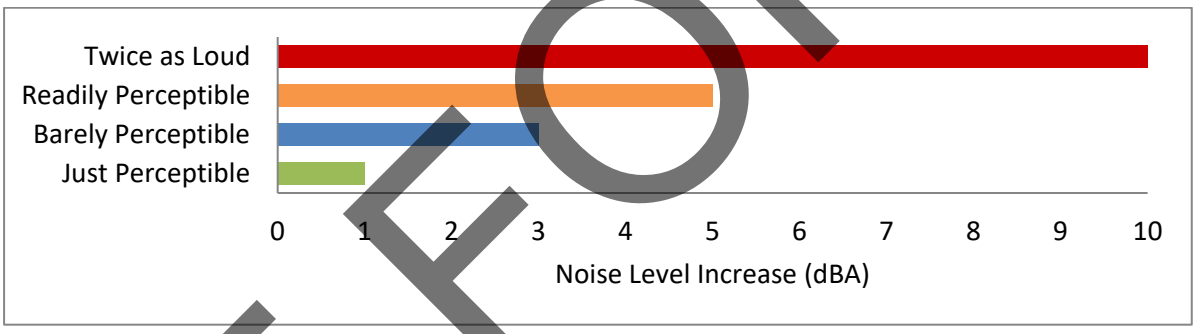
Community responses to noise may range from registering a complaint by telephone or letter, to initiating court action, depending upon everyone's susceptibility to noise and personal attitudes about noise. Several factors are related to the level of community annoyance including:

- Fear associated with noise producing activities;

- Socio-economic status and educational level;
- Perception that those affected are being unfairly treated;
- Attitudes regarding the usefulness of the noise-producing activity;
- Belief that the noise source can be controlled.

Approximately ten percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints will occur. Twenty-five percent of the population will not complain even in very severe noise environments. Thus, a variety of reactions can be expected from people exposed to any given noise environment. (6) Surveys have shown that about ten percent of the people exposed to traffic noise of 60 dBA will report being highly annoyed with the noise, and each increase of one dBA is associated with approximately two percent more people being highly annoyed. When traffic noise exceeds 60 dBA or aircraft noise exceeds 55 dBA, people may begin to complain. (6) Despite this variability in behavior on an individual level, the population can be expected to exhibit the following responses to changes in noise levels as shown on Exhibit 2-B. A change of 3 dBA are considered *barely perceptible*, and changes of 5 dBA are considered *readily perceptible*. (4)

**EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION**




## 2.8 VIBRATION

Per the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual*, vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure-borne noise. Sources of ground-borne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such as explosions. As is the case with airborne sound, ground-borne vibrations may be described by amplitude and frequency.

Additionally, in contrast to airborne noise, ground-borne vibration outdoors is not a common environmental problem and annoyance from ground-borne vibration is almost exclusively an indoor phenomenon (7). Therefore, the effects of vibrations should only be evaluated at a structure and the effects of the building structure on the vibration should be considered. Wood-frame buildings, such as typical residential structures, are more easily excited by ground vibration than heavier buildings. In contrast, large masonry buildings with spread footings have a low

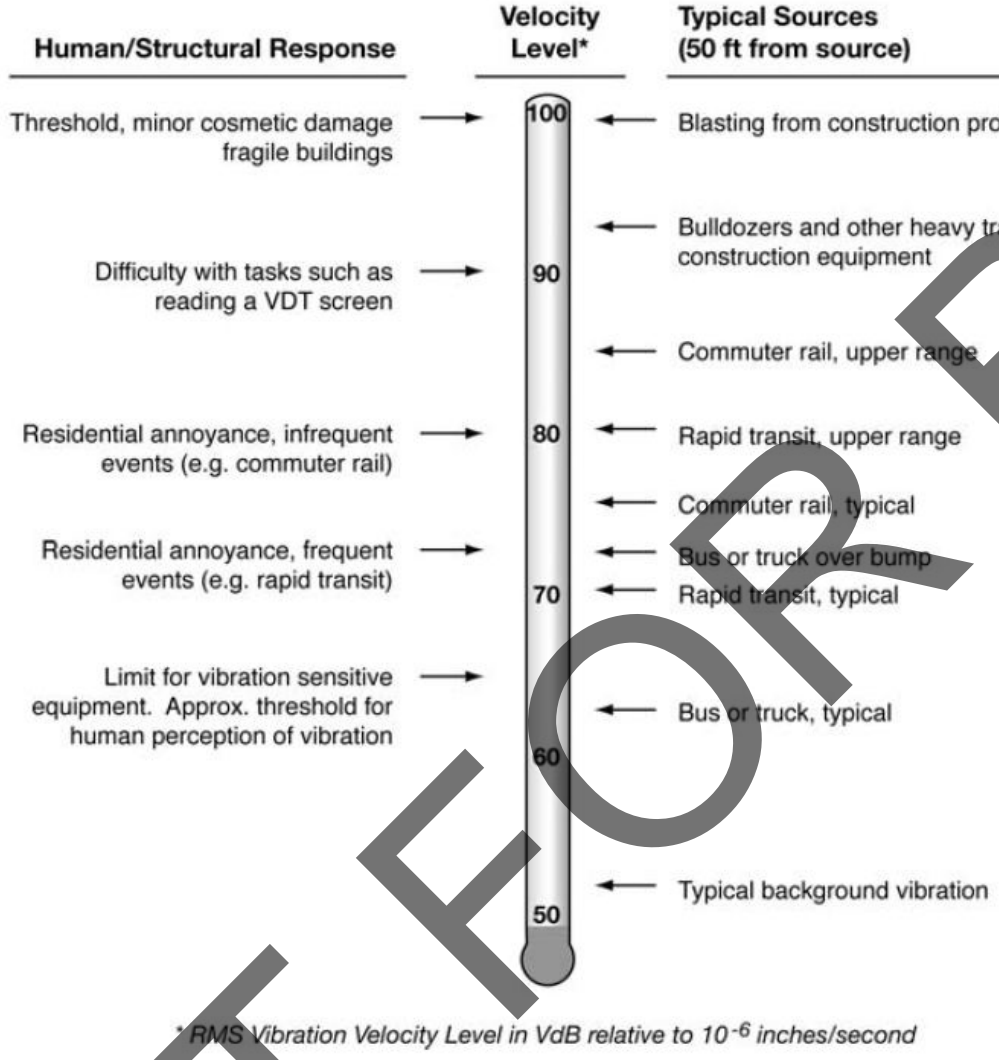
response to ground vibration (7). In general, the heavier a building is, the lower the response will be to the incident vibration energy. However, all structurers reduce vibration levels due to the coupling of the building to the soil.

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal (7). The PPV is most frequently used to describe vibration impacts to buildings but is not always suitable for evaluating human response (annoyance) because it takes some time for the human body to respond to vibration signals. Instead, the human body responds to average vibration amplitude often described as the root mean square (RMS). The RMS amplitude is defined as the average of the squared amplitude of the signal and is most frequently used to describe the effect of vibration on the human body (7). However, the RMS amplitude and PPV are related mathematically, and the RMS amplitude of equipment is typically calculated from the PPV reference level. The RMS amplitude is approximately 70% of the PPV (8). Thus, either can be used on the description of vibration impacts.

While not universally accepted, vibration decibel notation (VdB) is another vibration notation developed and used by the FTA in their guidance manual to describe vibration levels and provide a background of common vibration levels and set vibration limits (9). Decibel notation (VdB) serves to reduce the range of numbers used to describe vibration levels and is used in this report to describe vibration levels.

As stated in the FTA guidance manual, the background vibration-velocity level in residential areas is generally 50 VdB. Ground-borne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground-borne vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Exhibit 2-C illustrates common vibration sources and the human and structural response to ground-borne vibration.

**EXHIBIT 2-C: TYPICAL LEVELS OF GROUND-BORNE VIBRATION**




Source: Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual.

*This page intentionally left blank*

# 3 REGULATORY SETTING

To limit population exposure to physically and/or psychologically damaging as well as intrusive noise levels, the federal government, the State of California, various county governments, and most municipalities in the state have established standards and ordinances to control noise. In most areas, automobile and truck traffic is the major source of environmental noise. Traffic activity generally produces an average sound level that remains constant with time. Air and rail traffic, and commercial and industrial activities are also major sources of noise in some areas. Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies.

## 3.1 STATE OF CALIFORNIA NOISE REQUIREMENTS

The State of California regulates freeway noise, sets standards for sound transmission, provides occupational noise control criteria, identifies noise standards, and provides guidance for local land use compatibility. State law requires that each county and city adopt a General Plan that includes a Noise Element which is to be prepared per guidelines adopted by the Governor's Office of Planning and Research (OPR). (10) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*. In addition, the California Environmental Quality Act (CEQA) requires that all known environmental effects of a project be analyzed, including environmental noise impacts.

## 3.2 COUNTY OF SAN BERNARDINO DEVELOPMENT CODE

While the County of San Bernardino Hazards Element provides guidelines and criteria to assess transportation noise on sensitive land uses, the County Code, Title 8 Development Code contains the noise level limits for mobile, stationary, and construction-related noise sources. (11)

### 3.2.1 TRANSPORTATION NOISE STANDARDS

Section 83.01.080(d), Table 83-3, contains the County of San Bernardino's mobile noise source-related standards, shown on Exhibit 3-A. Based on the County's mobile noise source standards, there are no exterior noise level standards for the Project commercial land use. Exterior transportation (mobile) noise level standards for residential land uses in the Project study area are shown to be 60 dBA CNEL, while non-noise-sensitive land uses, such as office uses, require exterior noise levels of 65 dBA CNEL per the County's Table 83-3 mobile noise source standards.

**EXHIBIT 3-A: COUNTY OF SAN BERNARDINO MOBILE NOISE LEVEL STANDARDS**

| *Noise Standards for Adjacent Mobile Noise Sources* | | | |
|---|---|---|---|
| *Land Use* | | *Ldn (or CNEL) dB(A)* | |
| *Categories* | *Uses* | *Interior (1)* | *Exterior (2)* |
| Residential | Single and multi-family, duplex, mobile homes | 45 | 60(3) |
| Commercial | Hotel, motel, transient housing | 45 | 60(3) |
| | Commercial retail, bank, restaurant | 50 | N/A |
| | Office building, research and development, professional offices | 45 | 65 |
| | Amphitheater, concert hall, auditorium, movie theater | 45 | N/A |
| Institutional/Public | Hospital, nursing home, school classroom, religious institution, library | 45 | 65 |
| Open Space | Park | N/A | 65 |

Notes:

(1) The indoor environment shall exclude bathrooms, kitchens, toilets, closets and corridors.

(2) The outdoor environment shall be limited to:

- Hospital/office building patios
- Hotel and motel recreation areas
- Mobile home parks
- Multi-family private patios or balconies
- Park picnic areas
- Private yard of single-family dwellings
- School playgrounds

(3) An exterior noise level of up to 65 dB(A) (or CNEL) shall be allowed provided exterior noise levels have been substantially mitigated through a reasonable application of the best available noise reduction technology, and interior noise exposure does not exceed 45 dB(A) (or CNEL) with windows and doors closed. Requiring that windows and doors remain closed to achieve an acceptable interior noise level shall necessitate the use of air conditioning or mechanical ventilation.

CNEL = (Community Noise Equivalent Level). The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and ten decibels to sound levels in the night from 10:00 p.m. to 7:00 a.m.

*Source: County of San Bernardino County Code, Title 8 Development Code, Table 83-3.*

### 3.2.2 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property such as the San Bernardino Animal Care Center Project, stationary-source (operational) noise such as the expected kennels, dog yards/parks, air conditioning units, parking lot vehicle movements, an emergency generator, and trash enclosure activity are typically evaluated against standards established under a jurisdiction's Municipal Code. The County of San Bernardino County Code, Title 8 Development Code, Section 83.01.080(c) establishes the noise level standards for stationary noise sources. Since the Project's land use will potentially impact adjacent noise-sensitive uses in the Project study area, this noise study relies on the more conservative residential noise level standards to describe potential operational noise impacts.

For residential properties, the exterior noise level shall not exceed 55 dBA $L_{eq}$ during the daytime hours (7:00 a.m. to 10:00 p.m.) and 45 dBA $L_{eq}$ during the nighttime hours (10:00 p.m. to 7:00 a.m.) for both the whole hour, and for not more than 30 minutes in any hour. (11) The exterior noise level standards shall apply for a cumulative period of 30 minutes in any hour, as well as the standard plus 5 dBA cannot be exceeded for a cumulative period of more than 15 minutes in any hour, or the standard plus 10 dBA for a cumulative period of more than 5 minutes in any hour,

or the standard plus 15 dBA for a cumulative period of more than 1 minute in any hour, or the standard plus 20 dBA for any period of time. Further, Section 83.01.080(e) indicates that if the existing ambient noise level already exceeds any of the exterior noise level limit categories, then the standard shall be adjusted to reflect the ambient conditions. The County of San Bernardino operational noise level standards are shown on Table 3-1 and included in Appendix 3.1.

**TABLE 3-1: OPERATIONAL NOISE LEVEL STANDARDS**

| Affected Land Uses (Receiving Noise) | 7:00 a.m. - 10:00 p.m. (dBA $L_{eq}$) | 10:00 p.m. - 7:00 a.m. (dBA $L_{eq}$) |
|---|---|---|
| Residential | 55 | 45 |
| Professional Services | 55 | 55 |
| Other Commercial | 60 | 60 |
| Industrial | 70 | 70 |

$L_{eq}$ = (Equivalent Energy Level). The sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period, typically one, eight or 24 hours.
dB(A) = (A-weighted Sound Pressure Level). The sound pressure level, in decibels, as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound, placing greater emphasis on those frequencies within the sensitivity range of the human ear.

The percentile noise descriptors are provided to ensure that the duration of the noise source is fully considered. However, due to the relatively constant intensity of the Project operational activities, the $L_{50}$ or average $L_{eq}$ noise level metrics best describe the kennels, dog yards/parks, air conditioning units, parking lot vehicle movements, an emergency generator, and trash enclosure activity. In addition, the $L_{eq}$ noise level metric accounts for noise fluctuations over time by averaging the louder and quieter events and giving more weight to the louder events. In addition, due to the mathematical relationship between the median ($L_{50}$) and the mean ($L_{eq}$), the $L_{eq}$ will always be larger than or equal to the $L_{50}$. The more variable the noise becomes, the larger the $L_{eq}$ becomes in comparison to the $L_{50}$. Therefore, this noise study conservatively relies on the average $L_{eq}$ sound level limits to describe the Project operational noise levels.

## 3.3 CONSTRUCTION NOISE STANDARDS

Section 83.01.080(g)(3) of the County of San Bernardino Development Code, provided in Appendix 3.1, indicates that construction activity is considered exempt from the noise level standards between the hours of 7:00 a.m. to 7:00 p.m. except on Sundays and Federal holidays. (11) However, neither the County of San Bernardino General Plan or Municipal Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers, which would allow for a quantified determination of what CEQA constitutes a *substantial temporary or periodic noise increase*. Therefore, a numerical construction threshold based on Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* is used for analysis of daytime construction impacts, as discussed below.

According to the FTA, local noise ordinances are typically not very useful in evaluating construction noise. They usually relate to nuisance and hours of allowed activity, and sometimes

specify limits in terms of maximum levels, but are generally not practical for assessing the impact of a construction project. Project construction noise criteria should account for the existing noise environment, the absolute noise levels during construction activities, the duration of the construction, and the adjacent land use. Due to the lack of standardized construction noise thresholds, the FTA provides guidelines that can be considered reasonable criteria for construction noise assessment. The FTA considers a daytime exterior construction noise level of 80 dBA $L_{eq}$ as a threshold for noise sensitive residential land use, a noise level of 85 dBA $L_{eq}$ for commercial locations, and 90 dBA $L_{eq}$ for industrial locations. (7)

## 3.4 CONSTRUCTION VIBRATION STANDARDS

Construction activity can result in varying degrees of ground-borne vibration, depending on the equipment and methods used, distance to the affected structures and soil type. Construction vibration is generally associated with pile driving and rock blasting. Other construction equipment such as air compressors, light trucks, hydraulic loaders, etc., generates little or no ground vibration. (7)

The County of San Bernardino Development Code, Section 83.01.090(a) states that vibration shall be no *greater than or equal to two-tenths inches per second measured at or beyond the lot line*. (11) Therefore, to determine if the vibration levels due to the operation and construction of the Project, the peak particle velocity (PPV) vibration level standard of 0.2 inches per second is used.

# 4 SIGNIFICANCE CRITERIA

The following significance criteria are based on currently adopted guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (10) For the purposes of this report, impacts would be potentially significant if the Project results in or causes:

A. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

B. Generation of excessive ground-borne vibration or ground-borne noise levels?

C. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

While the County of San Bernardino General Plan Guidelines provide direction on noise compatibility and establish noise standards by land use type that are sufficient to assess the significance of noise impacts, they do not define the levels at which increases are considered substantial for use under Guideline A. CEQA Appendix G Guideline C applies to nearby public and private airports, if any, and the Project's land use compatibility.

## 4.1 CEQA GUIDELINES NOT FURTHER ANALYZED

The Project site is not located within two miles of a public airport or within an airport land use plan. The closest airport is the Flabob Airport located over 5 miles south of the Project site. As such, the Project site would not be exposed to excessive noise levels from airport operations, and therefore, impacts are considered *less than significant,* and no further noise analysis is conducted in relation to CEQA Appendix G Guideline C.

Since the Project is relocating the San Bernardino Animal Care Center facility, the Project is not anticipated to generate a substantial amount of traffic and would not result in a substantial increase in off-site traffic noise levels, impacts are considered *less than significant,* and no further noise analysis is conducted in relation to CEQA Appendix G Guideline C.

## 4.2 NOISE-SENSITIVE RECEIVERS

Noise level increases resulting from the Project are evaluated based on the Appendix G CEQA Guidelines described above at the closest sensitive receiver locations. Under CEQA, consideration must be given to the magnitude of the increase, the existing ambient noise levels, and the location of noise-sensitive receivers to determine if a noise increase represents a significant adverse environmental impact. This approach recognizes *that there is no single noise increase that renders the noise impact significant.* (12)

Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding human reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to

a new noise is the comparison of it to the existing environment to which one has adapted—the so-called *ambient* environment. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will typically be judged. The Federal Interagency Committee on Noise (FICON) (13) developed guidance to be used for the assessment of project-generated increases in noise levels that consider the ambient noise level. The FICON recommendations are based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (CNEL) and equivalent continuous noise level ($L_{eq}$).

As previously stated, the approach used in this noise study recognizes *that there is no single noise increase that renders the noise impact significant*, based on a 2008 California Court of Appeal ruling on Gray v. County of Madera. (12) For example, if the ambient noise environment is quiet (<60 dBA) and the new noise source greatly increases the noise levels, an impact may occur if the noise criteria may be exceeded. Therefore, for this analysis, FICON identifies a *readily perceptible* 5 dBA or greater project-related noise level increase is considered a significant impact when the noise criteria for a given land use is exceeded. Per the FICON, in areas where the without project noise levels range from 60 to 65 dBA, a 3 dBA *barely perceptible* noise level increase appears to be appropriate for most people. When the without project noise levels already exceed 65 dBA, any increase in community noise louder than 1.5 dBA or greater is considered a significant impact if the noise criteria for a given land use is exceeded, since it likely contributes to an existing noise exposure exceedance.

The FICON guidance provides an established source of criteria to assess the impacts of substantial temporary or permanent increase in ambient noise levels. Based on the FICON criteria, the amount to which a given noise level increase is considered acceptable is reduced when the without Project noise levels are already shown to exceed certain land-use specific exterior noise level criteria. The specific levels are based on typical responses to noise level increases of 5 dBA or *readily perceptible*, 3 dBA or *barely perceptible*, and 1.5 dBA depending on the underlying without Project noise levels for noise-sensitive uses. These levels of increases and their perceived acceptance are consistent with guidance provided by both the Federal Highway Administration (4 p. 9) and Caltrans (14 p. 2_48).

## 4.3 SIGNIFICANCE CRITERIA SUMMARY

Noise impacts shall be considered significant if any of the following occur as a direct result of the proposed Project. Table 4-1 shows the significance criteria summary matrix.

**TABLE 4-1: SIGNIFICANCE CRITERIA SUMMARY**

| Analysis | Land Use | Condition(s) | Significance Criteria | |
|---|---|---|---|---|
| | | | **Daytime** | **Nighttime** |
| Off-Site | Noise-Sensitive[1] | if ambient is < 60 dBA CNEL | ≥ 5 dBA CNEL Project increase | |
| | | if ambient is 60 - 65 dBA CNEL | ≥ 3 dBA CNEL Project increase | |
| | | if ambient is > 65 dBA CNEL | ≥ 1.5 dBA CNEL Project increase | |
| Operational | Residential | Exterior Noise Level Limit[2] | 55 dBA $L_{eq}$ | 45 dBA $L_{eq}$ |
| | Noise-Sensitive[1] | if ambient is < 60 dBA $L_{eq}$ | ≥ 5 dBA $L_{eq}$ Project increase | |
| | | if ambient is 60 - 65 dBA $L_{eq}$ | ≥ 3 dBA $L_{eq}$ Project increase | |
| | | if ambient is > 65 dBA $L_{eq}$ | ≥ 1.5 dBA $L_{eq}$ Project increase | |
| Construction | All | Permitted between 7:00 a.m. to 7:00 p.m.; except Sundays and Federal holidays.[3] | | |
| | Residential | Noise Level Threshold[4] | 80 dBA $L_{eq}$ | n/a |
| | Commercial | | 85 dBA $L_{eq}$ | n/a |
| | Industrial | | 90 dBA $L_{eq}$ | n/a |
| | All | Vibration Level Threshold[5] | 0.2 PPV in/sec | n/a |

[1] FICON, 1992.
[2] County of San Bernardino Development Code, Title 8, Section 83.01.080 (Appendix 3.1)
[3] Section 83.01.080(g)(3) of the County of San Bernardino County Code.
[4] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual.
[5] Section 83.01.090(a) of the County of San Bernardino County Code.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m. "n/a" = construction activities are not planned during the nighttime hours; "PPV" = peak particle velocity.

*This page intentionally left blank*

# 5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, 24-hour noise level measurements were taken at four locations in the Project study area. The receiver locations were selected to describe and document the existing noise environment within the Project study area. Exhibit 5-A provides the boundaries of the Project study area and the noise level measurement locations. To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. on Wednesday, December 14th, 2022.

## 5.1 MEASUREMENT PROCEDURE AND CRITERIA

To describe the existing noise environment, the hourly noise levels were measured during typical weekday conditions over a 24-hour period. By collecting individual hourly noise level measurements, it is possible to describe the daytime and nighttime hourly noise levels and calculate the 24-hour CNEL. The long-term noise readings were recorded using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (15)

## 5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest sensitive receiver locations as possible to assess the existing ambient hourly noise levels surrounding the Project site. Both Caltrans and the FTA recognize that it is not reasonable to collect noise level measurements that can fully represent every part of a private yard, patio, deck, or balcony normally used for human activity when estimating impacts for new development projects. This is demonstrated in the Caltrans general site location guidelines which indicate that, *sites must be free of noise contamination by sources other than sources of interest. Avoid sites located near sources such as barking dogs, lawnmowers, pool pumps, and air conditioners unless it is the express intent of the analyst to measure these sources*. (3) Further, FTA guidance states, t*hat it is not necessary nor recommended that existing noise exposure be determined by measuring at every noise-sensitive location in the project area. Rather, the recommended approach is to characterize the noise environment for clusters of sites based on measurements or estimates at representative locations in the community*. (7)

Based on recommendations of Caltrans and the FTA, it is not necessary to collect measurements at each individual building or residence, because each receiver measurement represents a group of buildings that share acoustical equivalence. (7) In other words, the area represented by the receiver shares similar shielding, terrain, and geometric relationship to the reference noise source. Receivers represent a location of noise sensitive areas and are used to estimate the future noise level impacts. Collecting reference ambient noise level measurements at the nearby sensitive receiver locations allows for a comparison of the before and after Project noise levels

and is necessary to assess potential noise impacts due to the Project's contribution to the ambient noise levels.

## 5.3 NOISE MEASUREMENT RESULTS

The noise measurements presented below focus on the average or equivalent sound levels ($L_{eq}$). The equivalent sound level ($L_{eq}$) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. Table 5-1 identifies the hourly daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) noise levels at each noise level measurement location.

**TABLE 5-1: 24-HOUR AMBIENT NOISE LEVEL MEASUREMENTS**

| Location[1] | Description | Energy Average Noise Level (dBA $L_{eq}$)[2] | |
|---|---|---|---|
| | | Daytime | Nighttime |
| L1 | Located west of the Project site near single-family residence at 18259 Valley Boulevard A. | 70.5 | 66.8 |
| L2 | Located south of the Project site near single-family residences at 18363 Valley Boulevard. | 65.5 | 65.0 |
| L3 | Located east of the Project site near single-family residences at 18363 Valley Boulevard. | 66.2 | 64.7 |
| L4 | Located north of the Project site near single-family residence at 18301 Marygold Avenue. | 64.0 | 59.4 |

[1] See Exhibit 5-A for the noise level measurement locations.
[2] Energy (logarithmic) average levels. The long-term 24-hour measurement worksheets are included in Appendix 5.2. "Daytime" = 7:00 a.m. to 7:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

Table 5-1 provides the (energy average) noise levels used to describe the daytime and nighttime ambient conditions. These daytime and nighttime energy average noise levels represent the average of all hourly noise levels observed during these time periods expressed as a single number. Appendix 5.2 provides summary worksheets of the noise levels for each hour as well as the minimum, maximum, $L_1$, $L_2$, $L_5$, $L_8$, $L_{25}$, $L_{50}$, $L_{90}$, $L_{95}$, and $L_{99}$ percentile noise levels observed during the daytime and nighttime periods.

The background ambient noise levels in the Project study area are dominated by the transportation-related noise associated with surface streets in addition to background industrial land use activities. This includes the auto and heavy truck activities on study area roadway segments near the noise level measurement locations.

## EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS

*This page intentionally left blank.*

# 6 OFF-SITE TRANSPORTATION NOISE IMPACTS

The Project would result in a small increase in regional and local traffic volumes. The expected Project is anticipated to generate a maximum of 318 daily trips which would represent an incremental increase to the existing roadway volumes and would not double traffic volumes on local roads. Therefore, the Project is not expected to generate perceptible noise level increase (i.e., 3 dBA) at nearby sensitive land uses adjacent to study area roadways. Due to the low traffic volumes generated by the Project, the off-site traffic noise levels generated by the Project are considered *less than significant* and no further analysis is required.

*This page intentionally left blank.*

# 7 SENSITIVE RECEIVER LOCATIONS

To assess the potential for long-term operational and short-term construction noise impacts, the following sensitive receiver locations, as shown on Exhibit 7-A, were identified as representative locations for analysis. Sensitive receivers are generally defined as locations where people reside or where the presence of unwanted sound could otherwise adversely affect the use of the land. Noise-sensitive land uses are generally considered to include schools, hospitals, single-family dwellings, mobile home parks, churches, libraries, and recreation areas. Moderately noise-sensitive land uses typically include multi-family dwellings, hotels, motels, dormitories, out-patient clinics, cemeteries, golf courses, country clubs, athletic/tennis clubs, and equestrian clubs. Land uses that are considered relatively insensitive to noise include business, commercial, and professional developments. Land uses that are typically not affected by noise include: industrial, manufacturing, utilities, agriculture, undeveloped land, parking lots, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals.

To describe the potential off-site Project noise levels, three receiver locations in the vicinity of the Project site were identified. All distances are measured from the Project site boundary to the outdoor living areas (e.g., private backyards) or at the building façade, whichever is closer to the Project site. The selection of receiver locations is based on FHWA guidelines and is consistent with additional guidance provided by Caltrans and the FTA, as previously described in Section 5.2. Other sensitive land uses in the Project study area that are located at greater distances than those identified in this noise study will experience lower noise levels than those presented in this report due to the additional attenuation from distance and the shielding of intervening structures. Distance is measured in a straight line from the project boundary to each receiver location.

R1: Location R1 represents the existing noise sensitive residence at 1825 Valley Boulevard, approximately 15 feet west of the Project site. Receiver R1 is placed in the private outdoor living areas facing the Project site. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

R2: Location R2 represents the existing noise sensitive residence at 18301 Marygold Avenue, approximately 748 feet north of the Project site. Receiver R2 is placed in the private outdoor living areas facing the Project site. A 24-hour noise measurement was taken near this location, L4, to describe the existing ambient noise environment.

R3: Location R3 represents the existing noise sensitive residence at 18349 Valley Boulevard, approximately 159 feet south of the Project site. Receiver R3 is placed in the private outdoor living areas facing the Project site. A 24-hour noise measurement was taken near this location, L3, to describe the existing ambient noise environment.

R4: Location R4 represents the existing noise sensitive residence at 18363 Valley Boulevard, approximately 149 feet east of the Project site. Receiver R4 is placed in the private outdoor living area facing the Project site. A 24-hour noise measurement was taken near this location, L2, to describe the ambient noise environment.

## EXHIBIT 7-A: SENSITIVE RECEIVER LOCATIONS

# 8 OPERATIONAL NOISE IMPACTS

This section analyzes the potential stationary-source operational noise impacts at the nearest receiver locations, identified in Section 7, resulting from the operation of the San Bernardino Animal Care Center Project. Exhibit 8-A identifies the representative noise source activities used to assess the operational noise levels.

## 8.1 OPERATIONAL NOISE SOURCES

This operational noise analysis is intended to describe noise level impacts associated with the typical daytime and nighttime activities at the Project site. The on-site Project-related noise sources are expected to include: kennels, dog yards/parks, air conditioning units, parking lot vehicle movements, an emergency generator, and trash enclosure activity.

## 8.2 REFERENCE NOISE LEVELS

To estimate the Project operational noise impacts, reference noise level measurements were collected from similar types of activities to represent the noise levels expected with the development of the proposed Project. This section provides a detailed description of the reference noise level measurements shown on Table 8-1 used to estimate the Project operational noise impacts. It is important to note that the following projected noise levels assume the worst-case noise environment with the kennels, dog yards/parks, air conditioning units, parking lot vehicle movements, an emergency generator, and trash enclosure activity all operating continuously. These sources of noise activity will likely vary throughout the day.

### 8.2.1 MEASUREMENT PROCEDURES

The reference noise level measurements presented in this section were collected using a Larson Davis LxT Type 1 precisions sound level meter (serial number 01146). The LxT sound level meter was calibrated using a Larson-Davis calibrator, Model CAL 200, was programmed in "slow" mode to record noise levels in "A" weighted form and was located at approximately five feet above the ground elevation for each measurement. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (15)

### 8.2.2 ANIMAL DROP-OFF AND DOG PARK/MEET AND GREET ACTIVITY

To describe the potential noise level impacts associated with the Project's animal drop-off and dog park/meet and greet activities, Urban Crossroads, Inc. collected a reference noise level measurement at High Valley Veterinarian Clinic in the County of San Diego. The reference noise level measurement describes large and small dogs growling, whining, baying, and barking at other dogs within the facility. At 50 feet from the noise source, a reference noise level of 64.1 dBA $L_{eq}$.

## EXHIBIT 8-A: OPERATIONAL NOISE SOURCE LOCATIONS

**TABLE 8-1: REFERENCE NOISE LEVEL MEASUREMENTS**

| Noise Source[1] | Noise Source Height (Feet) | Min./Hour[2] | | Reference Noise Level (dBA $L_{eq}$) @ 50 Feet | Sound Power Level (dBA)[3] |
|---|---|---|---|---|---|
| | | Day | Night | | |
| Animal Drop-Off | 3' | 60 | 60 | 64.1 | 95.7 |
| Dog Park/Meet and Greet Activity | 3' | 60 | 0 | 64.1 | 95.7 |
| Roof-Top Air Conditioning Units | 5' | 39 | 28 | 47.4 | 79.0 |
| Parking Lot Vehicle Movements | 5' | 60 | 0 | 42.8 | 74.4 |
| Trash Enclosure Activity | 5' | 10 | 10 | 57.4 | 89.0 |
| Truck Wash | 5' | 30 | 30 | 62.4 | 94.0 |
| Generator | 8' | 30 | 0 | 83.3 | 114.9 |

[1] As measured by Urban Crossroads, Inc.
[2] Anticipated duration (minutes within the hour) of noise activity during typical hourly conditions expected at the Project site. "Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 7:00 a.m.
[3] Sound power level represents the total amount of acoustical energy (noise level) produced by a sound source independent of distance or surroundings. Sound power levels calculated using the CadnaA noise model at the reference distance to the noise source. Numbers may vary due to size differences between point and area noise sources.

### 8.2.3 AIR CONDITIONING UNITS

The noise level measurements describe a single mechanical air conditioning unit. The reference noise level represents a Lennox SCA120 series 10-ton model packaged air conditioning unit. At the uniform reference distance of 50 feet, the reference noise level is 57.2 dBA $L_{eq}$. Based on the typical operating conditions observed over a four-day measurement period, the roof-top air conditioning units are estimated to operate for and average 39 minutes per hour during the daytime hours, and 28 minutes per hour during the nighttime hours. These operating conditions reflect peak summer cooling requirements with measured temperatures approaching 96 degrees Fahrenheit (°F) with average daytime temperatures of 82°F. For this noise analysis, the air conditioning units are expected to be ground mounted adjacent to the Project's administration building.

### 8.2.4 PARKING LOT VEHICLE MOVEMENTS

To describe the on-site parking lot activity a reference noise level of 56.1 dBA $L_{eq}$ at 50 feet is used. Parking lot activity are expected to take place during the full hour (60 minutes) throughout the daytime and evening hours. The parking lot is anticipated to have little to no traffic at night. The parking lot noise levels are mainly due cars pulling in and out of parking spaces in combination with sales staff talking to customers.

### 8.2.5 TRASH ENCLOSURE ACTIVITY

To describe the noise levels associated with a trash enclosure activity, Urban Crossroads collected a reference noise level measurement at an existing trash enclosure containing two dumpster bins. The trash enclosure noise levels describe metal gates opening and closing, metal scraping

against concrete floor sounds, dumpster movement on metal wheels, and trash dropping into the metal dumpster. The reference noise levels describe trash enclosure noise activities when trash is dropped into an empty metal dumpster, as would occur at the Project Site. The measured reference noise level at the uniform 50-foot reference distance is 57.3 dBA $L_{eq}$ for the trash enclosure activity. The reference noise level describes the expected noise source activities associated with the trash enclosures for the Project's proposed building. Typical trash enclosure activities are estimated to occur for 10 minutes per hour and may occur during the daytime and nighttime.

### 8.2.6 TRUCK WASH

To describe the noise levels associated with truck washout activity, Urban Crossroads collected a reference noise level measurement at an existing vehicle washing facility. The vehicle washing noise levels describe a gas powered pressure washer operating for 30 minutes washing out metal bins. The measured reference noise level at the uniform 50-foot reference distance is 62.4 dBA $L_{eq}$ for the trash enclosure activity. Typical truck washing activities are estimated to occur for 30 minutes per hour and may occur during the daytime or nighttime.

### 8.2.7 GENERATOR

The Project would also include a generator located within a weather enclosure. The location of the generator is shown in Exhibit 8-A. According to the Project applicant, the generator is anticipated to be a 600 kilo Watt (kW) unit. The 600 kW generators can produce an uncontrolled noise level of 90 dBA $L_{max}$ at 23 feet. The generator would have a standard muffler, which would provide approximately 15 dBA reduction from the uncontrolled noise levels. The generators are for emergency purposes and would only be operated under normal operations for half an hour each week for maintenance and testing. The only scenario in which they would operate for a full hour would be in the case of a power outage. Even in this scenario, the generators would likely only operate at 70 percent of maximum capacity. Therefore, for assessment purposes, the generators were modeled operating at full power for 30 minutes during daytime hours.

## 8.3 CADNAA NOISE PREDICTION MODEL

To fully describe the exterior operational noise levels from the Project, Urban Crossroads, Inc. developed a noise prediction model using the CadnaA (Computer Aided Noise Abatement) computer program. CadnaA can analyze multiple types of noise sources using the spatially accurate Project site plan, georeferenced Nearmap aerial imagery, topography, buildings, and barriers in its calculations to predict outdoor noise levels.

Using the ISO 9613 protocol, CadnaA will calculate the distance from each noise source to the noise receiver locations, using the ground absorption, distance, and barrier/building attenuation inputs to provide a summary of noise level at each receiver and the partial noise level contributions by noise source. Consistent with the ISO 9613 protocol, the CadnaA noise prediction model relies on the reference sound power level ($L_w$) to describe individual noise sources. While sound pressure levels (e.g., $L_{eq}$) quantify in decibels the intensity of given sound sources at a reference distance, sound power levels ($L_w$) are connected to the sound source and

are independent of distance. Sound pressure levels vary substantially with distance from the source and diminish because of intervening obstacles and barriers, air absorption, wind, and other factors. Sound power is the acoustical energy emitted by the sound source and is an absolute value that is not affected by the environment.

The operational noise level calculations provided in this noise study account for the distance attenuation provided due to geometric spreading, when sound from a localized stationary source (i.e., a point source) propagates uniformly outward in a spherical pattern. A default ground attenuation factor of 0.5 was used in the CadnaA noise analysis to account for a mix of soft and hard site conditions. Appendix 8.1 includes the detailed noise model inputs.

## 8.4 PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the proposed Project operations that include kennels, dog yards/parks, air conditioning units, parking lot vehicle movements, an emergency generator, and trash enclosure activity, Urban Crossroads, Inc. calculated the operational source noise levels that are expected to be generated at the Project site and the Project-related noise level increases that would be experienced at each of the sensitive receiver locations. Table 8-2 shows the Project operational noise levels during the daytime hours of 7:00 a.m. to 10:00 p.m. The daytime hourly noise levels at the off-site receiver locations are expected to range from 39.9 to 50.0 dBA $L_{eq}$.

**TABLE 8-2: DAYTIME PROJECT OPERATIONAL NOISE LEVELS**

| Noise Source[1] | Daytime Noise Level (dBA $L_{eq}$) | | | |
|---|---|---|---|---|
| | R1 | R2 | R3 | R4 |
| Animal Drop-Off | 48.5 | 36.4 | 40.5 | 46.5 |
| Dog Park/Meet and Greet | 42.3 | 36.7 | 47.0 | 43.9 |
| Roof-Top Air Conditioning Units | 39.8 | 25.0 | 32.3 | 33.4 |
| Parking Lot Vehicle Movements | 32.1 | 26.1 | 34.0 | 27.0 |
| Trash Enclosure Activity | 14.6 | 15.7 | 20.2 | 28.9 |
| Truck Wash | 23.0 | 19.1 | 28.5 | 37.5 |
| Generator | 58.3 | 38.4 | 44.5 | 45.7 |
| **Total (All Noise Sources)** | **50.0** | **39.9** | **48.2** | **48.9** |

[1] See Exhibit 8-A for the noise source locations. CadnaA noise model calculations are included in Appendix 8.1.

Table 8-3 shows the Project operational noise levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. The nighttime hourly noise levels at the off-site receiver locations are expected to range from 33.0 to 38.2 dBA $L_{eq}$. The differences between the daytime and nighttime noise levels are largely related to the duration of noise activity with minimal nighttime operations (Table 9-1).

**TABLE 8-3: NIGHTTIME PROJECT OPERATIONAL NOISE LEVELS**

| Noise Source[1] | Nighttime Noise Level (dBA $L_{eq}$) | | | |
|---|---|---|---|---|
| | R1 | R2 | R3 | R4 |
| Animal Drop-Off | 27.6 | 32.3 | 36.5 | 42.5 |
| Dog Park/Meet and Greet | 0.0 | 0.0 | 0.0 | 0.0 |
| Roof-Top Air Conditioning Units | 37.4 | 22.5 | 29.9 | 31.0 |
| Parking Lot Vehicle Movements | 25.0 | 15.7 | 19.9 | 25.0 |
| Trash Enclosure Activity | 13.7 | 14.7 | 19.3 | 27.9 |
| Truck Wash | 21.7 | 17.9 | 27.3 | 36.2 |
| Generator | 0.0 | 0.0 | 0.0 | 0.0 |
| **Total (All Noise Sources)** | **38.2** | **33.0** | **37.9** | **43.8** |

[1] See Exhibit 8-A for the noise source locations. CadnaA noise model calculations are included in Appendix 8.1.

## 8.5 PROJECT OPERATIONAL NOISE LEVEL COMPLIANCE

To demonstrate compliance with local noise regulations, the Project-only operational noise levels are evaluated against exterior noise level thresholds based on the County of San Bernardino exterior noise level standards at nearest noise-sensitive receiver locations. Table 9-4 shows the operational noise levels associated with the Project will satisfy the County of San Bernardino exterior noise level standards at all nearby receiver locations. Therefore, the operational noise impacts are considered *less than significant* at the nearest noise-sensitive receiver locations.

**TABLE 8-4: OPERATIONAL NOISE LEVEL COMPLIANCE**

| Receiver Location[1] | Project Operational Noise Levels (dBA $L_{eq}$)[2] | | Exterior Noise Level Standards (dBA $L_{eq}$)[3] | | Noise Level Standards Exceeded?[4] | |
|---|---|---|---|---|---|---|
| | Daytime | Nighttime | Daytime | Nighttime | Daytime | Nighttime |
| R1 | 50.0 | 38.2 | 55 | 45 | No | No |
| R2 | 39.9 | 33.0 | 55 | 45 | No | No |
| R3 | 48.2 | 37.9 | 55 | 45 | No | No |
| R4 | 48.9 | 43.8 | 55 | 45 | No | No |

[1] See Exhibit 7-A for the receiver locations.
[2] Proposed Project operational noise levels as shown in Tables 8-3 and 8-4.
[3] Exterior noise level standards are shown in Table 3-1.
[4] Do the estimated Project operational noise source activities exceed the noise level standards? "Daytime" = 7:01 a.m. to 10:00 p.m.; "Nighttime" = 10:01 p.m. to 7:00 a.m.

## 8.6 PROJECT OPERATIONAL NOISE LEVEL INCREASES

To describe the Project operational noise level increases, the Project operational noise levels are combined with the existing ambient noise levels measurements for the nearest receiver locations potentially impacted by Project operational noise sources. Since the units used to measure noise, decibels (dB), are logarithmic units, the Project-operational and existing ambient noise levels

cannot be combined using standard arithmetic equations. (3) Instead, they must be logarithmically added using the following base equation:

$$SPL_{Total} = 10\log_{10}[10^{SPL1/10} + 10^{SPL2/10} + \ldots 10^{SPLn/10}]$$

Where "SPL1," "SPL2," etc. are equal to the sound pressure levels being combined, or in this case, the Project-operational and existing ambient noise levels. The difference between the combined Project and ambient noise levels describes the Project noise level increases to the existing ambient noise environment. As indicated on Tables 8-5 and 8-6, the Project will generate daytime and nighttime operational noise level increases ranging from less than 0.1 to 0.1 dBA $L_{eq}$ at the nearest receiver locations. Project-related operational noise level increases will satisfy the operational noise level increase significance criteria presented on Table 4-1. Therefore, the incremental Project operational noise level increase is considered *less than significant* at all receiver locations.

**TABLE 8-5: DAYTIME PROJECT OPERATIONAL NOISE LEVEL INCREASES**

| Receiver Location[1] | Total Project Operational Noise Level[2] | Measurement Location[3] | Reference Ambient Noise Levels[4] | Combined Project and Ambient[5] | Project Increase[6] | Increase Criteria[7] | Increase Criteria Exceeded? |
|---|---|---|---|---|---|---|---|
| R1 | 50.0 | L1 | 70.5 | 70.5 | 0.0 | 3 | No |
| R2 | 39.9 | L2 | 65.5 | 65.5 | 0.0 | 3 | No |
| R3 | 48.2 | L3 | 66.2 | 66.3 | 0.1 | 3 | No |
| R4 | 48.9 | L4 | 64.0 | 64.1 | 0.1 | 3 | No |

[1] See Exhibit 7-A for the receiver locations.
[2] Total Project daytime operational noise levels as shown on Table 8-4.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed daytime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance increase criteria as shown on Table 4-1.

**TABLE 8-6: NIGHTTIME OPERATIONAL NOISE LEVEL INCREASES**

| Receiver Location[1] | Total Project Operational Noise Level[2] | Measurement Location[3] | Reference Ambient Noise Levels[4] | Combined Project and Ambient[5] | Project Increase[6] | Increase Criteria[7] | Increase Criteria Exceeded? |
|---|---|---|---|---|---|---|---|
| R1 | 38.2 | L1 | 70.5 | 70.5 | 0.0 | 3 | No |
| R2 | 33.0 | L2 | 65.5 | 65.5 | 0.0 | 3 | No |
| R3 | 37.9 | L3 | 66.2 | 66.2 | 0.0 | 3 | No |
| R4 | 43.8 | L4 | 64.0 | 64.0 | 0.0 | 3 | No |

[1] See Exhibit 7-A for the receiver locations.
[2] Total Project nighttime operational noise levels as shown on Table 8-5.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed nighttime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance increase criteria as shown on Table 4-1.

# 9 CONSTRUCTION IMPACTS

This section analyzes potential impacts resulting from the short-term construction activities associated with the development of the Project. Exhibit 9-A shows the construction noise source activity location in relation to the nearest sensitive receiver locations previously described in Section 7. To prevent high levels of construction noise from impacting noise-sensitive land uses, County of San Bernardino Development Code Section 83.01.080(g)(3), states that construction activities are limited to the hours of 7:00 a.m. to 7:00 p.m. on any day and limited at any time on Sundays and federal holidays.

## 9.1 CONSTRUCTION NOISE LEVELS

Noise generated by the Project construction equipment will include a combination of trucks, power tools, concrete mixers, and portable generators that when combined can reach high levels. The number and mix of construction equipment are expected to occur in the following stages:

- Site Preparation
- Grading
- Building Construction
- Paving
- Architectural Coating

## 9.2 TYPICAL CONSTRUCTION REFERENCE NOISE LEVELS

To describe peak construction noise activities, this construction noise analysis was prepared using reference noise level measurements published in the *FHWA Road Construction Nosie Model* (RCNM) (16). The RCNM database provides a conservative source of reference construction noise levels. Table 9-1 provides a summary of the FHWA construction reference noise level measurements expressed in hourly average dBA $L_{eq}$ using the estimated FHWA RCNM usage factors to describe the typical construction activities for each stage of Project construction (16).

## EXHIBIT 9-A: CONSTRUCTION NOISE ACTIVITY

**TABLE 9-1: CONSTRUCTION REFERENCE NOISE LEVELS**

| Construction Stage | Construction Equipment | Reference Noise Level @ 50 Feet (dBA $L_{eq}$)[1] | Combined Reference Noise Level (dBA $L_{eq}$) |
|---|---|---|---|
| Site Preparation | Tractor | 80.0 | 84.4 |
| | Grader | 81.0 | |
| | Excavator | 76.7 | |
| Grading | Dozer | 77.7 | 80.6 |
| | Front End Loader | 75.1 | |
| | Backhoe | 73.6 | |
| Building Construction | Front End Loader | 75.1 | 81.4 |
| | Crane | 72.6 | |
| | Gradall | 79.4 | |
| Paving | Paver | 74.2 | 77.8 |
| | Roller | 73.0 | |
| | Vacuum Street Sweeper | 71.6 | |
| Arch. Coating | Man Lift | 67.8 | 74.8 |
| | Compressor (air) | 73.8 | |

[1] FHWA's Roadway Construction Noise Model, January 2006.

## 9.3 CONSTRUCTION NOISE ANALYSIS

Using the reference construction equipment noise levels and the CadnaA noise prediction model, calculations of the Project construction noise level impacts at the nearest sensitive receiver locations were completed. To assess the worst-case construction noise levels, the Project construction noise analysis relies on the highest noise level impacts when equipment with the highest reference noise level is operating at the closest point from the edge of primary construction activity (Project site boundary) to each receiver location. This is simulated by modeling multiple pieces of construction as moving point sources. As shown on Table 9-2, the construction noise levels are expected to range from 46.0 to 69.7 dBA $L_{eq}$, and the highest construction levels are expected to range from 53.2 to 69.7 dBA $L_{eq}$ at the nearest receiver locations. Appendix 9.1 includes the detailed CadnaA construction noise model inputs.

**TABLE 9-2: CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY**

| Receiver Location[1] | Construction Noise Levels (dBA $L_{max}$) | | | | | |
|---|---|---|---|---|---|---|
| | Site Preparation | Grading | Building Construction | Paving | Arch. Coating | Highest Levels[2] |
| R1 | 69.7 | 66.4 | 68.1 | 62.9 | 62.5 | 69.7 |
| R2 | 53.2 | 49.9 | 51.6 | 46.4 | 46.0 | 53.2 |
| R3 | 62.0 | 58.7 | 60.4 | 55.2 | 54.8 | 62.0 |
| R4 | 63.0 | 59.7 | 61.4 | 56.2 | 55.8 | 63.0 |

[1] Noise receiver locations are shown on Exhibit 7-A.
[2] Construction noise level calculations based on distance from the project site boundaries (construction activity area) to nearby receiver locations. CadnaA construction noise model inputs are included in Appendix 9.1.

## 9.4 CONSTRUCTION NOISE LEVEL COMPLIANCE

To evaluate whether the Project will generate potentially significant short-term noise levels at nearest receiver locations, a construction-related daytime noise level threshold of 80 dBA $L_{eq}$ is used as a reasonable threshold to assess the daytime construction noise level impacts at residential locations. The construction noise analysis shows that the nearest receiver locations will satisfy the reasonable daytime significance thresholds shown in Table 4-1 during Project construction activities as shown on Table 9-3. Therefore, the noise impacts due to Project construction noise is considered *less than significant* at all receiver locations.

**TABLE 9-3: CONSTRUCTION NOISE LEVEL COMPLIANCE**

| Receiver Location[1] | Construction Noise Levels (dBA $L_{max}$) | | |
|---|---|---|---|
| | Highest Construction Noise Levels[2] | Threshold[3] | Threshold Exceeded?[4] |
| R1 | 69.7 | 80 | No |
| R2 | 53.2 | 80 | No |
| R3 | 62.0 | 80 | No |
| R4 | 63.0 | 80 | No |

[1] Noise receiver locations are shown on Exhibit 7-A.
[2] Highest construction noise level calculations based on distance from the construction noise source activity to nearby receiver locations as shown on Table 9-2.
[3] Construction noise level thresholds are limited to the noise sensitive receiver locations (Section 3.5).
[4] Do the estimated Project construction noise levels exceed the construction noise level threshold?

## 9.6 CONSTRUCTION VIBRATION IMPACTS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent, localized intrusion. Ground-borne vibration levels resulting from typical construction activities occurring within the Project site were estimated by data published by the Federal Transit Administration (FTA) (7) and Caltrans (8). However, while vehicular traffic is rarely perceptible, construction has the potential to result in varying degrees of temporary ground vibration, depending on the specific construction activities and equipment used.

Ground vibration levels associated with various types of construction equipment are summarized on Table 9-4. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the potential Project construction vibration levels using the following vibration assessment methods defined by Caltrans. Caltrans provides the following equation: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$ (17).

**TABLE 9-4: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT**

| Equipment | PPV (in/sec) at 25 feet |
|---|---|
| Small bulldozer | 0.003 |
| Jackhammer | 0.035 |
| Loaded Trucks | 0.076 |
| Large bulldozer | 0.089 |

Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual

Table 9-5 presents the expected Project related vibration levels at the nearby receiver locations. At distances ranging from 15 feet to 748 feet from Project construction activities (at the Project site boundary), construction vibration levels are estimated to range from less than 0.01 to 0.15 PPV (in/sec) and will remain below the County of San Bernardino 0.2 PPV (in/sec) threshold for vibration at all receiver locations. Therefore, the Project-related vibration impacts are considered *less than significant* during the construction activities at the Project site.

Further, vibration levels at the site of the closest sensitive receiver are unlikely to be sustained during the entire construction period but will occur rather only during the times that heavy construction equipment is operating simultaneously adjacent to the Project site perimeter.

**TABLE 9-5: PROJECT CONSTRUCTION VIBRATION LEVELS**

| Receiver[1] | Distance to Const. Activity (Feet)[2] | Typical Construction Vibration Levels PPV (in/sec)[3] | | | | | Thresholds PPV (in/sec)[4] | Thresholds Exceeded?[5] |
|---|---|---|---|---|---|---|---|---|
| | | Small bulldozer | Jackhammer | Loaded Trucks | Large bulldozer | Highest Vibration Level | | |
| R1 | 15’ | 0.00 | 0.86 | 0.16 | 0.19 | 0.19 | 0.20 | No |
| R2 | 748' | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 | No |
| R3 | 159' | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.20 | No |
| R4 | 149' | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.20 | No |

[1] Receiver locations are shown on Exhibit 9-A.
[2] Distance from Project construction boundary to the receiver building structure.
[3] Based on the Vibration Source Levels of Construction Equipment (Table 9-4).
[4] Caltrans 2020.
[5] Does the peak vibration exceed the acceptable vibration thresholds?
"PPV" = Peak Particle Velocity

Moreover, the impacts at the site of the closest sensitive receivers are unlikely to be sustained during the entire construction period but will occur rather only during the times that heavy construction equipment is operating adjacent to the Project site perimeter.

# 10 REFERENCES


1. **State of California.** *California Environmental Quality Act, Appendix G.* 2018.
2. **Environmental Protection Agency Office of Noise Abatement and Control.** *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.* March 1974. EPA/ONAC 550/9/74-004.
3. **California Department of Transportation Environmental Program.** *Technical Noise Supplement - A Technical Supplement to the Traffic Noise Analysis Protocol.* Sacramento, CA : s.n., September 2013.
4. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning, Noise and Air Quality Branch.** *Highway Traffic Noise Analysis and Abatement Policy and Guidance.* December 2011.
5. **U.S. Department of Transportation, Federal Highway Administration.** *Highway Traffic Noise in the United States, Problem and Response.* April 2000. p. 3.
6. **U.S. Environmental Protection Agency Office of Noise Abatement and Control.** *Noise Effects Handbook-A Desk Reference to Health and Welfare Effects of Noise.* October 1979 (revised July 1981). EPA 550/9/82/106.
7. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment Manual, FTA Report No. 0123.* September 2018.
8. **California Department of Transportation.** *Transportation and Construction Vibration Guidance Manual.* April 2020.
9. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment Manual, FTA-VA-90-1003-06.* May 2006.
10. **Office of Planning and Research.** *State of California General Plan Guidelines.* October 2017.
11. **County of San Bernardino.** *Code of Ordinances, Title 8 Development Code, Chapter 83.01 General Performance Standards.*
12. **California Court of Appeal.** *Gray v. County of Madera, F053661.* 167 Cal.App.4th 1099; - Cal.Rptr.3d, October 2008.
13. **Federal Interagency Committee on Noise.** *Federal Agency Review of Selected Airport Noise Analysis Issues.* August 1992.
14. **California Department of Transportation.** *Technical Noise Supplement.* November 2009.
15. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*
16. **U.S. Department of Transportation, Federal Highway Administration.** *Road Construction Noise Model, version 1.0.* 2006.
17. **California Department of Transportation.** *Transportation and Construciton Vibration Guidance Manual.* April 2020.

*This page intentionally left blank*

# 11 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed San Bernardino Animal Care Center Project. The information contained in this noise study report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (619) 778-1971.

William Maddux
Senior Associate
URBAN CROSSROADS, INC.
(619) 788-1971
bmaddux@urbanxroads.com

### EDUCATION

Bachelor of Science in Urban and Regional Planning
California Polytechnic State University, Pomona • June 2000

### PROFESSIONAL AFFILIATIONS

ASA – Acoustical Society of America
AEP – Association of Environmental Planners
AWMA – Air and Waste Management Association
INCE – Institute of Noise Control Engineers

### PROFESSIONAL CERTIFICATIONS

Approved Acoustical Consultant • County of San Diego
FHWA Traffic Noise Model of Training • November 2004
CadnaA Basic and Advanced Training Certificate • October 2008.

*This page intentionally left blank*

# APPENDIX 3.1:

# COUNTY OF SAN BERNARDINO MUNICIPAL CODE

*This page intentionally left blank*

## § 83.01.080 Noise.

This Section establishes standards concerning acceptable noise levels for both noise-sensitive land uses and for noise-generating land uses.

(a) *Noise Measurement.* Noise shall be measured:

(1) At the property line of the nearest site that is occupied by, and/or zoned or designated to allow the development of noise-sensitive land uses;

(2) With a sound level meter that meets the standards of the American National Standards Institute (ANSI § SI4 1979, Type 1 or Type 2);

(3) Using the "A" weighted sound pressure level scale in decibels (ref. pressure = 20 micronewtons per meter squared). The unit of measure shall be designated as dB(A).

(b) *Noise Impacted Areas.* Areas within the County shall be designated as "noise-impacted" if exposed to existing or projected future exterior noise levels from mobile or stationary sources exceeding the standards listed in Subdivision (d) (Noise Standards for Stationary Noise Sources) and Subdivision (e) (Noise Standards for Adjacent Mobile Noise Sources), below. New development of residential or other noise-sensitive land uses shall not be allowed in noise-impacted areas unless effective mitigation measures are incorporated into the project design to reduce noise levels to these standards. Noise-sensitive land uses shall include residential uses, schools, hospitals, nursing homes, religious institutions, libraries, and similar uses.

(c) *Noise Standards for Stationary Noise Sources.*

(1) *Noise Standards.* Table 83-2 (Noise Standards for Stationary Noise Sources) describes the noise standard for emanations from a stationary noise source, as it affects adjacent properties:

***Table 83-2***

***Noise Standards for Stationary Noise Sources***

| ***Affected Land Uses (Receiving Noise)*** | ***7:00 a.m. - 10:00 p.m. Leq*** | ***10:00 p.m. - 7:00 a.m. Leq*** |
|---|---|---|
| Residential | 55 dB(A) | 45 dB(A) |
| Professional Services | 55 dB(A) | 55 dB(A) |
| Other Commercial | 60 dB(A) | 60 dB(A) |
| Industrial | 70 dB(A) | 70 dB(A) |

Leq = (Equivalent Energy Level). The sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period, typically one, eight or 24 hours.

dB(A) = (A-weighted Sound Pressure Level). The sound pressure level, in decibels, as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound, placing greater emphasis on those frequencies within the sensitivity range of the human ear.

Ldn = (Day-Night Noise Level). The average equivalent A-weighted sound level during a 24-hour day obtained by adding 10 decibels to the hourly noise levels measured during the night (from 10:00 p.m. to 7:00 a.m.). In this way Ldn takes into account the lower tolerance of people for noise during nighttime periods.

(2) *Noise Limit Categories.* No person shall operate or cause to be operated a source of sound at a location or allow the creation of noise on property owned, leased, occupied, or otherwise controlled by the person, which causes the noise level, when measured on another property, either incorporated or unincorporated, to exceed any one of the following:

(A) The noise standard for the receiving land use as specified in Subdivision (b) (Noise-Impacted Areas), above, for a cumulative period of more than 30 minutes in any hour.

(B) The noise standard plus five dB(A) for a cumulative period of more than 15 minutes in any hour.

(C) The noise standard plus ten dB(A) for a cumulative period of more than five minutes in any hour.

(D) The noise standard plus 15 dB(A) for a cumulative period of more than one minute in any hour.

(E) The noise standard plus 20 dB(A) for any period of time.

(d) *Noise Standards for Adjacent Mobile Noise Sources.* Noise from mobile sources may affect adjacent properties adversely. When it does, the noise shall be mitigated for any new development to a level that shall not exceed the standards described in the following Table 83-3 (Noise Standards for Adjacent Mobile Noise Sources).

***Table 83-3***

***Noise Standards for Adjacent Mobile Noise Sources***

| ***Land Use*** | | ***Ldn (or CNEL) dB(A)*** | |
|---|---|---|---|
| ***Categories*** | ***Uses*** | ***Interior*** (1) | ***Exterior*** (2) |

***Table 83-3***

***Noise Standards for Adjacent Mobile Noise Sources***

| ***Land Use*** | | ***Ldn (or CNEL) dB(A)*** | |
|---|---|---|---|
| ***Categories*** | ***Uses*** | ***Interior*** (1) | ***Exterior*** (2) |
| Residential | Single and multi-family, duplex, mobile homes | 45 | 60(3) |
| Commercial | Hotel, motel, transient housing | 45 | 60(3) |
| | Commercial retail, bank, restaurant | 50 | N/A |
| | Office building, research and development, professional offices | 45 | 65 |
| | Amphitheater, concert hall, auditorium, movie theater | 45 | N/A |
| Institutional/Public | Hospital, nursing home, school classroom, religious institution, library | 45 | 65 |
| Open Space | Park | N/A | 65 |

**Notes:**

(1) The indoor environment shall exclude bathrooms, kitchens, toilets, closets and corridors.

(2) The outdoor environment shall be limited to:
- Hospital/office building patios
- Hotel and motel recreation areas
- Mobile home parks
- Multi-family private patios or balconies

| |
|---|
| · Park picnic areas<br>· Private yard of single-family dwellings<br>· School playgrounds |
| (3) An exterior noise level of up to 65 dB(A) (or CNEL) shall be allowed provided exterior noise levels have been substantially mitigated through a reasonable application of the best available noise reduction technology, and interior noise exposure does not exceed 45 dB(A) (or CNEL) with windows and doors closed. Requiring that windows and doors remain closed to achieve an acceptable interior noise level shall necessitate the use of air conditioning or mechanical ventilation. |
| CNEL = (Community Noise Equivalent Level). The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and ten decibels to sound levels in the night from 10:00 p.m. to 7:00 a.m. |

(e) *Increases in Allowable Noise Levels.* If the measured ambient level exceeds any of the first four noise limit categories in Subdivision (d)(2), above, the allowable noise exposure standard shall be increased to reflect the ambient noise level. If the ambient noise level exceeds the fifth noise limit category in Subdivision (d)(2), above, the maximum allowable noise level under this category shall be increased to reflect the maximum ambient noise level.

(f) *Reductions in Allowable Noise Levels.* If the alleged offense consists entirely of impact noise or simple tone noise, each of the noise levels in Table 83-2 (Noise Standards for Stationary Noise Sources) shall be reduced by five dB(A).

(g) *Exempt Noise.* The following sources of noise shall be exempt from the regulations of this Section:

(1) Motor vehicles not under the control of the commercial or industrial use.

(2) Emergency equipment, vehicles, and devices.

(3) Temporary construction, maintenance, repair, or demolition activities between 7:00 a.m. and 7:00 p.m., except Sundays and Federal holidays.

(h) *Noise Standards for Other Structures.* All other structures shall be sound attenuated against the combined input of all present and projected exterior noise to not exceed the criteria.

***Table 83-4***

***Noise Standards for Other Structures***

| ***Typical Uses*** | ***12-Hour Equivalent Sound Level (Interior) in dBA Ldn*** |
|---|---|
| Educational, institutions, libraries, meeting facilities, etc. | 45 |
| General office, reception, etc. | 50 |
| Retail stores, restaurants, etc. | 55 |
| Other areas for manufacturing, assembly, testing, warehousing, etc. | 65 |

In addition, the average of the maximum levels on the loudest of intrusive sounds occurring during a 24-hour period shall not exceed 65 dBA interior.

(Ord. 4011, passed - -2007; Am. Ord. 4245, passed - -2014)

*This page intentionally left blank*

# APPENDIX 5.1:

# NOISE LEVEL MEASUREMENT WORKSHEETS

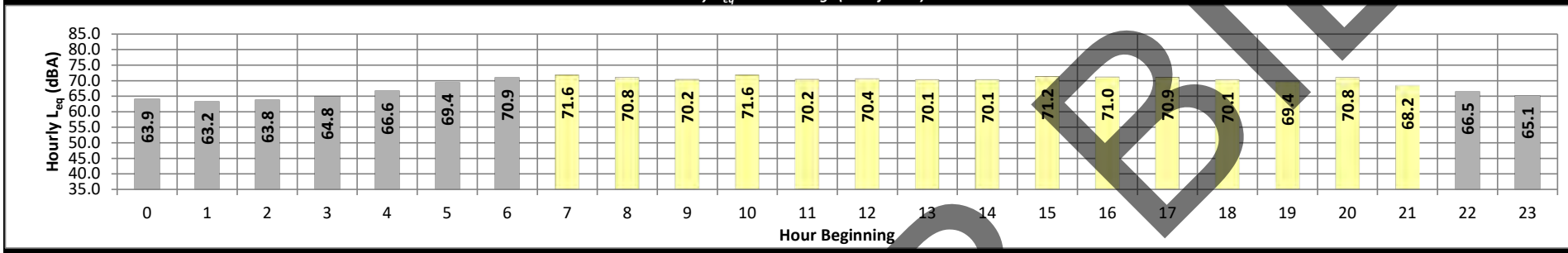
*This page intentionally left blank*

## 24-Hour Noise Level Measurement Summary

*Date:* Wednesday, December 14, 2022 *Location:* L1 - Located west of the Project site near single-family *Meter:* Piccolo II *JN:* 15264

*Project:* Bloomington Animal Shelter *Source:* residence at 18259 Valley Boulevard A. *Analyst:* A. Shami

***Hourly $L_{eq}$ dBA Readings (unadjusted)***




| Timeframe | Hour | $L_{eq}$ | $L_{max}$ | $L_{min}$ | L1% | L2% | L5% | L8% | L25% | L50% | L90% | L95% | L99% | $L_{eq}$ | Adj. | Adj. $L_{eq}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Night | 0 | 63.9 | 74.4 | 55.6 | 74.0 | 73.4 | 71.2 | 68.7 | 62.2 | 58.8 | 56.6 | 56.2 | 55.7 | 63.9 | 10.0 | 73.9 |
| | 1 | 63.2 | 72.5 | 55.3 | 72.2 | 71.8 | 70.5 | 68.7 | 62.4 | 58.5 | 56.1 | 55.8 | 55.4 | 63.2 | 10.0 | 73.2 |
| | 2 | 63.8 | 73.7 | 57.2 | 73.4 | 72.8 | 70.9 | 68.7 | 62.0 | 59.6 | 57.9 | 57.6 | 57.3 | 63.8 | 10.0 | 73.8 |
| | 3 | 64.8 | 74.0 | 58.6 | 73.6 | 73.1 | 71.6 | 69.9 | 63.8 | 60.9 | 59.2 | 58.9 | 58.6 | 64.8 | 10.0 | 74.8 |
| | 4 | 66.6 | 75.2 | 59.7 | 74.9 | 74.4 | 73.1 | 71.8 | 66.4 | 62.7 | 60.3 | 60.0 | 59.8 | 66.6 | 10.0 | 76.6 |
| | 5 | 69.4 | 77.9 | 61.4 | 77.6 | 77.1 | 75.4 | 74.2 | 69.8 | 65.7 | 62.0 | 61.8 | 61.5 | 69.4 | 10.0 | 79.4 |
| | 6 | 70.9 | 78.7 | 62.4 | 78.3 | 77.8 | 76.1 | 75.0 | 71.8 | 68.7 | 63.4 | 63.0 | 62.6 | 70.9 | 10.0 | 80.9 |
| Day | 7 | 71.6 | 78.4 | 62.3 | 78.0 | 77.6 | 76.5 | 75.9 | 73.0 | 69.7 | 63.7 | 62.9 | 62.4 | 71.6 | 0.0 | 71.6 |
| | 8 | 70.8 | 77.5 | 59.1 | 77.2 | 76.8 | 75.8 | 75.0 | 72.4 | 68.8 | 61.1 | 60.2 | 59.3 | 70.8 | 0.0 | 70.8 |
| | 9 | 70.2 | 76.8 | 57.8 | 76.5 | 76.0 | 75.0 | 74.4 | 71.9 | 68.4 | 61.0 | 59.4 | 58.0 | 70.2 | 0.0 | 70.2 |
| | 10 | 71.6 | 80.7 | 58.2 | 80.3 | 79.4 | 76.7 | 75.5 | 72.6 | 69.4 | 61.7 | 60.1 | 58.5 | 71.6 | 0.0 | 71.6 |
| | 11 | 70.2 | 76.1 | 58.1 | 75.9 | 75.5 | 74.7 | 74.1 | 72.0 | 69.0 | 61.0 | 59.3 | 58.3 | 70.2 | 0.0 | 70.2 |
| | 12 | 70.4 | 77.0 | 56.8 | 76.7 | 76.2 | 75.2 | 74.2 | 72.0 | 69.0 | 60.4 | 58.5 | 57.0 | 70.4 | 0.0 | 70.4 |
| | 13 | 70.1 | 76.8 | 56.8 | 76.5 | 76.1 | 74.8 | 73.9 | 71.7 | 68.7 | 60.4 | 58.5 | 57.1 | 70.1 | 0.0 | 70.1 |
| | 14 | 70.1 | 76.1 | 58.3 | 75.8 | 75.4 | 74.4 | 73.8 | 71.7 | 69.0 | 61.7 | 60.3 | 58.7 | 70.1 | 0.0 | 70.1 |
| | 15 | 71.2 | 78.7 | 59.0 | 78.2 | 77.5 | 75.9 | 74.9 | 72.5 | 69.8 | 62.6 | 60.9 | 59.3 | 71.2 | 0.0 | 71.2 |
| | 16 | 71.0 | 77.0 | 60.1 | 76.7 | 76.3 | 75.3 | 74.8 | 72.5 | 69.7 | 62.8 | 61.3 | 60.2 | 71.0 | 0.0 | 71.0 |
| | 17 | 70.9 | 77.6 | 60.5 | 77.3 | 76.7 | 75.3 | 74.6 | 72.3 | 69.6 | 63.0 | 61.6 | 60.7 | 70.9 | 0.0 | 70.9 |
| | 18 | 70.1 | 76.6 | 59.6 | 76.3 | 75.9 | 74.9 | 74.2 | 71.8 | 68.5 | 61.3 | 60.2 | 59.7 | 70.1 | 0.0 | 70.1 |
| | 19 | 69.4 | 76.8 | 59.2 | 76.5 | 76.1 | 74.8 | 74.0 | 70.9 | 66.5 | 60.4 | 59.7 | 59.3 | 69.4 | 5.0 | 74.4 |
| | 20 | 70.8 | 81.9 | 61.1 | 81.5 | 81.0 | 77.7 | 75.1 | 69.7 | 65.9 | 61.9 | 61.5 | 61.2 | 70.8 | 5.0 | 75.8 |
| | 21 | 68.2 | 76.5 | 59.1 | 76.2 | 75.6 | 74.1 | 73.1 | 69.0 | 64.6 | 59.9 | 59.5 | 59.1 | 68.2 | 5.0 | 73.2 |
| Night | 22 | 66.5 | 75.7 | 57.9 | 75.3 | 74.8 | 73.1 | 71.6 | 66.5 | 61.9 | 58.6 | 58.3 | 58.0 | 66.5 | 10.0 | 76.5 |
| | 23 | 65.1 | 74.8 | 56.7 | 74.5 | 73.9 | 72.1 | 70.4 | 64.1 | 60.0 | 57.5 | 57.2 | 56.8 | 65.1 | 10.0 | 75.1 |

| Timeframe | Hour | $L_{eq}$ | $L_{max}$ | $L_{min}$ | L1% | L2% | L5% | L8% | L25% | L50% | L90% | L95% | L99% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Day | Min | 68.2 | 76.1 | 56.8 | 75.8 | 75.4 | 74.1 | 73.1 | 69.0 | 64.6 | 59.9 | 58.5 | 57.0 |
| | Max | 71.6 | 81.9 | 62.3 | 81.5 | 81.0 | 77.7 | 75.9 | 73.0 | 69.8 | 63.7 | 62.9 | 62.4 |
| Energy Average | | 70.5 | Average: | | 77.3 | 76.8 | 75.4 | 74.5 | 71.7 | 68.4 | 61.5 | 60.3 | 59.3 |
| Night | Min | 63.2 | 72.5 | 55.3 | 72.2 | 71.8 | 70.5 | 68.7 | 62.0 | 58.5 | 56.1 | 55.8 | 55.4 |
| | Max | 70.9 | 78.7 | 62.4 | 78.3 | 77.8 | 76.1 | 75.0 | 71.8 | 68.7 | 63.4 | 63.0 | 62.6 |
| Energy Average | | 66.8 | Average: | | 74.9 | 74.4 | 72.7 | 71.0 | 65.4 | 61.9 | 59.1 | 58.7 | 58.4 |

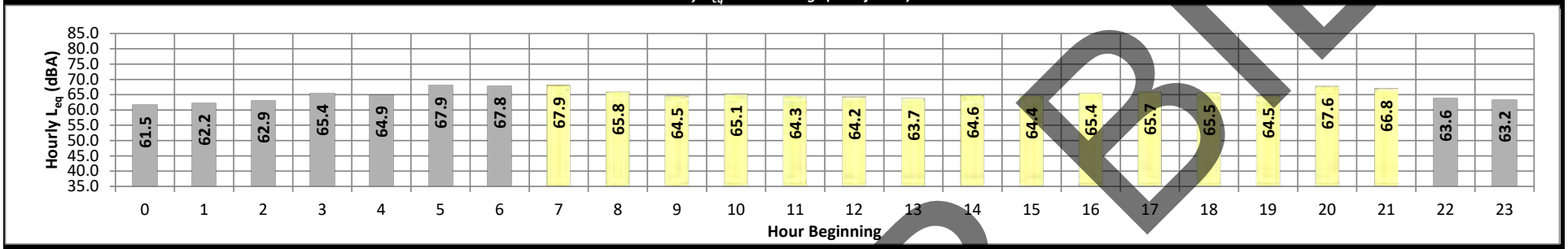
| 24-Hour | $L_{eq}$ (dBA) Daytime (7am-10pm) | Nighttime (10pm-7am) |
|---|---|---|
| **69.5** | **70.5** | **66.8** |

## 24-Hour Noise Level Measurement Summary

*Date:* Wednesday, December 14, 2022 *Location:* L2 - Located north of the Project site near single-family *Meter:* Piccolo II *JN:* 15264

*Project:* Bloomington Animal Shelter *Source:* residence at 18301 Marygold Avenue. *Analyst:* A. Shami

***Hourly $L_{eq}$ dBA Readings (unadjusted)***




| Timeframe | Hour | $L_{eq}$ | $L_{max}$ | $L_{min}$ | L1% | L2% | L5% | L8% | L25% | L50% | L90% | L95% | L99% | $L_{eq}$ | Adj. | Adj. $L_{eq}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Night | 0 | 61.5 | 69.4 | 57.0 | 69.0 | 68.5 | 66.6 | 65.1 | 61.3 | 59.6 | 57.8 | 57.4 | 57.1 | 61.5 | 10.0 | 71.5 |
| | 1 | 62.2 | 68.8 | 58.3 | 68.5 | 68.0 | 66.3 | 65.6 | 62.6 | 60.8 | 59.0 | 58.7 | 58.4 | 62.2 | 10.0 | 72.2 |
| | 2 | 62.9 | 68.4 | 59.7 | 68.1 | 67.6 | 66.6 | 65.9 | 63.4 | 62.0 | 60.4 | 60.1 | 59.8 | 62.9 | 10.0 | 72.9 |
| | 3 | 65.4 | 71.8 | 61.4 | 71.0 | 70.3 | 69.0 | 68.2 | 65.7 | 64.5 | 62.4 | 61.9 | 61.5 | 65.4 | 10.0 | 75.4 |
| | 4 | 64.9 | 72.0 | 61.8 | 71.5 | 70.7 | 68.4 | 67.3 | 65.1 | 63.9 | 62.5 | 62.2 | 61.9 | 64.9 | 10.0 | 74.9 |
| | 5 | 67.9 | 74.1 | 64.7 | 73.6 | 73.2 | 71.9 | 70.9 | 68.2 | 66.8 | 65.3 | 65.1 | 64.8 | 67.9 | 10.0 | 77.9 |
| | 6 | 67.8 | 73.3 | 64.2 | 72.9 | 72.4 | 71.4 | 70.7 | 68.4 | 66.8 | 64.9 | 64.6 | 64.3 | 67.8 | 10.0 | 77.8 |
| Day | 7 | 67.9 | 74.0 | 64.2 | 73.4 | 72.7 | 71.4 | 70.7 | 68.4 | 66.9 | 64.8 | 64.5 | 64.3 | 67.9 | 0.0 | 67.9 |
| | 8 | 65.8 | 72.0 | 60.6 | 71.7 | 71.2 | 70.0 | 69.2 | 66.8 | 64.5 | 61.6 | 61.1 | 60.7 | 65.8 | 0.0 | 65.8 |
| | 9 | 64.5 | 71.1 | 58.1 | 70.6 | 70.0 | 68.6 | 67.8 | 65.5 | 63.2 | 59.3 | 58.7 | 58.2 | 64.5 | 0.0 | 64.5 |
| | 10 | 65.1 | 70.9 | 57.9 | 70.6 | 70.1 | 69.1 | 68.5 | 66.4 | 64.2 | 59.3 | 58.6 | 58.0 | 65.1 | 0.0 | 65.1 |
| | 11 | 64.3 | 70.4 | 57.3 | 70.0 | 69.6 | 68.8 | 68.1 | 65.4 | 63.1 | 58.9 | 58.1 | 57.5 | 64.3 | 0.0 | 64.3 |
| | 12 | 64.2 | 70.2 | 56.8 | 69.9 | 69.5 | 68.5 | 67.8 | 65.4 | 63.1 | 58.3 | 57.6 | 56.9 | 64.2 | 0.0 | 64.2 |
| | 13 | 63.7 | 69.8 | 56.3 | 69.5 | 69.2 | 67.9 | 67.2 | 64.9 | 62.8 | 57.9 | 57.0 | 56.4 | 63.7 | 0.0 | 63.7 |
| | 14 | 64.6 | 72.2 | 57.9 | 71.8 | 71.1 | 69.4 | 68.3 | 65.3 | 63.0 | 59.3 | 58.6 | 58.0 | 64.6 | 0.0 | 64.6 |
| | 15 | 64.4 | 71.2 | 57.0 | 70.7 | 70.0 | 68.7 | 67.8 | 65.4 | 63.2 | 58.6 | 57.8 | 57.2 | 64.4 | 0.0 | 64.4 |
| | 16 | 65.4 | 72.0 | 59.9 | 71.6 | 71.0 | 69.4 | 68.6 | 66.2 | 64.3 | 60.9 | 60.5 | 60.0 | 65.4 | 0.0 | 65.4 |
| | 17 | 65.7 | 72.0 | 60.1 | 71.4 | 70.6 | 69.3 | 68.7 | 66.7 | 64.9 | 61.3 | 60.8 | 60.2 | 65.7 | 0.0 | 65.7 |
| | 18 | 65.5 | 72.0 | 60.5 | 71.5 | 70.8 | 69.6 | 68.6 | 66.4 | 64.4 | 61.4 | 60.9 | 60.6 | 65.5 | 0.0 | 65.5 |
| | 19 | 64.5 | 69.7 | 60.0 | 69.5 | 69.1 | 68.2 | 67.6 | 65.6 | 63.6 | 60.9 | 60.5 | 60.1 | 64.5 | 5.0 | 69.5 |
| | 20 | 67.6 | 73.8 | 64.1 | 73.4 | 72.9 | 71.7 | 70.3 | 67.8 | 66.7 | 64.9 | 64.5 | 64.2 | 67.6 | 5.0 | 72.6 |
| | 21 | 66.8 | 73.6 | 63.2 | 73.3 | 72.9 | 70.8 | 69.2 | 67.2 | 65.8 | 63.9 | 63.6 | 63.3 | 66.8 | 5.0 | 71.8 |
| Night | 22 | 63.6 | 70.5 | 59.6 | 70.2 | 69.8 | 68.0 | 66.9 | 64.0 | 62.1 | 60.3 | 60.0 | 59.7 | 63.6 | 10.0 | 73.6 |
| | 23 | 63.2 | 70.6 | 59.0 | 70.3 | 69.9 | 67.9 | 66.5 | 63.4 | 61.6 | 59.7 | 59.4 | 59.1 | 63.2 | 10.0 | 73.2 |

| Timeframe | Hour | $L_{eq}$ | $L_{max}$ | $L_{min}$ | L1% | L2% | L5% | L8% | L25% | L50% | L90% | L95% | L99% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Day | Min | 63.7 | 69.7 | 56.3 | 69.5 | 69.1 | 67.9 | 67.2 | 64.9 | 62.8 | 57.9 | 57.0 | 56.4 |
| | Max | 67.9 | 74.0 | 64.2 | 73.4 | 72.9 | 71.7 | 70.7 | 68.4 | 66.9 | 64.9 | 64.5 | 64.3 |
| Energy Average | | 65.5 | Average: | | 71.3 | 70.7 | 69.4 | 68.5 | 66.2 | 64.2 | 60.8 | 60.2 | 59.7 |
| Night | Min | 61.5 | 68.4 | 57.0 | 68.1 | 67.6 | 66.3 | 65.1 | 61.3 | 59.6 | 57.8 | 57.4 | 57.1 |
| | Max | 67.9 | 74.1 | 64.7 | 73.6 | 73.2 | 71.9 | 70.9 | 68.4 | 66.8 | 65.3 | 65.1 | 64.8 |
| Energy Average | | 65.0 | Average: | | 70.6 | 70.0 | 68.5 | 67.5 | 64.7 | 63.1 | 61.4 | 61.1 | 60.7 |

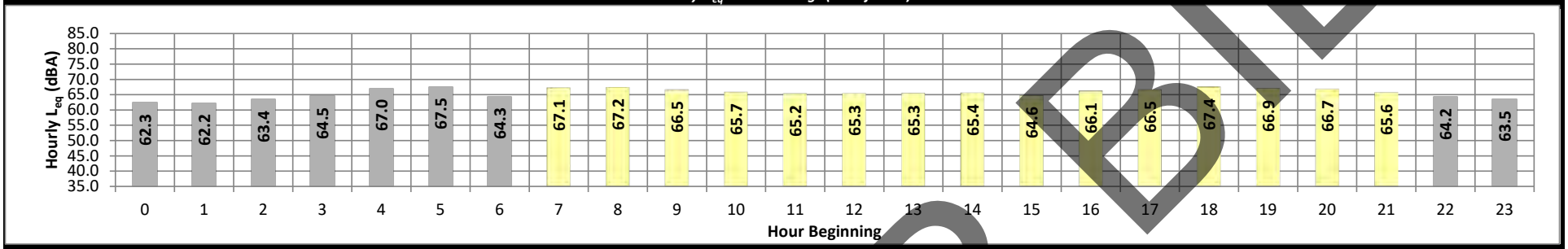
| $L_{eq}$ (dBA) | | |
|---|---|---|
| 24-Hour | Daytime (7am-10pm) | Nighttime (10pm-7am) |
| 65.3 | 65.5 | 65.0 |

## 24-Hour Noise Level Measurement Summary

*Date:* Wednesday, December 14, 2022 *Location:* L3- Located south of the Project site near single-family *Meter:* Piccolo II *JN:* 15264

*Project:* Bloomington Animal Shelter *Source:* residence at 18363 Valley Boulevard. *Analyst:* A. Shami

***Hourly $L_{eq}$ dBA Readings (unadjusted)***




| Timeframe | Hour | $L_{eq}$ | $L_{max}$ | $L_{min}$ | L1% | L2% | L5% | L8% | L25% | L50% | L90% | L95% | L99% | $L_{eq}$ | Adj. | Adj. $L_{eq}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Night | 0 | 62.3 | 67.9 | 56.9 | 66.9 | 66.5 | 65.5 | 64.9 | 63.3 | 61.7 | 58.7 | 58.0 | 57.3 | 62.3 | 10.0 | 72.3 |
| | 1 | 62.2 | 67.6 | 57.2 | 66.8 | 66.4 | 65.5 | 65.0 | 63.2 | 61.6 | 58.8 | 58.2 | 57.6 | 62.2 | 10.0 | 72.2 |
| | 2 | 63.4 | 69.4 | 58.2 | 68.2 | 67.7 | 66.9 | 66.0 | 64.2 | 62.7 | 59.9 | 59.3 | 58.6 | 63.4 | 10.0 | 73.4 |
| | 3 | 64.5 | 69.1 | 60.6 | 68.2 | 67.7 | 67.0 | 66.5 | 65.3 | 64.1 | 62.0 | 61.5 | 61.0 | 64.5 | 10.0 | 74.5 |
| | 4 | 67.0 | 72.7 | 63.6 | 71.5 | 70.8 | 69.5 | 68.9 | 67.4 | 66.5 | 64.9 | 64.5 | 64.0 | 67.0 | 10.0 | 77.0 |
| | 5 | 67.5 | 70.8 | 65.0 | 70.1 | 69.7 | 69.2 | 68.9 | 68.1 | 67.4 | 66.1 | 65.8 | 65.4 | 67.5 | 10.0 | 77.5 |
| | 6 | 64.3 | 69.9 | 61.7 | 68.5 | 68.0 | 66.6 | 65.8 | 64.7 | 63.9 | 62.7 | 62.4 | 62.0 | 64.3 | 10.0 | 74.3 |
| Day | 7 | 67.1 | 70.6 | 64.7 | 69.8 | 69.4 | 68.7 | 68.4 | 67.6 | 66.9 | 65.7 | 65.4 | 65.0 | 67.1 | 0.0 | 67.1 |
| | 8 | 67.2 | 72.7 | 64.4 | 71.7 | 71.1 | 69.3 | 68.8 | 67.7 | 66.9 | 65.5 | 65.2 | 64.8 | 67.2 | 0.0 | 67.2 |
| | 9 | 66.5 | 71.0 | 63.3 | 69.8 | 69.2 | 68.5 | 68.2 | 67.1 | 66.2 | 64.6 | 64.1 | 63.6 | 66.5 | 0.0 | 66.5 |
| | 10 | 65.7 | 72.2 | 62.2 | 70.6 | 69.8 | 68.3 | 67.4 | 66.1 | 65.2 | 63.5 | 63.1 | 62.6 | 65.7 | 0.0 | 65.7 |
| | 11 | 65.2 | 69.3 | 62.0 | 68.4 | 68.0 | 67.4 | 67.0 | 65.8 | 64.9 | 63.4 | 62.9 | 62.4 | 65.2 | 0.0 | 65.2 |
| | 12 | 65.3 | 69.6 | 62.1 | 68.6 | 68.3 | 67.5 | 67.0 | 65.9 | 65.1 | 63.4 | 63.0 | 62.5 | 65.3 | 0.0 | 65.3 |
| | 13 | 65.3 | 69.2 | 62.1 | 68.4 | 68.0 | 67.3 | 66.9 | 66.0 | 65.1 | 63.5 | 63.0 | 62.5 | 65.3 | 0.0 | 65.3 |
| | 14 | 65.4 | 71.4 | 62.4 | 69.7 | 69.0 | 67.8 | 67.1 | 65.8 | 65.0 | 63.6 | 63.2 | 62.8 | 65.4 | 0.0 | 65.4 |
| | 15 | 64.6 | 70.9 | 61.6 | 69.1 | 68.2 | 67.0 | 66.3 | 65.0 | 64.2 | 62.9 | 62.5 | 62.0 | 64.6 | 0.0 | 64.6 |
| | 16 | 66.1 | 74.5 | 63.3 | 72.1 | 70.8 | 68.5 | 67.6 | 66.3 | 65.5 | 64.3 | 64.0 | 63.6 | 66.1 | 0.0 | 66.1 |
| | 17 | 66.5 | 70.4 | 64.5 | 69.5 | 69.0 | 67.9 | 67.5 | 66.8 | 66.3 | 65.4 | 65.1 | 64.8 | 66.5 | 0.0 | 66.5 |
| | 18 | 67.4 | 71.7 | 65.2 | 70.7 | 70.1 | 69.0 | 68.6 | 67.7 | 67.2 | 66.1 | 65.9 | 65.5 | 67.4 | 0.0 | 67.4 |
| | 19 | 66.9 | 72.9 | 64.3 | 70.0 | 69.5 | 68.7 | 68.3 | 67.3 | 66.6 | 65.4 | 65.1 | 64.7 | 66.9 | 5.0 | 71.9 |
| | 20 | 66.7 | 70.8 | 63.5 | 70.0 | 69.7 | 69.0 | 68.5 | 67.3 | 66.4 | 64.7 | 64.3 | 63.9 | 66.7 | 5.0 | 71.7 |
| | 21 | 65.6 | 72.2 | 61.9 | 70.9 | 70.3 | 68.8 | 67.7 | 65.9 | 64.9 | 63.2 | 62.8 | 62.3 | 65.6 | 5.0 | 70.6 |
| Night | 22 | 64.2 | 69.4 | 60.4 | 68.2 | 67.6 | 66.7 | 66.1 | 64.9 | 63.8 | 61.8 | 61.3 | 60.8 | 64.2 | 10.0 | 74.2 |
| | 23 | 63.5 | 70.6 | 58.6 | 69.3 | 68.7 | 66.5 | 65.6 | 64.1 | 62.8 | 60.3 | 59.7 | 59.0 | 63.5 | 10.0 | 73.5 |

| Timeframe | Hour | $L_{eq}$ | $L_{max}$ | $L_{min}$ | L1% | L2% | L5% | L8% | L25% | L50% | L90% | L95% | L99% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Day | Min | 64.6 | 69.2 | 61.6 | 68.4 | 68.0 | 67.0 | 66.3 | 65.0 | 64.2 | 62.9 | 62.5 | 62.0 |
| | Max | 67.4 | 74.5 | 65.2 | 72.1 | 71.1 | 69.3 | 68.8 | 67.7 | 67.2 | 66.1 | 65.9 | 65.5 |
| Energy Average | | 66.2 | Average: | | 70.0 | 69.4 | 68.2 | 67.7 | 66.6 | 65.7 | 64.3 | 64.0 | 63.5 |
| Night | Min | 62.2 | 67.6 | 56.9 | 66.8 | 66.4 | 65.5 | 64.9 | 63.2 | 61.6 | 58.7 | 58.0 | 57.3 |
| | Max | 67.5 | 72.7 | 65.0 | 71.5 | 70.8 | 69.5 | 68.9 | 68.1 | 67.4 | 66.1 | 65.8 | 65.4 |
| Energy Average | | 64.7 | Average: | | 68.6 | 68.1 | 67.0 | 66.4 | 65.0 | 63.8 | 61.7 | 61.2 | 60.6 |

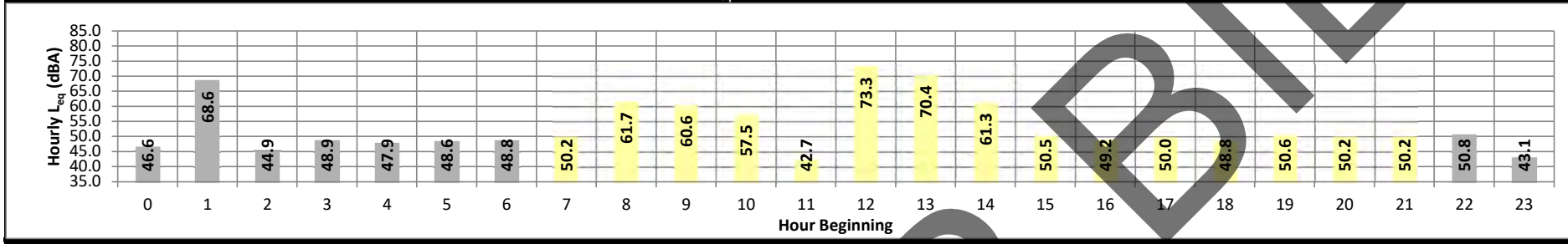
| $L_{eq}$ (dBA) | | |
|---|---|---|
| 24-Hour | Daytime (7am-10pm) | Nighttime (10pm-7am) |
| 65.7 | 66.2 | 64.7 |

## 24-Hour Noise Level Measurement Summary

*Date:* Tuesday, December 13, 2022 | *Location:* L4- Located North of the Project site near single-family | *Meter:* Piccolo II | *JN:* 15264

*Project:* Bloomington Animal Shelter | *Source:* residence at 18301 Marygold Avenue | *Analyst:* A. Shami

***Hourly $L_{eq}$ dBA Readings (unadjusted)***




| Timeframe | Hour | $L_{eq}$ | $L_{max}$ | $L_{min}$ | L1% | L2% | L5% | L8% | L25% | L50% | L90% | L95% | L99% | $L_{eq}$ | Adj. | Adj. $L_{eq}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Night | 0 | 46.6 | 61.7 | 39.9 | 59.7 | 58.0 | 52.9 | 46.7 | 41.8 | 41.2 | 40.2 | 40.1 | 39.9 | 46.6 | 10.0 | 56.6 |
| | 1 | 68.6 | 76.1 | 54.5 | 75.8 | 75.5 | 74.8 | 74.3 | 70.4 | 62.0 | 56.1 | 55.3 | 54.6 | 68.6 | 10.0 | 78.6 |
| | 2 | 44.9 | 52.8 | 41.9 | 52.4 | 51.9 | 50.0 | 47.8 | 44.3 | 43.2 | 42.1 | 42.0 | 41.9 | 44.9 | 10.0 | 54.9 |
| | 3 | 48.9 | 55.2 | 42.1 | 54.7 | 54.1 | 53.0 | 52.6 | 50.6 | 47.7 | 42.5 | 42.3 | 42.1 | 48.9 | 10.0 | 58.9 |
| | 4 | 47.9 | 56.6 | 41.5 | 56.0 | 55.2 | 53.7 | 52.6 | 48.4 | 44.2 | 41.7 | 41.6 | 41.4 | 47.9 | 10.0 | 57.9 |
| | 5 | 48.6 | 53.5 | 42.7 | 53.3 | 53.1 | 52.7 | 52.1 | 50.2 | 47.4 | 43.2 | 42.9 | 42.7 | 48.6 | 10.0 | 58.6 |
| | 6 | 48.8 | 57.8 | 43.4 | 57.5 | 57.0 | 55.3 | 53.3 | 47.8 | 46.1 | 43.9 | 43.7 | 43.5 | 48.8 | 10.0 | 58.8 |
| Day | 7 | 50.2 | 61.0 | 44.6 | 60.5 | 59.7 | 56.8 | 54.0 | 48.6 | 46.6 | 45.1 | 44.9 | 44.7 | 50.2 | 0.0 | 50.2 |
| | 8 | 61.7 | 70.4 | 50.6 | 69.9 | 69.3 | 68.0 | 67.2 | 62.2 | 57.3 | 51.7 | 51.3 | 50.9 | 61.7 | 0.0 | 61.7 |
| | 9 | 60.6 | 68.8 | 43.2 | 68.6 | 68.2 | 67.5 | 66.3 | 61.0 | 54.3 | 44.8 | 43.8 | 43.3 | 60.6 | 0.0 | 60.6 |
| | 10 | 57.5 | 66.4 | 44.8 | 65.8 | 65.3 | 63.5 | 62.4 | 58.8 | 52.6 | 46.9 | 45.7 | 44.9 | 57.5 | 0.0 | 57.5 |
| | 11 | 42.7 | 50.9 | 37.6 | 50.4 | 49.6 | 47.4 | 46.4 | 44.3 | 39.3 | 37.9 | 37.7 | 37.6 | 42.7 | 0.0 | 42.7 |
| | 12 | 73.3 | 77.7 | 67.8 | 77.0 | 76.6 | 75.8 | 75.4 | 74.3 | 73.1 | 70.2 | 69.5 | 68.4 | 73.3 | 0.0 | 73.3 |
| | 13 | 70.4 | 78.4 | 60.7 | 77.3 | 76.4 | 73.9 | 73.2 | 71.4 | 69.6 | 64.2 | 63.0 | 61.4 | 70.4 | 0.0 | 70.4 |
| | 14 | 61.3 | 68.7 | 52.2 | 68.3 | 67.6 | 66.3 | 65.7 | 62.1 | 59.1 | 53.7 | 52.9 | 52.4 | 61.3 | 0.0 | 61.3 |
| | 15 | 50.5 | 61.2 | 38.9 | 60.9 | 60.4 | 57.8 | 55.5 | 49.5 | 44.4 | 39.7 | 39.3 | 38.9 | 50.5 | 0.0 | 50.5 |
| | 16 | 49.2 | 57.2 | 40.9 | 56.7 | 56.1 | 54.9 | 53.9 | 49.8 | 46.4 | 42.2 | 41.6 | 41.0 | 49.2 | 0.0 | 49.2 |
| | 17 | 50.0 | 57.9 | 41.7 | 57.5 | 57.1 | 55.7 | 54.7 | 50.9 | 46.3 | 42.4 | 42.1 | 41.7 | 50.0 | 0.0 | 50.0 |
| | 18 | 48.8 | 56.7 | 43.1 | 56.3 | 55.9 | 54.2 | 53.0 | 49.2 | 46.1 | 43.8 | 43.4 | 43.2 | 48.8 | 0.0 | 48.8 |
| | 19 | 50.6 | 58.3 | 45.0 | 57.9 | 57.4 | 55.8 | 54.9 | 50.9 | 48.3 | 45.5 | 45.3 | 45.1 | 50.6 | 5.0 | 55.6 |
| | 20 | 50.2 | 57.6 | 43.3 | 57.2 | 56.6 | 55.1 | 54.5 | 51.7 | 47.6 | 43.7 | 43.5 | 43.3 | 50.2 | 5.0 | 55.2 |
| | 21 | 50.2 | 56.2 | 42.6 | 56.0 | 55.7 | 55.1 | 54.7 | 51.8 | 46.8 | 43.1 | 42.8 | 42.6 | 50.2 | 5.0 | 55.2 |
| Night | 22 | 50.8 | 58.4 | 41.8 | 58.1 | 57.8 | 57.2 | 56.1 | 52.0 | 46.6 | 42.5 | 42.2 | 41.9 | 50.8 | 10.0 | 60.8 |
| | 23 | 43.1 | 46.8 | 41.5 | 46.5 | 46.2 | 45.3 | 44.8 | 43.4 | 42.6 | 41.8 | 41.7 | 41.5 | 43.1 | 10.0 | 53.1 |

| Timeframe | Hour | $L_{eq}$ | $L_{max}$ | $L_{min}$ | L1% | L2% | L5% | L8% | L25% | L50% | L90% | L95% | L99% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Day | Min | 42.7 | 50.9 | 37.6 | 50.4 | 49.6 | 47.4 | 46.4 | 44.3 | 39.3 | 37.9 | 37.7 | 37.6 |
| | Max | 73.3 | 78.4 | 67.8 | 77.3 | 76.6 | 75.8 | 75.4 | 74.3 | 73.1 | 70.2 | 69.5 | 68.4 |
| Energy Average | | 64.0 | Average: | | 62.7 | 62.1 | 60.5 | 59.4 | 55.8 | 51.9 | 47.7 | 47.1 | 46.6 |
| Night | Min | 43.1 | 46.8 | 39.9 | 46.5 | 46.2 | 45.3 | 44.8 | 41.8 | 41.2 | 40.2 | 40.1 | 39.9 |
| | Max | 68.6 | 76.1 | 54.5 | 75.8 | 75.5 | 74.8 | 74.3 | 70.4 | 62.0 | 56.1 | 55.3 | 54.6 |
| Energy Average | | 59.4 | Average: | | 57.1 | 56.5 | 55.0 | 53.4 | 49.9 | 46.8 | 43.8 | 43.5 | 43.3 |

| $L_{eq}$ (dBA) | | |
|---|---|---|
| 24-Hour | Daytime (7am-10pm) | Nighttime (10pm-7am) |
| **62.8** | **64.0** | **59.4** |

# APPENDIX 8.1:

# CADNAA OPERATIONAL NOISE MODEL INPUTS

*This page intentionally left blank*

# 15264 - Bloomington Animal Shelter

**CadnaA Noise Prediction Model:** 15264-03_Operation.cna
**Date:** 08.12.23
**Analyst:** B. Maddux

## Calculation Configuration

| Configuration | |
|---|---|
| **Parameter** | **Value** |
| General | |
| Max. Error (dB) | 0.00 |
| Max. Search Radius (#(Unit,LEN)) | 2000.01 |
| Min. Dist Src to Rcvr | 0.00 |
| Partition | |
| Raster Factor | 0.50 |
| Max. Length of Section (#(Unit,LEN)) | 999.99 |
| Min. Length of Section (#(Unit,LEN)) | 1.01 |
| Min. Length of Section (%) | 0.00 |
| Proj. Line Sources | On |
| Proj. Area Sources | On |
| Ref. Time | |
| Daytime Penalty (dB) | 0.00 |
| Recr. Time Penalty (dB) | 5.00 |
| Night-time Penalty (dB) | 10.00 |
| DTM | |
| Standard Height (m) | 0.00 |
| Model of Terrain | Triangulation |
| Reflection | |
| max. Order of Reflection | 2 |
| Search Radius Src | 100.00 |
| Search Radius Rcvr | 100.00 |
| Max. Distance Source - Rcvr | 1000.00 1000.00 |
| Min. Distance Rvcr - Reflector | 1.00 1.00 |
| Min. Distance Source - Reflector | 0.10 |
| Industrial (ISO 9613) | |
| Lateral Diffraction | some Obj |
| Obst. within Area Src do not shield | On |
| Screening | Incl. Ground Att. over Barrier |
| | Dz with limit (20/25) |
| Barrier Coefficients C1,2,3 | 3.0 20.0 0.0 |
| Temperature (#(Unit,TEMP)) | 10 |
| rel. Humidity (%) | 70 |
| Ground Absorption G | 0.50 |
| Wind Speed for Dir. (#(Unit,SPEED)) | 3.0 |
| Roads (TNM) | |
| Railways (FTA/FRA) | |
| Aircraft (???) | |
| Strictly acc. to AzB | |

## Receiver Noise Levels

| Name | M. | ID | Level Lr | | | Limit. Value | | | Land Use | | | Height | | Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Day | Night | CNEL | Day | Night | CNEL | Type | Auto | Noise Type | | | X | Y | Z | |
| | | | (dBA) | (dBA) | (dBA) | (dBA) | (dBA) | (dBA) | | | | (ft) | | (ft) | (ft) | (ft) | |
| R1 | | R1 | 58.9 | 38.2 | 56.1 | 0.0 | 0.0 | 0.0 | | x | Total | 5.00 | r | 6211558.93 | 2334869.61 | 5.00 | |
| R2 | | R2 | 42.2 | 33.0 | 42.0 | 0.0 | 0.0 | 0.0 | | x | Total | 5.00 | r | 6211974.93 | 2335776.78 | 5.00 | |
| R3 | | R3 | 49.7 | 37.9 | 48.5 | 0.0 | 0.0 | 0.0 | | x | Total | 5.00 | r | 6212093.42 | 2334941.71 | 5.00 | |
| R4 | | R4 | 50.6 | 43.9 | 51.9 | 0.0 | 0.0 | 0.0 | | x | Total | 5.00 | r | 6212079.83 | 2334529.90 | 5.00 | |

## Point Source(s)

| Name | M. | ID | Result. PWL | | | Lw / Li | | | Operating Time | | | Height | | Coordinates | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Day | Evening | Night | Type | Value | norm. | Day | Special | Night | | | X | Y | Z |
| | | | (dBA) | (dBA) | (dBA) | | | dB(A) | (min) | (min) | (min) | (ft) | | (ft) | (ft) | (ft) |
| GEN1 | | GEN1 | 114.9 | 114.9 | 114.9 | Lw | 114.9 | | 450.00 | 0.00 | 0.00 | 8.00 | a | 6211620.86 | 2334738.61 | 8.00 |
| DROP01 | | DROP01 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 0.00 | 3.00 | a | 6211611.14 | 2334805.89 | 3.00 |
| DROP02 | | DROP02 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 270.00 | 3.00 | a | 6211860.20 | 2334459.32 | 3.00 |
| DROP03 | | DROP03 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 270.00 | 3.00 | a | 6211860.46 | 2334486.57 | 3.00 |
| DROP04 | | DROP04 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 270.00 | 3.00 | a | 6211860.90 | 2334516.44 | 3.00 |
| DROP05 | | DROP05 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 270.00 | 3.00 | a | 6211860.64 | 2334542.65 | 3.00 |
| DROP06 | | DROP06 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 270.00 | 3.00 | a | 6211859.77 | 2334568.15 | 3.00 |
| DROP07 | | DROP07 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 270.00 | 3.00 | a | 6211860.75 | 2334598.32 | 3.00 |
| TRASH1 | | TRASH1 | 89.0 | 89.0 | 89.0 | Lw | 89 | | 150.00 | 0.00 | 90.00 | 8.00 | a | 6211907.55 | 2334384.97 | 8.00 |
| AA01 | | AA01 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 0.00 | 3.00 | a | 6211686.59 | 2334803.17 | 3.00 |
| AA02 | | AA02 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 0.00 | 3.00 | a | 6211685.28 | 2334782.60 | 3.00 |
| AA03 | | AA03 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 0.00 | 3.00 | a | 6211685.02 | 2334762.28 | 3.00 |
| AA04 | | AA04 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 0.00 | 3.00 | a | 6211685.80 | 2334742.49 | 3.00 |
| AA05 | | AA05 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 0.00 | 3.00 | a | 6211851.43 | 2334840.41 | 3.00 |
| AA06 | | AA06 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 0.00 | 3.00 | a | 6211821.74 | 2334840.15 | 3.00 |
| AA07 | | AA07 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 0.00 | 3.00 | a | 6211851.95 | 2334813.59 | 3.00 |

| Name | M. | ID | Result. PWL | | | Lw / Li | | | Operating Time | | | Height | | Coordinates | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Day | Evening | Night | Type | Value | norm. | Day | Special | Night | | | X | Y | Z |
| | | | (dBA) | (dBA) | (dBA) | | | dB(A) | (min) | (min) | (min) | (ft) | | (ft) | (ft) | (ft) |
| AA08 | | AA08 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 0.00 | 3.00 | a | 6211820.18 | 2334814.11 | 3.00 |
| AA09 | | AA09 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 0.00 | 3.00 | a | 6211851.69 | 2334785.72 | 3.00 |
| AA10 | | AA10 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 0.00 | 3.00 | a | 6211817.84 | 2334784.68 | 3.00 |
| AA11 | | AA11 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 0.00 | 3.00 | a | 6211850.91 | 2334754.47 | 3.00 |
| AA12 | | AA12 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 0.00 | 3.00 | a | 6211817.58 | 2334750.83 | 3.00 |
| AA13 | | AA13 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 0.00 | 3.00 | a | 6211751.52 | 2334708.08 | 3.00 |
| AA14 | | AA14 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 0.00 | 3.00 | a | 6211751.52 | 2334681.69 | 3.00 |
| AA15 | | AA15 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 0.00 | 3.00 | a | 6211752.39 | 2334640.89 | 3.00 |
| AA16 | | AA16 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 0.00 | 3.00 | a | 6211751.00 | 2334616.06 | 3.00 |
| AA17 | | AA17 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 0.00 | 3.00 | a | 6211750.65 | 2334575.09 | 3.00 |
| AA18 | | AA18 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 0.00 | 3.00 | a | 6211750.48 | 2334549.05 | 3.00 |
| AA19 | | AA19 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 0.00 | 3.00 | a | 6211750.13 | 2334509.12 | 3.00 |
| AA20 | | AA20 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 0.00 | 3.00 | a | 6211749.78 | 2334481.86 | 3.00 |
| AA21 | | AA21 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 0.00 | 3.00 | a | 6211749.91 | 2334442.21 | 3.00 |
| AA22 | | AA22 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 0.00 | 3.00 | a | 6211749.39 | 2334416.34 | 3.00 |
| AA23 | | AA23 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 0.00 | 3.00 | a | 6211770.09 | 2334458.53 | 3.00 |
| AA24 | | AA24 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 0.00 | 3.00 | a | 6211770.31 | 2334483.49 | 3.00 |
| AA25 | | AA25 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 0.00 | 3.00 | a | 6211770.74 | 2334524.18 | 3.00 |
| AA26 | | AA26 | 95.7 | 95.7 | 95.7 | Lw | 95.7 | | 900.00 | 0.00 | 0.00 | 3.00 | a | 6211771.07 | 2334550.33 | 3.00 |
| AC01 | | AC01 | 79.0 | 79.0 | 79.0 | Lw | 79 | | 585.00 | 0.00 | 252.00 | 3.00 | g | 6211715.81 | 2334897.94 | 17.00 |
| AC02 | | AC02 | 79.0 | 79.0 | 79.0 | Lw | 79 | | 585.00 | 0.00 | 252.00 | 3.00 | g | 6211774.49 | 2334896.90 | 17.00 |
| AC03 | | AC03 | 79.0 | 79.0 | 79.0 | Lw | 79 | | 585.00 | 0.00 | 252.00 | 3.00 | g | 6211832.82 | 2334896.55 | 17.00 |
| AC04 | | AC04 | 79.0 | 79.0 | 79.0 | Lw | 79 | | 585.00 | 0.00 | 252.00 | 3.00 | g | 6211616.50 | 2334916.69 | 3.00 |
| AC05 | | AC05 | 79.0 | 79.0 | 79.0 | Lw | 79 | | 585.00 | 0.00 | 252.00 | 3.00 | g | 6211851.57 | 2334655.23 | 3.00 |
| AC06 | | AC06 | 79.0 | 79.0 | 79.0 | Lw | 79 | | 585.00 | 0.00 | 252.00 | 3.00 | g | 6211851.61 | 2334659.21 | 3.00 |
| AC07 | | AC07 | 79.0 | 79.0 | 79.0 | Lw | 79 | | 585.00 | 0.00 | 252.00 | 3.00 | g | 6211645.71 | 2334835.17 | 17.00 |
| AC08 | | AC08 | 79.0 | 79.0 | 79.0 | Lw | 79 | | 585.00 | 0.00 | 252.00 | 3.00 | g | 6211644.84 | 2334783.95 | 17.00 |
| AC09 | | AC09 | 79.0 | 79.0 | 79.0 | Lw | 79 | | 585.00 | 0.00 | 252.00 | 3.00 | g | 6211645.27 | 2334809.13 | 17.00 |
| AC10 | | AC10 | 79.0 | 79.0 | 79.0 | Lw | 79 | | 585.00 | 0.00 | 252.00 | 3.00 | g | 6211714.72 | 2334813.90 | 17.00 |
| AC11 | | AC11 | 79.0 | 79.0 | 79.0 | Lw | 79 | | 585.00 | 0.00 | 252.00 | 3.00 | g | 6211714.28 | 2334758.35 | 17.00 |
| AC12 | | AC12 | 79.0 | 79.0 | 79.0 | Lw | 79 | | 585.00 | 0.00 | 252.00 | 3.00 | g | 6211663.94 | 2334692.81 | 17.00 |
| AC13 | | AC13 | 79.0 | 79.0 | 79.0 | Lw | 79 | | 585.00 | 0.00 | 252.00 | 3.00 | g | 6211712.55 | 2334691.94 | 17.00 |
| AC14 | | AC14 | 79.0 | 79.0 | 79.0 | Lw | 79 | | 585.00 | 0.00 | 252.00 | 3.00 | g | 6211658.73 | 2334626.84 | 17.00 |
| AC15 | | AC15 | 79.0 | 79.0 | 79.0 | Lw | 79 | | 585.00 | 0.00 | 252.00 | 3.00 | g | 6211711.68 | 2334628.57 | 17.00 |
| AC16 | | AC16 | 79.0 | 79.0 | 79.0 | Lw | 79 | | 585.00 | 0.00 | 252.00 | 3.00 | g | 6211656.12 | 2334558.26 | 17.00 |
| AC17 | | AC17 | 79.0 | 79.0 | 79.0 | Lw | 79 | | 585.00 | 0.00 | 252.00 | 3.00 | g | 6211709.94 | 2334557.39 | 17.00 |
| AC18 | | AC18 | 79.0 | 79.0 | 79.0 | Lw | 79 | | 585.00 | 0.00 | 252.00 | 3.00 | g | 6211657.86 | 2334494.02 | 17.00 |
| AC19 | | AC19 | 79.0 | 79.0 | 79.0 | Lw | 79 | | 585.00 | 0.00 | 252.00 | 3.00 | g | 6211711.68 | 2334494.02 | 17.00 |
| AC20 | | AC20 | 79.0 | 79.0 | 79.0 | Lw | 79 | | 585.00 | 0.00 | 252.00 | 3.00 | g | 6211653.52 | 2334428.05 | 17.00 |
| AC21 | | AC21 | 79.0 | 79.0 | 79.0 | Lw | 79 | | 585.00 | 0.00 | 252.00 | 3.00 | g | 6211711.68 | 2334427.18 | 17.00 |
| AC22 | | AC22 | 79.0 | 79.0 | 79.0 | Lw | 79 | | 585.00 | 0.00 | 252.00 | 3.00 | g | 6211810.64 | 2334468.85 | 17.00 |
| AC23 | | AC23 | 79.0 | 79.0 | 79.0 | Lw | 79 | | 585.00 | 0.00 | 252.00 | 3.00 | g | 6211810.64 | 2334539.16 | 17.00 |
| WASH1 | | WASH1 | 94.0 | 94.0 | 94.0 | Lw | 94 | | 450.00 | 270.00 | 252.00 | 5.00 | a | 6211824.00 | 2334396.63 | 5.00 |
| WASH2 | | WASH2 | 94.0 | 94.0 | 94.0 | Lw | 94 | | 450.00 | 270.00 | 252.00 | 5.00 | a | 6211819.14 | 2334423.71 | 5.00 |

## Line Source(s)

| Name | M. | ID | Result. PWL | | | Result. PWL' | | | Lw / Li | | | Operating Time | | | Moving Pt. Src | | | | Height |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Day | Evening | Night | Day | Evening | Night | Type | Value | norm. | Day | Special | Night | Number | | | Speed | |
| | | | (dBA) | (dBA) | (dBA) | (dBA) | (dBA) | (dBA) | | | dB(A) | (min) | (min) | (min) | Day | Evening | Night | (mph) | (ft) |

| Name | ID | Height | | Coordinates | | | |
|---|---|---|---|---|---|---|---|
| | | Begin | End | x | y | z | Ground |
| | | (ft) | (ft) | (ft) | (ft) | (ft) | (ft) |

## Area Source(s)

| Name | M. | ID | Result. PWL | | | Result. PWL'' | | | Lw / Li | | | Operating Time | | | Height | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Day | Evening | Night | Day | Evening | Night | Type | Value | norm. | Day | Special | Night | (ft) | |
| | | | (dBA) | (dBA) | (dBA) | (dBA) | (dBA) | (dBA) | | | dB(A) | (min) | (min) | (min) | | |
| PARK1 | | PARK1 | 78.8 | 78.8 | 78.8 | 48.3 | 48.3 | 48.3 | Lw | 78.8 | | 900.00 | 0.00 | 540.00 | 5 | a |
| PARK2 | | PARK2 | 81.8 | 81.8 | 81.8 | 55.6 | 55.6 | 55.6 | Lw | 81.8 | | 900.00 | 0.00 | 540.00 | 5 | a |
| PARK3 | | PARK3 | 80.9 | 80.9 | 80.9 | 51.5 | 51.5 | 51.5 | Lw | 80.9 | | 900.00 | 0.00 | 540.00 | 5 | a |
| PARK4 | | PARK4 | 86.5 | 86.5 | 86.5 | 55.2 | 55.2 | 55.2 | Lw | 86.5 | | 900.00 | 0.00 | 0.00 | 5 | a |

| Name | ID | Height | | | Coordinates | | | |
|---|---|---|---|---|---|---|---|---|
| | | Begin | | End | x | y | z | Ground |
| | | (ft) | | (ft) | (ft) | (ft) | (ft) | (ft) |
| PARK1 | PARK1 | 5.00 | a | | 6211921.72 | 2334806.38 | 5.00 | 0.00 |
| | | | | | 6211919.11 | 2334411.19 | 5.00 | 0.00 |
| | | | | | 6211887.87 | 2334410.33 | 5.00 | 0.00 |
| | | | | | 6211892.38 | 2334806.67 | 5.00 | 0.00 |
| PARK2 | PARK2 | 5.00 | a | | 6211740.51 | 2334372.36 | 5.00 | 0.00 |
| | | | | | 6211740.77 | 2334346.32 | 5.00 | 0.00 |
| | | | | | 6211572.28 | 2334347.10 | 5.00 | 0.00 |
| | | | | | 6211572.80 | 2334374.70 | 5.00 | 0.00 |
| PARK3 | PARK3 | 5.00 | a | | 6211618.79 | 2334415.47 | 5.00 | 0.00 |

| Name | ID | Height | | | | Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Begin | | End | | x | y | z | Ground |
| | | (ft) | | (ft) | | (ft) | (ft) | (ft) | (ft) |
| | | | | | | 6211589.45 | 2334415.65 | 5.00 | 0.00 |
| | | | | | | 6211589.61 | 2334723.21 | 5.00 | 0.00 |
| | | | | | | 6211621.38 | 2334722.60 | 5.00 | 0.00 |
| PARK4 | PARK4 | 5.00 | a | | | 6211636.17 | 2335009.42 | 5.00 | 0.00 |
| | | | | | | 6211867.74 | 2335007.54 | 5.00 | 0.00 |
| | | | | | | 6211869.30 | 2334945.04 | 5.00 | 0.00 |
| | | | | | | 6211633.41 | 2334946.75 | 5.00 | 0.00 |

## Barrier(s)

| Name | Sel. | M. | ID | Absorption | | Z-Ext. | Cantilever | | Height | | | Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | left | right | | horz. | vert. | Begin | | End | x | y | z | Ground |
| | | | | | | (ft) | (ft) | (ft) | (ft) | | (ft) | (ft) | (ft) | (ft) | (ft) |
| BARRIERPLANNED | | | 0 | | | | | | 8.00 | a | | 6211575.10 | 2334897.28 | 8.00 | 0.00 |
| | | | | | | | | | | | | 6211570.00 | 2334302.73 | 8.00 | 0.00 |
| | | | | | | | | | | | | 6211926.98 | 2334305.99 | 8.00 | 0.00 |
| | | | | | | | | | | | | 6211929.15 | 2334885.42 | 8.00 | 0.00 |
| BARRIERPLANNED | | | 0 | | | | | | 10.00 | a | | 6211612.66 | 2334746.92 | 10.00 | 0.00 |
| | | | | | | | | | | | | 6211612.66 | 2334730.53 | 10.00 | 0.00 |
| | | | | | | | | | | | | 6211632.43 | 2334730.53 | 10.00 | 0.00 |
| | | | | | | | | | | | | 6211632.43 | 2334747.41 | 10.00 | 0.00 |
| | | | | | | | | | | | | 6211612.90 | 2334747.16 | 10.00 | 0.00 |

## Building(s)

| Name | Sel. | M. | ID | RB | Residents | Absorption | Height | | Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Begin | | x | y | z | Ground |
| | | | | | | | (ft) | | (ft) | (ft) | (ft) | (ft) |
| BUILDING | | | BUILDING00001 | x | 0 | | 14.00 | a | 6211872.46 | 2334922.60 | 14.00 | 0.00 |
| | | | | | | | | | 6211872.67 | 2334865.35 | 14.00 | 0.00 |
| | | | | | | | | | 6211736.67 | 2334865.94 | 14.00 | 0.00 |
| | | | | | | | | | 6211736.97 | 2334874.92 | 14.00 | 0.00 |
| | | | | | | | | | 6211687.39 | 2334875.03 | 14.00 | 0.00 |
| | | | | | | | | | 6211687.39 | 2334923.30 | 14.00 | 0.00 |
| BUILDING | | | BUILDING00002 | x | 0 | | 14.00 | a | 6211673.24 | 2334924.12 | 14.00 | 0.00 |
| | | | | | | | | | 6211673.24 | 2334871.69 | 14.00 | 0.00 |
| | | | | | | | | | 6211620.46 | 2334872.73 | 14.00 | 0.00 |
| | | | | | | | | | 6211620.81 | 2334924.12 | 14.00 | 0.00 |
| BUILDING | | | BUILDING00003 | x | 0 | | 14.00 | a | 6211743.29 | 2334840.14 | 14.00 | 0.00 |
| | | | | | | | | | 6211742.25 | 2334732.50 | 14.00 | 0.00 |
| | | | | | | | | | 6211688.36 | 2334732.04 | 14.00 | 0.00 |
| | | | | | | | | | 6211689.75 | 2334840.37 | 14.00 | 0.00 |
| BUILDING | | | BUILDING00004 | x | 0 | | 14.00 | a | 6211672.80 | 2334864.96 | 14.00 | 0.00 |
| | | | | | | | | | 6211671.41 | 2334756.63 | 14.00 | 0.00 |
| | | | | | | | | | 6211619.33 | 2334756.98 | 14.00 | 0.00 |
| | | | | | | | | | 6211619.68 | 2334865.66 | 14.00 | 0.00 |
| BUILDING | | | BUILDING00005 | x | 0 | | 14.00 | a | 6211671.76 | 2334751.59 | 14.00 | 0.00 |
| | | | | | | | | | 6211671.76 | 2334734.93 | 14.00 | 0.00 |
| | | | | | | | | | 6211645.03 | 2334734.93 | 14.00 | 0.00 |
| | | | | | | | | | 6211645.03 | 2334751.59 | 14.00 | 0.00 |
| BUILDING | | | BUILDING00006 | x | 0 | | 14.00 | a | 6211868.98 | 2334740.64 | 14.00 | 0.00 |
| | | | | | | | | | 6211868.29 | 2334673.97 | 14.00 | 0.00 |
| | | | | | | | | | 6211848.15 | 2334673.97 | 14.00 | 0.00 |
| | | | | | | | | | 6211847.80 | 2334583.69 | 14.00 | 0.00 |
| | | | | | | | | | 6211799.89 | 2334584.39 | 14.00 | 0.00 |
| | | | | | | | | | 6211801.62 | 2334740.98 | 14.00 | 0.00 |
| BUILDING | | | BUILDING00007 | x | 0 | | 14.00 | a | 6211746.67 | 2334720.39 | 14.00 | 0.00 |
| | | | | | | | | | 6211746.67 | 2334668.30 | 14.00 | 0.00 |
| | | | | | | | | | 6211633.83 | 2334668.65 | 14.00 | 0.00 |
| | | | | | | | | | 6211634.17 | 2334720.74 | 14.00 | 0.00 |
| BUILDING | | | BUILDING00008 | x | 0 | | 14.00 | a | 6211746.54 | 2334654.59 | 14.00 | 0.00 |
| | | | | | | | | | 6211746.54 | 2334602.51 | 14.00 | 0.00 |
| | | | | | | | | | 6211633.70 | 2334602.85 | 14.00 | 0.00 |
| | | | | | | | | | 6211634.04 | 2334654.94 | 14.00 | 0.00 |
| BUILDING | | | BUILDING00009 | x | 0 | | 14.00 | a | 6211745.07 | 2334588.44 | 14.00 | 0.00 |
| | | | | | | | | | 6211745.07 | 2334536.36 | 14.00 | 0.00 |
| | | | | | | | | | 6211632.22 | 2334536.71 | 14.00 | 0.00 |
| | | | | | | | | | 6211632.57 | 2334588.79 | 14.00 | 0.00 |
| BUILDING | | | BUILDING00010 | x | 0 | | 14.00 | a | 6211744.68 | 2334522.25 | 14.00 | 0.00 |
| | | | | | | | | | 6211744.68 | 2334470.17 | 14.00 | 0.00 |
| | | | | | | | | | 6211631.83 | 2334470.52 | 14.00 | 0.00 |
| | | | | | | | | | 6211632.18 | 2334522.60 | 14.00 | 0.00 |
| BUILDING | | | BUILDING00011 | x | 0 | | 14.00 | a | 6211743.98 | 2334455.24 | 14.00 | 0.00 |
| | | | | | | | | | 6211743.98 | 2334403.16 | 14.00 | 0.00 |
| | | | | | | | | | 6211631.14 | 2334403.50 | 14.00 | 0.00 |
| | | | | | | | | | 6211631.48 | 2334455.59 | 14.00 | 0.00 |
| BUILDING | | | BUILDING00012 | x | 0 | | 14.00 | a | 6211840.86 | 2334496.91 | 14.00 | 0.00 |

| Name | Sel. | M. | ID | RB | Residents | Absorption | Height | | Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Begin | | x | y | z | Ground |
| | | | | | | | (ft) | | (ft) | (ft) | (ft) | (ft) |
| | | | | | | | | | 6211840.86 | 2334444.82 | 14.00 | 0.00 |
| | | | | | | | | | 6211775.41 | 2334445.17 | 14.00 | 0.00 |
| | | | | | | | | | 6211775.75 | 2334497.25 | 14.00 | 0.00 |
| BUILDING | | | BUILDING00013 | x | 0 | | 14.00 | a | 6211841.38 | 2334563.57 | 14.00 | 0.00 |
| | | | | | | | | | 6211841.38 | 2334511.49 | 14.00 | 0.00 |
| | | | | | | | | | 6211774.89 | 2334511.84 | 14.00 | 0.00 |
| | | | | | | | | | 6211775.23 | 2334563.92 | 14.00 | 0.00 |

## Ground Absorption(s)

| Name | Sel. | M. | ID | G | Coordinates | |
|---|---|---|---|---|---|---|
| | | | | | x | y |
| | | | | | (ft) | (ft) |

## Contour(s)

| Name | Sel. | M. | ID | OnlyPts | Height | | Coordinates | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Begin | End | x | y | z |
| | | | | | (ft) | (ft) | (ft) | (ft) | (ft) |

## Vertical Area Source(s)

| Name | ID | Height | | Coordinates | | | |
|---|---|---|---|---|---|---|---|
| | | Begin | End | x | y | z | Ground |
| | | (ft) | (ft) | (ft) | (ft) | (ft) | (ft) |

## Rail

| Name | Sel. | M. | ID | Lw' | | Train Class | Correct. | Vmax |
|---|---|---|---|---|---|---|---|---|
| | | | | Day | Night | | Track | |
| | | | | (dBA) | (dBA) | | (dB) | (km(mph) |

## Sound Level Spectra

| Name | ID | Type | Oktave Spectrum (dB) | | | | | | | | | | | Source |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Weight. | 31.5 | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | A | lin | |

## Roads

| Name | Sel. | M. | ID | Lme | | | Count Data | | exact Count Data | | | | | | Speed Limit | | SCS | Surface | | Gradient | Mult. Reflection | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Day | Evening | Night | DTV | Str.class. | M | | | p (%) | | | Auto | Truck | Dist. | Dstro | Type | | Drefl | Hbuild | Dist. |
| | | | | (dBA) | (dBA) | (dBA) | | | Day | Evening | Night | Day | Evening | Night | (mph) | (mph) | | (dB) | | (%) | (dB) | (ft) | (ft) |

## RoadsGeo

| Name | Height | | Coordinates | | | | Dist | LSlope |
|---|---|---|---|---|---|---|---|---|
| | Begin | End | x | y | z | Ground | (ft) | (%) |
| | (ft) | (ft) | (ft) | (ft) | (ft) | (ft) | | |

# APPENDIX 9.1:

# CADNAA CONSTRUCTION NOISE MODEL INPUTS

*This page intentionally left blank*

# 15264 - Bloomington Animal Shelter

**CadnaA Noise Prediction Model:** 15264-02_Construction.cna
**Date:** 12.07.23
**Analyst:** B. Maddux

## Calculation Configuration

| Configuration | |
|---|---|
| **Parameter** | **Value** |
| General | |
| Max. Error (dB) | 0.00 |
| Max. Search Radius (#(Unit,LEN)) | 2000.01 |
| Min. Dist Src to Rcvr | 0.00 |
| Partition | |
| Raster Factor | 0.50 |
| Max. Length of Section (#(Unit,LEN)) | 999.99 |
| Min. Length of Section (#(Unit,LEN)) | 1.01 |
| Min. Length of Section (%) | 0.00 |
| Proj. Line Sources | On |
| Proj. Area Sources | On |
| Ref. Time | |
| Daytime Penalty (dB) | 0.00 |
| Recr. Time Penalty (dB) | 5.00 |
| Night-time Penalty (dB) | 10.00 |
| DTM | |
| Standard Height (m) | 0.00 |
| Model of Terrain | Triangulation |
| Reflection | |
| max. Order of Reflection | 2 |
| Search Radius Src | 100.00 |
| Search Radius Rcvr | 100.00 |
| Max. Distance Source - Rcvr | 1000.00 1000.00 |
| Min. Distance Rvcr - Reflector | 1.00 1.00 |
| Min. Distance Source - Reflector | 0.10 |
| Industrial (ISO 9613) | |
| Lateral Diffraction | some Obj |
| Obst. within Area Src do not shield | On |
| Screening | Incl. Ground Att. over Barrier |
| | Dz with limit (20/25) |
| Barrier Coefficients C1,2,3 | 3.0 20.0 0.0 |
| Temperature (#(Unit,TEMP)) | 10 |
| rel. Humidity (%) | 70 |
| Ground Absorption G | 0.50 |
| Wind Speed for Dir. (#(Unit,SPEED)) | 3.0 |
| Roads (TNM) | |
| Railways (FTA/FRA) | |
| Aircraft (???) | |
| Strictly acc. to AzB | |

## Receiver Noise Levels

| Name | M. | ID | Level Lr | | | Limit. Value | | | Land Use | | | Height | | Coordinates | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Day | Night | CNEL | Day | Night | CNEL | Type | Auto | Noise Type | | | X | Y | Z |
| | | | (dBA) | (dBA) | (dBA) | (dBA) | (dBA) | (dBA) | | | | (ft) | | (ft) | (ft) | (ft) |
| R1 | | R1 | 69.7 | -30.3 | 66.7 | 0.0 | 0.0 | 0.0 | | x | Total | 5.00 | r | 6211558.93 | 2334869.61 | 5.00 |
| R2 | | R2 | 53.2 | -46.8 | 50.2 | 0.0 | 0.0 | 0.0 | | x | Total | 5.00 | r | 6211974.93 | 2335776.78 | 5.00 |
| R3 | | R3 | 62.0 | -38.0 | 59.0 | 0.0 | 0.0 | 0.0 | | x | Total | 5.00 | r | 6212093.42 | 2334941.71 | 5.00 |
| R4 | | R4 | 63.0 | -37.0 | 60.0 | 0.0 | 0.0 | 0.0 | | x | Total | 5.00 | r | 6212079.83 | 2334529.90 | 5.00 |

## Point Source(s)

| Name | M. | ID | Result. PWL | | | Lw / Li | | | Operating Time | | | Height | | Coordinates | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Day | Evening | Night | Type | Value | norm. | Day | Special | Night | | | X | Y | Z |
| | | | (dBA) | (dBA) | (dBA) | | | dB(A) | (min) | (min) | (min) | (ft) | | (ft) | (ft) | (ft) |

## Line Source(s)

| Name | M. | ID | Result. PWL | | | Result. PWL' | | | Lw / Li | | | Operating Time | | | Moving Pt. Src | | | | Height | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Day | Evening | Night | Day | Evening | Night | Type | Value | norm. | Day | Special | Night | Number | | | Speed | | |
| | | | (dBA) | (dBA) | (dBA) | (dBA) | (dBA) | (dBA) | | | dB(A) | (min) | (min) | (min) | Day | Evening | Night | (mph) | (ft) | |

| Name | ID | Height | | Coordinates | | | |
|---|---|---|---|---|---|---|---|
| | | Begin | End | x | y | z | Ground |
| | | (ft) | (ft) | (ft) | (ft) | (ft) | (ft) |

## Area Source(s)

| Name | M. | ID | Result. PWL | | | Result. PWL'' | | | Lw / Li | | | Operating Time | | | Height | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Day | Evening | Night | Day | Evening | Night | Type | Value | norm. | Day | Special | Night | (ft) | |
| | | | (dBA) | (dBA) | (dBA) | (dBA) | (dBA) | (dBA) | | | dB(A) | (min) | (min) | (min) | | |
| CONSTRUCTIONAREA | | CA1 | 115.6 | 15.6 | 15.6 | 71.7 | -28.3 | -28.3 | PWL-Pt | 115.6 | | | | | 8 | r |

| Name | ID | Height | | | Coordinates | | | |
|---|---|---|---|---|---|---|---|---|
| | | Begin | | End | x | y | z | Ground |
| | | (ft) | | (ft) | (ft) | (ft) | (ft) | (ft) |
| CONSTRUCTIONAREA | CA1 | 8.00 | r | | 6211935.14 | 2335030.21 | 8.00 | 0.00 |
| | | | | | 6211929.11 | 2334306.32 | 8.00 | 0.00 |
| | | | | | 6211818.11 | 2334306.41 | 8.00 | 0.00 |
| | | | | | 6211760.13 | 2334306.45 | 8.00 | 0.00 |
| | | | | | 6211570.03 | 2334295.39 | 8.00 | 0.00 |
| | | | | | 6211575.59 | 2335032.81 | 8.00 | 0.00 |
| | | | | | 6211824.14 | 2335031.03 | 8.00 | 0.00 |

## Barrier(s)

| Name | Sel. | M. | ID | Absorption | | Z-Ext. | Cantilever | | Height | | Coordinates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | left | right | | horz. | vert. | Begin | End | x | y | z | Ground |
| | | | | | | (ft) | (ft) | (ft) | (ft) | (ft) | (ft) | (ft) | (ft) | (ft) |

## Building(s)

| Name | Sel. | M. | ID | RB | Residents | Absorption | Height | Coordinates | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Begin | x | y | z | Ground | |
| | | | | | | | (ft) | (ft) | (ft) | (ft) | (ft) | |

## Ground Absorption(s)

| Name | Sel. | M. | ID | G | Coordinates | |
|---|---|---|---|---|---|---|
| | | | | | x | y |
| | | | | | (ft) | (ft) |

## Contour(s)

| Name | Sel. | M. | ID | OnlyPts | Height | | Coordinates | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Begin | End | x | y | z |
| | | | | | (ft) | (ft) | (ft) | (ft) | (ft) |

## Vertical Area Source(s)

| Name | ID | Height | | Coordinates | | | |
|---|---|---|---|---|---|---|---|
| | | Begin | End | x | y | z | Ground |
| | | (ft) | (ft) | (ft) | (ft) | (ft) | (ft) |

## Rail

| Name | Sel. | M. | ID | Lw' | | Train Class | Correct. | Vmax |
|---|---|---|---|---|---|---|---|---|
| | | | | Day | Night | | Track | |
| | | | | (dBA) | (dBA) | | (dB) | (km(mph) |

## Sound Level Spectra

| Name | ID | Type | Oktave Spectrum (dB) | | | | | | | | | | | Source |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Weight. | 31.5 | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | A | lin | |

## Roads

| Name | Sel. | M. | ID | Lme | | | Count Data | | exact Count Data | | | | | | Speed Limit | | SCS | Surface | | Gradient | Mult. Reflection | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Day | Evening | Night | DTV | Str.class. | M | | | p (%) | | | Auto | Truck | Dist. | Dstro | Type | | Drefl | Hbuild | Dist. |
| | | | | (dBA) | (dBA) | (dBA) | | | Day | Evening | Night | Day | Evening | Night | (mph) | (mph) | | (dB) | | (%) | (dB) | (ft) | (ft) |

## RoadsGeo

| Name | Height | | | Coordinates | | | | Dist | LSlope |
|---|---|---|---|---|---|---|---|---|---|
| | Begin | | End | x | y | z | Ground | (ft) | (%) |
| | (ft) | | (ft) | (ft) | (ft) | (ft) | (ft) | | |