**Appendix A**

Summary of parameter fitting of 82 horizontal wells

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Decline curve | AHD | | DHD | | VSED | |
| Fitting parameters | b | D0 | a | m | n | τ |
| JI172\_H | 2.56 | 0.224 | 0.0006 | 0.366 | 0.199 | 11.306 |
| JI251\_H | 1.12 | 0.025 | -0.007 | 0.131 | 0.528 | 86.231 |
| JHW001 | 4.57 | 0.492 | -0.0003 | 0.234 | 0.170 | 46.447 |
| JHW003 | 4.45 | 0.190 | 0.00001 | 0.224 | 0.178 | 100.344 |
| JHW005 | 4.76 | 2.768 | 0.572 | 0.957 | 0.145 | 7.887 |
| JHW007 | -0.12 | 0.005 | -0.005 | -0.196 | 261.228 | 1117.136 |
| JI32\_H | 2.62 | 0.051 | -0.001 | 0.190 | 0.264 | 98.51 |
| JHW015 | 5.06 | 0.370 | -0.0002 | 0.209 | 0.175 | 100.133 |
| JHW016 | 4.65 | 0.101 | -0.0004 | 0.171 | 0.221 | 272.954 |
| JHW017 | 2.87 | 0.112 | -0.001 | 0.252 | 0.240 | 51.919 |
| JHW018 | 3.60 | 0.105 | 0.792 | 1.008 | 0.198 | 85.250 |
| JHW019 | 10.46 | 34.956 | 0.667 | 0.957 | 0.082 | 88.410 |
| JHW020 | 14.93 | 289.089 | 0.709 | 0.962 | 0.071 | 739.307 |
| JI36\_H | 2.20 | 0.025 | 1.122 | 1.094 | 0.256 | 76.036 |
| JHW023 | 1.95 | 0.013 | -0.002 | 0.119 | 0.408 | 269.755 |
| JHW025 | 3.27 | 0.265 | -0.001 | 0.270 | 0.230 | 34.262 |
| J10002\_H | 1.79 | 0.018 | 1.298 | 1.137 | 0.490 | 174.068 |
| J10003\_H | 5.40 | 2.311 | 0.484 | 0.904 | 0.165 | 19.668 |
| J10004\_H | 0.10 | 0.005 | -0.004 | 0.051 | 0.759 | 208.189 |
| J10012\_H | 2.60 | 0.028 | 1.102 | 1.085 | 0.409 | 188.478 |
| J10013\_H | 9.60 | 0.473 | 0.726 | 0.950 | 0.205 | 860.286 |
| J10014\_H | 3.58 | 0.019 | 1.074 | 1.060 | 0.375 | 475.254 |
| J10016\_H | 5.69 | 0.525 | 0.093 | 0.509 | 0.163 | 130.026 |
| J10022\_H | 2.77 | 0.103 | 0.874 | 1.480 | 0.305 | 61.465 |
| J10028\_H | 4.80 | 0.493 | 0.642 | 0.958 | 0.230 | 59.707 |
| J10030\_H | 6.90 | 2.289 | 0.011 | 0.330 | 0.117 | 58.915 |
| J10038\_H | 2.65 | 0.051 | -0.004 | 0.153 | 0.399 | 110.207 |
| J10064\_H | 0.71 | 0.007 | -0.004 | 0.047 | 0.732 | 222.115 |
| JHW031 | 2.17 | 0.046 | 1.088 | 1.086 | 0.387 | 90.648 |
| JHW032 | 1.37 | 0.019 | 1.269 | 1.141 | 0.492 | 123.167 |
| JHW033 | 2.88 | 0.011 | 1.099 | 1.065 | 0.404 | 507.295 |
| JHW034 | 2.81 | 0.035 | 1.021 | 1.064 | 0.327 | 186.177 |
| JHW035 | 5.41 | 1.871 | 0.608 | 0.956 | 0.096 | 11.299 |
| JHW036 | 1.25 | 0.012 | 1.224 | 1.116 | 0.499 | 202.169 |
| JHW037 | / | / | / | / | / | / |
| JHW038 | / | / | / | / | / | / |
| JHW042 | 1.46 | 0.022 | 1.315 | 1.155 | 0.500 | 114.253 |
| JHW043 | 1.76 | 0.030 | 1.155 | 1.118 | 0.483 | 102.167 |
|  |  | |  | |  | |
| Decline curve | AHD | | DHD | | VSED | |
| Fitting parameters | b | D0 | a | m | n | τ |
| JHW044 | 5.09 | 0.589 | 0.013 | 0.347 | 0.172 | 56.495 |
| JHW045 | 14.12 | 1597.234 | 0.033 | 0.433 | 0.044 | 36.390 |
| JHW4001 | / | / | / | / | / | / |
| J10005\_H | 3.58 | 0.068 | -0.007 | 0.130 | 0.500 | 91.774 |
| J10015\_H | 3.58 | 0.068 | / | / | / | / |
| J10018\_H | 66.36 | 3.7×1013 | 0.361 | 0.774 | -0.344 | 18.586 |
| J10019\_H | 6.43 | 0.221 | 0.001 | 0.190 | 0.201 | 401.285 |
| J10020\_H | 4.27 | 0.040 | 0.004 | 0.185 | 0.260 | 704.987 |
| J10021\_H | 7.32 | 0.525 | 0.730 | 0.967 | 0.210 | 278.633 |
| J10026\_H | 8.25 | 0.339 | -0.002 | 0.124 | 0.278 | 360.492 |
| J10027\_H | 12.46 | 0.923 | -0.003 | 0.063 | 0.304 | 720.348 |
| J10031\_H | 3.14 | 0.069 | -0.006 | 0.153 | 0.432 | 91.744 |
| J10043\_H | 5.72 | 0.438 | 0.017 | 0.323 | 0.195 | 129.372 |
| J10044\_H | / | / | / | / | / | / |
| J10046\_H | / | / | / | / | / | / |
| J10054\_H | 1.39 | 0.007 | -0.003 | 0.051 | 0.620 | 324.900 |
| J110057\_H | 6.30 | 0.350 | 0.745 | 0.976 | 0.235 | 197.786 |
| JHW00121 | 33.57 | 2.9×1012 | 0.101 | 0.585 | -0.607 | 251.115 |
| JHW00124 | 3.29 | 0.173 | 0.007 | 0.337 | 0.258 | 42.786 |
| JHW00321 | 2.43 | 0.009 | -0.003 | 0.038 | 0.760 | 305.993 |
| JHW00421 | / | / | / | / | / | / |
| JHW00422 | 3.60 | 0.081 | 0.001 | 0.202 | 0.344 | 98.536 |
| JHW00423 | 1.93 | 0.027 | -0.011 | 0.063 | 0.672 | 89.917 |
| JHW00525 | 150.37 | 2.9×1012 | 0.734 | 0.924 | -0.021 | 4.333 |
| JHW00526 | 39.76 | 1.6×1012 | 0.153 | 0.607 | -0.006 | 1.432 |
| JHW00722 | 156.16 | 2.3×1013 | 0.742 | 0.927 | -0.142 | 0.002 |
| JHW00724 | 1.89 | 0.023 | -0.008 | 0.070 | 0.628 | 113.771 |
| JHW00728 | 2.77 | 0.046 | -0.009 | 0.107 | 0.553 | 89.127 |
| JHW00921 | / | / | / | / | / | / |
| JHW00922 | -1.98 | 0.005 | -0.007 | 0.005 | 1.097 | 131.923 |
| JHW00923 | 1.95 | 0.051 | 1.216 | 1.154 | 0.558 | 60.567 |
| JHW00924 | -0.24 | 0.011 | -0.013 | -0.027 | 1.183 | 79.107 |
| JHW01021 | -0.74 | 0.007 | -0.008 | 0.018 | 1.014 | 117.020 |
| JHW01022 | 3.96 | 0.112 | 0.001 | 0.207 | 0.400 | 88.377 |
| JHW01023 | 21.32 | 2.068 | 0.670 | 0.901 | 0.127 | 169136.982 |
| JHW01121 | -2.22 | 0.006 | -0.011 | -0.021 | 1.536 | 77.712 |
| JHW01122 | / | / | / | / | / | / |
| JHW01123 | / | / | / | / | / | / |
| JHW01221 | 12.82 | 0.291 | 0.829 | 0.976 | 0.241 | 2091.441 |
| JHW01222 | / | / | / | / | / | / |
| JHW01321 | 1.51 | 0.024 | -0.010 | 0.063 | 0.691 | 90.060 |
|  |  |  |  |  |  |  |
| Decline curve | AHD | | DHD | | VSED | |
| Fitting parameters | b | D0 | a | m | n | τ |
| JHW01322 | 1.64 | 0.049 | -0.016 | 0.112 | 0.609 | 50.80 |
| JHW01323 | -2.21 | 0.004 | -0.007 | -0.011 | 1.737 | 109.024 |
| JHW01324 | 1.38 | 0.020 | 1.217 | 1.126 | 0.733 | 96.591 |
| JHW01711 | 4.23 | 0.187 | 0.730 | 0.983 | 0.290 | 89.657 |
| JHW02024 | 0.52 | 0.014 | -0.011 | 0.025 | 0.865 | 92.887 |
| JHW02026 | 1.31 | 0.029 | -0.012 | 0.079 | 0.664 | 71.779 |
| JHW041 | 2.32 | 0.034 | 1.107 | 1.095 | 0.389 | 133.969 |
| JHW051 | 5.63 | 0.090 | 0.990 | 1.057 | 0.361 | 166.103 |
| JHW052 | 0.921 | 0.003 | -0.002 | 0.015 | 0.822 | 434.444 |
| JHW07121 | / | / | / | / | / | / |
| JHW151 | -1.46 | 0.003 | -0.006 | -0.021 | 1.792 | 171.942 |
| JHW152 | / | / | / | / | / | / |
| JI179\_H | 1.69 | 0.172 | -0.016 | 0.322 | 0.614 | 15.272 |
| JI187\_H | 6.18 | 0.335 | 0.756 | 0.980 | 0.247 | 182.771 |
| JI41\_H | 33.95 | 3.2×1013 | 0.258 | 0.756 | -0.064 | 1652.546 |

Note: Red font is deleted well number, including small amount of data (represented by "/"), no peak production, multiple workovers or shut-ins. Data marked in yellow are valid data, data marked in green are invalid data.