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Human Health ProUCL Inputs and Outputs

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Green Alder Bark (mg/kg)

| | Aluminum | D_Aluminum | Antimony | D_Antimony | Arsenic | D_Arsenic | Barium | D_Barium | Chromium | D_Chromium | Cobalt | D_Cobalt | |
|----------|----------|------------|----------|------------|---------|-----------|--------|----------|----------|------------|--------|----------|---|
| 11MP20GA | 8 | | 1 | 1.96 | 1 | 0.26 | 1 | 117 | 1 | 0.2 | 0 | 0.148 | 1 |
| 11MP27GA | 8.4 | | 1 | 3.35 | 1 | 0.43 | 1 | 51.1 | 1 | 1.4 | 1 | 0.064 | 1 |
| 11MP34GA | 9.2 | | 1 | 0.635 | 1 | 0.91 | 1 | 2.35 | 1 | 0.2 | 0 | 0.191 | 1 |
| 11MP38GA | 12.2 | | 1 | 2.58 | 1 | 0.35 | 1 | 86.1 | 1 | 0.3 | 1 | 0.267 | 1 |
| 11MP44GA | 3.7 | | 1 | 0.435 | 1 | 0.23 | 1 | 46.5 | 1 | 0.2 | 0 | 0.074 | 1 |
| 11SM07GA | 17.3 | | 1 | 0.375 | 1 | 0.47 | 1 | 167 | 1 | 0.2 | 0 | 0.528 | 1 |
| 11SM11GA | 24.2 | | 1 | | | | | 203 | 1 | | | | |
| 11SM18GA | 9.7 | | 1 | 0.165 | 1 | 0.13 | 1 | 181 | 1 | 0.2 | 0 | 0.171 | 1 |
| 11SM81GA | | | | 0.39 | 1 | 0.06 | 1 | | | 1 | 1 | 0.178 | 1 |

| | Iron | D_Iron | Lead | D_Lead | Manganese | D_Manganese | Mercury | D_Mercury | Thallium | D_Thallium | Vanadium | D_Vanadium | |
|----------|------|--------|------|--------|-----------|-------------|---------|-----------|----------|------------|----------|------------|---|
| 11MP20GA | 19.3 | | 1 | 0.066 | 1 | 602 | 1 | 0.157 | 1 | 0.002 | 0 | 0.06 | 1 |
| 11MP27GA | 34.9 | | 1 | 0.067 | 1 | 91.2 | 1 | 0.243 | 1 | 0.002 | 0 | 0.05 | 1 |
| 11MP34GA | 24.5 | | 1 | 0.113 | 1 | 477 | 1 | 0.289 | 1 | 0.013 | 1 | 0.06 | 1 |
| 11MP38GA | 30.6 | | 1 | 0.108 | 1 | 197 | 1 | 0.252 | 1 | 0.002 | 0 | 0.07 | 1 |
| 11MP44GA | 17.6 | | 1 | 0.06 | 1 | 707 | 1 | 0.027 | 1 | 0.008 | 1 | 0.03 | 1 |
| 11SM07GA | 32.2 | | 1 | 0.102 | 1 | 1140 | 1 | 0.043 | 1 | 0.03 | 1 | 0.06 | 1 |
| 11SM11GA | | | | | | 245 | 1 | 0.036 | 1 | | | 0.07 | 1 |
| 11SM18GA | 19.9 | | 1 | 0.106 | 1 | 462 | 1 | 0.017 | 1 | 0.006 | 1 | 0.04 | 1 |
| 11SM81GA | 22.4 | | 1 | 0.076 | 1 | | | | | 0.002 | 0 | | |

White Spruce Needles (mg/kg)

| | Aluminum | D_Aluminum | Antimony | D_Antimony | Arsenic | D_Arsenic | Barium | D_Barium | Chromium | D_Chromium | Cobalt | D_Cobalt |
|----------|----------|------------|----------|------------|---------|-----------|--------|----------|----------|------------|--------|----------|
| 11MP20WS | 172 | 1 | 0.667 | 1 | 0.82 | 1 | 70.8 | 1 | 0.5 | 1 | 0.303 | 1 |
| 11MP31WS | 15 | 1 | 1.22 | 1 | 0.71 | 1 | 14.4 | 1 | 0.2 | 0 | 0.258 | 1 |
| 11MP34WS | 7.5 | 1 | 0.686 | 1 | 0.41 | 1 | 4.16 | 1 | 0.2 | 0 | 0.224 | 1 |
| 11MP38WS | 52.8 | 1 | 15.1 | 1 | 11.1 | 1 | 36.2 | 1 | 1.3 | 1 | 0.217 | 1 |
| 11MP91WS | 5.1 | 1 | 0.343 | 1 | 0.23 | 1 | 37.4 | 1 | 0.2 | 0 | 0.074 | 1 |
| 11SM07WS | 0.4 | 0 | 0.226 | 1 | 0.31 | 1 | 57.1 | 1 | 0.7 | 1 | 0.14 | 1 |
| 11SM11WS | 56.5 | 1 | 0.199 | 1 | 0.11 | 1 | 23 | 1 | | | 0.051 | 1 |
| 11SM18WS | 8.6 | 1 | 0.573 | 1 | 0.13 | 1 | 85.3 | 1 | 0.8 | 1 | 0.106 | 1 |

| | Iron | D_Iron | Lead | D_Lead | Manganese | D_Manganese | Mercury | D_Mercury | Thallium | D_Thallium | Vanadium | D_Vanadium |
|----------|------|--------|-------|--------|-----------|-------------|---------|-----------|----------|------------|----------|------------|
| 11MP20WS | 201 | 1 | 0.466 | 1 | 1340 | 1 | 0.641 | 1 | 0.002 | 0 | 0.47 | 1 |
| 11MP31WS | 31.8 | 1 | 0.05 | 1 | 2990 | 1 | 0.965 | 1 | 0.002 | 0 | 0.05 | 1 |
| 11MP34WS | 23.3 | 1 | 0.053 | 1 | 963 | 1 | 0.264 | 1 | 0.002 | 0 | 0.04 | 1 |
| 11MP38WS | 206 | 1 | 0.128 | 1 | 162 | 1 | 5.64 | 1 | 0.021 | 1 | 0.21 | 1 |
| 11MP91WS | 20.2 | 1 | 0.027 | 1 | 218 | 1 | 0.036 | 1 | 0.005 | 1 | 0.03 | 1 |
| 11SM07WS | 29.4 | 1 | 0.02 | 1 | 810 | 1 | 0.04 | 1 | 0.002 | 0 | 0.03 | 1 |
| 11SM11WS | 29.9 | 1 | 0.039 | 1 | 312 | 1 | 0.032 | 1 | 0.002 | 0 | 0.04 | 1 |
| 11SM18WS | 20.1 | 1 | 0.034 | 1 | 589 | 1 | 0.05 | 1 | 0.002 | 0 | 0.03 | 1 |

Sculpin (whole fish) - mg/kg-wet

| | Al | D_Al | Sb | D_Sb | As | D_As | Ba | D_Ba | Cd | D_Cd | Cr | D_Cr | Cu | D_Cu | Fe | D_Fe | Pb | D_Pb | Mn | D_Mn | Hg | D_Hg | Ni | D_Ni | Se | D_Se | V | D_V | Zn | D_Zn | Inorg As | D_Inorg As | MeHg | D_MeHg |
|---------------------|------|------|--------|------|--------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|--------|------|---------|------|-------|------|-------|------|---------|-----|--------|------|----------|------------|--------|--------|
| 2-RD-10-SC | 36.4 | 1 | 18.29 | 1 | 14.624 | 1 | 4.471 | 1 | 0.038 | 1 | 0.106 | 1 | 0.943 | 1 | 102 | 1 | 0.045 | 1 | 17.558 | 1 | 1.9511 | 1 | 0.225 | 1 | 1.825 | 1 | 0.276 | 1 | 35.373 | 1 | | | | |
| 2-RD-11-SC | 11.7 | 1 | 6.512 | 1 | 6.864 | 1 | 3.308 | 1 | 0.056 | 1 | 0.038 | 1 | 0.882 | 1 | 63.7 | 1 | 0.025 | 0 | 11.192 | 1 | 0.8909 | 1 | 0.137 | 1 | 1.852 | 1 | 0.21 | 1 | 29.254 | 1 | | | | |
| 2-RD-12-SC | 26.7 | 1 | 17.486 | 1 | 12.339 | 1 | 3.514 | 1 | 0.025 | 0 | 0.071 | 1 | 0.911 | 1 | 75.8 | 1 | 0.029 | 1 | 10.351 | 1 | 2.80423 | 1 | 0.115 | 1 | 1.533 | 1 | 0.211 | 1 | 26.177 | 1 | | | | |
| 2-RD-1-SC | 30.7 | 1 | 18.692 | 1 | 9.645 | 1 | 3.794 | 1 | 0.025 | 0 | 0.074 | 1 | 0.907 | 1 | 81.2 | 1 | 0.035 | 1 | 11.099 | 1 | 2.2593 | 1 | 0.105 | 1 | 2.975 | 1 | 0.16 | 1 | 24.836 | 1 | | | | |
| 2-RD-2-SC | 25.2 | 1 | 12.303 | 1 | 13.222 | 1 | 5.402 | 1 | 0.03 | 1 | 0.062 | 1 | 0.94 | 1 | 86.5 | 1 | 0.029 | 1 | 21.275 | 1 | 1.8515 | 1 | 0.16 | 1 | 1.836 | 1 | 0.214 | 1 | 29.581 | 1 | | | | |
| 2-RD-3-SC | 25.6 | 1 | 14.224 | 1 | 8.231 | 1 | 3.609 | 1 | 0.025 | 0 | 0.053 | 1 | 0.72 | 1 | 76.2 | 1 | 0.029 | 1 | 9.044 | 1 | 1.5268 | 1 | 0.083 | 1 | 1.596 | 1 | 0.152 | 1 | 20.634 | 1 | | | | |
| 2-RD-4-SC | 39.3 | 1 | 22.281 | 1 | 11.785 | 1 | 3.103 | 1 | 0.025 | 0 | 0.104 | 1 | 0.917 | 1 | 92.7 | 1 | 0.04 | 1 | 6.653 | 1 | 3.7009 | 1 | 0.119 | 1 | 2.025 | 1 | 0.195 | 1 | 22.897 | 1 | | | | |
| 2-RD-5-SC | 41.4 | 1 | 23.668 | 1 | 20.099 | 1 | 4.097 | 1 | 0.025 | 0 | 0.13 | 1 | 1.383 | 1 | 136 | 1 | 0.046 | 1 | 10.345 | 1 | 3.1578 | 1 | 0.231 | 1 | 2.414 | 1 | 0.243 | 1 | 22.666 | 1 | | | | |
| 2-RD-6-SC | 28.1 | 1 | 10.482 | 1 | 14.878 | 1 | 2.829 | 1 | 0.029 | 1 | 0.105 | 1 | 1.105 | 1 | 119.4 | 1 | 0.031 | 1 | 9.831 | 1 | 1.35536 | 1 | 0.211 | 1 | 2.223 | 1 | 0.22 | 1 | 28.516 | 1 | | | | |
| 2-RD-7-SC | 34.2 | 1 | 17.199 | 1 | 18.099 | 1 | 3.884 | 1 | 0.025 | 0 | 0.097 | 1 | 0.973 | 1 | 112.2 | 1 | 0.039 | 1 | 9.836 | 1 | 1.74736 | 1 | 0.183 | 1 | 2.252 | 1 | 0.266 | 1 | 27.254 | 1 | | | | |
| 2-RD-8-SC | 72.5 | 1 | 38.1 | 1 | 24.06 | 1 | 5.15 | 1 | 0.032 | 1 | 0.188 | 1 | 1.164 | 1 | 183.7 | 1 | 0.079 | 1 | 11.712 | 1 | 3.6834 | 1 | 0.263 | 1 | 2.234 | 1 | 0.317 | 1 | 26.68 | 1 | | | | |
| 2-RD-9-SC | 42.6 | 1 | 10.145 | 1 | 9.314 | 1 | 3.156 | 1 | 0.025 | 0 | 0.155 | 1 | 0.761 | 1 | 77.9 | 1 | 0.027 | 1 | 10.888 | 1 | 0.68364 | 1 | 0.151 | 1 | 2.423 | 1 | 0.182 | 1 | 27.235 | 1 | | | 0.16 | 1 |
| RD 10/Slimey Scul | 6.5 | 1 | 0.479 | 1 | 1.098 | 1 | 2.008 | 1 | 0.027 | 1 | 0.057 | 1 | 0.885 | 1 | 20.8 | 1 | 0.025 | 0 | 9.76 | 1 | 0.07 | 1 | 0.044 | 1 | 0.851 | 1 | 0.102 | 1 | 17.129 | 1 | | | | |
| RD 11/Slimey Scul | 15.4 | 1 | 1.374 | 1 | 2.554 | 1 | 2.602 | 1 | 0.025 | 0 | 0.062 | 1 | 1.016 | 1 | 49.2 | 1 | 0.025 | 0 | 9.502 | 1 | 0.13 | 1 | 0.069 | 1 | 1.43 | 1 | 0.123 | 1 | 21.938 | 1 | | | | |
| RD 12/Slimey Scul | 20.9 | 1 | 4.044 | 1 | 3.387 | 1 | 3.066 | 1 | 0.059 | 1 | 0.069 | 1 | 0.969 | 1 | 60.5 | 1 | 0.026 | 1 | 8.562 | 1 | 0.63 | 1 | 0.095 | 1 | 1.199 | 1 | 0.161 | 1 | 23.009 | 1 | | | | |
| RD 13/Slimey Scul | 10.9 | 1 | 1.496 | 1 | 4.493 | 1 | 4.347 | 1 | 0.103 | 1 | 2.431 | 1 | 1.149 | 1 | 59.5 | 1 | 0.025 | 0 | 15.994 | 1 | 0.23 | 1 | 0.113 | 1 | 1.052 | 1 | 0.359 | 1 | 30.716 | 1 | | | | |
| RD 15/Slimey Scul | 6.9 | 1 | 1.151 | 1 | 2.63 | 1 | 3.067 | 1 | 0.037 | 1 | 0.053 | 1 | 1.693 | 1 | 32.9 | 1 | 0.025 | 0 | 8.442 | 1 | 0.09 | 1 | 0.064 | 1 | 0.912 | 1 | 0.136 | 1 | 22.158 | 1 | | | | |
| RD 4/Slimey Sculp | 6.6 | 1 | 1.513 | 1 | 2.352 | 1 | 3.341 | 1 | 0.025 | 0 | 0.039 | 1 | 1.965 | 1 | 27.5 | 1 | 0.025 | 1 | 9.423 | 1 | 0.09 | 1 | 0.045 | 1 | 1.127 | 1 | 0.132 | 1 | 20.657 | 1 | | | | |
| RD 7/Slimey Sculp | 10.3 | 1 | 2.173 | 1 | 3.029 | 1 | 2.688 | 1 | 0.025 | 0 | 0.046 | 1 | 2.263 | 1 | 30.1 | 1 | 0.025 | 0 | 11.292 | 1 | 0.09 | 1 | 0.05 | 1 | 0.986 | 1 | 0.095 | 1 | 19.812 | 1 | | | | |
| RD 8/Slimey Sculp | 3.6 | 1 | 0.399 | 1 | 1.132 | 1 | 2.405 | 1 | 0.052 | 1 | 0.028 | 1 | 0.72 | 1 | 18.9 | 1 | 0.025 | 0 | 8.955 | 1 | 0.05 | 1 | 0.039 | 1 | 1.291 | 1 | 0.122 | 1 | 18.718 | 1 | | | | |
| RD 9/Slimey Sculp | 5.3 | 1 | 0.615 | 1 | 1.439 | 1 | 2.82 | 1 | 0.047 | 1 | 0.035 | 1 | 0.816 | 1 | 25.1 | 1 | 0.025 | 0 | 13.854 | 1 | 0.06 | 1 | 0.044 | 1 | 0.834 | 1 | 0.206 | 1 | 26.846 | 1 | | | | |
| RD 5,6,14 Composite | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RDSS1-1 | 20.9 | 1 | | | 5.81 | 1 | 4.56 | 1 | 0.03 | 1 | 0.05 | 0 | 1.41 | 1 | 64 | 1 | 0.003 | 0 | 22.4 | 1 | 0.273 | 1 | 0.171 | 1 | 0.68 | 1 | 0.038 | 0 | 32 | 1 | | | 0.312 | 1 |
| RDSS1-10 | 18.2 | 1 | | | 2.9 | 1 | 5.14 | 1 | 0.076 | 1 | 0.05 | 0 | 1.07 | 1 | 51 | 1 | 0.039 | 1 | 40.7 | 1 | 0.135 | 1 | 0.016 | 0 | 1.05 | 1 | 0.04 | 0 | 30.3 | 1 | | | 0.114 | 1 |
| RDSS1-11 | 15.1 | 1 | | | 3.13 | 1 | 3.9 | 1 | 0.049 | 1 | 0.06 | 0 | 1.02 | 1 | 59 | 1 | 0.004 | 0 | 14 | 1 | 0.131 | 1 | 0.018 | 0 | 0.59 | 1 | 0.043 | 0 | 26.7 | 1 | | | | |
| RDSS1-12 | 37.4 | 1 | | | 7.89 | 1 | 3.49 | 1 | 0.033 | 1 | 0.05 | 0 | 1.08 | 1 | 89 | 1 | 0.004 | 0 | 17.1 | 1 | 0.158 | 1 | 0.168 | 1 | 0.61 | 1 | 0.042 | 0 | 24.1 | 1 | | | | |
| RDSS1-2 | 12.1 | 1 | | | 4.51 | 1 | 1.93 | 1 | 0.044 | 1 | 0.05 | 0 | 1.13 | 1 | 59 | 1 | 0.003 | 0 | 7.46 | 1 | 0.269 | 1 | 0.015 | 0 | 0.92 | 1 | 0.038 | 0 | 26.1 | 1 | | | 0.164 | 1 |
| RDSS1-3 | 9.3 | 1 | | | 1.62 | 1 | 4.83 | 1 | 0.066 | 1 | 0.06 | 0 | 1.1 | 1 | 53 | 1 | 0.004 | 0 | 19.2 | 1 | 0.161 | 1 | 0.018 | 0 | 0.98 | 1 | 0.044 | 0 | 33.5 | 1 | | | 0.0501 | 1 |
| RDSS1-4 | 4.9 | 1 | | | 6.07 | 1 | 1.6 | 1 | 0.026 | 1 | 0.06 | 0 | 1.01 | 1 | 40 | 1 | 0.004 | 0 | 9.17 | 1 | 0.123 | 1 | 0.018 | 0 | 0.78 | 1 | 0.044 | 0 | 26.3 | 1 | | | | |
| RDSS1-5 | 18.4 | 1 | | | 9.11 | 1 | 3.21 | 1 | 0.037 | 1 | 0.05 | 0 | 1.02 | 1 | 93 | 1 | 0.004 | 0 | 22.7 | 1 | 0.142 | 1 | 0.017 | 0 | 0.64 | 1 | 0.041 | 0 | 20.3 | 1 | | | | |
| RDSS1-6 | 15.9 | 1 | | | 7.78 | 1 | 2.29 | 1 | 0.031 | 1 | 0.05 | 0 | 1.08 | 1 | 66 | 1 | 0.003 | 0 | 16.4 | 1 | 0.159 | 1 | 0.016 | 0 | 0.9 | 1 | 0.038 | 0 | 26.1 | 1 | | | | |
| RDSS1-7 | 10.4 | 1 | | | 2.49 | 1 | 3.94 | 1 | 0.033 | 1 | 0.05 | 0 | 1.12 | 1 | 45 | 1 | 0.004 | 0 | 14.2 | 1 | 0.102 | 1 | 0.016 | 0 | 0.92 | 1 | 0.039 | 0 | 24.4 | 1 | | | | |
| RDSS1-8 | 4.5 | 1 | | | 1.98 | 1 | 1.79 | 1 | 0.026 | 1 | 0.05 | 0 | 1.09 | 1 | 28 | 1 | 0.004 | 0 | 14 | 1 | 0.0858 | 1 | 0.016 | 0 | 0.96 | 1 | 0.04 | 0 | 21.3 | 1 | | | | |
| RDSS1-9 | 34.9 | 1 | | | 4.95 | 1 | 3.49 | 1 | 0.054 | 1 | 0.06 | 0 | 1.01 | 1 | 98 | 1 | 0.004 | 0 | 8.27 | 1 | 0.279 | 1 | 0.018 | 0 | 0.76 | 1 | 0.043 | 0 | 24.5 | 1 | | | | |
| RDSS2-1 | 13.4 | 1 | | | 12.2 | 1 | 4.63 | 1 | 0.003 | 0 | 0.06 | 0 | 1.23 | 1 | 115 | 1 | 0.004 | 0 | 12.5 | 1 | 0.219 | 1 | 0.155 | 1 | 1.18 | 1 | 0.043 | 0 | 21.9 | 1 | 14 | 1 | 0.135 | 1 |
| RDSS2-10 | 55.7 | 1 | | | 22.3 | 1 | 1.63 | 1 | 0.003 | 0 | 0.05 | 0 | 1.8 | 1 | 247 | 1 | 0.052 | 1 | 19.4 | 1 | 0.341 | 1 | 0.503 | 1 | 1.35 | 1 | 0.311 | 1 | 23.6 | 1 | 17.4 | 1 | | |
| RDSS2-11 | 18.7 | 1 | | | 12.3 | 1 | 1.95 | 1 | 0.06 | 1 | 0.05 | 0 | 1.27 | 1 | 139 | 1 | 0.004 | 0 | 11.6 | 1 | 0.223 | 1 | 0.115 | 1 | 1.48 | 1 | 0.042 | 0 | 24.9 | 1 | 7.47 | 1 | | |
| RDSS2-12 | 37.8 | 1 | | | 9.27 | 1 | 2.11 | 1 | 0.022 | 1 | 0.05 | 0 | 1.18 | 1 | 133 | 1 | 0.055 | 1 | 9.11 | 1 | 0.999 | 1 | 0.132 | 1 | 0.67 | 1 | 0.042 | 0 | 19.7 | 1 | 3.18 | 1 | | |
| RDSS2-2 | 3.6 | 1 | | | 6.94 | 1 | 3.74 | 1 | 0.003 | 0 | 0.05 | 0 | 0.99 | 1 | 52 | 1 | 0.004 | 0 | 10.2 | 1 | 0.0998 | 1 | 0.016 | 0 | 0.58 | 1 | 0.039 | 0 | 22 | 1 | 7.48 | 1 | 0.0827 | 1 |
| RDSS2-3 | 3.7 | 1 | | | 3.66 | 1 | 0.986 | 1 | 0.062 | 1 | 0.05 | 0 | 1 | 1 | 61 | 1 | 0.004 | 0 | 3.49 | 1 | 0.114 | 1 | 0.017 | 0 | 0.94 | 1 | 0.04 | 0 | 20.6 | 1 | 2.07 | 1 | | |
| RDSS2-4 | 47.2 | 1 | | | 45.9 | 1 | 6.96 | 1 | 0.003 | 0 | 0.05 | 0 | 1.52 | 1 | 367 | 1 | 0.053 | 1 | 23 | 1 | 0.504 | 1 | 0.274 | 1 | 1.19 | 1 | 0.33 | 1 | 26.3 | 1 | 37.9 | 1 | | |
| RDSS2-5 | 19.9 | 1 | | | 11.1 | 1 | 1.36 | 1 | 0.036 | 1 | 0.05 | 0 | 1.56 | 1 | 144 | 1 | 0.003 | 0 | 14.2 | 1 | 0.336 | 1 | 0.155 | 1 | 1.34 | 1 | 0.039 | 0 | 26.1 | 1 | 2.66 | 1 | | |
| RDSS2-6 | 14.6 | 1 | | | 15.2 | 1 | 4.84 | 1 | 0.03 | 1 | 0.05 | 0 | 1.23 | 1 | 104 | 1 | 0.004 | 0 | 8.81 | 1 | 0.239 | 1 | 0.178 | 1 | 1.28 | 1 | 0.04 | 0 | 15.9 | 1 | 13.9 | 1 | | |
| RDSS2-7 | 13.6 | 1 | | | 17.7 | 1 | 1.66 | 1 | 0.003 | 0 | 0.06 | 0 | 1.38 | 1 | 194 | 1 | 0.004 | 0 | 9.67 | 1 | 0.153 | 1 | 0.108 | 1 | 0.61 | 1 | 0.044 | 0 | 16.4 | 1 | 16.3 | 1 | | |
| RDSS2-8 | 32 | 1 | | | 40.5 | 1 | 2.59 | 1 | 0.003 | 0 | 0.06 | 0 | 1.61 | 1 | 386 | 1 | 0.004 | 0 | 23.5 | 1 | 0.427 | 1 | 0.3 | 1 | 1.01 | 1 | 0.043 | 0 | 21.1 | 1 | 29.7 | 1 | | |
| RDSS2-9 | 32.2 | 1 | | | 25 | 1 | 2.97 | 1 | 0.033 | 1 | 0.05 | 0 | 1.07 | 1 | 285 | 1 | 0.004 | 0 | 30.3 | 1 | 0.181 | 1 | 0.258 | 1 | 1.34 | 1 | 0.433</ | | | | | | | |

General UCL Statistics for Data Sets with Non-Detects

User Selected Options
 From File WorkSheet.wst
 Full Precision OFF
 Confidence Coefficient 95%
 Number of Bootstrap Operations 2000

Aluminum

General Statistics

Number of Valid Observations 8 Number of Distinct Observations 8

Raw Statistics

| | | |
|--------------------------|----------------------------|-------|
| | Log-transformed Statistics | |
| Minimum | 3.7 Minimum of Log Data | 1.308 |
| Maximum | 24.2 Maximum of Log Data | 3.186 |
| Mean | 11.59 Mean of log Data | 2.318 |
| Geometric Mean | 10.16 SD of log Data | 0.56 |
| Median | 9.45 | |
| SD | 6.399 | |
| Std. Error of Mean | 2.262 | |
| Coefficient of Variation | 0.552 | |
| Skewness | 1.166 | |

Warning: There are only 8 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

| | | |
|---|--|-------|
| Normal Distribution Test | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.898 Shapiro Wilk Test Statistic | 0.956 |
| Shapiro Wilk Critical Value | 0.818 Shapiro Wilk Critical Value | 0.818 |
| Data appear Normal at 5% Significance Level | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|-------|---------------------------------|-------|
| 95% Student's-t UCL | 15.87 | Assuming Lognormal Distribution | |
| 95% UCLs (Adjusted for Skewness) | | 95% H-UCL | 20 |
| 95% Adjusted-CLT UCL (Chen-1995) | 16.3 | 95% Chebyshev (MVUE) UCL | 21.78 |
| 95% Modified-t UCL (Johnson-1978) | 16.03 | 97.5% Chebyshev (MVUE) UCL | 26.18 |
| | | 99% Chebyshev (MVUE) UCL | 34.81 |

Gamma Distribution Test

| | | | |
|--------------------------------------|--------|---|-------|
| k star (bias corrected) | 2.556 | Data Distribution | |
| Theta Star | 4.534 | Data appear Normal at 5% Significance Level | |
| MLE of Mean | 11.59 | | |
| MLE of Standard Deviation | 7.248 | | |
| nu star | 40.89 | | |
| Approximate Chi Square Value (.05) | 27.23 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0195 | 95% CLT UCL | 15.31 |
| Adjusted Chi Square Value | 24.45 | 95% Jackknife UCL | 15.87 |
| | | 95% Standard Bootstrap UCL | 15.07 |
| Anderson-Darling Test Statistic | 0.302 | 95% Bootstrap-t UCL | 19.6 |
| Anderson-Darling 5% Critical Value | 0.719 | 95% Hall's Bootstrap UCL | 43.48 |
| Kolmogorov-Smirnov Test Statistic | 0.194 | 95% Percentile Bootstrap UCL | 15.23 |
| Kolmogorov-Smirnov 5% Critical Value | 0.295 | 95% BCA Bootstrap UCL | 16.08 |

| | | |
|--|-------------------------------|-------|
| Data appear Gamma Distributed at 5% Significance Level | 95% Chebyshev(Mean, Sd) UCL | 21.45 |
| | 97.5% Chebyshev(Mean, Sd) UCL | 25.72 |
| Assuming Gamma Distribution | 99% Chebyshev(Mean, Sd) UCL | 34.1 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 17.4 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 19.38 | |
| Potential UCL to Use | Use 95% Student's-t UCL | 15.87 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Antimony

General Statistics

| | | | |
|------------------------------|---|---------------------------------|---|
| Number of Valid Observations | 8 | Number of Distinct Observations | 8 |
| Number of Missing Values | 1 | | |

Raw Statistics

| | | | |
|--------------------------|-------|----------------------------|--------|
| | | Log-transformed Statistics | |
| Minimum | 0.165 | Minimum of Log Data | -1.802 |
| Maximum | 3.35 | Maximum of Log Data | 1.209 |
| Mean | 1.236 | Mean of log Data | -0.273 |
| Geometric Mean | 0.761 | SD of log Data | 1.083 |
| Median | 0.535 | | |
| SD | 1.219 | | |
| Std. Error of Mean | 0.431 | | |
| Coefficient of Variation | 0.986 | | |
| Skewness | 0.95 | | |

Warning: There are only 8 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

| | | | |
|--|-------|--|-------|
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.814 | Shapiro Wilk Test Statistic | 0.911 |
| Shapiro Wilk Critical Value | 0.818 | Shapiro Wilk Critical Value | 0.818 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|-------|---------------------------------|-------|
| 95% Student's-t UCL | 2.053 | Assuming Lognormal Distribution | |
| 95% UCLs (Adjusted for Skewness) | | 95% H-UCL | 6.059 |
| 95% Adjusted-CLT UCL (Chen-1995) | 2.1 | 95% Chebyshev (MVUE) UCL | 3.351 |
| 95% Modified-t UCL (Johnson-1978) | 2.077 | 97.5% Chebyshev (MVUE) UCL | 4.265 |
| | | 99% Chebyshev (MVUE) UCL | 6.06 |

Gamma Distribution Test

| | | | |
|------------------------------------|--------|--|-------|
| k star (bias corrected) | 0.815 | Data Distribution | |
| Theta Star | 1.518 | Data appear Gamma Distributed at 5% Significance Level | |
| MLE of Mean | 1.236 | | |
| MLE of Standard Deviation | 1.37 | | |
| nu star | 13.03 | | |
| Approximate Chi Square Value (.05) | 5.915 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0195 | 95% CLT UCL | 1.945 |

| | | | |
|--|-------|-------------------------------|-------|
| Adjusted Chi Square Value | 4.759 | 95% Jackknife UCL | 2.053 |
| | | 95% Standard Bootstrap UCL | 1.895 |
| Anderson-Darling Test Statistic | 0.548 | 95% Bootstrap-t UCL | 2.513 |
| Anderson-Darling 5% Critical Value | 0.733 | 95% Hall's Bootstrap UCL | 1.805 |
| Kolmogorov-Smirnov Test Statistic | 0.252 | 95% Percentile Bootstrap UCL | 1.921 |
| Kolmogorov-Smirnov 5% Critical Value | 0.301 | 95% BCA Bootstrap UCL | 2.056 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 3.115 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 3.928 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 5.525 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 2.724 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 3.386 | | |
| Potential UCL to Use | | Use 95% Approximate Gamma UCL | 2.724 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics

| | | | |
|------------------------------|---|---------------------------------|---|
| Number of Valid Observations | 8 | Number of Distinct Observations | 8 |
| Number of Missing Values | 1 | | |

Raw Statistics

| | | | |
|--------------------------|--------|----------------------------|---------|
| | | Log-transformed Statistics | |
| Minimum | 0.06 | Minimum of Log Data | -2.813 |
| Maximum | 0.91 | Maximum of Log Data | -0.0943 |
| Mean | 0.355 | Mean of log Data | -1.302 |
| Geometric Mean | 0.272 | SD of log Data | 0.836 |
| Median | 0.305 | | |
| SD | 0.264 | | |
| Std. Error of Mean | 0.0935 | | |
| Coefficient of Variation | 0.745 | | |
| Skewness | 1.371 | | |

Warning: There are only 8 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

| | | | |
|---|-------|--|-------|
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.896 | Shapiro Wilk Test Statistic | 0.97 |
| Shapiro Wilk Critical Value | 0.818 | Shapiro Wilk Critical Value | 0.818 |
| Data appear Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|-------|----------------------------|-------|
| 95% Student's-t UCL | 0.532 | 95% H-UCL | 1.006 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 0.846 |
| 95% Adjusted-CLT UCL (Chen-1995) | 0.557 | 97.5% Chebyshev (MVUE) UCL | 1.054 |
| 95% Modified-t UCL (Johnson-1978) | 0.54 | 99% Chebyshev (MVUE) UCL | 1.462 |

| | | | |
|--|--------|---|-------|
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 1.352 | Data appear Normal at 5% Significance Level | |
| Theta Star | 0.263 | | |
| MLE of Mean | 0.355 | | |
| MLE of Standard Deviation | 0.305 | | |
| nu star | 21.64 | | |
| Approximate Chi Square Value (.05) | 12.07 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0195 | 95% CLT UCL | 0.509 |
| Adjusted Chi Square Value | 10.31 | 95% Jackknife UCL | 0.532 |
| | | 95% Standard Bootstrap UCL | 0.497 |
| Anderson-Darling Test Statistic | 0.164 | 95% Bootstrap-t UCL | 0.619 |
| Anderson-Darling 5% Critical Value | 0.724 | 95% Hall's Bootstrap UCL | 1.238 |
| Kolmogorov-Smirnov Test Statistic | 0.133 | 95% Percentile Bootstrap UCL | 0.501 |
| Kolmogorov-Smirnov 5% Critical Value | 0.297 | 95% BCA Bootstrap UCL | 0.556 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 0.762 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 0.939 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 1.285 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 0.637 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 0.745 | | |
| Potential UCL to Use | | Use 95% Student's-t UCL | 0.532 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

| | | | |
|------------------------------|---------|---------------------------------|-------|
| General Statistics | | | |
| Number of Valid Observations | 8 | Number of Distinct Observations | 8 |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 2.35 | Minimum of Log Data | 0.854 |
| Maximum | 203 | Maximum of Log Data | 5.313 |
| Mean | 106.8 | Mean of log Data | 4.184 |
| Geometric Mean | 65.65 | SD of log Data | 1.457 |
| Median | 101.6 | | |
| SD | 72.27 | | |
| Std. Error of Mean | 25.55 | | |
| Coefficient of Variation | 0.677 | | |
| Skewness | -0.0089 | | |

Warning: There are only 8 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

| | | | |
|---|-------|---|-------|
| Relevant UCL Statistics | | | |
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.945 | Shapiro Wilk Test Statistic | 0.757 |
| Shapiro Wilk Critical Value | 0.818 | Shapiro Wilk Critical Value | 0.818 |
| Data appear Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

| | | | |
|--|--------|---|-------|
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 155.2 | 95% H-UCL | 2416 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 501.2 |
| 95% Adjusted-CLT UCL (Chen-1995) | 148.7 | 97.5% Chebyshev (MVUE) UCL | 651.7 |
| 95% Modified-t UCL (Johnson-1978) | 155.2 | 99% Chebyshev (MVUE) UCL | 947.2 |
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 0.813 | Data appear Normal at 5% Significance Level | |
| Theta Star | 131.4 | | |
| MLE of Mean | 106.8 | | |
| MLE of Standard Deviation | 118.4 | | |
| nu star | 13 | | |
| Approximate Chi Square Value (.05) | 5.894 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0195 | 95% CLT UCL | 148.8 |
| Adjusted Chi Square Value | 4.74 | 95% Jackknife UCL | 155.2 |
| | | 95% Standard Bootstrap UCL | 146.4 |
| Anderson-Darling Test Statistic | 0.499 | 95% Bootstrap-t UCL | 159.9 |
| Anderson-Darling 5% Critical Value | 0.733 | 95% Hall's Bootstrap UCL | 142.7 |
| Kolmogorov-Smirnov Test Statistic | 0.197 | 95% Percentile Bootstrap UCL | 146.3 |
| Kolmogorov-Smirnov 5% Critical Value | 0.301 | 95% BCA Bootstrap UCL | 147.8 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 218.1 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 266.3 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 361 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 235.5 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 292.9 | | |
| Potential UCL to Use | | Use 95% Student's-t UCL | 155.2 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Note: For highly negative-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positively skewed data sets.

Chromium

| | | | |
|----------------------------------|-------|----------------------------|--------|
| General Statistics | | | |
| Number of Valid Data | 8 | Number of Detected Data | 3 |
| Number of Distinct Detected Data | 3 | Number of Non-Detect Data | 5 |
| Number of Missing Values | 1 | Percent Non-Detects | 62.50% |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum Detected | 0.3 | Minimum Detected | -1.204 |
| Maximum Detected | 1.4 | Maximum Detected | 0.336 |
| Mean of Detected | 0.9 | Mean of Detected | -0.289 |
| SD of Detected | 0.557 | SD of Detected | 0.81 |
| Minimum Non-Detect | 0.2 | Minimum Non-Detect | -1.609 |
| Maximum Non-Detect | 0.2 | Maximum Non-Detect | -1.609 |

Warning: There are only 3 Distinct Detected Values in this data set
The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

Cobalt

General Statistics

| | | | |
|------------------------------|---|---------------------------------|---|
| Number of Valid Observations | 8 | Number of Distinct Observations | 8 |
| Number of Missing Values | 1 | | |

Raw Statistics

| | | | |
|--------------------------|--------|----------------------------|--------|
| Minimum | 0.064 | Log-transformed Statistics | |
| Maximum | 0.528 | Minimum of Log Data | -2.749 |
| Mean | 0.203 | Maximum of Log Data | -0.639 |
| Geometric Mean | 0.166 | Mean of log Data | -1.796 |
| Median | 0.175 | SD of log Data | 0.672 |
| SD | 0.147 | | |
| Std. Error of Mean | 0.0518 | | |
| Coefficient of Variation | 0.724 | | |
| Skewness | 1.795 | | |

Warning: There are only 8 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

| | | | |
|--|-------|--|-------|
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.813 | Shapiro Wilk Test Statistic | 0.946 |
| Shapiro Wilk Critical Value | 0.818 | Shapiro Wilk Critical Value | 0.818 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|-------|---------------------------------|-------|
| 95% Student's-t UCL | 0.301 | Assuming Lognormal Distribution | |
| 95% UCLs (Adjusted for Skewness) | | 95% H-UCL | 0.411 |
| 95% Adjusted-CLT UCL (Chen-1995) | 0.323 | 95% Chebyshev (MVUE) UCL | 0.413 |
| 95% Modified-t UCL (Johnson-1978) | 0.306 | 97.5% Chebyshev (MVUE) UCL | 0.505 |
| | | 99% Chebyshev (MVUE) UCL | 0.685 |

Gamma Distribution Test

| | | | |
|--|--------|--|-------|
| k star (bias corrected) | 1.744 | Data Distribution | |
| Theta Star | 0.116 | Data appear Gamma Distributed at 5% Significance Level | |
| MLE of Mean | 0.203 | | |
| MLE of Standard Deviation | 0.153 | | |
| nu star | 27.9 | | |
| Approximate Chi Square Value (.05) | 16.85 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0195 | 95% CLT UCL | 0.288 |
| Adjusted Chi Square Value | 14.72 | 95% Jackknife UCL | 0.301 |
| | | 95% Standard Bootstrap UCL | 0.281 |
| Anderson-Darling Test Statistic | 0.354 | 95% Bootstrap-t UCL | 0.399 |
| Anderson-Darling 5% Critical Value | 0.722 | 95% Hall's Bootstrap UCL | 0.754 |
| Kolmogorov-Smirnov Test Statistic | 0.206 | 95% Percentile Bootstrap UCL | 0.288 |
| Kolmogorov-Smirnov 5% Critical Value | 0.297 | 95% BCA Bootstrap UCL | 0.322 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 0.429 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 0.526 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 0.718 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 0.335 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 0.384 | | |

| | | |
|----------------------|-------------------------------|-------|
| Potential UCL to Use | Use 95% Approximate Gamma UCL | 0.335 |
|----------------------|-------------------------------|-------|

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics

| | | | |
|------------------------------|---|---------------------------------|---|
| Number of Valid Observations | 8 | Number of Distinct Observations | 8 |
| Number of Missing Values | 1 | | |

Raw Statistics

| | | | |
|--------------------------|-------|----------------------------|-------|
| Minimum | 17.6 | Log-transformed Statistics | |
| Maximum | 34.9 | Minimum of Log Data | 2.868 |
| Mean | 25.18 | Maximum of Log Data | 3.552 |
| Geometric Mean | 24.45 | Mean of log Data | 3.196 |
| Median | 23.45 | SD of log Data | 0.258 |
| SD | 6.56 | | |
| Std. Error of Mean | 2.319 | | |
| Coefficient of Variation | 0.261 | | |
| Skewness | 0.418 | | |

Warning: There are only 8 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

| | | | |
|---|-------|--|-------|
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.908 | Shapiro Wilk Test Statistic | 0.923 |
| Shapiro Wilk Critical Value | 0.818 | Shapiro Wilk Critical Value | 0.818 |
| Data appear Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|-------|---------------------------------|-------|
| 95% Student's-t UCL | 29.57 | Assuming Lognormal Distribution | |
| 95% UCLs (Adjusted for Skewness) | | 95% H-UCL | 30.75 |
| 95% Adjusted-CLT UCL (Chen-1995) | 29.36 | 95% Chebyshev (MVUE) UCL | 35.22 |
| 95% Modified-t UCL (Johnson-1978) | 29.63 | 97.5% Chebyshev (MVUE) UCL | 39.56 |
| | | 99% Chebyshev (MVUE) UCL | 48.1 |

Gamma Distribution Test

| | | | |
|------------------------------------|--------|---|-------|
| k star (bias corrected) | 10.83 | Data Distribution | |
| Theta Star | 2.325 | Data appear Normal at 5% Significance Level | |
| MLE of Mean | 25.18 | | |
| MLE of Standard Deviation | 7.65 | | |
| nu star | 173.3 | | |
| Approximate Chi Square Value (.05) | 143.8 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0195 | 95% CLT UCL | 28.99 |
| Adjusted Chi Square Value | 137 | 95% Jackknife UCL | 29.57 |
| | | 95% Standard Bootstrap UCL | 28.65 |
| Anderson-Darling Test Statistic | 0.374 | 95% Bootstrap-t UCL | 30.16 |
| Anderson-Darling 5% Critical Value | 0.716 | 95% Hall's Bootstrap UCL | 28.22 |
| Kolmogorov-Smirnov Test Statistic | 0.195 | 95% Percentile Bootstrap UCL | 28.76 |

| | | | |
|--|-------|-------------------------------|-------|
| Kolmogorov-Smirnov 5% Critical Value | 0.294 | 95% BCA Bootstrap UCL | 29.21 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 35.28 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 39.66 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 48.25 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 30.33 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 31.83 | | |
| Potential UCL to Use | | Use 95% Student's-t UCL | 29.57 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Lead

General Statistics

| | | | |
|------------------------------|---|---------------------------------|---|
| Number of Valid Observations | 8 | Number of Distinct Observations | 8 |
| Number of Missing Values | 1 | | |

Raw Statistics

| | | | |
|--------------------------|---------|----------------------------|--------|
| | | Log-transformed Statistics | |
| Minimum | 0.06 | Minimum of Log Data | -2.813 |
| Maximum | 0.113 | Maximum of Log Data | -2.18 |
| Mean | 0.0873 | Mean of log Data | -2.468 |
| Geometric Mean | 0.0847 | SD of log Data | 0.26 |
| Median | 0.089 | | |
| SD | 0.022 | | |
| Std. Error of Mean | 0.00778 | | |
| Coefficient of Variation | 0.252 | | |
| Skewness | -0.0669 | | |

Warning: There are only 8 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

| | | | |
|---|-------|--|-------|
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.847 | Shapiro Wilk Test Statistic | 0.85 |
| Shapiro Wilk Critical Value | 0.818 | Shapiro Wilk Critical Value | 0.818 |
| Data appear Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|--------|----------------------------|-------|
| 95% Student's-t UCL | 0.102 | 95% H-UCL | 0.107 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 0.122 |
| 95% Adjusted-CLT UCL (Chen-1995) | 0.0999 | 97.5% Chebyshev (MVUE) UCL | 0.138 |
| 95% Modified-t UCL (Johnson-1978) | 0.102 | 99% Chebyshev (MVUE) UCL | 0.168 |

Gamma Distribution Test

| | | | |
|------------------------------------|---------|---|--|
| k star (bias corrected) | 10.92 | Data Distribution | |
| Theta Star | 0.00799 | Data appear Normal at 5% Significance Level | |
| MLE of Mean | 0.0873 | | |
| MLE of Standard Deviation | 0.0264 | | |
| nu star | 174.8 | | |
| Approximate Chi Square Value (.05) | 145.2 | Nonparametric Statistics | |

| | | | |
|--|--------|-------------------------------|--------|
| Adjusted Level of Significance | 0.0195 | 95% CLT UCL | 0.1 |
| Adjusted Chi Square Value | 138.4 | 95% Jackknife UCL | 0.102 |
| | | 95% Standard Bootstrap UCL | 0.0994 |
| Anderson-Darling Test Statistic | 0.658 | 95% Bootstrap-t UCL | 0.101 |
| Anderson-Darling 5% Critical Value | 0.716 | 95% Hall's Bootstrap UCL | 0.0965 |
| Kolmogorov-Smirnov Test Statistic | 0.272 | 95% Percentile Bootstrap UCL | 0.0988 |
| Kolmogorov-Smirnov 5% Critical Value | 0.294 | 95% BCA Bootstrap UCL | 0.0988 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 0.121 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 0.136 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 0.165 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 0.105 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 0.11 | | |
| Potential UCL to Use | | Use 95% Student's-t UCL | 0.102 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Note: For highly negative-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positively skewed data sets.

Manganese

| | | | |
|------------------------------|-------|---------------------------------|-------|
| General Statistics | | | |
| Number of Valid Observations | 8 | Number of Distinct Observations | 8 |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 91.2 | Minimum of Log Data | 4.513 |
| Maximum | 1140 | Maximum of Log Data | 7.039 |
| Mean | 490.2 | Mean of log Data | 5.95 |
| Geometric Mean | 383.8 | SD of log Data | 0.807 |
| Median | 469.5 | | |
| SD | 335.5 | | |
| Std. Error of Mean | 118.6 | | |
| Coefficient of Variation | 0.685 | | |
| Skewness | 0.921 | | |

Warning: There are only 8 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

| | | | |
|---|-------|--|-------|
| Relevant UCL Statistics | | | |
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.937 | Shapiro Wilk Test Statistic | 0.96 |
| Shapiro Wilk Critical Value | 0.818 | Shapiro Wilk Critical Value | 0.818 |
| Data appear Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 714.9 | 95% H-UCL | 1313 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 1147 |

| | | | |
|--|--------|---|-------|
| 95% Adjusted-CLT UCL (Chen-1995) | 726.5 | 97.5% Chebyshev (MVUE) UCL | 1424 |
| 95% Modified-t UCL (Johnson-1978) | 721.3 | 99% Chebyshev (MVUE) UCL | 1968 |
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 1.456 | Data appear Normal at 5% Significance Level | |
| Theta Star | 336.7 | | |
| MLE of Mean | 490.2 | | |
| MLE of Standard Deviation | 406.2 | | |
| nu star | 23.29 | | |
| Approximate Chi Square Value (.05) | 13.31 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0195 | 95% CLT UCL | 685.3 |
| Adjusted Chi Square Value | 11.45 | 95% Jackknife UCL | 714.9 |
| | | 95% Standard Bootstrap UCL | 670.4 |
| Anderson-Darling Test Statistic | 0.188 | 95% Bootstrap-t UCL | 766.8 |
| Anderson-Darling 5% Critical Value | 0.723 | 95% Hall's Bootstrap UCL | 821.6 |
| Kolmogorov-Smirnov Test Statistic | 0.181 | 95% Percentile Bootstrap UCL | 673.7 |
| Kolmogorov-Smirnov 5% Critical Value | 0.297 | 95% BCA Bootstrap UCL | 704.1 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 1007 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 1231 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 1670 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 857.6 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 997.1 | | |
| Potential UCL to Use | | Use 95% Student's-t UCL | 714.9 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

| | | | |
|------------------------------|--------|---------------------------------|--------|
| General Statistics | | | |
| Number of Valid Observations | 8 | Number of Distinct Observations | 8 |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 0.017 | Minimum of Log Data | -4.075 |
| Maximum | 0.289 | Maximum of Log Data | -1.241 |
| Mean | 0.133 | Mean of log Data | -2.505 |
| Geometric Mean | 0.0816 | SD of log Data | 1.15 |
| Median | 0.1 | | |
| SD | 0.115 | | |
| Std. Error of Mean | 0.0408 | | |
| Coefficient of Variation | 0.868 | | |
| Skewness | 0.301 | | |

Warning: There are only 8 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

| | | | |
|---|-------|--|-------|
| Relevant UCL Statistics | | | |
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.829 | Shapiro Wilk Test Statistic | 0.864 |
| Shapiro Wilk Critical Value | 0.818 | Shapiro Wilk Critical Value | 0.818 |
| Data appear Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

| | | | |
|--|--------|---|-------|
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 0.21 | 95% H-UCL | 0.826 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 0.396 |
| 95% Adjusted-CLT UCL (Chen-1995) | 0.205 | 97.5% Chebyshev (MVUE) UCL | 0.506 |
| 95% Modified-t UCL (Johnson-1978) | 0.211 | 99% Chebyshev (MVUE) UCL | 0.722 |
| | | | |
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 0.81 | Data appear Normal at 5% Significance Level | |
| Theta Star | 0.164 | | |
| MLE of Mean | 0.133 | | |
| MLE of Standard Deviation | 0.148 | | |
| nu star | 12.96 | | |
| Approximate Chi Square Value (.05) | 5.868 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0195 | 95% CLT UCL | 0.2 |
| Adjusted Chi Square Value | 4.717 | 95% Jackknife UCL | 0.21 |
| | | 95% Standard Bootstrap UCL | 0.197 |
| Anderson-Darling Test Statistic | 0.62 | 95% Bootstrap-t UCL | 0.217 |
| Anderson-Darling 5% Critical Value | 0.733 | 95% Hall's Bootstrap UCL | 0.184 |
| Kolmogorov-Smirnov Test Statistic | 0.256 | 95% Percentile Bootstrap UCL | 0.196 |
| Kolmogorov-Smirnov 5% Critical Value | 0.301 | 95% BCA Bootstrap UCL | 0.199 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 0.311 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 0.388 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 0.539 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 0.294 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 0.366 | | |
| | | | |
| Potential UCL to Use | | Use 95% Student's-t UCL | 0.21 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

| | | | |
|----------------------------------|--------|----------------------------|--------|
| General Statistics | | | |
| Number of Valid Data | 8 | Number of Detected Data | 4 |
| Number of Distinct Detected Data | 4 | Number of Non-Detect Data | 4 |
| Number of Missing Values | 1 | Percent Non-Detects | 50.00% |
| | | | |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum Detected | 0.006 | Minimum Detected | -5.116 |
| Maximum Detected | 0.03 | Maximum Detected | -3.507 |
| Mean of Detected | 0.0143 | Mean of Detected | -4.448 |
| SD of Detected | 0.0109 | SD of Detected | 0.704 |
| Minimum Non-Detect | 0.002 | Minimum Non-Detect | -6.215 |
| Maximum Non-Detect | 0.002 | Maximum Non-Detect | -6.215 |

Warning: There are only 4 Distinct Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

| | | | |
|--|---------|---|---------|
| UCL Statistics | | | |
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.842 | Shapiro Wilk Test Statistic | 0.947 |
| 5% Shapiro Wilk Critical Value | 0.748 | 5% Shapiro Wilk Critical Value | 0.748 |
| Data appear Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 0.00763 | Mean | -5.678 |
| SD | 0.0101 | SD | 1.393 |
| 95% DL/2 (t) UCL | 0.0144 | 95% H-Stat (DL/2) UCL | 0.094 |
| Maximum Likelihood Estimate(MLE) Method | | Log ROS Method | |
| Mean | 0.00193 | Mean in Log Scale | -5.596 |
| SD | 0.0155 | SD in Log Scale | 1.389 |
| 95% MLE (t) UCL | 0.0123 | Mean in Original Scale | 0.00782 |
| 95% MLE (Tiku) UCL | 0.0147 | SD in Original Scale | 0.00993 |
| | | 95% t UCL | 0.0145 |
| | | 95% Percentile Bootstrap UCL | 0.0139 |
| | | 95% BCA Bootstrap UCL | 0.0164 |
| | | 95% H UCL | 0.0999 |
| Gamma Distribution Test with Detected Values Only | | Data Distribution Test with Detected Values Only | |
| k star (bias corrected) | 0.839 | Data appear Normal at 5% Significance Level | |
| Theta Star | 0.017 | | |
| nu star | 6.709 | | |
| A-D Test Statistic | | 0.334 Nonparametric Statistics | |
| 5% A-D Critical Value | | 0.66 Kaplan-Meier (KM) Method | |
| K-S Test Statistic | | 0.66 Mean | |
| 5% K-S Critical Value | | 0.397 SD | |
| Data appear Gamma Distributed at 5% Significance Level | | SE of Mean | |
| | | 95% KM (t) UCL | |
| | | 95% KM (z) UCL | |
| | | 95% KM (jackknife) UCL | |
| | | 95% KM (bootstrap t) UCL | |
| | | 95% KM (BCA) UCL | |
| | | 95% KM (Percentile Bootstrap) UCL | |
| | | 95% KM (Chebyshev) UCL | |
| | | 97.5% KM (Chebyshev) UCL | |
| | | 99% KM (Chebyshev) UCL | |
| | | 3.121 Potential UCLs to Use | |
| | | 0.409 95% KM (t) UCL | |
| | | 0.0543 95% KM (Percentile Bootstrap) UCL | |
| | | N/A | |
| 95% Gamma Approximate UCL (Use when n >= 40) | | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | | | |
| Note: DL/2 is not a recommended method. | | | |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

| | | | |
|------------------------------|--------|---------------------------------|--------|
| Number of Valid Observations | 8 | Number of Distinct Observations | 5 |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 0.03 | Minimum of Log Data | -3.507 |
| Maximum | 0.07 | Maximum of Log Data | -2.659 |
| Mean | 0.055 | Mean of log Data | -2.935 |
| Geometric Mean | 0.0531 | SD of log Data | 0.295 |
| Median | 0.06 | | |
| SD | 0.0141 | | |
| Std. Error of Mean | 0.005 | | |
| Coefficient of Variation | 0.257 | | |
| Skewness | -0.808 | | |

Warning: There are only 8 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

| | | | |
|---|-------|--|-------|
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.897 | Shapiro Wilk Test Statistic | 0.857 |
| Shapiro Wilk Critical Value | 0.818 | Shapiro Wilk Critical Value | 0.818 |
| Data appear Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|--------|----------------------------|--------|
| 95% Student's-t UCL | 0.0645 | 95% H-UCL | 0.0697 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 0.0803 |
| 95% Adjusted-CLT UCL (Chen-1995) | 0.0617 | 97.5% Chebyshev (MVUE) UCL | 0.0912 |
| 95% Modified-t UCL (Johnson-1978) | 0.0642 | 99% Chebyshev (MVUE) UCL | 0.113 |

Gamma Distribution Test

| | | | |
|--|---------|-------------------------------|---|
| k star (bias corrected) | 9.227 | Data Distribution | Data appear Normal at 5% Significance Level |
| Theta Star | 0.00596 | | |
| MLE of Mean | 0.055 | | |
| MLE of Standard Deviation | 0.0181 | | |
| nu star | 147.6 | | |
| Approximate Chi Square Value (.05) | 120.5 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0195 | 95% CLT UCL | 0.0632 |
| Adjusted Chi Square Value | 114.4 | 95% Jackknife UCL | 0.0645 |
| | | 95% Standard Bootstrap UCL | 0.0628 |
| Anderson-Darling Test Statistic | 0.531 | 95% Bootstrap-t UCL | 0.0628 |
| Anderson-Darling 5% Critical Value | 0.716 | 95% Hall's Bootstrap UCL | 0.0617 |
| Kolmogorov-Smirnov Test Statistic | 0.289 | 95% Percentile Bootstrap UCL | 0.0625 |
| Kolmogorov-Smirnov 5% Critical Value | 0.294 | 95% BCA Bootstrap UCL | 0.0613 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 0.0768 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 0.0862 |
| | | 99% Chebyshev(Mean, Sd) UCL | 0.105 |
| Assuming Gamma Distribution | | | |
| 95% Approximate Gamma UCL (Use when n >= 40) | 0.0674 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 0.071 | | |

Potential UCL to Use Use 95% Student's-t UCL 0.0645

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Note: For highly negative-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positively skewed data sets.

General UCL Statistics for Data Sets with Non-Detects

User Selected Options
 From File WorkSheet.wst
 Full Precision OFF
 Confidence Coefficient 95%
 Number of Bootstrap Operations 2000

Aluminum

General Statistics

| | | | |
|----------------------------------|---|---------------------------|--------|
| Number of Valid Data | 8 | Number of Detected Data | 7 |
| Number of Distinct Detected Data | 7 | Number of Non-Detect Data | 1 |
| | | Percent Non-Detects | 12.50% |

Raw Statistics

| | | | |
|--------------------|-------|----------------------------|--------|
| Minimum Detected | 5.1 | Log-transformed Statistics | |
| Maximum Detected | 172 | Minimum Detected | 1.629 |
| Mean of Detected | 45.36 | Maximum Detected | 5.147 |
| SD of Detected | 59.92 | Mean of Detected | 3.093 |
| Minimum Non-Detect | 0.4 | SD of Detected | 1.304 |
| Maximum Non-Detect | 0.4 | Minimum Non-Detect | -0.916 |
| | | Maximum Non-Detect | -0.916 |

Warning: There are only 7 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

| | | | |
|--|-------|---|-------|
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.726 | Shapiro Wilk Test Statistic | 0.917 |
| 5% Shapiro Wilk Critical Value | 0.803 | 5% Shapiro Wilk Critical Value | 0.803 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|--------------------------|-------|---------------------------------|-------|
| DL/2 Substitution Method | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 39.71 | Mean | 2.505 |
| SD | 57.73 | SD | 2.055 |
| 95% DL/2 (t) UCL | 78.38 | 95% H-Stat (DL/2) UCL | 13392 |

Maximum Likelihood Estimate(MLE) Method

| | | | |
|--------------------|-------|------------------------------|-------|
| Mean | 35.13 | Log ROS Method | |
| SD | 59.48 | Mean in Log Scale | 2.689 |
| 95% MLE (t) UCL | 74.97 | SD in Log Scale | 1.664 |
| 95% MLE (Tiku) UCL | 73.38 | Mean in Original Scale | 39.8 |
| | | SD in Original Scale | 57.66 |
| | | 95% t UCL | 78.42 |
| | | 95% Percentile Bootstrap UCL | 74.62 |
| | | 95% BCA Bootstrap UCL | 85.58 |
| | | 95% H UCL | 1536 |

Gamma Distribution Test with Detected Values Only

| | | | |
|-------------------------|-------|--|--|
| k star (bias corrected) | 0.564 | Data Distribution Test with Detected Values Only | |
| Theta Star | 80.44 | Data appear Gamma Distributed at 5% Significance Level | |
| nu star | 7.894 | | |

| | | | |
|--|----------|-----------------------------------|-------|
| A-D Test Statistic | 0.468 | Nonparametric Statistics | |
| 5% A-D Critical Value | 0.734 | Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.734 | Mean | 40.33 |
| 5% K-S Critical Value | 0.322 | SD | 53.58 |
| Data appear Gamma Distributed at 5% Significance Level | | SE of Mean | 20.46 |
| | | 95% KM (t) UCL | 79.09 |
| Assuming Gamma Distribution | | 95% KM (z) UCL | 73.98 |
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (jackknife) UCL | 78.53 |
| Minimum | 1.00E-06 | 95% KM (bootstrap t) UCL | 130.2 |
| Maximum | 172 | 95% KM (BCA) UCL | 80.08 |
| Mean | 39.69 | 95% KM (Percentile Bootstrap) UCL | 75.15 |
| Median | 11.8 | 95% KM (Chebyshev) UCL | 129.5 |
| SD | 57.75 | 97.5% KM (Chebyshev) UCL | 168.1 |
| k star | 0.247 | 99% KM (Chebyshev) UCL | 243.9 |
| Theta star | 161 | | |
| Nu star | 3.944 | Potential UCLs to Use | |
| AppChi2 | 0.7 | 95% KM (Chebyshev) UCL | 129.5 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 223.7 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 366.7 | | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Antimony

| | | | |
|------------------------------|-------|---------------------------------|--------|
| General Statistics | | | |
| Number of Valid Observations | 8 | Number of Distinct Observations | 8 |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 0.199 | Minimum of Log Data | -1.614 |
| Maximum | 15.1 | Maximum of Log Data | 2.715 |
| Mean | 2.377 | Mean of log Data | -0.325 |
| Geometric Mean | 0.723 | SD of log Data | 1.37 |
| Median | 0.62 | | |
| SD | 5.151 | | |
| Std. Error of Mean | 1.821 | | |
| Coefficient of Variation | 2.167 | | |
| Skewness | 2.806 | | |

Warning: There are only 8 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

| | | | |
|--|-------|--|-------|
| Relevant UCL Statistics | | | |
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.475 | Shapiro Wilk Test Statistic | 0.82 |
| Shapiro Wilk Critical Value | 0.818 | Shapiro Wilk Critical Value | 0.818 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

| | | | |
|---|--------|--|-------|
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 5.827 | 95% H-UCL | 17.94 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 4.847 |
| 95% Adjusted-CLT UCL (Chen-1995) | 7.303 | 97.5% Chebyshev (MVUE) UCL | 6.276 |
| 95% Modified-t UCL (Johnson-1978) | 6.128 | 99% Chebyshev (MVUE) UCL | 9.084 |
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 0.414 | Data appear Lognormal at 5% Significance Level | |
| Theta Star | 5.742 | | |
| MLE of Mean | 2.377 | | |
| MLE of Standard Deviation | 3.694 | | |
| nu star | 6.623 | | |
| Approximate Chi Square Value (.05) | 1.966 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0195 | 95% CLT UCL | 5.373 |
| Adjusted Chi Square Value | 1.391 | 95% Jackknife UCL | 5.827 |
| | | 95% Standard Bootstrap UCL | 5.171 |
| Anderson-Darling Test Statistic | 1.275 | 95% Bootstrap-t UCL | 50.77 |
| Anderson-Darling 5% Critical Value | 0.76 | 95% Hall's Bootstrap UCL | 26.42 |
| Kolmogorov-Smirnov Test Statistic | 0.359 | 95% Percentile Bootstrap UCL | 5.96 |
| Kolmogorov-Smirnov 5% Critical Value | 0.308 | 95% BCA Bootstrap UCL | 7.827 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 10.32 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 13.75 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 20.5 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 8.006 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 11.32 | | |
| Potential UCL to Use | | Use 95% Chebyshev (Mean, Sd) UCL | 10.32 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

| | | | |
|------------------------------|-------|---------------------------------|--------|
| General Statistics | | | |
| Number of Valid Observations | 8 | Number of Distinct Observations | 8 |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 0.11 | Minimum of Log Data | -2.207 |
| Maximum | 11.1 | Maximum of Log Data | 2.407 |
| Mean | 1.728 | Mean of log Data | -0.739 |
| Geometric Mean | 0.477 | SD of log Data | 1.461 |
| Median | 0.36 | | |
| SD | 3.796 | | |
| Std. Error of Mean | 1.342 | | |
| Coefficient of Variation | 2.197 | | |
| Skewness | 2.803 | | |

Warning: There are only 8 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

| | | |
|---|--|--|
| Relevant UCL Statistics | | |
| Normal Distribution Test | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.48 Shapiro Wilk Test Statistic | 0.861 |
| Shapiro Wilk Critical Value | 0.818 Shapiro Wilk Critical Value | 0.818 |
| Data not Normal at 5% Significance Level | Data appear Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | |
| 95% Student's-t UCL | 4.27 | 95% H-UCL 17.93 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL 3.669 |
| 95% Adjusted-CLT UCL (Chen-1995) | 5.356 | 97.5% Chebyshev (MVUE) UCL 4.771 |
| 95% Modified-t UCL (Johnson-1978) | 4.492 | 99% Chebyshev (MVUE) UCL 6.936 |
| Gamma Distribution Test | | |
| k star (bias corrected) | 0.393 | Data appear Lognormal at 5% Significance Level |
| Theta Star | 4.401 | |
| MLE of Mean | 1.728 | |
| MLE of Standard Deviation | 2.757 | |
| nu star | 6.281 | |
| Approximate Chi Square Value (.05) | 1.785 | Nonparametric Statistics |
| Adjusted Level of Significance | 0.0195 | 95% CLT UCL 3.935 |
| Adjusted Chi Square Value | 1.246 | 95% Jackknife UCL 4.27 |
| | | 95% Standard Bootstrap UCL 3.806 |
| Anderson-Darling Test Statistic | 1.127 | 95% Bootstrap-t UCL 28.97 |
| Anderson-Darling 5% Critical Value | 0.763 | 95% Hall's Bootstrap UCL 19.12 |
| Kolmogorov-Smirnov Test Statistic | 0.364 | 95% Percentile Bootstrap UCL 4.36 |
| Kolmogorov-Smirnov 5% Critical Value | 0.309 | 95% BCA Bootstrap UCL 5.723 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL 7.577 |
| | | 97.5% Chebyshev(Mean, Sd) UCL 10.11 |
| | | 99% Chebyshev(Mean, Sd) UCL 15.08 |
| Assuming Gamma Distribution | | |
| 95% Approximate Gamma UCL (Use when n >= 40) | 6.078 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 8.71 | |
| Potential UCL to Use | Use 95% Chebyshev (Mean, Sd) UCL 7.577 | |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

| | | |
|------------------------------|-------|--|
| General Statistics | | |
| Number of Valid Observations | 8 | Number of Distinct Observations 8 |
| Raw Statistics | | |
| Minimum | 4.16 | Log-transformed Statistics Minimum of Log Data 1.426 |
| Maximum | 85.3 | Maximum of Log Data 4.446 |
| Mean | 41.05 | Mean of log Data 3.399 |
| Geometric Mean | 29.93 | SD of log Data 0.989 |
| Median | 36.8 | |
| SD | 28.12 | |
| Std. Error of Mean | 9.941 | |
| Coefficient of Variation | 0.685 | |
| Skewness | 0.36 | |

Warning: There are only 8 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

| | | |
|--|--|---|
| Relevant UCL Statistics | | |
| Normal Distribution Test | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.962 Shapiro Wilk Test Statistic | 0.908 |
| Shapiro Wilk Critical Value | 0.818 Shapiro Wilk Critical Value | 0.818 |
| Data appear Normal at 5% Significance Level | Data appear Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | |
| 95% Student's-t UCL | 59.88 | 95% H-UCL 173.6 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL 115.1 |
| 95% Adjusted-CLT UCL (Chen-1995) | 58.75 | 97.5% Chebyshev (MVUE) UCL 145.5 |
| 95% Modified-t UCL (Johnson-1978) | 60.09 | 99% Chebyshev (MVUE) UCL 205 |
| Gamma Distribution Test | | |
| k star (bias corrected) | 1.165 | Data appear Normal at 5% Significance Level |
| Theta Star | 35.23 | |
| MLE of Mean | 41.05 | |
| MLE of Standard Deviation | 38.03 | |
| nu star | 18.64 | |
| Approximate Chi Square Value (.05) | 9.854 | Nonparametric Statistics |
| Adjusted Level of Significance | 0.0195 | 95% CLT UCL 57.4 |
| Adjusted Chi Square Value | 8.288 | 95% Jackknife UCL 59.88 |
| | | 95% Standard Bootstrap UCL 56.32 |
| Anderson-Darling Test Statistic | 0.216 | 95% Bootstrap-t UCL 61.66 |
| Anderson-Darling 5% Critical Value | 0.726 | 95% Hall's Bootstrap UCL 60.97 |
| Kolmogorov-Smirnov Test Statistic | 0.163 | 95% Percentile Bootstrap UCL 56.51 |
| Kolmogorov-Smirnov 5% Critical Value | 0.298 | 95% BCA Bootstrap UCL 58.23 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL 84.38 |
| | | 97.5% Chebyshev(Mean, Sd) UCL 103.1 |
| | | 99% Chebyshev(Mean, Sd) UCL 140 |
| Assuming Gamma Distribution | | |
| 95% Approximate Gamma UCL (Use when n >= 40) | 77.64 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 92.3 | |
| Potential UCL to Use | Use 95% Student's-t UCL | 59.88 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

| | | |
|---|-------|--|
| General Statistics | | |
| Number of Valid Data | 7 | Number of Detected Data 4 |
| Number of Distinct Detected Data | 4 | Number of Non-Detect Data 3 |
| Number of Missing Values | 1 | Percent Non-Detects 42.86% |
| Raw Statistics | | |
| Minimum Detected | 0.5 | Log-transformed Statistics Minimum Detected -0.693 |
| Maximum Detected | 1.3 | Maximum Detected 0.262 |
| Mean of Detected | 0.825 | Mean of Detected -0.253 |
| SD of Detected | 0.34 | SD of Detected 0.396 |
| Minimum Non-Detect | 0.2 | Minimum Non-Detect -1.609 |
| Maximum Non-Detect | 0.2 | Maximum Non-Detect -1.609 |
| Warning: There are only 4 Distinct Detected Values in this data | | |

Note: It should be noted that even though bootstrap may be performed on this data set the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

| | | | |
|--|----------|---|--------|
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.924 | Shapiro Wilk Test Statistic | 0.979 |
| 5% Shapiro Wilk Critical Value | 0.748 | 5% Shapiro Wilk Critical Value | 0.748 |
| Data appear Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 0.514 | Mean | -1.131 |
| SD | 0.456 | SD | 1.131 |
| 95% DL/2 (t) UCL | 0.849 | 95% H-Stat (DL/2) UCL | 4.012 |
| Maximum Likelihood Estimate(MLE) Method | | Log ROS Method | |
| Mean | 0.833 | Mean in Log Scale | -0.768 |
| SD | 0.295 | SD in Log Scale | 0.726 |
| 95% MLE (t) UCL | 1.049 | Mean in Original Scale | 0.575 |
| 95% MLE (Tiku) UCL | 1.117 | SD in Original Scale | 0.396 |
| | | 95% t UCL | 0.866 |
| | | 95% Percentile Bootstrap UCL | 0.814 |
| | | 95% BCA Bootstrap UCL | 0.851 |
| | | 95% H UCL | 1.454 |
| Gamma Distribution Test with Detected Values Only | | Data Distribution Test with Detected Values Only | |
| k star (bias corrected) | 2.281 | Data appear Normal at 5% Significance Level | |
| Theta Star | 0.362 | | |
| nu star | 18.25 | | |
| A-D Test Statistic | 0.264 | Nonparametric Statistics | |
| 5% A-D Critical Value | 0.658 | Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.658 | Mean | 0.686 |
| 5% K-S Critical Value | 0.395 | SD | 0.275 |
| Data appear Gamma Distributed at 5% Significance Level | | SE of Mean | 0.12 |
| | | 95% KM (t) UCL | 0.919 |
| | | 95% KM (z) UCL | 0.883 |
| | | 95% KM (jackknife) UCL | 0.909 |
| Assuming Gamma Distribution | | 95% KM (bootstrap t) UCL | 0.956 |
| Gamma ROS Statistics using Extrapolated Data | 1.00E-06 | 95% KM (BCA) UCL | 1.043 |
| Minimum | 1.3 | 95% KM (Percentile Bootstrap) UCL | 0.943 |
| Mean | 0.471 | 95% KM (Chebyshev) UCL | 1.208 |
| Median | 0.5 | 97.5% KM (Chebyshev) UCL | 1.435 |
| SD | 0.502 | 99% KM (Chebyshev) UCL | 1.879 |
| k star | 0.178 | Potential UCLs to Use | |
| Theta star | 2.644 | 95% KM (t) UCL | 0.919 |
| Nu star | 2.496 | 95% KM (Percentile Bootstrap) UCL | 0.943 |
| AppChi2 | 0.24 | | |
| 95% Gamma Approximate UCL (Use when n >= 40) | 4.898 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | N/A | | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

| | | | |
|------------------------------|--------|---------------------------------|--------|
| Number of Valid Observations | 8 | Number of Distinct Observations | 8 |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 0.051 | Minimum of Log Data | -2.976 |
| Maximum | 0.303 | Maximum of Log Data | -1.194 |
| Mean | 0.172 | Mean of log Data | -1.92 |
| Geometric Mean | 0.147 | SD of log Data | 0.64 |
| Median | 0.179 | | |
| SD | 0.0917 | | |
| Std. Error of Mean | 0.0324 | | |
| Coefficient of Variation | 0.535 | | |
| Skewness | 0.0368 | | |

Warning: There are only 8 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

| | | | |
|---|-------|--|-------|
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.942 | Shapiro Wilk Test Statistic | 0.924 |
| Shapiro Wilk Critical Value | 0.818 | Shapiro Wilk Critical Value | 0.818 |
| Data appear Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|-------|---------------------------------|-------|
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 0.233 | 95% H-UCL | 0.339 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 0.35 |
| 95% Adjusted-CLT UCL (Chen-1995) | 0.225 | 97.5% Chebyshev (MVUE) UCL | 0.425 |
| 95% Modified-t UCL (Johnson-1978) | 0.233 | 99% Chebyshev (MVUE) UCL | 0.574 |

Gamma Distribution Test

| | | | |
|--|--------|---|-------|
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 2.161 | Data appear Normal at 5% Significance Level | |
| Theta Star | 0.0794 | | |
| MLE of Mean | 0.172 | | |
| MLE of Standard Deviation | 0.117 | | |
| nu star | 34.57 | | |
| Approximate Chi Square Value (.05) | 22.12 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0195 | 95% CLT UCL | 0.225 |
| Adjusted Chi Square Value | 19.64 | 95% Jackknife UCL | 0.233 |
| | | 95% Standard Bootstrap UCL | 0.221 |
| Anderson-Darling Test Statistic | 0.312 | 95% Bootstrap-t UCL | 0.236 |
| Anderson-Darling 5% Critical Value | 0.721 | 95% Hall's Bootstrap UCL | 0.219 |
| Kolmogorov-Smirnov Test Statistic | 0.234 | 95% Percentile Bootstrap UCL | 0.221 |
| Kolmogorov-Smirnov 5% Critical Value | 0.296 | 95% BCA Bootstrap UCL | 0.221 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 0.313 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 0.374 |
| | | 99% Chebyshev(Mean, Sd) UCL | 0.494 |
| Assuming Gamma Distribution | | | |
| 95% Approximate Gamma UCL (Use when n >= 40) | 0.268 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 0.302 | | |

Potential UCL to Use Use 95% Student's-t UCL 0.233

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

| | | |
|------------------------------|-------|--|
| General Statistics | | |
| Number of Valid Observations | 8 | Number of Distinct Observations 8 |
| Raw Statistics | | |
| Minimum | 20.1 | Log-transformed Statistics Minimum of Log Data 3.001 |
| Maximum | 206 | Maximum of Log Data 5.328 |
| Mean | 70.21 | Mean of log Data 3.753 |
| Geometric Mean | 42.65 | SD of log Data 0.98 |
| Median | 29.65 | |
| SD | 82.4 | |
| Std. Error of Mean | 29.13 | |
| Coefficient of Variation | 1.174 | |
| Skewness | 1.429 | |

Warning: There are only 8 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

| | | |
|---|--------|--|
| Relevant UCL Statistics | | |
| Normal Distribution Test | | |
| Shapiro Wilk Test Statistic | 0.617 | Lognormal Distribution Test Shapiro Wilk Test Statistic 0.714 |
| Shapiro Wilk Critical Value | 0.818 | Shapiro Wilk Critical Value 0.818 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level |
| Assuming Normal Distribution | | |
| 95% Student's-t UCL | 125.4 | Assuming Lognormal Distribution 95% H-UCL 240.9 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL 162.1 |
| 95% Adjusted-CLT UCL (Chen-1995) | 133.9 | 97.5% Chebyshev (MVUE) UCL 204.7 |
| 95% Modified-t UCL (Johnson-1978) | 127.9 | 99% Chebyshev (MVUE) UCL 288.3 |
| Gamma Distribution Test | | |
| k star (bias corrected) | 0.796 | Data Distribution Data do not follow a Discernable Distribution (0.05) |
| Theta Star | 88.17 | |
| MLE of Mean | 70.21 | |
| MLE of Standard Deviation | 78.68 | |
| nu star | 12.74 | |
| Approximate Chi Square Value (.05) | 5.72 | Nonparametric Statistics |
| Adjusted Level of Significance | 0.0195 | 95% CLT UCL 118.1 |
| Adjusted Chi Square Value | 4.586 | 95% Jackknife UCL 125.4 |
| | | 95% Standard Bootstrap UCL 114.7 |
| Anderson-Darling Test Statistic | 1.371 | 95% Bootstrap-t UCL 823 |
| Anderson-Darling 5% Critical Value | 0.734 | 95% Hall's Bootstrap UCL 749.4 |
| Kolmogorov-Smirnov Test Statistic | 0.412 | 95% Percentile Bootstrap UCL 115.4 |
| Kolmogorov-Smirnov 5% Critical Value | 0.301 | 95% BCA Bootstrap UCL 117.2 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL 197.2 |

| | | |
|--|----------------------------------|-------|
| | 97.5% Chebyshev(Mean, Sd) UCL | 252.1 |
| Assuming Gamma Distribution | 99% Chebyshev(Mean, Sd) UCL | 360.1 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 156.4 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 195.1 | |
| Potential UCL to Use | Use 95% Chebyshev (Mean, Sd) UCL | 197.2 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Lead

| | | |
|------------------------------|--------|-----------------------------------|
| General Statistics | | |
| Number of Valid Observations | 8 | Number of Distinct Observations 8 |
| Raw Statistics | | Log-transformed Statistics |
| Minimum | 0.02 | Minimum of Log Data -3.912 |
| Maximum | 0.466 | Maximum of Log Data -0.764 |
| Mean | 0.102 | Mean of log Data -2.863 |
| Geometric Mean | 0.0571 | SD of log Data 1.011 |
| Median | 0.0445 | |
| SD | 0.151 | |
| Std. Error of Mean | 0.0533 | |
| Coefficient of Variation | 1.477 | |
| Skewness | 2.576 | |

Warning: There are only 8 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

| | | |
|--|--------|--|
| Relevant UCL Statistics | | |
| Normal Distribution Test | | Lognormal Distribution Test |
| Shapiro Wilk Test Statistic | 0.587 | Shapiro Wilk Test Statistic 0.866 |
| Shapiro Wilk Critical Value | 0.818 | Shapiro Wilk Critical Value 0.818 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level |
| Assuming Normal Distribution | | Assuming Lognormal Distribution |
| 95% Student's-t UCL | 0.203 | 95% H-UCL 0.356 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL 0.227 |
| 95% Adjusted-CLT UCL (Chen-1995) | 0.242 | 97.5% Chebyshev (MVUE) UCL 0.287 |
| 95% Modified-t UCL (Johnson-1978) | 0.211 | 99% Chebyshev (MVUE) UCL 0.406 |
| Gamma Distribution Test | | Data Distribution |
| k star (bias corrected) | 0.705 | Data appear Lognormal at 5% Significance Level |
| Theta Star | 0.145 | |
| MLE of Mean | 0.102 | |
| MLE of Standard Deviation | 0.122 | |
| nu star | 11.27 | |
| Approximate Chi Square Value (.05) | 4.752 | Nonparametric Statistics |
| Adjusted Level of Significance | 0.0195 | 95% CLT UCL 0.19 |
| Adjusted Chi Square Value | 3.739 | 95% Jackknife UCL 0.203 |
| | | 95% Standard Bootstrap UCL 0.181 |

| | | | |
|---|-------|----------------------------------|-------|
| Anderson-Darling Test Statistic | 0.905 | 95% Bootstrap-t UCL | 0.951 |
| Anderson-Darling 5% Critical Value | 0.736 | 95% Hall's Bootstrap UCL | 0.723 |
| Kolmogorov-Smirnov Test Statistic | 0.344 | 95% Percentile Bootstrap UCL | 0.201 |
| Kolmogorov-Smirnov 5% Critical Value | 0.302 | 95% BCA Bootstrap UCL | 0.25 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 0.335 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 0.435 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 0.633 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 0.242 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 0.308 | | |
| Potential UCL to Use | | Use 95% Chebyshev (Mean, Sd) UCL | 0.335 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

| | | | |
|------------------------------|---|---------------------------------|---|
| Number of Valid Observations | 8 | Number of Distinct Observations | 8 |
|------------------------------|---|---------------------------------|---|

Raw Statistics

| Raw Statistics | Log-transformed Statistics | |
|--------------------------|----------------------------|---------------------|
| Minimum | 162 | Minimum of Log Data |
| Maximum | 2990 | Maximum of Log Data |
| Mean | 923 | Mean of log Data |
| Geometric Mean | 614.3 | SD of log Data |
| Median | 699.5 | |
| SD | 927.5 | |
| Std. Error of Mean | 327.9 | |
| Coefficient of Variation | 1.005 | |
| Skewness | 1.873 | |

Warning: There are only 8 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

| Normal Distribution Test | Lognormal Distribution Test | |
|--|-----------------------------|--|
| Shapiro Wilk Test Statistic | 0.798 | Shapiro Wilk Test Statistic |
| Shapiro Wilk Critical Value | 0.818 | Shapiro Wilk Critical Value |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level |

Assuming Normal Distribution

| | | | |
|-----------------------------------|------|----------------------------|------|
| 95% Student's-t UCL | 1544 | 95% H-UCL | 3452 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 2330 |
| 95% Adjusted-CLT UCL (Chen-1995) | 1694 | 97.5% Chebyshev (MVUE) UCL | 2941 |
| 95% Modified-t UCL (Johnson-1978) | 1580 | 99% Chebyshev (MVUE) UCL | 4142 |

Gamma Distribution Test

| Gamma Distribution Test | Data Distribution |
|---------------------------|-------------------|
| k star (bias corrected) | 0.94 |
| Theta Star | 981.8 |
| MLE of Mean | 923 |
| MLE of Standard Deviation | 951.9 |

| | | | |
|--|--------|-------------------------------|------|
| nu star | 15.04 | | |
| Approximate Chi Square Value (.05) | 7.291 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0195 | 95% CLT UCL | 1462 |
| Adjusted Chi Square Value | 5.98 | 95% Jackknife UCL | 1544 |
| | | 95% Standard Bootstrap UCL | 1423 |
| Anderson-Darling Test Statistic | 0.235 | 95% Bootstrap-t UCL | 2320 |
| Anderson-Darling 5% Critical Value | 0.73 | 95% Hall's Bootstrap UCL | 3865 |
| Kolmogorov-Smirnov Test Statistic | 0.155 | 95% Percentile Bootstrap UCL | 1471 |
| Kolmogorov-Smirnov 5% Critical Value | 0.3 | 95% BCA Bootstrap UCL | 1677 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 2352 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 2971 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 4186 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 1904 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 2322 | | |
| Potential UCL to Use | | Use 95% Approximate Gamma UCL | 1904 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

| | | | |
|------------------------------|---|---------------------------------|---|
| Number of Valid Observations | 8 | Number of Distinct Observations | 8 |
|------------------------------|---|---------------------------------|---|

Raw Statistics

| | | | |
|--------------------------|-------|----------------------------|--------|
| | | Log-transformed Statistics | |
| Minimum | 0.032 | Minimum of Log Data | -3.442 |
| Maximum | 5.64 | Maximum of Log Data | 1.73 |
| Mean | 0.959 | Mean of log Data | -1.633 |
| Geometric Mean | 0.195 | SD of log Data | 1.922 |
| Median | 0.157 | | |
| SD | 1.923 | | |
| Std. Error of Mean | 0.68 | | |
| Coefficient of Variation | 2.006 | | |
| Skewness | 2.656 | | |

Warning: There are only 8 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

| | | | |
|--|-------|--|-------|
| | | Lognormal Distribution Test | |
| Normal Distribution Test | | | |
| Shapiro Wilk Test Statistic | 0.559 | Shapiro Wilk Test Statistic | 0.871 |
| Shapiro Wilk Critical Value | 0.818 | Shapiro Wilk Critical Value | 0.818 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|-------|---------------------------------|-------|
| | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 2.246 | 95% H-UCL | 91.18 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 3.079 |
| 95% Adjusted-CLT UCL (Chen-1995) | 2.759 | 97.5% Chebyshev (MVUE) UCL | 4.067 |
| 95% Modified-t UCL (Johnson-1978) | 2.353 | 99% Chebyshev (MVUE) UCL | 6.008 |

| | | |
|--|----------------------------|--|
| Gamma Distribution Test | Data Distribution | |
| k star (bias corrected) | 0.341 | Data appear Gamma Distributed at 5% Significance Level |
| Theta Star | 2.813 | |
| MLE of Mean | 0.959 | |
| MLE of Standard Deviation | 1.642 | |
| nu star | 5.451 | |
| Approximate Chi Square Value (.05) | 1.366 | Nonparametric Statistics |
| Adjusted Level of Significance | 0.0195 | 95% CLT UCL |
| Adjusted Chi Square Value | 0.918 | 95% Jackknife UCL |
| | | 95% Standard Bootstrap UCL |
| Anderson-Darling Test Statistic | 0.697 | 95% Bootstrap-t UCL |
| Anderson-Darling 5% Critical Value | 0.778 | 95% Hall's Bootstrap UCL |
| Kolmogorov-Smirnov Test Statistic | 0.27 | 95% Percentile Bootstrap UCL |
| Kolmogorov-Smirnov 5% Critical Value | 0.313 | 95% BCA Bootstrap UCL |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL |
| | | 97.5% Chebyshev(Mean, Sd) UCL |
| | | 99% Chebyshev(Mean, Sd) UCL |
| Assuming Gamma Distribution | | |
| 95% Approximate Gamma UCL (Use when n >= 40) | 3.825 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 5.694 | |
| Potential UCL to Use | Use 95% Adjusted Gamma UCL | 5.694 |
| Recommended UCL exceeds the maximum observation | | |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

| | | |
|----------------------------------|----------------------------|---------------------------|
| General Statistics | | |
| Number of Valid Data | 8 | Number of Detected Data |
| Number of Distinct Detected Data | 2 | Number of Non-Detect Data |
| | | Percent Non-Detects |
| | | 75.00% |
| Raw Statistics | Log-transformed Statistics | |
| Minimum Detected | 0.005 | Minimum Detected |
| Maximum Detected | 0.021 | Maximum Detected |
| Mean of Detected | 0.013 | Mean of Detected |
| SD of Detected | 0.0113 | SD of Detected |
| Minimum Non-Detect | 0.002 | Minimum Non-Detect |
| Maximum Non-Detect | 0.002 | Maximum Non-Detect |

Warning: Data set has only 2 Distinct Detected Values.

This may not be adequate enough to compute meaningful and reliable test statistics and estimates.

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

| | | | |
|---|---------|--|---|
| UCL Statistics | | | |
| Normal Distribution Test with Detected Values Only | | | Lognormal Distribution Test with Detected Values Only |
| Shapiro Wilk Test Statistic | N/A | Shapiro Wilk Test Statistic | N/A |
| 5% Shapiro Wilk Critical Value | N/A | 5% Shapiro Wilk Critical Value | N/A |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 0.004 | Mean | -6.326 |
| SD | 0.00701 | SD | 1.143 |
| 95% DL/2 (t) UCL | 0.0087 | 95% H-Stat (DL/2) UCL | 0.0177 |
| Maximum Likelihood Estimate(MLE) Method | N/A | Log ROS Method | |
| MLE method failed to converge properly | | Mean in Log Scale | N/A |
| | | SD in Log Scale | N/A |
| | | Mean in Original Scale | N/A |
| | | SD in Original Scale | N/A |
| | | 95% t UCL | N/A |
| | | 95% Percentile Bootstrap UCL | N/A |
| | | 95% BCA Bootstrap UCL | N/A |
| | | 95% H-UCL | N/A |
| Gamma Distribution Test with Detected Values Only | | Data Distribution Test with Detected Values Only | |
| k star (bias corrected) | N/A | Data do not follow a Discernable Distribution (0.05) | |
| Theta Star | N/A | | |
| nu star | N/A | | |
| A-D Test Statistic | N/A | Nonparametric Statistics | |
| 5% A-D Critical Value | N/A | Kaplan-Meier (KM) Method | |
| K-S Test Statistic | N/A | Mean | 0.007 |
| 5% K-S Critical Value | N/A | SD | 0.00529 |
| Data not Gamma Distributed at 5% Significance Level | | SE of Mean | 0.00265 |
| | | 95% KM (t) UCL | 0.012 |
| | | 95% KM (z) UCL | 0.0114 |
| | | 95% KM (jackknife) UCL | N/A |
| | | 95% KM (bootstrap t) UCL | N/A |
| | | 95% KM (BCA) UCL | N/A |
| | | 95% KM (Percentile Bootstrap) UCL | N/A |
| | | 95% KM (Chebyshev) UCL | 0.0185 |
| | | 97.5% KM (Chebyshev) UCL | 0.0235 |
| | | 99% KM (Chebyshev) UCL | 0.0333 |
| Assuming Gamma Distribution | | Potential UCLs to Use | |
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (BCA) UCL | N/A |
| Minimum | N/A | | |
| Maximum | N/A | | |
| Mean | N/A | | |
| Median | N/A | | |
| SD | N/A | | |
| k star | N/A | | |
| Theta star | N/A | | |
| Nu star | N/A | | |
| AppChi2 | N/A | | |
| 95% Gamma Approximate UCL (Use when n >= 40) | N/A | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | N/A | | |
| Note: DL/2 is not a recommended method. | | | |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Vanadium

| | | |
|------------------------------|--------|-----------------------------------|
| General Statistics | | |
| Number of Valid Observations | 8 | Number of Distinct Observations 5 |
| Raw Statistics | | |
| Minimum | 0.03 | Log-transformed Statistics |
| Maximum | 0.47 | Minimum of Log Data -3.507 |
| Mean | 0.113 | Maximum of Log Data -0.755 |
| Geometric Mean | 0.0618 | Mean of log Data -2.784 |
| Median | 0.04 | SD of log Data 1.042 |
| SD | 0.157 | |
| Std. Error of Mean | 0.0554 | |
| Coefficient of Variation | 1.394 | |
| Skewness | 2.169 | |

Warning: There are only 8 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

| | | |
|---|--------|--|
| Relevant UCL Statistics | | |
| Normal Distribution Test | | |
| Shapiro Wilk Test Statistic | 0.62 | Lognormal Distribution Test |
| Shapiro Wilk Critical Value | 0.818 | Shapiro Wilk Test Statistic 0.739 |
| Data not Normal at 5% Significance Level | | Shapiro Wilk Critical Value 0.818 |
| | | Data not Lognormal at 5% Significance Level |
| Assuming Normal Distribution | | |
| 95% Student's-t UCL | 0.218 | Assuming Lognormal Distribution |
| 95% UCLs (Adjusted for Skewness) | | 95% H-UCL 0.427 |
| 95% Adjusted-CLT UCL (Chen-1995) | 0.249 | 95% Chebyshev (MVUE) UCL 0.257 |
| 95% Modified-t UCL (Johnson-1978) | 0.225 | 97.5% Chebyshev (MVUE) UCL 0.326 |
| | | 99% Chebyshev (MVUE) UCL 0.461 |
| Gamma Distribution Test | | |
| k star (bias corrected) | 0.688 | Data Distribution |
| Theta Star | 0.163 | Data do not follow a Discernable Distribution (0.05) |
| MLE of Mean | 0.113 | |
| MLE of Standard Deviation | 0.136 | |
| nu star | 11.01 | |
| Approximate Chi Square Value (.05) | 4.583 | Nonparametric Statistics |
| Adjusted Level of Significance | 0.0195 | 95% CLT UCL 0.204 |
| Adjusted Chi Square Value | 3.593 | 95% Jackknife UCL 0.218 |
| | | 95% Standard Bootstrap UCL 0.198 |
| Anderson-Darling Test Statistic | 1.23 | 95% Bootstrap-t UCL 1.72 |
| Anderson-Darling 5% Critical Value | 0.737 | 95% Hall's Bootstrap UCL 0.992 |
| Kolmogorov-Smirnov Test Statistic | 0.385 | 95% Percentile Bootstrap UCL 0.2 |
| Kolmogorov-Smirnov 5% Critical Value | 0.302 | 95% BCA Bootstrap UCL 0.245 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL 0.354 |
| | | 97.5% Chebyshev(Mean, Sd) UCL 0.459 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL 0.664 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 0.27 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 0.345 | |
| Potential UCL to Use | | Use 95% Hall's Bootstrap UCL 0.992 |
| Recommended UCL exceeds the maximum observation | | |

In Case Bootstrap t and/or Hall's Bootstrap yields an unreasonably large UCL value, use 97.5% or 99% Chebyshev (Mean, Sd) UCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Data Sets with Non-Detects

User Selected Options
 From File WorkSheet.wst
 Full Precision OFF
 Confidence Coefficient 95%
 Number of Bootstrap Operations 2000

AI

General Statistics

Number of Valid Observations 45 Number of Distinct Observations 43

Raw Statistics

| | | |
|--------------------------|----------------------------|-------|
| | Log-transformed Statistics | |
| Minimum | 3.6 Minimum of Log Data | 1.281 |
| Maximum | 72.5 Maximum of Log Data | 4.284 |
| Mean | 22.12 Mean of log Data | 2.826 |
| Geometric Mean | 16.88 SD of log Data | 0.794 |
| Median | 18.4 | |
| SD | 15.46 | |
| Std. Error of Mean | 2.305 | |
| Coefficient of Variation | 0.699 | |
| Skewness | 1.046 | |

Relevant UCL Statistics

| | | |
|--|--|-------|
| Normal Distribution Test | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.913 Shapiro Wilk Test Statistic | 0.951 |
| Shapiro Wilk Critical Value | 0.945 Shapiro Wilk Critical Value | 0.945 |
| Data not Normal at 5% Significance Level | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|-------|---------------------------------|-------|
| 95% Student's-t UCL | 25.99 | Assuming Lognormal Distribution | |
| 95% UCLs (Adjusted for Skewness) | | 95% H-UCL | 29.93 |
| 95% Adjusted-CLT UCL (Chen-1995) | 26.29 | 95% Chebyshev (MVUE) UCL | 36.1 |
| 95% Modified-t UCL (Johnson-1978) | 26.05 | 97.5% Chebyshev (MVUE) UCL | 41.81 |
| | | 99% Chebyshev (MVUE) UCL | 53.02 |

Gamma Distribution Test

| | | | |
|---------------------------|-------|--|--|
| k star (bias corrected) | 1.882 | Data Distribution | |
| Theta Star | 11.75 | Data appear Gamma Distributed at 5% Significance Level | |
| MLE of Mean | 22.12 | | |
| MLE of Standard Deviation | 16.12 | | |
| nu star | 169.4 | | |

Approximate Chi Square Value (.05)

| | | | |
|--------------------------------|--------|----------------------------|-------|
| Adjusted Level of Significance | 0.0447 | Nonparametric Statistics | |
| Adjusted Chi Square Value | 139.4 | 95% CLT UCL | 25.91 |
| | | 95% Jackknife UCL | 25.99 |
| | | 95% Standard Bootstrap UCL | 25.97 |

Anderson-Darling Test Statistic

| | | | |
|--|-------|-------------------------------|-------|
| Anderson-Darling Test Statistic | 0.301 | 95% Bootstrap-t UCL | 26.39 |
| Anderson-Darling 5% Critical Value | 0.761 | 95% Hall's Bootstrap UCL | 26.36 |
| Kolmogorov-Smirnov Test Statistic | 0.076 | 95% Percentile Bootstrap UCL | 26.12 |
| Kolmogorov-Smirnov 5% Critical Value | 0.133 | 95% BCA Bootstrap UCL | 26.24 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 32.16 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 36.51 |
| | | 99% Chebyshev(Mean, Sd) UCL | 45.05 |

Assuming Gamma Distribution

| | |
|--|-------|
| 95% Approximate Gamma UCL (Use when n >= 40) | 26.7 |
| 95% Adjusted Gamma UCL (Use when n < 40) | 26.87 |

Potential UCL to Use Use 95% Approximate Gamma UCL 26.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Sb

| | | |
|--|--------|--|
| General Statistics | | |
| Number of Valid Observations | 21 | Number of Distinct Observations 21 |
| Raw Statistics | | |
| Minimum | 0.399 | Log-transformed Statistics Minimum of Log Data -0.919 |
| Maximum | 38.1 | Maximum of Log Data 3.64 |
| Mean | 10.6 | Mean of log Data 1.641 |
| Geometric Mean | 5.16 | SD of log Data 1.45 |
| Median | 10.15 | |
| SD | 10.18 | |
| Std. Error of Mean | 2.221 | |
| Coefficient of Variation | 0.96 | |
| Skewness | 1 | |
| Relevant UCL Statistics | | |
| Normal Distribution Test | | |
| Shapiro Wilk Test Statistic | 0.875 | Lognormal Distribution Test Shapiro Wilk Test Statistic 0.902 |
| Shapiro Wilk Critical Value | 0.908 | Shapiro Wilk Critical Value 0.908 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level |
| Assuming Normal Distribution | | |
| 95% Student's-t UCL | 14.43 | Assuming Lognormal Distribution 95% H-UCL 42.04 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL 35.71 |
| 95% Adjusted-CLT UCL (Chen-1995) | 14.77 | 97.5% Chebyshev (MVUE) UCL 45.33 |
| 95% Modified-t UCL (Johnson-1978) | 14.51 | 99% Chebyshev (MVUE) UCL 64.24 |
| Gamma Distribution Test | | |
| k star (bias corrected) | 0.736 | Data Distribution Data appear Gamma Distributed at 5% Significance Level |
| Theta Star | 14.41 | |
| MLE of Mean | 10.6 | |
| MLE of Standard Deviation | 12.36 | |
| nu star | 30.91 | |
| Approximate Chi Square Value (.05) | 19.21 | Nonparametric Statistics |
| Adjusted Level of Significance | 0.0383 | 95% CLT UCL 14.25 |
| Adjusted Chi Square Value | 18.5 | 95% Jackknife UCL 14.43 |
| | | 95% Standard Bootstrap UCL 14.16 |
| Anderson-Darling Test Statistic | 0.691 | 95% Bootstrap-t UCL 15.35 |
| Anderson-Darling 5% Critical Value | 0.779 | 95% Hall's Bootstrap UCL 15.42 |
| Kolmogorov-Smirnov Test Statistic | 0.159 | 95% Percentile Bootstrap UCL 14.3 |
| Kolmogorov-Smirnov 5% Critical Value | 0.196 | 95% BCA Bootstrap UCL 14.77 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL 20.28 |
| | | 97.5% Chebyshev(Mean, Sd) UCL 24.47 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL 32.7 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 17.06 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 17.71 | |
| Potential UCL to Use | | Use 95% Approximate Gamma UCL 17.06 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

As

| | | |
|------------------------------|-------|---|
| General Statistics | | |
| Number of Valid Observations | 45 | Number of Distinct Observations 45 |
| Raw Statistics | | |
| Minimum | 1.098 | Log-transformed Statistics Minimum of Log Data 0.0935 |
| Maximum | 45.9 | Maximum of Log Data 3.826 |
| Mean | 10.35 | Mean of log Data 1.941 |
| Geometric Mean | 6.963 | SD of log Data 0.939 |
| Median | 7.89 | |

| | | | |
|--|--------|--|-------|
| SD | 9.642 | | |
| Std. Error of Mean | 1.437 | | |
| Coefficient of Variation | 0.932 | | |
| Skewness | 1.958 | | |
| Relevant UCL Statistics | | | |
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.805 | Shapiro Wilk Test Statistic | 0.971 |
| Shapiro Wilk Critical Value | 0.945 | Shapiro Wilk Critical Value | 0.945 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | | |
| 95% Student's-t UCL | 12.76 | 95% H-UCL | 14.99 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 18.18 |
| 95% Adjusted-CLT UCL (Chen-1995) | 13.16 | 97.5% Chebyshev (MVUE) UCL | 21.44 |
| 95% Modified-t UCL (Johnson-1978) | 12.83 | 99% Chebyshev (MVUE) UCL | 27.82 |
| Gamma Distribution Test | | | |
| k star (bias corrected) | 1.327 | Data Distribution | |
| Theta Star | 7.796 | Data appear Gamma Distributed at 5% Significance Level | |
| MLE of Mean | 10.35 | | |
| MLE of Standard Deviation | 8.981 | | |
| nu star | 119.4 | | |
| Approximate Chi Square Value (.05) | 95.21 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0447 | 95% CLT UCL | 12.71 |
| Adjusted Chi Square Value | 94.49 | 95% Jackknife UCL | 12.76 |
| | | 95% Standard Bootstrap UCL | 12.73 |
| Anderson-Darling Test Statistic | 0.319 | 95% Bootstrap-t UCL | 13.27 |
| Anderson-Darling 5% Critical Value | 0.77 | 95% Hall's Bootstrap UCL | 13.88 |
| Kolmogorov-Smirnov Test Statistic | 0.0845 | 95% Percentile Bootstrap UCL | 12.76 |
| Kolmogorov-Smirnov 5% Critical Value | 0.134 | 95% BCA Bootstrap UCL | 13.1 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 16.61 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 19.32 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 24.65 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 12.98 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 13.08 | | |
| Potential UCL to Use | | Use 95% Approximate Gamma UCL | 12.98 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Ba

| | | | |
|---|-------|--|---------|
| General Statistics | | | |
| Number of Valid Observations | 45 | Number of Distinct Observations | 44 |
| Raw Statistics | | | |
| Minimum | 0.986 | Log-transformed Statistics | |
| Maximum | 6.96 | Minimum of Log Data | -0.0141 |
| Mean | 3.295 | Maximum of Log Data | 1.94 |
| Geometric Mean | 3.054 | Mean of log Data | 1.116 |
| Median | 3.21 | SD of log Data | 0.41 |
| SD | 1.243 | | |
| Std. Error of Mean | 0.185 | | |
| Coefficient of Variation | 0.377 | | |
| Skewness | 0.48 | | |
| Relevant UCL Statistics | | | |
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.978 | Shapiro Wilk Test Statistic | 0.972 |
| Shapiro Wilk Critical Value | 0.945 | Shapiro Wilk Critical Value | 0.945 |
| Data appear Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

| | | | |
|--|--------|---|-------|
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 3.606 | 95% H-UCL | 3.721 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 4.226 |
| 95% Adjusted-CLT UCL (Chen-1995) | 3.614 | 97.5% Chebyshev (MVUE) UCL | 4.62 |
| 95% Modified-t UCL (Johnson-1978) | 3.608 | 99% Chebyshev (MVUE) UCL | 5.395 |
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 6.308 | Data appear Normal at 5% Significance Level | |
| Theta Star | 0.522 | | |
| MLE of Mean | 3.295 | | |
| MLE of Standard Deviation | 1.312 | | |
| nu star | 567.7 | | |
| Approximate Chi Square Value (.05) | 513.4 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0447 | 95% CLT UCL | 3.599 |
| Adjusted Chi Square Value | 511.7 | 95% Jackknife UCL | 3.606 |
| | | 95% Standard Bootstrap UCL | 3.595 |
| Anderson-Darling Test Statistic | 0.228 | 95% Bootstrap-t UCL | 3.615 |
| Anderson-Darling 5% Critical Value | 0.752 | 95% Hall's Bootstrap UCL | 3.624 |
| Kolmogorov-Smirnov Test Statistic | 0.0781 | 95% Percentile Bootstrap UCL | 3.612 |
| Kolmogorov-Smirnov 5% Critical Value | 0.132 | 95% BCA Bootstrap UCL | 3.62 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 4.103 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 4.452 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 5.139 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 3.643 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 3.655 | | |
| Potential UCL to Use | | Use 95% Student's-t UCL | 3.606 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cd

| | | | |
|----------------------------------|----|---------------------------|--------|
| General Statistics | | | |
| Number of Valid Data | 45 | Number of Detected Data | 29 |
| Number of Distinct Detected Data | 23 | Number of Non-Detect Data | 16 |
| | | Percent Non-Detects | 35.56% |

| | | | |
|--------------------|--------|----------------------------|--------|
| Raw Statistics | | Log-transformed Statistics | |
| Minimum Detected | 0.022 | Minimum Detected | -3.817 |
| Maximum Detected | 0.103 | Maximum Detected | -2.273 |
| Mean of Detected | 0.0434 | Mean of Detected | -3.209 |
| SD of Detected | 0.0182 | SD of Detected | 0.373 |
| Minimum Non-Detect | 0.003 | Minimum Non-Detect | -5.809 |
| Maximum Non-Detect | 0.025 | Maximum Non-Detect | -3.689 |

| | | | |
|--|--|---------------------------------|--------|
| Note: Data have multiple DLs - Use of KM Method is recommended | | Number treated as Non-Detect | 17 |
| For all methods (except KM, DL/2, and ROS Methods), | | Number treated as Detected | 28 |
| Observations < Largest ND are treated as NDs | | Single DL Non-Detect Percentage | 37.78% |

| | | | |
|--|-------|---|-------|
| UCL Statistics | | | |
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.862 | Shapiro Wilk Test Statistic | 0.949 |
| 5% Shapiro Wilk Critical Value | 0.926 | 5% Shapiro Wilk Critical Value | 0.926 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

| | | | |
|------------------------------|--------|---------------------------------|--------|
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 0.0309 | Mean | -3.909 |
| SD | 0.0225 | SD | 1.174 |
| 95% DL/2 (t) UCL | 0.0366 | 95% H-Stat (DL/2) UCL | 0.0631 |

| | | |
|---|-------------------------------|--------|
| Maximum Likelihood Estimate(MLE) Method | Log ROS Method | |
| Mean | 0.0304 Mean in Log Scale | -3.536 |
| SD | 0.024 SD in Log Scale | 0.555 |
| 95% MLE (t) UCL | 0.0364 Mean in Original Scale | 0.0338 |
| 95% MLE (Tiku) UCL | 0.037 SD in Original Scale | 0.0196 |
| | 95% t UCL | 0.0388 |
| | 95% Percentile Bootstrap UCL | 0.039 |
| | 95% BCA Bootstrap UCL | 0.0393 |
| | 95% H UCL | 0.04 |

| | | |
|---|--|--|
| Gamma Distribution Test with Detected Values Only | Data Distribution Test with Detected Values Only | |
| k star (bias corrected) | 6.426 Data appear Lognormal at 5% Significance Level | |
| Theta Star | 0.00675 | |
| nu star | 372.7 | |

| | | |
|---|--|---------|
| A-D Test Statistic | 0.781 Nonparametric Statistics | |
| 5% A-D Critical Value | 0.747 Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.747 Mean | 0.0358 |
| 5% K-S Critical Value | 0.163 SD | 0.0176 |
| Data not Gamma Distributed at 5% Significance Level | SE of Mean | 0.00267 |
| | 95% KM (t) UCL | 0.0403 |
| Assuming Gamma Distribution | 95% KM (z) UCL | 0.0402 |
| Gamma ROS Statistics using Extrapolated Data | 95% KM (jackknife) UCL | 0.0397 |
| Minimum | 1.00E-06 95% KM (bootstrap t) UCL | 0.0407 |
| Maximum | 0.103 95% KM (BCA) UCL | 0.042 |
| Mean | 0.0283 95% KM (Percentile Bootstrap) UCL | 0.041 |
| Median | 0.03 95% KM (Chebyshev) UCL | 0.0474 |
| SD | 0.0251 97.5% KM (Chebyshev) UCL | 0.0525 |
| k star | 0.256 99% KM (Chebyshev) UCL | 0.0624 |
| Theta star | 0.111 | |
| Nu star | 23.08 Potential UCLs to Use | |
| AppChi2 | 13.15 95% KM (BCA) UCL | 0.042 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 0.0497 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 0.0507 | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Cr

| | | |
|----------------------------------|------------------------------|--------|
| General Statistics | | |
| Number of Valid Data | 45 Number of Detected Data | 21 |
| Number of Distinct Detected Data | 19 Number of Non-Detect Data | 24 |
| | Percent Non-Detects | 53.33% |

| | | |
|--------------------|----------------------------|--------|
| Raw Statistics | Log-transformed Statistics | |
| Minimum Detected | 0.028 Minimum Detected | -3.576 |
| Maximum Detected | 2.431 Maximum Detected | 0.888 |
| Mean of Detected | 0.191 Mean of Detected | -2.501 |
| SD of Detected | 0.515 SD of Detected | 0.924 |
| Minimum Non-Detect | 0.05 Minimum Non-Detect | -2.996 |
| Maximum Non-Detect | 0.06 Maximum Non-Detect | -2.813 |

| | | |
|--|---------------------------------|--------|
| Note: Data have multiple DLs - Use of KM Method is recommended | Number treated as Non-Detect | 32 |
| For all methods (except KM, DL/2, and ROS Methods), | Number treated as Detected | 13 |
| Observations < Largest ND are treated as NDs | Single DL Non-Detect Percentage | 71.11% |

| | | |
|--|---|-------|
| UCL Statistics | | |
| Normal Distribution Test with Detected Values Only | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.29 Shapiro Wilk Test Statistic | 0.756 |
| 5% Shapiro Wilk Critical Value | 0.908 5% Shapiro Wilk Critical Value | 0.908 |
| Data not Normal at 5% Significance Level | Data not Lognormal at 5% Significance Level | |

| | | | |
|---|----------|--|--------|
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 0.103 | Mean | -3.106 |
| SD | 0.357 | SD | 0.848 |
| 95% DL/2 (t) UCL | 0.192 | 95% H-Stat (DL/2) UCL | 0.0851 |
| Maximum Likelihood Estimate(MLE) Method | N/A | Log ROS Method | |
| MLE yields a negative mean | | Mean in Log Scale | -3.063 |
| | | SD in Log Scale | 0.901 |
| | | Mean in Original Scale | 0.106 |
| | | SD in Original Scale | 0.356 |
| | | 95% t UCL | 0.195 |
| | | 95% Percentile Bootstrap UCL | 0.21 |
| | | 95% BCA Bootstrap UCL | 0.321 |
| | | 95% H-UCL | 0.0954 |
| Gamma Distribution Test with Detected Values Only | | Data Distribution Test with Detected Values Only | |
| k star (bias corrected) | 0.644 | Data do not follow a Discernable Distribution (0.05) | |
| Theta Star | 0.296 | | |
| nu star | 27.05 | | |
| A-D Test Statistic | 3.616 | Nonparametric Statistics | |
| 5% A-D Critical Value | 0.786 | Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.786 | Mean | 0.109 |
| 5% K-S Critical Value | 0.197 | SD | 0.352 |
| Data not Gamma Distributed at 5% Significance Level | | SE of Mean | 0.0537 |
| | | 95% KM (t) UCL | 0.199 |
| Assuming Gamma Distribution | | 95% KM (z) UCL | 0.198 |
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (jackknife) UCL | 0.198 |
| Minimum | 1.00E-06 | 95% KM (bootstrap t) UCL | 0.842 |
| Maximum | 2.431 | 95% KM (BCA) UCL | 0.218 |
| Mean | 0.0961 | 95% KM (Percentile Bootstrap) UCL | 0.214 |
| Median | 0.038 | 95% KM (Chebyshev) UCL | 0.343 |
| SD | 0.359 | 97.5% KM (Chebyshev) UCL | 0.445 |
| k star | 0.164 | 99% KM (Chebyshev) UCL | 0.644 |
| Theta star | 0.588 | | |
| Nu star | 14.72 | Potential UCLs to Use | |
| AppChi2 | 7.065 | 95% KM (t) UCL | 0.199 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 0.2 | 95% KM (% Bootstrap) UCL | 0.214 |
| 95% Adjusted Gamma UCL (Use when n < 40) | 0.205 | | |
| Note: DL/2 is not a recommended method. | | | |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Cu

| | | | |
|------------------------------|--------|---------------------------------|--------|
| General Statistics | | | |
| Number of Valid Observations | 45 | Number of Distinct Observations | 39 |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 0.72 | Minimum of Log Data | -0.329 |
| Maximum | 2.263 | Maximum of Log Data | 0.817 |
| Mean | 1.157 | Mean of log Data | 0.113 |
| Geometric Mean | 1.119 | SD of log Data | 0.252 |
| Median | 1.08 | | |
| SD | 0.324 | | |
| Std. Error of Mean | 0.0482 | | |
| Coefficient of Variation | 0.28 | | |
| Skewness | 1.5 | | |
| Relevant UCL Statistics | | Lognormal Distribution Test | |
| Normal Distribution Test | | Shapiro Wilk Test Statistic | 0.947 |
| Shapiro Wilk Test Statistic | 0.871 | | |

| | | | |
|---|--------|--|-------|
| Shapiro Wilk Critical Value | 0.945 | Shapiro Wilk Critical Value | 0.945 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 1.238 | 95% H-UCL | 1.234 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 1.346 |
| 95% Adjusted-CLT UCL (Chen-1995) | 1.248 | 97.5% Chebyshev (MVUE) UCL | 1.429 |
| 95% Modified-t UCL (Johnson-1978) | 1.24 | 99% Chebyshev (MVUE) UCL | 1.591 |
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 14.35 | Data appear Lognormal at 5% Significance Level | |
| Theta Star | 0.0806 | | |
| MLE of Mean | 1.157 | | |
| MLE of Standard Deviation | 0.305 | | |
| nu star | 1291 | | |
| Approximate Chi Square Value (.05) | 1209 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0447 | 95% CLT UCL | 1.236 |
| Adjusted Chi Square Value | 1206 | 95% Jackknife UCL | 1.238 |
| | | 95% Standard Bootstrap UCL | 1.236 |
| Anderson-Darling Test Statistic | 1.168 | 95% Bootstrap-t UCL | 1.257 |
| Anderson-Darling 5% Critical Value | 0.748 | 95% Hall's Bootstrap UCL | 1.254 |
| Kolmogorov-Smirnov Test Statistic | 0.147 | 95% Percentile Bootstrap UCL | 1.239 |
| Kolmogorov-Smirnov 5% Critical Value | 0.132 | 95% BCA Bootstrap UCL | 1.247 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 1.367 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 1.458 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 1.637 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 1.236 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 1.239 | | |
| Potential UCL to Use | | Use 95% Student's-t UCL | 1.238 |
| | | or 95% Modified-t UCL | 1.24 |
| | | or 95% H-UCL | 1.234 |

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

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|--|-------|--|-------|
| General Statistics | | | |
| Number of Valid Observations | 45 | Number of Distinct Observations | 44 |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 18.9 | Minimum of Log Data | 2.939 |
| Maximum | 386 | Maximum of Log Data | 5.956 |
| Mean | 100.1 | Mean of log Data | 4.348 |
| Geometric Mean | 77.36 | SD of log Data | 0.713 |
| Median | 76.2 | | |
| SD | 82.58 | | |
| Std. Error of Mean | 12.31 | | |
| Coefficient of Variation | 0.825 | | |
| Skewness | 2.083 | | |
| Relevant UCL Statistics | | Lognormal Distribution Test | |
| Normal Distribution Test | | | |
| Shapiro Wilk Test Statistic | 0.767 | Shapiro Wilk Test Statistic | 0.976 |
| Shapiro Wilk Critical Value | 0.945 | Shapiro Wilk Critical Value | 0.945 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

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| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 120.8 | 95% H-UCL | 124.7 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 149.2 |
| 95% Adjusted-CLT UCL (Chen-1995) | 124.4 | 97.5% Chebyshev (MVUE) UCL | 171 |
| 95% Modified-t UCL (Johnson-1978) | 121.4 | 99% Chebyshev (MVUE) UCL | 213.6 |
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 1.968 | Data appear Gamma Distributed at 5% Significance Level | |
| Theta Star | 50.85 | | |
| MLE of Mean | 100.1 | | |
| MLE of Standard Deviation | 71.34 | | |
| nu star | 177.1 | | |
| Approximate Chi Square Value (.05) | 147.4 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0447 | 95% CLT UCL | 120.3 |
| Adjusted Chi Square Value | 146.5 | 95% Jackknife UCL | 120.8 |
| | | 95% Standard Bootstrap UCL | 120.5 |
| Anderson-Darling Test Statistic | 0.737 | 95% Bootstrap-t UCL | 127.7 |
| Anderson-Darling 5% Critical Value | 0.76 | 95% Hall's Bootstrap UCL | 126.9 |
| Kolmogorov-Smirnov Test Statistic | 0.0979 | 95% Percentile Bootstrap UCL | 120.8 |
| Kolmogorov-Smirnov 5% Critical Value | 0.133 | 95% BCA Bootstrap UCL | 123.1 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 153.7 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 177 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 222.6 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 120.3 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 121 | | |
| Potential UCL to Use | | Use 95% Approximate Gamma UCL | 120.3 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

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|--|--------|---|--------|
| General Statistics | | | |
| Number of Valid Data | 45 | Number of Detected Data | 17 |
| Number of Distinct Detected Data | 14 | Number of Non-Detect Data | 28 |
| | | Percent Non-Detects | 62.22% |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum Detected | 0.025 | Minimum Detected | -3.689 |
| Maximum Detected | 0.079 | Maximum Detected | -2.538 |
| Mean of Detected | 0.0399 | Mean of Detected | -3.272 |
| SD of Detected | 0.0141 | SD of Detected | 0.322 |
| Minimum Non-Detect | 0.003 | Minimum Non-Detect | -5.809 |
| Maximum Non-Detect | 0.025 | Maximum Non-Detect | -3.689 |
| Note: Data have multiple DLs - Use of KM Method is recommended | | Number treated as Non-Detect | 28 |
| For all methods (except KM, DL/2, and ROS Methods), | | Number treated as Detected | 17 |
| Observations < Largest ND are treated as NDs | | Single DL Non-Detect Percentage | 62.22% |
| UCL Statistics | | | |
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.872 | Shapiro Wilk Test Statistic | 0.938 |
| 5% Shapiro Wilk Critical Value | 0.892 | 5% Shapiro Wilk Critical Value | 0.892 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 0.0182 | Mean | -4.803 |
| SD | 0.0195 | SD | 1.401 |
| 95% DL/2 (t) UCL | 0.023 | 95% H-Stat (DL/2) UCL | 0.0401 |

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| Maximum Likelihood Estimate(MLE) Method | Log ROS Method | |
| Mean | 0.0174 Mean in Log Scale | -3.906 |
| SD | 0.0229 SD in Log Scale | 0.606 |
| 95% MLE (t) UCL | 0.0231 Mean in Original Scale | 0.0241 |
| 95% MLE (Tiku) UCL | 0.0258 SD in Original Scale | 0.0156 |
| | 95% t UCL | 0.028 |
| | 95% Percentile Bootstrap UCL | 0.0281 |
| | 95% BCA Bootstrap UCL | 0.0285 |
| | 95% H UCL | 0.029 |

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| Gamma Distribution Test with Detected Values Only | Data Distribution Test with Detected Values Only | |
| k star (bias corrected) | 8.199 Data appear Gamma Distributed at 5% Significance Level | |
| Theta Star | 0.00487 | |
| nu star | 278.8 | |

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| A-D Test Statistic | 0.455 Nonparametric Statistics | |
| 5% A-D Critical Value | 0.739 Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.739 Mean | 0.0306 |
| 5% K-S Critical Value | 0.209 SD | 0.0111 |
| Data appear Gamma Distributed at 5% Significance Level | SE of Mean | 0.00171 |

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|--|--|--------|
| Assuming Gamma Distribution | 95% KM (t) UCL | 0.0335 |
| Gamma ROS Statistics using Extrapolated Data | 95% KM (z) UCL | 0.0334 |
| Minimum | 95% KM (jackknife) UCL | 0.0331 |
| Maximum | 95% KM (bootstrap t) UCL | 0.0344 |
| Mean | 0.079 95% KM (BCA) UCL | 0.0349 |
| Median | 0.0155 95% KM (Percentile Bootstrap) UCL | 0.0341 |
| SD | 1.00E-06 95% KM (Chebyshev) UCL | 0.0381 |
| k star | 0.0211 97.5% KM (Chebyshev) UCL | 0.0413 |
| Theta star | 0.156 99% KM (Chebyshev) UCL | 0.0476 |
| Nu star | 0.0998 | |
| AppChi2 | 14.02 Potential UCLs to Use | |
| 95% Gamma Approximate UCL (Use when n >= 40) | 6.584 95% KM (t) UCL | 0.0335 |
| 95% Adjusted Gamma UCL (Use when n < 40) | 0.0331 | |
| Note: DL/2 is not a recommended method. | 0.034 | |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

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|------------------------------|------------------------------------|----|
| General Statistics | | |
| Number of Valid Observations | 45 Number of Distinct Observations | 43 |

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|--------------------------|----------------------------|-------|
| Raw Statistics | Log-transformed Statistics | |
| Minimum | 3.49 Minimum of Log Data | 1.25 |
| Maximum | 40.7 Maximum of Log Data | 3.706 |
| Mean | 13.71 Mean of log Data | 2.518 |
| Geometric Mean | 12.41 SD of log Data | 0.442 |
| Median | 11.19 | |
| SD | 6.84 | |
| Std. Error of Mean | 1.02 | |
| Coefficient of Variation | 0.499 | |
| Skewness | 1.86 | |

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| Relevant UCL Statistics | Lognormal Distribution Test | |
| Normal Distribution Test | | |
| Shapiro Wilk Test Statistic | 0.836 Shapiro Wilk Test Statistic | 0.959 |
| Shapiro Wilk Critical Value | 0.945 Shapiro Wilk Critical Value | 0.945 |
| Data not Normal at 5% Significance Level | Data appear Lognormal at 5% Significance Level | |

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|----------------------------------|---------------------------------|-------|
| Assuming Normal Distribution | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 15.42 95% H-UCL | 15.49 |
| 95% UCLs (Adjusted for Skewness) | 95% Chebyshev (MVUE) UCL | 17.72 |

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|---|--------|--|-------|
| 95% Adjusted-CLT UCL (Chen-1995) | 15.69 | 97.5% Chebyshev (MVUE) UCL | 19.48 |
| 95% Modified-t UCL (Johnson-1978) | 15.47 | 99% Chebyshev (MVUE) UCL | 22.94 |
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 4.847 | Data appear Lognormal at 5% Significance Level | |
| Theta Star | 2.829 | | |
| MLE of Mean | 13.71 | | |
| MLE of Standard Deviation | 6.227 | | |
| nu star | 436.2 | | |
| Approximate Chi Square Value (.05) | 388.8 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0447 | 95% CLT UCL | 15.39 |
| Adjusted Chi Square Value | 387.3 | 95% Jackknife UCL | 15.42 |
| | | 95% Standard Bootstrap UCL | 15.38 |
| Anderson-Darling Test Statistic | 1.238 | 95% Bootstrap-t UCL | 15.89 |
| Anderson-Darling 5% Critical Value | 0.753 | 95% Hall's Bootstrap UCL | 16.22 |
| Kolmogorov-Smirnov Test Statistic | 0.157 | 95% Percentile Bootstrap UCL | 15.44 |
| Kolmogorov-Smirnov 5% Critical Value | 0.132 | 95% BCA Bootstrap UCL | 15.58 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 18.15 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 20.08 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 23.86 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 15.38 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 15.44 | | |
| Potential UCL to Use | | Use 95% Student's-t UCL | 15.42 |
| | | or 95% Modified-t UCL | 15.47 |
| | | or 95% H-UCL | 15.49 |

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

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|--|-------|---|--------|
| General Statistics | | | |
| Number of Valid Observations | 45 | Number of Distinct Observations | 43 |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 0.05 | Minimum of Log Data | -2.996 |
| Maximum | 3.701 | Maximum of Log Data | 1.309 |
| Mean | 0.731 | Mean of log Data | -1.12 |
| Geometric Mean | 0.326 | SD of log Data | 1.25 |
| Median | 0.23 | | |
| SD | 1.007 | | |
| Std. Error of Mean | 0.15 | | |
| Coefficient of Variation | 1.378 | | |
| Skewness | 1.816 | | |
| Relevant UCL Statistics | | | |
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.68 | Shapiro Wilk Test Statistic | 0.906 |
| Shapiro Wilk Critical Value | 0.945 | Shapiro Wilk Critical Value | 0.945 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 0.984 | 95% H-UCL | 1.179 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 1.391 |
| 95% Adjusted-CLT UCL (Chen-1995) | 1.022 | 97.5% Chebyshev (MVUE) UCL | 1.694 |
| 95% Modified-t UCL (Johnson-1978) | 0.99 | 99% Chebyshev (MVUE) UCL | 2.289 |

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| Gamma Distribution Test | Data Distribution | |
| k star (bias corrected) | 0.708 | Data do not follow a Discernable Distribution (0.05) |
| Theta Star | 1.033 | |
| MLE of Mean | 0.731 | |
| MLE of Standard Deviation | 0.869 | |
| nu star | 63.7 | |
| Approximate Chi Square Value (.05) | 46.34 | Nonparametric Statistics |
| Adjusted Level of Significance | 0.0447 | 95% CLT UCL |
| Adjusted Chi Square Value | 45.85 | 95% Jackknife UCL |
| | | 95% Standard Bootstrap UCL |
| Anderson-Darling Test Statistic | 2.659 | 95% Bootstrap-t UCL |
| Anderson-Darling 5% Critical Value | 0.79 | 95% Hall's Bootstrap UCL |
| Kolmogorov-Smirnov Test Statistic | 0.22 | 95% Percentile Bootstrap UCL |
| Kolmogorov-Smirnov 5% Critical Value | 0.137 | 95% BCA Bootstrap UCL |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL |
| | | 97.5% Chebyshev(Mean, Sd) UCL |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL |
| 95% Approximate Gamma UCL (Use when n >= 40) | 1.005 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 1.016 | |
| Potential UCL to Use | Use 95% Chebyshev (Mean, Sd) UCL | 1.386 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

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|----------------------------------|----|---------------------------|
| General Statistics | | |
| Number of Valid Data | 45 | Number of Detected Data |
| Number of Distinct Detected Data | 30 | Number of Non-Detect Data |
| | | Percent Non-Detects |
| | | 26.67% |

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|--------------------|----------------------------|--------------------|
| Raw Statistics | Log-transformed Statistics | |
| Minimum Detected | 0.039 | Minimum Detected |
| Maximum Detected | 0.503 | Maximum Detected |
| Mean of Detected | 0.153 | Mean of Detected |
| SD of Detected | 0.0955 | SD of Detected |
| Minimum Non-Detect | 0.015 | Minimum Non-Detect |
| Maximum Non-Detect | 0.018 | Maximum Non-Detect |

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|--|---------------------------------|--------|
| Note: Data have multiple DLs - Use of KM Method is recommended | Number treated as Non-Detect | 12 |
| For all methods (except KM, DL/2, and ROS Methods), | Number treated as Detected | 33 |
| Observations < Largest ND are treated as NDs | Single DL Non-Detect Percentage | 26.67% |

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|--|---|--|
| UCL Statistics | | |
| Normal Distribution Test with Detected Values Only | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.879 | Shapiro Wilk Test Statistic |
| 5% Shapiro Wilk Critical Value | 0.931 | 5% Shapiro Wilk Critical Value |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level |

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|------------------------------|---------------------------------|-----------------------|
| Assuming Normal Distribution | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | DL/2 Substitution Method | |
| Mean | 0.115 | Mean |
| SD | 0.104 | SD |
| 95% DL/2 (t) UCL | 0.141 | 95% H-Stat (DL/2) UCL |

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|---|----------------|------------------------------|
| Maximum Likelihood Estimate(MLE) Method | Log ROS Method | |
| Mean | 0.0963 | Mean in Log Scale |
| SD | 0.129 | SD in Log Scale |
| 95% MLE (t) UCL | 0.129 | Mean in Original Scale |
| 95% MLE (Tiku) UCL | 0.13 | SD in Original Scale |
| | | 95% t UCL |
| | | 95% Percentile Bootstrap UCL |
| | | 95% BCA Bootstrap UCL |

| | | |
|--|--|--------|
| | 95% H UCL | 0.165 |
| Gamma Distribution Test with Detected Values Only | Data Distribution Test with Detected Values Only | |
| k star (bias corrected) | 2.689 Data appear Gamma Distributed at 5% Significance Level | |
| Theta Star | 0.057 | |
| nu star | 177.5 | |
| A-D Test Statistic | 0.257 Nonparametric Statistics | |
| 5% A-D Critical Value | 0.754 Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.754 Mean | 0.123 |
| 5% K-S Critical Value | 0.154 SD | 0.0951 |
| Data appear Gamma Distributed at 5% Significance Level | SE of Mean | 0.0144 |
| | 95% KM (t) UCL | 0.147 |
| Assuming Gamma Distribution | 95% KM (z) UCL | 0.147 |
| Gamma ROS Statistics using Extrapolated Data | 95% KM (jackknife) UCL | 0.146 |
| Minimum | 1.00E-06 95% KM (bootstrap t) UCL | 0.151 |
| Maximum | 0.503 95% KM (BCA) UCL | 0.149 |
| Mean | 0.113 95% KM (Percentile Bootstrap) UCL | 0.149 |
| Median | 0.108 95% KM (Chebyshev) UCL | 0.186 |
| SD | 0.106 97.5% KM (Chebyshev) UCL | 0.213 |
| k star | 0.237 99% KM (Chebyshev) UCL | 0.266 |
| Theta star | 0.475 | |
| Nu star | 21.34 Potential UCLs to Use | |
| AppChi2 | 11.84 95% KM (Percentile Bootstrap) UCL | 0.149 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 0.203 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 0.207 | |
| Note: DL/2 is not a recommended method. | | |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

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|--|--------|--|
| General Statistics | | |
| Number of Valid Observations | 45 | Number of Distinct Observations 42 |
| Raw Statistics | | Log-transformed Statistics |
| Minimum | 0.58 | Minimum of Log Data -0.545 |
| Maximum | 2.975 | Maximum of Log Data 1.09 |
| Mean | 1.281 | Mean of log Data 0.154 |
| Geometric Mean | 1.166 | SD of log Data 0.432 |
| Median | 1.127 | |
| SD | 0.584 | |
| Std. Error of Mean | 0.0871 | |
| Coefficient of Variation | 0.456 | |
| Skewness | 1.03 | |
| Relevant UCL Statistics | | |
| Normal Distribution Test | | Lognormal Distribution Test |
| Shapiro Wilk Test Statistic | 0.896 | Shapiro Wilk Test Statistic 0.959 |
| Shapiro Wilk Critical Value | 0.945 | Shapiro Wilk Critical Value 0.945 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level |
| Assuming Normal Distribution | | Assuming Lognormal Distribution |
| 95% Student's-t UCL | 1.427 | 95% H-UCL 1.445 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL 1.65 |
| 95% Adjusted-CLT UCL (Chen-1995) | 1.438 | 97.5% Chebyshev (MVUE) UCL 1.811 |
| 95% Modified-t UCL (Johnson-1978) | 1.429 | 99% Chebyshev (MVUE) UCL 2.127 |
| Gamma Distribution Test | | Data Distribution |
| k star (bias corrected) | 5.155 | Data appear Gamma Distributed at 5% Significance Level |
| Theta Star | 0.248 | |
| MLE of Mean | 1.281 | |
| MLE of Standard Deviation | 0.564 | |

| | | | |
|--|--------|-------------------------------|-------|
| nu star | 464 | | |
| Approximate Chi Square Value (.05) | 415 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0447 | 95% CLT UCL | 1.424 |
| Adjusted Chi Square Value | 413.5 | 95% Jackknife UCL | 1.427 |
| | | 95% Standard Bootstrap UCL | 1.425 |
| Anderson-Darling Test Statistic | 0.619 | 95% Bootstrap-t UCL | 1.447 |
| Anderson-Darling 5% Critical Value | 0.753 | 95% Hall's Bootstrap UCL | 1.446 |
| Kolmogorov-Smirnov Test Statistic | 0.108 | 95% Percentile Bootstrap UCL | 1.43 |
| Kolmogorov-Smirnov 5% Critical Value | 0.132 | 95% BCA Bootstrap UCL | 1.439 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 1.66 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 1.824 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 2.147 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 1.432 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 1.437 | | |
| Potential UCL to Use | | Use 95% Approximate Gamma UCL | 1.432 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

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|----------------------------------|----|---------------------------|--------|
| General Statistics | | | |
| Number of Valid Data | 45 | Number of Detected Data | 24 |
| Number of Distinct Detected Data | 24 | Number of Non-Detect Data | 21 |
| | | Percent Non-Detects | 46.67% |

| | | | |
|--------------------|--------|----------------------------|--------|
| Raw Statistics | | Log-transformed Statistics | |
| Minimum Detected | 0.095 | Minimum Detected | -2.354 |
| Maximum Detected | 0.433 | Maximum Detected | -0.837 |
| Mean of Detected | 0.215 | Mean of Detected | -1.617 |
| SD of Detected | 0.0878 | SD of Detected | 0.408 |
| Minimum Non-Detect | 0.038 | Minimum Non-Detect | -3.27 |
| Maximum Non-Detect | 0.044 | Maximum Non-Detect | -3.124 |

| | | |
|--|---------------------------------|--------|
| Note: Data have multiple DLs - Use of KM Method is recommended | Number treated as Non-Detect | 21 |
| For all methods (except KM, DL/2, and ROS Methods), | Number treated as Detected | 24 |
| Observations < Largest ND are treated as NDs | Single DL Non-Detect Percentage | 46.67% |

| | | | |
|--|-------|---|-------|
| UCL Statistics | | | |
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.944 | Shapiro Wilk Test Statistic | 0.98 |
| 5% Shapiro Wilk Critical Value | 0.916 | 5% Shapiro Wilk Critical Value | 0.916 |
| Data appear Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

| | | | |
|------------------------------|-------|---------------------------------|--------|
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 0.124 | Mean | -2.676 |
| SD | 0.117 | SD | 1.183 |
| 95% DL/2 (t) UCL | 0.153 | 95% H-Stat (DL/2) UCL | 0.22 |

| | | | |
|---|--------|------------------------------|--------|
| Maximum Likelihood Estimate(MLE) Method | | Log ROS Method | |
| Mean | 0.0739 | Mean in Log Scale | -2.11 |
| SD | 0.177 | SD in Log Scale | 0.631 |
| 95% MLE (t) UCL | 0.118 | Mean in Original Scale | 0.148 |
| 95% MLE (Tiku) UCL | 0.127 | SD in Original Scale | 0.0971 |
| | | 95% t UCL | 0.172 |
| | | 95% Percentile Bootstrap UCL | 0.172 |
| | | 95% BCA Bootstrap UCL | 0.174 |
| | | 95% H UCL | 0.179 |

| | | | |
|---|--------|--|--|
| Gamma Distribution Test with Detected Values Only | | Data Distribution Test with Detected Values Only | |
| k star (bias corrected) | 5.715 | Data appear Normal at 5% Significance Level | |
| Theta Star | 0.0376 | | |

| | | | |
|--|----------|-----------------------------------|--------|
| nu star | 274.3 | | |
| A-D Test Statistic | 0.208 | Nonparametric Statistics | |
| 5% A-D Critical Value | 0.746 | Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.746 | Mean | 0.159 |
| 5% K-S Critical Value | 0.178 | SD | 0.0867 |
| Data appear Gamma Distributed at 5% Significance Level | | SE of Mean | 0.0132 |
| | | 95% KM (t) UCL | 0.181 |
| Assuming Gamma Distribution | | 95% KM (z) UCL | 0.181 |
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (jackknife) UCL | 0.179 |
| Minimum | 1.00E-06 | 95% KM (bootstrap t) UCL | 0.184 |
| Maximum | 0.433 | 95% KM (BCA) UCL | 0.189 |
| Mean | 0.115 | 95% KM (Percentile Bootstrap) UCL | 0.185 |
| Median | 0.102 | 95% KM (Chebyshev) UCL | 0.216 |
| SD | 0.126 | 97.5% KM (Chebyshev) UCL | 0.241 |
| k star | 0.154 | 99% KM (Chebyshev) UCL | 0.29 |
| Theta star | 0.742 | | |
| Nu star | 13.89 | Potential UCLs to Use | |
| AppChi2 | 6.498 | 95% KM (t) UCL | 0.181 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 0.245 | 95% KM (Percentile Bootstrap) UCL | 0.185 |
| 95% Adjusted Gamma UCL (Use when n < 40) | 0.251 | | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Zn

| | | | |
|---|--------|--|-------|
| General Statistics | | | |
| Number of Valid Observations | 45 | Number of Distinct Observations | 42 |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 15.9 | Minimum of Log Data | 2.766 |
| Maximum | 35.37 | Maximum of Log Data | 3.566 |
| Mean | 24.51 | Mean of log Data | 3.184 |
| Geometric Mean | 24.13 | SD of log Data | 0.18 |
| Median | 24.5 | | |
| SD | 4.36 | | |
| Std. Error of Mean | 0.65 | | |
| Coefficient of Variation | 0.178 | | |
| Skewness | 0.255 | | |
| Relevant UCL Statistics | | | |
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.981 | Shapiro Wilk Test Statistic | 0.98 |
| Shapiro Wilk Critical Value | 0.945 | Shapiro Wilk Critical Value | 0.945 |
| Data appear Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 25.61 | 95% H-UCL | 25.68 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 27.41 |
| 95% Adjusted-CLT UCL (Chen-1995) | 25.61 | 97.5% Chebyshev (MVUE) UCL | 28.66 |
| 95% Modified-t UCL (Johnson-1978) | 25.61 | 99% Chebyshev (MVUE) UCL | 31.12 |
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 29.92 | Data appear Normal at 5% Significance Level | |
| Theta Star | 0.819 | | |
| MLE of Mean | 24.51 | | |
| MLE of Standard Deviation | 4.481 | | |
| nu star | 2693 | | |
| Approximate Chi Square Value (.05) | 2573 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0447 | 95% CLT UCL | 25.58 |
| Adjusted Chi Square Value | 2569 | 95% Jackknife UCL | 25.61 |
| | | 95% Standard Bootstrap UCL | 25.56 |

| | | | |
|--|-------|-------------------------------|-------|
| Anderson-Darling Test Statistic | 0.228 | 95% Bootstrap-t UCL | 25.68 |
| Anderson-Darling 5% Critical Value | 0.748 | 95% Hall's Bootstrap UCL | 25.64 |
| Kolmogorov-Smirnov Test Statistic | 0.106 | 95% Percentile Bootstrap UCL | 25.58 |
| Kolmogorov-Smirnov 5% Critical Value | 0.131 | 95% BCA Bootstrap UCL | 25.57 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 27.35 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 28.57 |
| | | 99% Chebyshev(Mean, Sd) UCL | 30.98 |
| Assuming Gamma Distribution | | | |
| 95% Approximate Gamma UCL (Use when n >= 40) | 25.65 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 25.69 | | |
| Potential UCL to Use | | Use 95% Student's-t UCL | 25.61 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Inorg As

General Statistics

| | | | |
|------------------------------|----|---------------------------------|----|
| Number of Valid Observations | 12 | Number of Distinct Observations | 12 |
| Number of Missing Values | 33 | | |

Raw Statistics

| | | | |
|--------------------------|-------|----------------------------|-------|
| | | Log-transformed Statistics | |
| Minimum | 2.07 | Minimum of Log Data | 0.728 |
| Maximum | 37.9 | Maximum of Log Data | 3.635 |
| Mean | 13.56 | Mean of log Data | 2.267 |
| Geometric Mean | 9.648 | SD of log Data | 0.926 |
| Median | 12.3 | | |
| SD | 10.94 | | |
| Std. Error of Mean | 3.158 | | |
| Coefficient of Variation | 0.807 | | |
| Skewness | 1.19 | | |

Relevant UCL Statistics

| | | | |
|---|-------|--|-------|
| | | Lognormal Distribution Test | |
| Normal Distribution Test | | | |
| Shapiro Wilk Test Statistic | 0.88 | Shapiro Wilk Test Statistic | 0.943 |
| Shapiro Wilk Critical Value | 0.859 | Shapiro Wilk Critical Value | 0.859 |
| Data appear Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|-------|---------------------------------|-------|
| | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 19.23 | 95% H-UCL | 32.22 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 31.64 |
| 95% Adjusted-CLT UCL (Chen-1995) | 19.92 | 97.5% Chebyshev (MVUE) UCL | 39.22 |
| 95% Modified-t UCL (Johnson-1978) | 19.42 | 99% Chebyshev (MVUE) UCL | 54.1 |

Gamma Distribution Test

| | | | |
|--|-------|---|-------|
| | | Data Distribution | |
| k star (bias corrected) | 1.266 | Data appear Normal at 5% Significance Level | |
| Theta Star | 10.71 | | |
| MLE of Mean | 13.56 | | |
| MLE of Standard Deviation | 12.05 | | |
| nu star | 30.39 | | |
| Approximate Chi Square Value (.05) | 18.8 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.029 | 95% CLT UCL | 18.76 |
| Adjusted Chi Square Value | 17.42 | 95% Jackknife UCL | 19.23 |
| | | 95% Standard Bootstrap UCL | 18.53 |
| Anderson-Darling Test Statistic | 0.253 | 95% Bootstrap-t UCL | 21.08 |
| Anderson-Darling 5% Critical Value | 0.745 | 95% Hall's Bootstrap UCL | 28.9 |
| Kolmogorov-Smirnov Test Statistic | 0.135 | 95% Percentile Bootstrap UCL | 18.8 |
| Kolmogorov-Smirnov 5% Critical Value | 0.249 | 95% BCA Bootstrap UCL | 19.57 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 27.33 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 33.28 |
| | | 99% Chebyshev(Mean, Sd) UCL | 44.98 |
| Assuming Gamma Distribution | | | |
| 95% Approximate Gamma UCL (Use when n >= 40) | 21.93 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 23.66 | | |

| | | |
|----------------------|-------------------------|-------|
| Potential UCL to Use | Use 95% Student's-t UCL | 19.23 |
|----------------------|-------------------------|-------|

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

MeHg

General Statistics

| | | | |
|------------------------------|----|---------------------------------|---|
| Number of Valid Observations | 7 | Number of Distinct Observations | 7 |
| Number of Missing Values | 31 | | |

Raw Statistics

| | | | |
|--------------------------|--------|----------------------------|--------|
| | | Log-transformed Statistics | |
| Minimum | 0.0501 | Minimum of Log Data | -2.994 |
| Maximum | 0.312 | Maximum of Log Data | -1.165 |
| Mean | 0.145 | Mean of log Data | -2.067 |
| Geometric Mean | 0.127 | SD of log Data | 0.576 |
| Median | 0.135 | | |
| SD | 0.0841 | | |
| Std. Error of Mean | 0.0318 | | |
| Coefficient of Variation | 0.578 | | |
| Skewness | 1.37 | | |

Warning: A sample size of 'n' = 7 may not be adequate enough to compute meaningful and reliable test statistics and estimates!

It is suggested to collect at least 8 to 10 observations using these statistical methods!
If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Warning: There are only 7 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

| | | | |
|---|-------|--|-------|
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.89 | Shapiro Wilk Test Statistic | 0.977 |
| Shapiro Wilk Critical Value | 0.803 | Shapiro Wilk Critical Value | 0.803 |
| Data appear Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|-------|----------------------------|-------|
| 95% Student's-t UCL | 0.207 | 95% H-UCL | 0.277 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 0.285 |
| 95% Adjusted-CLT UCL (Chen-1995) | 0.215 | 97.5% Chebyshev (MVUE) UCL | 0.345 |
| 95% Modified-t UCL (Johnson-1978) | 0.21 | 99% Chebyshev (MVUE) UCL | 0.463 |

Gamma Distribution Test

| | | | |
|--|--------|---|-------|
| k star (bias corrected) | 2.253 | Data appear Normal at 5% Significance Level | |
| Theta Star | 0.0645 | | |
| MLE of Mean | 0.145 | | |
| MLE of Standard Deviation | 0.0969 | | |
| nu star | 31.54 | | |
| Approximate Chi Square Value (.05) | 19.71 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0158 | 95% CLT UCL | 0.198 |
| Adjusted Chi Square Value | 16.94 | 95% Jackknife UCL | 0.207 |
| | | 95% Standard Bootstrap UCL | 0.195 |
| Anderson-Darling Test Statistic | 0.226 | 95% Bootstrap-t UCL | 0.233 |
| Anderson-Darling 5% Critical Value | 0.71 | 95% Hall's Bootstrap UCL | 0.467 |
| Kolmogorov-Smirnov Test Statistic | 0.198 | 95% Percentile Bootstrap UCL | 0.199 |
| Kolmogorov-Smirnov 5% Critical Value | 0.313 | 95% BCA Bootstrap UCL | 0.209 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 0.284 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 0.344 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 0.462 |

95% Approximate Gamma UCL (Use when $n \geq 40$) 0.233
95% Adjusted Gamma UCL (Use when $n < 40$) 0.271

Potential UCL to Use Use 95% Student's-t UCL 0.207

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Sediment (mg/kg) unless otherwise noted

| | Aluminum | D_Aluminum | Antimony | D_Antimony | Arsenic | D_Arsenic | As(Inorg) | D_As(Inorg) | Barium | D_Barium | Cadmium | D_Cadmium | Chromium | D_Chromium | Cobalt | D_Cobalt | Copper | D_Copper | Iron | D_Iron | Lead |
|----------|----------|------------|----------|------------|---------|-----------|-----------|-------------|--------|----------|---------|-----------|----------|------------|--------|----------|--------|----------|--------|--------|------|
| 10KR02SD | 9750 | 1 | 1280 | 1 | 1790 | 1 | 1940 | 1 | 418 | 1 | 0.058 | 0 | 25 | 1 | 14.8 | 1 | 37.2 | 1 | 29100 | 1 | 7 |
| 10KR03SD | 17000 | 1 | 10 | 1 | 60 | 1 | 56 | 1 | 227 | 1 | 0.6 | 1 | 36 | 1 | 12.8 | 1 | 31 | 1 | 33900 | 1 | 10 |
| 10KR04SD | 12600 | 1 | 0.62 | 0 | 30 | 1 | 31.7 | 1 | 161 | 1 | 0.4 | 1 | 26.7 | 1 | 9.9 | 1 | 22 | 1 | 25100 | 1 | 7 |
| 10KR07SD | 4510 | 1 | 40 | 1 | 800 | 1 | 1020 | 1 | 145 | 1 | 0.061 | 0 | 18 | 1 | 18 | 1 | 56.5 | 1 | 48100 | 1 | 10 |
| 10KR10SD | 7080 | 1 | 1.2 | 0 | 160 | 1 | 178 | 1 | 151 | 1 | 0.056 | 0 | 17 | 1 | 15.1 | 1 | 41.9 | 1 | 31200 | 1 | 10 |
| 10KR11SD | 10600 | 1 | 0.56 | 0 | 21 | 1 | 24.7 | 1 | 138 | 1 | 0.4 | 1 | 23.3 | 1 | 9.2 | 1 | 19.6 | 1 | 23200 | 1 | 6 |
| 10RD02SD | 14700 | 1 | 1.2 | 0 | 50 | 1 | 54.8 | 1 | 278 | 1 | 0.059 | 0 | 25 | 1 | 13.7 | 1 | 23.4 | 1 | 29200 | 1 | 7 |
| 10RD03SD | 9340 | 1 | 1.2 | 0 | 60 | 1 | 55 | 1 | 146 | 1 | 0.06 | 0 | 19 | 1 | 16.5 | 1 | 24.4 | 1 | 38300 | 1 | 8 |
| 10RD04SD | 9350 | 1 | 2510 | 1 | 2290 | 1 | 2540 | 1 | 401 | 1 | 0.062 | 0 | 29 | 1 | 17.8 | 1 | 45.7 | 1 | 52000 | 1 | 14 |
| 10RD05SD | 910 | 1 | 1590 | 1 | 130000 | 1 | 188000 | 1 | 1990 | 1 | 1.4 | 0 | 18.1 | 0 | | | 30 | 1 | 344000 | 1 | 12.5 |
| 10RD06SD | 10200 | 1 | 4060 | 1 | 2950 | 1 | 4340 | 1 | 459 | 1 | 0.059 | 0 | 31 | 1 | 21.5 | 1 | 58.2 | 1 | 39200 | 1 | 11 |
| 10RD07SD | 9620 | 1 | 3430 | 1 | 2370 | 1 | 3770 | 1 | 542 | 1 | 0.06 | 0 | 32 | 1 | 22.3 | 1 | 55.5 | 1 | 34000 | 1 | 13 |
| 10RD08SD | | | | | | | 2390 | 1 | | | | | | | | | | | | | |
| 10RD09SD | 11900 | 1 | 3600 | 1 | 2920 | 1 | 3030 | 1 | 521 | 1 | 0.057 | 0 | 29 | 1 | 20.5 | 1 | 55.6 | 1 | 35200 | 1 | 12 |
| 10RD20SD | 9140 | 1 | 2130 | 1 | 2180 | 1 | 2450 | 1 | 429 | 1 | 0.059 | 0 | 28 | 1 | 16.4 | 1 | 43.6 | 1 | 33800 | 1 | 9 |
| 10RD21SD | | | | | | | | | | | | | | | 50 | 1 | | | | | |
| 11KR05SD | 6460 | 1 | 99 | 1 | 135 | 1 | 231 | 1 | 91.6 | 1 | 0.27 | 1 | 14.2 | 1 | 9.36 | 1 | 25.1 | 1 | 33400 | 1 | 7.78 |
| 11KR06SD | 12100 | 1 | 2.1 | 1 | 17.5 | 1 | 26 | 1 | 128 | 1 | 0.281 | 1 | 20.1 | 1 | 7.14 | 1 | 19 | 1 | 25900 | 1 | 7.32 |
| 11KR08SD | 9550 | 1 | 5.48 | 1 | 52 | 1 | 55 | 1 | 120 | 1 | 0.282 | 1 | 18.3 | 1 | 7.78 | 1 | 18.8 | 1 | 24000 | 1 | 6.71 |
| 11KR09SD | 9770 | 1 | 9.51 | 1 | 20.9 | 1 | 68.2 | 1 | 122 | 1 | 0.338 | 1 | 21.1 | 1 | 10.8 | 1 | 26.8 | 1 | 32400 | 1 | 9.34 |
| 11KR14SD | 11300 | 1 | 5.41 | 1 | 12.5 | 1 | 67.4 | 1 | 116 | 1 | 0.251 | 1 | 19.7 | 1 | 6.93 | 1 | 15 | 1 | 24200 | 1 | 6.62 |
| 11KR15SD | 6810 | 1 | 272 | 1 | 414 | 1 | 1860 | 1 | 124 | 1 | 0.219 | 1 | 11.1 | 1 | 7.69 | 1 | 20.3 | 1 | 19800 | 1 | 6.06 |
| 11KR16SD | 13500 | 1 | 15.2 | 1 | 39.2 | 1 | 70.5 | 1 | 152 | 1 | 0.342 | 1 | 21.9 | 1 | 8.14 | 1 | 23.2 | 1 | 29900 | 1 | 8.82 |
| 11KR17SD | 8610 | 1 | 4.26 | 1 | 17.5 | 1 | 39.9 | 1 | 111 | 1 | 0.345 | 1 | 17.7 | 1 | 10 | 1 | 24.9 | 1 | 26000 | 1 | 9.27 |
| 11RD10SD | 7290 | 1 | 5.71 | 1 | 62 | 1 | | | 119 | 1 | 0.232 | 1 | 11.8 | 1 | 11.9 | 1 | 14.9 | 1 | 36100 | 1 | 7.99 |
| 11RD11SD | 9930 | 1 | 7.39 | 1 | 32.5 | 1 | | | 130 | 1 | 0.163 | 1 | 14.9 | 1 | 8.69 | 1 | 13.2 | 1 | 33200 | 1 | 6.22 |
| 11RD12SD | 10600 | 1 | 6360 | 1 | 3610 | 1 | | | 985 | 1 | 0.317 | 1 | 47.4 | 1 | 12.5 | 1 | 45.7 | 1 | 28900 | 1 | 1.72 |

ug/mg

| | D_Lead | Manganese | D_Mangan | Mercury | D_Mercury | Methyl Me | D_Methyl | Nickel | D_Nickel | Selenium | D_Seleniur | Silver | D_Silver | Thallium | D_Thalliun | Vanadium | D_Vanadiu | Zinc | D_Zinc |
|----------|--------|-----------|----------|---------|-----------|-----------|----------|--------|----------|----------|------------|--------|----------|----------|------------|----------|-----------|------|--------|
| 10KR02SD | 1 | 750 | 1 | 56 | 1 | 0.592 | 1 | 48 | 1 | 1.7 | 0 | 0.116 | 0 | 0.7 | 0 | 27.3 | 1 | 83 | 1 |
| 10KR03SD | 1 | 712 | 1 | 2.1 | 1 | 0.812 | 1 | 35 | 1 | 1.2 | 0 | 0.081 | 0 | 0.5 | 0 | 48.5 | 1 | 105 | 1 |
| 10KR04SD | 1 | 429 | 1 | 0.82 | 1 | 0.285 | 1 | 28 | 1 | 0.9 | 0 | 0.061 | 0 | 0.38 | 0 | 36.9 | 1 | 80 | 1 |
| 10KR07SD | 1 | 684 | 1 | 13.2 | 1 | 0.009 | 0 | 55 | 1 | 1.8 | 0 | 0.121 | 0 | 0.8 | 0 | 32.5 | 1 | 119 | 1 |
| 10KR10SD | 1 | 735 | 1 | 3.6 | 1 | 0.654 | 1 | 38 | 1 | 1.7 | 0 | 0.113 | 0 | 0.7 | 0 | 31.4 | 1 | 99 | 1 |
| 10KR11SD | 1 | 451 | 1 | 0.52 | 1 | 0.184 | 1 | 27 | 1 | 0.81 | 0 | 0.055 | 0 | 0.34 | 0 | 31.8 | 1 | 75 | 1 |
| 10RD02SD | 1 | 2610 | 1 | 0.55 | 1 | 7.02 | 1 | 30 | 1 | 1.7 | 0 | 0.117 | 0 | 0.7 | 0 | 39.3 | 1 | 78 | 1 |
| 10RD03SD | 1 | 1310 | 1 | 0.42 | 1 | 0.218 | 1 | 38 | 1 | 1.8 | 0 | 0.12 | 0 | 0.8 | 0 | 37.9 | 1 | 91 | 1 |
| 10RD04SD | 1 | 1350 | 1 | 36 | 1 | 0.766 | 1 | 67 | 1 | 1.8 | 0 | 0.124 | 0 | 0.8 | 0 | 32.2 | 1 | 106 | 1 |
| 10RD05SD | 0 | | | 8.6 | 1 | | | 240 | 1 | 41 | 0 | 2.8 | 0 | 17.4 | 0 | 4.2 | 0 | 120 | 1 |
| 10RD06SD | 1 | 1560 | 1 | 63 | 1 | 0.993 | 1 | 61 | 1 | 1.7 | 0 | 0.117 | 0 | 0.7 | 0 | 25 | 1 | 100 | 1 |
| 10RD07SD | 1 | 1690 | 1 | 60 | 1 | 0.578 | 1 | 62 | 1 | 1.8 | 0 | 0.12 | 0 | 0.7 | 0 | 27.6 | 1 | 91 | 1 |
| 10RD08SD | | | | 79 | 1 | 1 | 1 | | | | | | | | | | | | |
| 10RD09SD | 1 | 1250 | 1 | 46 | 1 | 0.69 | 1 | 64 | 1 | 1.7 | 0 | 0.113 | 0 | 0.7 | 0 | 26.8 | 1 | 96 | 1 |
| 10RD20SD | 1 | 902 | 1 | | | 0.928 | 1 | 52 | 1 | 1.7 | 0 | 0.118 | 0 | 0.7 | 0 | 26.8 | 1 | 114 | 1 |
| 10RD21SD | | 1200 | 1 | | | 14.4 | 1 | | | | | | | | | | | | |
| 11KR05SD | 1 | 708 | 1 | 119 | 1 | 0.73 | 1 | 25.7 | 1 | 0.39 | 1 | 0.198 | 1 | 0.076 | 1 | 22.4 | 1 | 76.6 | 1 |
| 11KR06SD | 1 | 557 | 1 | 0.169 | 1 | 0.24 | 1 | 23.1 | 1 | 0.39 | 1 | 0.167 | 1 | 0.12 | 1 | 26.1 | 1 | 71.7 | 1 |
| 11KR08SD | 1 | 505 | 1 | 1.15 | 1 | 0.43 | 1 | 23.8 | 1 | 0.31 | 1 | 0.128 | 1 | 0.105 | 1 | 23.6 | 1 | 67.9 | 1 |
| 11KR09SD | 1 | 649 | 1 | 0.566 | 1 | 0.3 | 1 | 30.9 | 1 | 0.5 | 1 | 0.172 | 1 | 0.123 | 1 | 30.1 | 1 | 93.9 | 1 |
| 11KR14SD | 1 | 404 | 1 | 0.387 | 1 | 0.2 | 1 | 19.4 | 1 | 0.42 | 1 | 0.141 | 1 | 0.104 | 1 | 25.5 | 1 | 65.3 | 1 |
| 11KR15SD | 1 | 5410 | 1 | 39.2 | 1 | 2.64 | 1 | 21 | 1 | 0.55 | 1 | 0.098 | 1 | 0.09 | 1 | 16.6 | 1 | 53.8 | 1 |
| 11KR16SD | 1 | 586 | 1 | 2.36 | 1 | 1.33 | 1 | 25.3 | 1 | 0.52 | 1 | 0.229 | 1 | 0.136 | 1 | 28.6 | 1 | 80 | 1 |
| 11KR17SD | 1 | 527 | 1 | 0.442 | 1 | 0.32 | 1 | 26.1 | 1 | 0.39 | 1 | 0.15 | 1 | 0.109 | 1 | 27.7 | 1 | 82.1 | 1 |
| 11RD10SD | 1 | 1480 | 1 | 0.232 | 1 | 0.1 | 1 | 26 | 1 | 0.33 | 1 | 0.04 | 1 | 0.043 | 1 | 25.9 | 1 | 58.6 | 1 |
| 11RD11SD | 1 | 854 | 1 | 1.57 | 1 | | | 22 | 1 | 0.39 | 1 | 0.062 | 1 | 0.055 | 1 | 24.7 | 1 | 51.1 | 1 |
| 11RD12SD | 1 | 552 | 1 | 77 | 1 | 0.4 | 1 | 47.2 | 1 | 0.62 | 1 | 0.135 | 1 | 0.297 | 1 | 22.8 | 1 | 65.7 | 1 |

General UCL Statistics for Data Sets with Non-Detects

User Selected Options
 From File WorkSheet.wst
 Full Precision OFF
 Confidence Coefficient 95%
 Number of Bootstrap Operations 2000

Aluminum

General Statistics

Number of Valid Observations 25 Number of Distinct Observations 24
 Number of Missing Values 2

Raw Statistics

Minimum 910
 Maximum 17000
 Mean 9705
 Geometric Mean 8826
 Median 9750
 SD 3252
 Std. Error of Mean 650.3
 Coefficient of Variation 0.335
 Skewness -0.383

Log-transformed Statistics

Minimum of Log Data 6.813
 Maximum of Log Data 9.741
 Mean of log Data 9.086
 SD of log Data 0.55

Relevant UCL Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic 0.961
 Shapiro Wilk Critical Value 0.918
 Data appear Normal at 5% Significance Level

Lognormal Distribution Test

Shapiro Wilk Test Statistic 0.683
 Shapiro Wilk Critical Value 0.918
 Data not Lognormal at 5% Significance Level

Assuming Normal Distribution

95% Student's-t UCL 10817
 95% UCLs (Adjusted for Skewness)
 95% Adjusted-CLT UCL (Chen-1995) 10721
 95% Modified-t UCL (Johnson-1978) 10809

Assuming Lognormal Distribution

95% H-UCL 12852
 95% Chebyshev (MVUE) UCL 15322
 97.5% Chebyshev (MVUE) UCL 17540
 99% Chebyshev (MVUE) UCL 21897

Gamma Distribution Test

k star (bias corrected) 4.806
 Theta Star 2019
 MLE of Mean 9705
 MLE of Standard Deviation 4427
 nu star 240.3
 Approximate Chi Square Value (.05) 205.4
 Adjusted Level of Significance 0.0395
 Adjusted Chi Square Value 203.2

Data Distribution

Data appear Normal at 5% Significance Level
 Nonparametric Statistics
 95% CLT UCL 10774
 95% Jackknife UCL 10817
 95% Standard Bootstrap UCL 10743
 95% Bootstrap-t UCL 10761
 95% Hall's Bootstrap UCL 10780
 95% Percentile Bootstrap UCL 10714
 95% BCA Bootstrap UCL 10722
 95% Chebyshev(Mean, Sd) UCL 12539
 97.5% Chebyshev(Mean, Sd) UCL 13766
 99% Chebyshev(Mean, Sd) UCL 16175

Anderson-Darling Test Statistic

Anderson-Darling 5% Critical Value 0.747
 Kolmogorov-Smirnov Test Statistic 0.222
 Kolmogorov-Smirnov 5% Critical Value 0.175
 Data not Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution

95% Approximate Gamma UCL (Use when n >= 40) 11353
 95% Adjusted Gamma UCL (Use when n < 40) 11476

Potential UCL to Use Use 95% Student's-t UCL 10817

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Note: For highly negative-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positively skewed data sets.

Antimony

General Statistics

| | | | |
|----------------------------------|----|---------------------------|--------|
| Number of Valid Data | 25 | Number of Detected Data | 20 |
| Number of Distinct Detected Data | 20 | Number of Non-Detect Data | 5 |
| Number of Missing Values | 2 | Percent Non-Detects | 20.00% |

Raw Statistics

| | | | |
|--------------------|------|----------------------------|-------|
| | | Log-transformed Statistics | |
| Minimum Detected | 2.1 | Minimum Detected | 0.742 |
| Maximum Detected | 6360 | Maximum Detected | 8.758 |
| Mean of Detected | 1272 | Mean of Detected | 4.695 |
| SD of Detected | 1841 | SD of Detected | 2.93 |
| Minimum Non-Detect | 0.56 | Minimum Non-Detect | -0.58 |
| Maximum Non-Detect | 1.2 | Maximum Non-Detect | 0.182 |

| | | |
|--|---------------------------------|--------|
| Note: Data have multiple DLs - Use of KM Method is recommended | Number treated as Non-Detect | 5 |
| For all methods (except KM, DL/2, and ROS Methods), | Number treated as Detected | 20 |
| Observations < Largest ND are treated as NDs | Single DL Non-Detect Percentage | 20.00% |

UCL Statistics

| | | | |
|--|-------|---|-------|
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.743 | Shapiro Wilk Test Statistic | 0.852 |
| 5% Shapiro Wilk Critical Value | 0.905 | 5% Shapiro Wilk Critical Value | 0.905 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|--------------------------|------|---------------------------------|---------|
| DL/2 Substitution Method | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 1018 | Mean | 3.597 |
| SD | 1718 | SD | 3.442 |
| 95% DL/2 (t) UCL | 1606 | 95% H-Stat (DL/2) UCL | 1228483 |

Maximum Likelihood Estimate(MLE) Method

| | | | |
|--------------------|-------|------------------------------|---------|
| Mean | 752.1 | Log ROS Method | |
| SD | 1970 | Mean in Log Scale | 3.395 |
| 95% MLE (t) UCL | 1426 | SD in Log Scale | 3.737 |
| 95% MLE (Tiku) UCL | 1416 | Mean in Original Scale | 1017 |
| | | SD in Original Scale | 1718 |
| | | 95% t UCL | 1605 |
| | | 95% Percentile Bootstrap UCL | 1603 |
| | | 95% BCA Bootstrap UCL | 1783 |
| | | 95% H UCL | 6314687 |

Gamma Distribution Test with Detected Values Only

| | | | |
|-------------------------|-------|--|--|
| k star (bias corrected) | 0.274 | Data Distribution Test with Detected Values Only | |
| Theta Star | 4634 | Data do not follow a Discernable Distribution (0.05) | |
| nu star | 10.98 | | |

| | | | |
|---|----------|-----------------------------------|-------|
| A-D Test Statistic | 1.299 | Nonparametric Statistics | |
| 5% A-D Critical Value | 0.852 | Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.852 | Mean | 1018 |
| 5% K-S Critical Value | 0.211 | SD | 1683 |
| Data not Gamma Distributed at 5% Significance Level | | SE of Mean | 345.4 |
| | | 95% KM (t) UCL | 1609 |
| Assuming Gamma Distribution | | 95% KM (z) UCL | 1586 |
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (jackknife) UCL | 1605 |
| Minimum | 1.00E-06 | 95% KM (bootstrap t) UCL | 1798 |
| Maximum | 6360 | 95% KM (BCA) UCL | 1615 |
| Mean | 1017 | 95% KM (Percentile Bootstrap) UCL | 1578 |
| Median | 10 | 95% KM (Chebyshev) UCL | 2524 |
| SD | 1718 | 97.5% KM (Chebyshev) UCL | 3175 |
| k star | 0.143 | 99% KM (Chebyshev) UCL | 4455 |
| Theta star | 7126 | | |
| Nu star | 7.139 | Potential UCLs to Use | |
| AppChi2 | 2.247 | 99% KM (Chebyshev) UCL | 4455 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 3232 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 3518 | | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Arsenic

| | | | |
|--|--------|---|-------|
| General Statistics | | | |
| Number of Valid Observations | 25 | Number of Distinct Observations | 23 |
| Number of Missing Values | 2 | | |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 12.5 | Minimum of Log Data | 2.526 |
| Maximum | 130000 | Maximum of Log Data | 11.78 |
| Mean | 6004 | Mean of log Data | 5.375 |
| Geometric Mean | 215.9 | SD of log Data | 2.39 |
| Median | 62 | | |
| SD | 25859 | | |
| Std. Error of Mean | 5172 | | |
| Coefficient of Variation | 4.307 | | |
| Skewness | 4.983 | | |
| Relevant UCL Statistics | | | |
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.237 | Shapiro Wilk Test Statistic | 0.882 |
| Shapiro Wilk Critical Value | 0.918 | Shapiro Wilk Critical Value | 0.918 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 14852 | 95% H-UCL | 35772 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 9913 |
| 95% Adjusted-CLT UCL (Chen-1995) | 20018 | 97.5% Chebyshev (MVUE) UCL | 13053 |
| 95% Modified-t UCL (Johnson-1978) | 15711 | 99% Chebyshev (MVUE) UCL | 19220 |

| | | |
|---|------------------------------------|--|
| Gamma Distribution Test | Data Distribution | |
| k star (bias corrected) | 0.219 | Data do not follow a Discernable Distribution (0.05) |
| Theta Star | 27444 | |
| MLE of Mean | 6004 | |
| MLE of Standard Deviation | 12836 | |
| nu star | 10.94 | |
| Approximate Chi Square Value (.05) | 4.536 | Nonparametric Statistics |
| Adjusted Level of Significance | 0.0395 | 95% CLT UCL 14511 |
| Adjusted Chi Square Value | 4.258 | 95% Jackknife UCL 14852 |
| | | 95% Standard Bootstrap UCL 14182 |
| Anderson-Darling Test Statistic | 3.213 | 95% Bootstrap-t UCL 147023 |
| Anderson-Darling 5% Critical Value | 0.887 | 95% Hall's Bootstrap UCL 69087 |
| Kolmogorov-Smirnov Test Statistic | 0.273 | 95% Percentile Bootstrap UCL 16362 |
| Kolmogorov-Smirnov 5% Critical Value | 0.193 | 95% BCA Bootstrap UCL 26516 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL 28547 |
| | | 97.5% Chebyshev(Mean, Sd) UCL 38302 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL 57463 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 14477 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 15424 | |
| Potential UCL to Use | Use 97.5% Chebyshev (Mean, Sd) UCL | 38302 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

As(Inorg)

| | | |
|--|---------------------------------|---|
| General Statistics | | |
| Number of Valid Observations | 23 | Number of Distinct Observations 22 |
| Number of Missing Values | 1 | |
| Raw Statistics | Log-transformed Statistics | |
| Minimum | 24.7 | Minimum of Log Data 3.207 |
| Maximum | 188000 | Maximum of Log Data 12.14 |
| Mean | 9230 | Mean of log Data 5.878 |
| Geometric Mean | 356.9 | SD of log Data 2.345 |
| Median | 178 | |
| SD | 38995 | |
| Std. Error of Mean | 8131 | |
| Coefficient of Variation | 4.225 | |
| Skewness | 4.786 | |
| Relevant UCL Statistics | Lognormal Distribution Test | |
| Normal Distribution Test | | |
| Shapiro Wilk Test Statistic | 0.241 | Shapiro Wilk Test Statistic 0.865 |
| Shapiro Wilk Critical Value | 0.914 | Shapiro Wilk Critical Value 0.914 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level |
| Assuming Normal Distribution | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 23192 | 95% H-UCL 56433 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL 14664 |
| 95% Adjusted-CLT UCL (Chen-1995) | 31275 | 97.5% Chebyshev (MVUE) UCL 19309 |
| 95% Modified-t UCL (Johnson-1978) | 24545 | 99% Chebyshev (MVUE) UCL 28432 |

| | | |
|---|------------------------------------|--|
| Gamma Distribution Test | Data Distribution | |
| k star (bias corrected) | 0.222 | Data do not follow a Discernable Distribution (0.05) |
| Theta Star | 41494 | |
| MLE of Mean | 9230 | |
| MLE of Standard Deviation | 19570 | |
| nu star | 10.23 | |
| Approximate Chi Square Value (.05) | 4.088 | Nonparametric Statistics |
| Adjusted Level of Significance | 0.0389 | 95% CLT UCL 22605 |
| Adjusted Chi Square Value | 3.809 | 95% Jackknife UCL 23192 |
| | | 95% Standard Bootstrap UCL 22290 |
| Anderson-Darling Test Statistic | 3.121 | 95% Bootstrap-t UCL 287395 |
| Anderson-Darling 5% Critical Value | 0.884 | 95% Hall's Bootstrap UCL 122310 |
| Kolmogorov-Smirnov Test Statistic | 0.306 | 95% Percentile Bootstrap UCL 25304 |
| Kolmogorov-Smirnov 5% Critical Value | 0.2 | 95% BCA Bootstrap UCL 33773 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL 44673 |
| | | 97.5% Chebyshev(Mean, Sd) UCL 60008 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL 90133 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 23106 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 24794 | |
| Potential UCL to Use | Use 97.5% Chebyshev (Mean, Sd) UCL | 60008 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

| | | |
|--|---------------------------------|---|
| General Statistics | | |
| Number of Valid Observations | 25 | Number of Distinct Observations 25 |
| Number of Missing Values | 2 | |
| Raw Statistics | Log-transformed Statistics | |
| Minimum | 91.6 | Minimum of Log Data 4.517 |
| Maximum | 1990 | Maximum of Log Data 7.596 |
| Mean | 328.2 | Mean of log Data 5.409 |
| Geometric Mean | 223.3 | SD of log Data 0.791 |
| Median | 151 | |
| SD | 404.2 | |
| Std. Error of Mean | 80.84 | |
| Coefficient of Variation | 1.232 | |
| Skewness | 3.273 | |
| Relevant UCL Statistics | | |
| Normal Distribution Test | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.575 | Shapiro Wilk Test Statistic 0.843 |
| Shapiro Wilk Critical Value | 0.918 | Shapiro Wilk Critical Value 0.918 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level |
| Assuming Normal Distribution | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 466.5 | 95% H-UCL 439 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL 527.4 |
| 95% Adjusted-CLT UCL (Chen-1995) | 517.7 | 97.5% Chebyshev (MVUE) UCL 625.6 |
| 95% Modified-t UCL (Johnson-1978) | 475.3 | 99% Chebyshev (MVUE) UCL 818.3 |

| | | |
|---|----------------------------------|--|
| Gamma Distribution Test | Data Distribution | |
| k star (bias corrected) | 1.296 | Data do not follow a Discernable Distribution (0.05) |
| Theta Star | 253.2 | |
| MLE of Mean | 328.2 | |
| MLE of Standard Deviation | 288.3 | |
| nu star | 64.81 | |
| Approximate Chi Square Value (.05) | 47.28 | Nonparametric Statistics |
| Adjusted Level of Significance | 0.0395 | 95% CLT UCL |
| Adjusted Chi Square Value | 46.26 | 95% Jackknife UCL |
| | | 95% Standard Bootstrap UCL |
| Anderson-Darling Test Statistic | 2.08 | 95% Bootstrap-t UCL |
| Anderson-Darling 5% Critical Value | 0.763 | 95% Hall's Bootstrap UCL |
| Kolmogorov-Smirnov Test Statistic | 0.281 | 95% Percentile Bootstrap UCL |
| Kolmogorov-Smirnov 5% Critical Value | 0.178 | 95% BCA Bootstrap UCL |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL |
| | | 97.5% Chebyshev(Mean, Sd) UCL |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL |
| 95% Approximate Gamma UCL (Use when n >= 40) | 449.8 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 459.7 | |
| Potential UCL to Use | Use 95% Chebyshev (Mean, Sd) UCL | 680.6 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

| | | |
|--|---------------------------------|---|
| General Statistics | | |
| Number of Valid Data | 25 | Number of Detected Data |
| Number of Distinct Detected Data | 13 | Number of Non-Detect Data |
| Number of Missing Values | 2 | Percent Non-Detects |
| | | 44.00% |
| Raw Statistics | | Log-transformed Statistics |
| Minimum Detected | 0.163 | Minimum Detected |
| Maximum Detected | 0.6 | Maximum Detected |
| Mean of Detected | 0.317 | Mean of Detected |
| SD of Detected | 0.106 | SD of Detected |
| Minimum Non-Detect | 0.056 | Minimum Non-Detect |
| Maximum Non-Detect | 1.4 | Maximum Non-Detect |
| | | 0.336 |
| Note: Data have multiple DLs - Use of KM Method is recommended | Number treated as Non-Detect | 25 |
| For all methods (except KM, DL/2, and ROS Methods), | Number treated as Detected | 0 |
| Observations < Largest ND are treated as NDs | Single DL Non-Detect Percentage | 100.00% |
| UCL Statistics | | |
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only |
| Shapiro Wilk Test Statistic | 0.9 | Shapiro Wilk Test Statistic |
| 5% Shapiro Wilk Critical Value | 0.874 | 5% Shapiro Wilk Critical Value |
| Data appear Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level |
| Assuming Normal Distribution | | Assuming Lognormal Distribution |
| DL/2 Substitution Method | | DL/2 Substitution Method |
| Mean | 0.217 | Mean |
| SD | 0.19 | SD |
| 95% DL/2 (t) UCL | 0.283 | 95% H-Stat (DL/2) UCL |
| | | -2.092 |
| | | 1.225 |
| | | 0.526 |

| | | | |
|---|---|---|---|
| Maximum Likelihood Estimate(MLE) Method MLE method failed to converge properly | N/A | Log ROS Method Mean in Log Scale SD in Log Scale Mean in Original Scale SD in Original Scale 95% t UCL 95% Percentile Bootstrap UCL 95% BCA Bootstrap UCL 95% H-UCL | -1.524 0.458 0.242 0.118 0.282 0.281 0.284 0.29 |
| Gamma Distribution Test with Detected Values Only k star (bias corrected) Theta Star nu star | 8.547 0.0371 239.3 | Data Distribution Test with Detected Values Only Data appear Normal at 5% Significance Level | |
| A-D Test Statistic 5% A-D Critical Value K-S Test Statistic 5% K-S Critical Value Data appear Gamma Distributed at 5% Significance Level | 0.26 0.734 0.734 0.229 | Nonparametric Statistics Kaplan-Meier (KM) Method Mean SD SE of Mean 95% KM (t) UCL 95% KM (z) UCL 95% KM (jackknife) UCL 95% KM (bootstrap t) UCL 95% KM (BCA) UCL 95% KM (Percentile Bootstrap) UCL 95% KM (Chebyshev) UCL 97.5% KM (Chebyshev) UCL 99% KM (Chebyshev) UCL | 0.253 0.109 0.023 0.292 0.291 0.29 0.299 0.318 0.308 0.353 0.397 0.482 |
| Assuming Gamma Distribution Gamma ROS Statistics using Extrapolated Data Minimum Maximum Mean Median SD k star Theta star Nu star AppChi2 95% Gamma Approximate UCL (Use when n >= 40) 95% Adjusted Gamma UCL (Use when n < 40) | 1.00E-06 0.6 0.187 0.219 0.173 0.185 1.01 9.233 3.468 0.497 0.533 | Potential UCLs to Use 95% KM (t) UCL 95% KM (Percentile Bootstrap) UCL | 0.292 0.291 0.29 0.299 0.318 0.308 0.353 0.397 0.482 0.292 0.308 |
| Note: DL/2 is not a recommended method. | | | |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Chromium

| | | | |
|----------------------------------|-------|----------------------------|-------|
| General Statistics | | | |
| Number of Valid Data | 25 | Number of Detected Data | 24 |
| Number of Distinct Detected Data | 22 | Number of Non-Detect Data | 1 |
| Number of Missing Values | 2 | Percent Non-Detects | 4.00% |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum Detected | 11.1 | Minimum Detected | 2.407 |
| Maximum Detected | 47.4 | Maximum Detected | 3.859 |
| Mean of Detected | 23.22 | Mean of Detected | 3.086 |
| SD of Detected | 8.31 | SD of Detected | 0.349 |
| Minimum Non-Detect | 18.1 | Minimum Non-Detect | 2.896 |
| Maximum Non-Detect | 18.1 | Maximum Non-Detect | 2.896 |

| | | | |
|--|-------|---|-------|
| UCL Statistics | | | |
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.939 | Shapiro Wilk Test Statistic | 0.989 |
| 5% Shapiro Wilk Critical Value | 0.916 | 5% Shapiro Wilk Critical Value | 0.916 |
| Data appear Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 22.65 | Mean | 3.051 |
| SD | 8.615 | SD | 0.385 |
| 95% DL/2 (t) UCL | 25.6 | 95% H-Stat (DL/2) UCL | 26.37 |
| Maximum Likelihood Estimate(MLE) Method | | Log ROS Method | |
| Mean | 21.83 | Mean in Log Scale | 3.071 |
| SD | 9.582 | SD in Log Scale | 0.351 |
| 95% MLE (t) UCL | 25.11 | Mean in Original Scale | 22.88 |
| 95% MLE (Tiku) UCL | 25.34 | SD in Original Scale | 8.308 |
| | | 95% t UCL | 25.72 |
| | | 95% Percentile Bootstrap UCL | 25.53 |
| | | 95% BCA Bootstrap UCL | 25.92 |
| | | 95% H UCL | 26.17 |
| Gamma Distribution Test with Detected Values Only | | Data Distribution Test with Detected Values Only | |
| k star (bias corrected) | 7.659 | Data appear Normal at 5% Significance Level | |
| Theta Star | 3.031 | | |
| nu star | 367.6 | | |
| A-D Test Statistic | | 0.149 Nonparametric Statistics | |
| 5% A-D Critical Value | 0.745 | Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.745 | Mean | 22.89 |
| 5% K-S Critical Value | 0.178 | SD | 8.15 |
| Data appear Gamma Distributed at 5% Significance Level | | SE of Mean | 1.669 |
| | | 95% KM (t) UCL | 25.74 |
| | | 95% KM (z) UCL | 25.63 |
| | | 95% KM (jackknife) UCL | 25.74 |
| | | 95% KM (bootstrap t) UCL | 26.02 |
| | | 95% KM (BCA) UCL | 25.54 |
| | | 95% KM (Percentile Bootstrap) UCL | 25.6 |
| | | 95% KM (Chebyshev) UCL | 30.16 |
| | | 97.5% KM (Chebyshev) UCL | 33.31 |
| | | 99% KM (Chebyshev) UCL | 39.49 |
| | | 377.3 Potential UCLs to Use | |
| | | 333.3 95% KM (t) UCL | 25.74 |
| | | 25.89 95% KM (Percentile Bootstrap) UCL | 25.6 |
| | | 26.11 | |
| Note: DL/2 is not a recommended method. | | | |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Cobalt

| | | |
|--|--------|--|
| General Statistics | | |
| Number of Valid Observations | 25 | Number of Distinct Observations 25 |
| Number of Missing Values | 2 | |
| Raw Statistics | | |
| Minimum | 6.93 | Log-transformed Statistics |
| Maximum | 50 | Minimum of Log Data 1.936 |
| Mean | 14.38 | Maximum of Log Data 3.912 |
| Geometric Mean | 12.8 | Mean of log Data 2.549 |
| Median | 12.5 | SD of log Data 0.457 |
| SD | 8.751 | |
| Std. Error of Mean | 1.75 | |
| Coefficient of Variation | 0.609 | |
| Skewness | 2.979 | |
| Relevant UCL Statistics | | |
| Normal Distribution Test | | |
| Shapiro Wilk Test Statistic | 0.697 | Lognormal Distribution Test |
| Shapiro Wilk Critical Value | 0.918 | Shapiro Wilk Test Statistic 0.929 |
| Data not Normal at 5% Significance Level | | Shapiro Wilk Critical Value 0.918 |
| | | Data appear Lognormal at 5% Significance Level |
| Assuming Normal Distribution | | |
| 95% Student's-t UCL | 17.37 | Assuming Lognormal Distribution |
| 95% UCLs (Adjusted for Skewness) | | 95% H-UCL 17 |
| 95% Adjusted-CLT UCL (Chen-1995) | 18.37 | 95% Chebyshev (MVUE) UCL 19.97 |
| 95% Modified-t UCL (Johnson-1978) | 17.55 | 97.5% Chebyshev (MVUE) UCL 22.49 |
| | | 99% Chebyshev (MVUE) UCL 27.44 |
| Gamma Distribution Test | | |
| k star (bias corrected) | 3.954 | Data Distribution |
| Theta Star | 3.636 | Data appear Gamma Distributed at 5% Significance Level |
| MLE of Mean | 14.38 | |
| MLE of Standard Deviation | 7.23 | |
| nu star | 197.7 | |
| Approximate Chi Square Value (.05) | 166.2 | Nonparametric Statistics |
| Adjusted Level of Significance | 0.0395 | 95% CLT UCL 17.26 |
| Adjusted Chi Square Value | 164.2 | 95% Jackknife UCL 17.37 |
| | | 95% Standard Bootstrap UCL 17.19 |
| Anderson-Darling Test Statistic | 0.68 | 95% Bootstrap-t UCL 19.84 |
| Anderson-Darling 5% Critical Value | 0.748 | 95% Hall's Bootstrap UCL 30.2 |
| Kolmogorov-Smirnov Test Statistic | 0.113 | 95% Percentile Bootstrap UCL 17.32 |
| Kolmogorov-Smirnov 5% Critical Value | 0.175 | 95% BCA Bootstrap UCL 18.77 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL 22.01 |
| | | 97.5% Chebyshev(Mean, Sd) UCL 25.31 |
| | | 99% Chebyshev(Mean, Sd) UCL 31.79 |
| Assuming Gamma Distribution | | |
| 95% Approximate Gamma UCL (Use when n >= 40) | 17.11 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 17.31 | |
| Potential UCL to Use | | Use 95% Approximate Gamma UCL 17.11 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Copper

| | | |
|--|--------|--|
| General Statistics | | |
| Number of Valid Observations | 25 | Number of Distinct Observations 24 |
| Number of Missing Values | 2 | |
| Raw Statistics | | |
| Minimum | 13.2 | Log-transformed Statistics |
| Maximum | 58.2 | Minimum of Log Data 2.58 |
| Mean | 31.66 | Maximum of Log Data 4.064 |
| Geometric Mean | 28.68 | Mean of log Data 3.356 |
| Median | 25.1 | SD of log Data 0.454 |
| SD | 14.49 | |
| Std. Error of Mean | 2.897 | |
| Coefficient of Variation | 0.458 | |
| Skewness | 0.65 | |
| Relevant UCL Statistics | | |
| Normal Distribution Test | | |
| Shapiro Wilk Test Statistic | 0.887 | Lognormal Distribution Test Shapiro Wilk Test Statistic 0.939 |
| Shapiro Wilk Critical Value | 0.918 | Shapiro Wilk Critical Value 0.918 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level |
| Assuming Normal Distribution | | |
| 95% Student's-t UCL | 36.62 | Assuming Lognormal Distribution 95% H-UCL 37.99 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL 44.61 |
| 95% Adjusted-CLT UCL (Chen-1995) | 36.83 | 97.5% Chebyshev (MVUE) UCL 50.22 |
| 95% Modified-t UCL (Johnson-1978) | 36.68 | 99% Chebyshev (MVUE) UCL 61.24 |
| Gamma Distribution Test | | |
| k star (bias corrected) | 4.613 | Data Distribution Data appear Gamma Distributed at 5% Significance Level |
| Theta Star | 6.863 | |
| MLE of Mean | 31.66 | |
| MLE of Standard Deviation | 14.74 | |
| nu star | 230.6 | |
| Approximate Chi Square Value (.05) | 196.5 | Nonparametric Statistics |
| Adjusted Level of Significance | 0.0395 | 95% CLT UCL 36.43 |
| Adjusted Chi Square Value | 194.3 | 95% Jackknife UCL 36.62 |
| | | 95% Standard Bootstrap UCL 36.28 |
| Anderson-Darling Test Statistic | 0.678 | 95% Bootstrap-t UCL 37.27 |
| Anderson-Darling 5% Critical Value | 0.747 | 95% Hall's Bootstrap UCL 36.53 |
| Kolmogorov-Smirnov Test Statistic | 0.161 | 95% Percentile Bootstrap UCL 36.38 |
| Kolmogorov-Smirnov 5% Critical Value | 0.175 | 95% BCA Bootstrap UCL 36.65 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL 44.29 |
| | | 97.5% Chebyshev(Mean, Sd) UCL 49.75 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL 60.49 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 37.16 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 37.57 | |
| Potential UCL to Use | | Use 95% Approximate Gamma UCL 37.16 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics

| | | | |
|------------------------------|----|---------------------------------|----|
| Number of Valid Observations | 25 | Number of Distinct Observations | 25 |
| Number of Missing Values | 2 | | |

Raw Statistics

| | | | |
|--------------------------|--------|----------------------------|-------|
| Minimum | 19800 | Log-transformed Statistics | |
| Maximum | 344000 | Minimum of Log Data | 9.893 |
| Mean | 44404 | Maximum of Log Data | 12.75 |
| Geometric Mean | 34278 | Mean of log Data | 10.44 |
| Median | 32400 | SD of log Data | 0.529 |
| SD | 62847 | | |
| Std. Error of Mean | 12569 | | |
| Coefficient of Variation | 1.415 | | |
| Skewness | 4.891 | | |

Relevant UCL Statistics

| | | | |
|--|-------|---|-------|
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.301 | Shapiro Wilk Test Statistic | 0.602 |
| Shapiro Wilk Critical Value | 0.918 | Shapiro Wilk Critical Value | 0.918 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|-------|---------------------------------|-------|
| 95% Student's-t UCL | 65909 | Assuming Lognormal Distribution | |
| 95% UCLs (Adjusted for Skewness) | | 95% H-UCL | 48829 |
| 95% Adjusted-CLT UCL (Chen-1995) | 78216 | 95% Chebyshev (MVUE) UCL | 58050 |
| 95% Modified-t UCL (Johnson-1978) | 67958 | 97.5% Chebyshev (MVUE) UCL | 66219 |
| | | 99% Chebyshev (MVUE) UCL | 82263 |

Gamma Distribution Test

| | | | |
|---|--------|--|--------|
| k star (bias corrected) | 1.86 | Data Distribution | |
| Theta Star | 23875 | Data do not follow a Discernable Distribution (0.05) | |
| MLE of Mean | 44404 | | |
| MLE of Standard Deviation | 32560 | | |
| nu star | 92.99 | | |
| Approximate Chi Square Value (.05) | 71.75 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0395 | 95% CLT UCL | 65079 |
| Adjusted Chi Square Value | 70.48 | 95% Jackknife UCL | 65909 |
| | | 95% Standard Bootstrap UCL | 64145 |
| Anderson-Darling Test Statistic | 4.646 | 95% Bootstrap-t UCL | 188505 |
| Anderson-Darling 5% Critical Value | 0.756 | 95% Hall's Bootstrap UCL | 154232 |
| Kolmogorov-Smirnov Test Statistic | 0.357 | 95% Percentile Bootstrap UCL | 69136 |
| Kolmogorov-Smirnov 5% Critical Value | 0.177 | 95% BCA Bootstrap UCL | 82332 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 99192 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 122899 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 169467 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 57547 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 58586 | | |

Potential UCL to Use

| | | | |
|--|--|----------------------------------|-------|
| | | Use 95% Chebyshev (Mean, Sd) UCL | 99192 |
|--|--|----------------------------------|-------|

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Lead

General Statistics

| | | | |
|----------------------------------|----|---------------------------|-------|
| Number of Valid Data | 25 | Number of Detected Data | 24 |
| Number of Distinct Detected Data | 20 | Number of Non-Detect Data | 1 |
| Number of Missing Values | 2 | Percent Non-Detects | 4.00% |

Raw Statistics

| | | Log-transformed Statistics | |
|--------------------|-------|----------------------------|-------|
| Minimum Detected | 1.72 | Minimum Detected | 0.542 |
| Maximum Detected | 14 | Maximum Detected | 2.639 |
| Mean of Detected | 8.41 | Mean of Detected | 2.068 |
| SD of Detected | 2.608 | SD of Detected | 0.404 |
| Minimum Non-Detect | 12.5 | Minimum Non-Detect | 2.526 |
| Maximum Non-Detect | 12.5 | Maximum Non-Detect | 2.526 |

UCL Statistics

| | | Lognormal Distribution Test with Detected Values Only | |
|--|-------|---|-------|
| Normal Distribution Test with Detected Values Only | | | |
| Shapiro Wilk Test Statistic | 0.958 | Shapiro Wilk Test Statistic | 0.793 |
| 5% Shapiro Wilk Critical Value | 0.916 | 5% Shapiro Wilk Critical Value | 0.916 |
| Data appear Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | Assuming Lognormal Distribution | |
|--------------------------|-------|---------------------------------|-------|
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 8.324 | Mean | 2.058 |
| SD | 2.59 | SD | 0.398 |
| 95% DL/2 (t) UCL | 9.21 | 95% H-Stat (DL/2) UCL | 9.875 |

Maximum Likelihood Estimate(MLE) Method

| | | | |
|--|-----|------------------------------|-------|
| MLE method failed to converge properly | N/A | Log ROS Method | |
| | | Mean in Log Scale | 2.066 |
| | | SD in Log Scale | 0.395 |
| | | Mean in Original Scale | 8.377 |
| | | SD in Original Scale | 2.559 |
| | | 95% t UCL | 9.252 |
| | | 95% Percentile Bootstrap UCL | 9.172 |
| | | 95% BCA Bootstrap UCL | 9.192 |
| | | 95% H-UCL | 9.929 |

Gamma Distribution Test with Detected Values Only

| | | Data Distribution Test with Detected Values Only | |
|-------------------------|-------|--|--|
| k star (bias corrected) | 7.253 | Data appear Normal at 5% Significance Level | |
| Theta Star | 1.16 | | |
| nu star | 348.1 | | |

A-D Test Statistic

| | | | |
|--|-------|--------------------------|-------|
| 5% A-D Critical Value | 0.705 | Nonparametric Statistics | |
| K-S Test Statistic | 0.745 | Kaplan-Meier (KM) Method | |
| 5% K-S Critical Value | 0.745 | Mean | 8.392 |
| Data appear Gamma Distributed at 5% Significance Level | 0.178 | SD | 2.539 |

Assuming Gamma Distribution

| | | 95% KM (t) UCL | |
|--|-------|-----------------------------------|-------|
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (z) UCL | 9.258 |
| Minimum | 1.72 | 95% KM (jackknife) UCL | 9.293 |
| Maximum | 14 | 95% KM (bootstrap t) UCL | 9.289 |
| Mean | 8.42 | 95% KM (BCA) UCL | 9.249 |
| Median | 8 | 95% KM (Percentile Bootstrap) UCL | 9.23 |
| SD | 2.554 | 95% KM (Chebyshev) UCL | 10.69 |
| k star | 7.588 | 97.5% KM (Chebyshev) UCL | 11.68 |
| | | 99% KM (Chebyshev) UCL | 13.63 |

| | | | |
|--|-------|-----------------------------------|-------|
| Theta star | 1.11 | | |
| Nu star | 379.4 | Potential UCLs to Use | |
| AppChi2 | 335.2 | 95% KM (t) UCL | 9.292 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 9.529 | 95% KM (Percentile Bootstrap) UCL | 9.23 |
| 95% Adjusted Gamma UCL (Use when n < 40) | 9.61 | | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

| | | | |
|------------------------------|----|---------------------------------|----|
| Number of Valid Observations | 25 | Number of Distinct Observations | 25 |
| Number of Missing Values | 2 | | |

Raw Statistics

| | | | |
|--------------------------|-------|----------------------------|-------|
| | | Log-transformed Statistics | |
| Minimum | 404 | Minimum of Log Data | 6.001 |
| Maximum | 5410 | Maximum of Log Data | 8.596 |
| Mean | 1115 | Mean of log Data | 6.79 |
| Geometric Mean | 888.5 | SD of log Data | 0.616 |
| Median | 735 | | |
| SD | 1033 | | |
| Std. Error of Mean | 206.7 | | |
| Coefficient of Variation | 0.927 | | |
| Skewness | 3.308 | | |

Relevant UCL Statistics

| | | | |
|--|-------|---|-------|
| | | Lognormal Distribution Test | |
| Normal Distribution Test | | | |
| Shapiro Wilk Test Statistic | 0.614 | Shapiro Wilk Test Statistic | 0.91 |
| Shapiro Wilk Critical Value | 0.918 | Shapiro Wilk Critical Value | 0.918 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|------|---------------------------------|------|
| | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 1468 | 95% H-UCL | 1392 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 1671 |
| 95% Adjusted-CLT UCL (Chen-1995) | 1601 | 97.5% Chebyshev (MVUE) UCL | 1933 |
| 95% Modified-t UCL (Johnson-1978) | 1491 | 99% Chebyshev (MVUE) UCL | 2448 |

Gamma Distribution Test

| | | | |
|---|--------|--|------|
| | | Data Distribution | |
| k star (bias corrected) | 2.102 | Data do not follow a Discernable Distribution (0.05) | |
| Theta Star | 530.2 | | |
| MLE of Mean | 1115 | | |
| MLE of Standard Deviation | 768.7 | | |
| nu star | 105.1 | | |
| Approximate Chi Square Value (.05) | 82.45 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0395 | 95% CLT UCL | 1455 |
| Adjusted Chi Square Value | 81.09 | 95% Jackknife UCL | 1468 |
| | | 95% Standard Bootstrap UCL | 1441 |
| Anderson-Darling Test Statistic | 1.217 | 95% Bootstrap-t UCL | 1826 |
| Anderson-Darling 5% Critical Value | 0.755 | 95% Hall's Bootstrap UCL | 2963 |
| Kolmogorov-Smirnov Test Statistic | 0.195 | 95% Percentile Bootstrap UCL | 1487 |
| Kolmogorov-Smirnov 5% Critical Value | 0.176 | 95% BCA Bootstrap UCL | 1612 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 2015 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 2405 |

| | | |
|--|----------------------------------|------|
| Assuming Gamma Distribution | 99% Chebyshev(Mean, Sd) UCL | 3171 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 1421 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 1445 | |
| Potential UCL to Use | Use 95% Chebyshev (Mean, Sd) UCL | 2015 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

| | | | |
|------------------------------|----|---------------------------------|----|
| Number of Valid Observations | 25 | Number of Distinct Observations | 25 |
| Number of Missing Values | 2 | | |

Raw Statistics

| | | | |
|--------------------------|-------|----------------------------|--------|
| | | Log-transformed Statistics | |
| Minimum | 0.169 | Minimum of Log Data | -1.778 |
| Maximum | 119 | Maximum of Log Data | 4.779 |
| Mean | 24.48 | Mean of log Data | 1.486 |
| Geometric Mean | 4.419 | SD of log Data | 2.235 |
| Median | 2.36 | | |
| SD | 33.72 | | |
| Std. Error of Mean | 6.744 | | |
| Coefficient of Variation | 1.378 | | |
| Skewness | 1.316 | | |

Relevant UCL Statistics

| | | | |
|--|-------|---|-------|
| | | Lognormal Distribution Test | |
| Normal Distribution Test | | | |
| Shapiro Wilk Test Statistic | 0.751 | Shapiro Wilk Test Statistic | 0.884 |
| Shapiro Wilk Critical Value | 0.918 | Shapiro Wilk Critical Value | 0.918 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|-------|---------------------------------|-------|
| | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 36.01 | 95% H-UCL | 392.7 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 143.8 |
| 95% Adjusted-CLT UCL (Chen-1995) | 37.46 | 97.5% Chebyshev (MVUE) UCL | 188.5 |
| 95% Modified-t UCL (Johnson-1978) | 36.31 | 99% Chebyshev (MVUE) UCL | 276.3 |

Gamma Distribution Test

| | | | |
|---|--------|--|-------|
| | | Data Distribution | |
| k star (bias corrected) | 0.367 | Data do not follow a Discernable Distribution (0.05) | |
| Theta Star | 66.72 | | |
| MLE of Mean | 24.48 | | |
| MLE of Standard Deviation | 40.41 | | |
| nu star | 18.34 | | |
| Approximate Chi Square Value (.05) | 9.638 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0395 | 95% CLT UCL | 35.57 |
| Adjusted Chi Square Value | 9.209 | 95% Jackknife UCL | 36.01 |
| | | 95% Standard Bootstrap UCL | 35.67 |
| Anderson-Darling Test Statistic | 1.395 | 95% Bootstrap-t UCL | 38.45 |
| Anderson-Darling 5% Critical Value | 0.832 | 95% Hall's Bootstrap UCL | 37 |
| Kolmogorov-Smirnov Test Statistic | 0.208 | 95% Percentile Bootstrap UCL | 35.62 |
| Kolmogorov-Smirnov 5% Critical Value | 0.187 | 95% BCA Bootstrap UCL | 36.56 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 53.87 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 66.59 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 91.57 |

| | | |
|--|------------------------------------|-------|
| 95% Approximate Gamma UCL (Use when n >= 40) | 46.58 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 48.75 | |
| Potential UCL to Use | Use 97.5% Chebyshev (Mean, Sd) UCL | 66.59 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Methyl Mercury

General Statistics

| | | | |
|----------------------------------|----|---------------------------|-------|
| Number of Valid Data | 25 | Number of Detected Data | 24 |
| Number of Distinct Detected Data | 24 | Number of Non-Detect Data | 1 |
| Number of Missing Values | 2 | Percent Non-Detects | 4.00% |

Raw Statistics

| | | | |
|--------------------|-------|--------------------|--------|
| Minimum Detected | 0.1 | Minimum Detected | -2.303 |
| Maximum Detected | 14.4 | Maximum Detected | 2.667 |
| Mean of Detected | 1.492 | Mean of Detected | -0.449 |
| SD of Detected | 3.086 | SD of Detected | 1.127 |
| Minimum Non-Detect | 0.009 | Minimum Non-Detect | -4.711 |
| Maximum Non-Detect | 0.009 | Maximum Non-Detect | -4.711 |

Log-transformed Statistics

UCL Statistics

| | | | |
|--|-------|---|-------|
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.441 | Shapiro Wilk Test Statistic | 0.917 |
| 5% Shapiro Wilk Critical Value | 0.916 | 5% Shapiro Wilk Critical Value | 0.916 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|--------------------------|-------|---------------------------------|--------|
| DL/2 Substitution Method | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 1.433 | Mean | -0.647 |
| SD | 3.035 | SD | 1.483 |
| 95% DL/2 (t) UCL | 2.471 | 95% H-Stat (DL/2) UCL | 4.099 |

Maximum Likelihood Estimate(MLE) Method

| | | | |
|--------------------|-------|------------------------------|--------|
| Mean | 1.352 | Log ROS Method | |
| SD | 3.055 | Mean in Log Scale | -0.558 |
| 95% MLE (t) UCL | 2.398 | SD in Log Scale | 1.229 |
| 95% MLE (Tiku) UCL | 2.297 | Mean in Original Scale | 1.434 |
| | | SD in Original Scale | 3.034 |
| | | 95% t UCL | 2.472 |
| | | 95% Percentile Bootstrap UCL | 2.483 |
| | | 95% BCA Bootstrap UCL | 3.174 |
| | | 95% H UCL | 2.461 |

Gamma Distribution Test with Detected Values Only

| | | | |
|-------------------------|-------|--|--|
| k star (bias corrected) | 0.649 | Data Distribution Test with Detected Values Only | |
| Theta Star | 2.299 | Data appear Lognormal at 5% Significance Level | |
| nu star | 31.16 | | |

A-D Test Statistic

| | | | |
|-----------------------|-------|--------------------------|-------|
| 5% A-D Critical Value | 2.255 | Nonparametric Statistics | |
| K-S Test Statistic | 0.786 | Kaplan-Meier (KM) Method | |
| 5% K-S Critical Value | 0.786 | Mean | 1.436 |
| | 0.185 | SD | 2.972 |

| | | |
|---|---|-------|
| Data not Gamma Distributed at 5% Significance Level | SE of Mean | 0.607 |
| | 95% KM (t) UCL | 2.475 |
| Assuming Gamma Distribution | 95% KM (z) UCL | 2.435 |
| Gamma ROS Statistics using Extrapolated Data | 95% KM (jackknife) UCL | 2.472 |
| Minimum | 1.00E-06 95% KM (bootstrap t) UCL | 6.604 |
| Maximum | 14.4 95% KM (BCA) UCL | 2.599 |
| Mean | 1.432 95% KM (Percentile Bootstrap) UCL | 2.537 |
| Median | 0.592 95% KM (Chebyshev) UCL | 4.083 |
| SD | 3.035 97.5% KM (Chebyshev) UCL | 5.228 |
| k star | 0.446 99% KM (Chebyshev) UCL | 7.478 |
| Theta star | 3.212 | |
| Nu star | 22.3 Potential UCLs to Use | |
| AppChi2 | 12.56 97.5% KM (Chebyshev) UCL | 5.228 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 2.543 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 2.648 | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

| | | | |
|------------------------------|----|---------------------------------|----|
| Number of Valid Observations | 25 | Number of Distinct Observations | 24 |
| Number of Missing Values | 2 | | |

Raw Statistics

| | | | |
|--------------------------|-------|----------------------------|-------|
| | | Log-transformed Statistics | |
| Minimum | 19.4 | Minimum of Log Data | 2.965 |
| Maximum | 240 | Maximum of Log Data | 5.481 |
| Mean | 45.42 | Mean of log Data | 3.619 |
| Geometric Mean | 37.28 | SD of log Data | 0.55 |
| Median | 30.9 | | |
| SD | 43.29 | | |
| Std. Error of Mean | 8.658 | | |
| Coefficient of Variation | 0.953 | | |
| Skewness | 4.062 | | |

Relevant UCL Statistics

| | | | |
|--|-------|---|-------|
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.509 | Shapiro Wilk Test Statistic | 0.853 |
| Shapiro Wilk Critical Value | 0.918 | Shapiro Wilk Critical Value | 0.918 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|-------|---------------------------------|-------|
| 95% Student's-t UCL | 60.23 | Assuming Lognormal Distribution | |
| 95% UCLs (Adjusted for Skewness) | | 95% H-UCL | 54.33 |
| 95% Adjusted-CLT UCL (Chen-1995) | 67.18 | 95% Chebyshev (MVUE) UCL | 64.77 |
| 95% Modified-t UCL (Johnson-1978) | 61.41 | 97.5% Chebyshev (MVUE) UCL | 74.15 |
| | | 99% Chebyshev (MVUE) UCL | 92.58 |

Gamma Distribution Test

| | | | |
|---------------------------|-------|---|--|
| k star (bias corrected) | 2.392 | Data Distribution | |
| Theta Star | 18.99 | Data Follow Appr. Gamma Distribution at 5% Significance Level | |
| MLE of Mean | 45.42 | | |
| MLE of Standard Deviation | 29.36 | | |
| nu star | 119.6 | | |

| | | | |
|---|--------|-------------------------------|-------|
| Approximate Chi Square Value (.05) | 95.37 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0395 | 95% CLT UCL | 59.66 |
| Adjusted Chi Square Value | 93.89 | 95% Jackknife UCL | 60.23 |
| | | 95% Standard Bootstrap UCL | 59.34 |
| Anderson-Darling Test Statistic | 1.615 | 95% Bootstrap-t UCL | 80.52 |
| Anderson-Darling 5% Critical Value | 0.753 | 95% Hall's Bootstrap UCL | 113.7 |
| Kolmogorov-Smirnov Test Statistic | 0.17 | 95% Percentile Bootstrap UCL | 62.22 |
| Kolmogorov-Smirnov 5% Critical Value | 0.176 | 95% BCA Bootstrap UCL | 69.16 |
| Data follow Appr. Gamma Distribution at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 83.16 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 99.49 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 131.6 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 56.97 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 57.87 | | |
| Potential UCL to Use | | Use 95% Approximate Gamma UCL | 56.97 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Selenium

General Statistics

| | | | |
|----------------------------------|----|---------------------------|--------|
| Number of Valid Data | 25 | Number of Detected Data | 11 |
| Number of Distinct Detected Data | 8 | Number of Non-Detect Data | 14 |
| Number of Missing Values | 2 | Percent Non-Detects | 56.00% |

Raw Statistics

| | | | |
|--------------------|--------|----------------------------|--------|
| | | Log-transformed Statistics | |
| Minimum Detected | 0.31 | Minimum Detected | -1.171 |
| Maximum Detected | 0.62 | Maximum Detected | -0.478 |
| Mean of Detected | 0.437 | Mean of Detected | -0.849 |
| SD of Detected | 0.0969 | SD of Detected | 0.217 |
| Minimum Non-Detect | 0.81 | Minimum Non-Detect | -0.211 |
| Maximum Non-Detect | 41 | Maximum Non-Detect | 3.714 |

| | | |
|--|---------------------------------|---------|
| Note: Data have multiple DLs - Use of KM Method is recommended | Number treated as Non-Detect | 25 |
| For all methods (except KM, DL/2, and ROS Methods), | Number treated as Detected | 0 |
| Observations < Largest ND are treated as NDs | Single DL Non-Detect Percentage | 100.00% |

UCL Statistics

| | | | |
|--|------|---|-------|
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.92 | Shapiro Wilk Test Statistic | 0.938 |
| 5% Shapiro Wilk Critical Value | 0.85 | 5% Shapiro Wilk Critical Value | 0.85 |
| Data appear Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|--------------------------|-------|---------------------------------|--------|
| DL/2 Substitution Method | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 1.419 | Mean | -0.397 |
| SD | 3.981 | SD | 0.803 |
| 95% DL/2 (t) UCL | 2.781 | 95% H-Stat (DL/2) UCL | 1.345 |

| | | | |
|---|-----|------------------------|--------|
| Maximum Likelihood Estimate(MLE) Method | N/A | Log ROS Method | |
| MLE method failed to converge properly | | Mean in Log Scale | -0.849 |
| | | SD in Log Scale | 0.177 |
| | | Mean in Original Scale | 0.434 |
| | | SD in Original Scale | 0.0784 |

| | | |
|--|---|--------|
| | 95% t UCL | 0.461 |
| | 95% Percentile Bootstrap UCL | 0.459 |
| | 95% BCA Bootstrap UCL | 0.46 |
| | 95% H-UCL | 0.463 |
| Gamma Distribution Test with Detected Values Only | Data Distribution Test with Detected Values Only | |
| k star (bias corrected) | 17.02 Data appear Normal at 5% Significance Level | |
| Theta Star | 0.0257 | |
| nu star | 374.4 | |
| A-D Test Statistic | 0.45 Nonparametric Statistics | |
| 5% A-D Critical Value | 0.729 Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.729 Mean | 0.437 |
| 5% K-S Critical Value | 0.255 SD | 0.0924 |
| Data appear Gamma Distributed at 5% Significance Level | SE of Mean | 0.0292 |
| | 95% KM (t) UCL | 0.487 |
| Assuming Gamma Distribution | 95% KM (z) UCL | 0.485 |
| Gamma ROS Statistics using Extrapolated Data | 95% KM (jackknife) UCL | 0.489 |
| Minimum | 0.31 95% KM (bootstrap t) UCL | 0.503 |
| Maximum | 0.62 95% KM (BCA) UCL | 0.485 |
| Mean | 0.442 95% KM (Percentile Bootstrap) UCL | 0.485 |
| Median | 0.456 95% KM (Chebyshev) UCL | 0.565 |
| SD | 0.077 97.5% KM (Chebyshev) UCL | 0.62 |
| k star | 29.82 99% KM (Chebyshev) UCL | 0.728 |
| Theta star | 0.0148 | |
| Nu star | 1491 Potential UCLs to Use | |
| AppChi2 | 1402 95% KM (t) UCL | 0.487 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 0.47 95% KM (Percentile Bootstrap) UCL | 0.485 |
| 95% Adjusted Gamma UCL (Use when n < 40) | 0.472 | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Silver

| | | |
|--|---------------------------------|---------|
| General Statistics | | |
| Number of Valid Data | 25 Number of Detected Data | 11 |
| Number of Distinct Detected Data | 11 Number of Non-Detect Data | 14 |
| Number of Missing Values | 2 Percent Non-Detects | 56.00% |
| Raw Statistics | Log-transformed Statistics | |
| Minimum Detected | 0.04 Minimum Detected | -3.219 |
| Maximum Detected | 0.229 Maximum Detected | -1.474 |
| Mean of Detected | 0.138 Mean of Detected | -2.08 |
| SD of Detected | 0.0558 SD of Detected | 0.516 |
| Minimum Non-Detect | 0.055 Minimum Non-Detect | -2.9 |
| Maximum Non-Detect | 2.8 Maximum Non-Detect | 1.03 |
| Note: Data have multiple DLs - Use of KM Method is recommended | Number treated as Non-Detect | 25 |
| For all methods (except KM, DL/2, and ROS Methods), | Number treated as Detected | 0 |
| Observations < Largest ND are treated as NDs | Single DL Non-Detect Percentage | 100.00% |

| | | | |
|--|---------|---|--------|
| UCL Statistics | | | |
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.976 | Shapiro Wilk Test Statistic | 0.883 |
| 5% Shapiro Wilk Critical Value | 0.85 | 5% Shapiro Wilk Critical Value | 0.85 |
| Data appear Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 0.144 | Mean | -2.446 |
| SD | 0.268 | SD | 0.826 |
| 95% DL/2 (t) UCL | 0.236 | 95% H-Stat (DL/2) UCL | 0.179 |
| Maximum Likelihood Estimate(MLE) Method | N/A | Log ROS Method | |
| MLE method failed to converge properly | | Mean in Log Scale | -2.544 |
| | | SD in Log Scale | 0.556 |
| | | Mean in Original Scale | 0.092 |
| | | SD in Original Scale | 0.0558 |
| | | 95% t UCL | 0.111 |
| | | 95% Percentile Bootstrap UCL | 0.111 |
| | | 95% BCA Bootstrap UCL | 0.112 |
| | | 95% H-UCL | 0.115 |
| Gamma Distribution Test with Detected Values Only | | Data Distribution Test with Detected Values Only | |
| k star (bias corrected) | 3.784 | Data appear Normal at 5% Significance Level | |
| Theta Star | 0.0365 | | |
| nu star | 83.25 | | |
| A-D Test Statistic | 0.428 | Nonparametric Statistics | |
| 5% A-D Critical Value | 0.731 | Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.731 | Mean | 0.0912 |
| 5% K-S Critical Value | 0.256 | SD | 0.0581 |
| Data appear Gamma Distributed at 5% Significance Level | | SE of Mean | 0.0134 |
| Assuming Gamma Distribution | | 95% KM (t) UCL | 0.114 |
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (z) UCL | 0.113 |
| Minimum | 0.00793 | 95% KM (jackknife) UCL | 0.113 |
| Maximum | 0.229 | 95% KM (bootstrap t) UCL | 0.115 |
| Mean | 0.0864 | 95% KM (BCA) UCL | 0.143 |
| Median | 0.0822 | 95% KM (Percentile Bootstrap) UCL | 0.133 |
| SD | 0.0635 | 95% KM (Chebyshev) UCL | 0.15 |
| k star | 1.333 | 97.5% KM (Chebyshev) UCL | 0.175 |
| Theta star | 0.0648 | 99% KM (Chebyshev) UCL | 0.225 |
| Nu star | 66.66 | Potential UCLs to Use | |
| AppChi2 | 48.87 | 95% KM (t) UCL | 0.114 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 0.118 | 95% KM (Percentile Bootstrap) UCL | 0.133 |
| 95% Adjusted Gamma UCL (Use when n < 40) | 0.12 | | |
| Note: DL/2 is not a recommended method. | | | |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

| | | | |
|----------------------------------|----|---------------------------|--------|
| Number of Valid Data | 25 | Number of Detected Data | 11 |
| Number of Distinct Detected Data | 11 | Number of Non-Detect Data | 14 |
| Number of Missing Values | 2 | Percent Non-Detects | 56.00% |

Raw Statistics

| | | | |
|--------------------|-------|----------------------------|--------|
| Minimum Detected | 0.043 | Log-transformed Statistics | |
| Maximum Detected | 0.297 | Minimum Detected | -3.147 |
| Mean of Detected | 0.114 | Maximum Detected | -1.214 |
| SD of Detected | 0.067 | Mean of Detected | -2.29 |
| Minimum Non-Detect | 0.34 | SD of Detected | 0.502 |
| Maximum Non-Detect | 17.4 | Minimum Non-Detect | -1.079 |
| | | Maximum Non-Detect | 2.856 |

| | | |
|--|---------------------------------|---------|
| Note: Data have multiple DLs - Use of KM Method is recommended | Number treated as Non-Detect | 25 |
| For all methods (except KM, DL/2, and ROS Methods), | Number treated as Detected | 0 |
| Observations < Largest ND are treated as NDs | Single DL Non-Detect Percentage | 100.00% |

UCL Statistics

| | | | |
|--|-------|---|-------|
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.758 | Shapiro Wilk Test Statistic | 0.935 |
| 5% Shapiro Wilk Critical Value | 0.85 | 5% Shapiro Wilk Critical Value | 0.85 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|--------------------------|-------|---------------------------------|--------|
| DL/2 Substitution Method | | Assuming Lognormal Distribution | |
| Mean | 0.569 | DL/2 Substitution Method | |
| SD | 1.699 | Mean | -1.518 |
| 95% DL/2 (t) UCL | 1.15 | SD | 1.028 |
| | | 95% H-Stat (DL/2) UCL | 0.632 |

Maximum Likelihood Estimate(MLE) Method MLE method failed to converge properly

| | | |
|-----|------------------------------|--------|
| N/A | Log ROS Method | |
| | Mean in Log Scale | -2.29 |
| | SD in Log Scale | 0.409 |
| | Mean in Original Scale | 0.11 |
| | SD in Original Scale | 0.0512 |
| | 95% t UCL | 0.128 |
| | 95% Percentile Bootstrap UCL | 0.128 |
| | 95% BCA Bootstrap UCL | 0.134 |
| | 95% H-UCL | 0.129 |

Gamma Distribution Test with Detected Values Only k star (bias corrected)

| | | | |
|------------|--------|--|--|
| Theta Star | 3.165 | Data Distribution Test with Detected Values Only | |
| nu star | 0.0361 | Data appear Gamma Distributed at 5% Significance Level | |
| | 69.64 | | |

A-D Test Statistic

| | | | |
|--|-------|--------------------------|--------|
| 5% A-D Critical Value | 0.52 | Nonparametric Statistics | |
| K-S Test Statistic | 0.732 | Kaplan-Meier (KM) Method | |
| 5% K-S Critical Value | 0.732 | Mean | 0.114 |
| Data appear Gamma Distributed at 5% Significance Level | 0.256 | SD | 0.0638 |
| | | SE of Mean | 0.0202 |

Assuming Gamma Distribution

| | | | |
|--|--------|-----------------------------------|-------|
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (t) UCL | 0.149 |
| Minimum | 0.0366 | 95% KM (z) UCL | 0.148 |
| Maximum | 0.297 | 95% KM (jackknife) UCL | 0.15 |
| Mean | 0.117 | 95% KM (bootstrap t) UCL | 0.177 |
| | | 95% KM (BCA) UCL | 0.158 |
| | | 95% KM (Percentile Bootstrap) UCL | 0.15 |

| | | | |
|--|--------|--------------------------|-------|
| Median | 0.123 | 95% KM (Chebyshev) UCL | 0.202 |
| SD | 0.0512 | 97.5% KM (Chebyshev) UCL | 0.24 |
| k star | 5.092 | 99% KM (Chebyshev) UCL | 0.315 |
| Theta star | 0.0229 | | |
| Nu star | 254.6 | Potential UCLs to Use | |
| AppChi2 | 218.7 | 95% KM (t) UCL | 0.149 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 0.136 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 0.137 | | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

| | | | |
|----------------------------------|----|---------------------------|-------|
| Number of Valid Data | 25 | Number of Detected Data | 24 |
| Number of Distinct Detected Data | 23 | Number of Non-Detect Data | 1 |
| Number of Missing Values | 2 | Percent Non-Detects | 4.00% |

Raw Statistics

| | | | |
|--------------------|-------|----------------------------|-------|
| | | Log-transformed Statistics | |
| Minimum Detected | 16.6 | Minimum Detected | 2.809 |
| Maximum Detected | 48.5 | Maximum Detected | 3.882 |
| Mean of Detected | 29.08 | Mean of Detected | 3.347 |
| SD of Detected | 6.63 | SD of Detected | 0.219 |
| Minimum Non-Detect | 4.2 | Minimum Non-Detect | 1.435 |
| Maximum Non-Detect | 4.2 | Maximum Non-Detect | 1.435 |

UCL Statistics

| | | | |
|--|-------|---|-------|
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.923 | Shapiro Wilk Test Statistic | 0.964 |
| 5% Shapiro Wilk Critical Value | 0.916 | 5% Shapiro Wilk Critical Value | 0.916 |
| Data appear Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|--------------------------|-------|---------------------------------|-------|
| DL/2 Substitution Method | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 28 | Mean | 3.243 |
| SD | 8.441 | SD | 0.563 |
| 95% DL/2 (t) UCL | 30.89 | 95% H-Stat (DL/2) UCL | 37.82 |

Maximum Likelihood Estimate(MLE) Method

| | | | |
|--------------------|-------|------------------------------|-------|
| | | Log ROS Method | |
| Mean | 27.99 | Mean in Log Scale | 3.325 |
| SD | 8.327 | SD in Log Scale | 0.24 |
| 95% MLE (t) UCL | 30.84 | Mean in Original Scale | 28.59 |
| 95% MLE (Tiku) UCL | 30.9 | SD in Original Scale | 6.951 |
| | | 95% t UCL | 30.96 |
| | | 95% Percentile Bootstrap UCL | 30.87 |
| | | 95% BCA Bootstrap UCL | 30.96 |
| | | 95% H UCL | 31.22 |

Gamma Distribution Test with Detected Values Only

| | | | |
|-------------------------|-------|--|--|
| k star (bias corrected) | 18.9 | Data Distribution Test with Detected Values Only | |
| Theta Star | 1.539 | Data appear Normal at 5% Significance Level | |
| nu star | 907.2 | | |

| | | | |
|--|-------|-----------------------------------|-------|
| A-D Test Statistic | 0.485 | Nonparametric Statistics | |
| 5% A-D Critical Value | 0.742 | Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.742 | Mean | 28.58 |
| 5% K-S Critical Value | 0.178 | SD | 6.814 |
| Data appear Gamma Distributed at 5% Significance Level | | SE of Mean | 1.392 |
| | | 95% KM (t) UCL | 30.97 |
| Assuming Gamma Distribution | | 95% KM (z) UCL | 30.87 |
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (jackknife) UCL | 30.9 |
| Minimum | 8.432 | 95% KM (bootstrap t) UCL | 31.17 |
| Maximum | 48.5 | 95% KM (BCA) UCL | 31.16 |
| Mean | 28.26 | 95% KM (Percentile Bootstrap) UCL | 31.05 |
| Median | 27.3 | 95% KM (Chebyshev) UCL | 34.65 |
| SD | 7.693 | 97.5% KM (Chebyshev) UCL | 37.28 |
| k star | 10.37 | 99% KM (Chebyshev) UCL | 42.44 |
| Theta star | 2.725 | | |
| Nu star | 518.6 | Potential UCLs to Use | |
| AppChi2 | 466.8 | 95% KM (t) UCL | 30.97 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 31.39 | 95% KM (Percentile Bootstrap) UCL | 31.05 |
| 95% Adjusted Gamma UCL (Use when n < 40) | 31.62 | | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Zinc

| | | | |
|---|-------|--|-------|
| General Statistics | | | |
| Number of Valid Observations | 25 | Number of Distinct Observations | 23 |
| Number of Missing Values | 2 | | |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 51.1 | Minimum of Log Data | 3.934 |
| Maximum | 120 | Maximum of Log Data | 4.787 |
| Mean | 84.95 | Mean of log Data | 4.416 |
| Geometric Mean | 82.75 | SD of log Data | 0.236 |
| Median | 82.1 | | |
| SD | 19.46 | | |
| Std. Error of Mean | 3.892 | | |
| Coefficient of Variation | 0.229 | | |
| Skewness | 0.133 | | |
| Relevant UCL Statistics | | | |
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.973 | Shapiro Wilk Test Statistic | 0.97 |
| Shapiro Wilk Critical Value | 0.918 | Shapiro Wilk Critical Value | 0.918 |
| Data appear Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 91.61 | 95% H-UCL | 92.72 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 102.7 |
| 95% Adjusted-CLT UCL (Chen-1995) | 91.46 | 97.5% Chebyshev (MVUE) UCL | 110.4 |
| 95% Modified-t UCL (Johnson-1978) | 91.62 | 99% Chebyshev (MVUE) UCL | 125.4 |

| | | | |
|--|--------|---|-------|
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 16.99 | Data appear Normal at 5% Significance Level | |
| Theta Star | 5.001 | | |
| MLE of Mean | 84.95 | | |
| MLE of Standard Deviation | 20.61 | | |
| nu star | 849.4 | | |
| Approximate Chi Square Value (.05) | 782.8 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0395 | 95% CLT UCL | 91.35 |
| Adjusted Chi Square Value | 778.4 | 95% Jackknife UCL | 91.61 |
| | | 95% Standard Bootstrap UCL | 91.34 |
| Anderson-Darling Test Statistic | 0.172 | 95% Bootstrap-t UCL | 91.63 |
| Anderson-Darling 5% Critical Value | 0.743 | 95% Hall's Bootstrap UCL | 91.58 |
| Kolmogorov-Smirnov Test Statistic | 0.0885 | 95% Percentile Bootstrap UCL | 91.47 |
| Kolmogorov-Smirnov 5% Critical Value | 0.174 | 95% BCA Bootstrap UCL | 91.26 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 101.9 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 109.3 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 123.7 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 92.18 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 92.7 | | |
| Potential UCL to Use | | Use 95% Student's-t UCL | 91.61 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Surface Soil (mg/kg) - SMA

| | Aluminum | D_Aluminum | Antimony | D_Antimony | Arsenic | D_Arsenic | Barium | D_Barium | Chromium | D_Chromium | Cobalt | D_Cobalt | Iron | D_Iron | Lead | D_Lead | Manganese | D_Manganese | Mercury | D_Mercury | Thallium | D_Thallium | Vanadium | D_Vanadium |
|------------|----------|------------|----------|------------|---------|-----------|--------|----------|----------|------------|--------|----------|-------|--------|------|--------|-----------|-------------|---------|-----------|----------|------------|----------|------------|
| 10DS01SS | 4770 | 1 | 40 | 1 | 1010 | 1 | 171 | 1 | 20 | 1 | 17 | 1 | 46400 | 1 | 12 | 1 | 759 | 1 | 71 | 1 | 0.7 | 0 | 33.2 | 1 |
| 10DS02SS | 7770 | 1 | 40 | 1 | 550 | 1 | 174 | 1 | 21 | 1 | 12.6 | 1 | 32100 | 1 | 9 | 1 | 598 | 1 | 22 | 1 | 0.7 | 0 | 31 | 1 |
| 10DS03SS | 8200 | 1 | 21 | 1 | 355 | 1 | 166 | 1 | 18.9 | 1 | 17.5 | 1 | 28800 | 1 | 10 | 1 | 833 | 1 | 16 | 1 | 0.3 | 0 | 32.2 | 1 |
| 10RS01SS | 14600 | 1 | 34 | 1 | 29 | 1 | 202 | 1 | 30.5 | 1 | 11 | 1 | 29900 | 1 | 9 | 1 | 655 | 1 | 1.25 | 1 | 0.37 | 0 | 40.3 | 1 |
| 10RS02SS | 14000 | 1 | 9 | 1 | 30 | 1 | 188 | 1 | 29.4 | 1 | 10.9 | 1 | 29300 | 1 | 8 | 1 | 609 | 1 | 1.15 | 1 | 0.33 | 0 | 39.6 | 1 |
| 10RS03SS | 10600 | 1 | 0.53 | 0 | 110 | 1 | 154 | 1 | 20.6 | 1 | 13.4 | 1 | 24800 | 1 | 8 | 1 | 719 | 1 | 3.57 | 1 | 0.32 | 0 | 33.6 | 1 |
| 10SM01SS | 4340 | 1 | 40 | 1 | 1710 | 1 | 173 | 1 | 16 | 1 | 31.8 | 1 | 42700 | 1 | 18 | 1 | 844 | 1 | 29 | 1 | 0.7 | 0 | 23.4 | 1 |
| 10SM02SS | 5300 | 1 | 80 | 1 | 3620 | 1 | 212 | 1 | 17 | 1 | 26 | 1 | 48900 | 1 | 13 | 1 | 854 | 1 | 44 | 1 | 0.7 | 0 | 29.4 | 1 |
| 10SM03SS | 5950 | 1 | 90 | 1 | 2290 | 1 | 193 | 1 | 32 | 1 | 19 | 1 | | | 14 | 1 | | | | | | | 32.1 | 1 |
| 10SM04SS | 7530 | 1 | 20 | 1 | 1470 | 1 | 339 | 1 | 23 | 1 | 24.3 | 1 | 41300 | 1 | 16 | 1 | 1130 | 1 | 31 | 1 | 0.7 | 0 | 36 | 1 |
| 10SM05SS | 4720 | 1 | 140 | 1 | 5120 | 1 | 306 | 1 | 19 | 1 | 38.8 | 1 | 59100 | 1 | 16 | 1 | 4230 | 1 | 102 | 1 | 0.7 | 0 | 32.3 | 1 |
| 10SM06SS | 5440 | 1 | 30 | 1 | 890 | 1 | 317 | 1 | 11 | 1 | 35.3 | 1 | 55800 | 1 | 32 | 1 | 1430 | 1 | 25 | 1 | 0.7 | 0 | 25.3 | 1 |
| 10SM07SS | 6040 | 1 | 2.3 | 0 | 8510 | 1 | 332 | 1 | 21 | 1 | 11 | 1 | 37900 | 1 | 10 | 1 | 362 | 1 | 174 | 1 | 1.4 | 0 | 25 | 1 |
| 10SM08SS | 5330 | 1 | 10 | 1 | 230 | 1 | 241 | 1 | 15 | 1 | 22 | 1 | 58100 | 1 | 22 | 1 | 780 | 1 | 8 | 1 | 0.7 | 0 | 33 | 1 |
| 10SM09SS | 4130 | 1 | 1.1 | 0 | 190 | 1 | 287 | 1 | 14 | 1 | 26.9 | 1 | 40300 | 1 | 17 | 1 | 1040 | 1 | 9 | 1 | 0.7 | 0 | 28.6 | 1 |
| 10SM10SS | 15300 | 1 | 0.45 | 0 | 12 | 1 | 174 | 1 | 25.6 | 1 | 9.4 | 1 | 22400 | 1 | 6 | 1 | 340 | 1 | 0.15 | 1 | 0.27 | 0 | 42 | 1 |
| 10SM11SS | 19500 | 1 | 0.49 | 0 | 11 | 1 | 97 | 1 | 26.9 | 1 | 10.8 | 1 | 25100 | 1 | 8 | 1 | 323 | 1 | 0.17 | 1 | 0.3 | 0 | 44.3 | 1 |
| 10SM12SS | 12600 | 1 | 1.2 | 0 | 90 | 1 | 176 | 1 | 27 | 1 | 13.4 | 1 | 27500 | 1 | 10 | 1 | 529 | 1 | 5.4 | 1 | 0.7 | 0 | 43.6 | 1 |
| 10SM13SS | 9170 | 1 | 40 | 1 | 670 | 1 | 215 | 1 | 21 | 1 | 34.8 | 1 | 38400 | 1 | 14 | 1 | 1150 | 1 | 23 | 1 | 0.7 | 0 | 36.4 | 1 |
| 10SM14SS | 16300 | 1 | 0.48 | 0 | 10 | 1 | 165 | 1 | 26.1 | 1 | 9.5 | 1 | 22300 | 1 | 7 | 1 | 307 | 1 | 0.14 | 1 | 0.29 | 0 | 42.4 | 1 |
| 10SM15SS | 14800 | 1 | 0.48 | 0 | 21 | 1 | 165 | 1 | 24.6 | 1 | 15.7 | 1 | 23500 | 1 | 8 | 1 | 479 | 1 | 0.62 | 1 | 0.29 | 0 | 41.4 | 1 |
| 10SM16SS | 11000 | 1 | 1.2 | 0 | 350 | 1 | 248 | 1 | 21 | 1 | 18.6 | 1 | 37300 | 1 | 12 | 1 | 1050 | 1 | 8.8 | 1 | 0.7 | 0 | 39.5 | 1 |
| 10SM17SS | 12800 | 1 | 20 | 1 | 361 | 1 | 177 | 1 | 23.8 | 1 | 14 | 1 | 26400 | 1 | 9 | 1 | 526 | 1 | 12 | 1 | 0.28 | 0 | 37.9 | 1 |
| 10SM18SS | 5660 | 1 | 1.2 | 0 | 230 | 1 | 253 | 1 | 12 | 1 | 19.2 | 1 | 35200 | 1 | 16 | 1 | 1250 | 1 | 11 | 1 | 0.7 | 0 | 23 | 1 |
| 10SM19SS | 6670 | 1 | 20 | 1 | 670 | 1 | 148 | 1 | 17 | 1 | 18.6 | 1 | 34300 | 1 | 12 | 1 | 776 | 1 | 14 | 1 | 0.7 | 0 | 30.6 | 1 |
| 10SM20SS | 13900 | 1 | 0.48 | 0 | 9 | 1 | 121 | 1 | 21 | 1 | 5.9 | 1 | 17900 | 1 | 6 | 1 | 153 | 1 | 0.11 | 1 | 0.29 | 0 | 35.8 | 1 |
| 10SM21SS | 16800 | 1 | 0.47 | 0 | 39 | 1 | 220 | 1 | 27.2 | 1 | 11.1 | 1 | 23700 | 1 | 9 | 1 | 476 | 1 | 2 | 1 | 0.29 | 0 | 46.8 | 1 |
| 10SM22SS | 14600 | 1 | 0.49 | 0 | 17 | 1 | 147 | 1 | 27 | 1 | 12.1 | 1 | 23800 | 1 | 7 | 1 | 367 | 1 | 0.05 | 1 | 0.3 | 0 | 47.9 | 1 |
| 10SM23SS | 13000 | 1 | 508 | 1 | 223 | 1 | 163 | 1 | 22.5 | 1 | 9.5 | 1 | 20100 | 1 | 6 | 1 | 316 | 1 | 8.2 | 1 | 0.28 | 0 | 35.5 | 1 |
| 10SM24SS | 11900 | 1 | 1.2 | 0 | 0.9 | 0 | 149 | 1 | 24 | 1 | 17.3 | 1 | 36700 | 1 | 12 | 1 | 870 | 1 | 0.26 | 1 | 0.7 | 0 | 41.6 | 1 |
| 10SM25SS | 9000 | 1 | 1.1 | 0 | 40 | 1 | 103 | 1 | 22 | 1 | 18.5 | 1 | 37100 | 1 | 11 | 1 | 1030 | 1 | 0.9 | 1 | 0.7 | 0 | 43.7 | 1 |
| 10SM26SS | 12400 | 1 | 0.49 | 0 | 13 | 1 | 132 | 1 | 20.2 | 1 | 11.1 | 1 | 23200 | 1 | 8 | 1 | 517 | 1 | 0.64 | 1 | 0.3 | 0 | 37.3 | 1 |
| 10SM27SS | 11000 | 1 | 1.2 | 0 | 20 | 1 | 180 | 1 | 21 | 1 | 19.1 | 1 | 29500 | 1 | 11 | 1 | 1090 | 1 | 1.9 | 1 | 0.7 | 0 | 37.8 | 1 |
| 10SM28SS | 13900 | 1 | 109 | 1 | 177 | 1 | 145 | 1 | 22.8 | 1 | 9.8 | 1 | 19900 | 1 | 6 | 1 | 435 | 1 | 17 | 1 | 0.29 | 0 | 36.4 | 1 |
| 10SM29SS | 13200 | 1 | 0.5 | 0 | 11 | 1 | 136 | 1 | 23.8 | 1 | 8.7 | 1 | 21000 | 1 | 6 | 1 | 319 | 1 | 0.17 | 1 | 0.3 | 0 | 40 | 1 |
| 10SM30SS | 20300 | 1 | 0.54 | 0 | 46 | 1 | 213 | 1 | 30.2 | 1 | 12.2 | 1 | 28100 | 1 | 11 | 1 | 481 | 1 | 1.9 | 1 | 0.33 | 0 | 51.9 | 1 |
| 10SM41SS | | | | | | | | | | | | | 44500 | 1 | | | 817 | 1 | 24 | 1 | 0.7 | 0 | | |
| 11DS01SBC | 4080 | 1 | 11.6 | 1 | 1200 | 1 | 317 | 1 | 23.1 | 1 | 16 | 1 | 41500 | 1 | 12.1 | 1 | 822 | 1 | 326 | 1 | 0.123 | 1 | 27 | 1 |
| 11DS01SB1 | 4940 | 1 | 11.4 | 1 | 234 | 1 | 141 | 1 | | | | | | | 10 | 1 | 851 | 1 | 48.2 | 1 | | | | |
| 11DS01SB1 | 9690 | 1 | 1.4 | 1 | 13.3 | 1 | 123 | 1 | 23.4 | 1 | 9.87 | 1 | 19400 | 1 | 6.76 | 1 | 250 | 1 | 1.46 | 1 | 0.102 | 1 | 31.2 | 1 |
| 11DS01SB18 | | | | | | | | | 15.7 | 1 | 14.8 | 1 | 37700 | 1 | | | | | | | 0.122 | 1 | 25.2 | 1 |
| 11DS02SBC | 5930 | 1 | 31.5 | 1 | 360 | 1 | 123 | 1 | 17.2 | 1 | 12 | 1 | 47900 | 1 | 10.7 | 1 | 965 | 1 | 133 | 1 | 0.112 | 1 | 23.6 | 1 |
| 11DS02SB1 | 4950 | 1 | 122 | 1 | 205 | 1 | | | 18.5 | 1 | 16.2 | 1 | 64000 | 1 | 12.4 | 1 | 832 | 1 | | | 0.093 | 1 | 28.2 | 1 |
| 11DS02SB1 | 12100 | 1 | 0.886 | 1 | 12 | 1 | 149 | 1 | 24.8 | 1 | 9.55 | 1 | 22100 | 1 | 8.55 | 1 | 224 | 1 | 0.168 | 1 | 0.138 | 1 | 35.3 | 1 |
| 11DS02SB16 | | | | | | | | | 124 | 1 | | | | | | | | | 78.8 | 1 | | | | |
| 11RS01SBC | 11500 | 1 | 24.7 | 1 | 54.7 | 1 | 137 | 1 | 21.1 | 1 | 8.08 | 1 | 29400 | 1 | 9.79 | 1 | 526 | 1 | 6.44 | 1 | 0.14 | 1 | 28.1 | 1 |
| 11RS01SBC | 6180 | 1 | 68.7 | 1 | 142 | 1 | 104 | 1 | 25.1 | 1 | 12.9 | 1 | 66100 | 1 | 28.6 | 1 | 509 | 1 | 27.9 | 1 | 0.083 | 1 | 30.7 | 1 |
| 11RS01SB1 | 11800 | 1 | 25.8 | 1 | 50 | 1 | 124 | 1 | 22.3 | 1 | 8.67 | 1 | 41400 | 1 | 17.6 | 1 | 292 | 1 | 7.44 | 1 | 0.104 | 1 | 30.5 | 1 |
| 11RS02SBC | 8920 | 1 | 24.4 | 1 | 138 | 1 | 103 | 1 | 19.1 | 1 | 23.9 | 1 | 38300 | 1 | 11.6 | 1 | 1160 | 1 | 33.1 | 1 | 0.093 | 1 | 35.5 | 1 |
| 11RS02SBC | 3940 | 1 | 34.5 | 1 | 93.4 | 1 | 94.6 | 1 | 27.4 | 1 | 15.5 | 1 | 51400 | 1 | 12.9 | 1 | 1190 | 1 | 8.07 | 1 | 0.082 | 1 | 39.7 | 1 |
| 11RS02SB1 | 14000 | 1 | 1.17 | 1 | 8.01 | 1 | 154 | 1 | 28 | 1 | 9.93 | 1 | 23300 | 1 | 9.89 | 1 | 235 | 1 | 0.198 | 1 | 0.166 | 1 | 39.3 | 1 |
| 11SM10SB | 10000 | 1 | 2.49 | 1 | 200 | 1 | 139 | 1 | 16.9 | 1 | 13.2 | 1 | 35400 | 1 | 9.59 | 1 | 635 | 1 | 11.8 | 1 | 0.11 | 1 | 29.4 | 1 |
| 11SM10SB | 2210 | 1 | 6.15 | 1 | 6240 | 1 | 220 | 1 | 11.9 | 1 | 10.8 | 1 | 64700 | 1 | 15.7 | 1 | 549 | 1 | 48.3 | 1 | 1.54 | 1 | 19.1 | 1 |
| 11SM10SB | 2790 | 1 | 4.28 | 1 | 1690 | 1 | 81.5 | 1 | 9.8 | 1 | 19.8 | 1 | 49100 | 1 | 25 | 1 | 802 | 1 | 17.9 | 1 | 0.54 | 1 | 18.9 | 1 |
| 11SM11SB | 16800 | 1 | 0.25 | 1 | 8.67 | 1 | 157 | 1 | 22.4 | 1 | 10.4 | 1 | 28500 | 1 | 7.54 | 1 | 525 | 1 | 0.032 | 1 | 0.097 | 1 | 37.8 | 1 |
| 11SM11SB14 | | | | | | | | | 122 | 1 | | | 66400 | 1 | 15.8 | 1 | 2170 | 1 | 7.18 | 1 | 0.146 | 1 | | |
| 11SM11SB | 3080 | 1 | 1.43 | 1 | 261 | 1 | 118 | 1 | 12 | 1 | 25.8 | 1 | 55000 | 1 | 21.3 | 1 | 1330 | 1 | 6.93 | 1 | 0.121 | 1 | 25.3 | 1 |
| 11SM11SB | 7250 | 1 | | | | | | | 20.3 | 1 | 23.2 | 1 | | | | | | | | | | | 31.3 | 1 |
| 11SM31SB | 2130 | 1 | 8.57 | 1 | 273 | 1 | 71.7 | 1 | 8.22 | 1 | 12.3 | 1 | 54900 | 1 | 16.8 | 1 | 459 | 1 | 15.2 | 1 | 0.087 | 1 | 14.8 | 1 |

Surface Soil (mg/kg) - MPA

| | Aluminum | D_Aluminum | Antimony | D_Antimony | Arsenic | D_Arsenic | Barium | D_Barium | Chromium | D_Chromium | Cobalt | D_Cobalt | Iron | D_Iron | Lead | D_Lead | Manganese | D_Manganese | Mercury | D_Mercury | Naphthalene | D_Naphthalene | Thallium | D_Thallium | Vanadium | D_Vanadium |
|--------------|----------|------------|----------|------------|---------|-----------|--------|----------|----------|------------|--------|----------|-------|--------|------|--------|-----------|-------------|---------|-----------|-------------|---------------|----------|------------|----------|------------|
| 10MP01SS | 15300 | 1 | 20 | 1 | 100 | 1 | 84 | 1 | 24 | 1 | 10 | 1 | 30300 | 1 | 9 | 1 | 302 | 1 | 2.6 | 1 | | 0.8 | 0 | 47 | 1 | |
| 10MP02SS | 3390 | 1 | | | 7310 | 1 | 134 | 1 | 8 | 1 | 35 | 1 | 50100 | 1 | 20 | 1 | 1190 | 1 | | | | 1.3 | 0 | 20 | 1 | |
| 10MP030405SS | 13900 | 1 | 5500 | 1 | 5580 | 1 | 639 | 1 | 39 | 1 | 17.1 | 1 | 41300 | 1 | 28 | 1 | 737 | 1 | 680 | 1 | | 0.7 | 0 | 36.2 | 1 | |
| 10MP03SS | 15200 | 1 | 4720 | 1 | 5200 | 1 | 769 | 1 | 46 | 1 | 17.8 | 1 | 35800 | 1 | 38 | 1 | 527 | 1 | 710 | 1 | | 0.7 | 0 | 33.9 | 1 | |
| 10MP04SS | 16700 | 1 | 5530 | 1 | 6670 | 1 | 750 | 1 | 71 | 1 | 15.2 | 1 | 39400 | 1 | 24 | 1 | 502 | 1 | 860 | 1 | | 0.7 | 0 | 33.5 | 1 | |
| 10MP05SS | 14500 | 1 | 4460 | 1 | 5660 | 1 | 697 | 1 | 45 | 1 | 14.3 | 1 | 38400 | 1 | 24 | 1 | 523 | 1 | 900 | 1 | | 0.7 | 0 | 34.7 | 1 | |
| 10MP06070809 | 10400 | 1 | 4420 | 1 | 4520 | 1 | 496 | 1 | 34 | 1 | 19.1 | 1 | 42900 | 1 | 22 | 1 | 616 | 1 | 750 | 1 | | 0.7 | 0 | 33.5 | 1 | |
| 10MP06SS | 11500 | 1 | 5750 | 1 | 5640 | 1 | 580 | 1 | 29 | 1 | 14.2 | 1 | 40700 | 1 | 33 | 1 | 596 | 1 | 750 | 1 | | 0.7 | 0 | 29 | 1 | |
| 10MP07SS | 10700 | 1 | 8200 | 1 | 4280 | 1 | 572 | 1 | 32 | 1 | 17 | 1 | 35400 | 1 | 10 | 1 | 692 | 1 | 790 | 1 | | 1.4 | 0 | 29 | 1 | |
| 10MP08SS | 6440 | 1 | 1220 | 1 | 3040 | 1 | 286 | 1 | 24 | 1 | 21 | 1 | 46600 | 1 | 29 | 1 | 688 | 1 | 295 | 1 | | 0.7 | 0 | 31.4 | 1 | |
| 10MP09SS | 8210 | 1 | 1990 | 1 | 4200 | 1 | 424 | 1 | 33 | 1 | 20.2 | 1 | 41800 | 1 | 29 | 1 | 650 | 1 | 560 | 1 | | 0.7 | 0 | 30.3 | 1 | |
| 10MP10SS | 6800 | 1 | 470 | 1 | 1540 | 1 | 225 | 1 | 23 | 1 | 22.5 | 1 | 43700 | 1 | 30 | 1 | 813 | 1 | 172 | 1 | 14 | 1 | 0.7 | 0 | 39 | 1 |
| 10MP11SS | 12500 | 1 | 6980 | 1 | 5320 | 1 | 796 | 1 | 43 | 1 | 21 | 1 | 40300 | 1 | 19 | 1 | 785 | 1 | 660 | 1 | | 0.6 | 0 | 34.5 | 1 | |
| 10MP12SS | 12000 | 1 | 10900 | 1 | 4870 | 1 | 746 | 1 | 35 | 1 | 19 | 1 | 38000 | 1 | 1 | 0 | 801 | 1 | 304 | 1 | | 1.4 | 0 | 32 | 1 | |
| 10MP13SS | 14600 | 1 | 12100 | 1 | 4890 | 1 | 840 | 1 | 41 | 1 | 18 | 1 | 34100 | 1 | 1 | 0 | 676 | 1 | 690 | 1 | | 1.4 | 0 | 31 | 1 | |
| 10MP14SS | 9920 | 1 | 3400 | 1 | 2320 | 1 | 462 | 1 | 24 | 1 | 18.5 | 1 | 37800 | 1 | 24 | 1 | 874 | 1 | 162 | 1 | | 0.7 | 0 | 36.4 | 1 | |
| 10MP15SS | 14800 | 1 | 11800 | 1 | 4660 | 1 | 1160 | 1 | 30 | 1 | 18 | 1 | 33300 | 1 | 20 | 1 | 694 | 1 | 217 | 1 | | 1.5 | 0 | 32 | 1 | |
| 10MP16SS | 6570 | 1 | 1570 | 1 | 6950 | 1 | 358 | 1 | 40 | 1 | 22.3 | 1 | 41500 | 1 | 16 | 1 | | 290 | 1 | 1 | | 0.7 | 0 | 27.6 | 1 | |
| 10MP17SS | 15700 | 1 | | | 5540 | 1 | 1020 | 1 | 51 | 1 | | | 35900 | 1 | | | | | | | | | | | 34.8 | 1 |
| 10MP18SS | 11300 | 1 | 4810 | 1 | 2570 | 1 | 462 | 1 | 27 | 1 | 17.7 | 1 | 34500 | 1 | 16 | 1 | 965 | 1 | 136 | 1 | | 0.7 | 0 | 35.8 | 1 | |
| 10MP19SS | 13000 | 1 | 40 | 1 | 170 | 1 | 90.3 | 1 | 23 | 1 | 16.2 | 1 | 30600 | 1 | 9 | 1 | 537 | 1 | 38 | 1 | 2.7 | 0 | 0.7 | 0 | 45.4 | 1 |
| 10MP20SS | 7370 | 1 | 40 | 1 | 230 | 1 | 213 | 1 | 25 | 1 | 18.2 | 1 | 48100 | 1 | 40 | 1 | 1040 | 1 | 62 | 1 | 12 | 0 | 0.7 | 0 | 39.8 | 1 |
| 10MP21SS | 5330 | 1 | 80 | 1 | 360 | 1 | 319 | 1 | 32 | 1 | 25.2 | 1 | 55600 | 1 | 24 | 1 | 1390 | 1 | 63 | 1 | 3.6 | 0 | 0.7 | 0 | 49.5 | 1 |
| 10MP22SS | 6170 | 1 | 2500 | 1 | 1960 | 1 | 346 | 1 | 25 | 1 | 26.2 | 1 | 45000 | 1 | 28 | 1 | 991 | 1 | 106 | 1 | | 0.7 | 0 | 31.6 | 1 | |
| 10MP23SS | 11300 | 1 | 8720 | 1 | 4380 | 1 | 598 | 1 | 30 | 1 | 19 | 1 | 38400 | 1 | 10 | 1 | 892 | 1 | 261 | 1 | | 1.3 | 0 | 33 | 1 | |
| 10MP24SS | 5280 | 1 | 1180 | 1 | 2020 | 1 | 277 | 1 | 26 | 1 | 23 | 1 | 42500 | 1 | 30 | 1 | 768 | 1 | 440 | 1 | | 0.7 | 0 | 27.3 | 1 | |
| 10MP25SS | 13700 | 1 | 14100 | 1 | 5400 | 1 | 882 | 1 | 41 | 1 | 17 | 1 | 34000 | 1 | 80 | 1 | 604 | 1 | 1340 | 1 | | 1.3 | 0 | 31 | 1 | |
| 10MP26SS | 14600 | 1 | 15100 | 1 | 6420 | 1 | 890 | 1 | 49 | 1 | 18 | 1 | 35500 | 1 | 1 | 0 | 829 | 1 | 1620 | 1 | | 1.3 | 0 | 34 | 1 | |
| 10MP27SS | 12700 | 1 | 8480 | 1 | 6100 | 1 | 735 | 1 | 37 | 1 | 19 | 1 | 42600 | 1 | 220 | 1 | 708 | 1 | 250 | 1 | | 1.4 | 0 | 32 | 1 | |
| 10MP28SS | 12200 | 1 | 4780 | 1 | 5350 | 1 | 682 | 1 | 33 | 1 | 16.6 | 1 | 38700 | 1 | 43 | 1 | 617 | 1 | 820 | 1 | | 0.7 | 0 | 31.1 | 1 | |
| 10MP29SS | 14200 | 1 | 16700 | 1 | 6170 | 1 | 870 | 1 | 41 | 1 | 18 | 1 | 36700 | 1 | 1.9 | 0 | 739 | 1 | 440 | 1 | | 2.7 | 0 | 35 | 1 | |
| 10MP30SS | 8560 | 1 | 720 | 1 | 2930 | 1 | 263 | 1 | 22 | 1 | 15.8 | 1 | 31200 | 1 | 57 | 1 | 539 | 1 | 400 | 1 | | 0.7 | 0 | 29.4 | 1 | |
| 10MP31SS | 14700 | 1 | 7 | 1 | 19 | 1 | 76.2 | 1 | 21.5 | 1 | 7.4 | 1 | 26100 | 1 | 7 | 1 | 258 | 1 | 0.28 | 1 | | 0.32 | 0 | 47.5 | 1 | |
| 10MP32SS | 3100 | 1 | 1430 | 1 | 9880 | 1 | 126 | 1 | 19 | 1 | 16 | 1 | 44300 | 1 | 180 | 1 | 708 | 1 | 127 | 1 | 2.7 | 0 | 1.5 | 0 | 21 | 1 |
| 10MP33SS | 12000 | 1 | 9 | 1 | 18 | 1 | 112 | 1 | 18.7 | 1 | 5.9 | 1 | 16800 | 1 | 8 | 1 | 158 | 1 | 1.46 | 1 | | 0.4 | 0 | 32.2 | 1 | |
| 10MP34SS | 2410 | 1 | 780 | 1 | 8510 | 1 | 101 | 1 | 10 | 1 | 16 | 1 | 43300 | 1 | 160 | 1 | 814 | 1 | 79 | 1 | 2.6 | 0 | 1.4 | 0 | 20 | 1 |
| 10MP35SS | 11900 | 1 | 1680 | 1 | 2390 | 1 | 474 | 1 | 37 | 1 | 21.3 | 1 | 29900 | 1 | 43 | 1 | 764 | 1 | 183 | 1 | | 0.7 | 0 | 35.6 | 1 | |
| 10MP36SS | 3240 | 1 | 690 | 1 | 7050 | 1 | 145 | 1 | 18 | 1 | | | 49400 | 1 | 198 | 1 | 1090 | 1 | | 1 | 2.7 | 0 | 0.7 | 0 | 25.3 | 1 |
| 10MP37SS | 12100 | 1 | 20 | 1 | 60 | 1 | 144 | 1 | 24 | 1 | 20.3 | 1 | 34400 | 1 | 9 | 1 | 480 | 1 | 3.6 | 1 | | 0.7 | 0 | 41.1 | 1 | |
| 10MP38SS | 10900 | 1 | 760 | 1 | 992 | 1 | 207 | 1 | 22.9 | 1 | 20.1 | 1 | 27400 | 1 | 17 | 1 | 540 | 1 | 154 | 1 | | 0.28 | 0 | 35.6 | 1 | |
| 10MP39SS | 10800 | 1 | 1910 | 1 | 1770 | 1 | 401 | 1 | 34 | 1 | 16.2 | 1 | 31600 | 1 | 12 | 1 | 486 | 1 | 42 | 1 | | 0.7 | 0 | 34.1 | 1 | |
| 10MP40SS | 11700 | 1 | 267 | 1 | 375 | 1 | 162 | 1 | 25.4 | 1 | 13.6 | 1 | 26300 | 1 | 9 | 1 | 310 | 1 | 15 | 1 | | 0.3 | 0 | 39.3 | 1 | |
| 10MP41SS | 8450 | 1 | 39 | 1 | 516 | 1 | 102 | 1 | 18.9 | 1 | 9.5 | 1 | 22300 | 1 | 6 | 1 | 313 | 1 | 8 | 1 | | 0.28 | 0 | 30.8 | 1 | |
| 10MP424344SS | 5280 | 1 | 880 | 1 | 1840 | 1 | 211 | 1 | 20 | 1 | 20.5 | 1 | 50200 | 1 | 22 | 1 | 702 | 1 | 136 | 1 | | 0.7 | 0 | 32.7 | 1 | |
| 10MP42SS | 5660 | 1 | 560 | 1 | 1770 | 1 | 218 | 1 | 20 | 1 | 19.9 | 1 | 41900 | 1 | 22 | 1 | 759 | 1 | 124 | 1 | | 0.7 | 0 | 30.9 | 1 | |
| 10MP43SS | 5360 | 1 | 720 | 1 | 2080 | 1 | 224 | 1 | 21 | 1 | 20.5 | 1 | 41400 | 1 | 24 | 1 | 789 | 1 | 149 | 1 | | 0.7 | 0 | 31.2 | 1 | |
| 10MP44SS | 5210 | 1 | 340 | 1 | 860 | 1 | 196 | 1 | 19 | 1 | 19.6 | 1 | 43500 | 1 | 23 | 1 | 656 | 1 | 86 | 1 | | 0.7 | 0 | 35.5 | 1 | |
| 10MP45SS | 5630 | 1 | 220 | 1 | 1800 | 1 | 205 | 1 | 19 | 1 | 23.1 | 1 | 53700 | 1 | 21 | 1 | 877 | 1 | 87 | 1 | 26 | 1 | 0.7 | 0 | 37.3 | 1 |
| 10MP46SS | 12700 | 1 | 13000 | 1 | 4940 | 1 | 892 | 1 | 39 | 1 | 19 | 1 | 37200 | 1 | 1 | 0 | 758 | 1 | 194 | 1 | 2.7 | 0 | 1.3 | 0 | 34 | 1 |
| 10MP47SS | 5650 | 1 | 90 | 1 | 1180 | 1 | 191 | 1 | 20 | 1 | 21.4 | 1 | 47000 | 1 | 18 | 1 | 672 | 1 | 118 | 1 | 70 | 1 | 0.7 | 0 | 31.9 | 1 |
| 10MP48SS | 10500 | 1 | 5980 | 1 | 3940 | 1 | 498 | 1 | 31 | 1 | 16.3 | 1 | 35500 | 1 | 3090 | 1 | 737 | 1 | 1260 | 1 | | 0.6 | 0 | 32.2 | 1 | |
| 10MP49SS | 11900 | 1 | 10900 | 1 | 4130 | 1 | 562 | 1 | 42 | 1 | 17 | 1 | 32600 | 1 | 0.9 | 0 | 707 | 1 | 176 | 1 | | 1.3 | 0 | 34 | 1 | |
| 10MP50515253 | 9170 | 1 | 10100 | 1 | 3610 | 1 | 431 | 1 | 28 | 1 | 17 | 1 | 40100 | 1 | 20 | 1 | 605 | 1 | 144 | 1 | | 1.3 | 0 | 32 | 1 | |
| 10MP50SS | 10600 | 1 | 210 | 1 | 826 | 1 | 135 | 1 | 20.1 | 1 | 8.1 | 1 | 19700 | 1 | 11 | 1 | 267 | 1 | 318 | 1 | | 0.29 | 0 | 30.6 | 1 | |
| 10MP51SS | 11100 | 1 | 23300 | 1 | 4610 | 1 | 732 | 1 | 41 | 1 | 17 | 1 | 33600 | 1 | 1.9 | 0 | 644 | 1 | 119 | 1 | | 2.7 | 0 | 28 | 1 | |
| 10MP52SS | 12800 | 1 | 18500 | 1 | 5000 | 1 | 663 | 1 | 40 | 1 | 15 | 1 | 29700 | 1 | 1.9 | 0 | 562 | 1 | 183 | 1 | | 2.6 | 0 | 30 | 1 | |
| 10MP53SS | 6490 | 1 | 1480 | 1 | 3000 | 1 | 291 | 1 | 24 | 1 | 17.8 | 1 | 41000 | 1 | 44 | 1 | 501 | 1 | 183 | 1 | | 0.7 | 0 | 29.8 | 1 | |
| 10MP54SS | 6340 | 1 | 20 | 1 | 1360 | 1 | 186 | 1 | 18 | 1 | 18.7 | 1 | 39600 | 1 | 12 | 1 | 1110 | 1 | 24.4 | 1 | | 0.7 | 0 | 30.9 | 1 | |
| 10MP55565758 | 9340 | 1 | 764 | 1 | 1100 | 1 | 221 | 1 | 26.9 | 1 | 11.9 | 1 | 21800 | 1 | 9 | 1 | 644 | 1 | 114 | 1 | | 0.28 | 0 | 27.3 | 1 | |
| 10MP55SS | 9480 | 1 | 1890 | 1 | 2150 | 1 | 340 | 1 | 31 | 1 | 16.9 | 1 | 29200 | 1 | 13 | 1 | 573 | 1 | 124 | 1 | | 0.7 | 0 | 28.9 | 1 | |
| 10MP56SS | 7750 | 1 | 183 | 1 | 333 | 1 | 119 | 1 | 17 | 1 | 8.2 | 1 | 17300 | 1 | 5 | 1 | 309 | 1 | 19.1 | 1 | | 0.26 | 0 | 24.7 | 1 | |
| 10MP57SS | 7730 | 1 | 1630 | 1 | 2000 | 1 | 269 | 1 | 22 | 1 | 14.9 | 1 | 31700 | 1 | 18 | 1 | 559 | 1 | 150 | 1 | | 0.7 | 0 | 28 | 1 | |
| 10MP58SS | 8980 | 1 | 716 | 1 | 1080 | 1 | 256 | 1 | 24.3 | 1 | 13.7 | 1 | 25500 | 1 | | | | | | | | | | | | |

Surface Soil (mg/kg) - MPA

| | Aluminum | D_Aluminum | Antimony | D_Antimony | Arsenic | D_Arsenic | Barium | D_Barium | Chromium | D_Chromium | Cobalt | D_Cobalt | Iron | D_Iron | Lead | D_Lead | Manganese | D_Manganese | Mercury | D_Mercury | Naphthalene | D_Naphthalene | Thallium | D_Thallium | Vanadium | D_Vanadium |
|------------|----------|------------|----------|------------|---------|-----------|--------|----------|----------|------------|--------|----------|-------|--------|-------|--------|-----------|-------------|---------|-----------|-------------|---------------|----------|------------|----------|------------|
| 10MP61SS | 9710 | 1 | 1200 | 1 | 1410 | 1 | 211 | 1 | 23.4 | 1 | 15.7 | 1 | 27900 | 1 | 12 | 1 | 477 | 1 | 68 | 1 | | 0.29 | 0 | 33.2 | 1 | |
| 10MP62SS | 8550 | 1 | 1590 | 1 | 1880 | 1 | 297 | 1 | 26 | 1 | 20.3 | 1 | 34400 | 1 | 13 | 1 | 616 | 1 | 165 | 1 | | 0.7 | 0 | 31.4 | 1 | |
| 10MP63SS | 8200 | 1 | 2680 | 1 | 2880 | 1 | 319 | 1 | 28 | 1 | 18.2 | 1 | 33300 | 1 | 11 | 1 | 563 | 1 | 150 | 1 | | 0.7 | 0 | 27.7 | 1 | |
| 10MP64SS | 10300 | 1 | 1810 | 1 | 2520 | 1 | 371 | 1 | 33 | 1 | 17.3 | 1 | 28900 | 1 | 10 | 1 | 507 | 1 | 172 | 1 | | 0.7 | 0 | 28.6 | 1 | |
| 10MP65SS | 10400 | 1 | 589 | 1 | 1200 | 1 | 255 | 1 | 25.1 | 1 | 11.2 | 1 | 25600 | 1 | 10 | 1 | 411 | 1 | 54 | 1 | | 0.29 | 0 | 31.5 | 1 | |
| 10MP66SS | 5500 | 1 | 220 | 1 | 2490 | 1 | 212 | 1 | 31 | 1 | 23.7 | 1 | 43400 | 1 | 12 | 1 | 879 | 1 | 145 | 1 | | 0.6 | 0 | 32.4 | 1 | |
| 10MP67SS | 12400 | 1 | 9830 | 1 | 5240 | 1 | 622 | 1 | 36 | 1 | 18 | 1 | 31500 | 1 | 10 | 1 | 673 | 1 | 730 | 1 | | 1.4 | 0 | 32 | 1 | |
| 10MP68SS | 9470 | 1 | 351 | 1 | 959 | 1 | 149 | 1 | 20.8 | 1 | 15.3 | 1 | 21600 | 1 | 11 | 1 | 346 | 1 | 109 | 1 | | 0.3 | 0 | 30.9 | 1 | |
| 10MP80SS | 12600 | 1 | 5600 | 1 | 5800 | 1 | 567 | 1 | 35 | 1 | 17 | 1 | 35300 | 1 | 30 | 1 | 528 | 1 | 780 | 1 | | 1.4 | 0 | 31 | 1 | |
| 10MP81SS | | | 250 | 1 | | | | | | | | | | | | | | | 94 | 1 | | | | | | |
| 10MP82SS | | | 7300 | 1 | | | | | | | 22 | 1 | | | 70 | 1 | 693 | 1 | 479 | 1 | | 1.3 | 0 | | | |
| 10MP83SS | 5160 | 1 | 1670 | 1 | 1940 | 1 | 251 | 1 | 27 | 1 | 23.5 | 1 | 39300 | 1 | 28 | 1 | 711 | 1 | 387 | 1 | | 0.7 | 0 | 26.9 | 1 | |
| 10MP84SS | | | | | | | | | | | 18.1 | 1 | | | | | | | 85 | 1 | | | | | | |
| 10MP85SS | 4870 | 1 | 850 | 1 | 2160 | 1 | 208 | 1 | 34 | 1 | 24.4 | 1 | 37200 | 1 | 13 | 1 | 761 | 1 | 129 | 1 | | 0.6 | 0 | 29.7 | 1 | |
| 10MP86SS | 4170 | 1 | | | | | 219 | 1 | 13 | 1 | 1 | | | | | | | | | | | | | | | |
| 10MP87SS | 5320 | 1 | 90 | 1 | 320 | 1 | 297 | 1 | 25 | 1 | 22.2 | 1 | 45700 | 1 | 22 | 1 | 1500 | 1 | 67 | 1 | | 0.7 | 0 | 43 | 1 | |
| 10MP88SS | 15600 | 1 | 11500 | 1 | 5780 | 1 | 880 | 1 | 54 | 1 | 19 | 1 | 33300 | 1 | 0.9 | 0 | 665 | 1 | 590 | 1 | | 1.3 | 0 | 36 | 1 | |
| 10MP89SS | | | | | | | | | | | | | | | | | 726 | 1 | | | | | | | | |
| 10OP01SS | 21700 | 1 | 3520 | 1 | 5340 | 1 | 1710 | 1 | 101 | 1 | 20.1 | 1 | 19500 | 1 | 15 | 1 | 711 | 1 | 170 | 1 | | 0.7 | 0 | 37.5 | 1 | |
| 11MP70SS | 9990 | 1 | 4.6 | 1 | 33.9 | 1 | 144 | 1 | 18.7 | 1 | 11.4 | 1 | 30700 | 1 | 6.96 | 1 | 738 | 1 | 0.807 | 1 | 2.3 | 0 | 0.065 | 1 | 30.9 | 1 |
| 11MP71SS | 10800 | 1 | 0.708 | 1 | 10.8 | 1 | 99.1 | 1 | 20.3 | 1 | 12.5 | 1 | 43000 | 1 | 8.91 | 1 | 703 | 1 | 0.428 | 1 | | 0.071 | 1 | 35.4 | 1 | |
| 11MP01SB04 | 14400 | 1 | 0.94 | 1 | 10.3 | 1 | 147 | 1 | 19.6 | 1 | 13.3 | 1 | 31200 | 1 | 9.92 | 1 | 611 | 1 | 0.435 | 1 | | 0.085 | 1 | 35.5 | 1 | |
| 11MP01SB12 | 14200 | 1 | | 1 | 12.5 | 1 | | 1 | 26.3 | 1 | | 1 | | 1 | | | | | | | | | | | | |
| 11MP01SB16 | 5180 | 1 | 0.501 | 1 | 34 | 1 | 75.4 | 1 | 8.18 | 1 | 25 | 1 | 43300 | 1 | 13.3 | 1 | 563 | 1 | 1.56 | 1 | | 0.091 | 1 | 22.9 | 1 | |
| 11MP01SB18 | | | 0.343 | 1 | | 1 | 211 | 1 | | 1 | 18.4 | 1 | 66100 | 1 | 12.8 | 1 | 548 | 1 | 0.377 | 1 | | 0.077 | 1 | 37.2 | 1 | |
| 11MP10SB04 | 3000 | 1 | 8.09 | 1 | 25.5 | 1 | 133 | 1 | 13.5 | 1 | 13.8 | 1 | 51500 | 1 | 8.31 | 1 | 731 | 1 | 3.6 | 1 | | 0.065 | 1 | 31.6 | 1 | |
| 11MP10SB06 | 2830 | 1 | 3.38 | 1 | 15.6 | 1 | 126 | 1 | 14.1 | 1 | 15.7 | 1 | 41300 | 1 | 6.73 | 1 | 697 | 1 | 5.63 | 1 | | 0.068 | 1 | 35.7 | 1 | |
| 11MP11SB04 | 7280 | 1 | 5760 | 1 | 3740 | 1 | 394 | 1 | 18 | 1 | 16.2 | 1 | 45700 | 1 | 0.299 | 1 | 900 | 1 | 163 | 1 | | 0.167 | 1 | 20.7 | 1 | |
| 11MP11SB06 | 12500 | 1 | 323 | 1 | 471 | 1 | 194 | 1 | 19.9 | 1 | 11.7 | 1 | 39800 | 1 | 10.8 | 1 | 701 | 1 | 71.2 | 1 | | 0.082 | 1 | 31.6 | 1 | |
| 11MP11SB08 | 6980 | 1 | 5.86 | 1 | 38.2 | 1 | 188 | 1 | 20.1 | 1 | 12.1 | 1 | 25700 | 1 | 11.1 | 1 | 219 | 1 | 0.914 | 1 | | 0.096 | 1 | 34.1 | 1 | |
| 11MP12SB06 | 4840 | 1 | 184 | 1 | 562 | 1 | 147 | 1 | 14.5 | 1 | 15 | 1 | 38000 | 1 | 10.4 | 1 | 913 | 1 | 55.4 | 1 | | 0.089 | 1 | 24.8 | 1 | |
| 11MP12SB12 | 3490 | 1 | 0.547 | 1 | 91 | 1 | 90.5 | 1 | 11.9 | 1 | 18.2 | 1 | 42300 | 1 | 16.1 | 1 | 758 | 1 | 1.5 | 1 | | 0.076 | 1 | 26.7 | 1 | |
| 11MP12SB16 | 3630 | 1 | 46.5 | 1 | 665 | 1 | 86.6 | 1 | 10.6 | 1 | 22 | 1 | 35400 | 1 | 22.5 | 1 | 661 | 1 | 11.5 | 1 | | 0.098 | 1 | 26.5 | 1 | |
| 11MP13SB04 | 2440 | 1 | 50.1 | 1 | 126 | 1 | 99.4 | 1 | 13.3 | 1 | 13.7 | 1 | 35200 | 1 | 11 | 1 | 974 | 1 | 16.6 | 1 | | 0.066 | 1 | 23.3 | 1 | |
| 11MP13SB06 | 2620 | 1 | 11.5 | 1 | 79.1 | 1 | 197 | 1 | 15.3 | 1 | 18.3 | 1 | 33700 | 1 | 16 | 1 | 925 | 1 | 23.9 | 1 | | 0.088 | 1 | 33 | 1 | |
| 11MP14SB04 | 5490 | 1 | 6430 | 1 | 1790 | 1 | 333 | 1 | 16 | 1 | 14.7 | 1 | 40600 | 1 | 1.35 | 1 | 807 | 1 | 1410 | 1 | | 0.162 | 1 | 22.8 | 1 | |
| 11MP14SB14 | 5650 | 1 | 300 | 1 | 427 | 1 | 195 | 1 | 18.8 | 1 | 16.5 | 1 | 38200 | 1 | 24.1 | 1 | 885 | 1 | 70.1 | 1 | | 0.124 | 1 | 34.1 | 1 | |
| 11MP15SB04 | 3840 | 1 | 46.8 | 1 | 80.4 | 1 | 210 | 1 | 16.5 | 1 | 20.2 | 1 | 41100 | 1 | 18.6 | 1 | 993 | 1 | 57.4 | 1 | | 0.117 | 1 | 34.2 | 1 | |
| 11MP15SB06 | 3660 | 1 | 2.52 | 1 | 44.5 | 1 | 191 | 1 | 15.6 | 1 | 17.3 | 1 | 47100 | 1 | 16.4 | 1 | 1200 | 1 | 19.1 | 1 | | 0.096 | 1 | 32.8 | 1 | |
| 11MP15SB08 | 3370 | 1 | 0.916 | 1 | 29.1 | 1 | 168 | 1 | 13.6 | 1 | 18.3 | 1 | 42100 | 1 | 14.7 | 1 | 1040 | 1 | 5.78 | 1 | | 0.08 | 1 | 29.4 | 1 | |
| 11MP16SB04 | 3660 | 1 | 184 | 1 | 200 | 1 | 154 | 1 | 16.5 | 1 | 22.8 | 1 | 41500 | 1 | 19.2 | 1 | 1080 | 1 | 2170 | 1 | | 0.096 | 1 | 31.7 | 1 | |
| 11MP16SB08 | 3830 | 1 | 2.22 | 1 | 46.7 | 1 | 228 | 1 | 16.7 | 1 | 23.5 | 1 | 42200 | 1 | 15.4 | 1 | 1380 | 1 | 0.625 | 1 | | 0.096 | 1 | 34.8 | 1 | |
| 11MP16SB10 | 4670 | 1 | 1.15 | 1 | 35 | 1 | 165 | 1 | 14.2 | 1 | 21.7 | 1 | 41400 | 1 | 15.7 | 1 | 1200 | 1 | 14.9 | 1 | | 0.11 | 1 | 32 | 1 | |
| 11MP17SB04 | 4430 | 1 | 255 | 1 | 1170 | 1 | 149 | 1 | 15 | 1 | 15.9 | 1 | 53200 | 1 | 229 | 1 | 1630 | 1 | 274 | 1 | | 0.259 | 1 | 31.1 | 1 | |
| 11MP17SB14 | 10300 | 1 | 164 | 1 | 141 | 1 | 126 | 1 | 19 | 1 | 6.53 | 1 | 29800 | 1 | 10.5 | 1 | 443 | 1 | 22.7 | 1 | | 0.107 | 1 | 35 | 1 | |
| 11MP18SB04 | 7880 | 1 | 164 | 1 | 170 | 1 | 136 | 1 | 14.5 | 1 | 14.3 | 1 | 35600 | 1 | 10.7 | 1 | 905 | 1 | 41 | 1 | | 0.084 | 1 | 30.9 | 1 | |
| 11MP18SB10 | 10200 | 1 | 3.97 | 1 | 31.1 | 1 | 115 | 1 | 15.4 | 1 | 15.6 | 1 | 36200 | 1 | 11.8 | 1 | 728 | 1 | 1.24 | 1 | | 0.088 | 1 | 32.6 | 1 | |
| 11MP19SB04 | 4970 | 1 | 1.04 | 1 | 19.6 | 1 | 254 | 1 | 11.6 | 1 | 14.7 | 1 | 40700 | 1 | 9.82 | 1 | 1060 | 1 | 1.88 | 1 | | 0.074 | 1 | 36.4 | 1 | |
| 11MP19SB06 | 3080 | 1 | 0.674 | 1 | 9.83 | 1 | 134 | 1 | 10.4 | 1 | 18.5 | 1 | 45300 | 1 | 10.9 | 1 | 695 | 1 | 7.5 | 1 | | 0.069 | 1 | 35.5 | 1 | |
| 11MP20SB04 | 2670 | 1 | 0.909 | 1 | 22.2 | 1 | 190 | 1 | 14.1 | 1 | 14.1 | 1 | 45000 | 1 | 12.3 | 1 | 1100 | 1 | 2.12 | 1 | | 0.082 | 1 | 28.2 | 1 | |
| 11MP20SB08 | 5970 | 1 | 0.351 | 1 | 15.5 | 1 | 266 | 1 | 22.8 | 1 | 17.1 | 1 | 41600 | 1 | 13.1 | 1 | 1320 | 1 | 0.639 | 1 | | 0.072 | 1 | 38.3 | 1 | |
| 11MP20SB12 | | | | | | | | | | | | | 54000 | 1 | | | 1280 | 1 | | | | | | | | |
| 11MP20SB16 | 4580 | 1 | 0.358 | 1 | 7.77 | 1 | 166 | 1 | 18.1 | 1 | 25.7 | 1 | | | 16.8 | 1 | | | 0.758 | 1 | | 0.096 | 1 | 37.5 | 1 | |
| 11MP21SB04 | 6290 | 1 | 15.3 | 1 | 15.3 | 1 | 212 | 1 | 16.1 | 1 | 18.5 | 1 | 39800 | 1 | 15.7 | 1 | 973 | 1 | 1.09 | 1 | | 0.093 | 1 | 34.5 | 1 | |
| 11MP21SB08 | 5000 | 1 | 1.48 | 1 | 10.8 | 1 | 114 | 1 | 16.3 | 1 | 16.2 | 1 | 46600 | 1 | 11.6 | 1 | 362 | 1 | 0.85 | 1 | | 0.077 | 1 | 33.3 | 1 | |
| 11MP21SB14 | 2700 | 1 | 1.13 | 1 | 8.1 | 1 | 99.7 | 1 | 14.2 | 1 | 16.2 | 1 | 39800 | 1 | 12.1 | 1 | 599 | 1 | 0.751 | 1 | | 0.053 | 1 | 36.1 | 1 | |
| 11MP22SB04 | 11800 | 1 | 6370 | 1 | 4970 | 1 | 565 | 1 | 18.1 | 1 | 11.3 | 1 | 35500 | 1 | 0.587 | 1 | 978 | 1 | 61.7 | 1 | | 0.475 | 1 | 20.1 | 1 | |
| 11MP22SB08 | 9420 | 1 | 19300 | 1 | 7320 | 1 | 608 | 1 | 12.6 | 1 | 11.5 | 1 | 42800 | 1 | 0.055 | 1 | 532 | 1 | 223 | 1 | | 0.332 | 1 | 17 | 1 | |
| 11MP22SB12 | 5790 | 1 | 2680 | 1 | 2370 | 1 | 286 | 1 | 17.7 | 1 | 9.52 | 1 | 25400 | 1 | 3.52 | 1 | 677 | 1 | 72.8 | 1 | | 0.213 | 1 | 18.9 | 1 | |
| 11MP23SB10 | 2100 | 1 | 61.3 | 1 | 443 | 1 | 111 | 1 | 11.1 | 1 | 19.5 | 1 | 35500 | 1 | 14.2 | 1 | 595 | 1 | 337 | 1 | | 0.087 | 1 | 20.5 | 1 | |
| 11MP23SB14 | 2270 | 1 | 1350 | 1 | 1420 | 1 | 157 | 1 | 14.1 | 1 | 29.7 | 1 | 39900 | 1 | 13.1 | 1 | 1410 | 1 | 119 | 1 | | 0.131 | 1 | 20.7 | 1 | |
| 11MP24SB04 | 2190 | 1 | 201 | 1 | 1900 | 1 | 139 | 1 | 27.5 | 1 | 24.6 | 1 | 38700 | 1 | 19 | 1 | 678 | 1 | 390 | 1 | | 0.297 | 1 | 30.6 | 1 | |
| 11MP24SB12 | 10900 | 1 | 16100 | 1 | 9250 | 1 | 855 | 1 | 32.1 | 1 | 13 | 1 | 39600 | 1 | 0.25 | 1 | 788 | 1 | 1520 | 1 | | 0.344 | 1 | 22 | 1 | |

Surface Soil (mg/kg) - MPA

| | Aluminum | D_Aluminum | Antimony | D_Antimony | Arsenic | D_Arsenic | Barium | D_Barium | Chromium | D_Chromium | Cobalt | D_Cobalt | Iron | D_Iron | Lead | D_Lead | Manganese | D_Manganese | Mercury | D_Mercury | Naphthalene | D_Naphthalene | Thallium | D_Thallium | Vanadium | D_Vanadium |
|------------|----------|------------|----------|------------|---------|-----------|--------|----------|----------|------------|--------|----------|-------|--------|-------|--------|-----------|-------------|---------|-----------|-------------|---------------|----------|------------|----------|------------|
| 11MP26SB04 | 9440 | 1 | 14600 | 1 | 9530 | 1 | 609 | 1 | 18.8 | 1 | 10.2 | 1 | 32500 | 1 | 0.053 | 1 | 518 | 1 | 1270 | 1 | | | 0.504 | 1 | 16.5 | 1 |
| 11MP26SB10 | 10500 | 1 | 12400 | 1 | 8870 | 1 | 743 | 1 | 16.4 | 1 | 8.28 | 1 | 32700 | 1 | 3.71 | 1 | 499 | 1 | 1070 | 1 | | | 0.339 | 1 | 16.7 | 1 |
| 11MP26SB16 | 11400 | 1 | 1280 | 1 | 808 | 1 | 196 | 1 | 14.9 | 1 | 13.1 | 1 | 26700 | 1 | 9.32 | 1 | 671 | 1 | 44.2 | 1 | | | 0.151 | 1 | 25.5 | 1 |
| 11MP27SB04 | 11800 | 1 | 131 | 1 | 20.8 | 1 | 175 | 1 | 17.2 | 1 | 13.1 | 1 | 34900 | 1 | 9.07 | 1 | 887 | 1 | 0.532 | 1 | | | 0.088 | 1 | 35 | 1 |
| 11MP27SB06 | | | 53.8 | 1 | 93.4 | 1 | | | | | | | 38100 | 1 | | | | | 3.32 | 1 | | | | | | |
| 11MP27SB08 | 13000 | 1 | | | | | 234 | 1 | 29.3 | 1 | 16.8 | 1 | | | 10.8 | 1 | 923 | 1 | | | | | 0.106 | 1 | 39.7 | 1 |
| 11MP28SB06 | 9030 | 1 | 15400 | 1 | 7350 | 1 | 619 | 1 | 17.5 | 1 | 10.5 | 1 | 31900 | 1 | 0.027 | 1 | 570 | 1 | 434 | 1 | | | 0.306 | 1 | 16.5 | 1 |
| 11MP28SB08 | 6720 | 1 | 212 | 1 | 361 | 1 | 208 | 1 | 16.7 | 1 | 18.4 | 1 | 36700 | 1 | 13.4 | 1 | 664 | 1 | 42.1 | 1 | | | 0.129 | 1 | 29.5 | 1 |
| 11MP28SB10 | 12400 | 1 | | | | | | | | | | | | | 7.85 | 1 | 775 | 1 | | | | | | | 33.4 | 1 |
| 11MP28SB12 | | | 1350 | 1 | 1050 | 1 | 244 | 1 | 22.4 | 1 | 11.5 | 1 | 25900 | 1 | | | | | 845 | 1 | | | 0.15 | 1 | | |
| 11MP29SB06 | 12100 | 1 | | | 7360 | 1 | | | 32.4 | 1 | | | 48500 | 1 | | | 1720 | 1 | | | | | 0.554 | 1 | | |
| 11MP29SB10 | 9580 | 1 | 12600 | 1 | 5580 | 1 | 664 | 1 | 29.4 | 1 | 12.2 | 1 | 32000 | 1 | 0.055 | 1 | 665 | 1 | 163 | 1 | | | 0.423 | 1 | 17 | 1 |
| 11MP29SB16 | 10300 | 1 | 12900 | 1 | 4540 | 1 | 1020 | 1 | 23.5 | 1 | 11.8 | 1 | 33400 | 1 | 0.155 | 1 | 630 | 1 | 66.7 | 1 | | | 0.281 | 1 | 18.3 | 1 |
| 11MP29SB28 | | | 15800 | 1 | | | 777 | 1 | | | 10 | 1 | | | 0.237 | 1 | | | 172 | 1 | | | | | 18.7 | 1 |
| 11MP30SB06 | 8910 | 1 | 12800 | 1 | 8670 | 1 | 758 | 1 | 59.6 | 1 | 16.5 | 1 | 35100 | 1 | 0.19 | 1 | 706 | 1 | 2370 | 1 | | | 0.432 | 1 | 24.6 | 1 |
| 11MP30SB12 | 10700 | 1 | 4310 | 1 | 3990 | 1 | 172 | 1 | 18.6 | 1 | 7.48 | 1 | 30800 | 1 | 5.44 | 1 | 367 | 1 | 136 | 1 | | | 0.126 | 1 | 26.1 | 1 |
| 11MP30SB16 | 10900 | 1 | 195 | 1 | 255 | 1 | 124 | 1 | 20.6 | 1 | 16 | 1 | 18900 | 1 | 7.83 | 1 | 179 | 1 | 73.7 | 1 | | | 0.084 | 1 | 27.9 | 1 |
| 11MP31SB04 | 2640 | 1 | 2.34 | 1 | 19.7 | 1 | 79.2 | 1 | 11 | 1 | 14.3 | 1 | 23600 | 1 | 11.9 | 1 | 187 | 1 | 1.92 | 1 | | | 0.068 | 1 | 32.1 | 1 |
| 11MP32SB04 | 1760 | 1 | 128 | 1 | 3720 | 1 | 94 | 1 | 17.3 | 1 | 8.62 | 1 | 36700 | 1 | 95.2 | 1 | 841 | 1 | 134 | 1 | 15 | 1 | 0.307 | 1 | 19.9 | 1 |
| 11MP32SB06 | 1890 | 1 | 214 | 1 | 4170 | 1 | 89.4 | 1 | 19.5 | 1 | 9.32 | 1 | 37800 | 1 | 104 | 1 | 848 | 1 | 214 | 1 | | | 0.324 | 1 | 20.6 | 1 |
| 11MP32SB08 | 6550 | 1 | 186 | 1 | 4010 | 1 | 115 | 1 | 25.8 | 1 | 17.6 | 1 | 37300 | 1 | 124 | 1 | 1050 | 1 | 378 | 1 | | | 0.437 | 1 | 27.9 | 1 |
| 11MP33SB04 | 2110 | 1 | 3.68 | 1 | | | 152 | 1 | | | 34.4 | 1 | 47300 | 1 | 26.1 | 1 | 1270 | 1 | | | | | 0.135 | 1 | | |
| 11MP33SB06 | | | | 1 | 15.7 | 1 | | | 19.6 | 1 | | | | | | | | | 3.44 | 1 | | | | | 42.7 | 1 |
| 11MP34SB04 | 2650 | 1 | 1450 | 1 | 5780 | 1 | 111 | 1 | 30.7 | 1 | 18.7 | 1 | 42900 | 1 | 396 | 1 | 730 | 1 | 211 | 1 | 8.3 | 1 | 0.32 | 1 | 21.4 | 1 |
| 11MP34SB06 | 2770 | 1 | 668 | 1 | 4010 | 1 | 126 | 1 | 27.6 | 1 | 17.1 | 1 | 42900 | 1 | 376 | 1 | 861 | 1 | 212 | 1 | | | 0.347 | 1 | 22.6 | 1 |
| 11MP34SB08 | 9650 | 1 | | | | | 187 | 1 | 24.3 | 1 | 28.5 | 1 | 41000 | 1 | | | 817 | 1 | 73.4 | 1 | | | 0.166 | 1 | 41.3 | 1 |
| 11MP34SB12 | | | | | | | | | | | | | | | | | | | | | 12 | 0 | | | | |
| 11MP34SB22 | | | 165 | 1 | 1580 | 1 | | | | | | | | | 72.8 | 1 | | | | | | | | | | |
| 11MP35SB06 | 8620 | 1 | 4980 | 1 | 2350 | 1 | 321 | 1 | 34.7 | 1 | 14.2 | 1 | 28500 | 1 | 6.1 | 1 | 465 | 1 | 335 | 1 | | | 0.18 | 1 | 32.2 | 1 |
| 11MP35SB12 | 6550 | 1 | 3480 | 1 | 2870 | 1 | 574 | 1 | 15.3 | 1 | 9.69 | 1 | 24400 | 1 | 6.15 | 1 | 497 | 1 | 504 | 1 | | | 0.4 | 1 | 19.1 | 1 |
| 11MP35SB16 | 8980 | 1 | 4500 | 1 | 1300 | 1 | 309 | 1 | 14 | 1 | 8.31 | 1 | 31400 | 1 | 8.87 | 1 | 359 | 1 | 636 | 1 | | | 0.159 | 1 | 15 | 1 |
| 11MP36SB04 | 2730 | 1 | 965 | 1 | 7670 | 1 | 100 | 1 | 11.6 | 1 | 14.4 | 1 | 46400 | 1 | 384 | 1 | 1020 | 1 | 311 | 1 | | | 0.678 | 1 | 18.6 | 1 |
| 11MP36SB08 | 6380 | 1 | 287 | 1 | 2440 | 1 | 87.7 | 1 | 19.4 | 1 | 12.2 | 1 | 36400 | 1 | 112 | 1 | 654 | 1 | 14.3 | 1 | 250 | 0 | 0.202 | 1 | 26.1 | 1 |
| 11MP36SB16 | 3490 | 1 | 5.43 | 1 | 208 | 1 | 61.1 | 1 | 12.3 | 1 | 13.4 | 1 | 51200 | 1 | 27.5 | 1 | 1660 | 1 | 14 | 1 | | | 0.11 | 1 | 27.5 | 1 |
| 11MP37SB06 | 10500 | 1 | | | | | | | 21.7 | 1 | | | | | 16.3 | 1 | | | | | | | | | | |
| 11MP37SB08 | 8760 | 1 | 255 | 1 | 126 | 1 | 159 | 1 | 17.9 | 1 | 10.6 | 1 | 16100 | 1 | 12.3 | 1 | 501 | 1 | 20.6 | 1 | | | 0.1 | 1 | 28.4 | 1 |
| 11MP37SB16 | 2880 | 1 | 2.03 | 1 | 71.3 | 1 | 201 | 1 | 15.1 | 1 | 21 | 1 | 53600 | 1 | 12.7 | 1 | 1260 | 1 | 4.32 | 1 | 2.3 | 0 | 0.118 | 1 | 27.8 | 1 |
| 11MP37SB24 | | | 123 | 1 | 171 | 1 | 127 | 1 | | | 15.5 | 1 | 34700 | 1 | | | 633 | 1 | 45.6 | 1 | | | 0.094 | 1 | 37.9 | 1 |
| 11MP38SB10 | 10100 | 1 | 6080 | 1 | 3590 | 1 | 589 | 1 | 30.1 | 1 | 13 | 1 | 32100 | 1 | 9.26 | 1 | 475 | 1 | 315 | 1 | | | 0.395 | 1 | 21.2 | 1 |
| 11MP38SB14 | 7340 | 1 | 1250 | 1 | 680 | 1 | 152 | 1 | 11.4 | 1 | 10.3 | 1 | 31800 | 1 | 5.94 | 1 | 367 | 1 | 446 | 1 | | | 0.102 | 1 | 15.1 | 1 |
| 11MP38SB16 | 6430 | 1 | 413 | 1 | 706 | 1 | 113 | 1 | 18.8 | 1 | 17.3 | 1 | 39300 | 1 | 8.05 | 1 | 404 | 1 | 93.3 | 1 | | | 0.098 | 1 | 24.4 | 1 |
| 11MP39SB06 | 10100 | 1 | 5430 | 1 | 3240 | 1 | 936 | 1 | 21.5 | 1 | 9.18 | 1 | 25200 | 1 | 4.38 | 1 | 432 | 1 | 81.1 | 1 | | | 0.349 | 1 | 18.5 | 1 |
| 11MP39SB08 | 13800 | 1 | 2180 | 1 | 866 | 1 | 358 | 1 | 23.7 | 1 | 7.35 | 1 | 18700 | 1 | 7.55 | 1 | 322 | 1 | 43.8 | 1 | | | 0.185 | 1 | 23.9 | 1 |
| 11MP39SB12 | 7270 | 1 | 527 | 1 | 666 | 1 | 205 | 1 | 16.2 | 1 | 13 | 1 | 32100 | 1 | 8.63 | 1 | 697 | 1 | 111 | 1 | | | 0.09 | 1 | 21.8 | 1 |
| 11MP40SB06 | 11200 | 1 | 347 | 1 | 276 | 1 | 120 | 1 | 16.9 | 1 | 6.83 | 1 | 23200 | 1 | 8.27 | 1 | 246 | 1 | 10.3 | 1 | | | 0.085 | 1 | 29.4 | 1 |
| 11MP40SB08 | 9900 | 1 | 1460 | 1 | 2390 | 1 | 370 | 1 | 26.2 | 1 | 8.87 | 1 | 27200 | 1 | 6.63 | 1 | 359 | 1 | 185 | 1 | | | 0.2 | 1 | 18 | 1 |
| 11MP40SB10 | 7380 | 1 | 868 | 1 | 1150 | 1 | 347 | 1 | 21.3 | 1 | 11.5 | 1 | 33200 | 1 | 6.92 | 1 | 743 | 1 | 119 | 1 | | | 0.109 | 1 | 22.8 | 1 |
| 11MP41SB04 | 7330 | 1 | 1.04 | 1 | 30.7 | 1 | 154 | 1 | 17 | 1 | 16.9 | 1 | 49300 | 1 | 9.68 | 1 | 942 | 1 | 2.07 | 1 | | | 0.106 | 1 | 33 | 1 |
| 11MP41SB06 | 2990 | 1 | 1.14 | 1 | 59.8 | 1 | 152 | 1 | 11.1 | 1 | 27 | 1 | 41800 | 1 | 20.5 | 1 | 1010 | 1 | 3.55 | 1 | | | 0.131 | 1 | 29.7 | 1 |
| 11MP45SB04 | 9560 | 1 | 11800 | 1 | 3610 | 1 | 521 | 1 | 18.7 | 1 | 9.17 | 1 | 30800 | 1 | 0.043 | 1 | 536 | 1 | 1310 | 1 | 160 | 0 | 0.299 | 1 | 20.9 | 1 |
| 11MP45SB10 | 3240 | 1 | 104 | 1 | 282 | 1 | 132 | 1 | 12.8 | 1 | 16.5 | 1 | 38800 | 1 | 12.4 | 1 | 957 | 1 | 265 | 1 | | | 0.087 | 1 | 25.7 | 1 |
| 11MP45SB12 | 4110 | 1 | 16.5 | 1 | 152 | 1 | 126 | 1 | 13.8 | 1 | 13.9 | 1 | 36900 | 1 | 12.3 | 1 | 767 | 1 | 1020 | 1 | | | 0.116 | 1 | 25.3 | 1 |
| 11MP46SB04 | 8830 | 1 | 15800 | 1 | 4650 | 1 | 830 | 1 | 26.9 | 1 | 11.4 | 1 | 29200 | 1 | 0.074 | 1 | 626 | 1 | 167 | 1 | | | 0.414 | 1 | 19.1 | 1 |
| 11MP46SB12 | 2260 | 1 | 3150 | 1 | 449 | 1 | 141 | 1 | 12.4 | 1 | 18 | 1 | 43600 | 1 | 7.5 | 1 | 845 | 1 | 219 | 1 | | | 0.096 | 1 | 17.6 | 1 |
| 11MP47SB04 | 2650 | 1 | 1750 | 1 | 3840 | 1 | 139 | 1 | 11.9 | 1 | 17.4 | 1 | 40400 | 1 | 6.99 | 1 | 707 | 1 | 939 | 1 | | | 0.134 | 1 | 21.4 | 1 |
| 11MP48SB04 | 3670 | 1 | 1010 | 1 | 2730 | 1 | 152 | 1 | 13.8 | 1 | 15.2 | 1 | 39200 | 1 | 13.2 | 1 | 627 | 1 | 131 | 1 | | | 0.149 | 1 | 23.1 | 1 |
| 11MP48SB08 | 3410 | 1 | 324 | 1 | 2550 | 1 | 110 | 1 | 27.3 | 1 | 14.6 | 1 | 44400 | 1 | 13.7 | 1 | 639 | 1 | 304 | 1 | | | 0.169 | 1 | 25.5 | 1 |
| 11MP48SB12 | | | | | | | 222 | 1 | 29.8 | 1 | 9.41 | 1 | | | 8.66 | 1 | | | | | | | 0.211 | 1 | | |
| 11MP48SB16 | 11700 | 1 | 415 | 1 | 2150 | 1 | | | | | | | 29100 | 1 | | | 259 | 1 | 93.3 | 1 | | | | | 30.4 | 1 |
| 11MP49SB06 | 5320 | 1 | 303 | 1 | 2810 | 1 | 110 | 1 | 15.1 | 1 | 12.2 | 1 | 43400 | 1 | 12.5 | 1 | 454 | 1 | 134 | 1 | | | 0.171 | 1 | 21 | 1 |
| 11MP49SB10 | 13500 | 1 | 1240 | 1 | 348 | 1 | 135 | 1 | 20.3 | 1 | 6.84 | 1 | 24800 | 1 | 5.36 | 1 | 378 | 1 | 263 | 1 | | | 0.115 | 1 | 30.7 | 1 |
| 11MP49SB14 | 12000 | 1 | 94.6 | 1 | | | | | 19.9 | 1 | | | 17900 | 1 | | | | | 38.5 | 1 | | | | | 30.1 | 1 |
| 11MP49SB16 | | | | | 68 | 1 | | | | | | | | | | | | | | | | | | | | |

Surface Soil (mg/kg) - MPA

| | Aluminum | D_Aluminum | Antimony | D_Antimony | Arsenic | D_Arsenic | Barium | D_Barium | Chromium | D_Chromium | Cobalt | D_Cobalt | Iron | D_Iron | Lead | D_Lead | Manganese | D_Manganese | Mercury | D_Mercury | Naphthalene | D_Naphthalene | Thallium | D_Thallium | Vanadium | D_Vanadium |
|------------|----------|------------|----------|------------|---------|-----------|--------|----------|----------|------------|--------|----------|-------|--------|-------|--------|-----------|-------------|---------|-----------|-------------|---------------|----------|------------|----------|------------|
| 11MP51SB06 | 8410 | 1 | 863 | 1 | 2210 | 1 | 189 | 1 | 28.1 | 1 | 10.8 | 1 | 36700 | 1 | 18.2 | 1 | 531 | 1 | 438 | 1 | | | 0.264 | 1 | 42.1 | 1 |
| 11MP51SB08 | | | | | | | | | | | | | | | | | | | | | 120 | 0 | | | | |
| 11MP51SB14 | 1830 | 1 | 343 | 1 | 823 | 1 | 75 | 1 | 12.6 | 1 | 10.2 | 1 | 57400 | 1 | 6.77 | 1 | 353 | 1 | 38.3 | 1 | | | 0.078 | 1 | 19.1 | 1 |
| 11MP52SB06 | 7340 | 1 | 3770 | 1 | 2690 | 1 | 300 | 1 | 19.9 | 1 | 11.7 | 1 | 36900 | 1 | 0.767 | 1 | 760 | 1 | 500 | 1 | | | 0.207 | 1 | 19.6 | 1 |
| 11MP52SB10 | 10800 | 1 | 73.8 | 1 | 76.1 | 1 | 107 | 1 | 19.3 | 1 | 5.7 | 1 | 14800 | 1 | 6.25 | 1 | 170 | 1 | 18.8 | 1 | | | 0.084 | 1 | 27.6 | 1 |
| 11MP53SB04 | 6420 | 1 | 2220 | 1 | 2110 | 1 | 177 | 1 | 15.8 | 1 | 11.9 | 1 | 49200 | 1 | 13.2 | 1 | 494 | 1 | 6110 | 1 | | | 0.142 | 1 | 25.9 | 1 |
| 11MP53SB08 | 6020 | 1 | 262 | 1 | 625 | 1 | 103 | 1 | 15.2 | 1 | 11.1 | 1 | 35500 | 1 | 13.7 | 1 | 430 | 1 | 108 | 1 | | | 0.11 | 1 | 28.1 | 1 |
| 11MP54SB04 | 6380 | 1 | 110 | 1 | 746 | 1 | 121 | 1 | 15.4 | 1 | 11.1 | 1 | 39400 | 1 | 11.5 | 1 | 452 | 1 | 4340 | 1 | 810 | 1 | 0.129 | 1 | 23.8 | 1 |
| 11MP54SB06 | 9710 | 1 | 40.5 | 1 | 181 | 1 | 144 | 1 | 16.1 | 1 | 11.6 | 1 | 22500 | 1 | 8.7 | 1 | 317 | 1 | 5.65 | 1 | | | 0.093 | 1 | 26.3 | 1 |
| 11MP55SB04 | 6270 | 1 | 50.6 | 1 | 253 | 1 | 97.3 | 1 | 14.7 | 1 | 16.6 | 1 | 35400 | 1 | 11.5 | 1 | 1240 | 1 | 30.4 | 1 | | | 0.079 | 1 | 30.7 | 1 |
| 11MP55SB06 | 4510 | 1 | 23.9 | 1 | 81 | 1 | 194 | 1 | 11.2 | 1 | 17.3 | 1 | 37100 | 1 | 15.3 | 1 | 1950 | 1 | 4.21 | 1 | 24 | 1 | 0.144 | 1 | 24.2 | 1 |
| 11MP56SB04 | 11300 | 1 | 696 | 1 | 421 | 1 | 167 | 1 | 16.9 | 1 | 6.81 | 1 | 16800 | 1 | 4.86 | 1 | 317 | 1 | 86.6 | 1 | | | 0.096 | 1 | 24.2 | 1 |
| 11MP56SB06 | 10400 | 1 | 1190 | 1 | 715 | 1 | 198 | 1 | 22 | 1 | 9.25 | 1 | 37200 | 1 | 59.8 | 1 | 378 | 1 | 2030 | 1 | | | 0.114 | 1 | 34.1 | 1 |
| 11MP56SB10 | 2040 | 1 | 27.7 | 1 | 129 | 1 | 97.2 | 1 | 10.4 | 1 | 11.1 | 1 | 37900 | 1 | 8.62 | 1 | 308 | 1 | 15.2 | 1 | | | 0.051 | 1 | 21.5 | 1 |
| 11MP57SB04 | 9140 | 1 | 28900 | 1 | 9460 | 1 | 161 | 1 | | | 7.38 | 1 | 44700 | 1 | | | 435 | 1 | 2070 | 1 | | | 0.158 | 1 | 20.1 | 1 |
| 11MP57SB06 | 10300 | 1 | 57.8 | 1 | 581 | 1 | 89.1 | 1 | 17.1 | 1 | 10.9 | 1 | 37900 | 1 | 8.55 | 1 | 492 | 1 | 15.2 | 1 | 200 | 1 | 0.082 | 1 | 35.6 | 1 |
| 11MP57SB08 | 7640 | 1 | 137 | 1 | 483 | 1 | 85.9 | 1 | 17 | 1 | 10.9 | 1 | 29400 | 1 | 6.57 | 1 | 395 | 1 | 33.9 | 1 | | | 0.093 | 1 | 24.7 | 1 |
| 11MP57SB12 | | | | | | | | | 14.3 | 1 | | | | | 1.1 | 1 | | | | | | | | | | |
| 11MP58SB04 | 2150 | 1 | 40.7 | 1 | 819 | 1 | 138 | 1 | 11.2 | 1 | 21.9 | 1 | 37500 | 1 | 19.1 | 1 | 1150 | 1 | 69.4 | 1 | | | 0.094 | 1 | 23.2 | 1 |
| 11MP58SB08 | 7310 | 1 | 19600 | 1 | 4460 | 1 | 446 | 1 | 16.8 | 1 | 5.5 | 1 | 27900 | 1 | 0.047 | 1 | 247 | 1 | 622 | 1 | | | 0.257 | 1 | 14.2 | 1 |
| 11MP58SB12 | | | | | 323 | 1 | 98 | 1 | 16.9 | 1 | 12 | 1 | | | | | | | 40.3 | 1 | | | 0.075 | 1 | 31.8 | 1 |
| 11MP58SB16 | 8150 | 1 | 195 | 1 | | | | | | | | | 32400 | 1 | 8.66 | 1 | 639 | 1 | | | | | | | | |
| 11MP59SB04 | 2340 | 1 | 215 | 1 | 2870 | 1 | 139 | 1 | 12.6 | 1 | 20.9 | 1 | 37000 | 1 | 26.4 | 1 | 882 | 1 | 423 | 1 | | | 0.219 | 1 | 15.8 | 1 |
| 11MP59SB12 | 13900 | 1 | 441 | 1 | 319 | 1 | 144 | 1 | 20.2 | 1 | 9.29 | 1 | 29600 | 1 | 6.91 | 1 | 441 | 1 | 31.1 | 1 | | | 0.083 | 1 | 34.9 | 1 |
| 11MP59SB14 | 10900 | 1 | 570 | 1 | 366 | 1 | | | 19.7 | 1 | 10.7 | 1 | 32400 | 1 | | | 817 | 1 | | | | | 0.072 | 1 | 33.6 | 1 |
| 11MP59SB18 | | | | | | | 104 | 1 | | | | | | | 5.7 | 1 | | | 40.3 | 1 | | | | | | |
| 11MP60SB04 | 2160 | 1 | 181 | 1 | 2510 | 1 | 145 | 1 | 10.1 | 1 | 17.7 | 1 | 40800 | 1 | 15.1 | 1 | 845 | 1 | 276 | 1 | | | 0.17 | 1 | 20.7 | 1 |
| 11MP60SB14 | 2300 | 1 | 240 | 1 | 3120 | 1 | 116 | 1 | 17 | 1 | 22 | 1 | 46200 | 1 | 15.2 | 1 | 976 | 1 | 348 | 1 | | | 0.158 | 1 | 19.1 | 1 |
| 11MP61SB04 | 14300 | 1 | | | 52.9 | 1 | | | | | | | | | | | | | 2.62 | 1 | | | | | 33.2 | 1 |
| 11MP61SB06 | 14900 | 1 | 1.25 | 1 | 19.7 | 1 | 121 | 1 | 20 | 1 | 6.55 | 1 | 15000 | 1 | 7.96 | 1 | 173 | 1 | 0.702 | 1 | | | 0.105 | 1 | 33 | 1 |
| 11MP61SB08 | | | 4.39 | 1 | | | 123 | 1 | 19.1 | 1 | 6.27 | 1 | 18600 | 1 | 7.47 | 1 | 227 | 1 | | | | | 0.1 | 1 | | |
| 11MP62SB04 | 8510 | 1 | 973 | 1 | 416 | 1 | 112 | 1 | 15.4 | 1 | 9.59 | 1 | 24900 | 1 | 8.18 | 1 | 463 | 1 | 906 | 1 | | | 0.086 | 1 | 29.1 | 1 |
| 11MP62SB14 | 11800 | 1 | 3.23 | 1 | 27.3 | 1 | 75.7 | 1 | 17.1 | 1 | 6.33 | 1 | 16200 | 1 | 9.18 | 1 | 102 | 1 | 0.493 | 1 | | | 0.063 | 1 | 22.6 | 1 |
| 11MP63SB04 | 10700 | 1 | 115 | 1 | 61.6 | 1 | 95.5 | 1 | 15.2 | 1 | 6.8 | 1 | 21500 | 1 | 4.48 | 1 | 472 | 1 | 0.509 | 1 | | | 0.068 | 1 | 22 | 1 |
| 11MP63SB06 | 10300 | 1 | 223 | 1 | 208 | 1 | 85.8 | 1 | 17.8 | 1 | 7.22 | 1 | 42700 | 1 | 6.1 | 1 | 470 | 1 | 7.89 | 1 | | | 0.063 | 1 | 23.6 | 1 |
| 11MP66SB06 | 10600 | 1 | 131 | 1 | 196 | 1 | 87.3 | 1 | 19.9 | 1 | 14.3 | 1 | 21400 | 1 | 9.17 | 1 | 360 | 1 | 31 | 1 | | | 0.074 | 1 | 29.2 | 1 |
| 11MP66SB10 | 9950 | 1 | 24.6 | 1 | 78 | 1 | | | | | | | 45400 | 1 | 9.36 | 1 | | | | | | | 0.067 | 1 | | |
| 11MP66SB16 | | | | | | | | | | | | | | | | | | | | | 3500 | 1 | | | | |
| 11MP66SB24 | | | | | | | 99.5 | 1 | 23.2 | 1 | 17.1 | 1 | | | | | 840 | 1 | 20.9 | 1 | | | | | 31.5 | 1 |
| 11MP89SB06 | 8300 | 1 | 419 | 1 | 490 | 1 | 146 | 1 | 16 | 1 | 8.27 | 1 | 26300 | 1 | 7.36 | 1 | 281 | 1 | 251 | 1 | | | 0.109 | 1 | 24.5 | 1 |
| 11MP89SB12 | 13700 | 1 | 48.8 | 1 | 123 | 1 | 99.8 | 1 | 17.1 | 1 | 5.58 | 1 | 19700 | 1 | 7.13 | 1 | 153 | 1 | 1.71 | 1 | | | 0.089 | 1 | 31.1 | 1 |

Surface Soil (mg/kg) - DA

| | Aluminum | D_Aluminum | Antimony | D_Antimony | Arsenic | D_Arsenic | Barium | D_Barium | Chromium | D_Chromium | Cobalt | D_Cobalt | Iron | D_Iron | Lead | D_Lead | Manganese | D_Manganese | Mercury | D_Mercury | Thallium | D_Thallium | Vanadium | D_Vanadium |
|------------|----------|------------|----------|------------|---------|-----------|--------|----------|----------|------------|--------|----------|-------|--------|------|--------|-----------|-------------|---------|-----------|----------|------------|----------|------------|
| 10RD01SS | 16100 | 1 | 0.61 | 0 | 39 | 1 | 204 | 1 | 31.1 | 1 | 11.2 | 1 | 29800 | 1 | 8 | 1 | 635 | 1 | 1.74 | 1 | 0.37 | 0 | 42.4 | 1 |
| 10RD02SS | 10200 | 1 | 530 | 1 | 1280 | 1 | 287 | 1 | 26 | 1 | 14.5 | 1 | 30600 | 1 | 11 | 1 | 622 | 1 | 43 | 1 | 0.7 | 0 | 30.3 | 1 |
| 10RD03SS | 11700 | 1 | 479 | 1 | 950 | 1 | 265 | 1 | 26 | 1 | 10.5 | 1 | 27700 | 1 | 7 | 1 | 542 | 1 | 28 | 1 | 0.3 | 0 | 30.7 | 1 |
| 10RD04SS | 11800 | 1 | 381 | 1 | 1210 | 1 | 248 | 1 | 29.6 | 1 | 15.5 | 1 | 28600 | 1 | 10 | 1 | 545 | 1 | 99 | 1 | 0.32 | 0 | 34.9 | 1 |
| 10RD05SS | 11500 | 1 | 39 | 1 | 67 | 1 | 165 | 1 | 22.8 | 1 | 9.6 | 1 | 18400 | 1 | 7 | 1 | 221 | 1 | 3.8 | 1 | 0.34 | 0 | 35.7 | 1 |
| 10RD06SS | 9070 | 1 | 677 | 1 | 1250 | 1 | 215 | 1 | 25.7 | 1 | 11.9 | 1 | 23300 | 1 | 11 | 1 | 356 | 1 | 186 | 1 | 0.32 | 0 | 29.7 | 1 |
| 10RD07SS | 10800 | 1 | 30 | 1 | 76 | 1 | 120 | 1 | 21.5 | 1 | 12.2 | 1 | 21100 | 1 | 8 | 1 | 312 | 1 | 16 | 1 | 0.3 | 0 | 37.8 | 1 |
| 10RD08SS | 13800 | 1 | | | | | 157 | 1 | 25 | 1 | | | | | 11 | 1 | 595 | 1 | 0.9 | 1 | | | 42.5 | 1 |
| 10RD09SS | 17300 | 1 | 1.4 | 0 | 20 | 1 | 162 | 1 | 28 | 1 | 16 | 1 | 37300 | 1 | 9 | 1 | 936 | 1 | 2 | 1 | 0.9 | 0 | 48 | 1 |
| 10RD20SS | 9440 | 1 | 974 | 1 | 1310 | 1 | 218 | 1 | 24 | 1 | 12.4 | 1 | 27100 | 1 | 11 | 1 | 434 | 1 | 75 | 1 | 0.27 | 0 | 28.8 | 1 |
| 10RD30SS | | | 1.2 | 0 | 30 | 1 | | | | | 16.1 | | 31700 | 1 | | | | | | | 0.8 | 0 | | |
| 11RD01SB0 | 14800 | 1 | 0.657 | 1 | 10.3 | 1 | 124 | 1 | 22.6 | 1 | 6.02 | 1 | 19600 | 1 | 8.06 | 1 | 117 | 1 | 0.154 | 1 | 0.108 | 1 | 33.4 | 1 |
| 11RD01SB1 | 14800 | 1 | 0.352 | 1 | 3.36 | 1 | 167 | 1 | 28.2 | 1 | 9.65 | 1 | 23200 | 1 | 9.64 | 1 | 222 | 1 | 0.064 | 1 | 0.137 | 1 | 40.7 | 1 |
| 11RD01SB1 | 14600 | 1 | 0.359 | 1 | 8.74 | 1 | 140 | 1 | 27.6 | 1 | 10.8 | 1 | 22900 | 1 | 10.1 | 1 | 221 | 1 | 0.063 | 1 | 0.17 | 1 | 38.7 | 1 |
| 11RD02SB0 | 12100 | 1 | 1950 | 1 | 1880 | 1 | 310 | 1 | 29 | 1 | 13.1 | 1 | 30700 | 1 | 8.05 | 1 | 451 | 1 | 94.5 | 1 | 0.754 | 1 | 31.4 | 1 |
| 11RD02SB0 | 10600 | 1 | 868 | 1 | 1410 | 1 | 254 | 1 | 25.6 | 1 | 12.3 | 1 | 30800 | 1 | 10.3 | 1 | 477 | 1 | 30.6 | 1 | 0.203 | 1 | 30 | 1 |
| 11RD02SB1 | 8630 | 1 | 92 | 1 | 181 | 1 | 95.4 | 1 | 19 | 1 | 16.4 | 1 | 61100 | 1 | 5.66 | 1 | 561 | 1 | 1.78 | 1 | 0.051 | 1 | 31.4 | 1 |
| 11RD03SB0 | 9160 | 1 | 2710 | 1 | 3510 | 1 | 553 | 1 | 27.1 | 1 | 16.7 | 1 | 41100 | 1 | 5.78 | 1 | 786 | 1 | 340 | 1 | 0.388 | 1 | 25.3 | 1 |
| 11RD03SB0 | 5330 | 1 | 844 | 1 | 1790 | 1 | 227 | 1 | 23.5 | 1 | 12.6 | 1 | 32300 | 1 | 11.7 | 1 | 591 | 1 | 471 | 1 | 0.251 | 1 | 22.4 | 1 |
| 11RD03SB1 | 8240 | 1 | 545 | 1 | 503 | 1 | 113 | 1 | 21.1 | 1 | 16.5 | 1 | 34600 | 1 | 8.8 | 1 | 399 | 1 | 70.3 | 1 | 0.113 | 1 | 28.2 | 1 |
| 11RD04SB0 | 13000 | 1 | 149 | 1 | 40.7 | 1 | 129 | 1 | 23.3 | 1 | 6.46 | 1 | 28200 | 1 | 8.37 | 1 | 272 | 1 | 1.26 | 1 | 0.12 | 1 | 33.9 | 1 |
| 11RD04SB0 | 13800 | 1 | | | | | | | 25.5 | 1 | 9.2 | 1 | 29600 | 1 | 8.51 | 1 | | | | | | | 33.4 | 1 |
| 11RD04SB1 | 13400 | 1 | 1.09 | 1 | 8.75 | 1 | 180 | 1 | 21.4 | 1 | 6.33 | 1 | 16700 | 1 | 7.87 | 1 | 160 | 1 | 0.137 | 1 | 0.106 | 1 | 32.3 | 1 |
| 11RD04SB16 | | | 112 | 1 | 450 | 1 | 285 | 1 | | | | | | | | | 331 | 1 | 34 | 1 | 0.146 | 1 | | |
| 11RD05SB0 | 11700 | 1 | 1.33 | 1 | 7.86 | 1 | 124 | 1 | 20.6 | 1 | 6.16 | 1 | 19300 | 1 | 6.29 | 1 | 141 | 1 | 0.283 | 1 | 0.075 | 1 | 35.5 | 1 |
| 11RD05SB1 | 7370 | 1 | 18 | 1 | 36 | 1 | 82.2 | 1 | 21.7 | 1 | 19 | 1 | 23500 | 1 | 10.8 | 1 | 178 | 1 | 1.04 | 1 | 0.139 | 1 | 35.9 | 1 |
| 11RD05SB1 | 2500 | 1 | 0.669 | 1 | 41.2 | 1 | 78.5 | 1 | 16.9 | 1 | 14.5 | 1 | 41400 | 1 | 21.5 | 1 | 915 | 1 | 1.25 | 1 | 0.107 | 1 | 44.6 | 1 |
| 11RD06SB0 | 12700 | 1 | 6.23 | 1 | 18.1 | 1 | 99.9 | 1 | 20.9 | 1 | 7.66 | 1 | 19600 | 1 | 7.7 | 1 | 207 | 1 | 14.1 | 1 | 0.083 | 1 | 39.1 | 1 |
| 11RD06SB0 | 9600 | 1 | 11.3 | 1 | 42.5 | 1 | 78.2 | 1 | 20.4 | 1 | 9.98 | 1 | 20900 | 1 | 7.38 | 1 | 212 | 1 | 5.53 | 1 | 0.068 | 1 | 33.2 | 1 |
| 11RD06SB1 | 4350 | 1 | 0.763 | 1 | 19.6 | 1 | 78.9 | 1 | 12.1 | 1 | 12.3 | 1 | 19400 | 1 | 14.7 | 1 | 358 | 1 | 1.61 | 1 | 0.105 | 1 | 26 | 1 |
| 11RD07SB0 | 12200 | 1 | 4.96 | 1 | 11.1 | 1 | 92.3 | 1 | 19.6 | 1 | 9.54 | 1 | 21900 | 1 | 7.87 | 1 | 253 | 1 | 2.27 | 1 | 0.088 | 1 | 32.5 | 1 |
| 11RD07SB1 | 4330 | 1 | 1.32 | 1 | 22.2 | 1 | 63.1 | 1 | 14.4 | 1 | 9.57 | 1 | 35500 | 1 | 12.1 | 1 | 583 | 1 | 1.94 | 1 | 0.075 | 1 | 29 | 1 |
| 11RD07SB1 | 1530 | 1 | 0.321 | 1 | 25.9 | 1 | 113 | 1 | 12.6 | 1 | 10.1 | 1 | 96500 | 1 | 15 | 1 | 0.03 | 0 | 10.6 | 1 | 0.139 | 1 | 31.5 | 1 |
| 11RD20SB0 | 10400 | 1 | 7.69 | 1 | 21.5 | 1 | 103 | 1 | 19.8 | 1 | 10.4 | 1 | 23700 | 1 | 6.54 | 1 | 242 | 1 | 3.89 | 1 | 0.066 | 1 | 30.6 | 1 |

Surface Soil (mg/kg) - All samples

| | Aluminum | D_Aluminum | Antimony | D_Antimony | Arsenic | D_Arsenic | Barium | D_Barium | Chromium | D_Chromium | Cobalt | D_Cobalt | Iron | D_Iron | Lead | D_Lead | Manganese | D_Manganese | Mercury | D_Mercury | Naphthalene | D_Naphthalene | Thallium | D_Thallium | Vanadium | D_Vanadium | |
|----------|----------|------------|----------|------------|---------|-----------|--------|----------|----------|------------|--------|----------|-------|--------|------|--------|-----------|-------------|---------|-----------|-------------|---------------|----------|------------|----------|------------|---|
| 10DS01SS | 4770 | 1 | 40 | 1 | 1010 | 1 | 171 | 1 | 20 | 1 | 17 | 1 | 46400 | 1 | 12 | 1 | 759 | 1 | 71 | 1 | | | 0.7 | 0 | 33.2 | 1 | |
| 10DS02SS | 7770 | 1 | 40 | 1 | 550 | 1 | 174 | 1 | 21 | 1 | 12.6 | 1 | 32100 | 1 | 9 | 1 | 598 | 1 | 22 | 1 | | | 0.7 | 0 | 31 | 1 | |
| 10DS03SS | 8200 | 1 | 21 | 1 | 355 | 1 | 166 | 1 | 18.9 | 1 | 17.5 | 1 | 28800 | 1 | 10 | 1 | 833 | 1 | 16 | 1 | | | 0.3 | 0 | 32.2 | 1 | |
| 10MP01SS | 15300 | 1 | 20 | 1 | 100 | 1 | 84 | 1 | 24 | 1 | 10 | 1 | 30300 | 1 | 9 | 1 | 302 | 1 | 2.6 | 1 | | | 0.8 | 0 | 47 | 1 | |
| 10MP02SS | 3390 | 1 | | | 7310 | 1 | 134 | 1 | 8 | 1 | 35 | 1 | 50100 | 1 | 20 | 1 | 1190 | 1 | | | | | 1.3 | 0 | 20 | 1 | |
| 10MP0304 | 13900 | 1 | 5500 | 1 | 5580 | 1 | 639 | 1 | 39 | 1 | 17.1 | 1 | 41300 | 1 | 28 | 1 | 737 | 1 | 680 | 1 | | | 0.7 | 0 | 36.2 | 1 | |
| 10MP03SS | 15200 | 1 | 4720 | 1 | 5200 | 1 | 769 | 1 | 46 | 1 | 17.8 | 1 | 35800 | 1 | 38 | 1 | 527 | 1 | 710 | 1 | | | 0.7 | 0 | 33.9 | 1 | |
| 10MP04SS | 16700 | 1 | 5530 | 1 | 6670 | 1 | 750 | 1 | 71 | 1 | 15.2 | 1 | 39400 | 1 | 24 | 1 | 502 | 1 | 860 | 1 | | | 0.7 | 0 | 33.5 | 1 | |
| 10MP05SS | 14500 | 1 | 4460 | 1 | 5660 | 1 | 697 | 1 | 45 | 1 | 14.3 | 1 | 38400 | 1 | 24 | 1 | 523 | 1 | 900 | 1 | | | 0.7 | 0 | 34.7 | 1 | |
| 10MP0607 | 10400 | 1 | 4420 | 1 | 4520 | 1 | 496 | 1 | 34 | 1 | 19.1 | 1 | 42900 | 1 | 22 | 1 | 616 | 1 | 750 | 1 | | | 0.7 | 0 | 33.5 | 1 | |
| 10MP06SS | 11500 | 1 | 5750 | 1 | 5640 | 1 | 580 | 1 | 29 | 1 | 14.2 | 1 | 40700 | 1 | 33 | 1 | 596 | 1 | 750 | 1 | | | 0.7 | 0 | 29 | 1 | |
| 10MP07SS | 10700 | 1 | 8200 | 1 | 4280 | 1 | 572 | 1 | 32 | 1 | 17 | 1 | 35400 | 1 | 10 | 1 | 692 | 1 | 790 | 1 | | | 1.4 | 0 | 29 | 1 | |
| 10MP08SS | 6440 | 1 | 1220 | 1 | 3040 | 1 | 286 | 1 | 24 | 1 | 21 | 1 | 46600 | 1 | 29 | 1 | 688 | 1 | 295 | 1 | | | 0.7 | 0 | 31.4 | 1 | |
| 10MP09SS | 8210 | 1 | 1990 | 1 | 4200 | 1 | 424 | 1 | 33 | 1 | 20.2 | 1 | 41800 | 1 | 29 | 1 | 650 | 1 | 560 | 1 | | | 0.7 | 0 | 30.3 | 1 | |
| 10MP10SS | 6800 | 1 | 470 | 1 | 1540 | 1 | 225 | 1 | 23 | 1 | 22.5 | 1 | 43700 | 1 | 30 | 1 | 813 | 1 | 172 | 1 | | 14 | 1 | 0.7 | 0 | 39 | 1 |
| 10MP11SS | 12500 | 1 | 6980 | 1 | 5320 | 1 | 796 | 1 | 43 | 1 | 21 | 1 | 40300 | 1 | 19 | 1 | 785 | 1 | 660 | 1 | | | 0.6 | 0 | 34.5 | 1 | |
| 10MP12SS | 12000 | 1 | 10900 | 1 | 4870 | 1 | 746 | 1 | 35 | 1 | 19 | 1 | 38000 | 1 | 1 | 0 | 801 | 1 | 304 | 1 | | | 1.4 | 0 | 32 | 1 | |
| 10MP13SS | 14600 | 1 | 12100 | 1 | 4890 | 1 | 840 | 1 | 41 | 1 | 18 | 1 | 34100 | 1 | 1 | 0 | 676 | 1 | 690 | 1 | | | 1.4 | 0 | 31 | 1 | |
| 10MP14SS | 9920 | 1 | 3400 | 1 | 2320 | 1 | 462 | 1 | 24 | 1 | 18.5 | 1 | 37800 | 1 | 24 | 1 | 874 | 1 | 162 | 1 | | | 0.7 | 0 | 36.4 | 1 | |
| 10MP15SS | 14800 | 1 | 11800 | 1 | 4660 | 1 | 1160 | 1 | 30 | 1 | 18 | 1 | 33300 | 1 | 20 | 1 | 694 | 1 | 217 | 1 | | | 1.5 | 0 | 32 | 1 | |
| 10MP16SS | 6570 | 1 | 1570 | 1 | 6950 | 1 | 358 | 1 | 40 | 1 | 22.3 | 1 | 41500 | 1 | 16 | 1 | | | 290 | 1 | | | 0.7 | 0 | 27.6 | 1 | |
| 10MP17SS | 15700 | 1 | | | 5540 | 1 | 1020 | 1 | 51 | 1 | | | 35900 | 1 | | | | | | | | | | | 34.8 | 1 | |
| 10MP18SS | 11300 | 1 | 4810 | 1 | 2570 | 1 | 462 | 1 | 27 | 1 | 17.7 | 1 | 34500 | 1 | 16 | 1 | 965 | 1 | 136 | 1 | | | 0.7 | 0 | 35.8 | 1 | |
| 10MP19SS | 13000 | 1 | 40 | 1 | 170 | 1 | 90.3 | 1 | 23 | 1 | 16.2 | 1 | 30600 | 1 | 9 | 1 | 537 | 1 | 38 | 1 | | 2.7 | 0 | 0.7 | 0 | 45.4 | 1 |
| 10MP20SS | 7370 | 1 | 40 | 1 | 230 | 1 | 213 | 1 | 25 | 1 | 18.2 | 1 | 48100 | 1 | 40 | 1 | 1040 | 1 | 62 | 1 | | 12 | 0 | 0.7 | 0 | 39.8 | 1 |
| 10MP21SS | 5330 | 1 | 80 | 1 | 360 | 1 | 319 | 1 | 32 | 1 | 25.2 | 1 | 55600 | 1 | 24 | 1 | 1390 | 1 | 63 | 1 | | 3.6 | 0 | 0.7 | 0 | 49.5 | 1 |
| 10MP22SS | 6170 | 1 | 2500 | 1 | 1960 | 1 | 346 | 1 | 25 | 1 | 26.2 | 1 | 45000 | 1 | 28 | 1 | 991 | 1 | 106 | 1 | | | 0.7 | 0 | 31.6 | 1 | |
| 10MP23SS | 11300 | 1 | 8720 | 1 | 4380 | 1 | 598 | 1 | 30 | 1 | 19 | 1 | 38400 | 1 | 10 | 1 | 892 | 1 | 261 | 1 | | | 1.3 | 0 | 33 | 1 | |
| 10MP24SS | 5280 | 1 | 1180 | 1 | 2020 | 1 | 277 | 1 | 26 | 1 | 23 | 1 | 42500 | 1 | 30 | 1 | 768 | 1 | 440 | 1 | | | 0.7 | 0 | 27.3 | 1 | |
| 10MP25SS | 13700 | 1 | 14100 | 1 | 5400 | 1 | 882 | 1 | 41 | 1 | 17 | 1 | 34000 | 1 | 80 | 1 | 604 | 1 | 1340 | 1 | | | 1.3 | 0 | 31 | 1 | |
| 10MP26SS | 14600 | 1 | 15100 | 1 | 6420 | 1 | 890 | 1 | 49 | 1 | 18 | 1 | 35500 | 1 | 1 | 0 | 829 | 1 | 1620 | 1 | | | 1.3 | 0 | 34 | 1 | |
| 10MP27SS | 12700 | 1 | 8480 | 1 | 6100 | 1 | 735 | 1 | 37 | 1 | 19 | 1 | 42600 | 1 | 220 | 1 | 708 | 1 | 250 | 1 | | | 1.4 | 0 | 32 | 1 | |
| 10MP28SS | 12200 | 1 | 4780 | 1 | 5350 | 1 | 682 | 1 | 33 | 1 | 16.6 | 1 | 38700 | 1 | 43 | 1 | 617 | 1 | 820 | 1 | | | 0.7 | 0 | 31.1 | 1 | |
| 10MP29SS | 14200 | 1 | 16700 | 1 | 6170 | 1 | 870 | 1 | 41 | 1 | 18 | 1 | 36700 | 1 | 1.9 | 0 | 739 | 1 | 440 | 1 | | | 2.7 | 0 | 35 | 1 | |
| 10MP30SS | 8560 | 1 | 720 | 1 | 2930 | 1 | 263 | 1 | 22 | 1 | 15.8 | 1 | 31200 | 1 | 57 | 1 | 539 | 1 | 400 | 1 | | | 0.7 | 0 | 29.4 | 1 | |
| 10MP31SS | 14700 | 1 | 7 | 1 | 19 | 1 | 76.2 | 1 | 21.5 | 1 | 7.4 | 1 | 26100 | 1 | 7 | 1 | 258 | 1 | 0.28 | 1 | | | 0.32 | 0 | 47.5 | 1 | |
| 10MP32SS | 3100 | 1 | 1430 | 1 | 9880 | 1 | 126 | 1 | 19 | 1 | 16 | 1 | 44300 | 1 | 180 | 1 | 708 | 1 | 127 | 1 | | 2.7 | 0 | 1.5 | 0 | 21 | 1 |
| 10MP33SS | 12000 | 1 | 9 | 1 | 18 | 1 | 112 | 1 | 18.7 | 1 | 5.9 | 1 | 16800 | 1 | 8 | 1 | 158 | 1 | 1.46 | 1 | | | 0.4 | 0 | 32.2 | 1 | |
| 10MP34SS | 2410 | 1 | 780 | 1 | 8510 | 1 | 101 | 1 | 10 | 1 | 16 | 1 | 43300 | 1 | 160 | 1 | 814 | 1 | 79 | 1 | | 2.6 | 0 | 1.4 | 0 | 20 | 1 |
| 10MP35SS | 11900 | 1 | 1680 | 1 | 2390 | 1 | 474 | 1 | 37 | 1 | 21.3 | 1 | 29900 | 1 | 43 | 1 | 764 | 1 | 183 | 1 | | | 0.7 | 0 | 35.6 | 1 | |
| 10MP36SS | 3240 | 1 | 690 | 1 | 7050 | 1 | 145 | 1 | 18 | 1 | | | 49400 | 1 | 198 | 1 | 1090 | 1 | | | | 2.7 | 0 | 0.7 | 0 | 25.3 | 1 |
| 10MP37SS | 12100 | 1 | 20 | 1 | 60 | 1 | 144 | 1 | 24 | 1 | 20.3 | 1 | 34400 | 1 | 9 | 1 | 480 | 1 | 3.6 | 1 | | | 0.7 | 0 | 41.1 | 1 | |
| 10MP38SS | 10900 | 1 | 760 | 1 | 992 | 1 | 207 | 1 | 22.9 | 1 | 20.1 | 1 | 27400 | 1 | 17 | 1 | 540 | 1 | 154 | 1 | | | 0.28 | 0 | 35.6 | 1 | |
| 10MP39SS | 10800 | 1 | 1910 | 1 | 1770 | 1 | 401 | 1 | 34 | 1 | 16.2 | 1 | 31600 | 1 | 12 | 1 | 486 | 1 | 42 | 1 | | | 0.7 | 0 | 34.1 | 1 | |
| 10MP40SS | 11700 | 1 | 267 | 1 | 375 | 1 | 162 | 1 | 25.4 | 1 | 13.6 | 1 | 26300 | 1 | 9 | 1 | 310 | 1 | 15 | 1 | | | 0.3 | 0 | 39.3 | 1 | |
| 10MP41SS | 8450 | 1 | 39 | 1 | 516 | 1 | 102 | 1 | 18.9 | 1 | 9.5 | 1 | 22300 | 1 | 6 | 1 | 313 | 1 | 8 | 1 | | | 0.28 | 0 | 30.8 | 1 | |
| 10MP4243 | 5280 | 1 | 880 | 1 | 1840 | 1 | 211 | 1 | 20 | 1 | 20.5 | 1 | 50200 | 1 | 22 | 1 | 702 | 1 | 136 | 1 | | | 0.7 | 0 | 32.7 | 1 | |
| 10MP42SS | 5660 | 1 | 560 | 1 | 1770 | 1 | 218 | 1 | 20 | 1 | 19.9 | 1 | 41900 | 1 | 22 | 1 | 759 | 1 | 124 | 1 | | | 0.7 | 0 | 30.9 | 1 | |
| 10MP43SS | 5360 | 1 | 720 | 1 | 2080 | 1 | 224 | 1 | 21 | 1 | 20.5 | 1 | 41400 | 1 | 24 | 1 | 789 | 1 | 149 | 1 | | | 0.7 | 0 | 31.2 | 1 | |
| 10MP44SS | 5210 | 1 | 340 | 1 | 860 | 1 | 196 | 1 | 19 | 1 | 19.6 | 1 | 43500 | 1 | 23 | 1 | 656 | 1 | 86 | 1 | | | 0.7 | 0 | 35.5 | 1 | |
| 10MP45SS | 5630 | 1 | 220 | 1 | 1800 | 1 | 205 | 1 | 19 | 1 | 23.1 | 1 | 53700 | 1 | 21 | 1 | 877 | 1 | 87 | 1 | | 26 | 1 | 0.7 | 0 | 37.3 | 1 |
| 10MP46SS | 12700 | 1 | 13000 | 1 | 4940 | 1 | 892 | 1 | 39 | 1 | 19 | 1 | 37200 | 1 | 1 | 0 | 758 | 1 | 194 | 1 | | 2.7 | 0 | 1.3 | 0 | 34 | 1 |
| 10MP47SS | 5650 | 1 | 90 | 1 | 1180 | 1 | 191 | 1 | 20 | 1 | 21.4 | 1 | 47000 | 1 | 18 | 1 | 672 | 1 | 118 | 1 | | 70 | 1 | 0.7 | 0 | 31.9 | 1 |
| 10MP48SS | 10500 | 1 | 5980 | 1 | 3940 | 1 | 498 | 1 | 31 | 1 | 16.3 | 1 | 35500 | 1 | 3090 | 1 | 737 | 1 | 1260 | 1 | | | 0.6 | 0 | 32.2 | 1 | |
| 10MP49SS | 11900 | 1 | 10900 | 1 | 4130 | 1 | 562 | 1 | 42 | 1 | 17 | 1 | 32600 | 1 | 0.9 | 0 | 707 | 1 | 176 | 1 | | | 1.3 | 0 | 34 | 1 | |
| 10MP5051 | 9170 | 1 | 10100 | 1 | 3610 | 1 | 431 | 1 | 28 | 1 | 17 | 1 | 40100 | 1 | 20 | 1 | 605 | 1 | 144 | 1 | | | 1.3 | 0 | 32 | 1 | |
| 10MP50SS | 10600 | 1 | 210 | 1 | 826 | 1 | 135 | 1 | 20.1 | 1 | 8.1 | 1 | 19700 | 1 | 11 | 1 | 267 | 1 | 318 | 1 | | | 0.29 | 0 | 30.6 | 1 | |
| 10MP51SS | 11100 | 1 | 23300 | 1 | 4610 | 1 | 732 | 1 | 41 | 1 | 17 | 1 | 33600 | 1 | 1.9 | 0 | 644 | 1 | 119 | 1 | | | 2.7 | 0 | 28 | 1 | |
| 10MP52SS | 12800 | 1 | 18500 | 1 | 5000 | 1 | 663 | 1 | 40 | 1 | 15 | 1 | 29700 | 1 | 1.9 | 0 | 562 | 1 | 183 | 1 | | | 2.6 | 0 | 30 | 1 | |

Surface Soil (mg/kg) - All samples

| | Aluminum | D_Aluminum | Antimony | D_Antimony | Arsenic | D_Arsenic | Barium | D_Barium | Chromium | D_Chromium | Cobalt | D_Cobalt | Iron | D_Iron | Lead | D_Lead | Manganese | D_Manganese | Mercury | D_Mercury | Naphthalene | D_Naphthalene | Thallium | D_Thallium | Vanadium | D_Vanadium |
|----------|----------|------------|----------|------------|---------|-----------|--------|----------|----------|------------|--------|----------|-------|--------|------|--------|-----------|-------------|---------|-----------|-------------|---------------|----------|------------|----------|------------|
| 10MP53SS | 6490 | 1 | 1480 | 1 | 3000 | 1 | 291 | 1 | 24 | 1 | 17.8 | 1 | 41000 | 1 | 44 | 1 | 501 | 1 | 183 | 1 | | 0.7 | 0 | 29.8 | 1 | |
| 10MP54SS | 6340 | 1 | 20 | 1 | 1360 | 1 | 186 | 1 | 18 | 1 | 18.7 | 1 | 39600 | 1 | 12 | 1 | 1110 | 1 | 24.4 | 1 | | 0.7 | 0 | 30.9 | 1 | |
| 10MP55SS | 9340 | 1 | 764 | 1 | 1100 | 1 | 221 | 1 | 26.9 | 1 | 11.9 | 1 | 21800 | 1 | 9 | 1 | 644 | 1 | 114 | 1 | | 0.28 | 0 | 27.3 | 1 | |
| 10MP55SS | 9480 | 1 | 1890 | 1 | 2150 | 1 | 340 | 1 | 31 | 1 | 16.9 | 1 | 29200 | 1 | 13 | 1 | 573 | 1 | 124 | 1 | | 0.7 | 0 | 28.9 | 1 | |
| 10MP56SS | 7750 | 1 | 183 | 1 | 333 | 1 | 119 | 1 | 17 | 1 | 8.2 | 1 | 17300 | 1 | 5 | 1 | 309 | 1 | 19.1 | 1 | | 0.26 | 0 | 24.7 | 1 | |
| 10MP57SS | 7730 | 1 | 1630 | 1 | 2000 | 1 | 269 | 1 | 22 | 1 | 14.9 | 1 | 31700 | 1 | 18 | 1 | 559 | 1 | 150 | 1 | | 0.7 | 0 | 28 | 1 | |
| 10MP58SS | 8980 | 1 | 716 | 1 | 1080 | 1 | 256 | 1 | 24.3 | 1 | 13.7 | 1 | 25500 | 1 | 14 | 1 | 415 | 1 | 114 | 1 | | 0.29 | 0 | 28.4 | 1 | |
| 10MP59SS | | | 170 | 1 | 1130 | 1 | | | | | 23.1 | 1 | 38000 | 1 | 14 | 1 | 991 | 1 | 115 | 1 | | 0.6 | 0 | 24.3 | 1 | |
| 10MP60SS | 5910 | 1 | 660 | 1 | 1800 | 1 | 217 | 1 | 20 | 1 | 21.7 | 1 | 35100 | 1 | 19 | 1 | 572 | 1 | 144 | 1 | | 0.6 | 0 | 29.6 | 1 | |
| 10MP61SS | 9710 | 1 | 1200 | 1 | 1410 | 1 | 211 | 1 | 23.4 | 1 | 15.7 | 1 | 27900 | 1 | 12 | 1 | 477 | 1 | 68 | 1 | | 0.29 | 0 | 33.2 | 1 | |
| 10MP62SS | 8550 | 1 | 1590 | 1 | 1880 | 1 | 297 | 1 | 26 | 1 | 20.3 | 1 | 34400 | 1 | 13 | 1 | 616 | 1 | 165 | 1 | | 0.7 | 0 | 31.4 | 1 | |
| 10MP63SS | 8200 | 1 | 2680 | 1 | 2880 | 1 | 319 | 1 | 28 | 1 | 18.2 | 1 | 33300 | 1 | 11 | 1 | 563 | 1 | 150 | 1 | | 0.7 | 0 | 27.7 | 1 | |
| 10MP64SS | 10300 | 1 | 1810 | 1 | 2520 | 1 | 371 | 1 | 33 | 1 | 17.3 | 1 | 28900 | 1 | 10 | 1 | 507 | 1 | 172 | 1 | | 0.7 | 0 | 28.6 | 1 | |
| 10MP65SS | 10400 | 1 | 589 | 1 | 1200 | 1 | 255 | 1 | 25.1 | 1 | 11.2 | 1 | 25600 | 1 | 10 | 1 | 411 | 1 | 54 | 1 | | 0.29 | 0 | 31.5 | 1 | |
| 10MP66SS | 5500 | 1 | 220 | 1 | 2490 | 1 | 212 | 1 | 31 | 1 | 23.7 | 1 | 43400 | 1 | 12 | 1 | 879 | 1 | 145 | 1 | | 0.6 | 0 | 32.4 | 1 | |
| 10MP67SS | 12400 | 1 | 9830 | 1 | 5240 | 1 | 622 | 1 | 36 | 1 | 18 | 1 | 31500 | 1 | 10 | 1 | 673 | 1 | 730 | 1 | | 1.4 | 0 | 32 | 1 | |
| 10MP68SS | 9470 | 1 | 351 | 1 | 959 | 1 | 149 | 1 | 20.8 | 1 | 15.3 | 1 | 21600 | 1 | 11 | 1 | 346 | 1 | 109 | 1 | | 0.3 | 0 | 30.9 | 1 | |
| 10MP80SS | 12600 | 1 | 5600 | 1 | 5800 | 1 | 567 | 1 | 35 | 1 | 17 | 1 | 35300 | 1 | 30 | 1 | 528 | 1 | 780 | 1 | | 1.4 | 0 | 31 | 1 | |
| 10MP81SS | | | 250 | 1 | | | | | | | | | | | | | | | 94 | 1 | | | | | | |
| 10MP82SS | | | 7300 | 1 | | | | | | | 22 | 1 | | | 70 | 1 | 693 | 1 | 479 | 1 | | 1.3 | 0 | | | |
| 10MP83SS | 5160 | 1 | 1670 | 1 | 1940 | 1 | 251 | 1 | 27 | 1 | 23.5 | 1 | 39300 | 1 | 28 | 1 | 711 | 1 | 387 | 1 | | 0.7 | 0 | 26.9 | 1 | |
| 10MP84SS | | | | | | | | | | | 18.1 | 1 | | | 1 | | | | 85 | 1 | | | | | | |
| 10MP85SS | 4870 | 1 | 850 | 1 | 2160 | 1 | 208 | 1 | 34 | 1 | 24.4 | 1 | 37200 | 1 | 13 | 1 | 761 | 1 | 129 | 1 | | 0.6 | 0 | 29.7 | 1 | |
| 10MP86SS | 4170 | 1 | | | | | 219 | 1 | 13 | 1 | | | | | | | | | | | | | | | | |
| 10MP87SS | 5320 | 1 | 90 | 1 | 320 | 1 | 297 | 1 | 25 | 1 | 22.2 | 1 | 45700 | 1 | 22 | 1 | 1500 | 1 | 67 | 1 | | 0.7 | 0 | 43 | 1 | |
| 10MP88SS | 15600 | 1 | 11500 | 1 | 5780 | 1 | 880 | 1 | 54 | 1 | 19 | 1 | 33300 | 1 | 0.9 | 0 | 665 | 1 | 590 | 1 | | 1.3 | 0 | 36 | 1 | |
| 10MP89SS | | | | | | | | | | | | | | | | | 726 | 1 | | | | | | | | |
| 10OP01SS | 21700 | 1 | 3520 | 1 | 5340 | 1 | 1710 | 1 | 101 | 1 | 20.1 | 1 | 19500 | 1 | 15 | 1 | 711 | 1 | 170 | 1 | | 0.7 | 0 | 37.5 | 1 | |
| 10RD01SS | 16100 | 1 | 0.61 | 0 | 39 | 1 | 204 | 1 | 31.1 | 1 | 11.2 | 1 | 29800 | 1 | 8 | 1 | 635 | 1 | 1.74 | 1 | | 0.37 | 0 | 42.4 | 1 | |
| 10RD02SS | 10200 | 1 | 530 | 1 | 1280 | 1 | 287 | 1 | 26 | 1 | 14.5 | 1 | 30600 | 1 | 11 | 1 | 622 | 1 | 43 | 1 | | 0.7 | 0 | 30.3 | 1 | |
| 10RD03SS | 11700 | 1 | 479 | 1 | 950 | 1 | 265 | 1 | 26 | 1 | 10.5 | 1 | 27700 | 1 | 7 | 1 | 542 | 1 | 28 | 1 | | 0.3 | 0 | 30.7 | 1 | |
| 10RD04SS | 11800 | 1 | 381 | 1 | 1210 | 1 | 248 | 1 | 29.6 | 1 | 15.5 | 1 | 28600 | 1 | 10 | 1 | 545 | 1 | 99 | 1 | | 0.32 | 0 | 34.9 | 1 | |
| 10RD05SS | 11500 | 1 | 39 | 1 | 67 | 1 | 165 | 1 | 22.8 | 1 | 9.6 | 1 | 18400 | 1 | 7 | 1 | 221 | 1 | 3.8 | 1 | | 0.34 | 0 | 35.7 | 1 | |
| 10RD06SS | 9070 | 1 | 677 | 1 | 1250 | 1 | 215 | 1 | 25.7 | 1 | 11.9 | 1 | 23300 | 1 | 11 | 1 | 356 | 1 | 186 | 1 | | 0.32 | 0 | 29.7 | 1 | |
| 10RD07SS | 10800 | 1 | 30 | 1 | 76 | 1 | 120 | 1 | 21.5 | 1 | 12.2 | 1 | 21100 | 1 | 8 | 1 | 312 | 1 | 16 | 1 | | 0.3 | 0 | 37.8 | 1 | |
| 10RD08SS | 13800 | 1 | | | | | 157 | 1 | 25 | 1 | | | | | 11 | 1 | 595 | 1 | 0.9 | 1 | | | | 42.5 | 1 | |
| 10RD09SS | 17300 | 1 | 1.4 | 0 | 20 | 1 | 162 | 1 | 28 | 1 | 16 | 1 | 37300 | 1 | 9 | 1 | 936 | 1 | 2 | 1 | | 0.9 | 0 | 48 | 1 | |
| 10RD20SS | 9440 | 1 | 974 | 1 | 1310 | 1 | 218 | 1 | 24 | 1 | 12.4 | 1 | 27100 | 1 | 11 | 1 | 434 | 1 | 75 | 1 | | 0.27 | 0 | 28.8 | 1 | |
| 10RD30SS | | | 1.2 | 0 | 30 | 1 | | | | | 16.1 | 1 | 31700 | 1 | | | | | | | | 0.8 | 0 | | | |
| 10RS01SS | 14600 | 1 | 34 | 1 | 29 | 1 | 202 | 1 | 30.5 | 1 | 11 | 1 | 29900 | 1 | 9 | 1 | 655 | 1 | 1.25 | 1 | | 0.37 | 0 | 40.3 | 1 | |
| 10RS02SS | 14000 | 1 | 9 | 1 | 30 | 1 | 188 | 1 | 29.4 | 1 | 10.9 | 1 | 29300 | 1 | 8 | 1 | 609 | 1 | 1.15 | 1 | | 0.33 | 0 | 39.6 | 1 | |
| 10RS03SS | 10600 | 1 | 0.53 | 0 | 110 | 1 | 154 | 1 | 20.6 | 1 | 13.4 | 1 | 24800 | 1 | 8 | 1 | 719 | 1 | 3.57 | 1 | | 0.32 | 0 | 33.6 | 1 | |
| 10SM01SS | 4340 | 1 | 40 | 1 | 1710 | 1 | 173 | 1 | 16 | 1 | 31.8 | 1 | 42700 | 1 | 18 | 1 | 844 | 1 | 29 | 1 | | 0.7 | 0 | 23.4 | 1 | |
| 10SM02SS | 5300 | 1 | 80 | 1 | 3620 | 1 | 212 | 1 | 17 | 1 | 26 | 1 | 48900 | 1 | 13 | 1 | 854 | 1 | 44 | 1 | | 0.7 | 0 | 29.4 | 1 | |
| 10SM03SS | 5950 | 1 | 90 | 1 | 2290 | 1 | 193 | 1 | 32 | 1 | 19 | 1 | | | 14 | 1 | | | | | | | | 32.1 | 1 | |
| 10SM04SS | 7530 | 1 | 20 | 1 | 1470 | 1 | 339 | 1 | 23 | 1 | 24.3 | 1 | 41300 | 1 | 16 | 1 | 1130 | 1 | 31 | 1 | | 0.7 | 0 | 36 | 1 | |
| 10SM05SS | 4720 | 1 | 140 | 1 | 5120 | 1 | 306 | 1 | 19 | 1 | 38.8 | 1 | 59100 | 1 | 16 | 1 | 4230 | 1 | 102 | 1 | | 0.7 | 0 | 32.3 | 1 | |
| 10SM06SS | 5440 | 1 | 30 | 1 | 890 | 1 | 317 | 1 | 11 | 1 | 35.3 | 1 | 55800 | 1 | 32 | 1 | 1430 | 1 | 25 | 1 | | 0.7 | 0 | 25.3 | 1 | |
| 10SM07SS | 6040 | 1 | 2.3 | 0 | 8510 | 1 | 332 | 1 | 21 | 1 | 11 | 1 | 37900 | 1 | 10 | 1 | 362 | 1 | 174 | 1 | | 1.4 | 0 | 25 | 1 | |
| 10SM08SS | 5330 | 1 | 10 | 1 | 230 | 1 | 241 | 1 | 15 | 1 | 22 | 1 | 58100 | 1 | 22 | 1 | 780 | 1 | 8 | 1 | | 0.7 | 0 | 33 | 1 | |
| 10SM09SS | 4130 | 1 | 1.1 | 0 | 190 | 1 | 287 | 1 | 14 | 1 | 26.9 | 1 | 40300 | 1 | 17 | 1 | 1040 | 1 | 9 | 1 | | 0.7 | 0 | 28.6 | 1 | |
| 10SM10SS | 15300 | 1 | 0.45 | 0 | 12 | 1 | 174 | 1 | 25.6 | 1 | 9.4 | 1 | 22400 | 1 | 6 | 1 | 340 | 1 | 0.15 | 1 | | 0.27 | 0 | 42 | 1 | |
| 10SM11SS | 19500 | 1 | 0.49 | 0 | 11 | 1 | 97 | 1 | 26.9 | 1 | 10.8 | 1 | 25100 | 1 | 8 | 1 | 323 | 1 | 0.17 | 1 | | 0.3 | 0 | 44.3 | 1 | |
| 10SM12SS | 12600 | 1 | 1.2 | 0 | 90 | 1 | 176 | 1 | 27 | 1 | 13.4 | 1 | 27500 | 1 | 10 | 1 | 529 | 1 | 5.4 | 1 | | 0.7 | 0 | 43.6 | 1 | |
| 10SM13SS | 9170 | 1 | 40 | 1 | 670 | 1 | 215 | 1 | 21 | 1 | 34.8 | 1 | 38400 | 1 | 14 | 1 | 1150 | 1 | 23 | 1 | | 0.7 | 0 | 36.4 | 1 | |
| 10SM14SS | 16300 | 1 | 0.48 | 0 | 10 | 1 | 165 | 1 | 26.1 | 1 | 9.5 | 1 | 22300 | 1 | 7 | 1 | 307 | 1 | 0.14 | 1 | | 0.29 | 0 | 42.4 | 1 | |
| 10SM15SS | 14800 | 1 | 0.48 | 0 | 21 | 1 | 165 | 1 | 24.6 | 1 | 15.7 | 1 | 23500 | 1 | 8 | 1 | 479 | 1 | 0.62 | 1 | | 0.29 | 0 | 41.4 | 1 | |
| 10SM16SS | 11000 | 1 | 1.2 | 0 | 350 | 1 | 248 | 1 | 21 | 1 | 18.6 | 1 | 37300 | 1 | 12 | 1 | 1050 | 1 | 8.8 | 1 | | 0.7 | 0 | 39.5 | 1 | |
| 10SM17SS | 12800 | 1 | 20 | 1 | 361 | 1 | 177 | 1 | 23.8 | 1 | 14 | 1 | 26400 | 1 | 9 | 1 | 526 | 1 | 12 | 1 | | 0.28 | 0 | 37.9 | 1 | |

Surface Soil (mg/kg) - All samples

| | Aluminum | D_Aluminum | Antimony | D_Antimony | Arsenic | D_Arsenic | Barium | D_Barium | Chromium | D_Chromium | Cobalt | D_Cobalt | Iron | D_Iron | Lead | D_Lead | Manganese | D_Manganese | Mercury | D_Mercury | Naphthalene | D_Naphthalene | Thallium | D_Thallium | Vanadium | D_Vanadium |
|------------|----------|------------|----------|------------|---------|-----------|--------|----------|----------|------------|--------|----------|-------|--------|-------|--------|-----------|-------------|---------|-----------|-------------|---------------|----------|------------|----------|------------|
| 10SM18SS | 5660 | 1 | 1.2 | 0 | 230 | 1 | 253 | 1 | 12 | 1 | 19.2 | 1 | 35200 | 1 | 16 | 1 | 1250 | 1 | 11 | 1 | | | 0.7 | 0 | 23 | 1 |
| 10SM19SS | 6670 | 1 | 20 | 1 | 670 | 1 | 148 | 1 | 17 | 1 | 18.6 | 1 | 34300 | 1 | 12 | 1 | 776 | 1 | 14 | 1 | | | 0.7 | 0 | 30.6 | 1 |
| 10SM20SS | 13900 | 1 | 0.48 | 0 | 9 | 1 | 121 | 1 | 21 | 1 | 5.9 | 1 | 17900 | 1 | 6 | 1 | 153 | 1 | 0.11 | 1 | | | 0.29 | 0 | 35.8 | 1 |
| 10SM21SS | 16800 | 1 | 0.47 | 0 | 39 | 1 | 220 | 1 | 27.2 | 1 | 11.1 | 1 | 23700 | 1 | 9 | 1 | 476 | 1 | 2 | 1 | | | 0.29 | 0 | 46.8 | 1 |
| 10SM22SS | 14600 | 1 | 0.49 | 0 | 17 | 1 | 147 | 1 | 27 | 1 | 12.1 | 1 | 23800 | 1 | 7 | 1 | 367 | 1 | 0.05 | 1 | | | 0.3 | 0 | 47.9 | 1 |
| 10SM23SS | 13000 | 1 | 508 | 1 | 223 | 1 | 163 | 1 | 22.5 | 1 | 9.5 | 1 | 20100 | 1 | 6 | 1 | 316 | 1 | 8.2 | 1 | | | 0.28 | 0 | 35.5 | 1 |
| 10SM24SS | 11900 | 1 | 1.2 | 0 | 0.9 | 0 | 149 | 1 | 24 | 1 | 17.3 | 1 | 36700 | 1 | 12 | 1 | 870 | 1 | 0.26 | 1 | | | 0.7 | 0 | 41.6 | 1 |
| 10SM25SS | 9000 | 1 | 1.1 | 0 | 40 | 1 | 103 | 1 | 22 | 1 | 18.5 | 1 | 37100 | 1 | 11 | 1 | 1030 | 1 | 0.9 | 1 | | | 0.7 | 0 | 43.7 | 1 |
| 10SM26SS | 12400 | 1 | 0.49 | 0 | 13 | 1 | 132 | 1 | 20.2 | 1 | 11.1 | 1 | 23200 | 1 | 8 | 1 | 517 | 1 | 0.64 | 1 | | | 0.3 | 0 | 37.3 | 1 |
| 10SM27SS | 11000 | 1 | 1.2 | 0 | 20 | 1 | 180 | 1 | 21 | 1 | 19.1 | 1 | 29500 | 1 | 11 | 1 | 1090 | 1 | 1.9 | 1 | | | 0.7 | 0 | 37.8 | 1 |
| 10SM28SS | 13900 | 1 | 109 | 1 | 177 | 1 | 145 | 1 | 22.8 | 1 | 9.8 | 1 | 19900 | 1 | 6 | 1 | 435 | 1 | 17 | 1 | | | 0.29 | 0 | 36.4 | 1 |
| 10SM29SS | 13200 | 1 | 0.5 | 0 | 11 | 1 | 136 | 1 | 23.8 | 1 | 8.7 | 1 | 21000 | 1 | 6 | 1 | 319 | 1 | 0.17 | 1 | | | 0.3 | 0 | 40 | 1 |
| 10SM30SS | 20300 | 1 | 0.54 | 0 | 46 | 1 | 213 | 1 | 30.2 | 1 | 12.2 | 1 | 28100 | 1 | 11 | 1 | 481 | 1 | 1.9 | 1 | | | 0.33 | 0 | 51.9 | 1 |
| 10SM41SS | | | | | | | | | | | | | 44500 | 1 | | | 817 | 1 | 24 | 1 | | | 0.7 | 0 | | |
| 11MP70SS | 9990 | 1 | 4.6 | 1 | 33.9 | 1 | 144 | 1 | 18.7 | 1 | 11.4 | 1 | 30700 | 1 | 6.96 | 1 | 738 | 1 | 0.807 | 1 | 2.3 | 0 | 0.065 | 1 | 30.9 | 1 |
| 11MP71SS | 10800 | 1 | 0.708 | 1 | 10.8 | 1 | 99.1 | 1 | 20.3 | 1 | 12.5 | 1 | 43000 | 1 | 8.91 | 1 | 703 | 1 | 0.428 | 1 | | | 0.071 | 1 | 35.4 | 1 |
| 11DS01SBC | 4080 | 1 | 11.6 | 1 | 1200 | 1 | 317 | 1 | 23.1 | 1 | 16 | 1 | 41500 | 1 | 12.1 | 1 | 822 | 1 | 326 | 1 | | | 0.123 | 1 | 27 | 1 |
| 11DS01SB1 | 4940 | 1 | 11.4 | 1 | 234 | 1 | 141 | 1 | | | | | | | 10 | 1 | 851 | 1 | 48.2 | 1 | | | | | | |
| 11DS01SB1 | 9690 | 1 | 1.4 | 1 | 13.3 | 1 | 123 | 1 | 23.4 | 1 | 9.87 | 1 | 19400 | 1 | 6.76 | 1 | 250 | 1 | 1.46 | 1 | | | 0.102 | 1 | 31.2 | 1 |
| 11DS01SB18 | | | | | | | | | 15.7 | 1 | 14.8 | 1 | 37700 | 1 | | | | | | | | | 0.122 | 1 | 25.2 | 1 |
| 11DS02SBC | 5930 | 1 | 31.5 | 1 | 360 | 1 | 123 | 1 | 17.2 | 1 | 12 | 1 | 47900 | 1 | 10.7 | 1 | 965 | 1 | 133 | 1 | | | 0.112 | 1 | 23.6 | 1 |
| 11DS02SB1 | 4950 | 1 | 122 | 1 | 205 | 1 | | 1 | 18.5 | 1 | 16.2 | 1 | 64000 | 1 | 12.4 | 1 | 832 | 1 | | 1 | | | 0.093 | 1 | 28.2 | 1 |
| 11DS02SB1 | 12100 | 1 | 0.886 | 1 | 12 | 1 | 149 | 1 | 24.8 | 1 | 9.55 | 1 | 22100 | 1 | 8.55 | 1 | 224 | 1 | 0.168 | 1 | | | 0.138 | 1 | 35.3 | 1 |
| 11DS02SB16 | | | | | | | 124 | 1 | | | | | | | | | | | 78.8 | 1 | | | | | | |
| 11MP01SB | 14400 | 1 | 0.94 | 1 | 10.3 | 1 | 147 | 1 | 19.6 | 1 | 13.3 | 1 | 31200 | 1 | 9.92 | 1 | 611 | 1 | 0.435 | 1 | | | 0.085 | 1 | 35.5 | 1 |
| 11MP01SB | 14200 | 1 | | | 12.5 | 1 | | | 26.3 | 1 | | | | | | | | | | | | | | | | |
| 11MP01SB | 5180 | 1 | 0.501 | 1 | 34 | 1 | 75.4 | 1 | 8.18 | 1 | 25 | 1 | 43300 | 1 | 13.3 | 1 | 563 | 1 | 1.56 | 1 | | | 0.091 | 1 | 22.9 | 1 |
| 11MP01SB18 | | | 0.343 | 1 | | | 211 | 1 | | | 18.4 | 1 | 66100 | 1 | 12.8 | 1 | 548 | 1 | 0.377 | 1 | | | 0.077 | 1 | 37.2 | 1 |
| 11MP10SB | 3000 | 1 | 8.09 | 1 | 25.5 | 1 | 133 | 1 | 13.5 | 1 | 13.8 | 1 | 51500 | 1 | 8.31 | 1 | 731 | 1 | 3.6 | 1 | | | 0.065 | 1 | 31.6 | 1 |
| 11MP10SB | 2830 | 1 | 3.38 | 1 | 15.6 | 1 | 126 | 1 | 14.1 | 1 | 15.7 | 1 | 41300 | 1 | 6.73 | 1 | 697 | 1 | 5.63 | 1 | | | 0.068 | 1 | 35.7 | 1 |
| 11MP11SB | 7280 | 1 | 5760 | 1 | 3740 | 1 | 394 | 1 | 18 | 1 | 16.2 | 1 | 45700 | 1 | 0.299 | 1 | 900 | 1 | 163 | 1 | | | 0.167 | 1 | 20.7 | 1 |
| 11MP11SB | 12500 | 1 | 323 | 1 | 471 | 1 | 194 | 1 | 19.9 | 1 | 11.7 | 1 | 39800 | 1 | 10.8 | 1 | 701 | 1 | 71.2 | 1 | | | 0.082 | 1 | 31.6 | 1 |
| 11MP11SB | 6980 | 1 | 5.86 | 1 | 38.2 | 1 | 188 | 1 | 20.1 | 1 | 12.1 | 1 | 25700 | 1 | 11.1 | 1 | 219 | 1 | 0.914 | 1 | | | 0.096 | 1 | 34.1 | 1 |
| 11MP12SB | 4840 | 1 | 184 | 1 | 562 | 1 | 147 | 1 | 14.5 | 1 | 15 | 1 | 38000 | 1 | 10.4 | 1 | 913 | 1 | 55.4 | 1 | | | 0.089 | 1 | 24.8 | 1 |
| 11MP12SB | 3490 | 1 | 0.547 | 1 | 91 | 1 | 90.5 | 1 | 11.9 | 1 | 18.2 | 1 | 42300 | 1 | 16.1 | 1 | 758 | 1 | 1.5 | 1 | | | 0.076 | 1 | 26.7 | 1 |
| 11MP12SB | 3630 | 1 | 46.5 | 1 | 665 | 1 | 86.6 | 1 | 10.6 | 1 | 22 | 1 | 35400 | 1 | 22.5 | 1 | 661 | 1 | 11.5 | 1 | | | 0.098 | 1 | 26.5 | 1 |
| 11MP13SB | 2440 | 1 | 50.1 | 1 | 126 | 1 | 99.4 | 1 | 13.3 | 1 | 13.7 | 1 | 35200 | 1 | 11 | 1 | 974 | 1 | 16.6 | 1 | | | 0.066 | 1 | 23.3 | 1 |
| 11MP13SB | 2620 | 1 | 11.5 | 1 | 79.1 | 1 | 197 | 1 | 15.3 | 1 | 18.3 | 1 | 33700 | 1 | 16 | 1 | 925 | 1 | 23.9 | 1 | | | 0.088 | 1 | 33 | 1 |
| 11MP14SB | 5490 | 1 | 6430 | 1 | 1790 | 1 | 333 | 1 | 16 | 1 | 14.7 | 1 | 40600 | 1 | 1.35 | 1 | 807 | 1 | 1410 | 1 | | | 0.162 | 1 | 22.8 | 1 |
| 11MP14SB | 5650 | 1 | 300 | 1 | 427 | 1 | 195 | 1 | 18.8 | 1 | 16.5 | 1 | 38200 | 1 | 24.1 | 1 | 885 | 1 | 70.1 | 1 | | | 0.124 | 1 | 34.1 | 1 |
| 11MP15SB | 3840 | 1 | 46.8 | 1 | 80.4 | 1 | 210 | 1 | 16.5 | 1 | 20.2 | 1 | 41100 | 1 | 18.6 | 1 | 993 | 1 | 57.4 | 1 | | | 0.117 | 1 | 34.2 | 1 |
| 11MP15SB | 3660 | 1 | 2.52 | 1 | 44.5 | 1 | 191 | 1 | 15.6 | 1 | 17.3 | 1 | 47100 | 1 | 16.4 | 1 | 1200 | 1 | 19.1 | 1 | | | 0.096 | 1 | 32.8 | 1 |
| 11MP15SB | 3370 | 1 | 0.916 | 1 | 29.1 | 1 | 168 | 1 | 13.6 | 1 | 18.3 | 1 | 42100 | 1 | 14.7 | 1 | 1040 | 1 | 5.78 | 1 | | | 0.08 | 1 | 29.4 | 1 |
| 11MP16SB | 3660 | 1 | 184 | 1 | 200 | 1 | 154 | 1 | 16.5 | 1 | 22.8 | 1 | 41500 | 1 | 19.2 | 1 | 1080 | 1 | 2170 | 1 | | | 0.096 | 1 | 31.7 | 1 |
| 11MP16SB | 3830 | 1 | 2.22 | 1 | 46.7 | 1 | 228 | 1 | 16.7 | 1 | 23.5 | 1 | 42200 | 1 | 15.4 | 1 | 1380 | 1 | 0.625 | 1 | | | 0.096 | 1 | 34.8 | 1 |
| 11MP16SB | 4670 | 1 | 1.15 | 1 | 35 | 1 | 165 | 1 | 14.2 | 1 | 21.7 | 1 | 41400 | 1 | 15.7 | 1 | 1200 | 1 | 14.9 | 1 | | | 0.11 | 1 | 32 | 1 |
| 11MP17SB | 4430 | 1 | 255 | 1 | 1170 | 1 | 149 | 1 | 15 | 1 | 15.9 | 1 | 53200 | 1 | 229 | 1 | 1630 | 1 | 274 | 1 | | | 0.259 | 1 | 31.1 | 1 |
| 11MP17SB | 10300 | 1 | 164 | 1 | 141 | 1 | 126 | 1 | 19 | 1 | 6.53 | 1 | 29800 | 1 | 10.5 | 1 | 443 | 1 | 22.7 | 1 | | | 0.107 | 1 | 35 | 1 |
| 11MP18SB | 7880 | 1 | 164 | 1 | 170 | 1 | 136 | 1 | 14.5 | 1 | 14.3 | 1 | 35600 | 1 | 10.7 | 1 | 905 | 1 | 41 | 1 | | | 0.084 | 1 | 30.9 | 1 |
| 11MP18SB | 10200 | 1 | 3.97 | 1 | 31.1 | 1 | 115 | 1 | 15.4 | 1 | 15.6 | 1 | 36200 | 1 | 11.8 | 1 | 728 | 1 | 1.24 | 1 | | | 0.088 | 1 | 32.6 | 1 |
| 11MP19SB | 4970 | 1 | 1.04 | 1 | 19.6 | 1 | 254 | 1 | 11.6 | 1 | 14.7 | 1 | 40700 | 1 | 9.82 | 1 | 1060 | 1 | 1.88 | 1 | | | 0.074 | 1 | 36.4 | 1 |
| 11MP19SB | 3080 | 1 | 0.674 | 1 | 9.83 | 1 | 134 | 1 | 10.4 | 1 | 18.5 | 1 | 45300 | 1 | 10.9 | 1 | 695 | 1 | 7.5 | 1 | | | 0.069 | 1 | 35.5 | 1 |
| 11MP20SB | 2670 | 1 | 0.909 | 1 | 22.2 | 1 | 190 | 1 | 14.1 | 1 | 14.1 | 1 | 45000 | 1 | 12.3 | 1 | 1100 | 1 | 2.12 | 1 | | | 0.082 | 1 | 28.2 | 1 |
| 11MP20SB | 5970 | 1 | 0.351 | 1 | 15.5 | 1 | 266 | 1 | 22.8 | 1 | 17.1 | 1 | 41600 | 1 | 13.1 | 1 | 1320 | 1 | 0.639 | 1 | | | 0.072 | 1 | 38.3 | 1 |
| 11MP20SB12 | | | | | | | | | | | | | 54000 | 1 | | | 1280 | 1 | | | | | | | | |
| 11MP20SB | 4580 | 1 | 0.358 | 1 | 7.77 | 1 | 166 | 1 | 18.1 | 1 | 25.7 | 1 | | | 16.8 | 1 | | | 0.758 | 1 | | | 0.096 | 1 | 37.5 | 1 |
| 11MP21SB | 6290 | 1 | 15.3 | 1 | 15.3 | 1 | 212 | 1 | 16.1 | 1 | 18.5 | 1 | 39800 | 1 | 15.7 | 1 | 973 | 1 | 1.09 | 1 | | | 0.093 | 1 | 34.5 | 1 |
| 11MP21SB | 5000 | 1 | 1.48 | 1 | 10.8 | 1 | 114 | 1 | 16.3 | 1 | 16.2 | 1 | 46600 | 1 | 11.6 | 1 | 362 | 1 | 0.85 | 1 | | | 0.077 | 1 | 33.3 | 1 |
| 11MP21SB | 2700 | 1 | 1.13 | 1 | 8.1 | 1 | 99.7 | 1 | 14.2 | 1 | 16.2 | 1 | 39800 | 1 | 12.1 | 1 | 599 | 1 | 0.751 | 1 | | | 0.053 | 1 | 36.1 | 1 |

Surface Soil (mg/kg) - All samples

| | Aluminum | D_Aluminum | Antimony | D_Antimony | Arsenic | D_Arsenic | Barium | D_Barium | Chromium | D_Chromium | Cobalt | D_Cobalt | Iron | D_Iron | Lead | D_Lead | Manganese | D_Manganese | Mercury | D_Mercury | Naphthalene | D_Naphthalene | Thallium | D_Thallium | Vanadium | D_Vanadium |
|------------|----------|------------|----------|------------|---------|-----------|--------|----------|----------|------------|--------|----------|-------|--------|-------|--------|-----------|-------------|---------|-----------|-------------|---------------|----------|------------|----------|------------|
| 11MP22SB | 11800 | 1 | 6370 | 1 | 4970 | 1 | 565 | 1 | 18.1 | 1 | 11.3 | 1 | 35500 | 1 | 0.587 | 1 | 978 | 1 | 61.7 | 1 | | | 0.475 | 1 | 20.1 | 1 |
| 11MP22SB | 9420 | 1 | 19300 | 1 | 7320 | 1 | 608 | 1 | 12.6 | 1 | 11.5 | 1 | 42800 | 1 | 0.055 | 1 | 532 | 1 | 223 | 1 | | | 0.332 | 1 | 17 | 1 |
| 11MP22SB | 5790 | 1 | 2680 | 1 | 2370 | 1 | 286 | 1 | 17.7 | 1 | 9.52 | 1 | 25400 | 1 | 3.52 | 1 | 677 | 1 | 72.8 | 1 | | | 0.213 | 1 | 18.9 | 1 |
| 11MP23SB | 2100 | 1 | 61.3 | 1 | 443 | 1 | 111 | 1 | 11.1 | 1 | 19.5 | 1 | 35500 | 1 | 14.2 | 1 | 595 | 1 | 337 | 1 | | | 0.087 | 1 | 20.5 | 1 |
| 11MP23SB | 2270 | 1 | 1350 | 1 | 1420 | 1 | 157 | 1 | 14.1 | 1 | 29.7 | 1 | 39900 | 1 | 13.1 | 1 | 1410 | 1 | 119 | 1 | | | 0.131 | 1 | 20.7 | 1 |
| 11MP24SB | 2190 | 1 | 201 | 1 | 1900 | 1 | 139 | 1 | 27.5 | 1 | 24.6 | 1 | 38700 | 1 | 19 | 1 | 678 | 1 | 390 | 1 | | | 0.297 | 1 | 30.6 | 1 |
| 11MP24SB | 10900 | 1 | 16100 | 1 | 9250 | 1 | 855 | 1 | 32.1 | 1 | 13 | 1 | 39600 | 1 | 0.25 | 1 | 788 | 1 | 1520 | 1 | | | 0.344 | 1 | 22 | 1 |
| 11MP25SB08 | | | | | | | 1050 | 1 | 38.9 | 1 | 13.9 | 1 | | | 0.145 | 1 | | | | | | | 0.512 | 1 | 22 | 1 |
| 11MP25SB | 12900 | 1 | 16800 | 1 | 7020 | 1 | | | | | | | 37800 | 1 | | | 668 | 1 | 565 | 1 | | | | | | |
| 11MP26SB | 9440 | 1 | 14600 | 1 | 9530 | 1 | 609 | 1 | 18.8 | 1 | 10.2 | 1 | 32500 | 1 | 0.053 | 1 | 518 | 1 | 1270 | 1 | | | 0.504 | 1 | 16.5 | 1 |
| 11MP26SB | 10500 | 1 | 12400 | 1 | 8870 | 1 | 743 | 1 | 16.4 | 1 | 8.28 | 1 | 32700 | 1 | 3.71 | 1 | 499 | 1 | 1070 | 1 | | | 0.339 | 1 | 16.7 | 1 |
| 11MP26SB | 11400 | 1 | 1280 | 1 | 808 | 1 | 196 | 1 | 14.9 | 1 | 13.1 | 1 | 26700 | 1 | 9.32 | 1 | 671 | 1 | 44.2 | 1 | | | 0.151 | 1 | 25.5 | 1 |
| 11MP27SB | 11800 | 1 | 131 | 1 | 20.8 | 1 | 175 | 1 | 17.2 | 1 | 13.1 | 1 | 34900 | 1 | 9.07 | 1 | 887 | 1 | 0.532 | 1 | | | 0.088 | 1 | 35 | 1 |
| 11MP27SB06 | | | 53.8 | 1 | 93.4 | 1 | | | | | | | 38100 | 1 | | | | | 3.32 | 1 | | | | | | |
| 11MP27SB | 13000 | 1 | | | | | 234 | 1 | 29.3 | 1 | 16.8 | 1 | | | 10.8 | 1 | 923 | 1 | | | | | 0.106 | 1 | 39.7 | 1 |
| 11MP28SB | 9030 | 1 | 15400 | 1 | 7350 | 1 | 619 | 1 | 17.5 | 1 | 10.5 | 1 | 31900 | 1 | 0.027 | 1 | 570 | 1 | 434 | 1 | | | 0.306 | 1 | 16.5 | 1 |
| 11MP28SB | 6720 | 1 | 212 | 1 | 361 | 1 | 208 | 1 | 16.7 | 1 | 18.4 | 1 | 36700 | 1 | 13.4 | 1 | 664 | 1 | 42.1 | 1 | | | 0.129 | 1 | 29.5 | 1 |
| 11MP28SB | 12400 | 1 | | | | | | | | | | | | | 7.85 | 1 | 775 | 1 | | | | | | | 33.4 | 1 |
| 11MP28SB12 | | | 1350 | 1 | 1050 | 1 | 244 | 1 | 22.4 | 1 | 11.5 | 1 | 25900 | 1 | | | | | 845 | 1 | | | 0.15 | 1 | | |
| 11MP29SB | 12100 | 1 | | | 7360 | 1 | | | 32.4 | 1 | | | 48500 | 1 | | | 1720 | 1 | | | | | 0.554 | 1 | | |
| 11MP29SB | 9580 | 1 | 12600 | 1 | 5580 | 1 | 664 | 1 | 29.4 | 1 | 12.2 | 1 | 32000 | 1 | 0.055 | 1 | 665 | 1 | 163 | 1 | | | 0.423 | 1 | 17 | 1 |
| 11MP29SB | 10300 | 1 | 12900 | 1 | 4540 | 1 | 1020 | 1 | 23.5 | 1 | 11.8 | 1 | 33400 | 1 | 0.155 | 1 | 630 | 1 | 66.7 | 1 | | | 0.281 | 1 | 18.3 | 1 |
| 11MP29SB28 | | | 15800 | 1 | | | 777 | 1 | | | 10 | 1 | | | 0.237 | 1 | | | 172 | 1 | | | | | 18.7 | 1 |
| 11MP30SB | 8910 | 1 | 12800 | 1 | 8670 | 1 | 758 | 1 | 59.6 | 1 | 16.5 | 1 | 35100 | 1 | 0.19 | 1 | 706 | 1 | 2370 | 1 | | | 0.432 | 1 | 24.6 | 1 |
| 11MP30SB | 10700 | 1 | 4310 | 1 | 3990 | 1 | 172 | 1 | 18.6 | 1 | 7.48 | 1 | 30800 | 1 | 5.44 | 1 | 367 | 1 | 136 | 1 | | | 0.126 | 1 | 26.1 | 1 |
| 11MP30SB | 10900 | 1 | 195 | 1 | 255 | 1 | 124 | 1 | 20.6 | 1 | 16 | 1 | 18900 | 1 | 7.83 | 1 | 179 | 1 | 73.7 | 1 | | | 0.084 | 1 | 27.9 | 1 |
| 11MP31SB | 2640 | 1 | 2.34 | 1 | 19.7 | 1 | 79.2 | 1 | 11 | 1 | 14.3 | 1 | 23600 | 1 | 11.9 | 1 | 187 | 1 | 1.92 | 1 | | | 0.068 | 1 | 32.1 | 1 |
| 11MP32SB | 1760 | 1 | 128 | 1 | 3720 | 1 | 94 | 1 | 17.3 | 1 | 8.62 | 1 | 36700 | 1 | 95.2 | 1 | 841 | 1 | 134 | 1 | 15 | | 0.307 | 1 | 19.9 | 1 |
| 11MP32SB | 1890 | 1 | 214 | 1 | 4170 | 1 | 89.4 | 1 | 19.5 | 1 | 9.32 | 1 | 37800 | 1 | 104 | 1 | 848 | 1 | 214 | 1 | | | 0.324 | 1 | 20.6 | 1 |
| 11MP32SB | 6550 | 1 | 186 | 1 | 4010 | 1 | 115 | 1 | 25.8 | 1 | 17.6 | 1 | 37300 | 1 | 124 | 1 | 1050 | 1 | 378 | 1 | | | 0.437 | 1 | 27.9 | 1 |
| 11MP33SB | 2110 | 1 | 3.68 | 1 | | | 152 | 1 | | | 34.4 | 1 | 47300 | 1 | 26.1 | 1 | 1270 | 1 | | | | | 0.135 | 1 | | |
| 11MP33SB06 | | | | | 15.7 | 1 | | | 19.6 | 1 | | | | | | | | | 3.44 | 1 | | | | | 42.7 | 1 |
| 11MP34SB | 2650 | 1 | 1450 | 1 | 5780 | 1 | 111 | 1 | 30.7 | 1 | 18.7 | 1 | 42900 | 1 | 396 | 1 | 730 | 1 | 211 | 1 | 8.3 | | 0.32 | 1 | 21.4 | 1 |
| 11MP34SB | 2770 | 1 | 668 | 1 | 4010 | 1 | 126 | 1 | 27.6 | 1 | 17.1 | 1 | 42900 | 1 | 376 | 1 | 861 | 1 | 212 | 1 | | | 0.347 | 1 | 22.6 | 1 |
| 11MP34SB | 9650 | 1 | | | | | 187 | 1 | 24.3 | 1 | 28.5 | 1 | 41000 | 1 | | | 817 | 1 | 73.4 | 1 | | | 0.166 | 1 | 41.3 | 1 |
| 11MP34SB12 | | | | | | | | | | | | | | | | | | | | | 12 | | 0 | | | |
| 11MP34SB22 | | | 165 | 1 | 1580 | 1 | | | | | | | | | 72.8 | 1 | | | | | | | | | | |
| 11MP35SB | 8620 | 1 | 4980 | 1 | 2350 | 1 | 321 | 1 | 34.7 | 1 | 14.2 | 1 | 28500 | 1 | 6.1 | 1 | 465 | 1 | 335 | 1 | | | 0.18 | 1 | 32.2 | 1 |
| 11MP35SB | 6550 | 1 | 3480 | 1 | 2870 | 1 | 574 | 1 | 15.3 | 1 | 9.69 | 1 | 24400 | 1 | 6.15 | 1 | 497 | 1 | 504 | 1 | | | 0.4 | 1 | 19.1 | 1 |
| 11MP35SB | 8980 | 1 | 4500 | 1 | 1300 | 1 | 309 | 1 | 14 | 1 | 8.31 | 1 | 31400 | 1 | 8.87 | 1 | 359 | 1 | 636 | 1 | | | 0.159 | 1 | 15 | 1 |
| 11MP36SB | 2730 | 1 | 965 | 1 | 7670 | 1 | 100 | 1 | 11.6 | 1 | 14.4 | 1 | 46400 | 1 | 384 | 1 | 1020 | 1 | 311 | 1 | | | 0.678 | 1 | 18.6 | 1 |
| 11MP36SB | 6380 | 1 | 287 | 1 | 2440 | 1 | 87.7 | 1 | 19.4 | 1 | 12.2 | 1 | 36400 | 1 | 112 | 1 | 654 | 1 | 14.3 | 1 | 250 | | 0.202 | 1 | 26.1 | 1 |
| 11MP36SB | 3490 | 1 | 5.43 | 1 | 208 | 1 | 61.1 | 1 | 12.3 | 1 | 13.4 | 1 | 51200 | 1 | 27.5 | 1 | 1660 | 1 | 14 | 1 | | | 0.11 | 1 | 27.5 | 1 |
| 11MP37SB | 10500 | 1 | | | | | | | 21.7 | 1 | | | | | 16.3 | 1 | | | | | | | | | | |
| 11MP37SB | 8760 | 1 | 255 | 1 | 126 | 1 | 159 | 1 | 17.9 | 1 | 10.6 | 1 | 16100 | 1 | 12.3 | 1 | 501 | 1 | 20.6 | 1 | | | 0.1 | 1 | 28.4 | 1 |
| 11MP37SB | 2880 | 1 | 2.03 | 1 | 71.3 | 1 | 201 | 1 | 15.1 | 1 | 21 | 1 | 53600 | 1 | 12.7 | 1 | 1260 | 1 | 4.32 | 1 | 2.3 | | 0.118 | 1 | 27.8 | 1 |
| 11MP37SB24 | | | 123 | 1 | 171 | 1 | 127 | 1 | | | | | 15.5 | 1 | 34700 | 1 | 633 | 1 | 45.6 | 1 | | | 0.094 | 1 | 37.9 | 1 |
| 11MP38SB | 10100 | 1 | 6080 | 1 | 3590 | 1 | 589 | 1 | 30.1 | 1 | 13 | 1 | 32100 | 1 | 9.26 | 1 | 475 | 1 | 315 | 1 | | | 0.395 | 1 | 21.2 | 1 |
| 11MP38SB | 7340 | 1 | 1250 | 1 | 680 | 1 | 152 | 1 | 11.4 | 1 | 10.3 | 1 | 31800 | 1 | 5.94 | 1 | 367 | 1 | 446 | 1 | | | 0.102 | 1 | 15.1 | 1 |
| 11MP38SB | 6430 | 1 | 413 | 1 | 706 | 1 | 113 | 1 | 18.8 | 1 | 17.3 | 1 | 39300 | 1 | 8.05 | 1 | 404 | 1 | 93.3 | 1 | | | 0.098 | 1 | 24.4 | 1 |
| 11MP39SB | 10100 | 1 | 5430 | 1 | 3240 | 1 | 936 | 1 | 21.5 | 1 | 9.18 | 1 | 25200 | 1 | 4.38 | 1 | 432 | 1 | 81.1 | 1 | | | 0.349 | 1 | 18.5 | 1 |
| 11MP39SB | 13800 | 1 | 2180 | 1 | 866 | 1 | 358 | 1 | 23.7 | 1 | 7.35 | 1 | 18700 | 1 | 7.55 | 1 | 322 | 1 | 43.8 | 1 | | | 0.185 | 1 | 23.9 | 1 |
| 11MP39SB | 7270 | 1 | 527 | 1 | 666 | 1 | 205 | 1 | 16.2 | 1 | 13 | 1 | 32100 | 1 | 8.63 | 1 | 697 | 1 | 111 | 1 | | | 0.09 | 1 | 21.8 | 1 |
| 11MP40SB | 11200 | 1 | 347 | 1 | 276 | 1 | 120 | 1 | 16.9 | 1 | 6.83 | 1 | 23200 | 1 | 8.27 | 1 | 246 | 1 | 10.3 | 1 | | | 0.085 | 1 | 29.4 | 1 |
| 11MP40SB | 9900 | 1 | 1460 | 1 | 2390 | 1 | 370 | 1 | 26.2 | 1 | 8.87 | 1 | 27200 | 1 | 6.63 | 1 | 359 | 1 | 185 | 1 | | | 0.2 | 1 | 18 | 1 |
| 11MP40SB | 7380 | 1 | 868 | 1 | 1150 | 1 | 347 | 1 | 21.3 | 1 | 11.5 | 1 | 33200 | 1 | 6.92 | 1 | 743 | 1 | 119 | 1 | | | 0.109 | 1 | 22.8 | 1 |
| 11MP41SB | 7330 | 1 | 1.04 | 1 | 30.7 | 1 | 154 | 1 | 17 | 1 | 16.9 | 1 | 49300 | 1 | 9.68 | 1 | 942 | 1 | 2.07 | 1 | | | 0.106 | 1 | 33 | 1 |
| 11MP41SB | 2990 | 1 | 1.14 | 1 | 59.8 | 1 | 152 | 1 | 11.1 | 1 | 27 | 1 | 41800 | 1 | 20.5 | 1 | 1010 | 1 | 3.55 | 1 | | | 0.131 | 1 | 29.7 | 1 |
| 11MP45SB | 9560 | 1 | 11800 | 1 | 3610 | 1 | 521 | 1 | 18.7 | 1 | 9.17 | 1 | 30800 | 1 | 0.043 | 1 | 536 | 1 | 1310 | 1 | 160 | | 0.299 | 1 | 20.9 | 1 |

Surface Soil (mg/kg) - All samples

| | Aluminum | D_Aluminum | Antimony | D_Antimony | Arsenic | D_Arsenic | Barium | D_Barium | Chromium | D_Chromium | Cobalt | D_Cobalt | Iron | D_Iron | Lead | D_Lead | Manganese | D_Manganese | Mercury | D_Mercury | Naphthalene | D_Naphthalene | Thallium | D_Thallium | Vanadium | D_Vanadium | |
|------------|----------|------------|----------|------------|---------|-----------|--------|----------|----------|------------|--------|----------|-------|--------|------|--------|-----------|-------------|---------|-----------|-------------|---------------|----------|------------|----------|------------|--|
| 11MP45SB | 3240 | | 1 | 104 | 1 | 282 | 1 | 132 | 1 | 12.8 | 1 | 16.5 | 1 | 38800 | 1 | 12.4 | 1 | 957 | 1 | 265 | 1 | | 0.087 | 1 | 25.7 | 1 | |
| 11MP45SB | 4110 | | 1 | 16.5 | 1 | 152 | 1 | 126 | 1 | 13.8 | 1 | 13.9 | 1 | 36900 | 1 | 12.3 | 1 | 767 | 1 | 1020 | 1 | | 0.116 | 1 | 25.3 | 1 | |
| 11MP46SB | 8830 | | 1 | 15800 | 1 | 4650 | 1 | 830 | 1 | 26.9 | 1 | 11.4 | 1 | 29200 | 1 | 0.074 | 1 | 626 | 1 | 167 | 1 | | 0.414 | 1 | 19.1 | 1 | |
| 11MP46SB | 2260 | | 1 | 3150 | 1 | 449 | 1 | 141 | 1 | 12.4 | 1 | 18 | 1 | 43600 | 1 | 7.5 | 1 | 845 | 1 | 219 | 1 | | 0.096 | 1 | 17.6 | 1 | |
| 11MP47SB | 2650 | | 1 | 1750 | 1 | 3840 | 1 | 139 | 1 | 11.9 | 1 | 17.4 | 1 | 40400 | 1 | 6.99 | 1 | 707 | 1 | 939 | 1 | | 0.134 | 1 | 21.4 | 1 | |
| 11MP48SB | 3670 | | 1 | 1010 | 1 | 2730 | 1 | 152 | 1 | 13.8 | 1 | 15.2 | 1 | 39200 | 1 | 13.2 | 1 | 627 | 1 | 131 | 1 | | 0.149 | 1 | 23.1 | 1 | |
| 11MP48SB | 3410 | | 1 | 324 | 1 | 2550 | 1 | 110 | 1 | 27.3 | 1 | 14.6 | 1 | 44400 | 1 | 13.7 | 1 | 639 | 1 | 304 | 1 | | 0.169 | 1 | 25.5 | 1 | |
| 11MP48SB12 | | | | | | | | 222 | 1 | 29.8 | 1 | 9.41 | 1 | | 1 | 8.66 | 1 | | | | | | 0.211 | 1 | | | |
| 11MP48SB | 11700 | | 1 | 415 | 1 | 2150 | 1 | | | | | | 29100 | 1 | | | 259 | 1 | 93.3 | 1 | | | | | 30.4 | 1 | |
| 11MP49SB | 5320 | | 1 | 303 | 1 | 2810 | 1 | 110 | 1 | 15.1 | 1 | 12.2 | 1 | 43400 | 1 | 12.5 | 1 | 454 | 1 | 134 | 1 | | 0.171 | 1 | 21 | 1 | |
| 11MP49SB | 13500 | | 1 | 1240 | 1 | 348 | 1 | 135 | 1 | 20.3 | 1 | 6.84 | 1 | 24800 | 1 | 5.36 | 1 | 378 | 1 | 263 | 1 | | 0.115 | 1 | 30.7 | 1 | |
| 11MP49SB | 12000 | | 1 | 94.6 | 1 | | | | | 19.9 | 1 | | 17900 | 1 | | | | | 38.5 | 1 | | | | | 30.1 | 1 | |
| 11MP49SB16 | | | | | 68 | 1 | 110 | 1 | | | 6.79 | 1 | | 5.13 | 1 | 226 | 1 | | | | | | 0.069 | 1 | | | |
| 11MP50SB | 2230 | | 1 | 5 | 1 | 230 | 1 | 117 | 1 | 17.7 | 1 | 14.5 | 1 | 50700 | 1 | 10.2 | 1 | 947 | 1 | 18 | 1 | | 0.094 | 1 | 29.5 | 1 | |
| 11MP51SB | 3130 | | 1 | 247 | 1 | 879 | 1 | 90.1 | 1 | 10.8 | 1 | 14.3 | 1 | 39600 | 1 | 13.1 | 1 | 388 | 1 | 70.7 | 1 | | 0.154 | 1 | 18 | 1 | |
| 11MP51SB | 8410 | | 1 | 863 | 1 | 2210 | 1 | 189 | 1 | 28.1 | 1 | 10.8 | 1 | 36700 | 1 | 18.2 | 1 | 531 | 1 | 438 | 1 | | 0.264 | 1 | 42.1 | 1 | |
| 11MP51SB08 | | | | | | | | | | | | | | | | | | | | | 120 | | 0 | | | | |
| 11MP51SB | 1830 | | 1 | 343 | 1 | 823 | 1 | 75 | 1 | 12.6 | 1 | 10.2 | 1 | 57400 | 1 | 6.77 | 1 | 353 | 1 | 38.3 | 1 | | 0.078 | 1 | 19.1 | 1 | |
| 11MP52SB | 7340 | | 1 | 3770 | 1 | 2690 | 1 | 300 | 1 | 19.9 | 1 | 11.7 | 1 | 36900 | 1 | 0.767 | 1 | 760 | 1 | 500 | 1 | | 0.207 | 1 | 19.6 | 1 | |
| 11MP52SB | 10800 | | 1 | 73.8 | 1 | 76.1 | 1 | 107 | 1 | 19.3 | 1 | 5.7 | 1 | 14800 | 1 | 6.25 | 1 | 170 | 1 | 18.8 | 1 | | 0.084 | 1 | 27.6 | 1 | |
| 11MP53SB | 6420 | | 1 | 2220 | 1 | 2110 | 1 | 177 | 1 | 15.8 | 1 | 11.9 | 1 | 49200 | 1 | 13.2 | 1 | 494 | 1 | 6110 | 1 | | 0.142 | 1 | 25.9 | 1 | |
| 11MP53SB | 6020 | | 1 | 262 | 1 | 625 | 1 | 103 | 1 | 15.2 | 1 | 11.1 | 1 | 35500 | 1 | 13.7 | 1 | 430 | 1 | 108 | 1 | | 0.11 | 1 | 28.1 | 1 | |
| 11MP54SB | 6380 | | 1 | 110 | 1 | 746 | 1 | 121 | 1 | 15.4 | 1 | 11.1 | 1 | 39400 | 1 | 11.5 | 1 | 452 | 1 | 4340 | 1 | 810 | 0.129 | 1 | 23.8 | 1 | |
| 11MP54SB | 9710 | | 1 | 40.5 | 1 | 181 | 1 | 144 | 1 | 16.1 | 1 | 11.6 | 1 | 22500 | 1 | 8.7 | 1 | 317 | 1 | 5.65 | 1 | | 0.093 | 1 | 26.3 | 1 | |
| 11MP55SB | 6270 | | 1 | 50.6 | 1 | 253 | 1 | 97.3 | 1 | 14.7 | 1 | 16.6 | 1 | 35400 | 1 | 11.5 | 1 | 1240 | 1 | 30.4 | 1 | | 0.079 | 1 | 30.7 | 1 | |
| 11MP55SB | 4510 | | 1 | 23.9 | 1 | 81 | 1 | 194 | 1 | 11.2 | 1 | 17.3 | 1 | 37100 | 1 | 15.3 | 1 | 1950 | 1 | 4.21 | 1 | 24 | 0.144 | 1 | 24.2 | 1 | |
| 11MP56SB | 11300 | | 1 | 696 | 1 | 421 | 1 | 167 | 1 | 16.9 | 1 | 6.81 | 1 | 16800 | 1 | 4.86 | 1 | 317 | 1 | 86.6 | 1 | | 0.096 | 1 | 24.2 | 1 | |
| 11MP56SB | 10400 | | 1 | 1190 | 1 | 715 | 1 | 198 | 1 | 22 | 1 | 9.25 | 1 | 37200 | 1 | 59.8 | 1 | 378 | 1 | 2030 | 1 | | 0.114 | 1 | 34.1 | 1 | |
| 11MP56SB | 2040 | | 1 | 27.7 | 1 | 129 | 1 | 97.2 | 1 | 10.4 | 1 | 11.1 | 1 | 37900 | 1 | 8.62 | 1 | 308 | 1 | 15.2 | 1 | | 0.051 | 1 | 21.5 | 1 | |
| 11MP57SB | 9140 | | 1 | 28900 | 1 | 9460 | 1 | 161 | 1 | | | 7.38 | 1 | 44700 | 1 | | | 435 | 1 | 2070 | 1 | | 0.158 | 1 | 20.1 | 1 | |
| 11MP57SB | 10300 | | 1 | 57.8 | 1 | 581 | 1 | 89.1 | 1 | 17.1 | 1 | 10.9 | 1 | 37900 | 1 | 8.55 | 1 | 492 | 1 | 15.2 | 1 | 200 | 0.082 | 1 | 35.6 | 1 | |
| 11MP57SB | 7640 | | 1 | 137 | 1 | 483 | 1 | 85.9 | 1 | 17 | 1 | 10.9 | 1 | 29400 | 1 | 6.57 | 1 | 395 | 1 | 33.9 | 1 | | 0.093 | 1 | 24.7 | 1 | |
| 11MP57SB12 | | | | | | | | | | 14.3 | 1 | | | | | 1.1 | 1 | | | | | | | | | | |
| 11MP58SB | 2150 | | 1 | 40.7 | 1 | 819 | 1 | 138 | 1 | 11.2 | 1 | 21.9 | 1 | 37500 | 1 | 19.1 | 1 | 1150 | 1 | 69.4 | 1 | | 0.094 | 1 | 23.2 | 1 | |
| 11MP58SB | 7310 | | 1 | 19600 | 1 | 4460 | 1 | 446 | 1 | 16.8 | 1 | 5.5 | 1 | 27900 | 1 | 0.047 | 1 | 247 | 1 | 622 | 1 | | 0.257 | 1 | 14.2 | 1 | |
| 11MP58SB12 | | | | | 323 | 1 | 98 | 1 | | 16.9 | 1 | 12 | 1 | | | | | | | 40.3 | 1 | | 0.075 | 1 | 31.8 | 1 | |
| 11MP58SB | 8150 | | 1 | 195 | 1 | | | | | | | | 32400 | 1 | 8.66 | 1 | 639 | 1 | | | | | | | | | |
| 11MP59SB | 2340 | | 1 | 215 | 1 | 2870 | 1 | 139 | 1 | 12.6 | 1 | 20.9 | 1 | 37000 | 1 | 26.4 | 1 | 882 | 1 | 423 | 1 | | 0.219 | 1 | 15.8 | 1 | |
| 11MP59SB | 13900 | | 1 | 441 | 1 | 319 | 1 | 144 | 1 | 20.2 | 1 | 9.29 | 1 | 29600 | 1 | 6.91 | 1 | 441 | 1 | 31.1 | 1 | | 0.083 | 1 | 34.9 | 1 | |
| 11MP59SB | 10900 | | 1 | 570 | 1 | 366 | 1 | | | 19.7 | 1 | 10.7 | 1 | 32400 | 1 | | | 817 | 1 | | | | 0.072 | 1 | 33.6 | 1 | |
| 11MP59SB18 | | | | | | | | 104 | 1 | | | | | | | 5.7 | 1 | | | 40.3 | 1 | | | | | | |
| 11MP60SB | 2160 | | 1 | 181 | 1 | 2510 | 1 | 145 | 1 | 10.1 | 1 | 17.7 | 1 | 40800 | 1 | 15.1 | 1 | 845 | 1 | 276 | 1 | | 0.17 | 1 | 20.7 | 1 | |
| 11MP60SB | 2300 | | 1 | 240 | 1 | 3120 | 1 | 116 | 1 | 17 | 1 | 22 | 1 | 46200 | 1 | 15.2 | 1 | 976 | 1 | 348 | 1 | | 0.158 | 1 | 19.1 | 1 | |
| 11MP61SB | 14300 | | 1 | | | 52.9 | 1 | | | | | | | | | | | | | 2.62 | 1 | | | | 33.2 | 1 | |
| 11MP61SB | 14900 | | 1 | 1.25 | 1 | 19.7 | 1 | 121 | 1 | 20 | 1 | 6.55 | 1 | 15000 | 1 | 7.96 | 1 | 173 | 1 | 0.702 | 1 | | 0.105 | 1 | 33 | 1 | |
| 11MP61SB08 | | | | 4.39 | 1 | | | 123 | 1 | 19.1 | 1 | 6.27 | 1 | 18600 | 1 | 7.47 | 1 | 227 | 1 | | | | 0.1 | 1 | | | |
| 11MP62SB | 8510 | | 1 | 973 | 1 | 416 | 1 | 112 | 1 | 15.4 | 1 | 9.59 | 1 | 24900 | 1 | 8.18 | 1 | 463 | 1 | 906 | 1 | | 0.086 | 1 | 29.1 | 1 | |
| 11MP62SB | 11800 | | 1 | 3.23 | 1 | 27.3 | 1 | 75.7 | 1 | 17.1 | 1 | 6.33 | 1 | 16200 | 1 | 9.18 | 1 | 102 | 1 | 0.493 | 1 | | 0.063 | 1 | 22.6 | 1 | |
| 11MP63SB | 10700 | | 1 | 115 | 1 | 61.6 | 1 | 95.5 | 1 | 15.2 | 1 | 6.8 | 1 | 21500 | 1 | 4.48 | 1 | 472 | 1 | 0.509 | 1 | | 0.068 | 1 | 22 | 1 | |
| 11MP63SB | 10300 | | 1 | 223 | 1 | 208 | 1 | 85.8 | 1 | 17.8 | 1 | 7.22 | 1 | 42700 | 1 | 6.1 | 1 | 470 | 1 | 7.89 | 1 | | 0.063 | 1 | 23.6 | 1 | |
| 11MP66SB | 10600 | | 1 | 131 | 1 | 196 | 1 | 87.3 | 1 | 19.9 | 1 | 14.3 | 1 | 21400 | 1 | 9.17 | 1 | 360 | 1 | 31 | 1 | | 0.074 | 1 | 29.2 | 1 | |
| 11MP66SB | 9950 | | 1 | 24.6 | 1 | 78 | 1 | | | | | | 45400 | 1 | 9.36 | 1 | | | | | | | | 0.067 | 1 | | |
| 11MP66SB16 | | | | | | | | | | | | | | | | | | | | | 3500 | | 1 | | | | |
| 11MP66SB24 | | | | | | | | 99.5 | 1 | 23.2 | 1 | 17.1 | 1 | | | | | 840 | 1 | 20.9 | 1 | | | | 31.5 | 1 | |
| 11MP89SB | 8300 | | 1 | 419 | 1 | 490 | 1 | 146 | 1 | 16 | 1 | 8.27 | 1 | 26300 | 1 | 7.36 | 1 | 281 | 1 | 251 | 1 | | 0.109 | 1 | 24.5 | 1 | |
| 11MP89SB | 13700 | | 1 | 48.8 | 1 | 123 | 1 | 99.8 | 1 | 17.1 | 1 | 5.58 | 1 | 19700 | 1 | 7.13 | 1 | 153 | 1 | 1.71 | 1 | | 0.089 | 1 | 31.1 | 1 | |
| 11RD01SB | 14800 | | 1 | 0.657 | 1 | 10.3 | 1 | 124 | 1 | 22.6 | 1 | 6.02 | 1 | 19600 | 1 | 8.06 | 1 | 117 | 1 | 0.154 | 1 | | 0.108 | 1 | 33.4 | 1 | |
| 11RD01SB | 14800 | | 1 | 0.352 | 1 | 3.36 | 1 | 167 | 1 | 28.2 | 1 | 9.65 | 1 | 23200 | 1 | 9.64 | 1 | 222 | 1 | 0.064 | 1 | | 0.137 | 1 | 40.7 | 1 | |
| 11RD01SB | 14600 | | 1 | 0.359 | 1 | 8.74 | 1 | 140 | 1 | 27.6 | 1 | 10.8 | 1 | 22900 | 1 | 10.1 | 1 | 221 | 1 | 0.063 | 1 | | 0.17 | 1 | 38.7 | 1 | |

Surface Soil (mg/kg) - All samples

| | Aluminum | D_Aluminum | Antimony | D_Antimony | Arsenic | D_Arsenic | Barium | D_Barium | Chromium | D_Chromium | Cobalt | D_Cobalt | Iron | D_Iron | Lead | D_Lead | Manganese | D_Manganese | Mercury | D_Mercury | Naphthalene | D_Naphthalene | Thallium | D_Thallium | Vanadium | D_Vanadium |
|------------|----------|------------|----------|------------|---------|-----------|--------|----------|----------|------------|--------|----------|-------|--------|------|--------|-----------|-------------|---------|-----------|-------------|---------------|----------|------------|----------|------------|
| 11RD02SBC | 12100 | 1 | 1950 | 1 | 1880 | 1 | 310 | 1 | 29 | 1 | 13.1 | 1 | 30700 | 1 | 8.05 | 1 | 451 | 1 | 94.5 | 1 | | | 0.754 | 1 | 31.4 | 1 |
| 11RD02SBC | 10600 | 1 | 868 | 1 | 1410 | 1 | 254 | 1 | 25.6 | 1 | 12.3 | 1 | 30800 | 1 | 10.3 | 1 | 477 | 1 | 30.6 | 1 | | | 0.203 | 1 | 30 | 1 |
| 11RD02SB1 | 8630 | 1 | 92 | 1 | 181 | 1 | 95.4 | 1 | 19 | 1 | 16.4 | 1 | 61100 | 1 | 5.66 | 1 | 561 | 1 | 1.78 | 1 | | | 0.051 | 1 | 31.4 | 1 |
| 11RD03SBC | 9160 | 1 | 2710 | 1 | 3510 | 1 | 553 | 1 | 27.1 | 1 | 16.7 | 1 | 41100 | 1 | 5.78 | 1 | 786 | 1 | 340 | 1 | | | 0.388 | 1 | 25.3 | 1 |
| 11RD03SBC | 5330 | 1 | 844 | 1 | 1790 | 1 | 227 | 1 | 23.5 | 1 | 12.6 | 1 | 32300 | 1 | 11.7 | 1 | 591 | 1 | 471 | 1 | | | 0.251 | 1 | 22.4 | 1 |
| 11RD03SB1 | 8240 | 1 | 545 | 1 | 503 | 1 | 113 | 1 | 21.1 | 1 | 16.5 | 1 | 34600 | 1 | 8.8 | 1 | 399 | 1 | 70.3 | 1 | | | 0.113 | 1 | 28.2 | 1 |
| 11RD04SBC | 13000 | 1 | 149 | 1 | 40.7 | 1 | 129 | 1 | 23.3 | 1 | 6.46 | 1 | 28200 | 1 | 8.37 | 1 | 272 | 1 | 1.26 | 1 | | | 0.12 | 1 | 33.9 | 1 |
| 11RD04SBC | 13800 | 1 | | | | | | | 25.5 | 1 | 9.2 | 1 | 29600 | 1 | 8.51 | 1 | | | | | | | | | 33.4 | 1 |
| 11RD04SB1 | 13400 | 1 | 1.09 | 1 | 8.75 | 1 | 180 | 1 | 21.4 | 1 | 6.33 | 1 | 16700 | 1 | 7.87 | 1 | 160 | 1 | 0.137 | 1 | | | 0.106 | 1 | 32.3 | 1 |
| 11RD04SB16 | | | 112 | 1 | 450 | 1 | 285 | 1 | | | | | | | | | 331 | 1 | 34 | 1 | | | 0.146 | 1 | | 1 |
| 11RD05SBC | 11700 | 1 | 1.33 | 1 | 7.86 | 1 | 124 | 1 | 20.6 | 1 | 6.16 | 1 | 19300 | 1 | 6.29 | 1 | 141 | 1 | 0.283 | 1 | | | 0.075 | 1 | 35.5 | 1 |
| 11RD05SB1 | 7370 | 1 | 18 | 1 | 36 | 1 | 82.2 | 1 | 21.7 | 1 | 19 | 1 | 23500 | 1 | 10.8 | 1 | 178 | 1 | 1.04 | 1 | | | 0.139 | 1 | 35.9 | 1 |
| 11RD05SB1 | 2500 | 1 | 0.669 | 1 | 41.2 | 1 | 78.5 | 1 | 16.9 | 1 | 14.5 | 1 | 41400 | 1 | 21.5 | 1 | 915 | 1 | 1.25 | 1 | | | 0.107 | 1 | 44.6 | 1 |
| 11RD06SBC | 12700 | 1 | 6.23 | 1 | 18.1 | 1 | 99.9 | 1 | 20.9 | 1 | 7.66 | 1 | 19600 | 1 | 7.7 | 1 | 207 | 1 | 14.1 | 1 | | | 0.083 | 1 | 39.1 | 1 |
| 11RD06SBC | 9600 | 1 | 11.3 | 1 | 42.5 | 1 | 78.2 | 1 | 20.4 | 1 | 9.98 | 1 | 20900 | 1 | 7.38 | 1 | 212 | 1 | 5.53 | 1 | | | 0.068 | 1 | 33.2 | 1 |
| 11RD06SB1 | 4350 | 1 | 0.763 | 1 | 19.6 | 1 | 78.9 | 1 | 12.1 | 1 | 12.3 | 1 | 19400 | 1 | 14.7 | 1 | 358 | 1 | 1.61 | 1 | | | 0.105 | 1 | 26 | 1 |
| 11RD07SBC | 12200 | 1 | 4.96 | 1 | 11.1 | 1 | 92.3 | 1 | 19.6 | 1 | 9.54 | 1 | 21900 | 1 | 7.87 | 1 | 253 | 1 | 2.27 | 1 | | | 0.088 | 1 | 32.5 | 1 |
| 11RD07SB1 | 4330 | 1 | 1.32 | 1 | 22.2 | 1 | 63.1 | 1 | 14.4 | 1 | 9.57 | 1 | 35500 | 1 | 12.1 | 1 | 583 | 1 | 1.94 | 1 | | | 0.075 | 1 | 29 | 1 |
| 11RD07SB1 | 1530 | 1 | 0.321 | 1 | 25.9 | 1 | 113 | 1 | 12.6 | 1 | 10.1 | 1 | 96500 | 1 | 15 | 1 | 0.03 | 0 | 10.6 | 1 | | | 0.139 | 1 | 31.5 | 1 |
| 11RD20SBC | 10400 | 1 | 7.69 | 1 | 21.5 | 1 | 103 | 1 | 19.8 | 1 | 10.4 | 1 | 23700 | 1 | 6.54 | 1 | 242 | 1 | 3.89 | 1 | | | 0.066 | 1 | 30.6 | 1 |
| 11RS01SBO | 11500 | 1 | 24.7 | 1 | 54.7 | 1 | 137 | 1 | 21.1 | 1 | 8.08 | 1 | 29400 | 1 | 9.79 | 1 | 526 | 1 | 6.44 | 1 | | | 0.14 | 1 | 28.1 | 1 |
| 11RS01SBO | 6180 | 1 | 68.7 | 1 | 142 | 1 | 104 | 1 | 25.1 | 1 | 12.9 | 1 | 66100 | 1 | 28.6 | 1 | 509 | 1 | 27.9 | 1 | | | 0.083 | 1 | 30.7 | 1 |
| 11RS01SB1 | 11800 | 1 | 25.8 | 1 | 50 | 1 | 124 | 1 | 22.3 | 1 | 8.67 | 1 | 41400 | 1 | 17.6 | 1 | 292 | 1 | 7.44 | 1 | | | 0.104 | 1 | 30.5 | 1 |
| 11RS02SBO | 8920 | 1 | 24.4 | 1 | 138 | 1 | 103 | 1 | 19.1 | 1 | 23.9 | 1 | 38300 | 1 | 11.6 | 1 | 1160 | 1 | 33.1 | 1 | | | 0.093 | 1 | 35.5 | 1 |
| 11RS02SBO | 3940 | 1 | 34.5 | 1 | 93.4 | 1 | 94.6 | 1 | 27.4 | 1 | 15.5 | 1 | 51400 | 1 | 12.9 | 1 | 1190 | 1 | 8.07 | 1 | | | 0.082 | 1 | 39.7 | 1 |
| 11RS02SB1 | 14000 | 1 | 1.17 | 1 | 8.01 | 1 | 154 | 1 | 28 | 1 | 9.93 | 1 | 23300 | 1 | 9.89 | 1 | 235 | 1 | 0.198 | 1 | | | 0.166 | 1 | 39.3 | 1 |
| 11SM10SBI | 10000 | 1 | 2.49 | 1 | 200 | 1 | 139 | 1 | 16.9 | 1 | 13.2 | 1 | 35400 | 1 | 9.59 | 1 | 635 | 1 | 11.8 | 1 | | | 0.11 | 1 | 29.4 | 1 |
| 11SM10SB | 2210 | 1 | 6.15 | 1 | 6240 | 1 | 220 | 1 | 11.9 | 1 | 10.8 | 1 | 64700 | 1 | 15.7 | 1 | 549 | 1 | 48.3 | 1 | | | 1.54 | 1 | 19.1 | 1 |
| 11SM10SB | 2790 | 1 | 4.28 | 1 | 1690 | 1 | 81.5 | 1 | 9.8 | 1 | 19.8 | 1 | 49100 | 1 | 25 | 1 | 802 | 1 | 17.9 | 1 | | | 0.54 | 1 | 18.9 | 1 |
| 11SM11SBI | 16800 | 1 | 0.25 | 1 | 8.67 | 1 | 157 | 1 | 22.4 | 1 | 10.4 | 1 | 28500 | 1 | 7.54 | 1 | 525 | 1 | 0.032 | 1 | | | 0.097 | 1 | 37.8 | 1 |
| 11SM11SB14 | | | 1.5 | 1 | 122 | 1 | 220 | 1 | | | | | 66400 | 1 | 15.8 | 1 | 2170 | 1 | 7.18 | 1 | | | 0.146 | 1 | | 1 |
| 11SM11SB | 3080 | 1 | 1.43 | 1 | 261 | 1 | 118 | 1 | 12 | 1 | 25.8 | 1 | 55000 | 1 | 21.3 | 1 | 1330 | 1 | 6.93 | 1 | | | 0.121 | 1 | 25.3 | 1 |
| 11SM11SB | 7250 | 1 | | | | | | | 20.3 | 1 | 23.2 | 1 | 1 | | | | | | | | | | | | 31.3 | 1 |
| 11SM31SBI | 2130 | 1 | 8.57 | 1 | 273 | 1 | 71.7 | 1 | 8.22 | 1 | 12.3 | 1 | 54900 | 1 | 16.8 | 1 | 459 | 1 | 15.2 | 1 | | | 0.087 | 1 | 14.8 | 1 |

General UCL Statistics for Data Sets with Non-Detects

User Selected Options
 From File WorkSheet.wst
 Full Precision OFF
 Confidence Coefficient 95%
 Number of Bootstrap Operations 2000

Aluminum

General Statistics

Number of Valid Observations 55 Number of Distinct Observations 50
 Number of Missing Values 4

Raw Statistics

Minimum 2130
 Maximum 20300
 Mean 9542
 Geometric Mean 8297
 Median 9170
 SD 4671
 Std. Error of Mean 629.8
 Coefficient of Variation 0.49
 Skewness 0.29

Log-transformed Statistics

Minimum of Log Data 7.664
 Maximum of Log Data 9.918
 Mean of log Data 9.024
 SD of log Data 0.565

Relevant UCL Statistics

Normal Distribution Test

Lilliefors Test Statistic 0.128
 Lilliefors Critical Value 0.119
 Data not Normal at 5% Significance Level

Lognormal Distribution Test

Lilliefors Test Statistic 0.127
 Lilliefors Critical Value 0.119
 Data not Lognormal at 5% Significance Level

Assuming Normal Distribution

95% Student's-t UCL 10596
 95% UCLs (Adjusted for Skewness)
 95% Adjusted-CLT UCL (Chen-1995) 10604
 95% Modified-t UCL (Johnson-1978) 10600

Assuming Lognormal Distribution

95% H-UCL 11292
 95% Chebyshev (MVUE) UCL 13136
 97.5% Chebyshev (MVUE) UCL 14621
 99% Chebyshev (MVUE) UCL 17538

Gamma Distribution Test

k star (bias corrected) 3.544
 Theta Star 2692
 MLE of Mean 9542
 MLE of Standard Deviation 5068
 nu star 389.9
 Approximate Chi Square Value (.05) 345.1
 Adjusted Level of Significance 0.0456
 Adjusted Chi Square Value 344

Data Distribution

Data appear Gamma Distributed at 5% Significance Level

Anderson-Darling Test Statistic

Anderson-Darling 5% Critical Value 0.753
 Kolmogorov-Smirnov Test Statistic 0.111
 Kolmogorov-Smirnov 5% Critical Value 0.121
 Data appear Gamma Distributed at 5% Significance Level

Nonparametric Statistics

95% CLT UCL 10578
 95% Jackknife UCL 10596
 95% Standard Bootstrap UCL 10570
 95% Bootstrap-t UCL 10628
 95% Hall's Bootstrap UCL 10581
 95% Percentile Bootstrap UCL 10549
 95% BCA Bootstrap UCL 10510
 95% Chebyshev(Mean, Sd) UCL 12287
 97.5% Chebyshev(Mean, Sd) UCL 13475
 99% Chebyshev(Mean, Sd) UCL 15809

Assuming Gamma Distribution

95% Approximate Gamma UCL (Use when n >= 40) 10780
 95% Adjusted Gamma UCL (Use when n < 40) 10815
 Potential UCL to Use

Use 95% Approximate Gamma UCL 10780

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Antimony

General Statistics

| | | | |
|----------------------------------|----|---------------------------|--------|
| Number of Valid Data | 55 | Number of Detected Data | 36 |
| Number of Distinct Detected Data | 31 | Number of Non-Detect Data | 19 |
| Number of Missing Values | 4 | Percent Non-Detects | 34.55% |

Raw Statistics

| | | | |
|--------------------|-------|----------------------------|--------|
| Minimum Detected | 0.25 | Log-transformed Statistics | |
| Maximum Detected | 508 | Minimum Detected | -1.386 |
| Mean of Detected | 45.38 | Maximum Detected | 6.23 |
| SD of Detected | 86.89 | Mean of Detected | 2.767 |
| Minimum Non-Detect | 0.45 | SD of Detected | 1.652 |
| Maximum Non-Detect | 2.3 | Minimum Non-Detect | -0.799 |
| | | Maximum Non-Detect | 0.833 |

| | | |
|--|---------------------------------|--------|
| Note: Data have multiple DLs - Use of KM Method is recommended | Number treated as Non-Detect | 25 |
| For all methods (except KM, DL/2, and ROS Methods), | Number treated as Detected | 30 |
| Observations < Largest ND are treated as NDs | Single DL Non-Detect Percentage | 45.45% |

UCL Statistics

| | | | |
|--|-------|---|-------|
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.483 | Shapiro Wilk Test Statistic | 0.959 |
| 5% Shapiro Wilk Critical Value | 0.935 | 5% Shapiro Wilk Critical Value | 0.935 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|--------------------------|-------|---------------------------------|-------|
| DL/2 Substitution Method | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 29.85 | Mean | 1.464 |
| SD | 73.21 | SD | 2.265 |
| 95% DL/2 (t) UCL | 46.37 | 95% H-Stat (DL/2) UCL | 199.6 |

Maximum Likelihood Estimate(MLE) Method N/A
MLE yields a negative mean

| | |
|------------------------------|-------|
| Log ROS Method | |
| Mean in Log Scale | 1.577 |
| SD in Log Scale | 2.155 |
| Mean in Original Scale | 29.92 |
| SD in Original Scale | 73.18 |
| 95% t UCL | 46.43 |
| 95% Percentile Bootstrap UCL | 48.22 |
| 95% BCA Bootstrap UCL | 58.91 |
| 95% H-UCL | 156.4 |

Gamma Distribution Test with Detected Values Only

| | | | |
|-------------------------|-------|---|--|
| k star (bias corrected) | 0.56 | Data Distribution Test with Detected Values Only | |
| Theta Star | 81.04 | Data Follow Appr. Gamma Distribution at 5% Significance Level | |
| nu star | 40.32 | | |

A-D Test Statistic

| | | | |
|---|-------|--------------------------|-------|
| 5% A-D Critical Value | 0.599 | Nonparametric Statistics | |
| K-S Test Statistic | 0.804 | Kaplan-Meier (KM) Method | |
| 5% K-S Critical Value | 0.804 | Mean | 29.81 |
| Data follow Appr. Gamma Distribution at 5% Significance Level | 0.154 | SD | 72.55 |
| | | SE of Mean | 9.922 |
| | | 95% KM (t) UCL | 46.41 |
| Assuming Gamma Distribution | | 95% KM (z) UCL | 46.13 |

| | | | |
|--|----------|-----------------------------------|-------|
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (jackknife) UCL | 46.15 |
| Minimum | 1.00E-06 | 95% KM (bootstrap t) UCL | 66.84 |
| Maximum | 508 | 95% KM (BCA) UCL | 50.89 |
| Mean | 29.7 | 95% KM (Percentile Bootstrap) UCL | 46.66 |
| Median | 6.15 | 95% KM (Chebyshev) UCL | 73.06 |
| SD | 73.27 | 97.5% KM (Chebyshev) UCL | 91.77 |
| k star | 0.13 | 99% KM (Chebyshev) UCL | 128.5 |
| Theta star | 229.2 | | |
| Nu star | 14.25 | Potential UCLs to Use | |
| AppChi2 | 6.746 | 95% KM (BCA) UCL | 50.89 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 62.77 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 64.09 | | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics

| | | | |
|----------------------------------|----|---------------------------|-------|
| Number of Valid Data | 55 | Number of Detected Data | 54 |
| Number of Distinct Detected Data | 50 | Number of Non-Detect Data | 1 |
| Number of Missing Values | 4 | Percent Non-Detects | 1.82% |

Raw Statistics

| | | | |
|--------------------|-------|----------------------------|--------|
| | | Log-transformed Statistics | |
| Minimum Detected | 8.01 | Minimum Detected | 2.081 |
| Maximum Detected | 8510 | Maximum Detected | 9.049 |
| Mean of Detected | 748.9 | Mean of Detected | 4.978 |
| SD of Detected | 1620 | SD of Detected | 1.919 |
| Minimum Non-Detect | 0.9 | Minimum Non-Detect | -0.105 |
| Maximum Non-Detect | 0.9 | Maximum Non-Detect | -0.105 |

UCL Statistics

| | | | |
|--|-------|---|-------|
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Lilliefors Test Statistic | 0.335 | Lilliefors Test Statistic | 0.084 |
| 5% Lilliefors Critical Value | 0.121 | 5% Lilliefors Critical Value | 0.121 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|--------------------------|-------|---------------------------------|-------|
| DL/2 Substitution Method | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 735.3 | Mean | 4.873 |
| SD | 1608 | SD | 2.054 |
| 95% DL/2 (t) UCL | 1098 | 95% H-Stat (DL/2) UCL | 3097 |

Maximum Likelihood Estimate(MLE) Method

| | | | |
|--------------------|------|------------------------------|-------|
| | | Log ROS Method | |
| Mean | 716 | Mean in Log Scale | 4.887 |
| SD | 1613 | SD in Log Scale | 2.018 |
| 95% MLE (t) UCL | 1080 | Mean in Original Scale | 735.3 |
| 95% MLE (Tiku) UCL | 1041 | SD in Original Scale | 1608 |
| | | 95% t UCL | 1098 |
| | | 95% Percentile Bootstrap UCL | 1114 |
| | | 95% BCA Bootstrap UCL | 1186 |
| | | 95% H UCL | 2818 |

Gamma Distribution Test with Detected Values Only

Data Distribution Test with Detected Values Only

| | | | |
|---|----------|--|-------|
| k star (bias corrected) | 0.391 | Data appear Lognormal at 5% Significance Level | |
| Theta Star | 1915 | | |
| nu star | 42.24 | | |
| A-D Test Statistic | 2.131 | Nonparametric Statistics | |
| 5% A-D Critical Value | 0.839 | Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.839 | Mean | 735.4 |
| 5% K-S Critical Value | 0.13 | SD | 1594 |
| Data not Gamma Distributed at 5% Significance Level | | SE of Mean | 216.9 |
| | | 95% KM (t) UCL | 1098 |
| Assuming Gamma Distribution | | 95% KM (z) UCL | 1092 |
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (jackknife) UCL | 1098 |
| Minimum | 1.00E-06 | 95% KM (bootstrap t) UCL | 1355 |
| Maximum | 8510 | 95% KM (BCA) UCL | 1125 |
| Mean | 735.3 | 95% KM (Percentile Bootstrap) UCL | 1120 |
| Median | 177 | 95% KM (Chebyshev) UCL | 1681 |
| SD | 1608 | 97.5% KM (Chebyshev) UCL | 2090 |
| k star | 0.337 | 99% KM (Chebyshev) UCL | 2894 |
| Theta star | 2182 | | |
| Nu star | 37.06 | Potential UCLs to Use | |
| AppChi2 | 24.12 | 97.5% KM (Chebyshev) UCL | 2090 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 1130 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 1143 | | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Barium

| | | | |
|--|-------|--|--------|
| General Statistics | | | |
| Number of Valid Observations | 55 | Number of Distinct Observations | 45 |
| Number of Missing Values | 4 | | |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 71.7 | Minimum of Log Data | 4.272 |
| Maximum | 339 | Maximum of Log Data | 5.826 |
| Mean | 176.1 | Mean of log Data | 5.108 |
| Geometric Mean | 165.4 | SD of log Data | 0.356 |
| Median | 165 | | |
| SD | 64.67 | | |
| Std. Error of Mean | 8.72 | | |
| Coefficient of Variation | 0.367 | | |
| Skewness | 0.941 | | |
| Relevant UCL Statistics | | | |
| Normal Distribution Test | | Lognormal Distribution Test | |
| Lilliefors Test Statistic | 0.149 | Lilliefors Test Statistic | 0.0789 |
| Lilliefors Critical Value | 0.119 | Lilliefors Critical Value | 0.119 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 190.6 | 95% H-UCL | 191.7 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 213.7 |
| 95% Adjusted-CLT UCL (Chen-1995) | 191.6 | 97.5% Chebyshev (MVUE) UCL | 230.1 |
| 95% Modified-t UCL (Johnson-1978) | 190.8 | 99% Chebyshev (MVUE) UCL | 262.2 |

| | | | |
|--|--------|--|-------|
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 7.729 | Data appear Gamma Distributed at 5% Significance Level | |
| Theta Star | 22.78 | | |
| MLE of Mean | 176.1 | | |
| MLE of Standard Deviation | 63.33 | | |
| nu star | 850.2 | | |
| Approximate Chi Square Value (.05) | 783.5 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0456 | 95% CLT UCL | 190.4 |
| Adjusted Chi Square Value | 781.8 | 95% Jackknife UCL | 190.6 |
| | | 95% Standard Bootstrap UCL | 190.3 |
| Anderson-Darling Test Statistic | 0.492 | 95% Bootstrap-t UCL | 193.2 |
| Anderson-Darling 5% Critical Value | 0.752 | 95% Hall's Bootstrap UCL | 192.1 |
| Kolmogorov-Smirnov Test Statistic | 0.102 | 95% Percentile Bootstrap UCL | 190.7 |
| Kolmogorov-Smirnov 5% Critical Value | 0.12 | 95% BCA Bootstrap UCL | 193.4 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 214.1 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 230.5 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 262.8 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 191 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 191.4 | | |
| Potential UCL to Use | | Use 95% Approximate Gamma UCL | 191 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

| | | | |
|---|--------|---|-------|
| General Statistics | | | |
| Number of Valid Observations | 55 | Number of Distinct Observations | 46 |
| Number of Missing Values | 4 | | |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 8.22 | Minimum of Log Data | 2.107 |
| Maximum | 32 | Maximum of Log Data | 3.466 |
| Mean | 21.13 | Mean of log Data | 3.012 |
| Geometric Mean | 20.34 | SD of log Data | 0.294 |
| Median | 21 | | |
| SD | 5.437 | | |
| Std. Error of Mean | 0.733 | | |
| Coefficient of Variation | 0.257 | | |
| Skewness | -0.348 | | |
| Relevant UCL Statistics | | | |
| Normal Distribution Test | | Lognormal Distribution Test | |
| Lilliefors Test Statistic | 0.0902 | Lilliefors Test Statistic | 0.15 |
| Lilliefors Critical Value | 0.119 | Lilliefors Critical Value | 0.119 |
| Data appear Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

| | | | |
|---|--------|---|-------|
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 22.36 | 95% H-UCL | 22.74 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 24.96 |
| 95% Adjusted-CLT UCL (Chen-1995) | 22.3 | 97.5% Chebyshev (MVUE) UCL | 26.57 |
| 95% Modified-t UCL (Johnson-1978) | 22.35 | 99% Chebyshev (MVUE) UCL | 29.75 |
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 12.47 | Data appear Normal at 5% Significance Level | |
| Theta Star | 1.694 | | |
| MLE of Mean | 21.13 | | |
| MLE of Standard Deviation | 5.984 | | |
| nu star | 1372 | | |
| Approximate Chi Square Value (.05) | 1287 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0456 | 95% CLT UCL | 22.34 |
| Adjusted Chi Square Value | 1285 | 95% Jackknife UCL | 22.36 |
| | | 95% Standard Bootstrap UCL | 22.33 |
| Anderson-Darling Test Statistic | 0.953 | 95% Bootstrap-t UCL | 22.32 |
| Anderson-Darling 5% Critical Value | 0.75 | 95% Hall's Bootstrap UCL | 22.34 |
| Kolmogorov-Smirnov Test Statistic | 0.131 | 95% Percentile Bootstrap UCL | 22.33 |
| Kolmogorov-Smirnov 5% Critical Value | 0.12 | 95% BCA Bootstrap UCL | 22.4 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 24.33 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 25.71 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 28.43 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 22.53 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 22.57 | | |
| Potential UCL to Use | | Use 95% Student's-t UCL | 22.36 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Note: For highly negative-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positively skewed data sets.

Cobalt

| | | | |
|------------------------------|-------|---------------------------------|-------|
| General Statistics | | | |
| Number of Valid Observations | 55 | Number of Distinct Observations | 49 |
| Number of Missing Values | 4 | | |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 5.9 | Minimum of Log Data | 1.775 |
| Maximum | 38.8 | Maximum of Log Data | 3.658 |
| Mean | 16.18 | Mean of log Data | 2.694 |
| Geometric Mean | 14.79 | SD of log Data | 0.417 |
| Median | 13.4 | | |
| SD | 7.413 | | |
| Std. Error of Mean | 1 | | |
| Coefficient of Variation | 0.458 | | |
| Skewness | 1.302 | | |

| | | | |
|---|--------|--|-------|
| Relevant UCL Statistics | | | |
| Normal Distribution Test | | Lognormal Distribution Test | |
| Lilliefors Test Statistic | 0.155 | Lilliefors Test Statistic | 0.103 |
| Lilliefors Critical Value | 0.119 | Lilliefors Critical Value | 0.119 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 17.85 | 95% H-UCL | 17.9 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 20.2 |
| 95% Adjusted-CLT UCL (Chen-1995) | 18.01 | 97.5% Chebyshev (MVUE) UCL | 21.97 |
| 95% Modified-t UCL (Johnson-1978) | 17.88 | 99% Chebyshev (MVUE) UCL | 25.45 |
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 5.441 | Data appear Lognormal at 5% Significance Level | |
| Theta Star | 2.973 | | |
| MLE of Mean | 16.18 | | |
| MLE of Standard Deviation | 6.935 | | |
| nu star | 598.5 | | |
| Approximate Chi Square Value (.05) | 542.7 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0456 | 95% CLT UCL | 17.82 |
| Adjusted Chi Square Value | 541.3 | 95% Jackknife UCL | 17.85 |
| | | 95% Standard Bootstrap UCL | 17.81 |
| Anderson-Darling Test Statistic | 1.004 | 95% Bootstrap-t UCL | 18.1 |
| Anderson-Darling 5% Critical Value | 0.753 | 95% Hall's Bootstrap UCL | 18.13 |
| Kolmogorov-Smirnov Test Statistic | 0.125 | 95% Percentile Bootstrap UCL | 17.86 |
| Kolmogorov-Smirnov 5% Critical Value | 0.12 | 95% BCA Bootstrap UCL | 18.12 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 20.53 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 22.42 |
| | | 99% Chebyshev(Mean, Sd) UCL | 26.12 |
| Assuming Gamma Distribution | | | |
| 95% Approximate Gamma UCL (Use when n >= 40) | 17.84 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 17.88 | | |
| Potential UCL to Use | | Use 95% Student's-t UCL | 17.85 |
| | | or 95% Modified-t UCL | 17.88 |
| | | or 95% H-UCL | 17.9 |

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.

H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.

It is therefore recommended to avoid the use of H-statistic based 95% UCLs.

Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics

| | | | |
|------------------------------|----|---------------------------------|----|
| Number of Valid Observations | 55 | Number of Distinct Observations | 55 |
| Number of Missing Values | 4 | | |

Raw Statistics

| | | | |
|----------------|-------|----------------------------|-------|
| | | Log-transformed Statistics | |
| Minimum | 17900 | Minimum of Log Data | 9.793 |
| Maximum | 66400 | Maximum of Log Data | 11.1 |
| Mean | 36905 | Mean of log Data | 10.45 |
| Geometric Mean | 34561 | SD of log Data | 0.365 |

| | | | |
|--|--------|--|--------|
| Median | 35400 | | |
| SD | 13641 | | |
| Std. Error of Mean | 1839 | | |
| Coefficient of Variation | 0.37 | | |
| Skewness | 0.638 | | |
| Relevant UCL Statistics | | | |
| Normal Distribution Test | | Lognormal Distribution Test | |
| Lilliefors Test Statistic | 0.133 | Lilliefors Test Statistic | 0.0905 |
| Lilliefors Critical Value | 0.119 | Lilliefors Critical Value | 0.119 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | | |
| 95% Student's-t UCL | 39984 | Assuming Lognormal Distribution | |
| 95% UCLs (Adjusted for Skewness) | | 95% H-UCL | 40329 |
| 95% Adjusted-CLT UCL (Chen-1995) | 40100 | 95% Chebyshev (MVUE) UCL | 45044 |
| 95% Modified-t UCL (Johnson-1978) | 40010 | 97.5% Chebyshev (MVUE) UCL | 48568 |
| | | 99% Chebyshev (MVUE) UCL | 55491 |
| Gamma Distribution Test | | | |
| k star (bias corrected) | 7.37 | Data Distribution | |
| Theta Star | 5008 | Data appear Gamma Distributed at 5% Significance Level | |
| MLE of Mean | 36905 | | |
| MLE of Standard Deviation | 13594 | | |
| nu star | 810.7 | | |
| Approximate Chi Square Value (.05) | 745.6 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0456 | 95% CLT UCL | 39931 |
| Adjusted Chi Square Value | 743.9 | 95% Jackknife UCL | 39984 |
| | | 95% Standard Bootstrap UCL | 39975 |
| Anderson-Darling Test Statistic | 0.645 | 95% Bootstrap-t UCL | 40306 |
| Anderson-Darling 5% Critical Value | 0.752 | 95% Hall's Bootstrap UCL | 40081 |
| Kolmogorov-Smirnov Test Statistic | 0.108 | 95% Percentile Bootstrap UCL | 39900 |
| Kolmogorov-Smirnov 5% Critical Value | 0.12 | 95% BCA Bootstrap UCL | 40031 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 44923 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 48392 |
| | | 99% Chebyshev(Mean, Sd) UCL | 55206 |
| Assuming Gamma Distribution | | | |
| 95% Approximate Gamma UCL (Use when n >= 40) | 40127 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 40217 | | |
| Potential UCL to Use | | Use 95% Approximate Gamma UCL | 40127 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Lead

| | | | |
|------------------------------|-------|---------------------------------|-------|
| General Statistics | | | |
| Number of Valid Observations | 55 | Number of Distinct Observations | 32 |
| Number of Missing Values | 4 | | |
| Raw Statistics | | | |
| Minimum | 6 | Log-transformed Statistics | |
| Maximum | 32 | Minimum of Log Data | 1.792 |
| Mean | 12.21 | Maximum of Log Data | 3.466 |
| Geometric Mean | 11.22 | Mean of log Data | 2.417 |
| Median | 11 | SD of log Data | 0.404 |

| | | | |
|---|--------|---|--------|
| SD | 5.563 | | |
| Std. Error of Mean | 0.75 | | |
| Coefficient of Variation | 0.456 | | |
| Skewness | 1.602 | | |
| Relevant UCL Statistics | | | |
| Normal Distribution Test | | Lognormal Distribution Test | |
| Lilliefors Test Statistic | 0.163 | Lilliefors Test Statistic | 0.0847 |
| Lilliefors Critical Value | 0.119 | Lilliefors Critical Value | 0.119 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | | |
| 95% Student's-t UCL | 13.47 | Assuming Lognormal Distribution | |
| 95% UCLs (Adjusted for Skewness) | | 95% H-UCL | 13.45 |
| 95% Adjusted-CLT UCL (Chen-1995) | 13.62 | 95% Chebyshev (MVUE) UCL | 15.13 |
| 95% Modified-t UCL (Johnson-1978) | 13.49 | 97.5% Chebyshev (MVUE) UCL | 16.42 |
| | | 99% Chebyshev (MVUE) UCL | 18.95 |
| Gamma Distribution Test | | | |
| k star (bias corrected) | 5.728 | Data Distribution | |
| Theta Star | 2.132 | Data Follow Appr. Gamma Distribution at 5% Significance Level | |
| MLE of Mean | 12.21 | | |
| MLE of Standard Deviation | 5.102 | | |
| nu star | 630 | | |
| Approximate Chi Square Value (.05) | 572.8 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0456 | 95% CLT UCL | 13.45 |
| Adjusted Chi Square Value | 571.3 | 95% Jackknife UCL | 13.47 |
| | | 95% Standard Bootstrap UCL | 13.43 |
| Anderson-Darling Test Statistic | 0.786 | 95% Bootstrap-t UCL | 13.69 |
| Anderson-Darling 5% Critical Value | 0.753 | 95% Hall's Bootstrap UCL | 13.78 |
| Kolmogorov-Smirnov Test Statistic | 0.109 | 95% Percentile Bootstrap UCL | 13.46 |
| Kolmogorov-Smirnov 5% Critical Value | 0.12 | 95% BCA Bootstrap UCL | 13.61 |
| Data follow Appr. Gamma Distribution at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 15.48 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 16.9 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 19.68 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 13.43 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 13.47 | | |
| Potential UCL to Use | | Use 95% Approximate Gamma UCL | 13.43 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

| | | | |
|------------------------------|-------|---------------------------------|-------|
| General Statistics | | | |
| Number of Valid Observations | 55 | Number of Distinct Observations | 54 |
| Number of Missing Values | 4 | | |
| Raw Statistics | | | |
| Minimum | 153 | Log-transformed Statistics | |
| Maximum | 4230 | Minimum of Log Data | 5.03 |
| Mean | 777.6 | Maximum of Log Data | 8.35 |
| Geometric Mean | 643.6 | Mean of log Data | 6.467 |
| Median | 655 | SD of log Data | 0.601 |
| SD | 603.8 | | |
| Std. Error of Mean | 81.41 | | |

| | | | |
|--|--------|--|--------|
| Coefficient of Variation | 0.776 | | |
| Skewness | 3.753 | | |
| Relevant UCL Statistics | | | |
| Normal Distribution Test | | Lognormal Distribution Test | |
| Lilliefors Test Statistic | 0.185 | Lilliefors Test Statistic | 0.0809 |
| Lilliefors Critical Value | 0.119 | Lilliefors Critical Value | 0.119 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | | |
| 95% Student's-t UCL | 913.9 | 95% H-UCL | 904.3 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 1059 |
| 95% Adjusted-CLT UCL (Chen-1995) | 955.6 | 97.5% Chebyshev (MVUE) UCL | 1185 |
| 95% Modified-t UCL (Johnson-1978) | 920.8 | 99% Chebyshev (MVUE) UCL | 1432 |
| Assuming Lognormal Distribution | | | |
| Gamma Distribution Test | | | |
| k star (bias corrected) | 2.658 | Data Distribution | |
| Theta Star | 292.6 | Data appear Gamma Distributed at 5% Significance Level | |
| MLE of Mean | 777.6 | | |
| MLE of Standard Deviation | 477 | | |
| nu star | 292.4 | | |
| Approximate Chi Square Value (.05) | 253.8 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0456 | 95% CLT UCL | 911.5 |
| Adjusted Chi Square Value | 252.8 | 95% Jackknife UCL | 913.9 |
| | | 95% Standard Bootstrap UCL | 911 |
| Anderson-Darling Test Statistic | 0.641 | 95% Bootstrap-t UCL | 994.8 |
| Anderson-Darling 5% Critical Value | 0.759 | 95% Hall's Bootstrap UCL | 1541 |
| Kolmogorov-Smirnov Test Statistic | 0.0937 | 95% Percentile Bootstrap UCL | 921.5 |
| Kolmogorov-Smirnov 5% Critical Value | 0.121 | 95% BCA Bootstrap UCL | 958.6 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 1133 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 1286 |
| | | 99% Chebyshev(Mean, Sd) UCL | 1588 |
| Assuming Gamma Distribution | | | |
| 95% Approximate Gamma UCL (Use when n >= 40) | 895.9 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 899.4 | | |
| Potential UCL to Use | | Use 95% Approximate Gamma UCL | 895.9 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

| | | | |
|------------------------------|-------|---------------------------------|--------|
| General Statistics | | | |
| Number of Valid Observations | 55 | Number of Distinct Observations | 53 |
| Number of Missing Values | 4 | | |
| Raw Statistics | | | |
| Minimum | 0.032 | Log-transformed Statistics | |
| Maximum | 326 | Minimum of Log Data | -3.442 |
| Mean | 26.32 | Maximum of Log Data | 5.787 |
| Geometric Mean | 5.169 | Mean of log Data | 1.643 |
| Median | 8.2 | SD of log Data | 2.247 |
| SD | 53.16 | | |
| Std. Error of Mean | 7.168 | | |
| Coefficient of Variation | 2.02 | | |
| Skewness | 4.047 | | |

| | | |
|--|---|--|
| Relevant UCL Statistics | | |
| Normal Distribution Test | Lognormal Distribution Test | |
| Lilliefors Test Statistic | 0.31 | Lilliefors Test Statistic 0.157 |
| Lilliefors Critical Value | 0.119 | Lilliefors Critical Value 0.119 |
| Data not Normal at 5% Significance Level | Data not Lognormal at 5% Significance Level | |
| | | |
| Assuming Normal Distribution | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 38.31 | 95% H-UCL 224.8 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL 169 |
| 95% Adjusted-CLT UCL (Chen-1995) | 42.29 | 97.5% Chebyshev (MVUE) UCL 217.9 |
| 95% Modified-t UCL (Johnson-1978) | 38.97 | 99% Chebyshev (MVUE) UCL 314.1 |
| | | |
| Gamma Distribution Test | Data Distribution | |
| k star (bias corrected) | 0.394 | Data appear Gamma Distributed at 5% Significance Level |
| Theta Star | 66.83 | |
| MLE of Mean | 26.32 | |
| MLE of Standard Deviation | 41.94 | |
| nu star | 43.32 | |
| Approximate Chi Square Value (.05) | 29.23 | Nonparametric Statistics |
| Adjusted Level of Significance | 0.0456 | 95% CLT UCL 38.11 |
| Adjusted Chi Square Value | 28.91 | 95% Jackknife UCL 38.31 |
| | | 95% Standard Bootstrap UCL 37.62 |
| Anderson-Darling Test Statistic | 0.621 | 95% Bootstrap-t UCL 47.69 |
| Anderson-Darling 5% Critical Value | 0.838 | 95% Hall's Bootstrap UCL 84.25 |
| Kolmogorov-Smirnov Test Statistic | 0.0876 | 95% Percentile Bootstrap UCL 38.87 |
| Kolmogorov-Smirnov 5% Critical Value | 0.129 | 95% BCA Bootstrap UCL 43.85 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL 57.56 |
| | | 97.5% Chebyshev(Mean, Sd) UCL 71.08 |
| | | 99% Chebyshev(Mean, Sd) UCL 97.64 |
| Assuming Gamma Distribution | | |
| 95% Approximate Gamma UCL (Use when n >= 40) | 39.01 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 39.43 | |
| Potential UCL to Use | Use 95% Adjusted Gamma UCL 39.43 | |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

| | | |
|--|---------------------------------|------------------------------|
| General Statistics | | |
| Number of Valid Data | 55 | Number of Detected Data 19 |
| Number of Distinct Detected Data | 18 | Number of Non-Detect Data 36 |
| Number of Missing Values | 4 | Percent Non-Detects 65.45% |
| | | |
| Raw Statistics | Log-transformed Statistics | |
| Minimum Detected | 0.082 | Minimum Detected -2.501 |
| Maximum Detected | 1.54 | Maximum Detected 0.432 |
| Mean of Detected | 0.21 | Mean of Detected -1.98 |
| SD of Detected | 0.337 | SD of Detected 0.715 |
| Minimum Non-Detect | 0.27 | Minimum Non-Detect -1.309 |
| Maximum Non-Detect | 1.4 | Maximum Non-Detect 0.336 |
| | | |
| Note: Data have multiple DLs - Use of KM Method is recommended | Number treated as Non-Detect | 54 |
| For all methods (except KM, DL/2, and ROS Methods), | Number treated as Detected | 1 |
| Observations < Largest ND are treated as NDs | Single DL Non-Detect Percentage | 98.18% |

| | | | |
|---|----------|---|--------|
| UCL Statistics | | Lognormal Distribution Test with Detected Values Only | |
| Normal Distribution Test with Detected Values Only | | Shapiro Wilk Test Statistic | 0.634 |
| Shapiro Wilk Test Statistic | 0.392 | 5% Shapiro Wilk Critical Value | 0.901 |
| 5% Shapiro Wilk Critical Value | 0.901 | Data not Lognormal at 5% Significance Level | |
| Data not Normal at 5% Significance Level | | | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 0.247 | Mean | -1.62 |
| SD | 0.221 | SD | 0.616 |
| 95% DL/2 (t) UCL | 0.296 | 95% H-Stat (DL/2) UCL | 0.282 |
| Maximum Likelihood Estimate(MLE) Method | N/A | Log ROS Method | |
| MLE method failed to converge properly | | Mean in Log Scale | -2.054 |
| | | SD in Log Scale | 0.529 |
| | | Mean in Original Scale | 0.16 |
| | | SD in Original Scale | 0.203 |
| | | 95% t UCL | 0.206 |
| | | 95% Percentile Bootstrap UCL | 0.21 |
| | | 95% BCA Bootstrap UCL | 0.245 |
| | | 95% H-UCL | 0.169 |
| Gamma Distribution Test with Detected Values Only | | Data Distribution Test with Detected Values Only | |
| k star (bias corrected) | 1.153 | Data do not follow a Discernable Distribution (0.05) | |
| Theta Star | 0.182 | | |
| nu star | 43.83 | | |
| A-D Test Statistic | 3.678 | Nonparametric Statistics | |
| 5% A-D Critical Value | 0.761 | Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.761 | Mean | 0.151 |
| 5% K-S Critical Value | 0.203 | SD | 0.203 |
| Data not Gamma Distributed at 5% Significance Level | | SE of Mean | 0.0294 |
| Assuming Gamma Distribution | | 95% KM (t) UCL | 0.2 |
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (z) UCL | 0.199 |
| Minimum | 1.00E-06 | 95% KM (jackknife) UCL | 0.199 |
| Maximum | 1.54 | 95% KM (bootstrap t) UCL | 0.373 |
| Mean | 0.197 | 95% KM (BCA) UCL | 0.203 |
| Median | 0.14 | 95% KM (Percentile Bootstrap) UCL | 0.205 |
| SD | 0.221 | 95% KM (Chebyshev) UCL | 0.279 |
| k star | 0.488 | 97.5% KM (Chebyshev) UCL | 0.334 |
| Theta star | 0.404 | 99% KM (Chebyshev) UCL | 0.443 |
| Nu star | 53.73 | Potential UCLs to Use | |
| AppChi2 | 37.89 | 95% KM (t) UCL | 0.2 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 0.28 | 95% KM (% Bootstrap) UCL | 0.205 |
| 95% Adjusted Gamma UCL (Use when n < 40) | 0.283 | | |
| Note: DL/2 is not a recommended method. | | | |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

| | | | |
|------------------------------|----|---------------------------------|----|
| Number of Valid Observations | 55 | Number of Distinct Observations | 50 |
| Number of Missing Values | 4 | | |

Raw Statistics

| | | | |
|--------------------------|--------|----------------------------|-------|
| Minimum | 14.8 | Log-transformed Statistics | |
| Maximum | 51.9 | Minimum of Log Data | 2.695 |
| Mean | 33.85 | Maximum of Log Data | 3.949 |
| Geometric Mean | 32.9 | Mean of log Data | 3.494 |
| Median | 33.6 | SD of log Data | 0.248 |
| SD | 7.725 | | |
| Std. Error of Mean | 1.042 | | |
| Coefficient of Variation | 0.228 | | |
| Skewness | -0.137 | | |

Relevant UCL Statistics

| | | | |
|---|--------|--|-------|
| Normal Distribution Test | | Lognormal Distribution Test | |
| Lilliefors Test Statistic | 0.0654 | Lilliefors Test Statistic | 0.102 |
| Lilliefors Critical Value | 0.119 | Lilliefors Critical Value | 0.119 |
| Data appear Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|-------|---------------------------------|-------|
| 95% Student's-t UCL | 35.59 | Assuming Lognormal Distribution | |
| 95% UCLs (Adjusted for Skewness) | | 95% H-UCL | 35.96 |
| 95% Adjusted-CLT UCL (Chen-1995) | 35.54 | 95% Chebyshev (MVUE) UCL | 38.93 |
| 95% Modified-t UCL (Johnson-1978) | 35.59 | 97.5% Chebyshev (MVUE) UCL | 41.1 |
| | | 99% Chebyshev (MVUE) UCL | 45.37 |

Gamma Distribution Test

| | | | |
|--|--------|---|-------|
| k star (bias corrected) | 16.84 | Data Distribution | |
| Theta Star | 2.01 | Data appear Normal at 5% Significance Level | |
| MLE of Mean | 33.85 | | |
| MLE of Standard Deviation | 8.247 | | |
| nu star | 1853 | Nonparametric Statistics | |
| Approximate Chi Square Value (.05) | 1754 | 95% CLT UCL | 35.56 |
| Adjusted Level of Significance | 0.0456 | 95% Jackknife UCL | 35.59 |
| Adjusted Chi Square Value | 1751 | 95% Standard Bootstrap UCL | 35.54 |
| Anderson-Darling Test Statistic | 0.389 | 95% Bootstrap-t UCL | 35.53 |
| Anderson-Darling 5% Critical Value | 0.749 | 95% Hall's Bootstrap UCL | 35.6 |
| Kolmogorov-Smirnov Test Statistic | 0.0924 | 95% Percentile Bootstrap UCL | 35.52 |
| Kolmogorov-Smirnov 5% Critical Value | 0.12 | 95% BCA Bootstrap UCL | 35.5 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 38.39 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 40.35 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 44.21 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 35.76 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 35.81 | | |

Potential UCL to Use

| | |
|-------------------------|-------|
| Use 95% Student's-t UCL | 35.59 |
|-------------------------|-------|

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Note: For highly negative-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positively skewed data sets.

General UCL Statistics for Data Sets with Non-Detects

User Selected Options
 From File WorkSheet.wst
 Full Precision OFF
 Confidence Coefficient 95%
 Number of Bootstrap Operations 2000

Aluminum

General Statistics

| | | | |
|------------------------------|-----|---------------------------------|-----|
| Number of Valid Observations | 212 | Number of Distinct Observations | 166 |
| Number of Missing Values | 24 | | |

Raw Statistics

| | |
|--------------------------|-------|
| Minimum | 1760 |
| Maximum | 21700 |
| Mean | 8176 |
| Geometric Mean | 7053 |
| Median | 8430 |
| SD | 3968 |
| Std. Error of Mean | 272.6 |
| Coefficient of Variation | 0.485 |
| Skewness | 0.194 |

Log-transformed Statistics

| | |
|---------------------|-------|
| Minimum of Log Data | 7.473 |
| Maximum of Log Data | 9.985 |
| Mean of log Data | 8.861 |
| SD of log Data | 0.586 |

Relevant UCL Statistics

Normal Distribution Test

| | |
|--|--------|
| Lilliefors Test Statistic | 0.0703 |
| Lilliefors Critical Value | 0.0609 |
| Data not Normal at 5% Significance Level | |

Lognormal Distribution Test

| | |
|---|--------|
| Lilliefors Test Statistic | 0.123 |
| Lilliefors Critical Value | 0.0609 |
| Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | |
|-----------------------------------|------|
| 95% Student's-t UCL | 8627 |
| 95% UCLs (Adjusted for Skewness) | |
| 95% Adjusted-CLT UCL (Chen-1995) | 8629 |
| 95% Modified-t UCL (Johnson-1978) | 8627 |

Assuming Lognormal Distribution

| | |
|----------------------------|-------|
| 95% H-UCL | 9026 |
| 95% Chebyshev (MVUE) UCL | 9953 |
| 97.5% Chebyshev (MVUE) UCL | 10639 |
| 99% Chebyshev (MVUE) UCL | 11987 |

Gamma Distribution Test

| | |
|------------------------------------|--------|
| k star (bias corrected) | 3.493 |
| Theta Star | 2341 |
| MLE of Mean | 8176 |
| MLE of Standard Deviation | 4375 |
| nu star | 1481 |
| Approximate Chi Square Value (.05) | 1393 |
| Adjusted Level of Significance | 0.0489 |
| Adjusted Chi Square Value | 1392 |

Data Distribution

Data do not follow a Discernable Distribution (0.05)

Anderson-Darling Test Statistic

| | |
|---|--------|
| Anderson-Darling 5% Critical Value | 0.758 |
| Kolmogorov-Smirnov Test Statistic | 0.107 |
| Kolmogorov-Smirnov 5% Critical Value | 0.0626 |
| Data not Gamma Distributed at 5% Significance Level | |

Nonparametric Statistics

| | |
|-------------------------------|-------|
| 95% CLT UCL | 8625 |
| 95% Jackknife UCL | 8627 |
| 95% Standard Bootstrap UCL | 8629 |
| 95% Bootstrap-t UCL | 8629 |
| 95% Hall's Bootstrap UCL | 8606 |
| 95% Percentile Bootstrap UCL | 8629 |
| 95% BCA Bootstrap UCL | 8636 |
| 95% Chebyshev(Mean, Sd) UCL | 9364 |
| 97.5% Chebyshev(Mean, Sd) UCL | 9878 |
| 99% Chebyshev(Mean, Sd) UCL | 10888 |

Assuming Gamma Distribution

| | |
|--|------|
| 95% Approximate Gamma UCL (Use when n >= 40) | 8695 |
| 95% Adjusted Gamma UCL (Use when n < 40) | 8699 |

Potential UCL to Use Use 95% Chebyshev (Mean, Sd) UCL 9364

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Antimony

| | | | |
|---|--------|--|--------|
| General Statistics | | | |
| Number of Valid Observations | 212 | Number of Distinct Observations | 195 |
| Number of Missing Values | 24 | | |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 0.343 | Minimum of Log Data | -1.07 |
| Maximum | 28900 | Maximum of Log Data | 10.27 |
| Mean | 2974 | Mean of log Data | 5.759 |
| Geometric Mean | 317 | SD of log Data | 2.899 |
| Median | 430 | | |
| SD | 5149 | | |
| Std. Error of Mean | 353.6 | | |
| Coefficient of Variation | 1.731 | | |
| Skewness | 2.245 | | |
| Relevant UCL Statistics | | Lognormal Distribution Test | |
| Normal Distribution Test | | | |
| Lilliefors Test Statistic | 0.294 | Lilliefors Test Statistic | 0.0894 |
| Lilliefors Critical Value | 0.0609 | Lilliefors Critical Value | 0.0609 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 3558 | 95% H-UCL | 49254 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 53181 |
| 95% Adjusted-CLT UCL (Chen-1995) | 3614 | 97.5% Chebyshev (MVUE) UCL | 67874 |
| 95% Modified-t UCL (Johnson-1978) | 3568 | 99% Chebyshev (MVUE) UCL | 96736 |
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 0.306 | Data do not follow a Discernable Distribution (0.05) | |
| Theta Star | 9731 | | |
| MLE of Mean | 2974 | | |
| MLE of Standard Deviation | 5380 | | |
| nu star | 129.6 | | |
| Approximate Chi Square Value (.05) | 104.3 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0489 | 95% CLT UCL | 3556 |
| Adjusted Chi Square Value | 104.1 | 95% Jackknife UCL | 3558 |
| | | 95% Standard Bootstrap UCL | 3553 |
| Anderson-Darling Test Statistic | 1.925 | 95% Bootstrap-t UCL | 3639 |
| Anderson-Darling 5% Critical Value | 0.868 | 95% Hall's Bootstrap UCL | 3634 |
| Kolmogorov-Smirnov Test Statistic | 0.0863 | 95% Percentile Bootstrap UCL | 3557 |
| Kolmogorov-Smirnov 5% Critical Value | 0.0676 | 95% BCA Bootstrap UCL | 3630 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 4516 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 5183 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 6493 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 3696 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 3701 | | |
| Potential UCL to Use | | Use 95% Chebyshev (Mean, Sd) UCL | 4516 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

| | | |
|---|--------|--|
| General Statistics | | |
| Number of Valid Observations | 212 | Number of Distinct Observations 197 |
| Number of Missing Values | 24 | |
| Raw Statistics | | |
| Minimum | 7.77 | Log-transformed Statistics Minimum of Log Data 2.05 |
| Maximum | 9880 | Maximum of Log Data 9.198 |
| Mean | 2239 | Mean of log Data 6.585 |
| Geometric Mean | 723.9 | SD of log Data 1.957 |
| Median | 1190 | |
| SD | 2468 | |
| Std. Error of Mean | 169.5 | |
| Coefficient of Variation | 1.102 | |
| Skewness | 1.144 | |
| Relevant UCL Statistics | | |
| Normal Distribution Test | | |
| Lilliefors Test Statistic | 0.183 | Lilliefors Test Statistic 0.143 |
| Lilliefors Critical Value | 0.0609 | Lilliefors Critical Value 0.0609 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level |
| Assuming Normal Distribution | | |
| 95% Student's-t UCL | 2519 | Assuming Lognormal Distribution 95% H-UCL 7472 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL 9373 |
| 95% Adjusted-CLT UCL (Chen-1995) | 2532 | 97.5% Chebyshev (MVUE) UCL 11356 |
| 95% Modified-t UCL (Johnson-1978) | 2521 | 99% Chebyshev (MVUE) UCL 15251 |
| Gamma Distribution Test | | |
| k star (bias corrected) | 0.549 | Data Distribution Data do not follow a Discernable Distribution (0.05) |
| Theta Star | 4078 | |
| MLE of Mean | 2239 | |
| MLE of Standard Deviation | 3022 | |
| nu star | 232.8 | |
| Approximate Chi Square Value (.05) | 198.5 | Nonparametric Statistics |
| Adjusted Level of Significance | 0.0489 | 95% CLT UCL 2518 |
| Adjusted Chi Square Value | 198.3 | 95% Jackknife UCL 2519 |
| | | 95% Standard Bootstrap UCL 2520 |
| Anderson-Darling Test Statistic | 2.316 | 95% Bootstrap-t UCL 2535 |
| Anderson-Darling 5% Critical Value | 0.816 | 95% Hall's Bootstrap UCL 2533 |
| Kolmogorov-Smirnov Test Statistic | 0.0811 | 95% Percentile Bootstrap UCL 2525 |
| Kolmogorov-Smirnov 5% Critical Value | 0.0656 | 95% BCA Bootstrap UCL 2521 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL 2978 |
| | | 97.5% Chebyshev(Mean, Sd) UCL 3298 |
| | | 99% Chebyshev(Mean, Sd) UCL 3925 |
| Assuming Gamma Distribution | | |
| 95% Approximate Gamma UCL (Use when n >= 40) | 2626 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 2629 | |
| Potential UCL to Use | | Use 95% Chebyshev (Mean, Sd) UCL 2978 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

| | | |
|---|--------|--|
| General Statistics | | |
| Number of Valid Observations | 212 | Number of Distinct Observations 174 |
| Number of Missing Values | 24 | |
| Raw Statistics | | |
| Minimum | 61.1 | Log-transformed Statistics |
| Maximum | 1710 | Minimum of Log Data 4.113 |
| Mean | 300 | Maximum of Log Data 7.444 |
| Geometric Mean | 222.8 | Mean of log Data 5.406 |
| Median | 194 | SD of log Data 0.737 |
| SD | 264 | |
| Std. Error of Mean | 18.13 | |
| Coefficient of Variation | 0.88 | |
| Skewness | 1.863 | |
| Relevant UCL Statistics | | |
| Normal Distribution Test | | |
| Lilliefors Test Statistic | 0.235 | Lilliefors Test Statistic 0.117 |
| Lilliefors Critical Value | 0.0609 | Lilliefors Critical Value 0.0609 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level |
| Assuming Normal Distribution | | |
| 95% Student's-t UCL | 329.9 | Assuming Lognormal Distribution |
| 95% UCLs (Adjusted for Skewness) | | 95% H-UCL 322.7 |
| 95% Adjusted-CLT UCL (Chen-1995) | 332.3 | 95% Chebyshev (MVUE) UCL 364.1 |
| 95% Modified-t UCL (Johnson-1978) | 330.3 | 97.5% Chebyshev (MVUE) UCL 395.4 |
| | | 99% Chebyshev (MVUE) UCL 456.8 |
| Gamma Distribution Test | | |
| k star (bias corrected) | 1.807 | Data Distribution |
| Theta Star | 166 | Data do not follow a Discernable Distribution (0.05) |
| MLE of Mean | 300 | |
| MLE of Standard Deviation | 223.1 | |
| nu star | 766.4 | |
| Approximate Chi Square Value (.05) | 703.1 | Nonparametric Statistics |
| Adjusted Level of Significance | 0.0489 | 95% CLT UCL 329.8 |
| Adjusted Chi Square Value | 702.7 | 95% Jackknife UCL 329.9 |
| | | 95% Standard Bootstrap UCL 329.5 |
| Anderson-Darling Test Statistic | 8.442 | 95% Bootstrap-t UCL 334.3 |
| Anderson-Darling 5% Critical Value | 0.768 | 95% Hall's Bootstrap UCL 333.9 |
| Kolmogorov-Smirnov Test Statistic | 0.169 | 95% Percentile Bootstrap UCL 333.2 |
| Kolmogorov-Smirnov 5% Critical Value | 0.0632 | 95% BCA Bootstrap UCL 333.4 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL 379 |
| | | 97.5% Chebyshev(Mean, Sd) UCL 413.2 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL 480.4 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 327 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 327.2 | |
| Potential UCL to Use | | Use 95% Chebyshev (Mean, Sd) UCL 379 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

| | | | |
|---|--------|--|--------|
| General Statistics | | | |
| Number of Valid Observations | 212 | Number of Distinct Observations | 133 |
| Number of Missing Values | 24 | | |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 8 | Minimum of Log Data | 2.079 |
| Maximum | 101 | Maximum of Log Data | 4.615 |
| Mean | 22.79 | Mean of log Data | 3.035 |
| Geometric Mean | 20.8 | SD of log Data | 0.412 |
| Median | 19.8 | | |
| SD | 11.21 | | |
| Std. Error of Mean | 0.77 | | |
| Coefficient of Variation | 0.492 | | |
| Skewness | 2.591 | | |
| Relevant UCL Statistics | | | |
| Normal Distribution Test | | Lognormal Distribution Test | |
| Lilliefors Test Statistic | 0.154 | Lilliefors Test Statistic | 0.0898 |
| Lilliefors Critical Value | 0.0609 | Lilliefors Critical Value | 0.0609 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 24.06 | 95% H-UCL | 23.8 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 25.53 |
| 95% Adjusted-CLT UCL (Chen-1995) | 24.2 | 97.5% Chebyshev (MVUE) UCL | 26.79 |
| 95% Modified-t UCL (Johnson-1978) | 24.09 | 99% Chebyshev (MVUE) UCL | 29.26 |
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 5.568 | Data do not follow a Discernable Distribution (0.05) | |
| Theta Star | 4.093 | | |
| MLE of Mean | 22.79 | | |
| MLE of Standard Deviation | 9.659 | | |
| nu star | 2361 | | |
| Approximate Chi Square Value (.05) | 2249 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0489 | 95% CLT UCL | 24.06 |
| Adjusted Chi Square Value | 2248 | 95% Jackknife UCL | 24.06 |
| | | 95% Standard Bootstrap UCL | 24.04 |
| Anderson-Darling Test Statistic | 2.564 | 95% Bootstrap-t UCL | 24.23 |
| Anderson-Darling 5% Critical Value | 0.756 | 95% Hall's Bootstrap UCL | 24.29 |
| Kolmogorov-Smirnov Test Statistic | 0.117 | 95% Percentile Bootstrap UCL | 24.1 |
| Kolmogorov-Smirnov 5% Critical Value | 0.0624 | 95% BCA Bootstrap UCL | 24.18 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 26.15 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 27.6 |
| | | 99% Chebyshev(Mean, Sd) UCL | 30.45 |
| Assuming Gamma Distribution | | | |
| 95% Approximate Gamma UCL (Use when n >= 40) | 23.92 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 23.93 | | |
| Potential UCL to Use | | | |
| | | Use 95% Student's-t UCL | 24.06 |
| | | or 95% Modified-t UCL | 24.09 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

| | | | |
|---|--------|---|--------|
| General Statistics | | | |
| Number of Valid Observations | 212 | Number of Distinct Observations | 136 |
| Number of Missing Values | 24 | | |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 5.5 | Minimum of Log Data | 1.705 |
| Maximum | 35 | Maximum of Log Data | 3.555 |
| Mean | 15.52 | Mean of log Data | 2.676 |
| Geometric Mean | 14.53 | SD of log Data | 0.377 |
| Median | 15.95 | | |
| SD | 5.407 | | |
| Std. Error of Mean | 0.371 | | |
| Coefficient of Variation | 0.348 | | |
| Skewness | 0.431 | | |
| Relevant UCL Statistics | | Lognormal Distribution Test | |
| Normal Distribution Test | | | |
| Lilliefors Test Statistic | 0.0475 | Lilliefors Test Statistic | 0.101 |
| Lilliefors Critical Value | 0.0609 | Lilliefors Critical Value | 0.0609 |
| Data appear Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 16.13 | 95% H-UCL | 16.32 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 17.41 |
| 95% Adjusted-CLT UCL (Chen-1995) | 16.14 | 97.5% Chebyshev (MVUE) UCL | 18.2 |
| 95% Modified-t UCL (Johnson-1978) | 16.13 | 99% Chebyshev (MVUE) UCL | 19.74 |
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 7.658 | Data appear Normal at 5% Significance Level | |
| Theta Star | 2.026 | | |
| MLE of Mean | 15.52 | | |
| MLE of Standard Deviation | 5.608 | | |
| nu star | 3247 | | |
| Approximate Chi Square Value (.05) | 3116 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0489 | 95% CLT UCL | 16.13 |
| Adjusted Chi Square Value | 3115 | 95% Jackknife UCL | 16.13 |
| | | 95% Standard Bootstrap UCL | 16.13 |
| Anderson-Darling Test Statistic | 1.405 | 95% Bootstrap-t UCL | 16.15 |
| Anderson-Darling 5% Critical Value | 0.754 | 95% Hall's Bootstrap UCL | 16.13 |
| Kolmogorov-Smirnov Test Statistic | 0.0813 | 95% Percentile Bootstrap UCL | 16.11 |
| Kolmogorov-Smirnov 5% Critical Value | 0.0623 | 95% BCA Bootstrap UCL | 16.13 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 17.14 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 17.84 |
| | | 99% Chebyshev(Mean, Sd) UCL | 19.21 |
| Assuming Gamma Distribution | | | |
| 95% Approximate Gamma UCL (Use when n >= 40) | 16.17 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 16.18 | | |
| Potential UCL to Use | | Use 95% Student's-t UCL | 16.13 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

| | | |
|---|-------------------------|---|
| General Statistics | | |
| Number of Valid Observations | 212 | Number of Distinct Observations 161 |
| Number of Missing Values | 24 | |
| Raw Statistics | | |
| Minimum | 14800 | Log-transformed Statistics |
| Maximum | 66100 | Minimum of Log Data 9.602 |
| Mean | 36094 | Maximum of Log Data 11.1 |
| Geometric Mean | 34848 | Mean of log Data 10.46 |
| Median | 36900 | SD of log Data 0.277 |
| SD | 8985 | |
| Std. Error of Mean | 617.1 | |
| Coefficient of Variation | 0.249 | |
| Skewness | -0.127 | |
| Relevant UCL Statistics | | |
| Normal Distribution Test | | |
| Lilliefors Test Statistic | 0.0597 | Lognormal Distribution Test 0.114 |
| Lilliefors Critical Value | 0.0609 | Lilliefors Critical Value 0.0609 |
| Data appear Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level |
| Assuming Normal Distribution | | |
| 95% Student's-t UCL | 37113 | Assuming Lognormal Distribution |
| 95% UCLs (Adjusted for Skewness) | | 95% H-UCL 37411 |
| 95% Adjusted-CLT UCL (Chen-1995) | 37103 | 95% Chebyshev (MVUE) UCL 39263 |
| 95% Modified-t UCL (Johnson-1978) | 37112 | 97.5% Chebyshev (MVUE) UCL 40586 |
| | | 99% Chebyshev (MVUE) UCL 43185 |
| Gamma Distribution Test | | |
| k star (bias corrected) | 14.2 | Data Distribution |
| Theta Star | 2542 | Data appear Normal at 5% Significance Level |
| MLE of Mean | 36094 | |
| MLE of Standard Deviation | 9578 | |
| nu star | 6021 | |
| Approximate Chi Square Value (.05) | 5842 | Nonparametric Statistics |
| Adjusted Level of Significance | 0.0489 | 95% CLT UCL 37109 |
| Adjusted Chi Square Value | 5841 | 95% Jackknife UCL 37113 |
| | | 95% Standard Bootstrap UCL 37111 |
| Anderson-Darling Test Statistic | 2.713 | 95% Bootstrap-t UCL 37077 |
| Anderson-Darling 5% Critical Value | 0.751 | 95% Hall's Bootstrap UCL 37069 |
| Kolmogorov-Smirnov Test Statistic | 0.0969 | 95% Percentile Bootstrap UCL 37096 |
| Kolmogorov-Smirnov 5% Critical Value | 0.0622 | 95% BCA Bootstrap UCL 37109 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL 38784 |
| | | 97.5% Chebyshev(Mean, Sd) UCL 39947 |
| | | 99% Chebyshev(Mean, Sd) UCL 42234 |
| Assuming Gamma Distribution | | |
| 95% Approximate Gamma UCL (Use when n >= 40) | 37202 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 37210 | |
| Potential UCL to Use | Use 95% Student's-t UCL | 37113 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Note: For highly negative-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positively skewed data sets.

Lead

General Statistics

| | | | |
|----------------------------------|-----|---------------------------|-------|
| Number of Valid Data | 212 | Number of Detected Data | 203 |
| Number of Distinct Detected Data | 154 | Number of Non-Detect Data | 9 |
| Number of Missing Values | 24 | Percent Non-Detects | 4.25% |

Raw Statistics

| | | | |
|--------------------|-------|----------------------------|--------|
| | | Log-transformed Statistics | |
| Minimum Detected | 0.027 | Minimum Detected | -3.612 |
| Maximum Detected | 3090 | Maximum Detected | 8.036 |
| Mean of Detected | 41.37 | Mean of Detected | 2.381 |
| SD of Detected | 222.1 | SD of Detected | 1.61 |
| Minimum Non-Detect | 0.9 | Minimum Non-Detect | -0.105 |
| Maximum Non-Detect | 1.9 | Maximum Non-Detect | 0.642 |

| | | |
|--|---------------------------------|--------|
| Note: Data have multiple DLs - Use of KM Method is recommended | Number treated as Non-Detect | 26 |
| For all methods (except KM, DL/2, and ROS Methods), | Number treated as Detected | 186 |
| Observations < Largest ND are treated as NDs | Single DL Non-Detect Percentage | 12.26% |

UCL Statistics

| | | | |
|--|--------|---|--------|
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Lilliefors Test Statistic | 0.426 | Lilliefors Test Statistic | 0.222 |
| 5% Lilliefors Critical Value | 0.0622 | 5% Lilliefors Critical Value | 0.0622 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|--------------------------|-------|---------------------------------|-------|
| DL/2 Substitution Method | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 39.64 | Mean | 2.258 |
| SD | 217.4 | SD | 1.681 |
| 95% DL/2 (t) UCL | 64.31 | 95% H-Stat (DL/2) UCL | 54.36 |

Maximum Likelihood Estimate(MLE) Method

| | | | |
|--------------------|-------|------------------------------|-------|
| Mean | 17.65 | Log ROS Method | |
| SD | 233.6 | Mean in Log Scale | 2.27 |
| 95% MLE (t) UCL | 44.16 | SD in Log Scale | 1.663 |
| 95% MLE (Tiku) UCL | 42.27 | Mean in Original Scale | 39.65 |
| | | SD in Original Scale | 217.4 |
| | | 95% t UCL | 64.32 |
| | | 95% Percentile Bootstrap UCL | 67.64 |
| | | 95% BCA Bootstrap UCL | 88.68 |
| | | 95% H UCL | 53.05 |

Gamma Distribution Test with Detected Values Only

| | | | |
|-------------------------|-------|--|--|
| k star (bias corrected) | 0.473 | Data Distribution Test with Detected Values Only | |
| Theta Star | 87.45 | Data do not follow a Discernable Distribution (0.05) | |
| nu star | 192.1 | | |

| | | | |
|---|----------|-----------------------------------|-------|
| A-D Test Statistic | 4.93E+28 | Nonparametric Statistics | |
| 5% A-D Critical Value | 0.827 | Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.827 | Mean | 39.63 |
| 5% K-S Critical Value | 0.0672 | SD | 216.9 |
| Data not Gamma Distributed at 5% Significance Level | | SE of Mean | 14.93 |
| | | 95% KM (t) UCL | 64.3 |
| Assuming Gamma Distribution | | 95% KM (z) UCL | 64.19 |
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (jackknife) UCL | 64.3 |
| Minimum | 1.00E-06 | 95% KM (bootstrap t) UCL | 136 |
| Maximum | 3090 | 95% KM (BCA) UCL | 70.93 |
| Mean | 39.62 | 95% KM (Percentile Bootstrap) UCL | 69.45 |
| Median | 11.7 | 95% KM (Chebyshev) UCL | 104.7 |
| SD | 217.4 | 97.5% KM (Chebyshev) UCL | 132.9 |
| k star | 0.338 | 99% KM (Chebyshev) UCL | 188.2 |
| Theta star | 117 | | |
| Nu star | 143.5 | Potential UCLs to Use | |
| AppChi2 | 116.8 | 97.5% KM (Chebyshev) UCL | 132.9 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 48.66 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 48.73 | | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Manganese

| | | | |
|--|--------|---|--------|
| General Statistics | | | |
| Number of Valid Observations | 212 | Number of Distinct Observations | 191 |
| Number of Missing Values | 24 | | |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 102 | Minimum of Log Data | 4.625 |
| Maximum | 1950 | Maximum of Log Data | 7.576 |
| Mean | 690.4 | Mean of log Data | 6.429 |
| Geometric Mean | 619.5 | SD of log Data | 0.492 |
| Median | 671.5 | | |
| SD | 310.6 | | |
| Std. Error of Mean | 21.33 | | |
| Coefficient of Variation | 0.45 | | |
| Skewness | 0.918 | | |
| Relevant UCL Statistics | | | |
| Normal Distribution Test | | | |
| Lilliefors Test Statistic | 0.0854 | Lilliefors Test Statistic | 0.0899 |
| Lilliefors Critical Value | 0.0609 | Lilliefors Critical Value | 0.0609 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 725.7 | 95% H-UCL | 743 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 807.3 |
| 95% Adjusted-CLT UCL (Chen-1995) | 727 | 97.5% Chebyshev (MVUE) UCL | 854.3 |
| 95% Modified-t UCL (Johnson-1978) | 725.9 | 99% Chebyshev (MVUE) UCL | 946.6 |

| | | |
|---|-------------------------------|---|
| Gamma Distribution Test | Data Distribution | |
| k star (bias corrected) | 4.712 | Data Follow Appr. Gamma Distribution at 5% Significance Level |
| Theta Star | 146.5 | |
| MLE of Mean | 690.4 | |
| MLE of Standard Deviation | 318.1 | |
| nu star | 1998 | |
| Approximate Chi Square Value (.05) | 1895 | Nonparametric Statistics |
| Adjusted Level of Significance | 0.0489 | 95% CLT UCL |
| Adjusted Chi Square Value | 1894 | 95% Jackknife UCL |
| | | 95% Standard Bootstrap UCL |
| Anderson-Darling Test Statistic | 0.776 | 95% Bootstrap-t UCL |
| Anderson-Darling 5% Critical Value | 0.756 | 95% Hall's Bootstrap UCL |
| Kolmogorov-Smirnov Test Statistic | 0.0585 | 95% Percentile Bootstrap UCL |
| Kolmogorov-Smirnov 5% Critical Value | 0.0624 | 95% BCA Bootstrap UCL |
| Data follow Appr. Gamma Distribution at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL |
| | | 97.5% Chebyshev(Mean, Sd) UCL |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL |
| 95% Approximate Gamma UCL (Use when n >= 40) | 727.9 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 728.1 | |
| Potential UCL to Use | Use 95% Approximate Gamma UCL | 727.9 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

| | | |
|--|---|---------------------------------|
| General Statistics | | |
| Number of Valid Observations | 212 | Number of Distinct Observations |
| Number of Missing Values | 24 | 190 |
| Raw Statistics | Log-transformed Statistics | |
| Minimum | 0.28 | Minimum of Log Data |
| Maximum | 6110 | Maximum of Log Data |
| Mean | 314.6 | Mean of log Data |
| Geometric Mean | 68.81 | SD of log Data |
| Median | 118.5 | |
| SD | 639.4 | |
| Std. Error of Mean | 43.91 | |
| Coefficient of Variation | 2.033 | |
| Skewness | 5.392 | |
| Relevant UCL Statistics | Lognormal Distribution Test | |
| Normal Distribution Test | 0.312 | Lilliefors Test Statistic |
| Lilliefors Test Statistic | 0.0609 | Lilliefors Critical Value |
| Lilliefors Critical Value | | 0.122 |
| Data not Normal at 5% Significance Level | | 0.0609 |
| | Data not Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 387.1 | 95% H-UCL |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL |
| 95% Adjusted-CLT UCL (Chen-1995) | 404.2 | 97.5% Chebyshev (MVUE) UCL |
| 95% Modified-t UCL (Johnson-1978) | 389.8 | 99% Chebyshev (MVUE) UCL |
| | | 1318 |
| | | 1631 |
| | | 2010 |
| | | 2752 |

| | | |
|---|----------------------------------|--|
| Gamma Distribution Test | Data Distribution | |
| k star (bias corrected) | 0.425 | Data do not follow a Discernable Distribution (0.05) |
| Theta Star | 739.6 | |
| MLE of Mean | 314.6 | |
| MLE of Standard Deviation | 482.3 | |
| nu star | 180.3 | |
| Approximate Chi Square Value (.05) | 150.3 | Nonparametric Statistics |
| Adjusted Level of Significance | 0.0489 | 95% CLT UCL 386.8 |
| Adjusted Chi Square Value | 150.1 | 95% Jackknife UCL 387.1 |
| | | 95% Standard Bootstrap UCL 385.4 |
| Anderson-Darling Test Statistic | 1.26 | 95% Bootstrap-t UCL 417.3 |
| Anderson-Darling 5% Critical Value | 0.838 | 95% Hall's Bootstrap UCL 428.9 |
| Kolmogorov-Smirnov Test Statistic | 0.079 | 95% Percentile Bootstrap UCL 388.3 |
| Kolmogorov-Smirnov 5% Critical Value | 0.0665 | 95% BCA Bootstrap UCL 404 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL 506 |
| | | 97.5% Chebyshev(Mean, Sd) UCL 588.8 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL 751.5 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 377.5 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 378 | |
| Potential UCL to Use | Use 95% Chebyshev (Mean, Sd) UCL | 506 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Naphthalene

| | | |
|--|---------------------------------|------------------------------|
| General Statistics | | |
| Number of Valid Data | 22 | Number of Detected Data 9 |
| Number of Distinct Detected Data | 9 | Number of Non-Detect Data 13 |
| Number of Missing Values | 211 | Percent Non-Detects 59.09% |
| Raw Statistics | Log-transformed Statistics | |
| Minimum Detected | 8.3 | Minimum Detected 2.116 |
| Maximum Detected | 3500 | Maximum Detected 8.161 |
| Mean of Detected | 518.6 | Mean of Detected 4.256 |
| SD of Detected | 1147 | SD of Detected 2.063 |
| Minimum Non-Detect | 2.3 | Minimum Non-Detect 0.833 |
| Maximum Non-Detect | 250 | Maximum Non-Detect 5.521 |
| Note: Data have multiple DLs - Use of KM Method is recommended | Number treated as Non-Detect | 20 |
| For all methods (except KM, DL/2, and ROS Methods), | Number treated as Detected | 2 |
| Observations < Largest ND are treated as NDs | Single DL Non-Detect Percentage | 90.91% |

Warning: There are only 9 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

| | | | |
|---|----------|---|-------|
| UCL Statistics | | | |
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.527 | Shapiro Wilk Test Statistic | 0.885 |
| 5% Shapiro Wilk Critical Value | 0.829 | 5% Shapiro Wilk Critical Value | 0.829 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 225.2 | Mean | 2.615 |
| SD | 751.6 | SD | 2.321 |
| 95% DL/2 (t) UCL | 501 | 95% H-Stat (DL/2) UCL | 2243 |
| Maximum Likelihood Estimate(MLE) Method | N/A | Log ROS Method | |
| MLE method failed to converge properly | | Mean in Log Scale | 1.3 |
| | | SD in Log Scale | 2.979 |
| | | Mean in Original Scale | 212.6 |
| | | SD in Original Scale | 754.6 |
| | | 95% t UCL | 489.5 |
| | | 95% Percentile Bootstrap UCL | 520.9 |
| | | 95% BCA Bootstrap UCL | 717.8 |
| | | 95% H-UCL | 14733 |
| Gamma Distribution Test with Detected Values Only | | Data Distribution Test with Detected Values Only | |
| k star (bias corrected) | | 0.3 Data Follow Appr. Gamma Distribution at 5% Significance Level | |
| Theta Star | 1729 | | |
| nu star | 5.399 | | |
| A-D Test Statistic | 0.94 | Nonparametric Statistics | |
| 5% A-D Critical Value | 0.8 | Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.8 | Mean | 218.4 |
| 5% K-S Critical Value | 0.3 | SD | 735.7 |
| Data follow Appr. Gamma Distribution at 5% Significance Level | | SE of Mean | 166.4 |
| | | 95% KM (t) UCL | 504.7 |
| | | 95% KM (z) UCL | 492.1 |
| | | 95% KM (jackknife) UCL | 492 |
| Assuming Gamma Distribution | | 95% KM (bootstrap t) UCL | 3644 |
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (BCA) UCL | 506.6 |
| Minimum | 1.00E-06 | 95% KM (Percentile Bootstrap) UCL | 506.6 |
| Maximum | 3500 | 95% KM (Chebyshev) UCL | 943.7 |
| Mean | 212.2 | 97.5% KM (Chebyshev) UCL | 1257 |
| Median | 1.00E-06 | 99% KM (Chebyshev) UCL | 1874 |
| SD | 754.7 | | |
| k star | 0.0922 | Potential UCLs to Use | |
| Theta star | 2301 | | |
| Nu star | 4.057 | 95% KM (t) UCL | 504.7 |
| AppChi2 | 0.744 | | |
| 95% Gamma Approximate UCL (Use when n >= 40) | 1156 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 1327 | | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

| | | | |
|----------------------------------|-----|---------------------------|--------|
| Number of Valid Data | 212 | Number of Detected Data | 133 |
| Number of Distinct Detected Data | 97 | Number of Non-Detect Data | 79 |
| Number of Missing Values | 24 | Percent Non-Detects | 37.26% |

Raw Statistics

| | | | |
|--------------------|-------|----------------------------|--------|
| Minimum Detected | 0.051 | Log-transformed Statistics | |
| Maximum Detected | 0.678 | Minimum Detected | -2.976 |
| Mean of Detected | 0.162 | Maximum Detected | -0.389 |
| SD of Detected | 0.121 | Mean of Detected | -2.024 |
| Minimum Non-Detect | 0.26 | SD of Detected | 0.598 |
| Maximum Non-Detect | 2.7 | Minimum Non-Detect | -1.347 |
| | | Maximum Non-Detect | 0.993 |

| | | |
|--|---------------------------------|---------|
| Note: Data have multiple DLs - Use of KM Method is recommended | Number treated as Non-Detect | 212 |
| For all methods (except KM, DL/2, and ROS Methods), | Number treated as Detected | 0 |
| Observations < Largest ND are treated as NDs | Single DL Non-Detect Percentage | 100.00% |

UCL Statistics

| | | | |
|--|--------|---|--------|
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Lilliefors Test Statistic | 0.219 | Lilliefors Test Statistic | 0.154 |
| 5% Lilliefors Critical Value | 0.0768 | 5% Lilliefors Critical Value | 0.0768 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|--------------------------|-------|---------------------------------|--------|
| DL/2 Substitution Method | | Assuming Lognormal Distribution | |
| Mean | 0.261 | DL/2 Substitution Method | |
| SD | 0.222 | Mean | -1.638 |
| 95% DL/2 (t) UCL | 0.287 | SD | 0.762 |
| | | 95% H-Stat (DL/2) UCL | 0.288 |

Maximum Likelihood Estimate(MLE) Method
MLE method failed to converge properly

N/A

| | |
|------------------------------|--------|
| Log ROS Method | |
| Mean in Log Scale | -2.037 |
| SD in Log Scale | 0.548 |
| Mean in Original Scale | 0.154 |
| SD in Original Scale | 0.105 |
| 95% t UCL | 0.166 |
| 95% Percentile Bootstrap UCL | 0.166 |
| 95% BCA Bootstrap UCL | 0.168 |
| 95% H-UCL | 0.162 |

Gamma Distribution Test with Detected Values Only

| | | | |
|-------------------------|--------|--|--|
| k star (bias corrected) | 2.556 | Data Distribution Test with Detected Values Only | |
| Theta Star | 0.0633 | Data do not follow a Discernable Distribution (0.05) | |
| nu star | 679.9 | | |

A-D Test Statistic

| | | | |
|---|--------|--------------------------|-------|
| 5% A-D Critical Value | 0.762 | Nonparametric Statistics | |
| K-S Test Statistic | 0.762 | Kaplan-Meier (KM) Method | |
| 5% K-S Critical Value | 0.0817 | Mean | 0.158 |
| Data not Gamma Distributed at 5% Significance Level | | SD | 0.117 |

Assuming Gamma Distribution

| | | | |
|--|----------|-----------------------------------|---------|
| Gamma ROS Statistics using Extrapolated Data | | SE of Mean | 0.00983 |
| Minimum | 1.00E-06 | 95% KM (t) UCL | 0.174 |
| Maximum | 0.678 | 95% KM (z) UCL | 0.174 |
| Mean | 0.162 | 95% KM (jackknife) UCL | 0.174 |
| | | 95% KM (bootstrap t) UCL | 0.177 |
| | | 95% KM (BCA) UCL | 0.174 |
| | | 95% KM (Percentile Bootstrap) UCL | 0.175 |

| | | | |
|--|--------|--------------------------|-------|
| Median | 0.131 | 95% KM (Chebyshev) UCL | 0.201 |
| SD | 0.106 | 97.5% KM (Chebyshev) UCL | 0.219 |
| k star | 1.912 | 99% KM (Chebyshev) UCL | 0.256 |
| Theta star | 0.0849 | | |
| Nu star | 810.6 | Potential UCLs to Use | |
| AppChi2 | 745.5 | 95% KM (BCA) UCL | 0.174 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 0.176 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 0.177 | | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

| | | | |
|------------------------------|-----|---------------------------------|-----|
| Number of Valid Observations | 212 | Number of Distinct Observations | 140 |
| Number of Missing Values | 24 | | |

Raw Statistics

| | | | |
|--------------------------|--------|---------------------|-------|
| Minimum | 14.2 | Minimum of Log Data | 2.653 |
| Maximum | 49.5 | Maximum of Log Data | 3.902 |
| Mean | 29.03 | Mean of log Data | 3.339 |
| Geometric Mean | 28.19 | SD of log Data | 0.248 |
| Median | 30.05 | | |
| SD | 6.802 | | |
| Std. Error of Mean | 0.467 | | |
| Coefficient of Variation | 0.234 | | |
| Skewness | 0.0558 | | |

Log-transformed Statistics

Relevant UCL Statistics

| | | | |
|--|--------|---|--------|
| Normal Distribution Test | | Lognormal Distribution Test | |
| Lilliefors Test Statistic | 0.0774 | Lilliefors Test Statistic | 0.115 |
| Lilliefors Critical Value | 0.0609 | Lilliefors Critical Value | 0.0609 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|------|----------------------------|-------|
| 95% Student's-t UCL | 29.8 | 95% H-UCL | 29.93 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 31.26 |
| 95% Adjusted-CLT UCL (Chen-1995) | 29.8 | 97.5% Chebyshev (MVUE) UCL | 32.2 |
| 95% Modified-t UCL (Johnson-1978) | 29.8 | 99% Chebyshev (MVUE) UCL | 34.07 |

Assuming Lognormal Distribution

Gamma Distribution Test

| | | | |
|------------------------------------|--------|------------------------------|---|
| k star (bias corrected) | 17 | Data Distribution | 17 Data do not follow a Discernable Distribution (0.05) |
| Theta Star | 1.708 | | |
| MLE of Mean | 29.03 | | |
| MLE of Standard Deviation | 7.04 | | |
| nu star | 7207 | | |
| Approximate Chi Square Value (.05) | 7011 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0489 | 95% CLT UCL | 29.79 |
| Adjusted Chi Square Value | 7009 | 95% Jackknife UCL | 29.8 |
| | | 95% Standard Bootstrap UCL | 29.81 |
| Anderson-Darling Test Statistic | 2.5 | 95% Bootstrap-t UCL | 29.83 |
| Anderson-Darling 5% Critical Value | 0.751 | 95% Hall's Bootstrap UCL | 29.8 |
| Kolmogorov-Smirnov Test Statistic | 0.104 | 95% Percentile Bootstrap UCL | 29.78 |

| | | | |
|---|--------|-------------------------------|-------|
| Kolmogorov-Smirnov 5% Critical Value | 0.0621 | 95% BCA Bootstrap UCL | 29.8 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 31.06 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 31.94 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 33.67 |
| 95% Approximate Gamma UCL (Use when $n \geq 40$) | 29.84 | | |
| 95% Adjusted Gamma UCL (Use when $n < 40$) | 29.84 | | |
| Potential UCL to Use | | Use 95% Student's-t UCL | 29.8 |
| | | or 95% Modified-t UCL | 29.8 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Data Sets with Non-Detects

User Selected Options
 From File WorkSheet.wst
 Full Precision OFF
 Confidence Coefficient 95%
 Number of Bootstrap Operations 2000

Aluminum

General Statistics

Number of Valid Observations 32 Number of Distinct Observations 29
 Number of Missing Values 2

Raw Statistics

Minimum 1530
 Maximum 17300
 Mean 10527
 Geometric Mean 9493
 Median 11150
 SD 3832
 Std. Error of Mean 677.3
 Coefficient of Variation 0.364
 Skewness -0.658

Log-transformed Statistics

Minimum of Log Data 7.333
 Maximum of Log Data 9.758
 Mean of log Data 9.158
 SD of log Data 0.536

Relevant UCL Statistics

Normal Distribution Test
 Shapiro Wilk Test Statistic 0.955 Shapiro Wilk Test Statistic 0.795
 Shapiro Wilk Critical Value 0.93 Shapiro Wilk Critical Value 0.93
 Data appear Normal at 5% Significance Level Data not Lognormal at 5% Significance Level

Assuming Normal Distribution

95% Student's-t UCL 11675
 95% UCLs (Adjusted for Skewness)
 95% Adjusted-CLT UCL (Chen-1995) 11557
 95% Modified-t UCL (Johnson-1978) 11662

Assuming Lognormal Distribution

95% H-UCL 13235
 95% Chebyshev (MVUE) UCL 15638
 97.5% Chebyshev (MVUE) UCL 17686
 99% Chebyshev (MVUE) UCL 21709

Gamma Distribution Test

k star (bias corrected) 4.552
 Theta Star 2312
 MLE of Mean 10527
 MLE of Standard Deviation 4934
 nu star 291.3
 Approximate Chi Square Value (.05) 252.8
 Adjusted Level of Significance 0.0416
 Adjusted Chi Square Value 250.9

Data Distribution

Data appear Normal at 5% Significance Level

Anderson-Darling Test Statistic

Anderson-Darling 5% Critical Value 0.748
 Kolmogorov-Smirnov Test Statistic 0.181
 Kolmogorov-Smirnov 5% Critical Value 0.156

Nonparametric Statistics

95% CLT UCL 11641
 95% Jackknife UCL 11675
 95% Standard Bootstrap UCL 11622
 95% Bootstrap-t UCL 11591
 95% Hall's Bootstrap UCL 11594
 95% Percentile Bootstrap UCL 11672
 95% BCA Bootstrap UCL 11564
 95% Chebyshev(Mean, Sd) UCL 13479
 97.5% Chebyshev(Mean, Sd) UCL 14757
 99% Chebyshev(Mean, Sd) UCL 17266

Assuming Gamma Distribution

95% Approximate Gamma UCL (Use when n >= 40) 12131
 95% Adjusted Gamma UCL (Use when n < 40) 12224

Potential UCL to Use Use 95% Student's-t UCL 11675

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Note: For highly negative-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positively skewed data sets.

Antimony

General Statistics

| | | | |
|----------------------------------|----|---------------------------|-------|
| Number of Valid Data | 32 | Number of Detected Data | 29 |
| Number of Distinct Detected Data | 29 | Number of Non-Detect Data | 3 |
| Number of Missing Values | 2 | Percent Non-Detects | 9.38% |

Raw Statistics

| | | | |
|--------------------|-------|----------------------------|--------|
| Minimum Detected | 0.321 | Log-transformed Statistics | |
| Maximum Detected | 2710 | Minimum Detected | -1.136 |
| Mean of Detected | 359.8 | Maximum Detected | 7.905 |
| SD of Detected | 634.2 | Mean of Detected | 3.294 |
| Minimum Non-Detect | 0.61 | SD of Detected | 3.046 |
| Maximum Non-Detect | 1.4 | Minimum Non-Detect | -0.494 |
| | | Maximum Non-Detect | 0.336 |

| | | |
|--|---------------------------------|--------|
| Note: Data have multiple DLs - Use of KM Method is recommended | Number treated as Non-Detect | 12 |
| For all methods (except KM, DL/2, and ROS Methods), | Number treated as Detected | 20 |
| Observations < Largest ND are treated as NDs | Single DL Non-Detect Percentage | 37.50% |

UCL Statistics

| | | | |
|--|---|---|-------|
| Normal Distribution Test with Detected Values Only | Lognormal Distribution Test with Detected Values Only | | |
| Shapiro Wilk Test Statistic | 0.634 | Shapiro Wilk Test Statistic | 0.905 |
| 5% Shapiro Wilk Critical Value | 0.926 | 5% Shapiro Wilk Critical Value | 0.926 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|--------------------------|---------------------------------|-----------------------|-------|
| DL/2 Substitution Method | Assuming Lognormal Distribution | | |
| Mean | DL/2 Substitution Method | | |
| 326.1 | Mean | 2.921 | |
| SD | 612.1 | SD | 3.127 |
| 95% DL/2 (t) UCL | 509.6 | 95% H-Stat (DL/2) UCL | 58205 |

Maximum Likelihood Estimate(MLE) Method

| | | | |
|--------------------|-------------------|------------------------------|-------|
| Mean | Log ROS Method | | |
| 86.36 | Mean in Log Scale | 2.915 | |
| SD | 839.8 | SD in Log Scale | 3.141 |
| 95% MLE (t) UCL | 338.1 | Mean in Original Scale | 326.2 |
| 95% MLE (Tiku) UCL | 363.3 | SD in Original Scale | 612.1 |
| | | 95% t UCL | 509.6 |
| | | 95% Percentile Bootstrap UCL | 519.2 |
| | | 95% BCA Bootstrap UCL | 575.6 |
| | | 95% H UCL | 62047 |

Gamma Distribution Test with Detected Values Only

| | | |
|-------------------------|---|--|
| k star (bias corrected) | Data Distribution Test with Detected Values Only | |
| 0.266 | Data Follow Appr. Gamma Distribution at 5% Significance Level | |
| Theta Star | 1355 | |
| nu star | 15.4 | |

| | | | |
|---|----------|-----------------------------------|-------|
| A-D Test Statistic | 0.931 | Nonparametric Statistics | |
| 5% A-D Critical Value | 0.868 | Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.868 | Mean | 326.1 |
| 5% K-S Critical Value | 0.178 | SD | 602.4 |
| Data follow Appr. Gamma Distribution at 5% Significance Level | | SE of Mean | 108.4 |
| | | 95% KM (t) UCL | 509.9 |
| Assuming Gamma Distribution | | 95% KM (z) UCL | 504.4 |
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (jackknife) UCL | 509.6 |
| Minimum | 1.00E-06 | 95% KM (bootstrap t) UCL | 641.9 |
| Maximum | 2710 | 95% KM (BCA) UCL | 505.6 |
| Mean | 326.1 | 95% KM (Percentile Bootstrap) UCL | 507.3 |
| Median | 14.65 | 95% KM (Chebyshev) UCL | 798.6 |
| SD | 612.1 | 97.5% KM (Chebyshev) UCL | 1003 |
| k star | 0.186 | 99% KM (Chebyshev) UCL | 1405 |
| Theta star | 1754 | | |
| Nu star | 11.9 | Potential UCLs to Use | |
| AppChi2 | 5.162 | 95% KM (Chebyshev) UCL | 798.6 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 751.8 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 788 | | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Arsenic

| | | | |
|--|-------|---|-------|
| General Statistics | | | |
| Number of Valid Observations | 32 | Number of Distinct Observations | 32 |
| Number of Missing Values | 2 | | |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 3.36 | Minimum of Log Data | 1.212 |
| Maximum | 3510 | Maximum of Log Data | 8.163 |
| Mean | 508.6 | Mean of log Data | 4.512 |
| Geometric Mean | 91.11 | SD of log Data | 2.069 |
| Median | 40.95 | | |
| SD | 814.5 | | |
| Std. Error of Mean | 144 | | |
| Coefficient of Variation | 1.602 | | |
| Skewness | 2.038 | | |
| Relevant UCL Statistics | | | |
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.675 | Shapiro Wilk Test Statistic | 0.889 |
| Shapiro Wilk Critical Value | 0.93 | Shapiro Wilk Critical Value | 0.93 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 752.7 | 95% H-UCL | 3349 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 2060 |
| 95% Adjusted-CLT UCL (Chen-1995) | 800.8 | 97.5% Chebyshev (MVUE) UCL | 2671 |
| 95% Modified-t UCL (Johnson-1978) | 761.3 | 99% Chebyshev (MVUE) UCL | 3871 |

| | | |
|---|------------------------------------|--|
| Gamma Distribution Test | Data Distribution | |
| k star (bias corrected) | 0.37 | Data do not follow a Discernable Distribution (0.05) |
| Theta Star | 1375 | |
| MLE of Mean | 508.6 | |
| MLE of Standard Deviation | 836.3 | |
| nu star | 23.67 | |
| Approximate Chi Square Value (.05) | 13.6 | Nonparametric Statistics |
| Adjusted Level of Significance | 0.0416 | 95% CLT UCL 745.4 |
| Adjusted Chi Square Value | 13.19 | 95% Jackknife UCL 752.7 |
| | | 95% Standard Bootstrap UCL 742.5 |
| Anderson-Darling Test Statistic | 2.227 | 95% Bootstrap-t UCL 833.4 |
| Anderson-Darling 5% Critical Value | 0.836 | 95% Hall's Bootstrap UCL 866.2 |
| Kolmogorov-Smirnov Test Statistic | 0.265 | 95% Percentile Bootstrap UCL 763 |
| Kolmogorov-Smirnov 5% Critical Value | 0.167 | 95% BCA Bootstrap UCL 806.9 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL 1136 |
| | | 97.5% Chebyshev(Mean, Sd) UCL 1408 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL 1941 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 885.3 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 912.8 | |
| Potential UCL to Use | Use 97.5% Chebyshev (Mean, Sd) UCL | 1408 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

| | | |
|--|---------------------------------|--|
| General Statistics | | |
| Number of Valid Observations | 32 | Number of Distinct Observations 30 |
| Number of Missing Values | 2 | |
| Raw Statistics | Log-transformed Statistics | |
| Minimum | 63.1 | Minimum of Log Data 4.145 |
| Maximum | 553 | Maximum of Log Data 6.315 |
| Mean | 172.9 | Mean of log Data 5.022 |
| Geometric Mean | 151.7 | SD of log Data 0.506 |
| Median | 148.5 | |
| SD | 99.23 | |
| Std. Error of Mean | 17.54 | |
| Coefficient of Variation | 0.574 | |
| Skewness | 1.946 | |
| Relevant UCL Statistics | | |
| Normal Distribution Test | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.833 | Shapiro Wilk Test Statistic 0.97 |
| Shapiro Wilk Critical Value | 0.93 | Shapiro Wilk Critical Value 0.93 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level |
| Assuming Normal Distribution | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 202.6 | 95% H-UCL 205.6 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL 241.7 |
| 95% Adjusted-CLT UCL (Chen-1995) | 208.2 | 97.5% Chebyshev (MVUE) UCL 271.9 |
| 95% Modified-t UCL (Johnson-1978) | 203.6 | 99% Chebyshev (MVUE) UCL 331.4 |

| | | |
|--|-------------------------------|--|
| Gamma Distribution Test | Data Distribution | |
| k star (bias corrected) | 3.638 | Data appear Gamma Distributed at 5% Significance Level |
| Theta Star | 47.52 | |
| MLE of Mean | 172.9 | |
| MLE of Standard Deviation | 90.63 | |
| nu star | 232.8 | |
| Approximate Chi Square Value (.05) | 198.5 | Nonparametric Statistics |
| Adjusted Level of Significance | 0.0416 | 95% CLT UCL |
| Adjusted Chi Square Value | 196.8 | 95% Jackknife UCL |
| | | 95% Standard Bootstrap UCL |
| Anderson-Darling Test Statistic | 0.46 | 95% Bootstrap-t UCL |
| Anderson-Darling 5% Critical Value | 0.751 | 95% Hall's Bootstrap UCL |
| Kolmogorov-Smirnov Test Statistic | 0.119 | 95% Percentile Bootstrap UCL |
| Kolmogorov-Smirnov 5% Critical Value | 0.156 | 95% BCA Bootstrap UCL |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL |
| | | 97.5% Chebyshev(Mean, Sd) UCL |
| | | 99% Chebyshev(Mean, Sd) UCL |
| Assuming Gamma Distribution | | |
| 95% Approximate Gamma UCL (Use when n >= 40) | 202.7 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 204.5 | |
| Potential UCL to Use | Use 95% Approximate Gamma UCL | 202.7 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

| | | |
|---|---------------------------------|---|
| General Statistics | | |
| Number of Valid Observations | 32 | Number of Distinct Observations |
| Number of Missing Values | 2 | 31 |
| Raw Statistics | Log-transformed Statistics | |
| Minimum | 12.1 | Minimum of Log Data |
| Maximum | 31.1 | Maximum of Log Data |
| Mean | 22.89 | Mean of log Data |
| Geometric Mean | 22.36 | SD of log Data |
| Median | 23.05 | |
| SD | 4.689 | |
| Std. Error of Mean | 0.829 | |
| Coefficient of Variation | 0.205 | |
| Skewness | -0.559 | |
| Relevant UCL Statistics | | |
| Normal Distribution Test | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.961 | Shapiro Wilk Test Statistic |
| Shapiro Wilk Critical Value | 0.93 | Shapiro Wilk Critical Value |
| Data appear Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level |
| Assuming Normal Distribution | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 24.3 | 95% H-UCL |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL |
| 95% Adjusted-CLT UCL (Chen-1995) | 24.17 | 97.5% Chebyshev (MVUE) UCL |
| 95% Modified-t UCL (Johnson-1978) | 24.29 | 99% Chebyshev (MVUE) UCL |

| | | | |
|--|--------|---|-------|
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 19.51 | Data appear Normal at 5% Significance Level | |
| Theta Star | 1.173 | | |
| MLE of Mean | 22.89 | | |
| MLE of Standard Deviation | 5.183 | | |
| nu star | 1249 | | |
| Approximate Chi Square Value (.05) | 1168 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0416 | 95% CLT UCL | 24.26 |
| Adjusted Chi Square Value | 1163 | 95% Jackknife UCL | 24.3 |
| | | 95% Standard Bootstrap UCL | 24.27 |
| Anderson-Darling Test Statistic | 0.655 | 95% Bootstrap-t UCL | 24.17 |
| Anderson-Darling 5% Critical Value | 0.745 | 95% Hall's Bootstrap UCL | 24.19 |
| Kolmogorov-Smirnov Test Statistic | 0.108 | 95% Percentile Bootstrap UCL | 24.23 |
| Kolmogorov-Smirnov 5% Critical Value | 0.155 | 95% BCA Bootstrap UCL | 24.24 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 26.51 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 28.07 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 31.14 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 24.48 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 24.57 | | |
| Potential UCL to Use | | Use 95% Student's-t UCL | 24.3 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Note: For highly negative-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positively skewed data sets.

Cobalt

| | | | |
|---|-------|--|-------|
| General Statistics | | | |
| Number of Valid Observations | 32 | Number of Distinct Observations | 30 |
| Number of Missing Values | 2 | | |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 6.02 | Minimum of Log Data | 1.795 |
| Maximum | 19 | Maximum of Log Data | 2.944 |
| Mean | 11.72 | Mean of log Data | 2.417 |
| Geometric Mean | 11.21 | SD of log Data | 0.311 |
| Median | 11.55 | | |
| SD | 3.431 | | |
| Std. Error of Mean | 0.607 | | |
| Coefficient of Variation | 0.293 | | |
| Skewness | 0.157 | | |
| Relevant UCL Statistics | | Lognormal Distribution Test | |
| Normal Distribution Test | | Shapiro Wilk Test Statistic | 0.943 |
| Shapiro Wilk Test Statistic | 0.959 | Shapiro Wilk Critical Value | 0.93 |
| Shapiro Wilk Critical Value | 0.93 | Data appear Lognormal at 5% Significance Level | |
| Data appear Normal at 5% Significance Level | | | |

| | | | |
|--|--------|---|-------|
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 12.75 | 95% H-UCL | 13.01 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 14.61 |
| 95% Adjusted-CLT UCL (Chen-1995) | 12.74 | 97.5% Chebyshev (MVUE) UCL | 15.85 |
| 95% Modified-t UCL (Johnson-1978) | 12.76 | 99% Chebyshev (MVUE) UCL | 18.29 |
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 10.33 | Data appear Normal at 5% Significance Level | |
| Theta Star | 1.134 | | |
| MLE of Mean | 11.72 | | |
| MLE of Standard Deviation | 3.647 | | |
| nu star | 661.4 | | |
| Approximate Chi Square Value (.05) | 602.7 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0416 | 95% CLT UCL | 12.72 |
| Adjusted Chi Square Value | 599.8 | 95% Jackknife UCL | 12.75 |
| | | 95% Standard Bootstrap UCL | 12.72 |
| Anderson-Darling Test Statistic | 0.424 | 95% Bootstrap-t UCL | 12.8 |
| Anderson-Darling 5% Critical Value | 0.746 | 95% Hall's Bootstrap UCL | 12.8 |
| Kolmogorov-Smirnov Test Statistic | 0.0963 | 95% Percentile Bootstrap UCL | 12.71 |
| Kolmogorov-Smirnov 5% Critical Value | 0.155 | 95% BCA Bootstrap UCL | 12.73 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 14.37 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 15.51 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 17.76 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 12.87 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 12.93 | | |
| Potential UCL to Use | | Use 95% Student's-t UCL | 12.75 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

| | | | |
|--|-------|---|-------|
| General Statistics | | | |
| Number of Valid Observations | 32 | Number of Distinct Observations | 31 |
| Number of Missing Values | 2 | | |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 16700 | Minimum of Log Data | 9.723 |
| Maximum | 96500 | Maximum of Log Data | 11.48 |
| Mean | 30253 | Mean of log Data | 10.24 |
| Geometric Mean | 28043 | SD of log Data | 0.362 |
| Median | 27950 | | |
| SD | 15005 | | |
| Std. Error of Mean | 2653 | | |
| Coefficient of Variation | 0.496 | | |
| Skewness | 3.16 | | |
| Relevant UCL Statistics | | Lognormal Distribution Test | |
| Normal Distribution Test | | Shapiro Wilk Test Statistic | 0.893 |
| Shapiro Wilk Test Statistic | 0.675 | Shapiro Wilk Critical Value | 0.93 |
| Shapiro Wilk Critical Value | 0.93 | Data not Lognormal at 5% Significance Level | |
| Data not Normal at 5% Significance Level | | | |

| | | | |
|---|--------|--|-------|
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 34751 | 95% H-UCL | 33728 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 38406 |
| 95% Adjusted-CLT UCL (Chen-1995) | 36199 | 97.5% Chebyshev (MVUE) UCL | 42097 |
| 95% Modified-t UCL (Johnson-1978) | 34998 | 99% Chebyshev (MVUE) UCL | 49348 |
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 6.141 | Data do not follow a Discernable Distribution (0.05) | |
| Theta Star | 4926 | | |
| MLE of Mean | 30253 | | |
| MLE of Standard Deviation | 12208 | | |
| nu star | 393 | | |
| Approximate Chi Square Value (.05) | 348.1 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0416 | 95% CLT UCL | 34616 |
| Adjusted Chi Square Value | 345.8 | 95% Jackknife UCL | 34751 |
| | | 95% Standard Bootstrap UCL | 34609 |
| Anderson-Darling Test Statistic | 1.33 | 95% Bootstrap-t UCL | 38655 |
| Anderson-Darling 5% Critical Value | 0.747 | 95% Hall's Bootstrap UCL | 55464 |
| Kolmogorov-Smirnov Test Statistic | 0.163 | 95% Percentile Bootstrap UCL | 35056 |
| Kolmogorov-Smirnov 5% Critical Value | 0.156 | 95% BCA Bootstrap UCL | 36384 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 41815 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 46818 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 56646 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 34160 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 34383 | | |
| Potential UCL to Use | | Use 95% Student's-t UCL | 34751 |
| | | or 95% Modified-t UCL | 34998 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Lead

| | | | |
|--|-------|--|-------|
| General Statistics | | | |
| Number of Valid Observations | 32 | Number of Distinct Observations | 26 |
| Number of Missing Values | 2 | | |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 5.66 | Minimum of Log Data | 1.733 |
| Maximum | 21.5 | Maximum of Log Data | 3.068 |
| Mean | 9.554 | Mean of log Data | 2.214 |
| Geometric Mean | 9.148 | SD of log Data | 0.288 |
| Median | 8.655 | | |
| SD | 3.16 | | |
| Std. Error of Mean | 0.559 | | |
| Coefficient of Variation | 0.331 | | |
| Skewness | 1.953 | | |
| Relevant UCL Statistics | | Lognormal Distribution Test | |
| Normal Distribution Test | | Shapiro Wilk Test Statistic | 0.955 |
| Shapiro Wilk Test Statistic | 0.841 | Shapiro Wilk Critical Value | 0.93 |
| Shapiro Wilk Critical Value | 0.93 | Data appear Lognormal at 5% Significance Level | |
| Data not Normal at 5% Significance Level | | | |

| | | | |
|--|--------|--|-------|
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 10.5 | 95% H-UCL | 10.46 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 11.67 |
| 95% Adjusted-CLT UCL (Chen-1995) | 10.68 | 97.5% Chebyshev (MVUE) UCL | 12.6 |
| 95% Modified-t UCL (Johnson-1978) | 10.53 | 99% Chebyshev (MVUE) UCL | 14.43 |
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 10.61 | Data appear Gamma Distributed at 5% Significance Level | |
| Theta Star | 0.9 | | |
| MLE of Mean | 9.554 | | |
| MLE of Standard Deviation | 2.933 | | |
| nu star | 679 | | |
| Approximate Chi Square Value (.05) | 619.6 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0416 | 95% CLT UCL | 10.47 |
| Adjusted Chi Square Value | 616.6 | 95% Jackknife UCL | 10.5 |
| | | 95% Standard Bootstrap UCL | 10.44 |
| Anderson-Darling Test Statistic | 0.617 | 95% Bootstrap-t UCL | 10.85 |
| Anderson-Darling 5% Critical Value | 0.746 | 95% Hall's Bootstrap UCL | 11.32 |
| Kolmogorov-Smirnov Test Statistic | 0.121 | 95% Percentile Bootstrap UCL | 10.52 |
| Kolmogorov-Smirnov 5% Critical Value | 0.155 | 95% BCA Bootstrap UCL | 10.67 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 11.99 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 13.04 |
| | | 99% Chebyshev(Mean, Sd) UCL | 15.11 |
| Assuming Gamma Distribution | | | |
| 95% Approximate Gamma UCL (Use when n >= 40) | 10.47 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 10.52 | | |
| Potential UCL to Use | | Use 95% Approximate Gamma UCL | 10.47 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

| | | | |
|--|-------|---|--------|
| General Statistics | | | |
| Number of Valid Data | 32 | Number of Detected Data | 31 |
| Number of Distinct Detected Data | 30 | Number of Non-Detect Data | 1 |
| Number of Missing Values | 2 | Percent Non-Detects | 3.13% |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum Detected | 117 | Minimum Detected | 4.762 |
| Maximum Detected | 936 | Maximum Detected | 6.842 |
| Mean of Detected | 415.3 | Mean of Detected | 5.884 |
| SD of Detected | 222.5 | SD of Detected | 0.561 |
| Minimum Non-Detect | 0.03 | Minimum Non-Detect | -3.507 |
| Maximum Non-Detect | 0.03 | Maximum Non-Detect | -3.507 |
| UCL Statistics | | | |
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.921 | Shapiro Wilk Test Statistic | 0.963 |
| 5% Shapiro Wilk Critical Value | 0.929 | 5% Shapiro Wilk Critical Value | 0.929 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

| | | |
|--|--|-------|
| Assuming Normal Distribution | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | DL/2 Substitution Method | |
| Mean | 402.3 Mean | 5.569 |
| SD | 230.9 SD | 1.866 |
| 95% DL/2 (t) UCL | 471.5 95% H-Stat (DL/2) UCL | 5041 |
| Maximum Likelihood Estimate(MLE) Method | Log ROS Method | |
| Mean | 399.4 Mean in Log Scale | 5.84 |
| SD | 233.5 SD in Log Scale | 0.606 |
| 95% MLE (t) UCL | 469.4 Mean in Original Scale | 405.1 |
| 95% MLE (Tiku) UCL | 469.1 SD in Original Scale | 226.4 |
| | 95% t UCL | 472.9 |
| | 95% Percentile Bootstrap UCL | 470.4 |
| | 95% BCA Bootstrap UCL | 474.1 |
| | 95% H UCL | 514.4 |
| Gamma Distribution Test with Detected Values Only | Data Distribution Test with Detected Values Only | |
| k star (bias corrected) | 3.278 Data appear Gamma Distributed at 5% Significance Level | |
| Theta Star | 126.7 | |
| nu star | 203.2 | |
| A-D Test Statistic | 0.406 Nonparametric Statistics | |
| 5% A-D Critical Value | 0.751 Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.751 Mean | 406 |
| 5% K-S Critical Value | 0.159 SD | 221.6 |
| Data appear Gamma Distributed at 5% Significance Level | SE of Mean | 39.82 |
| | 95% KM (t) UCL | 473.5 |
| Assuming Gamma Distribution | 95% KM (z) UCL | 471.5 |
| Gamma ROS Statistics using Extrapolated Data | 95% KM (jackknife) UCL | 473 |
| Minimum | 1.00E-06 95% KM (bootstrap t) UCL | 476.8 |
| Maximum | 936 95% KM (BCA) UCL | 468.9 |
| Mean | 402.3 95% KM (Percentile Bootstrap) UCL | 473.3 |
| Median | 357 95% KM (Chebyshev) UCL | 579.6 |
| SD | 230.9 97.5% KM (Chebyshev) UCL | 654.7 |
| k star | 0.757 99% KM (Chebyshev) UCL | 802.2 |
| Theta star | 531.3 | |
| Nu star | 48.46 Potential UCLs to Use | |
| AppChi2 | 33.48 95% KM (BCA) UCL | 468.9 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 582.3 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 594.2 | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

| | | | |
|------------------------------|----|---------------------------------|----|
| Number of Valid Observations | 32 | Number of Distinct Observations | 32 |
| Number of Missing Values | 2 | | |

Raw Statistics

| | | | |
|---------|-------|---------------------|--------|
| Minimum | 0.063 | Minimum of Log Data | -2.765 |
| Maximum | 471 | Maximum of Log Data | 6.155 |
| Mean | 48.18 | Mean of log Data | 1.709 |

Log-transformed Statistics

| | | | |
|---|--------|--|-------|
| Geometric Mean | 5.523 | SD of log Data | 2.458 |
| Median | 3.845 | | |
| SD | 103.6 | | |
| Std. Error of Mean | 18.31 | | |
| Coefficient of Variation | 2.149 | | |
| Skewness | 3.141 | | |
| Relevant UCL Statistics | | | |
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.526 | Shapiro Wilk Test Statistic | 0.962 |
| Shapiro Wilk Critical Value | 0.93 | Shapiro Wilk Critical Value | 0.93 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | | |
| 95% Student's-t UCL | 79.22 | Assuming Lognormal Distribution | |
| 95% UCLs (Adjusted for Skewness) | | 95% H-UCL | 842.3 |
| 95% Adjusted-CLT UCL (Chen-1995) | 89.15 | 95% Chebyshev (MVUE) UCL | 303.2 |
| 95% Modified-t UCL (Johnson-1978) | 80.91 | 97.5% Chebyshev (MVUE) UCL | 398.4 |
| | | 99% Chebyshev (MVUE) UCL | 585.5 |
| Gamma Distribution Test | | | |
| k star (bias corrected) | 0.307 | Data Distribution | |
| Theta Star | 157 | Data appear Lognormal at 5% Significance Level | |
| MLE of Mean | 48.18 | | |
| MLE of Standard Deviation | 86.97 | | |
| nu star | 19.64 | | |
| Approximate Chi Square Value (.05) | 10.59 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0416 | 95% CLT UCL | 78.29 |
| Adjusted Chi Square Value | 10.23 | 95% Jackknife UCL | 79.22 |
| | | 95% Standard Bootstrap UCL | 77.88 |
| Anderson-Darling Test Statistic | 1.097 | 95% Bootstrap-t UCL | 116.9 |
| Anderson-Darling 5% Critical Value | 0.851 | 95% Hall's Bootstrap UCL | 195.9 |
| Kolmogorov-Smirnov Test Statistic | 0.183 | 95% Percentile Bootstrap UCL | 81.51 |
| Kolmogorov-Smirnov 5% Critical Value | 0.168 | 95% BCA Bootstrap UCL | 93.04 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 128 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 162.5 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 230.3 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 89.38 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 92.49 | | |
| Potential UCL to Use | | Use 97.5% Chebyshev (Mean, Sd) UCL | 162.5 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

| | | | |
|----------------------------------|-------|----------------------------|--------|
| General Statistics | | | |
| Number of Valid Data | 32 | Number of Detected Data | 22 |
| Number of Distinct Detected Data | 20 | Number of Non-Detect Data | 10 |
| Number of Missing Values | 2 | Percent Non-Detects | 31.25% |
| Raw Statistics | | | |
| Minimum Detected | 0.051 | Log-transformed Statistics | |
| Maximum Detected | 0.754 | Minimum Detected | -2.976 |
| Mean of Detected | 0.159 | Maximum Detected | -0.282 |
| | | Mean of Detected | -2.072 |

| | | | |
|--|--------|---|---------|
| SD of Detected | 0.152 | SD of Detected | 0.613 |
| Minimum Non-Detect | 0.27 | Minimum Non-Detect | -1.309 |
| Maximum Non-Detect | 0.9 | Maximum Non-Detect | -0.105 |
| Note: Data have multiple DLs - Use of KM Method is recommended | | Number treated as Non-Detect | 32 |
| For all methods (except KM, DL/2, and ROS Methods), | | Number treated as Detected | 0 |
| Observations < Largest ND are treated as NDs | | Single DL Non-Detect Percentage | 100.00% |
| UCL Statistics | | | |
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.59 | Shapiro Wilk Test Statistic | 0.901 |
| 5% Shapiro Wilk Critical Value | 0.911 | 5% Shapiro Wilk Critical Value | 0.911 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 0.181 | Mean | -1.914 |
| SD | 0.145 | SD | 0.61 |
| 95% DL/2 (t) UCL | 0.225 | 95% H-Stat (DL/2) UCL | 0.222 |
| Maximum Likelihood Estimate(MLE) Method | N/A | Log ROS Method | |
| MLE method failed to converge properly | | Mean in Log Scale | -2.096 |
| | | SD in Log Scale | 0.514 |
| | | Mean in Original Scale | 0.146 |
| | | SD in Original Scale | 0.127 |
| | | 95% t UCL | 0.184 |
| | | 95% Percentile Bootstrap UCL | 0.186 |
| | | 95% BCA Bootstrap UCL | 0.207 |
| | | 95% H-UCL | 0.168 |
| Gamma Distribution Test with Detected Values Only | | Data Distribution Test with Detected Values Only | |
| k star (bias corrected) | 2.031 | Data do not follow a Discernable Distribution (0.05) | |
| Theta Star | 0.0782 | | |
| nu star | 89.34 | | |
| A-D Test Statistic | 1.405 | Nonparametric Statistics | |
| 5% A-D Critical Value | 0.754 | Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.754 | Mean | 0.148 |
| 5% K-S Critical Value | 0.188 | SD | 0.131 |
| Data not Gamma Distributed at 5% Significance Level | | SE of Mean | 0.0252 |
| Assuming Gamma Distribution | | 95% KM (t) UCL | 0.191 |
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (z) UCL | 0.189 |
| Minimum | 0.051 | 95% KM (jackknife) UCL | 0.191 |
| Maximum | 0.754 | 95% KM (bootstrap t) UCL | 0.241 |
| Mean | 0.159 | 95% KM (BCA) UCL | 0.192 |
| Median | 0.138 | 95% KM (Percentile Bootstrap) UCL | 0.194 |
| SD | 0.127 | 95% KM (Chebyshev) UCL | 0.258 |
| k star | 2.895 | 97.5% KM (Chebyshev) UCL | 0.305 |
| Theta star | 0.0549 | 99% KM (Chebyshev) UCL | 0.399 |
| Nu star | 185.3 | Potential UCLs to Use | |
| AppChi2 | 154.8 | 95% KM (BCA) UCL | 0.192 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 0.19 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 0.192 | | |
| Note: DL/2 is not a recommended method. | | | |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Vanadium

| | | |
|--|--------|---|
| General Statistics | | |
| Number of Valid Observations | 32 | Number of Distinct Observations 30 |
| Number of Missing Values | 2 | |
| Raw Statistics | | |
| Minimum | 22.4 | Log-transformed Statistics |
| Maximum | 48 | Minimum of Log Data 3.109 |
| Mean | 33.74 | Maximum of Log Data 3.871 |
| Geometric Mean | 33.28 | Mean of log Data 3.505 |
| Median | 32.85 | SD of log Data 0.168 |
| SD | 5.744 | |
| Std. Error of Mean | 1.015 | |
| Coefficient of Variation | 0.17 | |
| Skewness | 0.547 | |
| Relevant UCL Statistics | | |
| Normal Distribution Test | | |
| Shapiro Wilk Test Statistic | 0.97 | Lognormal Distribution Test |
| Shapiro Wilk Critical Value | 0.93 | Shapiro Wilk Test Statistic 0.987 |
| Data appear Normal at 5% Significance Level | | Shapiro Wilk Critical Value 0.93 |
| Assuming Normal Distribution | | |
| 95% Student's-t UCL | 35.47 | Assuming Lognormal Distribution |
| 95% UCLs (Adjusted for Skewness) | | 95% H-UCL 35.57 |
| 95% Adjusted-CLT UCL (Chen-1995) | 35.52 | 95% Chebyshev (MVUE) UCL 38.14 |
| 95% Modified-t UCL (Johnson-1978) | 35.48 | 97.5% Chebyshev (MVUE) UCL 40.05 |
| | | 99% Chebyshev (MVUE) UCL 43.79 |
| Gamma Distribution Test | | |
| k star (bias corrected) | 33.07 | Data Distribution |
| Theta Star | 1.02 | Data appear Normal at 5% Significance Level |
| MLE of Mean | 33.74 | |
| MLE of Standard Deviation | 5.868 | |
| nu star | 2116 | |
| Approximate Chi Square Value (.05) | 2011 | Nonparametric Statistics |
| Adjusted Level of Significance | 0.0416 | 95% CLT UCL 35.41 |
| Adjusted Chi Square Value | 2005 | 95% Jackknife UCL 35.47 |
| | | 95% Standard Bootstrap UCL 35.33 |
| Anderson-Darling Test Statistic | 0.278 | 95% Bootstrap-t UCL 35.52 |
| Anderson-Darling 5% Critical Value | 0.745 | 95% Hall's Bootstrap UCL 35.67 |
| Kolmogorov-Smirnov Test Statistic | 0.0963 | 95% Percentile Bootstrap UCL 35.37 |
| Kolmogorov-Smirnov 5% Critical Value | 0.155 | 95% BCA Bootstrap UCL 35.56 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL 38.17 |
| | | 97.5% Chebyshev(Mean, Sd) UCL 40.09 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL 43.85 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 35.52 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 35.62 | |
| Potential UCL to Use | | Use 95% Student's-t UCL 35.47 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Data Sets with Non-Detects

User Selected Options
 From File WorkSheet.wst
 Full Precision OFF
 Confidence Coefficient 95%
 Number of Bootstrap Operations 2000

Aluminum

General Statistics

| | | | |
|------------------------------|-----|---------------------------------|-----|
| Number of Valid Observations | 299 | Number of Distinct Observations | 210 |
| Number of Missing Values | 30 | | |

Raw Statistics

| | |
|--------------------------|-------|
| Minimum | 1530 |
| Maximum | 21700 |
| Mean | 8679 |
| Geometric Mean | 7502 |
| Median | 8980 |
| SD | 4161 |
| Std. Error of Mean | 240.6 |
| Coefficient of Variation | 0.479 |
| Skewness | 0.176 |

Log-transformed Statistics

| | |
|---------------------|-------|
| Minimum of Log Data | 7.333 |
| Maximum of Log Data | 9.985 |
| Mean of log Data | 8.923 |
| SD of log Data | 0.585 |

Relevant UCL Statistics

Normal Distribution Test

| | |
|--|--------|
| Lilliefors Test Statistic | 0.0669 |
| Lilliefors Critical Value | 0.0512 |
| Data not Normal at 5% Significance Level | |

Lognormal Distribution Test

| | |
|---|--------|
| Lilliefors Test Statistic | 0.127 |
| Lilliefors Critical Value | 0.0512 |
| Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | |
|-----------------------------------|------|
| 95% Student's-t UCL | 9076 |
| 95% UCLs (Adjusted for Skewness) | |
| 95% Adjusted-CLT UCL (Chen-1995) | 9078 |
| 95% Modified-t UCL (Johnson-1978) | 9077 |

Assuming Lognormal Distribution

| | |
|----------------------------|-------|
| 95% H-UCL | 9474 |
| 95% Chebyshev (MVUE) UCL | 10309 |
| 97.5% Chebyshev (MVUE) UCL | 10921 |
| 99% Chebyshev (MVUE) UCL | 12124 |

Gamma Distribution Test

| | |
|------------------------------------|--------|
| k star (bias corrected) | 3.554 |
| Theta Star | 2442 |
| MLE of Mean | 8679 |
| MLE of Standard Deviation | 4604 |
| nu star | 2125 |
| Approximate Chi Square Value (.05) | 2019 |
| Adjusted Level of Significance | 0.0492 |
| Adjusted Chi Square Value | 2018 |

Data Distribution

Data do not follow a Discernable Distribution (0.05)

Anderson-Darling Test Statistic

| | |
|---|--------|
| Anderson-Darling 5% Critical Value | 0.759 |
| Kolmogorov-Smirnov Test Statistic | 0.102 |
| Kolmogorov-Smirnov 5% Critical Value | 0.0525 |
| Data not Gamma Distributed at 5% Significance Level | |

Nonparametric Statistics

| | |
|-------------------------------|-------|
| 95% CLT UCL | 9075 |
| 95% Jackknife UCL | 9076 |
| 95% Standard Bootstrap UCL | 9075 |
| 95% Bootstrap-t UCL | 9063 |
| 95% Hall's Bootstrap UCL | 9057 |
| 95% Percentile Bootstrap UCL | 9086 |
| 95% BCA Bootstrap UCL | 9075 |
| 95% Chebyshev(Mean, Sd) UCL | 9728 |
| 97.5% Chebyshev(Mean, Sd) UCL | 10182 |
| 99% Chebyshev(Mean, Sd) UCL | 11073 |

Assuming Gamma Distribution

| | |
|--|------|
| 95% Approximate Gamma UCL (Use when n >= 40) | 9135 |
| 95% Adjusted Gamma UCL (Use when n < 40) | 9137 |

| | | |
|----------------------|----------------------------------|------|
| Potential UCL to Use | Use 95% Chebyshev (Mean, Sd) UCL | 9728 |
|----------------------|----------------------------------|------|

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Antimony

General Statistics

| | | | |
|----------------------------------|-----|---------------------------|-------|
| Number of Valid Data | 299 | Number of Detected Data | 277 |
| Number of Distinct Detected Data | 247 | Number of Non-Detect Data | 22 |
| Number of Missing Values | 30 | Percent Non-Detects | 7.36% |

Raw Statistics

| | | | |
|--------------------|-------|----------------------------|--------|
| Minimum Detected | 0.25 | Log-transformed Statistics | |
| Maximum Detected | 28900 | Minimum Detected | -1.386 |
| Mean of Detected | 2320 | Maximum Detected | 10.27 |
| SD of Detected | 4660 | Mean of Detected | 5.112 |
| Minimum Non-Detect | 0.45 | SD of Detected | 3.017 |
| Maximum Non-Detect | 2.3 | Minimum Non-Detect | -0.799 |
| | | Maximum Non-Detect | 0.833 |

| | | |
|--|---------------------------------|--------|
| Note: Data have multiple DLs - Use of KM Method is recommended | Number treated as Non-Detect | 56 |
| For all methods (except KM, DL/2, and ROS Methods), | Number treated as Detected | 243 |
| Observations < Largest ND are treated as NDs | Single DL Non-Detect Percentage | 18.73% |

UCL Statistics

| | | | |
|--|---|---|--------|
| Normal Distribution Test with Detected Values Only | Lognormal Distribution Test with Detected Values Only | | |
| Lilliefors Test Statistic | 0.313 | Lilliefors Test Statistic | 0.059 |
| 5% Lilliefors Critical Value | 0.0532 | 5% Lilliefors Critical Value | 0.0532 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|--------------------------|---------------------------------|-----------------------|-------|
| DL/2 Substitution Method | Assuming Lognormal Distribution | | |
| DL/2 Substitution Method | DL/2 Substitution Method | | |
| Mean | 2149 | Mean | 4.665 |
| SD | 4526 | SD | 3.312 |
| 95% DL/2 (t) UCL | 2581 | 95% H-Stat (DL/2) UCL | 62985 |

Maximum Likelihood Estimate(MLE) Method

| | | | |
|--------------------|------|------------------------------|-------|
| Mean | 1466 | Log ROS Method | |
| SD | 5189 | Mean in Log Scale | 4.684 |
| 95% MLE (t) UCL | 1961 | SD in Log Scale | 3.285 |
| 95% MLE (Tiku) UCL | 1946 | Mean in Original Scale | 2149 |
| | | SD in Original Scale | 4526 |
| | | 95% t UCL | 2581 |
| | | 95% Percentile Bootstrap UCL | 2614 |
| | | 95% BCA Bootstrap UCL | 2599 |
| | | 95% H UCL | 57992 |

Gamma Distribution Test with Detected Values Only

| | | | |
|-------------------------|-------|--|--|
| k star (bias corrected) | 0.266 | Data Distribution Test with Detected Values Only | |
| Theta Star | 8719 | Data do not follow a Discernable Distribution (0.05) | |
| nu star | 147.4 | | |

A-D Test Statistic

| | | | |
|-----------------------|--------|--------------------------|------|
| 5% A-D Critical Value | 4.663 | Nonparametric Statistics | |
| K-S Test Statistic | 0.886 | Kaplan-Meier (KM) Method | |
| 5% K-S Critical Value | 0.886 | Mean | 2149 |
| | 0.0599 | SD | 4518 |

| | | |
|---|--|-------|
| Data not Gamma Distributed at 5% Significance Level | SE of Mean | 261.8 |
| | 95% KM (t) UCL | 2581 |
| Assuming Gamma Distribution | 95% KM (z) UCL | 2580 |
| Gamma ROS Statistics using Extrapolated Data | 95% KM (jackknife) UCL | 2581 |
| Minimum | 1.00E-06 95% KM (bootstrap t) UCL | 2633 |
| Maximum | 28900 95% KM (BCA) UCL | 2614 |
| Mean | 2149 95% KM (Percentile Bootstrap) UCL | 2609 |
| Median | 183 95% KM (Chebyshev) UCL | 3290 |
| SD | 4526 97.5% KM (Chebyshev) UCL | 3784 |
| k star | 0.188 99% KM (Chebyshev) UCL | 4754 |
| Theta star | 11414 | |
| Nu star | 112.6 Potential UCLs to Use | |
| AppChi2 | 89.1 97.5% KM (Chebyshev) UCL | 3784 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 2716 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 2719 | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Arsenic

| | | |
|--|--------|---|
| General Statistics | | |
| Number of Valid Data | 299 | Number of Detected Data 298 |
| Number of Distinct Detected Data | 262 | Number of Non-Detect Data 1 |
| Number of Missing Values | 30 | Percent Non-Detects 0.33% |
| Raw Statistics | | |
| Minimum Detected | 3.36 | Log-transformed Statistics Minimum Detected 1.212 |
| Maximum Detected | 9880 | Maximum Detected 9.198 |
| Mean of Detected | 1783 | Mean of Detected 6.071 |
| SD of Detected | 2320 | SD of Detected 2.12 |
| Minimum Non-Detect | 0.9 | Minimum Non-Detect -0.105 |
| Maximum Non-Detect | 0.9 | Maximum Non-Detect -0.105 |
| UCL Statistics | | |
| Normal Distribution Test with Detected Values Only | 0.221 | Lognormal Distribution Test with Detected Values Only Lilliefors Test Statistic 0.106 |
| Lilliefors Test Statistic | 0.0513 | 5% Lilliefors Critical Value 0.0513 |
| 5% Lilliefors Critical Value | | Data not Lognormal at 5% Significance Level |
| Data not Normal at 5% Significance Level | | |
| Assuming Normal Distribution | | |
| DL/2 Substitution Method | | Assuming Lognormal Distribution DL/2 Substitution Method |
| Mean | 1777 | Mean 6.048 |
| SD | 2318 | SD 2.153 |
| 95% DL/2 (t) UCL | 1999 | 95% H-Stat (DL/2) UCL 6494 |
| Maximum Likelihood Estimate(MLE) Method | | |
| Mean | 1773 | Log ROS Method Mean in Log Scale 6.05 |
| SD | 2320 | SD in Log Scale 2.146 |
| 95% MLE (t) UCL | 1994 | Mean in Original Scale 1777 |
| 95% MLE (Tiku) UCL | 1976 | SD in Original Scale 2318 |
| | | 95% t UCL 1999 |
| | | 95% Percentile Bootstrap UCL 2000 |

| | | |
|---|--|-------|
| | 95% BCA Bootstrap UCL | 2028 |
| | 95% H UCL | 6401 |
| Gamma Distribution Test with Detected Values Only | Data Distribution Test with Detected Values Only | |
| k star (bias corrected) | 0.453 Data do not follow a Discernable Distribution (0.05) | |
| Theta Star | 3936 | |
| nu star | 270 | |
| A-D Test Statistic | 3.718 Nonparametric Statistics | |
| 5% A-D Critical Value | 0.833 Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.833 Mean | 1777 |
| 5% K-S Critical Value | 0.0557 SD | 2314 |
| Data not Gamma Distributed at 5% Significance Level | SE of Mean | 134.1 |
| | 95% KM (t) UCL | 1999 |
| Assuming Gamma Distribution | 95% KM (z) UCL | 1998 |
| Gamma ROS Statistics using Extrapolated Data | 95% KM (jackknife) UCL | 1999 |
| Minimum | 1.00E-06 95% KM (bootstrap t) UCL | 2017 |
| Maximum | 9880 95% KM (BCA) UCL | 2007 |
| Mean | 1777 95% KM (Percentile Bootstrap) UCL | 2004 |
| Median | 665 95% KM (Chebyshev) UCL | 2362 |
| SD | 2318 97.5% KM (Chebyshev) UCL | 2615 |
| k star | 0.436 99% KM (Chebyshev) UCL | 3111 |
| Theta star | 4072 | |
| Nu star | 261 Potential UCLs to Use | |
| AppChi2 | 224.6 97.5% KM (Chebyshev) UCL | 2615 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 2065 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 2067 | |
| Note: DL/2 is not a recommended method. | | |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Barium

| | | |
|--|---|-------------------------------------|
| General Statistics | | |
| Number of Valid Observations | 299 | Number of Distinct Observations 215 |
| Number of Missing Values | 30 | |
| Raw Statistics | Log-transformed Statistics | |
| Minimum | 61.1 | Minimum of Log Data 4.113 |
| Maximum | 1710 | Maximum of Log Data 7.444 |
| Mean | 263.6 | Mean of log Data 5.31 |
| Geometric Mean | 202.4 | SD of log Data 0.676 |
| Median | 174 | |
| SD | 233.2 | |
| Std. Error of Mean | 13.49 | |
| Coefficient of Variation | 0.885 | |
| Skewness | 2.304 | |
| Relevant UCL Statistics | | |
| Normal Distribution Test | Lognormal Distribution Test | |
| Lilliefors Test Statistic | 0.243 Lilliefors Test Statistic | 0.115 |
| Lilliefors Critical Value | 0.0512 Lilliefors Critical Value | 0.0512 |
| Data not Normal at 5% Significance Level | Data not Lognormal at 5% Significance Level | |

| | | | |
|---|--------|--|-------|
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 285.8 | 95% H-UCL | 274.1 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 302.1 |
| 95% Adjusted-CLT UCL (Chen-1995) | 287.7 | 97.5% Chebyshev (MVUE) UCL | 322.8 |
| 95% Modified-t UCL (Johnson-1978) | 286.1 | 99% Chebyshev (MVUE) UCL | 363.5 |
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 2.027 | Data do not follow a Discernable Distribution (0.05) | |
| Theta Star | 130.1 | | |
| MLE of Mean | 263.6 | | |
| MLE of Standard Deviation | 185.2 | | |
| nu star | 1212 | | |
| Approximate Chi Square Value (.05) | 1132 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0492 | 95% CLT UCL | 285.8 |
| Adjusted Chi Square Value | 1132 | 95% Jackknife UCL | 285.8 |
| | | 95% Standard Bootstrap UCL | 285.8 |
| Anderson-Darling Test Statistic | 13.08 | 95% Bootstrap-t UCL | 287.3 |
| Anderson-Darling 5% Critical Value | 0.766 | 95% Hall's Bootstrap UCL | 288.1 |
| Kolmogorov-Smirnov Test Statistic | 0.169 | 95% Percentile Bootstrap UCL | 286.1 |
| Kolmogorov-Smirnov 5% Critical Value | 0.0529 | 95% BCA Bootstrap UCL | 287.4 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 322.4 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 347.8 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 397.8 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 282.2 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 282.3 | | |
| Potential UCL to Use | | Use 95% Chebyshev (Mean, Sd) UCL | 322.4 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

| | | | |
|--|--------|--|--------|
| General Statistics | | | |
| Number of Valid Observations | 299 | Number of Distinct Observations | 165 |
| Number of Missing Values | 30 | | |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 8 | Minimum of Log Data | 2.079 |
| Maximum | 101 | Maximum of Log Data | 4.615 |
| Mean | 22.5 | Mean of log Data | 3.039 |
| Geometric Mean | 20.88 | SD of log Data | 0.377 |
| Median | 20.6 | | |
| SD | 9.852 | | |
| Std. Error of Mean | 0.57 | | |
| Coefficient of Variation | 0.438 | | |
| Skewness | 2.742 | | |
| Relevant UCL Statistics | | Lognormal Distribution Test | |
| Normal Distribution Test | | Lilliefors Test Statistic | 0.0351 |
| Lilliefors Test Statistic | 0.118 | Lilliefors Critical Value | 0.0512 |
| Lilliefors Critical Value | 0.0512 | Data appear Lognormal at 5% Significance Level | |
| Data not Normal at 5% Significance Level | | | |

| | | | |
|---|--------|--|-------|
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 23.44 | 95% H-UCL | 23.28 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 24.61 |
| 95% Adjusted-CLT UCL (Chen-1995) | 23.53 | 97.5% Chebyshev (MVUE) UCL | 25.56 |
| 95% Modified-t UCL (Johnson-1978) | 23.45 | 99% Chebyshev (MVUE) UCL | 27.43 |
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 6.793 | Data appear Lognormal at 5% Significance Level | |
| Theta Star | 3.312 | | |
| MLE of Mean | 22.5 | | |
| MLE of Standard Deviation | 8.632 | | |
| nu star | 4062 | | |
| Approximate Chi Square Value (.05) | 3915 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0492 | 95% CLT UCL | 23.43 |
| Adjusted Chi Square Value | 3914 | 95% Jackknife UCL | 23.44 |
| | | 95% Standard Bootstrap UCL | 23.41 |
| Anderson-Darling Test Statistic | 1.686 | 95% Bootstrap-t UCL | 23.52 |
| Anderson-Darling 5% Critical Value | 0.756 | 95% Hall's Bootstrap UCL | 23.57 |
| Kolmogorov-Smirnov Test Statistic | 0.0617 | 95% Percentile Bootstrap UCL | 23.44 |
| Kolmogorov-Smirnov 5% Critical Value | 0.0523 | 95% BCA Bootstrap UCL | 23.51 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 24.98 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 26.05 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 28.17 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 23.34 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 23.35 | | |
| Potential UCL to Use | | Use 95% Student's-t UCL | 23.44 |
| | | or 95% Modified-t UCL | 23.45 |
| | | or 95% H-UCL | 23.28 |

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.

H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.

It is therefore recommended to avoid the use of H-statistic based 95% UCLs.

Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

| | | | |
|------------------------------|-------|---------------------------------|-------|
| General Statistics | | | |
| Number of Valid Observations | 299 | Number of Distinct Observations | 181 |
| Number of Missing Values | 30 | | |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 5.5 | Minimum of Log Data | 1.705 |
| Maximum | 38.8 | Maximum of Log Data | 3.658 |
| Mean | 15.23 | Mean of log Data | 2.652 |
| Geometric Mean | 14.18 | SD of log Data | 0.386 |
| Median | 14.9 | | |
| SD | 5.781 | | |
| Std. Error of Mean | 0.334 | | |
| Coefficient of Variation | 0.38 | | |
| Skewness | 0.883 | | |

| | | | |
|---|--------|---|--------|
| Relevant UCL Statistics | | Lognormal Distribution Test | |
| Normal Distribution Test | | | |
| Lilliefors Test Statistic | 0.0619 | Lilliefors Test Statistic | 0.0745 |
| Lilliefors Critical Value | 0.0512 | Lilliefors Critical Value | 0.0512 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 15.78 | 95% H-UCL | 15.88 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 16.81 |
| 95% Adjusted-CLT UCL (Chen-1995) | 15.8 | 97.5% Chebyshev (MVUE) UCL | 17.47 |
| 95% Modified-t UCL (Johnson-1978) | 15.79 | 99% Chebyshev (MVUE) UCL | 18.78 |
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 7.065 | Data Follow Appr. Gamma Distribution at 5% Significance Level | |
| Theta Star | 2.156 | | |
| MLE of Mean | 15.23 | | |
| MLE of Standard Deviation | 5.731 | | |
| nu star | 4225 | | |
| Approximate Chi Square Value (.05) | 4075 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0492 | 95% CLT UCL | 15.78 |
| Adjusted Chi Square Value | 4074 | 95% Jackknife UCL | 15.78 |
| | | 95% Standard Bootstrap UCL | 15.78 |
| Anderson-Darling Test Statistic | 0.668 | 95% Bootstrap-t UCL | 15.81 |
| Anderson-Darling 5% Critical Value | 0.756 | 95% Hall's Bootstrap UCL | 15.78 |
| Kolmogorov-Smirnov Test Statistic | 0.0529 | 95% Percentile Bootstrap UCL | 15.77 |
| Kolmogorov-Smirnov 5% Critical Value | 0.0523 | 95% BCA Bootstrap UCL | 15.8 |
| Data follow Appr. Gamma Distribution at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 16.69 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 17.32 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 18.56 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 15.79 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 15.8 | | |
| Potential UCL to Use | | Use 95% Approximate Gamma UCL | 15.79 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

| | | | |
|------------------------------|-------|---------------------------------|-------|
| General Statistics | | | |
| Number of Valid Observations | 299 | Number of Distinct Observations | 210 |
| Number of Missing Values | 30 | | |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 14800 | Minimum of Log Data | 9.602 |
| Maximum | 96500 | Maximum of Log Data | 11.48 |
| Mean | 35618 | Mean of log Data | 10.43 |
| Geometric Mean | 33996 | SD of log Data | 0.311 |
| Median | 35500 | | |
| SD | 10856 | | |
| Std. Error of Mean | 627.8 | | |
| Coefficient of Variation | 0.305 | | |
| Skewness | 0.848 | | |

| | | | |
|---|--------|--|--------|
| Relevant UCL Statistics | | | |
| Normal Distribution Test | | Lognormal Distribution Test | |
| Lilliefors Test Statistic | 0.0611 | Lilliefors Test Statistic | 0.0861 |
| Lilliefors Critical Value | 0.0512 | Lilliefors Critical Value | 0.0512 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 36654 | 95% H-UCL | 36800 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 38532 |
| 95% Adjusted-CLT UCL (Chen-1995) | 36684 | 97.5% Chebyshev (MVUE) UCL | 39770 |
| 95% Modified-t UCL (Johnson-1978) | 36659 | 99% Chebyshev (MVUE) UCL | 42200 |
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 10.78 | Data do not follow a Discernable Distribution (0.05) | |
| Theta Star | 3304 | | |
| MLE of Mean | 35618 | | |
| MLE of Standard Deviation | 10847 | | |
| nu star | 6448 | | |
| Approximate Chi Square Value (.05) | 6262 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0492 | 95% CLT UCL | 36651 |
| Adjusted Chi Square Value | 6261 | 95% Jackknife UCL | 36654 |
| | | 95% Standard Bootstrap UCL | 36681 |
| Anderson-Darling Test Statistic | 1.339 | 95% Bootstrap-t UCL | 36666 |
| Anderson-Darling 5% Critical Value | 0.755 | 95% Hall's Bootstrap UCL | 36691 |
| Kolmogorov-Smirnov Test Statistic | 0.0663 | 95% Percentile Bootstrap UCL | 36659 |
| Kolmogorov-Smirnov 5% Critical Value | 0.0522 | 95% BCA Bootstrap UCL | 36642 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 38355 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 39539 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 41865 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 36674 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 36679 | | |
| Potential UCL to Use | | Use 95% Student's-t UCL | 36654 |
| | | or 95% Modified-t UCL | 36659 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Lead

| | | | |
|----------------------------------|-------|----------------------------|--------|
| General Statistics | | | |
| Number of Valid Data | 299 | Number of Detected Data | 290 |
| Number of Distinct Detected Data | 182 | Number of Non-Detect Data | 9 |
| Number of Missing Values | 30 | Percent Non-Detects | 3.01% |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum Detected | 0.027 | Minimum Detected | -3.612 |
| Maximum Detected | 3090 | Maximum Detected | 8.036 |
| Mean of Detected | 32.33 | Mean of Detected | 2.369 |
| SD of Detected | 186.2 | SD of Detected | 1.362 |
| Minimum Non-Detect | 0.9 | Minimum Non-Detect | -0.105 |
| Maximum Non-Detect | 1.9 | Maximum Non-Detect | 0.642 |

| | | |
|--|---------------------------------|-------|
| Note: Data have multiple DLs - Use of KM Method is recommended | Number treated as Non-Detect | 26 |
| For all methods (except KM, DL/2, and ROS Methods), | Number treated as Detected | 273 |
| Observations < Largest ND are treated as NDs | Single DL Non-Detect Percentage | 8.70% |

UCL Statistics

| | | |
|--|---|-------|
| Normal Distribution Test with Detected Values Only | Lognormal Distribution Test with Detected Values Only | |
| Lilliefors Test Statistic | 0.431 Lilliefors Test Statistic | 0.233 |
| 5% Lilliefors Critical Value | 0.052 5% Lilliefors Critical Value | 0.052 |
| Data not Normal at 5% Significance Level | Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | |
|--------------------------|---------------------------------|-------|
| DL/2 Substitution Method | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | DL/2 Substitution Method | |
| Mean | 31.38 Mean | 2.283 |
| SD | 183.4 SD | 1.429 |
| 95% DL/2 (t) UCL | 48.88 95% H-Stat (DL/2) UCL | 33.58 |

Maximum Likelihood Estimate(MLE) Method

| | | |
|--------------------|------------------------------|-------|
| Mean | 18.65 Mean in Log Scale | 2.3 |
| SD | 192.7 SD in Log Scale | 1.398 |
| 95% MLE (t) UCL | 37.04 Mean in Original Scale | 31.39 |
| 95% MLE (Tiku) UCL | 35.39 SD in Original Scale | 183.4 |
| | 95% t UCL | 48.89 |
| | 95% Percentile Bootstrap UCL | 51.26 |
| | 95% BCA Bootstrap UCL | 63.01 |
| | 95% H UCL | 32.46 |

Gamma Distribution Test with Detected Values Only

| | |
|-------------------------|---|
| k star (bias corrected) | 0.56 Data do not follow a Discernable Distribution (0.05) |
| Theta Star | 57.74 |
| nu star | 324.8 |

A-D Test Statistic

| | | |
|---|-----------------------------------|-------|
| 5% A-D Critical Value | 3.45E+28 Nonparametric Statistics | |
| K-S Test Statistic | 0.815 Kaplan-Meier (KM) Method | |
| 5% K-S Critical Value | 0.815 Mean | 31.36 |
| Data not Gamma Distributed at 5% Significance Level | 0.0561 SD | 183.1 |

Assuming Gamma Distribution

| | | |
|--|---|-------|
| Gamma ROS Statistics using Extrapolated Data | SE of Mean | 10.61 |
| Minimum | 1.00E-06 95% KM (t) UCL | 48.87 |
| Maximum | 3090 95% KM (z) UCL | 48.81 |
| Mean | 31.36 95% KM (jackknife) UCL | 48.87 |
| Median | 11 95% KM (bootstrap t) UCL | 99.7 |
| SD | 183.4 95% KM (BCA) UCL | 52.28 |
| k star | 0.416 95% KM (Percentile Bootstrap) UCL | 50.63 |
| Theta star | 75.38 95% KM (Chebyshev) UCL | 77.61 |
| Nu star | 248.8 97.5% KM (Chebyshev) UCL | 97.62 |
| AppChi2 | 213.2 99% KM (Chebyshev) UCL | 136.9 |
| 95% Gamma Approximate UCL (Use when n >= 40) | Potential UCLs to Use | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 213.2 95% KM (Chebyshev) UCL | 77.61 |
| | 36.58 | |
| | 36.61 | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

| | | | |
|----------------------------------|-----|---------------------------|-------|
| Number of Valid Data | 299 | Number of Detected Data | 298 |
| Number of Distinct Detected Data | 260 | Number of Non-Detect Data | 1 |
| Number of Missing Values | 30 | Percent Non-Detects | 0.33% |

Raw Statistics

| | | Log-transformed Statistics | |
|--------------------|-------|----------------------------|--------|
| Minimum Detected | 102 | Minimum Detected | 4.625 |
| Maximum Detected | 4230 | Maximum Detected | 8.35 |
| Mean of Detected | 677.9 | Mean of Detected | 6.379 |
| SD of Detected | 386 | SD of Detected | 0.546 |
| Minimum Non-Detect | 0.03 | Minimum Non-Detect | -3.507 |
| Maximum Non-Detect | 0.03 | Maximum Non-Detect | -3.507 |

UCL Statistics

| | | Lognormal Distribution Test with Detected Values Only | |
|--|--------|---|--------|
| Normal Distribution Test with Detected Values Only | | | |
| Lilliefors Test Statistic | 0.0959 | Lilliefors Test Statistic | 0.0739 |
| 5% Lilliefors Critical Value | 0.0513 | 5% Lilliefors Critical Value | 0.0513 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | Assuming Lognormal Distribution | |
|--------------------------|-------|---------------------------------|-------|
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 675.6 | Mean | 6.344 |
| SD | 387.3 | SD | 0.819 |
| 95% DL/2 (t) UCL | 712.6 | 95% H-Stat (DL/2) UCL | 875.1 |

Maximum Likelihood Estimate(MLE) Method

| | | Log ROS Method | |
|--------------------|-------|------------------------------|-------|
| Mean | 675.1 | Mean in Log Scale | 6.374 |
| SD | 387.8 | SD in Log Scale | 0.553 |
| 95% MLE (t) UCL | 712.1 | Mean in Original Scale | 676 |
| 95% MLE (Tiku) UCL | 711.5 | SD in Original Scale | 386.7 |
| | | 95% t UCL | 712.9 |
| | | 95% Percentile Bootstrap UCL | 713.3 |
| | | 95% BCA Bootstrap UCL | 717.9 |
| | | 95% H UCL | 724.4 |

Gamma Distribution Test with Detected Values Only

| | | Data Distribution Test with Detected Values Only | |
|-------------------------|-------|---|--|
| k star (bias corrected) | 3.703 | Data Follow Appr. Gamma Distribution at 5% Significance Level | |
| Theta Star | 183.1 | | |
| nu star | 2207 | | |

A-D Test Statistic

| | | | |
|---|--------|--------------------------|-------|
| 5% A-D Critical Value | 0.847 | Nonparametric Statistics | |
| K-S Test Statistic | 0.759 | Kaplan-Meier (KM) Method | |
| 5% K-S Critical Value | 0.759 | Mean | 676 |
| Data follow Appr. Gamma Distribution at 5% Significance Level | 0.0526 | SD | 386.1 |

Assuming Gamma Distribution

| | | SE of Mean | |
|--|----------|-----------------------------------|-------|
| Gamma ROS Statistics using Extrapolated Data | | | |
| Minimum | 1.00E-06 | 95% KM (t) UCL | 712.9 |
| Maximum | 4230 | 95% KM (z) UCL | 712.8 |
| Mean | 675.6 | 95% KM (jackknife) UCL | 712.8 |
| Median | 639 | 95% KM (bootstrap t) UCL | 719 |
| SD | 387.3 | 95% KM (BCA) UCL | 718.6 |
| k star | 2.583 | 95% KM (Percentile Bootstrap) UCL | 716.5 |
| | | 95% KM (Chebyshev) UCL | 773.5 |
| | | 97.5% KM (Chebyshev) UCL | 815.7 |
| | | 99% KM (Chebyshev) UCL | 898.5 |

| | | | |
|--|-------|-----------------------|-------|
| Theta star | 261.6 | | |
| Nu star | 1545 | Potential UCLs to Use | |
| AppChi2 | 1454 | 95% KM (BCA) UCL | 718.6 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 717.6 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 717.8 | | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

| | | | |
|------------------------------|-----|---------------------------------|-----|
| Number of Valid Observations | 299 | Number of Distinct Observations | 266 |
| Number of Missing Values | 30 | | |

Raw Statistics

| | | | |
|--------------------------|-------|----------------------------|--------|
| | | Log-transformed Statistics | |
| Minimum | 0.032 | Minimum of Log Data | -3.442 |
| Maximum | 6110 | Maximum of Log Data | 8.718 |
| Mean | 233 | Mean of log Data | 3.485 |
| Geometric Mean | 32.63 | SD of log Data | 2.521 |
| Median | 57.4 | | |
| SD | 554.4 | | |
| Std. Error of Mean | 32.06 | | |
| Coefficient of Variation | 2.379 | | |
| Skewness | 6.243 | | |

Relevant UCL Statistics

| | | | |
|--|--------|---|--------|
| | | Lognormal Distribution Test | |
| Normal Distribution Test | | | |
| Lilliefors Test Statistic | 0.337 | Lilliefors Test Statistic | 0.0999 |
| Lilliefors Critical Value | 0.0512 | Lilliefors Critical Value | 0.0512 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|-------|---------------------------------|------|
| | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 285.9 | 95% H-UCL | 1351 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 1667 |
| 95% Adjusted-CLT UCL (Chen-1995) | 298.1 | 97.5% Chebyshev (MVUE) UCL | 2064 |
| 95% Modified-t UCL (Johnson-1978) | 287.9 | 99% Chebyshev (MVUE) UCL | 2844 |

Gamma Distribution Test

| | | | |
|---|--------|--|-------|
| | | Data Distribution | |
| k star (bias corrected) | 0.342 | Data do not follow a Discernable Distribution (0.05) | |
| Theta Star | 681.5 | | |
| MLE of Mean | 233 | | |
| MLE of Standard Deviation | 398.5 | | |
| nu star | 204.5 | | |
| Approximate Chi Square Value (.05) | 172.4 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0492 | 95% CLT UCL | 285.8 |
| Adjusted Chi Square Value | 172.2 | 95% Jackknife UCL | 285.9 |
| | | 95% Standard Bootstrap UCL | 285.4 |
| Anderson-Darling Test Statistic | 2.445 | 95% Bootstrap-t UCL | 303.1 |
| Anderson-Darling 5% Critical Value | 0.86 | 95% Hall's Bootstrap UCL | 313.4 |
| Kolmogorov-Smirnov Test Statistic | 0.0768 | 95% Percentile Bootstrap UCL | 292.4 |
| Kolmogorov-Smirnov 5% Critical Value | 0.0564 | 95% BCA Bootstrap UCL | 305.1 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 372.8 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 433.3 |

| | | |
|--|----------------------------------|-------|
| Assuming Gamma Distribution | 99% Chebyshev(Mean, Sd) UCL | 552.1 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 276.4 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 276.6 | |
| Potential UCL to Use | Use 95% Chebyshev (Mean, Sd) UCL | 372.8 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Naphthalene

General Statistics

| | | | |
|----------------------------------|-----|---------------------------|--------|
| Number of Valid Data | 22 | Number of Detected Data | 9 |
| Number of Distinct Detected Data | 9 | Number of Non-Detect Data | 13 |
| Number of Missing Values | 267 | Percent Non-Detects | 59.09% |

Raw Statistics

| | | | |
|--------------------|-------|----------------------------|-------|
| | | Log-transformed Statistics | |
| Minimum Detected | 8.3 | Minimum Detected | 2.116 |
| Maximum Detected | 3500 | Maximum Detected | 8.161 |
| Mean of Detected | 518.6 | Mean of Detected | 4.256 |
| SD of Detected | 1147 | SD of Detected | 2.063 |
| Minimum Non-Detect | 2.3 | Minimum Non-Detect | 0.833 |
| Maximum Non-Detect | 250 | Maximum Non-Detect | 5.521 |

| | | |
|--|---------------------------------|--------|
| Note: Data have multiple DLs - Use of KM Method is recommended | Number treated as Non-Detect | 20 |
| For all methods (except KM, DL/2, and ROS Methods), | Number treated as Detected | 2 |
| Observations < Largest ND are treated as NDs | Single DL Non-Detect Percentage | 90.91% |

Warning: There are only 9 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

| | | | |
|--|-------|---|-------|
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.527 | Shapiro Wilk Test Statistic | 0.885 |
| 5% Shapiro Wilk Critical Value | 0.829 | 5% Shapiro Wilk Critical Value | 0.829 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|--------------------------|-------|---------------------------------|-------|
| DL/2 Substitution Method | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 225.2 | Mean | 2.615 |
| SD | 751.6 | SD | 2.321 |
| 95% DL/2 (t) UCL | 501 | 95% H-Stat (DL/2) UCL | 2243 |

Maximum Likelihood Estimate(MLE) Method N/A
MLE method failed to converge properly

| | |
|------------------------------|-------|
| Log ROS Method | |
| Mean in Log Scale | 1.3 |
| SD in Log Scale | 2.979 |
| Mean in Original Scale | 212.6 |
| SD in Original Scale | 754.6 |
| 95% t UCL | 489.5 |
| 95% Percentile Bootstrap UCL | 517.7 |
| 95% BCA Bootstrap UCL | 694.1 |

| | | | |
|---|----------|---|-------|
| Gamma Distribution Test with Detected Values Only | | Data Distribution Test with Detected Values Only | |
| k star (bias corrected) | | 0.3 Data Follow Appr. Gamma Distribution at 5% Significance Level | |
| Theta Star | 1729 | | |
| nu star | 5.399 | | |
| A-D Test Statistic | 0.94 | Nonparametric Statistics | |
| 5% A-D Critical Value | | 0.8 Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.8 | Mean | 218.4 |
| 5% K-S Critical Value | 0.3 | SD | 735.7 |
| Data follow Appr. Gamma Distribution at 5% Significance Level | | SE of Mean | 166.4 |
| | | 95% KM (t) UCL | 504.7 |
| Assuming Gamma Distribution | | 95% KM (z) UCL | 492.1 |
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (jackknife) UCL | 492 |
| Minimum | 1.00E-06 | 95% KM (bootstrap t) UCL | 3647 |
| Maximum | 3500 | 95% KM (BCA) UCL | 529.7 |
| Mean | 212.2 | 95% KM (Percentile Bootstrap) UCL | 513.4 |
| Median | 1.00E-06 | 95% KM (Chebyshev) UCL | 943.7 |
| SD | 754.7 | 97.5% KM (Chebyshev) UCL | 1257 |
| k star | 0.0922 | 99% KM (Chebyshev) UCL | 1874 |
| Theta star | 2301 | | |
| Nu star | 4.057 | Potential UCLs to Use | |
| AppChi2 | 0.744 | 95% KM (t) UCL | 504.7 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 1156 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 1327 | | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Thallium

| | | | |
|--|--------|---|---------|
| General Statistics | | | |
| Number of Valid Data | 299 | Number of Detected Data | 174 |
| Number of Distinct Detected Data | 117 | Number of Non-Detect Data | 125 |
| Number of Missing Values | 30 | Percent Non-Detects | 41.81% |
| Raw Statistics | | | |
| Minimum Detected | 0.051 | Log-transformed Statistics | |
| Maximum Detected | 1.54 | Minimum Detected | -2.976 |
| Mean of Detected | 0.167 | Maximum Detected | 0.432 |
| SD of Detected | 0.162 | Mean of Detected | -2.026 |
| Minimum Non-Detect | 0.26 | SD of Detected | 0.61 |
| Maximum Non-Detect | 2.7 | Minimum Non-Detect | -1.347 |
| | | Maximum Non-Detect | 0.993 |
| Note: Data have multiple DLs - Use of KM Method is recommended | | | |
| For all methods (except KM, DL/2, and ROS Methods), | | Number treated as Non-Detect | 299 |
| Observations < Largest ND are treated as NDs | | Number treated as Detected | 0 |
| | | Single DL Non-Detect Percentage | 100.00% |
| UCL Statistics | | | |
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Lilliefors Test Statistic | 0.26 | Lilliefors Test Statistic | 0.14 |
| 5% Lilliefors Critical Value | 0.0672 | 5% Lilliefors Critical Value | 0.0672 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

| | | | |
|---|----------|--|---------|
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 0.25 | Mean | -1.664 |
| SD | 0.216 | SD | 0.726 |
| 95% DL/2 (t) UCL | 0.271 | 95% H-Stat (DL/2) UCL | 0.267 |
| Maximum Likelihood Estimate(MLE) Method | N/A | Log ROS Method | |
| MLE method failed to converge properly | | Mean in Log Scale | -2.053 |
| | | SD in Log Scale | 0.548 |
| | | Mean in Original Scale | 0.154 |
| | | SD in Original Scale | 0.131 |
| | | 95% t UCL | 0.167 |
| | | 95% Percentile Bootstrap UCL | 0.168 |
| | | 95% BCA Bootstrap UCL | 0.17 |
| | | 95% H-UCL | 0.158 |
| Gamma Distribution Test with Detected Values Only | | Data Distribution Test with Detected Values Only | |
| k star (bias corrected) | 2.248 | Data do not follow a Discernable Distribution (0.05) | |
| Theta Star | 0.0742 | | |
| nu star | 782.4 | | |
| A-D Test Statistic | 10.13 | Nonparametric Statistics | |
| 5% A-D Critical Value | 0.764 | Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.764 | Mean | 0.156 |
| 5% K-S Critical Value | 0.0712 | SD | 0.139 |
| Data not Gamma Distributed at 5% Significance Level | | SE of Mean | 0.00918 |
| | | 95% KM (t) UCL | 0.171 |
| Assuming Gamma Distribution | | 95% KM (z) UCL | 0.171 |
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (jackknife) UCL | 0.171 |
| Minimum | 1.00E-06 | 95% KM (bootstrap t) UCL | 0.174 |
| Maximum | 1.54 | 95% KM (BCA) UCL | 0.172 |
| Mean | 0.165 | 95% KM (Percentile Bootstrap) UCL | 0.171 |
| Median | 0.131 | 95% KM (Chebyshev) UCL | 0.196 |
| SD | 0.133 | 97.5% KM (Chebyshev) UCL | 0.213 |
| k star | 1.556 | 99% KM (Chebyshev) UCL | 0.247 |
| Theta star | 0.106 | | |
| Nu star | 930.5 | Potential UCLs to Use | |
| AppChi2 | 860.7 | 95% KM (t) UCL | 0.171 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 0.179 | 95% KM (% Bootstrap) UCL | 0.171 |
| 95% Adjusted Gamma UCL (Use when n < 40) | 0.179 | | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Vanadium

| | | | |
|------------------------------|------|---------------------------------|-------|
| General Statistics | | | |
| Number of Valid Observations | 299 | Number of Distinct Observations | 176 |
| Number of Missing Values | 30 | | |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 14.2 | Minimum of Log Data | 2.653 |
| Maximum | 51.9 | Maximum of Log Data | 3.949 |

| | | | |
|---|--------|--|--------|
| Mean | 30.42 | Mean of log Data | 3.385 |
| Geometric Mean | 29.52 | SD of log Data | 0.251 |
| Median | 31 | | |
| SD | 7.194 | | |
| Std. Error of Mean | 0.416 | | |
| Coefficient of Variation | 0.236 | | |
| Skewness | 0.0801 | | |
| Relevant UCL Statistics | | | |
| Normal Distribution Test | | Lognormal Distribution Test | |
| Lilliefors Test Statistic | 0.0586 | Lilliefors Test Statistic | 0.105 |
| Lilliefors Critical Value | 0.0512 | Lilliefors Critical Value | 0.0512 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 31.1 | 95% H-UCL | 31.23 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 32.42 |
| 95% Adjusted-CLT UCL (Chen-1995) | 31.1 | 97.5% Chebyshev (MVUE) UCL | 33.27 |
| 95% Modified-t UCL (Johnson-1978) | 31.1 | 99% Chebyshev (MVUE) UCL | 34.93 |
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 16.72 | Data do not follow a Discernable Distribution (0.05) | |
| Theta Star | 1.82 | | |
| MLE of Mean | 30.42 | | |
| MLE of Standard Deviation | 7.439 | | |
| nu star | 9997 | | |
| Approximate Chi Square Value (.05) | 9766 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0492 | 95% CLT UCL | 31.1 |
| Adjusted Chi Square Value | 9765 | 95% Jackknife UCL | 31.1 |
| | | 95% Standard Bootstrap UCL | 31.11 |
| Anderson-Darling Test Statistic | 2.337 | 95% Bootstrap-t UCL | 31.13 |
| Anderson-Darling 5% Critical Value | 0.752 | 95% Hall's Bootstrap UCL | 31.09 |
| Kolmogorov-Smirnov Test Statistic | 0.0906 | 95% Percentile Bootstrap UCL | 31.12 |
| Kolmogorov-Smirnov 5% Critical Value | 0.0521 | 95% BCA Bootstrap UCL | 31.04 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 32.23 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 33.02 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 34.56 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 31.14 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 31.14 | | |
| Potential UCL to Use | | Use 95% Student's-t UCL | 31.1 |
| | | or 95% Modified-t UCL | 31.1 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Soil inorganic arsenic (mg/kg)

| | Inorg As (MPA) | | Inorg As (SMA) | | Inorg As (DA) | | Inorg As (All) |
|------------|----------------|------------|----------------|-----------|---------------|------------|----------------|
| 10MP01SS | 115 | 10DS01SS | 1330 | 10RD04SS | 1190 | 10DS01SS | 1330 |
| 10MP16SS | 12800 | 10RS01SS | 25.1 | 10RD06SS | 1410 | 10MP01SS | 115 |
| 10MP25SS | 9680 | 10SM03SS | 3640 | 10RD09SS | 197 | 10MP16SS | 12800 |
| 10MP26SS | 7080 | 10SM05SS | 6510 | 11RD02SBC | 2090 | 10MP25SS | 9680 |
| 10MP27SS | 7780 | 10SM07SS | 20100 | 11RD03SBC | 5550 | 10MP26SS | 7080 |
| 10MP29SS | 7420 | 10SM12SS | 99.1 | 11RD05SB1 | 67.5 | 10MP27SS | 7780 |
| 10MP32SS | 13300 | 10SM13SS | 579 | | | 10MP29SS | 7420 |
| 10MP34SS | 12000 | 10SM18SS | 781 | | | 10MP32SS | 13300 |
| 10MP41SS | 374 | 10SM19SS | 853 | | | 10MP34SS | 12000 |
| 10MP52SS | 2580 | 10SM21SS | 60.3 | | | 10MP41SS | 374 |
| 10MP57SS | 1950 | 10SM23SS | 311 | | | 10MP52SS | 2580 |
| 10MP59SS | 815 | 10SM27SS | 24.9 | | | 10MP57SS | 1950 |
| 10MP82SS | 6790 | 10SM28SS | 352 | | | 10MP59SS | 815 |
| 10MP84SS | 10000 | 11DS01SB06 | 1110 | | | 10MP82SS | 6790 |
| 10OP01SS | 6750 | 11RS02SB04 | 71.9 | | | 10MP84SS | 10000 |
| 11MP34SB06 | 4930 | 11SM10SB10 | 4170 | | | 10OP01SS | 6750 |
| 11MP36SB04 | 7840 | 11SM31SB06 | 476 | | | 10RD04SS | 1190 |
| 11MP38SB10 | 3080 | | | | | 10RD06SS | 1410 |
| 11MP41SB06 | 10.7 | | | | | 10RD09SS | 197 |
| | | | | | | 10RS01SS | 25.1 |
| | | | | | | 10SM03SS | 3640 |
| | | | | | | 10SM05SS | 6510 |
| | | | | | | 10SM07SS | 20100 |
| | | | | | | 10SM12SS | 99.1 |
| | | | | | | 10SM13SS | 579 |
| | | | | | | 10SM18SS | 781 |
| | | | | | | 10SM19SS | 853 |
| | | | | | | 10SM21SS | 60.3 |
| | | | | | | 10SM23SS | 311 |
| | | | | | | 10SM27SS | 24.9 |
| | | | | | | 10SM28SS | 352 |
| | | | | | | 11DS01SB06 | 1110 |
| | | | | | | 11MP34SB06 | 4930 |
| | | | | | | 11MP36SB04 | 7840 |
| | | | | | | 11MP38SB10 | 3080 |
| | | | | | | 11MP41SB06 | 10.7 |
| | | | | | | 11RD02SB04 | 2090 |
| | | | | | | 11RD03SB06 | 5550 |
| | | | | | | 11RD05SB16 | 67.5 |
| | | | | | | 11RS02SB04 | 71.9 |
| | | | | | | 11SM10SB10 | 4170 |
| | | | | | | 11SM31SB06 | 476 |

General UCL Statistics for Full Data Sets

User Selected Options
 From File WorkSheet.wst
 Full Precision OFF
 Confidence Coefficient 95%
 Number of Bootstrap Operations 2000

MPA

General Statistics

Number of Valid Observations 19 Number of Distinct Observations 19

Raw Statistics

| | | | |
|--------------------------|--------|----------------------------|-------|
| | | Log-transformed Statistics | |
| Minimum | 10.7 | Minimum of Log Data | 2.37 |
| Maximum | 13300 | Maximum of Log Data | 9.496 |
| Mean | 6068 | Mean of log Data | 7.989 |
| Geometric Mean | 2948 | SD of log Data | 1.866 |
| Median | 6790 | | |
| SD | 4363 | | |
| Std. Error of Mean | 1001 | | |
| Coefficient of Variation | 0.719 | | |
| Skewness | 0.0833 | | |

Relevant UCL Statistics

| | | | |
|---|-------|---|-------|
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.934 | Shapiro Wilk Test Statistic | 0.753 |
| Shapiro Wilk Critical Value | 0.901 | Shapiro Wilk Critical Value | 0.901 |
| Data appear Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|------|----------------------------|-------|
| 95% Student's-t UCL | 7804 | 95% H-UCL | 98184 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 44684 |
| 95% Adjusted-CLT UCL (Chen-1995) | 7735 | 97.5% Chebyshev (MVUE) UCL | 58101 |
| 95% Modified-t UCL (Johnson-1978) | 7807 | 99% Chebyshev (MVUE) UCL | 84455 |

Gamma Distribution Test

| | | | |
|---|--------|---|-------|
| k star (bias corrected) | 0.725 | Data appear Normal at 5% Significance Level | |
| Theta Star | 8369 | | |
| MLE of Mean | 6068 | | |
| MLE of Standard Deviation | 7126 | | |
| nu star | 27.55 | | |
| Approximate Chi Square Value (.05) | 16.58 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0369 | 95% CLT UCL | 7715 |
| Adjusted Chi Square Value | 15.84 | 95% Jackknife UCL | 7804 |
| | | 95% Standard Bootstrap UCL | 7666 |
| Anderson-Darling Test Statistic | 1.092 | 95% Bootstrap-t UCL | 7848 |
| Anderson-Darling 5% Critical Value | 0.776 | 95% Hall's Bootstrap UCL | 7607 |
| Kolmogorov-Smirnov Test Statistic | 0.259 | 95% Percentile Bootstrap UCL | 7593 |
| Kolmogorov-Smirnov 5% Critical Value | 0.206 | 95% BCA Bootstrap UCL | 7650 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 10432 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 12320 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 16028 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 10084 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 10557 | | |

Potential UCL to Use Use 95% Student's-t UCL 7804

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

SMA

| | | |
|--|--------|--|
| General Statistics | | |
| Number of Valid Observations | 17 | Number of Distinct Observations 17 |
| Raw Statistics | | Log-transformed Statistics |
| Minimum | 24.9 | Minimum of Log Data 3.215 |
| Maximum | 20100 | Maximum of Log Data 9.908 |
| Mean | 2382 | Mean of log Data 6.258 |
| Geometric Mean | 521.9 | SD of log Data 1.935 |
| Median | 579 | |
| SD | 4910 | |
| Std. Error of Mean | 1191 | |
| Coefficient of Variation | 2.061 | |
| Skewness | 3.313 | |
| Relevant UCL Statistics | | |
| Normal Distribution Test | | Lognormal Distribution Test |
| Shapiro Wilk Test Statistic | 0.521 | Shapiro Wilk Test Statistic 0.969 |
| Shapiro Wilk Critical Value | 0.892 | Shapiro Wilk Critical Value 0.892 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level |
| Assuming Normal Distribution | | Assuming Lognormal Distribution |
| 95% Student's-t UCL | 4461 | 95% H-UCL 26708 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL 9043 |
| 95% Adjusted-CLT UCL (Chen-1995) | 5363 | 97.5% Chebyshev (MVUE) UCL 11814 |
| 95% Modified-t UCL (Johnson-1978) | 4620 | 99% Chebyshev (MVUE) UCL 17257 |
| Gamma Distribution Test | | Data Distribution |
| k star (bias corrected) | 0.392 | Data appear Gamma Distributed at 5% Significance Level |
| Theta Star | 6073 | |
| MLE of Mean | 2382 | |
| MLE of Standard Deviation | 3803 | |
| nu star | 13.34 | |
| Approximate Chi Square Value (.05) | 6.119 | Nonparametric Statistics |
| Adjusted Level of Significance | 0.0346 | 95% CLT UCL 4341 |
| Adjusted Chi Square Value | 5.613 | 95% Jackknife UCL 4461 |
| | | 95% Standard Bootstrap UCL 4253 |
| Anderson-Darling Test Statistic | 0.604 | 95% Bootstrap-t UCL 8775 |
| Anderson-Darling 5% Critical Value | 0.814 | 95% Hall's Bootstrap UCL 10997 |
| Kolmogorov-Smirnov Test Statistic | 0.194 | 95% Percentile Bootstrap UCL 4577 |
| Kolmogorov-Smirnov 5% Critical Value | 0.223 | 95% BCA Bootstrap UCL 5914 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL 7573 |
| | | 97.5% Chebyshev(Mean, Sd) UCL 9819 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL 14231 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 5191 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 5659 | |
| Potential UCL to Use | | Use 95% Adjusted Gamma UCL 5659 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

DA

| | | |
|------------------------------|-------|-----------------------------------|
| General Statistics | | |
| Number of Valid Observations | 6 | Number of Distinct Observations 6 |
| Raw Statistics | | Log-transformed Statistics |
| Minimum | 67.5 | Minimum of Log Data 4.212 |
| Maximum | 5550 | Maximum of Log Data 8.622 |
| Mean | 1751 | Mean of log Data 6.682 |
| Geometric Mean | 798.3 | SD of log Data 1.627 |
| Median | 1300 | |
| SD | 2011 | |
| Std. Error of Mean | 821.1 | |
| Coefficient of Variation | 1.149 | |
| Skewness | 1.701 | |

Warning: A sample size of 'n' = 6 may not be adequate enough to compute meaningful and reliable test statistics and estimates!

It is suggested to collect at least 8 to 10 observations using these statistical methods!
 If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Warning: There are only 6 Values in this data
 Note: It should be noted that even though bootstrap methods may be performed on this data set, the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

| | | |
|---|--------|--|
| Relevant UCL Statistics | | |
| Normal Distribution Test | | Lognormal Distribution Test |
| Shapiro Wilk Test Statistic | 0.821 | Shapiro Wilk Test Statistic 0.933 |
| Shapiro Wilk Critical Value | 0.788 | Shapiro Wilk Critical Value 0.788 |
| Data appear Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level |
| Assuming Normal Distribution | | Assuming Lognormal Distribution |
| 95% Student's-t UCL | 3405 | 95% H-UCL 301145 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL 7752 |
| 95% Adjusted-CLT UCL (Chen-1995) | 3711 | 97.5% Chebyshev (MVUE) UCL 10196 |
| 95% Modified-t UCL (Johnson-1978) | 3500 | 99% Chebyshev (MVUE) UCL 14995 |
| Gamma Distribution Test | | Data Distribution |
| k star (bias corrected) | 0.492 | Data appear Normal at 5% Significance Level |
| Theta Star | 3562 | |
| MLE of Mean | 1751 | |
| MLE of Standard Deviation | 2497 | |
| nu star | 5.898 | |
| Approximate Chi Square Value (.05) | 1.588 | Nonparametric Statistics |
| Adjusted Level of Significance | 0.0122 | 95% CLT UCL 3101 |
| Adjusted Chi Square Value | 0.914 | 95% Jackknife UCL 3405 |
| | | 95% Standard Bootstrap UCL 2966 |
| Anderson-Darling Test Statistic | 0.242 | 95% Bootstrap-t UCL 4895 |

| | | | |
|--|-------|-------------------------------|------|
| Anderson-Darling 5% Critical Value | 0.721 | 95% Hall's Bootstrap UCL | 9483 |
| Kolmogorov-Smirnov Test Statistic | 0.198 | 95% Percentile Bootstrap UCL | 3093 |
| Kolmogorov-Smirnov 5% Critical Value | 0.343 | 95% BCA Bootstrap UCL | 3520 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 5330 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 6879 |
| | | 99% Chebyshev(Mean, Sd) UCL | 9921 |
| Assuming Gamma Distribution | | | |
| 95% Approximate Gamma UCL (Use when n >= 40) | 6502 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 11298 | | |
| Potential UCL to Use | | Use 95% Student's-t UCL | 3405 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

All

General Statistics

| | | | |
|------------------------------|----|---------------------------------|----|
| Number of Valid Observations | 42 | Number of Distinct Observations | 42 |
|------------------------------|----|---------------------------------|----|

Raw Statistics

| | | | |
|--------------------------|-------|----------------------------|-------|
| | | Log-transformed Statistics | |
| Minimum | 10.7 | Minimum of Log Data | 2.37 |
| Maximum | 20100 | Maximum of Log Data | 9.908 |
| Mean | 3959 | Mean of log Data | 7.101 |
| Geometric Mean | 1214 | SD of log Data | 1.999 |
| Median | 1680 | | |
| SD | 4697 | | |
| Std. Error of Mean | 724.8 | | |
| Coefficient of Variation | 1.186 | | |
| Skewness | 1.47 | | |

Relevant UCL Statistics

| | | | |
|--|-------|---|-------|
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.771 | Shapiro Wilk Test Statistic | 0.875 |
| Shapiro Wilk Critical Value | 0.942 | Shapiro Wilk Critical Value | 0.942 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|------|----------------------------|-------|
| 95% Student's-t UCL | 5179 | 95% H-UCL | 28010 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 22985 |
| 95% Adjusted-CLT UCL (Chen-1995) | 5327 | 97.5% Chebyshev (MVUE) UCL | 29518 |
| 95% Modified-t UCL (Johnson-1978) | 5207 | 99% Chebyshev (MVUE) UCL | 42350 |

Gamma Distribution Test

| | | | |
|------------------------------------|--------|--|------|
| k star (bias corrected) | 0.51 | Data appear Gamma Distributed at 5% Significance Level | |
| Theta Star | 7764 | | |
| MLE of Mean | 3959 | | |
| MLE of Standard Deviation | 5545 | | |
| nu star | 42.84 | | |
| Approximate Chi Square Value (.05) | 28.83 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0443 | 95% CLT UCL | 5152 |
| Adjusted Chi Square Value | 28.42 | 95% Jackknife UCL | 5179 |
| | | 95% Standard Bootstrap UCL | 5104 |
| Anderson-Darling Test Statistic | 0.465 | 95% Bootstrap-t UCL | 5366 |
| Anderson-Darling 5% Critical Value | 0.81 | 95% Hall's Bootstrap UCL | 5432 |
| Kolmogorov-Smirnov Test Statistic | 0.109 | 95% Percentile Bootstrap UCL | 5181 |

| | | | |
|--|-------|-------------------------------|-------|
| Kolmogorov-Smirnov 5% Critical Value | 0.144 | 95% BCA Bootstrap UCL | 5344 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 7119 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 8486 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 11171 |
| 95% Approximate Gamma UCL (Use when $n \geq 40$) | 5883 | | |
| 95% Adjusted Gamma UCL (Use when $n < 40$) | 5968 | | |
| Potential UCL to Use | | Use 95% Approximate Gamma UCL | 5883 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Groundwater (total) - ug/L unless otherwise noted

ng/L

| | Antimony | D_Antimony | Arsenic | D_Arsenic | Barium | D_Barium | Chromium | D_Chromium | Cobalt | D_Cobalt | Iron | D_Iron | Lead | D_Lead | Manganese | D_Manganese | Nickel | D_Nickel | Selenium | D_Selenium | Thallium | D_Thallium | As(Inorg) | D_As(Inorg) | Mercury | D_Mercury |
|-----------|----------|------------|---------|-----------|--------|----------|----------|------------|--------|----------|-------|--------|-------|--------|-----------|-------------|--------|----------|----------|------------|----------|------------|-----------|-------------|---------|-----------|
| 10MW01GW | 1.8 | 1 | 10.6 | 1 | 100 | 1 | 0.053 | 0 | 0.7 | 1 | 22400 | 1 | 0.2 | 0 | 914 | 1 | 1 | 1 | 0.125 | 0 | 0.003 | 0 | 27.35 | 1 | 16.7 | |
| 10MW03GW | 748 | 1 | 57.8 | 1 | 31.4 | 1 | 0.053 | 0 | 0.007 | 0 | 7.2 | 0 | 0.2 | 0 | 0.02 | 0 | 1.3 | 1 | 0.9 | 1 | 0.003 | 0 | 27.08 | 1 | 16.5 | |
| 10MW04GW | 29.1 | 1 | 8.8 | 1 | 35 | 1 | 0.053 | 0 | 1.6 | 1 | 7.2 | 0 | 0.2 | 0 | 1040 | 1 | 35.4 | 1 | 0.125 | 0 | 0.003 | 0 | 9.57 | 1 | 150 | |
| 10MW06GW | 5.4 | 1 | 28.1 | 1 | 79.3 | 1 | 0.053 | 0 | 1.4 | 1 | 1780 | 1 | 0.2 | 0 | 569 | 1 | 2.3 | 1 | 0.125 | 0 | 0.003 | 0 | 11.2 | 1 | 1.85 | |
| 10MW41GW | 29.3 | 1 | 8.9 | 1 | 35 | 1 | 0.053 | 0 | 1.6 | 1 | 7.2 | 0 | 0.2 | 0 | 1030 | 1 | 35.7 | 1 | 0.125 | 0 | 0.003 | 0 | 3.37 | 1 | 148 | |
| 11MP01GW | 1.59 | 1 | 0.6 | 1 | 39.1 | 1 | 0.67 | 1 | 0.103 | 1 | 299 | 1 | 0.102 | 1 | 3.68 | 1 | 1.16 | 1 | 0.4 | 1 | 0.005 | 0 | 0.806 | 1 | 47.7 | |
| 11MP100GW | 93.8 | 1 | 6680 | 1 | | | 1.15 | 1 | | | | | 0.339 | 1 | | | 5.67 | 1 | 0.3 | 0 | 0.008 | 1 | 15.4 | 1 | 21.5 | |
| 11MP101GW | 591 | 1 | 162 | 1 | | | 0.23 | 1 | | | | | 0.027 | 1 | | | | | | | 0.008 | 1 | 5.15 | 1 | 6070 | |
| 11MP14GW | 6.49 | 1 | 96.9 | 1 | 88.1 | 1 | 2.27 | 1 | 0.582 | 1 | 1150 | 1 | 0.339 | 1 | 128 | 1 | 2.64 | 1 | 0.3 | 0 | 0.005 | 0 | 39.1 | 1 | 2910 | |
| 11MP25GW | | | | | 73.6 | 1 | | | 6.81 | 1 | 18700 | 1 | | | 3310 | 1 | | | | | | | 92.2 | 1 | 237 | |
| 11MP29GW | 13100 | 1 | 5620 | 1 | 93.6 | 1 | 0.59 | 1 | 0.299 | 1 | 33.6 | 1 | 0.029 | 1 | 11.7 | 1 | 13.2 | 1 | 5.4 | 1 | 0.005 | 0 | 0.17 | 1 | 1210 | |
| 11MP30GW | 678 | 1 | 1020 | 1 | 46.9 | 1 | 0.83 | 1 | 7.36 | 1 | 10600 | 1 | 0.201 | 1 | 4750 | 1 | 4.01 | 1 | 0.3 | 0 | 0.015 | 1 | 4530 | 1 | 4000 | |
| 11MP31GW | 1.04 | 1 | 1.3 | 1 | 83.7 | 1 | 1.67 | 1 | 2.28 | 1 | 1720 | 1 | 0.861 | 1 | 543 | 1 | 6.5 | 1 | 0.3 | 0 | 0.008 | 1 | 7.21 | 1 | 411 | |
| 11MP33GW | 0.6 | 1 | 5.6 | 1 | 73.4 | 1 | 6.46 | 1 | 3.89 | 1 | 5570 | 1 | 2.02 | 1 | 141 | 1 | 12.1 | 1 | 1 | 1 | 0.029 | 1 | 14.2 | 1 | 261 | |
| 11MP38GW | | | | | 38.3 | 1 | | | 0.18 | 1 | 24.1 | 1 | | | 5.65 | 1 | 1.3 | 1 | 1.1 | 1 | | | 20.6 | 1 | 452 | |
| 11MP39GW | 5860 | 1 | 1760 | 1 | 114 | 1 | 0.08 | 1 | 0.071 | 1 | 5.8 | 1 | 0.019 | 1 | 5.55 | 1 | 1.51 | 1 | 0.3 | 1 | 0.007 | 1 | 5.42 | 1 | 1610 | |
| 11MP40GW | 297 | 1 | 80.4 | 1 | 52.9 | 1 | 0.22 | 1 | 0.106 | 1 | 104 | 1 | 0.137 | 1 | 17.6 | 1 | 2.06 | 1 | 0.3 | 0 | 0.006 | 1 | 1640 | 1 | 306 | |
| 11MP41GW | 1.21 | 1 | 36.9 | 1 | 224 | 1 | 10.6 | 1 | 9.48 | 1 | 2670 | 1 | 0.63 | 1 | 778 | 1 | 28.3 | 1 | 0.3 | 0 | 0.015 | 1 | 185 | 1 | 50.4 | |
| 11MP52GW | 26.2 | 1 | 78 | 1 | 365 | 1 | 1.39 | 1 | 40.5 | 1 | 12500 | 1 | 0.154 | 1 | 7370 | 1 | 32.9 | 1 | 0.3 | 0 | 0.075 | 1 | 6.92 | 1 | 141 | |
| 11MP60GW | 9.16 | 1 | 22.6 | 1 | 56.6 | 1 | 1.36 | 1 | 1.74 | 1 | 39.5 | 1 | 0.076 | 1 | 1040 | 1 | 35.9 | 1 | 0.3 | 0 | 0.016 | 1 | 0.721 | 1 | 759 | |
| 11MP62GW | 101 | 1 | 7.4 | 1 | 29.4 | 1 | 1.15 | 1 | 2.12 | 1 | 1370 | 1 | 0.81 | 1 | 107 | 1 | 4.11 | 1 | 0.3 | 0 | 0.006 | 1 | | | 413 | |
| 11MP66GW | 2.4 | 1 | 9.2 | 1 | 210 | 1 | 0.31 | 1 | 3.01 | 1 | 6450 | 1 | 0.187 | 1 | 905 | 1 | 4.74 | 1 | 0.3 | 0 | 0.008 | 1 | | | 155 | |
| 11MP88GW | 19.3 | 1 | 32.8 | 1 | 59.7 | 1 | 6.29 | 1 | 5.26 | 1 | 3510 | 1 | 0.728 | 1 | 1480 | 1 | 16 | 1 | 0.3 | 0 | 0.012 | 1 | | | 7.25 | |
| 11MP89GW | 5.86 | 1 | 6.2 | 1 | 55 | 1 | 1.03 | 1 | 4.77 | 1 | 609 | 1 | 0.257 | 1 | 207 | 1 | 13.9 | 1 | 0.3 | 0 | 0.012 | 1 | | | 25.4 | |
| 11MP91GW | 53.9 | 1 | 28.5 | 1 | 53 | 1 | 4.7 | 1 | 0.843 | 1 | 1100 | 1 | 0.794 | 1 | 62.2 | 1 | 4.7 | 1 | 0.4 | 1 | 0.016 | 1 | | | 532 | |
| 11MW01GW | 1.9 | 1 | 3.3 | 1 | 69.9 | 1 | 0.52 | 1 | 0.333 | 1 | 4620 | 1 | 0.149 | 1 | 306 | 1 | 0.9 | 1 | 0.5 | 1 | 0.005 | 0 | | | 56500 | |
| 11MW03GW | 917 | 1 | 58.9 | 1 | 28.2 | 1 | 0.28 | 1 | 0.045 | 1 | 15.3 | 1 | 0.025 | 1 | 1.12 | 1 | 1.6 | 1 | 0.7 | 1 | 0.005 | 0 | | | 981 | |
| 11MW04GW | 27.9 | 1 | 8 | 1 | 34.8 | 1 | 0.42 | 1 | 1.71 | 1 | 33.6 | 1 | 0.035 | 1 | 1120 | 1 | 32.6 | 1 | 0.3 | 0 | 0.005 | 0 | | | 115 | |
| 11MW06GW | 5.51 | 1 | 25.8 | 1 | 75.9 | 1 | 0.05 | 1 | 1.24 | 1 | 1720 | 1 | 0.035 | 1 | 536 | 1 | 2.28 | 1 | 0.3 | 0 | 0.007 | 1 | | | 247 | |
| 11RD05GW | 2.15 | 1 | 7.3 | 1 | 44.3 | 1 | 1.02 | 1 | 7.48 | 1 | 1590 | 1 | 0.755 | 1 | 597 | 1 | 29.9 | 1 | 1.1 | 1 | 0.024 | 1 | | | | |
| 11RD20GW | 427 | 1 | 15.2 | 1 | 41.5 | 1 | 0.43 | 1 | 0.745 | 1 | 294 | 1 | 0.166 | 1 | 212 | 1 | 7.94 | 1 | 0.3 | 0 | 0.011 | 1 | | | | |

Surface Water (RDC) - ug/L unless otherwise noted

| | 1-Methylnaphthalene | D_1-Methylnaphthalene | Antimony | D_Antimony | Arsenic | D_Arsenic | As(Inorg) | D_As(Inorg) | Cadmium | D_Cadmium | Cobalt | D_Cobalt | Copper | D_Copper | Iron | D_Iron | Lead | D_Lead | Naphthalene | D_Naphthalene |
|----------|---------------------|-----------------------|----------|------------|---------|-----------|-----------|-------------|---------|-----------|--------|----------|--------|----------|------|--------|-------|--------|-------------|---------------|
| 10RD02SW | | | 1.3 | 1 | 1 | 1 | 0.984 | 1 | 0.022 | 0 | 0.007 | 0 | 0.232 | 0 | 190 | 1 | 0.2 | 0 | | |
| 10RD03SW | 0.48 | 0 | 1.5 | 1 | 0.9 | 1 | | | 0.022 | 0 | 0.007 | 0 | 0.232 | 0 | 140 | 1 | 0.2 | 0 | 0.52 | 0 |
| 10RD04SW | 0.48 | 0 | 11 | 1 | 8.2 | 1 | 1.92 | 1 | 0.022 | 0 | 0.007 | 0 | 0.232 | 0 | 190 | 1 | 0.2 | 0 | 0.52 | 0 |
| 10RD05SW | 1.5 | 1 | 26.7 | 1 | 903 | 1 | 737 | 1 | 0.022 | 0 | 5.3 | 1 | 0.232 | 0 | 2160 | 1 | 0.2 | 0 | 0.52 | 0 |
| 10RD06SW | 0.48 | 0 | 141 | 1 | 79.6 | 1 | 66.2 | 1 | 0.022 | 0 | 0.3 | 1 | 0.232 | 0 | 180 | 1 | 0.2 | 0 | 0.52 | 0 |
| 10RD07SW | 0.48 | 0 | 158 | 1 | 80.5 | 1 | | | 0.022 | 0 | 0.2 | 1 | 0.232 | 0 | 150 | 1 | 0.2 | 0 | 0.52 | 0 |
| 10RD08SW | 0.48 | 0 | 170 | 1 | 85.6 | 1 | 86.8 | 1 | 0.022 | 0 | 0.2 | 1 | 0.5 | 1 | 140 | 1 | 0.2 | 0 | 0.52 | 0 |
| 10RD09SW | 0.48 | 0 | | | 73.1 | 1 | | | 0.022 | 0 | | | 0.232 | 0 | | | 0.2 | 0 | 0.52 | 0 |
| 10RD20SW | | | 108 | 1 | | | 8.74 | 1 | | | 0.3 | 1 | | | 190 | 1 | | | | |
| 11RD02SW | | | 1.42 | 1 | 1 | 1 | 0.917 | 1 | 0.005 | 0 | 0.061 | 1 | 0.29 | 1 | 131 | 1 | 0.008 | 1 | | |
| 11RD03SW | | | 1.51 | 1 | | | | | 0.006 | 1 | | | | | | | 0.013 | 1 | | |
| 11RD04SW | | | 17.3 | 1 | 11.3 | 1 | 9.32 | 1 | 0.005 | 0 | 0.059 | 1 | 0.33 | 1 | 147 | 1 | 0.012 | 1 | 0.37 | 0 |
| 11RD05SW | | | 32.6 | 1 | 1030 | 1 | 745 | 1 | 0.005 | 0 | 5.24 | 1 | 0.45 | 1 | 2390 | 1 | 0.079 | 1 | 0.68 | 1 |
| 11RD06SW | | | 162 | 1 | 85.3 | 1 | 87.1 | 1 | 0.005 | 0 | 0.274 | 1 | 0.45 | 1 | 199 | 1 | 0.02 | 1 | 0.37 | 0 |
| 11RD07SW | | | 167 | 1 | 80 | 1 | | | 0.005 | 1 | 0.23 | 1 | 0.53 | 1 | 186 | 1 | 0.026 | 1 | 0.37 | 0 |
| 11RD08SW | | | 184 | 1 | | | | | | | | | 0.48 | 1 | 189 | 1 | | | | |
| 11RD09SW | | | 126 | 1 | 73.1 | 1 | | | 0.005 | 0 | 0.244 | 1 | 0.47 | 1 | 205 | 1 | 0.024 | 1 | 0.37 | 0 |
| 11RD10SW | | | 1.95 | 1 | 1 | 1 | 0.822 | 1 | 0.005 | 0 | 0.06 | 1 | 0.35 | 1 | 128 | 1 | 0.018 | 1 | 0.37 | 0 |
| 11RD11SW | | | 8.81 | 1 | 6.7 | 1 | | | 0.005 | 0 | 0.677 | 1 | 0.71 | 1 | 2470 | 1 | 0.021 | 1 | 0.37 | 0 |
| 11RD12SW | | | 61.6 | 1 | 22.5 | 1 | 22 | 1 | 0.005 | 0 | 0.058 | 1 | 0.38 | 1 | 137 | 1 | 0.013 | 1 | 0.37 | 0 |
| 11RD20SW | | | | | 79.6 | 1 | | | 0.008 | 1 | 0.243 | 1 | | | | | 0.032 | 1 | 0.37 | 0 |
| 11RD21SW | | | | | 0.9 | 1 | | | | | 0.052 | 1 | 0.32 | 1 | 122 | 1 | | | 0.37 | 0 |

| | ng/L | | | | | | | | | | | | | | | |
|----------|--------|----------|----------|------------|--------|----------|------|--------|-----------|-------------|----------|------------|----------------|------------------|---------|-----------|
| | Nickel | D_Nickel | Selenium | D_Selenium | Silver | D_Silver | Zinc | D_Zinc | Manganese | D_Manganese | Chromium | D_Chromium | Methyl Mercury | D_Methyl Mercury | Mercury | D_Mercury |
| 10RD02SW | 0.081 | 0 | 0.125 | 0 | 0.009 | 0 | 0.81 | 0 | | | 0.053 | 0 | 0.101 | 1 | 2.83 | 1 |
| 10RD03SW | 0.081 | 0 | 0.125 | 0 | 0.009 | 0 | 0.81 | 0 | 11.8 | 1 | 0.053 | 0 | 0.091 | 1 | 2.33 | 1 |
| 10RD04SW | 0.081 | 0 | 0.125 | 0 | 0.009 | 0 | 0.81 | 0 | 11.8 | 1 | 0.053 | 0 | 0.115 | 1 | 15.8 | 1 |
| 10RD05SW | 19.2 | 1 | 0.125 | 0 | 0.009 | 0 | 0.81 | 0 | 13.3 | 1 | 0.053 | 0 | 0.491 | 1 | 43.4 | 1 |
| 10RD06SW | 1.1 | 1 | 0.125 | 0 | 0.009 | 0 | 0.81 | 0 | 13.3 | 1 | 0.053 | 0 | 0.141 | 1 | 208 | 1 |
| 10RD07SW | 1 | 1 | 0.125 | 0 | 0.009 | 0 | 0.81 | 0 | 14.6 | 1 | 0.053 | 0 | 0.123 | 1 | 233 | 1 |
| 10RD08SW | 1 | 1 | 0.125 | 0 | 0.009 | 0 | 0.81 | 0 | 15.4 | 1 | 0.053 | 0 | 0.129 | 1 | 385 | 1 |
| 10RD09SW | 1.1 | 1 | 0.125 | 0 | 0.009 | 0 | 0.81 | 0 | 19.1 | 1 | 0.053 | 0 | | | | |
| 10RD20SW | | | | | | | | | 24.5 | 1 | | | 0.144 | 1 | 187 | 1 |
| 11RD02SW | 0.36 | 1 | 0.5 | 1 | 0.004 | 0 | 0.2 | 0 | 26.4 | 1 | 0.22 | 1 | 0.08 | 1 | 3.94 | 1 |
| 11RD03SW | | | 0.4 | 1 | 0.012 | 1 | | | | | | | 0.09 | 1 | 4.5 | 1 |
| 11RD04SW | 0.43 | 1 | 0.4 | 1 | 0.004 | 0 | 0.2 | 0 | 26.6 | 1 | 0.28 | 1 | 0.08 | 1 | 20.4 | 1 |
| 11RD05SW | 17.1 | 1 | 0.2 | 0 | 0.004 | 0 | 1.7 | 1 | | | 0.15 | 1 | 0.62 | 1 | 63 | 1 |
| 11RD06SW | 1.18 | 1 | 0.3 | 1 | 0.004 | 0 | 0.3 | 1 | 27.6 | 1 | 0.27 | 1 | 0.14 | 1 | 214 | 1 |
| 11RD07SW | 1.13 | 1 | 0.4 | 1 | 0.004 | 0 | 0.3 | 1 | 28.2 | 1 | 0.28 | 1 | 0.14 | 1 | 200 | 1 |
| 11RD08SW | 1.23 | 1 | 0.5 | 1 | | | 0.5 | 1 | 29.5 | 1 | 0.52 | 1 | 0.12 | 1 | | |
| 11RD09SW | 1.25 | 1 | 0.4 | 1 | 0.004 | 0 | 0.5 | 1 | 30.5 | 1 | 0.57 | 1 | 0.13 | 1 | 312 | 1 |
| 11RD10SW | 0.46 | 1 | 0.3 | 0 | 0.004 | 0 | 0.4 | 1 | 32 | 1 | 0.37 | 1 | 0.08 | 1 | 4.27 | 1 |
| 11RD11SW | 1.38 | 1 | 0.3 | 0 | 0.004 | 0 | 2.1 | 1 | 32.7 | 1 | 0.22 | 1 | | | | |
| 11RD12SW | 0.45 | 1 | 0.5 | 1 | 0.004 | 0 | 0.3 | 1 | 86.4 | 1 | 0.25 | 1 | 0.09 | 1 | 71.1 | 1 |
| 11RD20SW | | | | | 0.026 | 1 | | | 354 | 1 | | | | | 344 | 1 |
| 11RD21SW | 0.43 | 1 | | | | | 0.2 | 0 | 379 | 1 | 0.45 | 1 | | | | |

General UCL Statistics for Data Sets with Non-Detects

User Selected Options
 From File WorkSheet.wst
 Full Precision OFF
 Confidence Coefficient 95%
 Number of Bootstrap Operations 2000

Antimony

General Statistics

| | | | |
|------------------------------|----|---------------------------------|----|
| Number of Valid Observations | 29 | Number of Distinct Observations | 29 |
| Number of Missing Values | 2 | | |

Raw Statistics

| | |
|--------------------------|-------|
| Minimum | 0.6 |
| Maximum | 13100 |
| Mean | 794.6 |
| Geometric Mean | 29.34 |
| Median | 26.2 |
| SD | 2606 |
| Std. Error of Mean | 483.9 |
| Coefficient of Variation | 3.28 |
| Skewness | 4.299 |

Log-transformed Statistics

| | |
|---------------------|--------|
| Minimum of Log Data | -0.511 |
| Maximum of Log Data | 9.48 |
| Mean of log Data | 3.379 |
| SD of log Data | 2.723 |

Relevant UCL Statistics

| | | | |
|--|-------|--|-------|
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.344 | Shapiro Wilk Test Statistic | 0.939 |
| Shapiro Wilk Critical Value | 0.926 | Shapiro Wilk Critical Value | 0.926 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | |
|-----------------------------------|------|
| 95% Student's-t UCL | 1618 |
| 95% UCLs (Adjusted for Skewness) | |
| 95% Adjusted-CLT UCL (Chen-1995) | 2003 |
| 95% Modified-t UCL (Johnson-1978) | 1682 |

Assuming Lognormal Distribution

| | |
|----------------------------|-------|
| 95% H-UCL | 16370 |
| 95% Chebyshev (MVUE) UCL | 3014 |
| 97.5% Chebyshev (MVUE) UCL | 3992 |
| 99% Chebyshev (MVUE) UCL | 5914 |

Gamma Distribution Test

| | |
|------------------------------------|--------|
| k star (bias corrected) | 0.22 |
| Theta Star | 3611 |
| MLE of Mean | 794.6 |
| MLE of Standard Deviation | 1694 |
| nu star | 12.76 |
| Approximate Chi Square Value (.05) | 5.734 |
| Adjusted Level of Significance | 0.0407 |
| Adjusted Chi Square Value | 5.453 |

Data Distribution

| | |
|--|------|
| Data appear Lognormal at 5% Significance Level | |
| Nonparametric Statistics | |
| 95% CLT UCL | 1591 |
| 95% Jackknife UCL | 1618 |
| 95% Standard Bootstrap UCL | 1566 |
| 95% Bootstrap-t UCL | 7350 |
| 95% Hall's Bootstrap UCL | 5119 |
| 95% Percentile Bootstrap UCL | 1647 |
| 95% BCA Bootstrap UCL | 2302 |
| 95% Chebyshev(Mean, Sd) UCL | 2904 |
| 97.5% Chebyshev(Mean, Sd) UCL | 3817 |
| 99% Chebyshev(Mean, Sd) UCL | 5609 |

Anderson-Darling Test Statistic

| | |
|---|-------|
| Anderson-Darling 5% Critical Value | 0.889 |
| Kolmogorov-Smirnov Test Statistic | 0.241 |
| Kolmogorov-Smirnov 5% Critical Value | 0.179 |
| Data not Gamma Distributed at 5% Significance Level | |

Assuming Gamma Distribution

| | |
|--|------|
| 95% Approximate Gamma UCL (Use when n >= 40) | 1769 |
| 95% Adjusted Gamma UCL (Use when n < 40) | 1860 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics

| | | | |
|------------------------------|----|---------------------------------|----|
| Number of Valid Observations | 29 | Number of Distinct Observations | 29 |
| Number of Missing Values | 2 | | |

Raw Statistics

| | | | |
|--------------------------|-------|----------------------------|--------|
| Minimum | 0.6 | Log-transformed Statistics | |
| Maximum | 6680 | Minimum of Log Data | -0.511 |
| Mean | 547.6 | Maximum of Log Data | 8.807 |
| Geometric Mean | 32.28 | Mean of log Data | 3.474 |
| Median | 25.8 | SD of log Data | 2.233 |
| SD | 1600 | | |
| Std. Error of Mean | 297.2 | | |
| Coefficient of Variation | 2.922 | | |
| Skewness | 3.365 | | |

Relevant UCL Statistics

| | | | |
|--|-------|---|-------|
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.387 | Shapiro Wilk Test Statistic | 0.917 |
| Shapiro Wilk Critical Value | 0.926 | Shapiro Wilk Critical Value | 0.926 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|------|---------------------------------|------|
| 95% Student's-t UCL | 1053 | Assuming Lognormal Distribution | |
| 95% UCLs (Adjusted for Skewness) | | 95% H-UCL | 2375 |
| 95% Adjusted-CLT UCL (Chen-1995) | 1235 | 95% Chebyshev (MVUE) UCL | 1050 |
| 95% Modified-t UCL (Johnson-1978) | 1084 | 97.5% Chebyshev (MVUE) UCL | 1372 |
| | | 99% Chebyshev (MVUE) UCL | 2005 |

Gamma Distribution Test

| | | | |
|---|--------|--|------|
| k star (bias corrected) | 0.248 | Data Distribution | |
| Theta Star | 2210 | Data do not follow a Discernable Distribution (0.05) | |
| MLE of Mean | 547.6 | | |
| MLE of Standard Deviation | 1100 | | |
| nu star | 14.37 | | |
| Approximate Chi Square Value (.05) | 6.827 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0407 | 95% CLT UCL | 1036 |
| Adjusted Chi Square Value | 6.517 | 95% Jackknife UCL | 1053 |
| | | 95% Standard Bootstrap UCL | 1023 |
| Anderson-Darling Test Statistic | 3.747 | 95% Bootstrap-t UCL | 2745 |
| Anderson-Darling 5% Critical Value | 0.877 | 95% Hall's Bootstrap UCL | 2906 |
| Kolmogorov-Smirnov Test Statistic | 0.327 | 95% Percentile Bootstrap UCL | 1095 |
| Kolmogorov-Smirnov 5% Critical Value | 0.178 | 95% BCA Bootstrap UCL | 1329 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 1843 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 2403 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 3504 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 1153 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 1208 | | |

Potential UCL to Use Use 97.5% Chebyshev (Mean, Sd) UCL 2403

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics

| | | | |
|------------------------------|----|---------------------------------|----|
| Number of Valid Observations | 29 | Number of Distinct Observations | 28 |
| Number of Missing Values | 2 | | |

Raw Statistics

| | | | |
|--------------------------|-------|----------------------------|-------|
| | | Log-transformed Statistics | |
| Minimum | 28.2 | Minimum of Log Data | 3.339 |
| Maximum | 365 | Maximum of Log Data | 5.9 |
| Mean | 80.4 | Mean of log Data | 4.157 |
| Geometric Mean | 63.9 | SD of log Data | 0.624 |
| Median | 56.6 | | |
| SD | 71.94 | | |
| Std. Error of Mean | 13.36 | | |
| Coefficient of Variation | 0.895 | | |
| Skewness | 2.802 | | |

Relevant UCL Statistics

| | | | |
|--|-------|---|-------|
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.653 | Shapiro Wilk Test Statistic | 0.914 |
| Shapiro Wilk Critical Value | 0.926 | Shapiro Wilk Critical Value | 0.926 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|-------|---------------------------------|-------|
| 95% Student's-t UCL | 103.1 | Assuming Lognormal Distribution | |
| 95% UCLs (Adjusted for Skewness) | | 95% H-UCL | 98.95 |
| 95% Adjusted-CLT UCL (Chen-1995) | 109.8 | 95% Chebyshev (MVUE) UCL | 118.5 |
| 95% Modified-t UCL (Johnson-1978) | 104.3 | 97.5% Chebyshev (MVUE) UCL | 136.5 |
| | | 99% Chebyshev (MVUE) UCL | 171.7 |

Gamma Distribution Test

| | | | |
|---|--------|---|-------|
| k star (bias corrected) | 2.112 | Data Distribution | |
| Theta Star | 38.06 | Data Follow Appr. Gamma Distribution at 5% Significance Level | |
| MLE of Mean | 80.4 | | |
| MLE of Standard Deviation | 55.32 | | |
| nu star | 122.5 | | |
| Approximate Chi Square Value (.05) | 97.96 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0407 | 95% CLT UCL | 102.4 |
| Adjusted Chi Square Value | 96.65 | 95% Jackknife UCL | 103.1 |
| | | 95% Standard Bootstrap UCL | 102 |
| Anderson-Darling Test Statistic | 1.42 | 95% Bootstrap-t UCL | 122 |
| Anderson-Darling 5% Critical Value | 0.756 | 95% Hall's Bootstrap UCL | 122.4 |
| Kolmogorov-Smirnov Test Statistic | 0.152 | 95% Percentile Bootstrap UCL | 104.6 |
| Kolmogorov-Smirnov 5% Critical Value | 0.164 | 95% BCA Bootstrap UCL | 112.6 |
| Data follow Appr. Gamma Distribution at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 138.6 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 163.8 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 213.3 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 100.6 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 101.9 | | |

Potential UCL to Use Use 95% Approximate Gamma UCL 100.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

| | | | |
|----------------------------------|----|---------------------------|--------|
| Number of Valid Data | 29 | Number of Detected Data | 24 |
| Number of Distinct Detected Data | 23 | Number of Non-Detect Data | 5 |
| Number of Missing Values | 2 | Percent Non-Detects | 17.24% |

Raw Statistics

| | | | |
|--------------------|-------|----------------------------|--------|
| Minimum Detected | 0.05 | Log-transformed Statistics | |
| Maximum Detected | 10.6 | Minimum Detected | -2.996 |
| Mean of Detected | 1.822 | Maximum Detected | 2.361 |
| SD of Detected | 2.596 | Mean of Detected | -0.188 |
| Minimum Non-Detect | 0.053 | SD of Detected | 1.324 |
| Maximum Non-Detect | 0.053 | Minimum Non-Detect | -2.937 |
| | | Maximum Non-Detect | -2.937 |

UCL Statistics

| | | | |
|--|-------|---|-------|
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.658 | Shapiro Wilk Test Statistic | 0.978 |
| 5% Shapiro Wilk Critical Value | 0.916 | 5% Shapiro Wilk Critical Value | 0.916 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|--------------------------|-------|---------------------------------|--------|
| DL/2 Substitution Method | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 1.512 | Mean | -0.782 |
| SD | 2.452 | SD | 1.786 |
| 95% DL/2 (t) UCL | 2.287 | 95% H-Stat (DL/2) UCL | 7.552 |

Maximum Likelihood Estimate(MLE) Method

| | | | |
|--------------------|-------|------------------------------|--------|
| Mean | 1.121 | Log ROS Method | |
| SD | 2.834 | Mean in Log Scale | -0.662 |
| 95% MLE (t) UCL | 2.016 | SD in Log Scale | 1.614 |
| 95% MLE (Tiku) UCL | 2.006 | Mean in Original Scale | 1.518 |
| | | SD in Original Scale | 2.448 |
| | | 95% t UCL | 2.291 |
| | | 95% Percentile Bootstrap UCL | 2.305 |
| | | 95% BCA Bootstrap UCL | 2.469 |
| | | 95% H UCL | 5.218 |

Gamma Distribution Test with Detected Values Only

| | | | |
|-------------------------|-------|--|--|
| k star (bias corrected) | 0.691 | Data Distribution Test with Detected Values Only | |
| Theta Star | 2.634 | Data appear Gamma Distributed at 5% Significance Level | |
| nu star | 33.19 | | |

A-D Test Statistic

| | | | |
|--|-------|--------------------------|-------|
| 5% A-D Critical Value | 0.781 | Nonparametric Statistics | |
| K-S Test Statistic | 0.782 | Kaplan-Meier (KM) Method | |
| 5% K-S Critical Value | 0.782 | Mean | 1.516 |
| Data appear Gamma Distributed at 5% Significance Level | 0.185 | SD | 2.407 |
| | | SE of Mean | 0.457 |
| | | 95% KM (t) UCL | 2.293 |

| | | | |
|--|----------|-----------------------------------|-------|
| Assuming Gamma Distribution | | 95% KM (z) UCL | 2.267 |
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (jackknife) UCL | 2.286 |
| Minimum | 1.00E-06 | 95% KM (bootstrap t) UCL | 2.85 |
| Maximum | 10.6 | 95% KM (BCA) UCL | 2.393 |
| Mean | 1.508 | 95% KM (Percentile Bootstrap) UCL | 2.338 |
| Median | 0.59 | 95% KM (Chebyshev) UCL | 3.506 |
| SD | 2.455 | 97.5% KM (Chebyshev) UCL | 4.367 |
| k star | 0.24 | 99% KM (Chebyshev) UCL | 6.058 |
| Theta star | 6.279 | | |
| Nu star | 13.93 | Potential UCLs to Use | |
| AppChi2 | 6.52 | 95% KM (Chebyshev) UCL | 3.506 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 3.22 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 3.376 | | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

| | | | |
|----------------------------------|----|---------------------------|-------|
| Number of Valid Data | 29 | Number of Detected Data | 28 |
| Number of Distinct Detected Data | 27 | Number of Non-Detect Data | 1 |
| Number of Missing Values | 2 | Percent Non-Detects | 3.45% |

Raw Statistics

| | | | |
|--------------------|-------|----------------------------|--------|
| Minimum Detected | 0.045 | Log-transformed Statistics | |
| Maximum Detected | 40.5 | Minimum Detected | -3.101 |
| Mean of Detected | 3.795 | Maximum Detected | 3.701 |
| SD of Detected | 7.661 | Mean of Detected | 0.217 |
| Minimum Non-Detect | 0.007 | SD of Detected | 1.642 |
| Maximum Non-Detect | 0.007 | Minimum Non-Detect | -4.962 |
| | | Maximum Non-Detect | -4.962 |

UCL Statistics

| | | | |
|--|-------|---|-------|
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.467 | Shapiro Wilk Test Statistic | 0.973 |
| 5% Shapiro Wilk Critical Value | 0.924 | 5% Shapiro Wilk Critical Value | 0.924 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|--------------------------|-------|---------------------------------|--------|
| DL/2 Substitution Method | | Assuming Lognormal Distribution | |
| Mean | 3.664 | DL/2 Substitution Method | |
| SD | 7.556 | Mean | 0.0143 |
| 95% DL/2 (t) UCL | 6.051 | SD | 1.947 |
| | | 95% H-Stat (DL/2) UCL | 27.57 |

Maximum Likelihood Estimate(MLE) Method

| | | | |
|--------------------|-------|------------------------------|--------|
| Mean | 3.493 | Log ROS Method | |
| SD | 7.598 | Mean in Log Scale | 0.0752 |
| 95% MLE (t) UCL | 5.894 | SD in Log Scale | 1.784 |
| 95% MLE (Tiku) UCL | 5.661 | Mean in Original Scale | 3.665 |
| | | SD in Original Scale | 7.555 |
| | | 95% t UCL | 6.051 |
| | | 95% Percentile Bootstrap UCL | 6.1 |
| | | 95% BCA Bootstrap UCL | 7.694 |
| | | 95% H UCL | 17.65 |

| | | | |
|--|--|--|-------|
| Gamma Distribution Test with Detected Values Only | Data Distribution Test with Detected Values Only | | |
| k star (bias corrected) | 0.523 | Data appear Gamma Distributed at 5% Significance Level | |
| Theta Star | 7.256 | | |
| nu star | 29.29 | | |
| A-D Test Statistic | 0.547 | Nonparametric Statistics | |
| 5% A-D Critical Value | 0.804 | Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.804 | Mean | 3.666 |
| 5% K-S Critical Value | 0.174 | SD | 7.424 |
| Data appear Gamma Distributed at 5% Significance Level | | SE of Mean | 1.404 |
| | | 95% KM (t) UCL | 6.054 |
| Assuming Gamma Distribution | | 95% KM (z) UCL | 5.975 |
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (jackknife) UCL | 6.051 |
| Minimum | 1.00E-06 | 95% KM (bootstrap t) UCL | 9.764 |
| Maximum | 40.5 | 95% KM (BCA) UCL | 6.297 |
| Mean | 3.664 | 95% KM (Percentile Bootstrap) UCL | 6.117 |
| Median | 1.6 | 95% KM (Chebyshev) UCL | 9.785 |
| SD | 7.556 | 97.5% KM (Chebyshev) UCL | 12.43 |
| k star | 0.397 | 99% KM (Chebyshev) UCL | 17.63 |
| Theta star | 9.224 | | |
| Nu star | 23.04 | Potential UCLs to Use | |
| AppChi2 | 13.12 | 95% KM (Chebyshev) UCL | 9.785 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 6.434 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 6.661 | | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Iron

| | | |
|--|-------|---|
| General Statistics | | |
| Number of Valid Data | 29 | Number of Detected Data 26 |
| Number of Distinct Detected Data | 24 | Number of Non-Detect Data 3 |
| Number of Missing Values | 2 | Percent Non-Detects 10.34% |
| Raw Statistics | | Log-transformed Statistics |
| Minimum Detected | 5.8 | Minimum Detected 1.758 |
| Maximum Detected | 22400 | Maximum Detected 10.02 |
| Mean of Detected | 3804 | Mean of Detected 6.626 |
| SD of Detected | 5912 | SD of Detected 2.37 |
| Minimum Non-Detect | 7.2 | Minimum Non-Detect 1.974 |
| Maximum Non-Detect | 7.2 | Maximum Non-Detect 1.974 |
| UCL Statistics | | |
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only |
| Shapiro Wilk Test Statistic | 0.676 | Shapiro Wilk Test Statistic 0.931 |
| 5% Shapiro Wilk Critical Value | 0.92 | 5% Shapiro Wilk Critical Value 0.92 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level |
| Assuming Normal Distribution | | Assuming Lognormal Distribution |
| DL/2 Substitution Method | | DL/2 Substitution Method |
| Mean | 3411 | Mean 6.073 |

| | | | |
|--|----------|--|--------|
| SD | 5709 | SD | 2.785 |
| 95% DL/2 (t) UCL | 5214 | 95% H-Stat (DL/2) UCL | 321720 |
| Maximum Likelihood Estimate(MLE) Method | | Log ROS Method | |
| Mean | 2851 | Mean in Log Scale | 6.133 |
| SD | 6222 | SD in Log Scale | 2.692 |
| 95% MLE (t) UCL | 4817 | Mean in Original Scale | 3411 |
| 95% MLE (Tiku) UCL | 4729 | SD in Original Scale | 5709 |
| | | 95% t UCL | 5215 |
| | | 95% Percentile Bootstrap UCL | 5228 |
| | | 95% BCA Bootstrap UCL | 6015 |
| | | 95% H UCL | 222865 |
| Gamma Distribution Test with Detected Values Only | | Data Distribution Test with Detected Values Only | |
| k star (bias corrected) | 0.385 | Data appear Gamma Distributed at 5% Significance Level | |
| Theta Star | 9889 | | |
| nu star | 20 | | |
| A-D Test Statistic | 0.328 | Nonparametric Statistics | |
| 5% A-D Critical Value | 0.829 | Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.829 | Mean | 3411 |
| 5% K-S Critical Value | 0.183 | SD | 5610 |
| Data appear Gamma Distributed at 5% Significance Level | | SE of Mean | 1062 |
| | | 95% KM (t) UCL | 5218 |
| Assuming Gamma Distribution | | 95% KM (z) UCL | 5159 |
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (jackknife) UCL | 5214 |
| Minimum | 1.00E-06 | 95% KM (bootstrap t) UCL | 6195 |
| Maximum | 22400 | 95% KM (BCA) UCL | 5298 |
| Mean | 3411 | 95% KM (Percentile Bootstrap) UCL | 5306 |
| Median | 1150 | 95% KM (Chebyshev) UCL | 8042 |
| SD | 5709 | 97.5% KM (Chebyshev) UCL | 10045 |
| k star | 0.205 | 99% KM (Chebyshev) UCL | 13981 |
| Theta star | 16660 | | |
| Nu star | 11.87 | Potential UCLs to Use | |
| AppChi2 | 5.144 | 95% KM (Chebyshev) UCL | 8042 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 7873 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 8297 | | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Lead

| | | | |
|----------------------------------|-------|----------------------------|--------|
| General Statistics | | | |
| Number of Valid Data | 29 | Number of Detected Data | 24 |
| Number of Distinct Detected Data | 22 | Number of Non-Detect Data | 5 |
| Number of Missing Values | 2 | Percent Non-Detects | 17.24% |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum Detected | 0.019 | Minimum Detected | -3.963 |
| Maximum Detected | 2.02 | Maximum Detected | 0.703 |
| Mean of Detected | 0.37 | Mean of Detected | -1.737 |
| SD of Detected | 0.457 | SD of Detected | 1.347 |
| Minimum Non-Detect | 0.2 | Minimum Non-Detect | -1.609 |

| | | | |
|--|----------|--|--------|
| Maximum Non-Detect | 0.2 | Maximum Non-Detect | -1.609 |
| UCL Statistics | | | |
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.729 | Shapiro Wilk Test Statistic | 0.944 |
| 5% Shapiro Wilk Critical Value | 0.916 | 5% Shapiro Wilk Critical Value | 0.916 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | | |
| DL/2 Substitution Method | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 0.323 | Mean | -1.834 |
| SD | 0.427 | SD | 1.24 |
| 95% DL/2 (t) UCL | 0.458 | 95% H-Stat (DL/2) UCL | 0.661 |
| Maximum Likelihood Estimate(MLE) Method | N/A | Log ROS Method | |
| MLE yields a negative mean | | Mean in Log Scale | -1.902 |
| | | SD in Log Scale | 1.304 |
| | | Mean in Original Scale | 0.32 |
| | | SD in Original Scale | 0.429 |
| | | 95% t UCL | 0.456 |
| | | 95% Percentile Bootstrap UCL | 0.458 |
| | | 95% BCA Bootstrap UCL | 0.494 |
| | | 95% H-UCL | 0.708 |
| Gamma Distribution Test with Detected Values Only | | Data Distribution Test with Detected Values Only | |
| k star (bias corrected) | 0.728 | Data appear Gamma Distributed at 5% Significance Level | |
| Theta Star | 0.508 | | |
| nu star | 34.94 | | |
| A-D Test Statistic | 0.54 | Nonparametric Statistics | |
| 5% A-D Critical Value | 0.78 | Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.78 | Mean | 0.321 |
| 5% K-S Critical Value | 0.185 | SD | 0.422 |
| Data appear Gamma Distributed at 5% Significance Level | | SE of Mean | 0.0802 |
| Assuming Gamma Distribution | | 95% KM (t) UCL | 0.458 |
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (z) UCL | 0.453 |
| Minimum | 1.00E-06 | 95% KM (jackknife) UCL | 0.457 |
| Maximum | 2.02 | 95% KM (bootstrap t) UCL | 0.526 |
| Mean | 0.324 | 95% KM (BCA) UCL | 0.457 |
| Median | 0.166 | 95% KM (Percentile Bootstrap) UCL | 0.454 |
| SD | 0.43 | 95% KM (Chebyshev) UCL | 0.671 |
| k star | 0.418 | 97.5% KM (Chebyshev) UCL | 0.822 |
| Theta star | 0.774 | 99% KM (Chebyshev) UCL | 1.119 |
| Nu star | 24.27 | Potential UCLs to Use | |
| AppChi2 | 14.05 | 95% KM (Chebyshev) UCL | 0.671 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 0.559 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 0.578 | | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

| | | | |
|----------------------------------|----|---------------------------|-------|
| Number of Valid Data | 29 | Number of Detected Data | 28 |
| Number of Distinct Detected Data | 27 | Number of Non-Detect Data | 1 |
| Number of Missing Values | 2 | Percent Non-Detects | 3.45% |

Raw Statistics

| | Raw Statistics | Log-transformed Statistics | |
|--------------------|----------------|----------------------------|--------|
| Minimum Detected | 1.12 | Minimum Detected | 0.113 |
| Maximum Detected | 7370 | Maximum Detected | 8.905 |
| Mean of Detected | 971.1 | Mean of Detected | 5.408 |
| SD of Detected | 1631 | SD of Detected | 2.285 |
| Minimum Non-Detect | 0.02 | Minimum Non-Detect | -3.912 |
| Maximum Non-Detect | 0.02 | Maximum Non-Detect | -3.912 |

UCL Statistics

| | Normal Distribution Test with Detected Values Only | Lognormal Distribution Test with Detected Values Only | |
|--|--|---|-------|
| Shapiro Wilk Test Statistic | 0.599 | Shapiro Wilk Test Statistic | 0.917 |
| 5% Shapiro Wilk Critical Value | 0.924 | 5% Shapiro Wilk Critical Value | 0.924 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | DL/2 Substitution Method | Assuming Lognormal Distribution | |
|------------------|--------------------------|---------------------------------|--------|
| Mean | 937.6 | Mean | 5.063 |
| SD | 1612 | SD | 2.914 |
| 95% DL/2 (t) UCL | 1447 | 95% H-Stat (DL/2) UCL | 216136 |

Maximum Likelihood Estimate(MLE) Method

| | Maximum Likelihood Estimate(MLE) Method | Log ROS Method | |
|--------------------|---|------------------------------|-------|
| Mean | 902.6 | Mean in Log Scale | 5.218 |
| SD | 1623 | SD in Log Scale | 2.468 |
| 95% MLE (t) UCL | 1415 | Mean in Original Scale | 937.6 |
| 95% MLE (Tiku) UCL | 1370 | SD in Original Scale | 1612 |
| | | 95% t UCL | 1447 |
| | | 95% Percentile Bootstrap UCL | 1459 |
| | | 95% BCA Bootstrap UCL | 1622 |
| | | 95% H UCL | 34065 |

Gamma Distribution Test with Detected Values Only

| | Gamma Distribution Test with Detected Values Only | Data Distribution Test with Detected Values Only | |
|-------------------------|---|--|--|
| k star (bias corrected) | 0.417 | Data appear Gamma Distributed at 5% Significance Level | |
| Theta Star | 2327 | | |
| nu star | 23.37 | | |

A-D Test Statistic

| | A-D Test Statistic | 0.4 Nonparametric Statistics | |
|--|--------------------|------------------------------|-------|
| 5% A-D Critical Value | 0.823 | Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.823 | Mean | 937.6 |
| 5% K-S Critical Value | 0.176 | SD | 1584 |
| Data appear Gamma Distributed at 5% Significance Level | | SE of Mean | 299.5 |

Assuming Gamma Distribution

| | Assuming Gamma Distribution | 95% KM (t) UCL | |
|--|-----------------------------|-----------------------------------|------|
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (z) UCL | 1430 |
| Minimum | 1.00E-06 | 95% KM (jackknife) UCL | 1447 |
| Maximum | 7370 | 95% KM (bootstrap t) UCL | 2010 |
| Mean | 937.6 | 95% KM (BCA) UCL | 1518 |
| Median | 536 | 95% KM (Percentile Bootstrap) UCL | 1464 |
| SD | 1612 | 95% KM (Chebyshev) UCL | 2243 |
| k star | 0.314 | 97.5% KM (Chebyshev) UCL | 2808 |
| | | 99% KM (Chebyshev) UCL | 3918 |

| | | | |
|--|-------|------------------------|------|
| Theta star | 2987 | | |
| Nu star | 18.21 | Potential UCLs to Use | |
| AppChi2 | 9.541 | 95% KM (Chebyshev) UCL | 2243 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 1789 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 1862 | | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

| | | | |
|------------------------------|----|---------------------------------|----|
| Number of Valid Observations | 29 | Number of Distinct Observations | 28 |
| Number of Missing Values | 2 | | |

Raw Statistics

| | | | |
|--------------------------|-------|----------------------------|--------|
| | | Log-transformed Statistics | |
| Minimum | 0.9 | Minimum of Log Data | -0.105 |
| Maximum | 35.9 | Maximum of Log Data | 3.581 |
| Mean | 11.78 | Mean of log Data | 1.769 |
| Geometric Mean | 5.866 | SD of log Data | 1.269 |
| Median | 4.74 | | |
| SD | 12.89 | | |
| Std. Error of Mean | 2.393 | | |
| Coefficient of Variation | 1.094 | | |
| Skewness | 1.008 | | |

Relevant UCL Statistics

| | | | |
|--|-------|---|-------|
| | | Lognormal Distribution Test | |
| Normal Distribution Test | | | |
| Shapiro Wilk Test Statistic | 0.76 | Shapiro Wilk Test Statistic | 0.907 |
| Shapiro Wilk Critical Value | 0.926 | Shapiro Wilk Critical Value | 0.926 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|-------|---------------------------------|-------|
| | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 15.85 | 95% H-UCL | 25.78 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 28.05 |
| 95% Adjusted-CLT UCL (Chen-1995) | 16.2 | 97.5% Chebyshev (MVUE) UCL | 34.77 |
| 95% Modified-t UCL (Johnson-1978) | 15.93 | 99% Chebyshev (MVUE) UCL | 47.96 |

Gamma Distribution Test

| | | | |
|---|--------|---|-------|
| | | Data Distribution | |
| k star (bias corrected) | 0.781 | Data Follow Appr. Gamma Distribution at 5% Significance Level | |
| Theta Star | 15.09 | | |
| MLE of Mean | 11.78 | | |
| MLE of Standard Deviation | 13.33 | | |
| nu star | 45.28 | | |
| Approximate Chi Square Value (.05) | 30.84 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0407 | 95% CLT UCL | 15.72 |
| Adjusted Chi Square Value | 30.13 | 95% Jackknife UCL | 15.85 |
| | | 95% Standard Bootstrap UCL | 15.67 |
| Anderson-Darling Test Statistic | 1.173 | 95% Bootstrap-t UCL | 16.47 |
| Anderson-Darling 5% Critical Value | 0.78 | 95% Hall's Bootstrap UCL | 15.79 |
| Kolmogorov-Smirnov Test Statistic | 0.151 | 95% Percentile Bootstrap UCL | 15.6 |
| Kolmogorov-Smirnov 5% Critical Value | 0.168 | 95% BCA Bootstrap UCL | 16.18 |
| Data follow Appr. Gamma Distribution at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 22.21 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 26.72 |

| | | |
|--|-------------------------------|-------|
| Assuming Gamma Distribution | 99% Chebyshev(Mean, Sd) UCL | 35.59 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 17.29 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 17.7 | |
| Potential UCL to Use | Use 95% Approximate Gamma UCL | 17.29 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Selenium

General Statistics

| | | | |
|----------------------------------|----|---------------------------|--------|
| Number of Valid Data | 29 | Number of Detected Data | 10 |
| Number of Distinct Detected Data | 8 | Number of Non-Detect Data | 19 |
| Number of Missing Values | 2 | Percent Non-Detects | 65.52% |

Raw Statistics

| | | | |
|--------------------|-------|----------------------------|--------|
| | | Log-transformed Statistics | |
| Minimum Detected | 0.3 | Minimum Detected | -1.204 |
| Maximum Detected | 5.4 | Maximum Detected | 1.686 |
| Mean of Detected | 1.18 | Mean of Detected | -0.231 |
| SD of Detected | 1.513 | SD of Detected | 0.822 |
| Minimum Non-Detect | 0.125 | Minimum Non-Detect | -2.079 |
| Maximum Non-Detect | 0.3 | Maximum Non-Detect | -1.204 |

| | | |
|--|---------------------------------|--------|
| Note: Data have multiple DLs - Use of KM Method is recommended | Number treated as Non-Detect | 19 |
| For all methods (except KM, DL/2, and ROS Methods), | Number treated as Detected | 10 |
| Observations < Largest ND are treated as NDs | Single DL Non-Detect Percentage | 65.52% |

UCL Statistics

| | | | |
|--|-------|---|-------|
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.553 | Shapiro Wilk Test Statistic | 0.873 |
| 5% Shapiro Wilk Critical Value | 0.842 | 5% Shapiro Wilk Critical Value | 0.842 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|--------------------------|-------|---------------------------------|--------|
| DL/2 Substitution Method | | Assuming Lognormal Distribution | |
| Mean | 0.493 | DL/2 Substitution Method | |
| SD | 0.997 | Mean | -1.444 |
| 95% DL/2 (t) UCL | 0.808 | SD | 1.051 |
| | | 95% H-Stat (DL/2) UCL | 0.678 |

Maximum Likelihood Estimate(MLE) Method N/A
MLE yields a negative mean

| | |
|------------------------------|--------|
| Log ROS Method | |
| Mean in Log Scale | -2.021 |
| SD in Log Scale | 1.615 |
| Mean in Original Scale | 0.457 |
| SD in Original Scale | 1.012 |
| 95% t UCL | 0.777 |
| 95% Percentile Bootstrap UCL | 0.792 |
| 95% BCA Bootstrap UCL | 1.002 |
| 95% H-UCL | 1.344 |

Gamma Distribution Test with Detected Values Only

| | | | |
|-------------------------|-------|--|--|
| k star (bias corrected) | 1.049 | Data Distribution Test with Detected Values Only | |
| Theta Star | 1.125 | Data appear Lognormal at 5% Significance Level | |
| nu star | 20.97 | | |

| | | | |
|---|----------|-----------------------------------|-------|
| A-D Test Statistic | 0.947 | Nonparametric Statistics | |
| 5% A-D Critical Value | 0.741 | Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.741 | Mean | 0.603 |
| 5% K-S Critical Value | 0.272 | SD | 0.941 |
| Data not Gamma Distributed at 5% Significance Level | | SE of Mean | 0.184 |
| | | 95% KM (t) UCL | 0.917 |
| Assuming Gamma Distribution | | 95% KM (z) UCL | 0.906 |
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (jackknife) UCL | 0.867 |
| Minimum | 1.00E-06 | 95% KM (bootstrap t) UCL | 1.576 |
| Maximum | 5.4 | 95% KM (BCA) UCL | 1.055 |
| Mean | 0.407 | 95% KM (Percentile Bootstrap) UCL | 0.962 |
| Median | 1.00E-06 | 95% KM (Chebyshev) UCL | 1.406 |
| SD | 1.031 | 97.5% KM (Chebyshev) UCL | 1.754 |
| k star | 0.112 | 99% KM (Chebyshev) UCL | 2.437 |
| Theta star | 3.647 | | |
| Nu star | 6.471 | Potential UCLs to Use | |
| AppChi2 | 1.885 | 95% KM (t) UCL | 0.917 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 1.397 | 95% KM (% Bootstrap) UCL | 0.962 |
| 95% Adjusted Gamma UCL (Use when n < 40) | 1.512 | | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Thallium

| | | | |
|--|--------|---|--------|
| General Statistics | | | |
| Number of Valid Data | 29 | Number of Detected Data | 18 |
| Number of Distinct Detected Data | 10 | Number of Non-Detect Data | 11 |
| Number of Missing Values | 2 | Percent Non-Detects | 37.93% |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum Detected | 0.006 | Minimum Detected | -5.116 |
| Maximum Detected | 0.075 | Maximum Detected | -2.59 |
| Mean of Detected | 0.0157 | Mean of Detected | -4.409 |
| SD of Detected | 0.0161 | SD of Detected | 0.646 |
| Minimum Non-Detect | 0.003 | Minimum Non-Detect | -5.809 |
| Maximum Non-Detect | 0.005 | Maximum Non-Detect | -5.298 |
| Note: Data have multiple DLs - Use of KM Method is recommended | | Number treated as Non-Detect | 11 |
| For all methods (except KM, DL/2, and ROS Methods), | | Number treated as Detected | 18 |
| Observations < Largest ND are treated as NDs | | Single DL Non-Detect Percentage | 37.93% |
| UCL Statistics | | | |
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.576 | Shapiro Wilk Test Statistic | 0.874 |
| 5% Shapiro Wilk Critical Value | 0.897 | 5% Shapiro Wilk Critical Value | 0.897 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 0.0105 | Mean | -5.097 |
| SD | 0.0142 | SD | 1.04 |
| 95% DL/2 (t) UCL | 0.015 | 95% H-Stat (DL/2) UCL | 0.0172 |

| | | |
|---|-------------------------------|--------|
| Maximum Likelihood Estimate(MLE) Method | Log ROS Method | |
| Mean | 0.00618 Mean in Log Scale | -5.02 |
| SD | 0.0186 SD in Log Scale | 0.974 |
| 95% MLE (t) UCL | 0.0121 Mean in Original Scale | 0.0108 |
| 95% MLE (Tiku) UCL | 0.0127 SD in Original Scale | 0.0141 |
| | 95% t UCL | 0.0152 |
| | 95% Percentile Bootstrap UCL | 0.0154 |
| | 95% BCA Bootstrap UCL | 0.0179 |
| | 95% H UCL | 0.0166 |

| | | |
|---|--|--|
| Gamma Distribution Test with Detected Values Only | Data Distribution Test with Detected Values Only | |
| k star (bias corrected) | 1.791 Data do not follow a Discernable Distribution (0.05) | |
| Theta Star | 0.00878 | |
| nu star | 64.49 | |

| | | |
|---|---|---------|
| A-D Test Statistic | 1.221 Nonparametric Statistics | |
| 5% A-D Critical Value | 0.752 Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.752 Mean | 0.012 |
| 5% K-S Critical Value | 0.206 SD | 0.0132 |
| Data not Gamma Distributed at 5% Significance Level | SE of Mean | 0.00252 |
| | 95% KM (t) UCL | 0.0163 |
| Assuming Gamma Distribution | 95% KM (z) UCL | 0.0162 |
| Gamma ROS Statistics using Extrapolated Data | 95% KM (jackknife) UCL | 0.0163 |
| Minimum | 1.00E-06 95% KM (bootstrap t) UCL | 0.0221 |
| Maximum | 0.075 95% KM (BCA) UCL | 0.0172 |
| Mean | 0.00976 95% KM (Percentile Bootstrap) UCL | 0.0168 |
| Median | 0.007 95% KM (Chebyshev) UCL | 0.023 |
| SD | 0.0147 97.5% KM (Chebyshev) UCL | 0.0278 |
| k star | 0.218 99% KM (Chebyshev) UCL | 0.0371 |
| Theta star | 0.0449 | |
| Nu star | 12.62 Potential UCLs to Use | |
| AppChi2 | 5.638 95% KM (BCA) UCL | 0.0172 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 0.0218 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 0.023 | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

As(Inorg)

| | | |
|------------------------------|-------|------------------------------------|
| General Statistics | | |
| Number of Valid Observations | 20 | Number of Distinct Observations 20 |
| Raw Statistics | | Log-transformed Statistics |
| Minimum | 0.17 | Minimum of Log Data -1.772 |
| Maximum | 4530 | Maximum of Log Data 8.418 |
| Mean | 332.1 | Mean of log Data 2.753 |
| Geometric Mean | 15.69 | SD of log Data 2.402 |
| Median | 12.7 | |
| SD | 1053 | |
| Std. Error of Mean | 235.4 | |
| Coefficient of Variation | 3.17 | |
| Skewness | 3.794 | |

| | | |
|---|--|--|
| Relevant UCL Statistics | | |
| Normal Distribution Test | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.359 | Shapiro Wilk Test Statistic 0.946 |
| Shapiro Wilk Critical Value | 0.905 | Shapiro Wilk Critical Value 0.905 |
| Data not Normal at 5% Significance Level | Data appear Lognormal at 5% Significance Level | |
| | | |
| Assuming Normal Distribution | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 739.1 | 95% H-UCL 4515 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL 715.9 |
| 95% Adjusted-CLT UCL (Chen-1995) | 932.6 | 97.5% Chebyshev (MVUE) UCL 945.9 |
| 95% Modified-t UCL (Johnson-1978) | 772.3 | 99% Chebyshev (MVUE) UCL 1398 |
| | | |
| Gamma Distribution Test | Data Distribution | |
| k star (bias corrected) | 0.233 | Data appear Lognormal at 5% Significance Level |
| Theta Star | 1424 | |
| MLE of Mean | 332.1 | |
| MLE of Standard Deviation | 687.8 | |
| nu star | 9.325 | |
| Approximate Chi Square Value (.05) | 3.524 | Nonparametric Statistics |
| Adjusted Level of Significance | 0.038 | 95% CLT UCL 719.2 |
| Adjusted Chi Square Value | 3.247 | 95% Jackknife UCL 739.1 |
| | | 95% Standard Bootstrap UCL 705.4 |
| Anderson-Darling Test Statistic | 2.513 | 95% Bootstrap-t UCL 8476 |
| Anderson-Darling 5% Critical Value | 0.873 | 95% Hall's Bootstrap UCL 7135 |
| Kolmogorov-Smirnov Test Statistic | 0.329 | 95% Percentile Bootstrap UCL 734.3 |
| Kolmogorov-Smirnov 5% Critical Value | 0.213 | 95% BCA Bootstrap UCL 1158 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL 1358 |
| | | 97.5% Chebyshev(Mean, Sd) UCL 1802 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL 2674 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 878.6 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 953.6 | |
| | | |
| Potential UCL to Use | Use 97.5% Chebyshev (Mean, Sd) UCL 1802 | |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

| | | |
|------------------------------|----------------------------|------------------------------------|
| General Statistics | | |
| Number of Valid Observations | 29 | Number of Distinct Observations 29 |
| | | |
| Raw Statistics | Log-transformed Statistics | |
| Minimum | 1.85 | Minimum of Log Data 0.615 |
| Maximum | 56500 | Maximum of Log Data 10.94 |
| Mean | 2683 | Mean of log Data 5.437 |
| Geometric Mean | 229.7 | SD of log Data 2.181 |
| Median | 247 | |
| SD | 10440 | |
| Std. Error of Mean | 1939 | |
| Coefficient of Variation | 3.892 | |
| Skewness | 5.245 | |

| | | |
|---|--------|--|
| Relevant UCL Statistics | | |
| Normal Distribution Test | | Lognormal Distribution Test |
| Shapiro Wilk Test Statistic | 0.266 | Shapiro Wilk Test Statistic 0.988 |
| Shapiro Wilk Critical Value | 0.926 | Shapiro Wilk Critical Value 0.926 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level |
| | | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution |
| 95% Student's-t UCL | 5980 | 95% H-UCL 13966 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL 6656 |
| 95% Adjusted-CLT UCL (Chen-1995) | 7889 | 97.5% Chebyshev (MVUE) UCL 8685 |
| 95% Modified-t UCL (Johnson-1978) | 6295 | 99% Chebyshev (MVUE) UCL 12671 |
| | | |
| Gamma Distribution Test | | Data Distribution |
| k star (bias corrected) | 0.277 | Data appear Lognormal at 5% Significance Level |
| Theta Star | 9687 | |
| MLE of Mean | 2683 | |
| MLE of Standard Deviation | 5098 | |
| nu star | 16.06 | |
| Approximate Chi Square Value (.05) | 8.005 | Nonparametric Statistics |
| Adjusted Level of Significance | 0.0407 | 95% CLT UCL 5871 |
| Adjusted Chi Square Value | 7.666 | 95% Jackknife UCL 5980 |
| | | 95% Standard Bootstrap UCL 5769 |
| Anderson-Darling Test Statistic | 2.417 | 95% Bootstrap-t UCL 31931 |
| Anderson-Darling 5% Critical Value | 0.863 | 95% Hall's Bootstrap UCL 21275 |
| Kolmogorov-Smirnov Test Statistic | 0.239 | 95% Percentile Bootstrap UCL 6499 |
| Kolmogorov-Smirnov 5% Critical Value | 0.177 | 95% BCA Bootstrap UCL 8651 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL 11133 |
| | | 97.5% Chebyshev(Mean, Sd) UCL 14789 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL 21972 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 5382 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 5620 | |
| | | |
| Potential UCL to Use | | Use 97.5% Chebyshev (Mean, Sd) UCL 14789 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Data Sets with Non-Detects

User Selected Options
 From File Worksheet.wst
 Full Precision OFF
 Confidence Coefficient 95%
 Number of Bootstrap Operations 2000

1-Methylnaphthalene

General Statistics

| | | | |
|----------------------------------|---|---------------------------|--------|
| Number of Valid Data | 7 | Number of Detected Data | 1 |
| Number of Distinct Detected Data | 1 | Number of Non-Detect Data | 6 |
| Number of Missing Values | 1 | Percent Non-Detects | 85.71% |

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
 It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable 1-Methylnaphthalene was not processed!

Antimony

General Statistics

| | | | |
|------------------------------|----|---------------------------------|----|
| Number of Valid Observations | 19 | Number of Distinct Observations | 19 |
| Number of Missing Values | 1 | | |

Raw Statistics

| | |
|--------------------------|-------|
| Minimum | 1.3 |
| Maximum | 184 |
| Mean | 72.72 |
| Geometric Mean | 24.15 |
| Median | 32.6 |
| SD | 72.6 |
| Std. Error of Mean | 16.66 |
| Coefficient of Variation | 0.998 |
| Skewness | 0.381 |

Log-transformed Statistics

| | |
|---------------------|-------|
| Minimum of Log Data | 0.262 |
| Maximum of Log Data | 5.215 |
| Mean of log Data | 3.184 |
| SD of log Data | 1.943 |

Relevant UCL Statistics

| | | | |
|--|-------|---|-------|
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.812 | Shapiro Wilk Test Statistic | 0.836 |
| Shapiro Wilk Critical Value | 0.901 | Shapiro Wilk Critical Value | 0.901 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | |
|-----------------------------------|-------|
| 95% Student's-t UCL | 101.6 |
| 95% UCLs (Adjusted for Skewness) | |
| 95% Adjusted-CLT UCL (Chen-1995) | 101.7 |
| 95% Modified-t UCL (Johnson-1978) | 101.8 |

Assuming Lognormal Distribution

| | |
|----------------------------|-------|
| 95% H-UCL | 1066 |
| 95% Chebyshev (MVUE) UCL | 425.4 |
| 97.5% Chebyshev (MVUE) UCL | 554.8 |
| 99% Chebyshev (MVUE) UCL | 808.9 |

Gamma Distribution Test

| | |
|---------------------------|-------|
| k star (bias corrected) | 0.511 |
| Theta Star | 142.2 |
| MLE of Mean | 72.72 |
| MLE of Standard Deviation | 101.7 |
| nu star | 19.43 |

Data Distribution

Data Follow Appr. Gamma Distribution at 5% Significance Level

Approximate Chi Square Value (.05)

| | | | |
|--------------------------------|--------|----------------------------|-------|
| Adjusted Level of Significance | 0.0369 | 95% CLT UCL | 100.1 |
| Adjusted Chi Square Value | 9.856 | 95% Jackknife UCL | 101.6 |
| | | 95% Standard Bootstrap UCL | 99.29 |

Nonparametric Statistics

| | |
|--------------------------|-------|
| 95% Bootstrap-t UCL | 103.2 |
| 95% Hall's Bootstrap UCL | 98.88 |

Anderson-Darling Test Statistic

Anderson-Darling 5% Critical Value

1.011

0.797

| | | | |
|---|-------|-------------------------------|-------|
| Kolmogorov-Smirnov Test Statistic | 0.196 | 95% Percentile Bootstrap UCL | 99.96 |
| Kolmogorov-Smirnov 5% Critical Value | 0.209 | 95% BCA Bootstrap UCL | 99.67 |
| Data follow Appr. Gamma Distribution at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 145.3 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 176.7 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 238.4 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 135.5 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 143.3 | | |
| Potential UCL to Use | | Use 95% Approximate Gamma UCL | 135.5 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics

| | | | |
|------------------------------|----|---------------------------------|----|
| Number of Valid Observations | 19 | Number of Distinct Observations | 14 |
| Number of Missing Values | 3 | | |

Raw Statistics

| | | | |
|--------------------------|-------|----------------------------|--------|
| | | Log-transformed Statistics | |
| Minimum | 0.9 | Minimum of Log Data | -0.105 |
| Maximum | 1030 | Maximum of Log Data | 6.937 |
| Mean | 138.1 | Mean of log Data | 3.057 |
| Geometric Mean | 21.26 | SD of log Data | 2.282 |
| Median | 73.1 | | |
| SD | 294.9 | | |
| Std. Error of Mean | 67.66 | | |
| Coefficient of Variation | 2.136 | | |
| Skewness | 2.746 | | |

Relevant UCL Statistics

| | | | |
|--|-------|---|-------|
| | | Lognormal Distribution Test | |
| Normal Distribution Test | | | |
| Shapiro Wilk Test Statistic | 0.472 | Shapiro Wilk Test Statistic | 0.879 |
| Shapiro Wilk Critical Value | 0.901 | Shapiro Wilk Critical Value | 0.901 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|-------|---------------------------------|-------|
| | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 255.4 | 95% H-UCL | 3707 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 745.8 |
| 95% Adjusted-CLT UCL (Chen-1995) | 294.9 | 97.5% Chebyshev (MVUE) UCL | 983.1 |
| 95% Modified-t UCL (Johnson-1978) | 262.5 | 99% Chebyshev (MVUE) UCL | 1449 |

Gamma Distribution Test

| | | | |
|---|--------|--|-------|
| | | Data Distribution | |
| k star (bias corrected) | 0.337 | Data do not follow a Discernable Distribution (0.05) | |
| Theta Star | 410.1 | | |
| MLE of Mean | 138.1 | | |
| MLE of Standard Deviation | 238 | | |
| nu star | 12.79 | | |
| Approximate Chi Square Value (.05) | 5.753 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0369 | 95% CLT UCL | 249.4 |
| Adjusted Chi Square Value | 5.345 | 95% Jackknife UCL | 255.4 |
| | | 95% Standard Bootstrap UCL | 244.4 |
| Anderson-Darling Test Statistic | 1.182 | 95% Bootstrap-t UCL | 913.3 |
| Anderson-Darling 5% Critical Value | 0.831 | 95% Hall's Bootstrap UCL | 1044 |
| Kolmogorov-Smirnov Test Statistic | 0.276 | 95% Percentile Bootstrap UCL | 254 |
| Kolmogorov-Smirnov 5% Critical Value | 0.214 | 95% BCA Bootstrap UCL | 294.4 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 433 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 560.6 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 811.3 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 307 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 330.5 | | |

| | | |
|----------------------|----------------------------------|-------|
| Potential UCL to Use | Use 99% Chebyshev (Mean, Sd) UCL | 811.3 |
|----------------------|----------------------------------|-------|

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

As(Inorg)

General Statistics

| | | | |
|------------------------------|----|---------------------------------|----|
| Number of Valid Observations | 12 | Number of Distinct Observations | 12 |
| Number of Missing Values | 8 | | |

Raw Statistics

| | | | |
|--------------------------|-------|----------------------------|--------|
| | | Log-transformed Statistics | |
| Minimum | 0.822 | Minimum of Log Data | -0.196 |
| Maximum | 745 | Maximum of Log Data | 6.613 |
| Mean | 147.2 | Mean of log Data | 2.849 |
| Geometric Mean | 17.26 | SD of log Data | 2.47 |
| Median | 15.66 | | |
| SD | 279.3 | | |
| Std. Error of Mean | 80.63 | | |
| Coefficient of Variation | 1.897 | | |
| Skewness | 1.993 | | |

Relevant UCL Statistics

| | | | |
|--|-------|--|-------|
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.557 | Shapiro Wilk Test Statistic | 0.912 |
| Shapiro Wilk Critical Value | 0.859 | Shapiro Wilk Critical Value | 0.859 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|-------|---------------------------------|-------|
| | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 292 | 95% H-UCL | 31832 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 790.8 |
| 95% Adjusted-CLT UCL (Chen-1995) | 329.4 | 97.5% Chebyshev (MVUE) UCL | 1052 |
| 95% Modified-t UCL (Johnson-1978) | 299.8 | 99% Chebyshev (MVUE) UCL | 1565 |

Gamma Distribution Test

| | | | |
|--|-------|--|-------|
| | | Data Distribution | |
| k star (bias corrected) | 0.294 | Data appear Gamma Distributed at 5% Significance Level | |
| Theta Star | 500 | | |
| MLE of Mean | 147.2 | | |
| MLE of Standard Deviation | 271.3 | | |
| nu star | 7.068 | | |
| Approximate Chi Square Value (.05) | 2.208 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.029 | 95% CLT UCL | 279.9 |
| Adjusted Chi Square Value | 1.817 | 95% Jackknife UCL | 292 |
| | | 95% Standard Bootstrap UCL | 271.4 |
| Anderson-Darling Test Statistic | 0.709 | 95% Bootstrap-t UCL | 1138 |
| Anderson-Darling 5% Critical Value | 0.82 | 95% Hall's Bootstrap UCL | 1145 |
| Kolmogorov-Smirnov Test Statistic | 0.205 | 95% Percentile Bootstrap UCL | 274 |
| Kolmogorov-Smirnov 5% Critical Value | 0.265 | 95% BCA Bootstrap UCL | 324.2 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 498.7 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 650.8 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 949.5 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 471.3 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 572.6 | | |

| | | |
|----------------------|----------------------------|-------|
| Potential UCL to Use | Use 95% Adjusted Gamma UCL | 572.6 |
|----------------------|----------------------------|-------|

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics

| | | | |
|----------------------------------|----|---------------------------|--------|
| Number of Valid Data | 19 | Number of Detected Data | 3 |
| Number of Distinct Detected Data | 3 | Number of Non-Detect Data | 16 |
| Number of Missing Values | 2 | Percent Non-Detects | 84.21% |

Raw Statistics

| | | | |
|--------------------|---------|----------------------------|--------|
| | | Log-transformed Statistics | |
| Minimum Detected | 0.005 | Minimum Detected | -5.298 |
| Maximum Detected | 0.008 | Maximum Detected | -4.828 |
| Mean of Detected | 0.00633 | Mean of Detected | -5.081 |
| SD of Detected | 0.00153 | SD of Detected | 0.237 |
| Minimum Non-Detect | 0.005 | Minimum Non-Detect | -5.298 |
| Maximum Non-Detect | 0.022 | Maximum Non-Detect | -3.817 |

| | | |
|--|---------------------------------|---------|
| Note: Data have multiple DLs - Use of KM Method is recommended | Number treated as Non-Detect | 19 |
| For all methods (except KM, DL/2, and ROS Methods), | Number treated as Detected | 0 |
| Observations < Largest ND are treated as NDs | Single DL Non-Detect Percentage | 100.00% |

Warning: There are only 3 Distinct Detected Values in this data set
 The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
 Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
 However, results obtained using 4 to 9 distinct values may not be reliable.
 It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics

| | | | |
|--|-------|---|-------|
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.964 | Shapiro Wilk Test Statistic | 0.984 |
| 5% Shapiro Wilk Critical Value | 0.767 | 5% Shapiro Wilk Critical Value | 0.767 |
| Data appear Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|--------------------------|---------|---------------------------------|--------|
| DL/2 Substitution Method | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 0.00668 | Mean | -5.224 |
| SD | 0.00404 | SD | 0.706 |
| 95% DL/2 (t) UCL | 0.00829 | 95% H-Stat (DL/2) UCL | 0.01 |

Maximum Likelihood Estimate(MLE) Method
 MLE method failed to converge properly

| | | |
|-----|------------------------------|---------|
| N/A | Log ROS Method | |
| | Mean in Log Scale | -5.883 |
| | SD in Log Scale | 0.592 |
| | Mean in Original Scale | 0.00328 |
| | SD in Original Scale | 0.00197 |
| | 95% t UCL | 0.00407 |
| | 95% Percentile Bootstrap UCL | 0.00404 |
| | 95% BCA Bootstrap UCL | 0.00414 |
| | 95% H-UCL | 0.00445 |

Gamma Distribution Test with Detected Values Only

| | | | |
|-------------------------|-----|--|--|
| k star (bias corrected) | N/A | Data Distribution Test with Detected Values Only | |
| Theta Star | N/A | Data appear Normal at 5% Significance Level | |
| nu star | N/A | | |

A-D Test Statistic

| | | | |
|---|-----|--------------------------|----------|
| 5% A-D Critical Value | N/A | Nonparametric Statistics | |
| K-S Test Statistic | N/A | Kaplan-Meier (KM) Method | |
| 5% K-S Critical Value | N/A | Mean | 0.00536 |
| Data not Gamma Distributed at 5% Significance Level | | SD | 8.81E-04 |
| | | SE of Mean | 3.25E-04 |
| | | 95% KM (t) UCL | 0.00593 |
| Assuming Gamma Distribution | | 95% KM (z) UCL | 0.0059 |

| | | | |
|--|-----|-----------------------------------|---------|
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (jackknife) UCL | 0.00607 |
| Minimum | N/A | 95% KM (bootstrap t) UCL | 0.00603 |
| Maximum | N/A | 95% KM (BCA) UCL | N/A |
| Mean | N/A | 95% KM (Percentile Bootstrap) UCL | 0.008 |
| Median | N/A | 95% KM (Chebyshev) UCL | 0.00678 |
| SD | N/A | 97.5% KM (Chebyshev) UCL | 0.0074 |
| k star | N/A | 99% KM (Chebyshev) UCL | 0.0086 |
| Theta star | N/A | | |
| Nu star | N/A | Potential UCLs to Use | |
| AppChi2 | N/A | 95% KM (t) UCL | 0.00593 |
| 95% Gamma Approximate UCL (Use when n >= 40) | N/A | 95% KM (Percentile Bootstrap) UCL | 0.008 |
| 95% Adjusted Gamma UCL (Use when n < 40) | N/A | | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Cobalt

| | | | |
|----------------------------------|----|---------------------------|--------|
| General Statistics | | | |
| Number of Valid Data | 19 | Number of Detected Data | 16 |
| Number of Distinct Detected Data | 14 | Number of Non-Detect Data | 3 |
| Number of Missing Values | 3 | Percent Non-Detects | 15.79% |

| | | | |
|--------------------|-------|----------------------------|--------|
| Raw Statistics | | Log-transformed Statistics | |
| Minimum Detected | 0.052 | Minimum Detected | -2.957 |
| Maximum Detected | 5.3 | Maximum Detected | 1.668 |
| Mean of Detected | 0.844 | Mean of Detected | -1.408 |
| SD of Detected | 1.735 | SD of Detected | 1.425 |
| Minimum Non-Detect | 0.007 | Minimum Non-Detect | -4.962 |
| Maximum Non-Detect | 0.007 | Maximum Non-Detect | -4.962 |

| | | | |
|--|-------|---|-------|
| UCL Statistics | | | |
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.47 | Shapiro Wilk Test Statistic | 0.828 |
| 5% Shapiro Wilk Critical Value | 0.887 | 5% Shapiro Wilk Critical Value | 0.887 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

| | | | |
|------------------------------|-------|---------------------------------|--------|
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 0.711 | Mean | -2.079 |
| SD | 1.615 | SD | 2.055 |
| 95% DL/2 (t) UCL | 1.353 | 95% H-Stat (DL/2) UCL | 8.502 |

| | | | |
|---|-------|------------------------------|-------|
| Maximum Likelihood Estimate(MLE) Method | | Log ROS Method | |
| Mean | 0.517 | Mean in Log Scale | -1.91 |
| SD | 1.759 | SD in Log Scale | 1.773 |
| 95% MLE (t) UCL | 1.217 | Mean in Original Scale | 0.712 |
| 95% MLE (Tiku) UCL | 1.185 | SD in Original Scale | 1.614 |
| | | 95% t UCL | 1.354 |
| | | 95% Percentile Bootstrap UCL | 1.322 |
| | | 95% BCA Bootstrap UCL | 1.57 |
| | | 95% H UCL | 3.57 |

| | | | |
|---|-------|--|--|
| Gamma Distribution Test with Detected Values Only | | Data Distribution Test with Detected Values Only | |
| k star (bias corrected) | 0.457 | Data do not follow a Discernable Distribution (0.05) | |
| Theta Star | 1.845 | | |
| nu star | 14.63 | | |

| | | | |
|---|----------|-----------------------------------|-------|
| A-D Test Statistic | 2.14 | Nonparametric Statistics | |
| 5% A-D Critical Value | 0.795 | Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.795 | Mean | 0.719 |
| 5% K-S Critical Value | 0.227 | SD | 1.568 |
| Data not Gamma Distributed at 5% Significance Level | | SE of Mean | 0.372 |
| | | 95% KM (t) UCL | 1.363 |
| Assuming Gamma Distribution | | 95% KM (z) UCL | 1.33 |
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (jackknife) UCL | 1.359 |
| Minimum | 1.00E-06 | 95% KM (bootstrap t) UCL | 6.609 |
| Maximum | 5.3 | 95% KM (BCA) UCL | 1.472 |
| Mean | 0.71 | 95% KM (Percentile Bootstrap) UCL | 1.301 |
| Median | 0.2 | 95% KM (Chebyshev) UCL | 2.338 |
| SD | 1.615 | 97.5% KM (Chebyshev) UCL | 3.039 |
| k star | 0.235 | 99% KM (Chebyshev) UCL | 4.416 |
| Theta star | 3.029 | | |
| Nu star | 8.912 | Potential UCLs to Use | |
| AppChi2 | 3.274 | 97.5% KM (Chebyshev) UCL | 3.039 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 1.934 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 2.124 | | |
| Note: DL/2 is not a recommended method. | | | |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Copper

| | | | |
|--|-------|---|--------|
| General Statistics | | | |
| Number of Valid Data | 19 | Number of Detected Data | 12 |
| Number of Distinct Detected Data | 11 | Number of Non-Detect Data | 7 |
| Number of Missing Values | 3 | Percent Non-Detects | 36.84% |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum Detected | 0.29 | Minimum Detected | -1.238 |
| Maximum Detected | 0.71 | Maximum Detected | -0.342 |
| Mean of Detected | 0.438 | Mean of Detected | -0.855 |
| SD of Detected | 0.116 | SD of Detected | 0.254 |
| Minimum Non-Detect | 0.232 | Minimum Non-Detect | -1.461 |
| Maximum Non-Detect | 0.232 | Maximum Non-Detect | -1.461 |
| UCL Statistics | | | |
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.918 | Shapiro Wilk Test Statistic | 0.958 |
| 5% Shapiro Wilk Critical Value | 0.859 | 5% Shapiro Wilk Critical Value | 0.859 |
| Data appear Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 0.32 | Mean | -1.334 |
| SD | 0.184 | SD | 0.674 |
| 95% DL/2 (t) UCL | 0.393 | 95% H-Stat (DL/2) UCL | 0.468 |
| Maximum Likelihood Estimate(MLE) Method | | Log ROS Method | |
| Mean | 0.315 | Mean in Log Scale | -1.097 |
| SD | 0.194 | SD in Log Scale | 0.396 |
| 95% MLE (t) UCL | 0.392 | Mean in Original Scale | 0.359 |
| 95% MLE (Tiku) UCL | 0.401 | SD in Original Scale | 0.142 |
| | | 95% t UCL | 0.416 |
| | | 95% Percentile Bootstrap UCL | 0.411 |
| | | 95% BCA Bootstrap UCL | 0.421 |
| | | 95% H UCL | 0.432 |

| | | |
|--|---|--------|
| Gamma Distribution Test with Detected Values Only | Data Distribution Test with Detected Values Only | |
| k star (bias corrected) | 12.59 Data appear Normal at 5% Significance Level | |
| Theta Star | 0.0348 | |
| nu star | 302.2 | |
| A-D Test Statistic | 0.306 Nonparametric Statistics | |
| 5% A-D Critical Value | 0.731 Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.731 Mean | 0.384 |
| 5% K-S Critical Value | 0.245 SD | 0.114 |
| Data appear Gamma Distributed at 5% Significance Level | SE of Mean | 0.0272 |
| | 95% KM (t) UCL | 0.431 |
| Assuming Gamma Distribution | 95% KM (z) UCL | 0.428 |
| Gamma ROS Statistics using Extrapolated Data | 95% KM (jackknife) UCL | 0.426 |
| Minimum | 1.00E-06 95% KM (bootstrap t) UCL | 0.44 |
| Maximum | 0.71 95% KM (BCA) UCL | 0.448 |
| Mean | 0.296 95% KM (Percentile Bootstrap) UCL | 0.438 |
| Median | 0.33 95% KM (Chebyshev) UCL | 0.502 |
| SD | 0.216 97.5% KM (Chebyshev) UCL | 0.554 |
| k star | 0.264 99% KM (Chebyshev) UCL | 0.655 |
| Theta star | 1.12 | |
| Nu star | 10.03 Potential UCLs to Use | |
| AppChi2 | 3.96 95% KM (t) UCL | 0.431 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 0.748 95% KM (Percentile Bootstrap) UCL | 0.438 |
| 95% Adjusted Gamma UCL (Use when n < 40) | 0.816 | |
| Note: DL/2 is not a recommended method. | | |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Iron

| | | |
|--|---|--|
| General Statistics | | |
| Number of Valid Observations | 19 | Number of Distinct Observations 16 |
| Number of Missing Values | 3 | |
| Raw Statistics | | |
| Minimum | 122 | Log-transformed Statistics Minimum of Log Data 4.804 |
| Maximum | 2470 | Maximum of Log Data 7.812 |
| Mean | 507.6 | Mean of log Data 5.506 |
| Geometric Mean | 246.3 | SD of log Data 1.015 |
| Median | 186 | |
| SD | 817.4 | |
| Std. Error of Mean | 187.5 | |
| Coefficient of Variation | 1.61 | |
| Skewness | 2.055 | |
| Relevant UCL Statistics | | |
| Normal Distribution Test | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.485 | Shapiro Wilk Test Statistic 0.598 |
| Shapiro Wilk Critical Value | 0.901 | Shapiro Wilk Critical Value 0.901 |
| Data not Normal at 5% Significance Level | Data not Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | |
| 95% Student's-t UCL | 832.8 | 95% H-UCL 773.5 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL 846.2 |
| 95% Adjusted-CLT UCL (Chen-1995) | 910.5 | 97.5% Chebyshev (MVUE) UCL 1041 |
| 95% Modified-t UCL (Johnson-1978) | 847.5 | 99% Chebyshev (MVUE) UCL 1423 |
| Gamma Distribution Test | | |
| k star (bias corrected) | 0.724 | Data Distribution Data do not follow a Discernable Distribution (0.05) |

| | | | |
|---|--------|----------------------------------|-------|
| Theta Star | 701 | | |
| MLE of Mean | 507.6 | | |
| MLE of Standard Deviation | 596.5 | | |
| nu star | 27.52 | | |
| Approximate Chi Square Value (.05) | 16.55 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0369 | 95% CLT UCL | 816 |
| Adjusted Chi Square Value | 15.81 | 95% Jackknife UCL | 832.8 |
| | | 95% Standard Bootstrap UCL | 811.2 |
| Anderson-Darling Test Statistic | 4.3 | 95% Bootstrap-t UCL | 939.2 |
| Anderson-Darling 5% Critical Value | 0.776 | 95% Hall's Bootstrap UCL | 710.2 |
| Kolmogorov-Smirnov Test Statistic | 0.468 | 95% Percentile Bootstrap UCL | 850.9 |
| Kolmogorov-Smirnov 5% Critical Value | 0.206 | 95% BCA Bootstrap UCL | 873.2 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 1325 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 1679 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 2373 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 843.8 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 883.4 | | |
| Potential UCL to Use | | Use 95% Chebyshev (Mean, Sd) UCL | 1325 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Lead

| | | | |
|--|--------|---|--------|
| General Statistics | | | |
| Number of Valid Data | 19 | Number of Detected Data | 11 |
| Number of Distinct Detected Data | 10 | Number of Non-Detect Data | 8 |
| Number of Missing Values | 2 | Percent Non-Detects | 42.11% |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum Detected | 0.008 | Minimum Detected | -4.828 |
| Maximum Detected | 0.079 | Maximum Detected | -2.538 |
| Mean of Detected | 0.0242 | Mean of Detected | -3.917 |
| SD of Detected | 0.0195 | SD of Detected | 0.608 |
| Minimum Non-Detect | 0.2 | Minimum Non-Detect | -1.609 |
| Maximum Non-Detect | 0.2 | Maximum Non-Detect | -1.609 |
| UCL Statistics | | | |
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.688 | Shapiro Wilk Test Statistic | 0.939 |
| 5% Shapiro Wilk Critical Value | 0.85 | 5% Shapiro Wilk Critical Value | 0.85 |
| Data not Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 0.0561 | Mean | -3.237 |
| SD | 0.0411 | SD | 0.936 |
| 95% DL/2 (t) UCL | 0.0725 | 95% H-Stat (DL/2) UCL | 0.106 |
| Maximum Likelihood Estimate(MLE) Method | N/A | Log ROS Method | |
| MLE method failed to converge properly | | Mean in Log Scale | -3.917 |
| | | SD in Log Scale | 0.571 |
| | | Mean in Original Scale | 0.0236 |
| | | SD in Original Scale | 0.0165 |
| | | 95% t UCL | 0.0301 |
| | | 95% Percentile Bootstrap UCL | 0.0296 |
| | | 95% BCA Bootstrap UCL | 0.0319 |
| | | 95% H-UCL | 0.031 |

| | | | |
|--|--|--|---------|
| Gamma Distribution Test with Detected Values Only | Data Distribution Test with Detected Values Only | | |
| k star (bias corrected) | 2.038 | Data appear Gamma Distributed at 5% Significance Level | |
| Theta Star | 0.0119 | | |
| nu star | 44.83 | | |
| A-D Test Statistic | 0.565 | Nonparametric Statistics | |
| 5% A-D Critical Value | 0.735 | Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.735 | Mean | 0.0242 |
| 5% K-S Critical Value | 0.257 | SD | 0.0186 |
| Data appear Gamma Distributed at 5% Significance Level | SE of Mean | | 0.00587 |
| | 95% KM (t) UCL | | 0.0344 |
| Assuming Gamma Distribution | | 95% KM (z) UCL | 0.0338 |
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (jackknife) UCL | 0.0346 |
| Minimum | 0.00201 | 95% KM (bootstrap t) UCL | 0.0495 |
| Maximum | 0.079 | 95% KM (BCA) UCL | 0.0348 |
| Mean | 0.0242 | 95% KM (Percentile Bootstrap) UCL | 0.0341 |
| Median | 0.021 | 95% KM (Chebyshev) UCL | 0.0498 |
| SD | 0.0169 | 97.5% KM (Chebyshev) UCL | 0.0609 |
| k star | 1.983 | 99% KM (Chebyshev) UCL | 0.0826 |
| Theta star | 0.0122 | | |
| Nu star | 75.34 | Potential UCLs to Use | |
| AppChi2 | 56.35 | 95% KM (t) UCL | 0.0344 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 0.0324 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 0.0333 | | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Naphthalene

General Statistics

| | | | |
|----------------------------------|----|---------------------------|--------|
| Number of Valid Data | 17 | Number of Detected Data | 1 |
| Number of Distinct Detected Data | 1 | Number of Non-Detect Data | 16 |
| Number of Missing Values | 5 | Percent Non-Detects | 94.12% |

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Naphthalene was not processed!

Nickel

General Statistics

| | | | |
|----------------------------------|----|---------------------------|--------|
| Number of Valid Data | 19 | Number of Detected Data | 16 |
| Number of Distinct Detected Data | 13 | Number of Non-Detect Data | 3 |
| Number of Missing Values | 3 | Percent Non-Detects | 15.79% |

Raw Statistics

| | | Log-transformed Statistics | |
|--------------------|-------|----------------------------|--------|
| Minimum Detected | 0.36 | Minimum Detected | -1.022 |
| Maximum Detected | 19.2 | Maximum Detected | 2.955 |
| Mean of Detected | 3.05 | Mean of Detected | 0.171 |
| SD of Detected | 5.917 | SD of Detected | 1.163 |
| Minimum Non-Detect | 0.081 | Minimum Non-Detect | -2.513 |
| Maximum Non-Detect | 0.081 | Maximum Non-Detect | -2.513 |

UCL Statistics

| | | Lognormal Distribution Test with Detected Values Only | |
|--|-------|---|-------|
| Normal Distribution Test with Detected Values Only | | | |
| Shapiro Wilk Test Statistic | 0.46 | Shapiro Wilk Test Statistic | 0.742 |
| 5% Shapiro Wilk Critical Value | 0.887 | 5% Shapiro Wilk Critical Value | 0.887 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | Assuming Lognormal Distribution | |
|--------------------------|-------|---------------------------------|--------|
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 2.575 | Mean | -0.362 |
| SD | 5.518 | SD | 1.652 |
| 95% DL/2 (t) UCL | 4.77 | 95% H-Stat (DL/2) UCL | 11.25 |

Maximum Likelihood Estimate(MLE) Method

| | | Log ROS Method | |
|--------------------|-------|------------------------------|--------|
| Mean | 1.92 | Mean in Log Scale | -0.215 |
| SD | 6.015 | SD in Log Scale | 1.41 |
| 95% MLE (t) UCL | 4.313 | Mean in Original Scale | 2.586 |
| 95% MLE (Tiku) UCL | 4.205 | SD in Original Scale | 5.513 |
| | | 95% t UCL | 4.779 |
| | | 95% Percentile Bootstrap UCL | 4.654 |
| | | 95% BCA Bootstrap UCL | 5.509 |
| | | 95% H UCL | 6.386 |

Gamma Distribution Test with Detected Values Only

| | | Data Distribution Test with Detected Values Only | |
|-------------------------|-------|--|--|
| k star (bias corrected) | 0.568 | Data do not follow a Discernable Distribution (0.05) | |
| Theta Star | 5.373 | | |
| nu star | 18.17 | | |

A-D Test Statistic

| | | Nonparametric Statistics | |
|---|-------|--------------------------|-------|
| 5% A-D Critical Value | 0.783 | Kaplan-Meier (KM) Method | |
| K-S Test Statistic | 0.783 | Mean | 2.625 |
| 5% K-S Critical Value | 0.225 | SD | 5.348 |
| Data not Gamma Distributed at 5% Significance Level | | SE of Mean | 1.267 |

Assuming Gamma Distribution

| | | 95% KM (t) UCL | |
|--|----------|-----------------------------------|-------|
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (z) UCL | 4.71 |
| Minimum | 1.00E-06 | 95% KM (jackknife) UCL | 4.802 |
| Maximum | 19.2 | 95% KM (bootstrap t) UCL | 28.87 |
| Mean | 2.568 | 95% KM (BCA) UCL | 4.726 |
| Median | 1 | 95% KM (Percentile Bootstrap) UCL | 4.609 |
| SD | 5.521 | 95% KM (Chebyshev) UCL | 8.149 |
| k star | 0.237 | 97.5% KM (Chebyshev) UCL | 10.54 |
| Theta star | 10.83 | 99% KM (Chebyshev) UCL | 15.23 |
| Nu star | 9.01 | Potential UCLs to Use | |
| AppChi2 | 3.333 | 97.5% KM (Chebyshev) UCL | 10.54 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 6.943 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 7.619 | | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Selenium

General Statistics

| | | | |
|----------------------------------|----|---------------------------|--------|
| Number of Valid Data | 19 | Number of Detected Data | 8 |
| Number of Distinct Detected Data | 3 | Number of Non-Detect Data | 11 |
| Number of Missing Values | 1 | Percent Non-Detects | 57.89% |

Raw Statistics

| | | | |
|--------------------|--------|----------------------------|--------|
| | | Log-transformed Statistics | |
| Minimum Detected | 0.3 | Minimum Detected | -1.204 |
| Maximum Detected | 0.5 | Maximum Detected | -0.693 |
| Mean of Detected | 0.425 | Mean of Detected | -0.869 |
| SD of Detected | 0.0707 | SD of Detected | 0.175 |
| Minimum Non-Detect | 0.125 | Minimum Non-Detect | -2.079 |
| Maximum Non-Detect | 0.3 | Maximum Non-Detect | -1.204 |

| | | |
|--|---------------------------------|--------|
| Note: Data have multiple DLs - Use of KM Method is recommended | Number treated as Non-Detect | 11 |
| For all methods (except KM, DL/2, and ROS Methods), | Number treated as Detected | 8 |
| Observations < Largest ND are treated as NDs | Single DL Non-Detect Percentage | 57.89% |

Warning: There are only 3 Distinct Detected Values in this data set
 The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
 Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
 However, results obtained using 4 to 9 distinct values may not be reliable.
 It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics

| | | | |
|--|-------|---|-------|
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.827 | Shapiro Wilk Test Statistic | 0.819 |
| 5% Shapiro Wilk Critical Value | 0.818 | 5% Shapiro Wilk Critical Value | 0.818 |
| Data appear Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|--------------------------|-------|---------------------------------|--------|
| DL/2 Substitution Method | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 0.226 | Mean | -1.854 |
| SD | 0.182 | SD | 0.911 |
| 95% DL/2 (t) UCL | 0.299 | 95% H-Stat (DL/2) UCL | 0.405 |

Maximum Likelihood Estimate(MLE) Method

| | | | |
|--------------------|-------|------------------------------|--------|
| | | Log ROS Method | |
| Mean | 0.278 | Mean in Log Scale | -1.149 |
| SD | 0.151 | SD in Log Scale | 0.291 |
| 95% MLE (t) UCL | 0.338 | Mean in Original Scale | 0.33 |
| 95% MLE (Tiku) UCL | 0.359 | SD in Original Scale | 0.0982 |
| | | 95% t UCL | 0.369 |
| | | 95% Percentile Bootstrap UCL | 0.367 |
| | | 95% BCA Bootstrap UCL | 0.367 |
| | | 95% H UCL | 0.375 |

Gamma Distribution Test with Detected Values Only

| | | | |
|-------------------------|--------|--|--|
| k star (bias corrected) | 24.4 | Data Distribution Test with Detected Values Only | |
| Theta Star | 0.0174 | Data appear Normal at 5% Significance Level | |
| nu star | 390.4 | | |

A-D Test Statistic

| | | | |
|-----------------------|-------|--------------------------|--|
| 5% A-D Critical Value | 0.763 | Nonparametric Statistics | |
| | 0.715 | Kaplan-Meier (KM) Method | |

| | | | |
|---|----------|-----------------------------------|--------|
| K-S Test Statistic | 0.715 | Mean | 0.353 |
| 5% K-S Critical Value | 0.294 | SD | 0.0752 |
| Data follow Appr. Gamma Distribution at 5% Significance Level | | SE of Mean | 0.0184 |
| | | 95% KM (t) UCL | 0.385 |
| Assuming Gamma Distribution | | 95% KM (z) UCL | 0.383 |
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (jackknife) UCL | 0.404 |
| Minimum | 1.00E-06 | 95% KM (bootstrap t) UCL | 0.387 |
| Maximum | 0.5 | 95% KM (BCA) UCL | 0.432 |
| Mean | 0.223 | 95% KM (Percentile Bootstrap) UCL | 0.426 |
| Median | 0.198 | 95% KM (Chebyshev) UCL | 0.433 |
| SD | 0.195 | 97.5% KM (Chebyshev) UCL | 0.468 |
| k star | 0.226 | 99% KM (Chebyshev) UCL | 0.536 |
| Theta star | 0.986 | | |
| Nu star | 8.597 | Potential UCLs to Use | |
| AppChi2 | 3.085 | 95% KM (t) UCL | 0.385 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 0.621 | 95% KM (Percentile Bootstrap) UCL | 0.426 |
| 95% Adjusted Gamma UCL (Use when n < 40) | 0.684 | | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

| | | | |
|----------------------------------|----|---------------------------|--------|
| Number of Valid Data | 19 | Number of Detected Data | 2 |
| Number of Distinct Detected Data | 2 | Number of Non-Detect Data | 17 |
| Number of Missing Values | 2 | Percent Non-Detects | 89.47% |

Raw Statistics

| | | | |
|--------------------|--------|----------------------------|--------|
| | | Log-transformed Statistics | |
| Minimum Detected | 0.012 | Minimum Detected | -4.423 |
| Maximum Detected | 0.026 | Maximum Detected | -3.65 |
| Mean of Detected | 0.019 | Mean of Detected | -4.036 |
| SD of Detected | 0.0099 | SD of Detected | 0.547 |
| Minimum Non-Detect | 0.004 | Minimum Non-Detect | -5.521 |
| Maximum Non-Detect | 0.009 | Maximum Non-Detect | -4.711 |

| | | |
|--|---------------------------------|--------|
| Note: Data have multiple DLs - Use of KM Method is recommended | Number treated as Non-Detect | 17 |
| For all methods (except KM, DL/2, and ROS Methods), | Number treated as Detected | 2 |
| Observations < Largest ND are treated as NDs | Single DL Non-Detect Percentage | 89.47% |

Warning: Data set has only 2 Distinct Detected Values.

This may not be adequate enough to compute meaningful and reliable test statistics and estimates.

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods. Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

| | | | |
|---|---------|--|---|
| UCL Statistics | | | |
| Normal Distribution Test with Detected Values Only | | | Lognormal Distribution Test with Detected Values Only |
| Shapiro Wilk Test Statistic | N/A | Shapiro Wilk Test Statistic | N/A |
| 5% Shapiro Wilk Critical Value | N/A | 5% Shapiro Wilk Critical Value | N/A |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 0.00484 | Mean | -5.644 |
| SD | 0.00564 | SD | 0.702 |
| 95% DL/2 (t) UCL | 0.00709 | 95% H-Stat (DL/2) UCL | 0.00654 |
| Maximum Likelihood Estimate(MLE) Method | N/A | Log ROS Method | |
| MLE method failed to converge properly | | Mean in Log Scale | N/A |
| | | SD in Log Scale | N/A |
| | | Mean in Original Scale | N/A |
| | | SD in Original Scale | N/A |
| | | 95% t UCL | N/A |
| | | 95% Percentile Bootstrap UCL | N/A |
| | | 95% BCA Bootstrap UCL | N/A |
| | | 95% H-UCL | N/A |
| Gamma Distribution Test with Detected Values Only | | Data Distribution Test with Detected Values Only | |
| k star (bias corrected) | N/A | Data do not follow a Discernable Distribution (0.05) | |
| Theta Star | N/A | | |
| nu star | N/A | | |
| A-D Test Statistic | N/A | Nonparametric Statistics | |
| 5% A-D Critical Value | N/A | Kaplan-Meier (KM) Method | |
| K-S Test Statistic | N/A | Mean | 0.0127 |
| 5% K-S Critical Value | N/A | SD | 0.00313 |
| Data not Gamma Distributed at 5% Significance Level | | SE of Mean | 0.00101 |
| | | 95% KM (t) UCL | 0.0145 |
| | | 95% KM (z) UCL | 0.0144 |
| | | 95% KM (jackknife) UCL | 0.022 |
| | | 95% KM (bootstrap t) UCL | N/A |
| | | 95% KM (BCA) UCL | 0.026 |
| | | 95% KM (Percentile Bootstrap) UCL | 0.026 |
| | | 95% KM (Chebyshev) UCL | 0.0172 |
| | | 97.5% KM (Chebyshev) UCL | 0.0191 |
| | | 99% KM (Chebyshev) UCL | 0.0228 |
| | | Potential UCLs to Use | |
| | | 95% KM (t) UCL | 0.0145 |
| | | 95% KM (% Bootstrap) UCL | 0.026 |
| | | | |
| Note: DL/2 is not a recommended method. | | | |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Zinc

| | | | |
|----------------------------------|----|---------------------------|--------|
| General Statistics | | | |
| Number of Valid Data | 19 | Number of Detected Data | 8 |
| Number of Distinct Detected Data | 5 | Number of Non-Detect Data | 11 |
| Number of Missing Values | 3 | Percent Non-Detects | 57.89% |

| Raw Statistics | Log-transformed Statistics | |
|--------------------|----------------------------|--------|
| Minimum Detected | 0.3 Minimum Detected | -1.204 |
| Maximum Detected | 2.1 Maximum Detected | 0.742 |
| Mean of Detected | 0.763 Mean of Detected | -0.58 |
| SD of Detected | 0.715 SD of Detected | 0.783 |
| Minimum Non-Detect | 0.2 Minimum Non-Detect | -1.609 |
| Maximum Non-Detect | 0.81 Maximum Non-Detect | -0.211 |

| | | |
|--|---------------------------------|--------|
| Note: Data have multiple DLs - Use of KM Method is recommended | Number treated as Non-Detect | 17 |
| For all methods (except KM, DL/2, and ROS Methods), | Number treated as Detected | 2 |
| Observations < Largest ND are treated as NDs | Single DL Non-Detect Percentage | 89.47% |

Warning: There are only 8 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

| Normal Distribution Test with Detected Values Only | Lognormal Distribution Test with Detected Values Only | |
|--|---|-------|
| Shapiro Wilk Test Statistic | 0.691 Shapiro Wilk Test Statistic | 0.779 |
| 5% Shapiro Wilk Critical Value | 0.818 5% Shapiro Wilk Critical Value | 0.818 |
| Data not Normal at 5% Significance Level | Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| DL/2 Substitution Method | Assuming Lognormal Distribution | |
|--------------------------|---------------------------------|--------|
| DL/2 Substitution Method | DL/2 Substitution Method | |
| Mean | 0.507 Mean | -0.988 |
| SD | 0.51 SD | 0.777 |
| 95% DL/2 (t) UCL | 0.71 95% H-Stat (DL/2) UCL | 0.768 |

Maximum Likelihood Estimate(MLE) Method
MLE method failed to converge properly

| | | |
|-----|------------------------------|--------|
| N/A | Log ROS Method | |
| | Mean in Log Scale | -1.182 |
| | SD in Log Scale | 0.912 |
| | Mean in Original Scale | 0.47 |
| | SD in Original Scale | 0.536 |
| | 95% t UCL | 0.683 |
| | 95% Percentile Bootstrap UCL | 0.676 |
| | 95% BCA Bootstrap UCL | 0.761 |
| | 95% H-UCL | 0.794 |

Gamma Distribution Test with Detected Values Only

| | | |
|-------------------------|--|--|
| k star (bias corrected) | 1.187 Data do not follow a Discernable Distribution (0.05) | |
| Theta Star | 0.642 | |
| nu star | 18.99 | |

A-D Test Statistic

| | | |
|---|--------------------------------|-------|
| 5% A-D Critical Value | 1.025 Nonparametric Statistics | |
| K-S Test Statistic | 0.726 Kaplan-Meier (KM) Method | |
| 5% K-S Critical Value | 0.726 Mean | 0.518 |
| Data not Gamma Distributed at 5% Significance Level | 0.298 SD | 0.485 |

Assuming Gamma Distribution

| | | |
|--|---|-------|
| Gamma ROS Statistics using Extrapolated Data | SE of Mean | 0.12 |
| Minimum | 95% KM (t) UCL | 0.727 |
| Maximum | 95% KM (z) UCL | 0.716 |
| Mean | 95% KM (jackknife) UCL | 0.719 |
| Median | 1.00E-06 95% KM (bootstrap t) UCL | 1.218 |
| SD | 2.1 95% KM (BCA) UCL | 0.753 |
| k star | 0.461 95% KM (Percentile Bootstrap) UCL | 0.721 |
| Theta star | 0.3 95% KM (Chebyshev) UCL | 1.042 |
| Nu star | 0.594 97.5% KM (Chebyshev) UCL | 1.269 |
| AppChi2 | 0.172 99% KM (Chebyshev) UCL | 1.715 |
| | 2.679 | |
| | 6.533 Potential UCLs to Use | |
| | 1.918 95% KM (t) UCL | 0.727 |

| | | | |
|--|-------|--------------------------|-------|
| 95% Gamma Approximate UCL (Use when n >= 40) | 1.569 | 95% KM (% Bootstrap) UCL | 0.721 |
| 95% Adjusted Gamma UCL (Use when n < 40) | 1.762 | | |

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

| | | | |
|------------------------------|----|---------------------------------|----|
| Number of Valid Observations | 19 | Number of Distinct Observations | 17 |
| Number of Missing Values | 3 | | |

Raw Statistics

| | | | |
|--------------------------|-------|----------------------------|-------|
| Minimum | 11.8 | Log-transformed Statistics | |
| Maximum | 379 | Minimum of Log Data | 2.468 |
| Mean | 61.93 | Maximum of Log Data | 5.938 |
| Geometric Mean | 30.45 | Mean of log Data | 3.416 |
| Median | 26.6 | SD of log Data | 0.999 |
| SD | 108.6 | | |
| Std. Error of Mean | 24.92 | | |
| Coefficient of Variation | 1.754 | | |
| Skewness | 2.697 | | |

Relevant UCL Statistics

| | | | |
|--|-------|---|-------|
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.47 | Shapiro Wilk Test Statistic | 0.761 |
| Shapiro Wilk Critical Value | 0.901 | Shapiro Wilk Critical Value | 0.901 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|-------|---------------------------------|-------|
| 95% Student's-t UCL | 105.2 | Assuming Lognormal Distribution | |
| 95% UCLs (Adjusted for Skewness) | | 95% H-UCL | 92.74 |
| 95% Adjusted-CLT UCL (Chen-1995) | 119.4 | 95% Chebyshev (MVUE) UCL | 102.2 |
| 95% Modified-t UCL (Johnson-1978) | 107.7 | 97.5% Chebyshev (MVUE) UCL | 125.5 |
| | | 99% Chebyshev (MVUE) UCL | 171.2 |

Gamma Distribution Test

| | | | |
|------------------------------------|--------|--|-------|
| k star (bias corrected) | 0.736 | Data Distribution | |
| Theta Star | 84.19 | Data do not follow a Discernable Distribution (0.05) | |
| MLE of Mean | 61.93 | | |
| MLE of Standard Deviation | 72.21 | | |
| nu star | 27.95 | | |
| Approximate Chi Square Value (.05) | 16.89 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0369 | 95% CLT UCL | 102.9 |
| Adjusted Chi Square Value | 16.14 | 95% Jackknife UCL | 105.2 |

Anderson-Darling Test Statistic

| | | | |
|---|-------|-------------------------------|-------|
| Anderson-Darling Test Statistic | 2.939 | 95% Standard Bootstrap UCL | 100.8 |
| Anderson-Darling 5% Critical Value | 0.776 | 95% Bootstrap-t UCL | 305.7 |
| Kolmogorov-Smirnov Test Statistic | 0.399 | 95% Hall's Bootstrap UCL | 315.2 |
| Kolmogorov-Smirnov 5% Critical Value | 0.206 | 95% Percentile Bootstrap UCL | 105.6 |
| Data not Gamma Distributed at 5% Significance Level | | 95% BCA Bootstrap UCL | 125.7 |
| | | 95% Chebyshev(Mean, Sd) UCL | 170.6 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 217.6 |
| | | 99% Chebyshev(Mean, Sd) UCL | 309.9 |

Assuming Gamma Distribution

| | |
|--|-------|
| 95% Approximate Gamma UCL (Use when n >= 40) | 102.5 |
| 95% Adjusted Gamma UCL (Use when n < 40) | 107.3 |

Potential UCL to Use Use 95% Chebyshev (Mean, Sd) UCL 170.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

| | | | |
|----------------------------------|----|---------------------------|--------|
| Number of Valid Data | 19 | Number of Detected Data | 11 |
| Number of Distinct Detected Data | 9 | Number of Non-Detect Data | 8 |
| Number of Missing Values | 3 | Percent Non-Detects | 42.11% |

Raw Statistics

| | | | |
|--------------------|-------|----------------------------|--------|
| | | Log-transformed Statistics | |
| Minimum Detected | 0.15 | Minimum Detected | -1.897 |
| Maximum Detected | 0.57 | Maximum Detected | -0.562 |
| Mean of Detected | 0.325 | Mean of Detected | -1.198 |
| SD of Detected | 0.135 | SD of Detected | 0.406 |
| Minimum Non-Detect | 0.053 | Minimum Non-Detect | -2.937 |
| Maximum Non-Detect | 0.053 | Maximum Non-Detect | -2.937 |

UCL Statistics

| | | | |
|--|-------|---|-------|
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Shapiro Wilk Test Statistic | 0.904 | Shapiro Wilk Test Statistic | 0.952 |
| 5% Shapiro Wilk Critical Value | 0.85 | 5% Shapiro Wilk Critical Value | 0.85 |
| Data appear Normal at 5% Significance Level | | Data appear Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|--------------------------|-------|---------------------------------|--------|
| DL/2 Substitution Method | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 0.2 | Mean | -2.222 |
| SD | 0.182 | SD | 1.271 |
| 95% DL/2 (t) UCL | 0.272 | 95% H-Stat (DL/2) UCL | 0.6 |

Maximum Likelihood Estimate(MLE) Method

| | | | |
|--------------------|-------|------------------------------|--------|
| | | Log ROS Method | |
| Mean | 0.134 | Mean in Log Scale | -1.658 |
| SD | 0.262 | SD in Log Scale | 0.665 |
| 95% MLE (t) UCL | 0.238 | Mean in Original Scale | 0.233 |
| 95% MLE (Tiku) UCL | 0.254 | SD in Original Scale | 0.151 |
| | | 95% t UCL | 0.293 |
| | | 95% Percentile Bootstrap UCL | 0.291 |
| | | 95% BCA Bootstrap UCL | 0.296 |
| | | 95% H UCL | 0.334 |

Gamma Distribution Test with Detected Values Only

| | | | |
|-------------------------|-------|--|--|
| k star (bias corrected) | 5.01 | Data Distribution Test with Detected Values Only | |
| Theta Star | 0.065 | Data appear Normal at 5% Significance Level | |
| nu star | 110.2 | | |

A-D Test Statistic

| | | | |
|--|-------|--------------------------|--------|
| 5% A-D Critical Value | 0.388 | Nonparametric Statistics | |
| K-S Test Statistic | 0.731 | Kaplan-Meier (KM) Method | |
| 5% K-S Critical Value | 0.731 | Mean | 0.252 |
| Data appear Gamma Distributed at 5% Significance Level | 0.256 | SD | 0.131 |
| | | SE of Mean | 0.0314 |

Assuming Gamma Distribution

| | | | |
|--|----------|-----------------------------------|-------|
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (t) UCL | 0.306 |
| Minimum | 1.00E-06 | 95% KM (z) UCL | 0.303 |
| Maximum | 0.57 | 95% KM (jackknife) UCL | 0.302 |
| Mean | 0.189 | 95% KM (bootstrap t) UCL | 0.309 |
| Median | 0.22 | 95% KM (BCA) UCL | 0.336 |
| SD | 0.192 | 95% KM (Percentile Bootstrap) UCL | 0.323 |
| | | 95% KM (Chebyshev) UCL | 0.388 |
| | | 97.5% KM (Chebyshev) UCL | 0.448 |

| | | | |
|--|-------|-----------------------------------|-------|
| k star | 0.182 | 99% KM (Chebyshev) UCL | 0.564 |
| Theta star | 1.044 | | |
| Nu star | 6.897 | Potential UCLs to Use | |
| AppChi2 | 2.114 | 95% KM (t) UCL | 0.306 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 0.618 | 95% KM (Percentile Bootstrap) UCL | 0.323 |
| 95% Adjusted Gamma UCL (Use when n < 40) | 0.691 | | |
| Note: DL/2 is not a recommended method. | | | |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). For additional insight, the user may want to consult a statistician.

Methyl Mercury

General Statistics

| | | | |
|------------------------------|----|---------------------------------|----|
| Number of Valid Observations | 18 | Number of Distinct Observations | 14 |
| Number of Missing Values | 2 | | |

Raw Statistics

| | | | |
|--------------------------|--------|----------------------------|--------|
| | | Log-transformed Statistics | |
| Minimum | 0.08 | Minimum of Log Data | -2.526 |
| Maximum | 0.62 | Maximum of Log Data | -0.478 |
| Mean | 0.161 | Mean of log Data | -2.032 |
| Geometric Mean | 0.131 | SD of log Data | 0.565 |
| Median | 0.122 | | |
| SD | 0.147 | | |
| Std. Error of Mean | 0.0346 | | |
| Coefficient of Variation | 0.91 | | |
| Skewness | 2.696 | | |

Relevant UCL Statistics

| | | | |
|--|-------|---|-------|
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.531 | Shapiro Wilk Test Statistic | 0.723 |
| Shapiro Wilk Critical Value | 0.897 | Shapiro Wilk Critical Value | 0.897 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |

Assuming Normal Distribution

| | | | |
|-----------------------------------|-------|---------------------------------|-------|
| | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 0.222 | 95% H-UCL | 0.205 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 0.244 |
| 95% Adjusted-CLT UCL (Chen-1995) | 0.242 | 97.5% Chebyshev (MVUE) UCL | 0.284 |
| 95% Modified-t UCL (Johnson-1978) | 0.225 | 99% Chebyshev (MVUE) UCL | 0.363 |

Gamma Distribution Test

| | | | |
|---|--------|--|-------|
| | | Data Distribution | |
| k star (bias corrected) | 2.173 | Data do not follow a Discernable Distribution (0.05) | |
| Theta Star | 0.0743 | | |
| MLE of Mean | 0.161 | | |
| MLE of Standard Deviation | 0.109 | | |
| nu star | 78.21 | | |
| Approximate Chi Square Value (.05) | 58.84 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0357 | 95% CLT UCL | 0.218 |
| Adjusted Chi Square Value | 57.23 | 95% Jackknife UCL | 0.222 |
| | | 95% Standard Bootstrap UCL | 0.217 |
| Anderson-Darling Test Statistic | 2.56 | 95% Bootstrap-t UCL | 0.481 |
| Anderson-Darling 5% Critical Value | 0.749 | 95% Hall's Bootstrap UCL | 0.609 |
| Kolmogorov-Smirnov Test Statistic | 0.376 | 95% Percentile Bootstrap UCL | 0.22 |
| Kolmogorov-Smirnov 5% Critical Value | 0.206 | 95% BCA Bootstrap UCL | 0.243 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 0.312 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 0.378 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 0.506 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 0.215 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 0.221 | | |

| | | | |
|----------------------|--|----------------------------------|-------|
| Potential UCL to Use | | Use 95% Chebyshev (Mean, Sd) UCL | 0.312 |
|----------------------|--|----------------------------------|-------|

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

| | | |
|--|--------|--|
| General Statistics | | |
| Number of Valid Observations | 18 | Number of Distinct Observations 18 |
| Number of Missing Values | 3 | |
| Raw Statistics | | |
| Minimum | 2.33 | Log-transformed Statistics Minimum of Log Data 0.846 |
| Maximum | 385 | Maximum of Log Data 5.953 |
| Mean | 128.6 | Mean of log Data 3.799 |
| Geometric Mean | 44.67 | SD of log Data 1.87 |
| Median | 67.05 | |
| SD | 132 | |
| Std. Error of Mean | 31.11 | |
| Coefficient of Variation | 1.027 | |
| Skewness | 0.641 | |
| Relevant UCL Statistics | | |
| Normal Distribution Test | | |
| Shapiro Wilk Test Statistic | 0.849 | Lognormal Distribution Test Shapiro Wilk Test Statistic 0.865 |
| Shapiro Wilk Critical Value | 0.897 | Shapiro Wilk Critical Value 0.897 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level |
| Assuming Normal Distribution | | |
| 95% Student's-t UCL | 182.7 | 95% H-UCL 1635 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL 683.8 |
| 95% Adjusted-CLT UCL (Chen-1995) | 184.8 | 97.5% Chebyshev (MVUE) UCL 890.2 |
| 95% Modified-t UCL (Johnson-1978) | 183.5 | 99% Chebyshev (MVUE) UCL 1296 |
| Gamma Distribution Test | | |
| k star (bias corrected) | 0.526 | Data Distribution Data appear Gamma Distributed at 5% Significance Level |
| Theta Star | 244.6 | |
| MLE of Mean | 128.6 | |
| MLE of Standard Deviation | 177.4 | |
| nu star | 18.92 | |
| Approximate Chi Square Value (.05) | 10.06 | Nonparametric Statistics |
| Adjusted Level of Significance | 0.0357 | 95% CLT UCL 179.8 |
| Adjusted Chi Square Value | 9.445 | 95% Jackknife UCL 182.7 |
| | | 95% Standard Bootstrap UCL 178.2 |
| Anderson-Darling Test Statistic | 0.785 | 95% Bootstrap-t UCL 188.1 |
| Anderson-Darling 5% Critical Value | 0.792 | 95% Hall's Bootstrap UCL 182 |
| Kolmogorov-Smirnov Test Statistic | 0.213 | 95% Percentile Bootstrap UCL 179.9 |
| Kolmogorov-Smirnov 5% Critical Value | 0.214 | 95% BCA Bootstrap UCL 181.7 |
| Data appear Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL 264.2 |
| | | 97.5% Chebyshev(Mean, Sd) UCL 322.9 |
| | | 99% Chebyshev(Mean, Sd) UCL 438.2 |
| Assuming Gamma Distribution | | |
| 95% Approximate Gamma UCL (Use when n >= 40) | 241.8 | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 257.6 | |
| Potential UCL to Use | | Use 95% Approximate Gamma UCL 241.8 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.