# Missouri Department of Natural Resources
## Little Blue River - WBID 0422
### Bacterial Data, 2006-2012

| Org | Site | Location | Mo | Dy | Yr | E coli | Rec. Season E. coli |
|---|---|---|---|---|---|---|---|
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 3 | 10 | 2006 | 600 | |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 4 | 29 | 2006 | 700 | 700 |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 5 | 3 | 2006 | 7000 | 7000 |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 8 | 14 | 2006 | 680 | 680 |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 9 | 27 | 2006 | 130 | 130 |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 10 | 15 | 2006 | 4200 | 4200 |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 10 | 27 | 2006 | 11000 | 11000 |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 12 | 5 | 2006 | 290 | |
| | | **Mean 2006** | | | | | **1648** |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 3 | 1 | 2007 | 3600 | |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 5 | 7 | 2007 | 38000 | 38000 |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 8 | 7 | 2007 | 83 | 83 |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 10 | 18 | 2007 | 21000 | 21000 |
| | | **Mean 2007** | | | | | **4046** |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 4 | 9 | 2008 | 7200 | 7200 |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 6 | 13 | 2008 | 23000 | 23000 |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 7 | 16 | 2008 | 310 | 310 |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 9 | 4 | 2008 | 6000 | 6000 |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 9 | 23 | 2008 | 120 | 120 |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 11 | 6 | 2008 | 47000 | |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 12 | 9 | 2008 | 740 | |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 12 | 9 | 2008 | 50 | |
| | | **Mean 2008** | | | | | **2059** |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 2 | 4 | 2009 | 1 | |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 2 | 11 | 2009 | 800 | |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 7 | 12 | 2009 | 13000 | 13000 |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 8 | 16 | 2009 | 20000 | 20000 |
| USGS | 422/22.0 | L. Blue R. @Lees Summit Rd. | 12 | 23 | 2009 | 1500 | |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 12 | 23 | 2009 | 1900 | |
| | | **Mean 2009** | | | | | **16125** |
| USGS | 422/22.0 | L. Blue R. @Lees Summit Rd. | 1 | 14 | 2010 | 370 | |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 1 | 14 | 2010 | 140 | |
| USGS | 422/22.0 | L. Blue R. @Lees Summit Rd. | 3 | 4 | 2010 | 8 | |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 3 | 4 | 2010 | 19 | |
| MDNR | 422/22.0 | L. Blue R. @Lees Summit Rd. | 3 | 9 | 2010 | 150 | |
| MDNR | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 3 | 9 | 2010 | 51 | |
| USGS | 422/22.0 | L. Blue R. @Lees Summit Rd. | 4 | 20 | 2010 | 140 | 140 |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 4 | 20 | 2010 | 170 | 170 |
| USEPA-7 | 422/22.0 | L. Blue R. @Lees Summit Rd. | 5 | 19 | 2010 | >241960 | 483920 |
| USEPA-7 | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 5 | 19 | 2010 | 100 | 100 |
| USGS | 422/22.0 | L. Blue R. @Lees Summit Rd. | 5 | 20 | 2010 | 25000 | 25000 |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 5 | 20 | 2010 | 28000 | 28000 |
| USEPA-7 | 422/22.0 | L. Blue R. @Lees Summit Rd. | 5 | 26 | 2010 | 687 | 687 |
| USEPA-7 | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 5 | 26 | 2010 | 55 | 55 |
| USEPA-7 | 422/22.0 | L. Blue R. @Lees Summit Rd. | 6 | 2 | 2010 | >2419 | 4838 |
| USEPA-7 | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 6 | 2 | 2010 | 1300 | 1300 |
| USEPA-7 | 422/22.0 | L. Blue R. @Lees Summit Rd. | 6 | 3 | 2010 | >2419 | 4838 |

| Org | Site | Location | Mo | Dy | Yr | E coli | Rec. Season E. coli |
|---|---|---|---|---|---|---|---|
| USEPA-7 | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 6 | 3 | 2010 | 1733 | 1733 |
| USEPA-7 | 422/22.0 | L. Blue R. @Lees Summit Rd. | 6 | 9 | 2010 | 5794 | 5794 |
| USEPA-7 | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 6 | 9 | 2010 | 14136 | 14136 |
| USEPA-7 | 422/22.0 | L. Blue R. @Lees Summit Rd. | 6 | 17 | 2010 | 6131 | 6131 |
| USEPA-7 | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 6 | 17 | 2010 | 14136 | 14136 |
| USEPA-7 | 422/22.0 | L. Blue R. @Lees Summit Rd. | 6 | 22 | 2010 | 266 | 266 |
| USEPA-7 | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 6 | 22 | 2010 | 194 | 194 |
| USEPA-7 | 422/22.0 | L. Blue R. @Lees Summit Rd. | 6 | 24 | 2010 | >2419 | 2419 |
| USEPA-7 | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 6 | 24 | 2010 | 1300 | 1300 |
| USEPA-7 | 422/22.0 | L. Blue R. @Lees Summit Rd. | 7 | 6 | 2010 | 17230 | 17230 |
| USEPA-7 | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 7 | 6 | 2010 | 17930 | 17930 |
| USGS | 422/22.0 | L. Blue R. @Lees Summit Rd. | 7 | 20 | 2010 | 130 | 130 |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 7 | 20 | 2010 | 98 | 98 |
| USEPA-7 | 422/22.0 | L. Blue R. @Lees Summit Rd. | 8 | 3 | 2010 | 16 | 16 |
| USEPA-7 | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 8 | 3 | 2010 | 55 | 55 |
| USEPA-7 | 422/22.0 | L. Blue R. @Lees Summit Rd. | 8 | 17 | 2010 | 64 | 64 |
| USEPA-7 | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 8 | 17 | 2010 | 81 | 81 |
| USEPA-7 | 422/22.0 | L. Blue R. @Lees Summit Rd. | 8 | 24 | 2010 | 231 | 231 |
| USEPA-7 | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 8 | 24 | 2010 | 435 | 435 |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 9 | 1 | 2010 | 20000 | 20000 |
| USEPA-7 | 422/22.0 | L. Blue R. @Lees Summit Rd. | 9 | 8 | 2010 | 95 | 95 |
| USEPA-7 | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 9 | 8 | 2010 | 114 | 114 |
| USEPA-7 | 422/22.0 | L. Blue R. @Lees Summit Rd. | 9 | 14 | 2010 | 6131 | 6131 |
| USEPA-7 | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 9 | 14 | 2010 | 1935 | 1935 |
| USGS | 422/22.0 | L. Blue R. @Lees Summit Rd. | 11 | 3 | 2010 | 89 | |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 11 | 3 | 2010 | 66 | |
| | | **Mean 2010** | | | | | **1063** |
| USGS | 422/22.0 | L. Blue R. @Lees Summit Rd. | 1 | 19 | 2011 | 17 | |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 1 | 19 | 2011 | 75 | |
| USGS | 422/22.0 | L. Blue R. @Lees Summit Rd. | 2 | 14 | 2011 | 440 | |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 2 | 14 | 2011 | 970 | |
| USGS | 422/22.0 | L. Blue R. @Lees Summit Rd. | 2 | 25 | 2011 | 810 | |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 2 | 25 | 2011 | 330 | |
| USGS | 422/22.0 | L. Blue R. @Lees Summit Rd. | 4 | 13 | 2011 | 63 | 63 |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 4 | 13 | 2011 | 53 | 53 |
| USGS | 422/22.0 | L. Blue R. @Lees Summit Rd. | 6 | 27 | 2011 | 11000 | 11000 |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 6 | 27 | 2011 | 18000 | 18000 |
| USGS | 422/22.0 | L. Blue R. @Lees Summit Rd. | 8 | 19 | 2011 | 11000 | 11000 |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 8 | 19 | 2011 | 22000 | 22000 |
| USGS | 422/22.0 | L. Blue R. @Lees Summit Rd. | 9 | 15 | 2011 | 86 | 86 |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 9 | 15 | 2011 | 150 | 150 |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 | 11 | 3 | 2011 | 6500 | |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 br | 12 | 1 | 2011 | 220 | |
| USGS | 422/21.3 | L. Blue R. @Lees Summit Rd. | 12 | 1 | 2011 | 190.0 | |
| | | **Mean 2011** | | | | | **1095** |
| USGS | 422/21.3 | L. Blue R. @Lees Summit Rd. | 1 | 19 | 2012 | 12 | |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 br | 1 | 19 | 2012 | 1 | |
| USGS | 422/21.3 | L. Blue R. @Lees Summit Rd. | 2 | 3 | 2012 | 1000 | |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 br | 2 | 3 | 2012 | 1000 | |
| USGS | 422/21.3 | L. Blue R. @Lees Summit Rd. | 5 | 22 | 2012 | 9 | 9 |

| Org | Site | Location | Mo | Dy | Yr | E coli | Rec. Season E. coli |
|---|---|---|---|---|---|---|---|
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 br | 5 | 22 | 2012 | 65 | 65.0 |
| USGS | 422/21.3 | L. Blue R. @Lees Summit Rd. | 6 | 11 | 2012 | 23000 | 23000 |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 br | 6 | 11 | 2012 | 18000 | 18000.0 |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 br | 9 | 12 | 2012 | 120 | 120.0 |
| USGS | 422/21.3 | L. Blue R. @Lees Summit Rd. | 9 | 13 | 2012 | 330 | 330 |
| USGS | 422/21.3 | L. Blue R. @Lees Summit Rd. | 11 | 29 | 2012 | 84 | |
| USGS | 422/11.5 | L. Blue R. nr Lake City @ Hwy 78 br | 11 | 29 | 2012 | 43 | |
| | | **Mean 2012** | | | | | **461** |

The water quality standard for *E. coli* in Class B recreational waters for protection of human health is 206 col/100 mL. This standard is for the geometric mean of all bacterial counts taken during each recreational season, April 1 through October 31. For *E. coli* bacteria, a water body is judged to be unimpaired if the geometric means for all of the last three years for which data is available are less than the appropriate water quality standard. At least five samples must be available from a given recreational season for that season to be considered. The above data shows annual geometric means above the standard. The Listing Methodology states that the data must be representative of typical water quality conditions for that waterbody. Both the USGS and EPA sampling programs on the Little Blue River were designed mainly to gather information on stormwater quality. This suggests a biased data set. Review of flow records for L. Blue River indicates about 55% of the E. coli sampling dates during the recreation season were during stormwater flows. Review of daily flow records indicates only about 45% of days during 2010-2012 had stormwater flows. On the adjacent lower Blue River, only 40% of days were stormwater flow days. Since some of the higher flows on L. Blue River may have been associated with reservoir releases not related to stormwater events, the 40% stormwater flow frequency was assumed to be a better estimate.

A statistical procedure was used to calculate geometric mean E coli values using the actual E coli values in the above data set but increasing the frequency of non-stormwater flow E coli data until it equalled 60 percent of all samples. This procedure yielded a recreation season geometric mean of 458 for the three recreation seasons combined. Thus, this analysis suggests that L. Blue River is **impaired** by bacteria.

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1/18/2013 jf