

# 2022 Water Testing

## What We Do:

FBSR samples local lakes, rivers, and streams to help determine the water quality of the Big Sioux River Watershed. Each year FBSR collects roughly 500 samples, spanning over 100 miles from Dell Rapids to Akron, IA. Following processing from the South Dakota Health Lab, the results are included in the South Dakota DANR water quality portal and posted to our website to allow public access to our data. Testing parameters included E. coli, total suspended solids, and nitrates.



## Why it Matters:

Recent water crises across the US have elevated awareness regarding the importance of water and rivers for communities. By being proactive, we can avoid the struggles and costs associated with the maltreatment of an important resource. This is why monitoring water quality and providing data to decision-makers is important for economic growth & development, recreation & tourism, safe local water, and the health of the community & wildlife.

### Results

Contaminant levels spiked following rainfall events. This was particularly evident following the August 7th rainfall of over 5 inches.

Our rivers and streams are regularly exceeding safe levels for E. coli.

Water quality decreases in the Big Sioux River as it flows south. Overall, the southern monitoring sites at Newton Hills and Akron, IA have higher levels of sediment and nitrates. In 2022, E. coli levels decreased at southern sites.

Nitrate levels continue to rise but are within safe levels. For the second year in a row, nitrates exceeded safe levels in the Big Sioux River.



### Implications

Recreationists should avoid immersion recreation following heavy rainfall events.

More riparian buffers are needed to reduce contaminant runoff.

The actions taken by communities upstream affect those downstream. Eventually, the water flowing through the Big Sioux River watershed will reach and contribute to the Dead Zone in the Gulf of Mexico.

High nitrate levels can lead to Blue Baby Syndrome. Fertilizer application should be limited, based on accurate soil testing. Pet owners should pick up and properly dispose of pet wastes.

2022 Summary	TSS Safe Level: 90 mg/L			E. coli Safe Level: 126 CFU/100 mL			Nitrate Safe Level: 10 mg/L		
	Average	Low	High	Average	Low	High	Average	Low	High
<b>BIG SIOUX RIVER SITES</b>									
Dell Rapids BSR Canoe Access	101	44	187	117	41	754	0.7	0.2	2.4
I-90 BSR	51	8	153	176	21	1200	0.5	0.2	1.7
Falls Park BSR	44	17	108	125	20	4880	0.3	0.2	1.8
Lien Park BSR	48	16	140	82	10	12000	1.3	0.3	6.9
Newton Hills BSR Canoe Access	85	24	308	73	10	389	3.2	1.5	8.6
Akron BSR Canoe Access	141	58	276	52	5	488	2.2	0.6	6.5
<b>SPLIT ROCK CREEK SITES</b>									
Garretson City Park SRC	36	26	76	236	11	6490	1.4	0.2	8
Palisades Park Campground Stream	7	3	98	396	42	1300	6.9	0.2	14.9
Palisades Picnic Area	35	7	97	165	5	6890	2.3	0.6	8.1
484th Ave on SRC	34	13	84	326	53	6490	2.6	0.7	8.1
264th St. Bridge South of Brandon	57	13	192	1021	137	24200	3.3	0.9	7.2
<b>SKUNK CREEK SITES</b>									
Skunk Creek 250th St. Bridge	49	26	115	236	40	613	0.6	0.2	5.9
Skunk Creek 254th St. Bridge	157	33	950	216	12	645	0.8	0.2	5.4
<b>NINE MILE CREEK SITE</b>									
Hwy 11 and Nine Mile Creek	22	3	128	173	7	6490	0.9	0.2	3.4
<b>WETLANDS AND LAKES</b>									
Dewey Gevik Observation Dock	9	3	60	31	3	219	0.2	0.2	0.2
Wall Lake Boat Ramp	7	3	18	9	1	770	0.2	0.2	0.2
Lake Alvin Boat Access	50	13	100	28	3	1110	0.4	0.2	2.6
Lake Lakota Boat Access	-	-	-	-	-	-	-	-	-

\*Red numbers dictate results over safe levels.

\*\*Geometric mean was used instead of arithmetic mean.

\*\*\*Lake Lakota was inaccessible in 2022.

Learn more at [fbsr.org/water-quality-monitoring](https://fbsr.org/water-quality-monitoring).

The best way you can support our work for a cleaner Big Sioux River for everyone is to donate.

Visit [fbsr.org/donate](https://fbsr.org/donate) to contribute.



# 2022 Contaminant Levels and Designated Use Criteria



The State of South Dakota has established designated use criteria for waterbodies in the Big Sioux River. Designated use establishes what the water can safely be used for, such as domestic water supply, immersion recreation, or fish and wildlife propagation. The following graphs plot the 30-day geometric mean designated use criteria for E. coli (126 CFU/100 mL), 30-day average for total suspended solids (90 mg/L), and the daily maximum contaminant level for nitrates (10 mg/L) against the average contaminant levels in 2022 at the 17 sites sampled by FBSR. A geometric mean was used to calculate the averages instead of arithmetic mean.

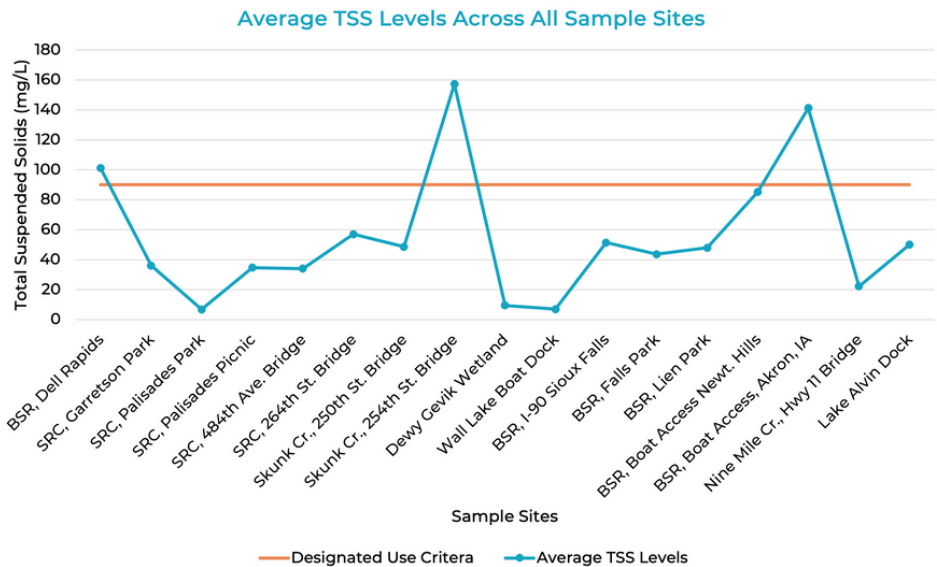
## Total Suspended Solids

Total Suspended Solids (TSS) can include a wide variety of materials, such as silt, decaying plant and animal matter, industrial wastes, and sewage.

High TSS levels decrease water clarity and can interfere with water chemistry and photosynthesis processes.

On average, in 2022, TSS levels exceeded the designated use criteria at three of the 17 sampled sites.

Thirteen sites exceeded the designated use criteria at least once during the 2022 testing season.



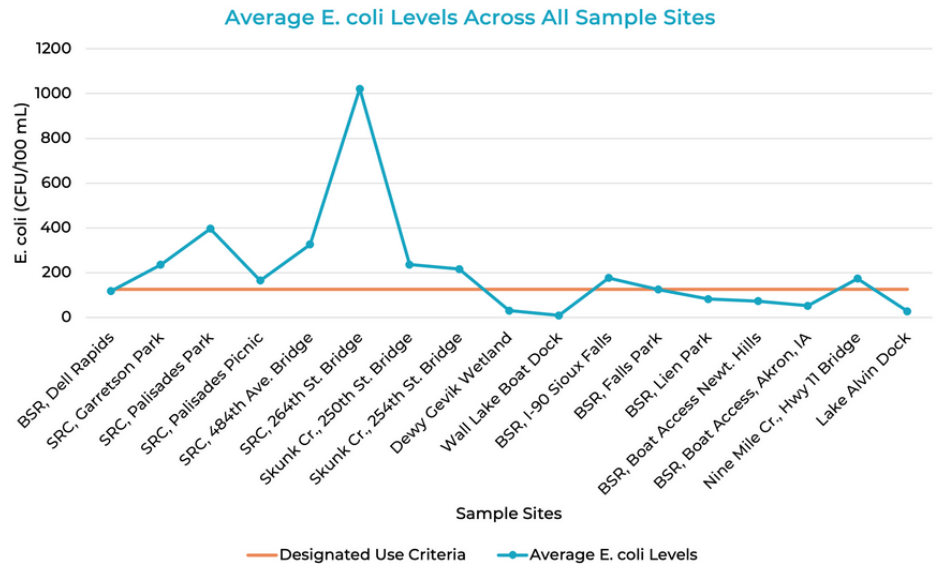
## E. coli

The presence of fecal coliform bacteria in aquatic environments indicates that the water has been contaminated with the fecal material of people or other animals.

Common sources of E. coli include agriculture runoff, wastewater treatment plants, failing septic systems, domestic and wild animal waste, and stormwater runoff.

On average, in 2022, E. coli levels exceeded the designated use criteria at nine of the 17 sampled sites, including the popular recreation spots of Palisades State Park and Split Rock Park in Garretson.

All 17 sites exceeded the designated use criteria at least once during the 2022 testing season.



## Nitrates

Nitrates are an essential source of nitrogen for plants and are commonly used in fertilizers.

When nitrogen fertilizers are used to enhance soil fertility, nitrates may be carried by rain over or through the soil and deposited in surface water.

High levels of nitrates in drinking water can lead to Blue Baby Syndrome and an increased risk of certain cancers and thyroid dysfunction.

On average, in 2022, nitrate levels did not exceed the designated use criteria.

One of the sites exceeded the designated use criteria at least once during the 2022 testing season.

