

STREAM CLASSIFICATION AND
CONTAMINATION STUDY BELOW
BLUE MOUNDS STATE PARK

Performed by Dave Marshall and Tom Mugan

Blue Mounds State Park operates a two-cell stabilization pond wastewater treatment system. There is very little discharge from the second cell because of low hydraulic loading and because the second cell has numerous cattails. However, during the summer camping season, a surface discharge occurs when influent rates are highest. The discharged effluent flows down a steep gulley and seeps rapidly into the ground approximately 50 yards below the lagoons. During periods of significant surface runoff, effluent is probably transported along with runoff water down the steep gulley to the base of the Mound. At NW $\frac{1}{4}$, SE $\frac{1}{4}$, Section 36, a spring emanates from the gulley which is one of two major springs feeding the tributary to the West Branch of Blue Mounds Creek.

STREAM CLASSIFICATION

Below the springs, the tributary meanders through a meadow and ultimately through pasture land before the confluence with West Branch Blue Mounds Creek. Representative aquatic macroinvertebrates indicated very good water quality with a Hilsenhof Biotic Index value of 3.79. The presence of mottled sculpins and blacknose dace also reflected good water quality. The only limitations of the stream are a combination of low stream flows and moderate stream bank erosion within the pasture lands. Although the stream is not managed for a trout fishery, trout probably occur in some areas of the stream migrating from West Branch Blue Mounds Creek. Currently, the stream is classified FAL-C supporting an intolerant forage fishery. Reclassification to FALT-A and trout stream management may occur in the future.

Completed copies of Macroinvertebrate Field And Bench Sheet (Form 3200-81) and Stream System Habitat Rating Form (Form 3200-68) and a copy of a USGS topo map of the area are attached.

CONTAMINATION STUDY

During the camping season, at times when precipitation and surface runoff do not occur, the fate of the Blue Mounds State Park wastewater effluent is unknown after seeping into the ground. The uncertain fate of the effluent is of concern since two residences are located at the base of the mound.

Blue Mounds State Park occupies the crest of West Blue Mound. This mound is comprised of a cap of dolomite underlain by a thick layer of relatively impermeable shale. The upper dolomite layer is subject to dissolution by percolating groundwater, resulting in solution cavities. This helps explain the sudden disappearance of the surface stream which carries the wastewater effluent. The underlying shale serves as a confining bed which tends to force percolating water to move laterally and give rise to springs further down toward the base of the mound. A number of caves are known to exist in the area of Blue Mounds. In general, it is difficult to predict where an underground stream may reappear at the surface, if it does at all.

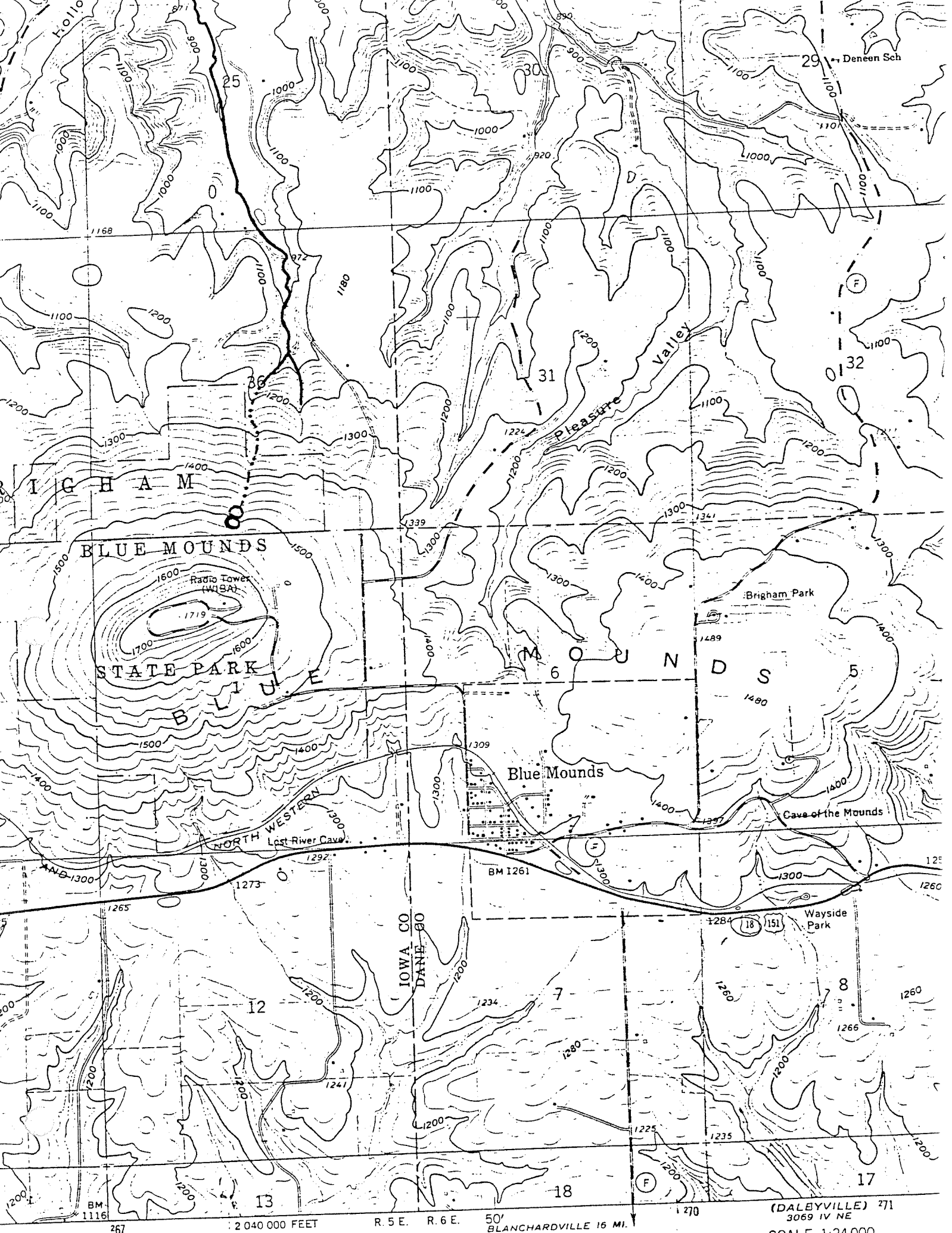
Chemical and Bacteriological Test Data

for
Blue Mounds Contamination Study

	Lagoon Discharge	Footbridge below Lag.	West Spring Below Lagoon			East Spring		Newhouse Well
	8/19	8/19	8/19	8/20	8/27	8/19	8/27	
Date	8/19	8/19	8/19	8/20	8/27	8/19	8/27	
Time	12:30	12:46	11:05	14:45	10:50			
Flow, gpm	0.5	0.5	-	-	-	-	-	-
BOD, mg/l	4	-	-	-	-	-	-	-
Susp Solids, mg/l	6	-	-	-	-	-	-	-
TKN, mg/l	2.2	0.5	<0.2	<0.2	-	<0.2	-	-
NH ₃ -N, mg/l	1.1	<0.02	<0.02	<0.02	-	<0.02	-	-
NO ₂ +NO ₃ -N, mg/l	0.1	0.60	0.46	0.46	0.43	0.70	0.61	0.5
Chloride, mg/l	52	33	2.9	3.0	2.7	2.2	2.3	-
Cond., μmho/cm	530	440	460	490	490	470	490	-
Fecal Coli. #/100ml	30	620	-	-	70	100	80	-
Fecal Strep #/100ml	-	-	-	-	130	-	280	-

All testing performed at the State Laboratory of Hygiene

A sample taken on September 15, 1987, by Norb Karr, Park Superintendent, showed the Newhouse well to be bacteriologically safe. This was a follow-up to a sample collected from an outside tap on August 19 which tested unsafe.



BLUE MOUNDS

STATE PARK

Blue Mounds

(DALBYVILLE) 271
3069 IV NE

2 040 000 FEET
R. 5 E. R. 6 E. 50' BLANCHARDVILLE 16 MI.

SCALE 1:24,000

Sample ID # 870819 - - - Waterbody Name Tribe to W. Br. Bluemounds Creek
Y M M D D Cnty Field #

Water Temp (Celsius) 17.5 Dissolved Oxygen (mg/l) 9.0 HBI = 3.79

Sample Location: 36 6-7N 5E Master Waterbody #
1/16 1/4 Sec. Tn., Rng.

Project Name Stream Classification Storet Station #

Ave. Stream Width (Ft.) at Site Ave. Stream Depth (Ft.) at Site

Collector Marshall D. Field # Rep 1 Rep 2 Rep 3
(Last Name, First Initial) Measured Velocity (fps)

Sorter Marshall Est. Velocity (fps) V. Slow (<0.2)
Est. % of sample sorted Slow (0.2-0.5)
Moderate (0.5-1.5)
Fast (1.5->)

Taxonomist Marshall Sampled Habitat: Riffle 2. Run
3. Pool 4. Lake

Location Description Mounds Park Rd.

Sampling Device: 1. D Frame 2. Artificial Substrate, 3. Surber, 4. Other
Est. Time Spent Sampling (Min.) 3

Substrate at Site Location (%)
Bedrock Rubble (2.5-10.0" dia.) 20 Sand 20 Clay Muck
10 Boulders (10.0" dia.) 70 Gravel (0.1-2.5" dia.) Silt Detritus 10 Debris/Veg

Substrate Sampled (%) (Same as above 100)
Bedrock Rubble (2.5-10.0" dia.) Sand Clay Muck
Boulders (10.0 dia.) Gravel (0.1-2.5" dia.) Silt Detritus Debris/Veg

Aquatic Vegetation % of Total Stream Channel at Sample Site

Observed Instream Water Quality Indicators (Perceived WQ: Excellent, Good, Fair, Poor)

	Not Present	Insignificant	Significant	Comments
Turbidity	1	2	3	
Chlorine or Toxic Scour	1	2	3	
Macrophytes	1	2	3	water cress
Filamentous Algae	1	2	3	
Planktonic Algae	1	2	3	
Slimes	1	2	3	
Iron Bacteria	1	2	3	

blacknose dace
mottled sculpins
minnow sp
creek chubs
white suckers

Factors Which May Be Affecting Habitat Quality

	Not Present	Insignificant	Significant	Comments
Sludge Deposits	1	2	3	
Silt and Sediment	1	2	3	
Channel Ditching	1	2	3	
Down/Up Stream Impoundment	1	2	3	pond discharge
Low Flows	1	2	3	
Wetlands	1	2	3	

Pollutant Sources

	Not Present	Insignificant	Significant	Comments
Livestock Pasturing	1	2	3	
Barnyard Runoff	1	2	3	
Cropland Runoff	1	2	3	
Tile Drains	1	2	3	
Septic Systems	1	2	3	
Stream Bank Erosion	1	2	3	
Urban Runoff	1	2	3	
Construction Runoff	1	2	3	
Point Source (Specify Type)	1	2	3	
Other (Specify)	1	2	3	