Appendix B

Water Quality Monitoring

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Technical Memorandum

To: Bassett Creek Watershed District Commissioners
From: Barr Engineering Company (Matt Hernick)
Subject: Bassett Creek E. Coli Bacteria Monitoring 2008
Date: 12/11/2008
Project: 23/27-0051.08-2008-507
c: Len Kremer

During the months of July, August, and September 2008 Barr Engineering Co. collected water samples at six locations along Bassett's Creek (see last page of memo) to determine the presence and quantity of bacteria in the steam. The samples were analyzed at the Minnesota Department of Health (MDH) Lab in St. Paul for E. Coli bacteria. All samples tested contained E. Coli, ranging from 23 MPN (Most Probable Number) per 100 ml to a maximum of more than 2,400 MPN / 100ml. Test results for all samples are in Table 1, all values are in MPN / 100ml. Figure 1 is a graphical representation of the E. Coli data.

Samples were collected in 250ml plastic bottles provided by MDH directly from the stream, utilizing disposable gloves. The bottles were uncapped and filled underwater, temporarily capped and brought to the surface, then excess water poured off to reach the 'fill line'. Samples were put on ice immediately after collection and delivered directly to the MDH lab after completion of sampling at the sixth site.

The density of E. Coli bacteria appears to be influenced by rainfall and runoff; the greatest number of E. Coli bacteria occurred on July 8 and September 24, when 3-4 times as much bacteria was present than the other days samples. In both cases significant rainfall was observed the day prior to sampling, as shown in Table 2. Stream velocity also likely influences the number of bacteria observed. This is apparent in a comparison of the bacterial counts from Site #3 and Site #6, a very slow-flowing pool with soil banks, and a swift-flowing rip-rapped section, respectively.

Under the State Standard (7050 Rule), E. Coli is not to exceed 126 organisms per 100 milliliters as a geometric mean of not less than five samples representative of conditions within any calendar month, nor

shall more than ten percent of all samples taken during any calendar month individually exceed 1,260 organisms per 100 milliliters. The standard applies only between April 1 and October 31.

Table 1: E. Coli Data, MPN / 100ml

STORET ID	s005-012	s005-013	s005-014	s005-015	s005-016	s005-017	
Date	**Site 1**	**Site 2**	**Site 3**	**Site 4**	**Site 5**	**Site 6**	Avg. by Date
7/8/2008	770	2400	2400	1100	1600	820	1515
7/17/2008	410	100	650	190	290	43	281
7/23/2008	78	490	770	120	170	35	277
8/6/2008	250	220	650	330	300	100	308
8/12/2008	710	370	710	520	310	23	441
8/20/2008	250	96	580	1300	280	120	438
9/9/2008	820	820	250	650	920	130	598
9/16/2008	140	360	710	210	580	130	355
9/24/2008*	2400	2400	2400	2400	2400	2400	2400
Avg. by Site	648	806	1013	758	761	422	735

* all samples 9/24/08 were >2400 MPN/100 ml, displayed as 2400

Table 2: Additional Site and Weather Data

Date	Barr Sampler	Sampler's Recorded Weather	Day of Sampling Rainfall [in]	Previous Day Rainfall [in]	E. Coli MPN/100ml Avg. by Date
7/8/2008	IJH & MAH2	75F, Clear, light breeze, Rain last night	0	0.47	1515
7/17/2008	IJH	80F, cloudy w/chance of rain, lt. breeze	0.17	0	281
7/23/2008	IJH	75F, clear, calm	0	0	277
8/6/2008	IJH	85F, clear	0.05	0	308
8/12/2008	IJH	70F, cloudy, rainy	0.4	T	441
8/20/2008	IJH	80F, sunny & beautiful	0	0	438
9/9/2008	MAH2	50F, clear and cool	0	0	598
9/16/2008	MAH2	50F, clear	0	0	355
9/24/2008	MAH2	55F, clear, rain yesterday and last night	0	0.61	2400

* Rainfall data from http://climate.umn.edu/doc/twin_cities/msp2000's.htm

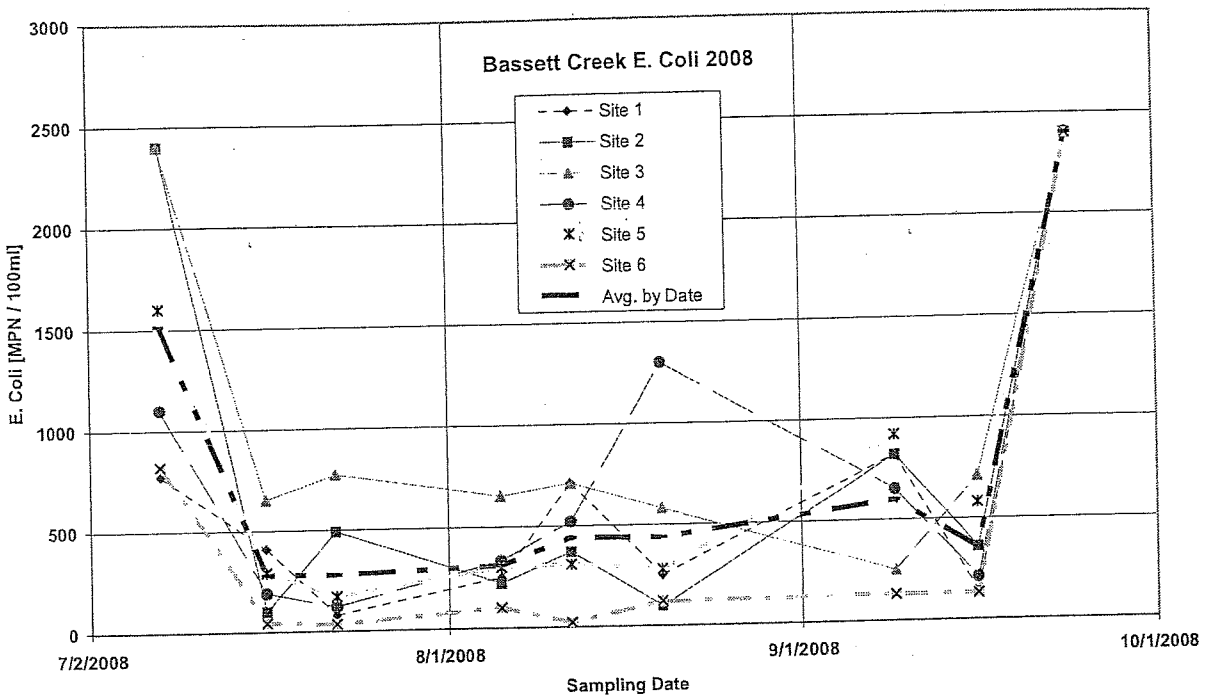

Figure 1: E. Coil Sampling Results

Sampling Locations:

#1 (STORET ID s005-012)

Location: Plymouth Creek, north of parking lot of building at north corner of Industrial Park Bvld and Teakwood Ln., Plymouth.

Stream conditions: Gravel and silt bottom, often shallow flow

#2 (STORET ID s005-013)

Location: Bassett Creek Main Stem, south of end of Rhode Island Ave., 1 block south of Phoenix St., Golden Valley. Downstream of culverts under railroad embankment.

Stream conditions: Gravel and silt bottom, often shallow flow

#3 (STORET ID s005-014)

Location: North Branch of Bassett Creek, just north of 32nd Ave N between Brunswick Ave and Adair Ave, Crystal.

Stream conditions: Silt bottom, very slow to almost stagnant flow in pool caused by woody debris dam in front of box culverts under 32nd Ave N.

#4 (STORET ID s005-015)

Location: Bassett Creek Main Stem, ~1000ft upstream of junction with Bassett Creek North Branch, near a red house near Golden Valley / Crystal boundary.

Stream conditions: Generally fast flowing, gravel/sand bottom. Waterfowl often present near sampling site.

#5 (STORET ID s005-016)

Location: Bassett Creek Main Stem, back yard of 3900 Bassett Creek Drive, Golden Valley.

Stream conditions: Silt and sand bottom, usually gently flowing.

#6 (STORET ID s005-017)

Location: Bassett Creek Main Stem, at Met Council WOMP station at (closed) Irving Ave. bridge north of city impound lot, Minneapolis.

Stream conditions: Rip rap bottom, generally fast flowing.