



Post Office Box 1165
Fort Myers, Florida 33902

January 26, 2018

The Honorable Randall Henderson: Mayor, City of Fort Myers

The Honorable Cecil Pendergrass: Chairman, Lee County Board of Commissioners

Re: Enterococcus Group Bacteria in Billy Creek

Dear Mayor Henderson and Chairman Pendergrass:

Calusa Waterkeeper (CWK) regularly monitors water quality in the Caloosahatchee Estuary and its watershed. CWK has found alarmingly high readings for Enterococci Group Bacteria (EGB) in Billy Creek that exceed state criteria.¹ This EGB contamination problem in Billy Creek raises serious public health concerns. EGB serves as an indicator of human fecal pollution and co-occurring pathogens. Surface waters contaminated with *Enterococcus* create a health risk to recreational users and can cause gastrointestinal illness, infections and rashes. Furthermore, multi-drug resistant *Enterococcus* strains have emerged as leading causes of hospital-acquired infections (Boehm and Sassoubre 2014).

The Environmental Protection Agency (EPA) has set a single sample maximum of 70 cfu/100 ml as a Marine Beach Action Value for Florida, effective January 1, 2016 forward. The Florida Department of Health (FDH) uses the EPA guidance and considers Enterococci values above 71 cfu/100 ml as unsatisfactory in the context of their Healthy Beaches Program. The MPN index is a probabilistic estimate of CFU approved by EPA.

Fort Myers and Lee County monthly sampling regularly breached the 70 MPN/100ml threshold, often by an order magnitude. But the City and County have never conducted

¹ Pursuant to the Florida Administrative Code (F.A.C.). Chapter 62-302.530, EGB "MPN or MF counts shall not exceed a monthly geometric mean of **35** nor exceed the ten percent threshold value (TPTV) of **130** in 10% or more of the samples during any 30-day period. If the threshold is exceeded the minimum sampling frequency increases to 10 samples per month thus enabling the calculation of a monthly average. The MPN index is a probabilistic estimate of CFU approved by EPA.

more than once per month for impairment eligibility. Considering the alarmingly high EGB levels in Billy Creek, Fort Myers and Lee County had the responsibility to increase sampling frequency to fully understand the EGB public health risk as outlined by FAC 62-302.530. Furthermore, the Florida Department of Environmental Protection (FDEP) should have recognized the extent of EGB contamination in Billy Creek and required the relevant jurisdictions to increase sampling frequency to enable a possible impairment determination. Such a determination could have required restoration.

CWK made several requests to the City for information. We appreciate Councilman Streets efforts to obtain the attached EGB data. The information provided, however, was limited to 2017 with conflicting results at several stations. Results provided by the City for EGB monthly sampling from 12/28/16 to 11/30/17 at four locations indicated a monthly low of 8.5 cfu/100ml to a high of 1360 cfu/100 ml with average annual geometric means varying from 39.49 cfu/100ml to 687.70 cfu/100ml. The FDEP does not consider annual geometric means for impairment status. More recent EGB information provided by the City for two additional stations on Billy Creek, sampled and analyzed monthly at one station and for at least six months at a second station by Lee County during 2017, indicated a low value of 236 cfu/100ml and high value of 2420 cfu/100ml.

A search of the Charlotte Harbor National Estuary Water Atlas database and Lee County's water quality web site indicated historical EGB data for the same two Lee County stations on Billy Creek at Veronica Shoemaker Boulevard from 9/5/01 to 1/20/15 and at Ortiz Avenue from 9/5/01 to 12/13/17. EGB values across all months at the Veronica Shoemaker Boulevard station averaged 640 cfu/100ml with a high value of 1929 cfu/100ml. At the Ortiz Avenue site average EGB values across all months was 1251 cfu/100ml with a high of 3920 cfu/100ml. Additional results for EGB values in Billy Creek from 2/8/05-6/17/10 are summarized in the Table attached.

These data and those provided by the City for 2017 indicate serious EGB contamination. FDEP does not list Billy Creek as impaired for EGB, apparently due to the failure to conduct adequate sampling frequency. The monthly geometric mean of 35 cfu/100ml and the Ten Percent Threshold Value, (not to exceed 130 cfu/100ml for 10% of monthly values) are based on a minimum of 10 samples per month as previously indicated. The City and Lee County have likely avoided an impairment determination and the associated restoration costs by only sampling once per month. In some instances, the City only collects samples when it detects a flow ("samples only collected when structure is flowing"), thus reducing the sampling frequency. Ironically, some of the highest EGB values occurred during low or no flow periods.

Considering the length of time (at least 16 years) for significantly elevated EGB, and the chronic public health risk this contamination poses, CWK requests that Fort Myers, Lee

County, FDOH and FDEP work together to develop an appropriate sampling design for EGB in Billy Creek. This will include recommendations for signage posting and other public notice that enables residents to understand the risk of EGB contamination. We recommend completion of this plan by June 1, 2018.

CWK thanks you in advance for your immediate attention to these critical matters and look forward to your response.

Sincerely,



John Cassani

Calusa Waterkeeper

cc.

Fort Myers City Council Members

Saeed Kazemi, Fort Myers City Manager

Grant Alley, Fort Myers City Attorney

Lee County Commissioners

Roger Desjarias, Lee County Manager

Richard Wesch, Lee County City Attorney

Jon Iglehart, Director FDEP South District Office

FDOH Lee County Unit (lee-pio@flhealth.gov)

Keith Kibbey, Lee County Division of Natural Resources

Roland Ottolini, Lee County Division of Natural Resources

Fort Myers News Press

Attachments:

EGB information provided by City of Fort Myers December 2017 – January 2018,

Graphics of Lee County derived ECB data for Billy Creek at Ortiz Avenue and Veronica Shoemaker Boulevard

Table 1. Summarized EGB values at Billy Creek stations CFMBILLY1,3,4,6

Boehm and Sassoubre 2014 reference citation

Billy Creek Enterococcus Sampling Results

Enterococcus Sampling

There are two methods used to determine the levels of Enterococci.

MPN (most probable number) uses the multiple tube fermentation method and is based on a statistical estimation - you need to calculate 95% confidence limits for this result as it is only an estimate.

CFU/100mL is colony-forming units - thus the count of bacterial colonies produced on agar plates. If you did duplicates you can also calculate 95% conf. limits for this. This is the method used by the City of Fort Myers in water quality analysis.

As the media used is different the results will not be comparable. A Duke University study noted: "It has been observed empirically that the standard multiple-tube fermentation (MTF) decimal dilution analysis MPN procedure is more variable than the membrane filtration CFU procedure, and that MTF-derived MPN estimates are somewhat higher on average than CFU estimates, on split samples from the same water bodies."

Enterococcus Sources

Enterococci are bacteria that live in the intestinal tracts of warm-blooded animals, including humans, and therefore indicate possible contamination of streams and rivers by fecal waste. There are also natural, non-fecal sources of fecal indicator bacteria, including plants, sand, soil and sediments, that contribute to a certain background level in ambient waters and vary based on local environmental and meteorological conditions.

Dog waste has 4 to 10 times more bacteria than human waste, because dogs are built to eat anything and have a generous supply of intestinal bacteria. Studies in Central Florida have also indicated that decaying vegetation can result in high bacteria readings during sampling.

City of Fort Myers Sample points and results (Annual Geometric Mean)

Monthly samples shall not exceed 130 cfu/100ml in marine waters per F.A.C. 62-302.530

Billy Creek Upstream of Diversion Weir	437 cfu/100ml
Flows entering the City of Fort Myers	
Billy Creek Filter Marsh	130 cfu/100ml
Flows diverted from Billy Creek to the Filter Marsh and back into the Creek	
Zapata Canal	48 cfu/100ml
Ford Street	229 cfu/100ml

The City of Fort Myers is currently evaluating the Ford Street Canal to determine the causes of the high readings and rectify the problem if necessary.

Enterococcus Species Billy Creek

DATE	BCP1-10	BCP4-10	CFM Billy 3	CFMFSP
1/12/2017	1360.00	181.42	57.08	572.29
2/8/2017	1002.08	121.42	52.50	608.50
3/8/2017	210.83	*	*	*
4/12/2017	169.58	*	*	*
5/10/2017	157.92	*	42.00	*
6/14/2017	90.92	11.89	8.50	555.44
7/13/2017	111.08	115.22	29.10	588.44
8/9/2017	102.58	124.22	56.10	859.22
9/20/2017	71.58	119.00	58.20	858.11
10/11/2017	81.08	119.00	58.20	866.78
Geometric Mean**	184.73	91.35	39.49	687.70

* Samples only collected when structure is flowing. No flow at structures during this time.

** Geometric Mean of 2017 data only

BCP1-10 Billy Creek discharging into city from upstream

Upstream of diversion weir into BC Filter Marsh

BCP4-10 Discharge from Billy Creek Filter Marsh discharges

CFM Billy3 Discharge from Zapata Canal into Billy Creek

CFMFSP Discharge from Ford Street Preserve into Billy Creek

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DEC 6 2017

BY: S. Baloun

SAMPLE_LOCCC	SAMPLE_LOCDE	SAMPLE_COLDATE	PSSCHEDULE_P	RESULT_ACODE	RESULT_ANALY	RESULT_RESULT	RESULT_QUALIF	AUNIT
BILLGR20	Billy Creek @ V	12/28/2016 9:37:00 AM	6	ENTEROLERT	Enterococci	1414		MPN/100mL
BILLGR20	Billy Creek @ V	1/23/2017 9:50:00 AM	6	ENTEROLERT	Enterococci	2420	J96	MPN/100mL
BILLGR20	Billy Creek @ V	2/21/2017 9:12:00 AM	6	ENTEROLERT	Enterococci	236		MPN/100mL
BILLGR20	Billy Creek @ V	3/15/2017 9:58:00 AM	6	ENTEROLERT	Enterococci	1553		MPN/100mL
BILLGR20	Billy Creek @ V	4/25/2017 11:14:00 AM	6	ENTEROLERT	Enterococci	2420	J96	MPN/100mL
BILLGR20	Billy Creek @ V	5/9/2017 10:05:00 AM	6	ENTEROLERT	Enterococci	687		MPN/100mL
BILLGR20	Billy Creek @ V	6/1/2017 9:20:00 AM	6	ENTEROLERT	Enterococci	2420	J96	MPN/100mL
BILLGR20	Billy Creek @ V	7/18/2017 9:44:00 AM	6	ENTEROLERT	Enterococci	250		MPN/100mL
BILLGR20	Billy Creek @ V	8/21/2017 9:43:00 AM	6	ENTEROLERT	Enterococci	613		MPN/100mL
BILLGR20	Billy Creek @ V	9/25/2017 10:32:00 AM	6	ENTEROLERT	Enterococci	2420		MPN/100mL
BILLGR20	Billy Creek @ V	10/23/2017 9:54:00 AM	6	ENTEROLERT	Enterococci	2420		MPN/100mL
BILLGR20	Billy Creek @ V	11/30/2017 9:11:00 AM	6	ENTEROLERT	Enterococci	649		MPN/100mL
BILLGR60	Billy Creek @	12/28/2016 9:56:00 AM	6	ENTEROLERT	Enterococci	1011		MPN/100mL
BILLGR60	Billy Creek @	1/23/2017 10:10:00 AM	6	ENTEROLERT	Enterococci	2420	J96	MPN/100mL
BILLGR60	Billy Creek @	7/18/2017 10:08:00 AM	6	ENTEROLERT	Enterococci	770		MPN/100mL
BILLGR60	Billy Creek @	8/21/2017 10:09:00 AM	6	ENTEROLERT	Enterococci	1986		MPN/100mL
BILLGR60	Billy Creek @	9/25/2017 10:50:00 AM	6	ENTEROLERT	Enterococci	1414		MPN/100mL
BILLGR60	Billy Creek @	10/23/2017 10:17:00 AM	6	ENTEROLERT	Enterococci	2420	J96	MPN/100mL
BILLGR60	Billy Creek @	11/30/2017 9:32:00 AM	6	ENTEROLERT	Enterococci	1986		MPN/100mL

BILLGR20 - Billy Creek @ Veronica Shoemaker
 BILLGR60 - Billy Creek @ Ortiz

Graphics of Lee County derived ECB data for Billy Creek at Ortiz Avenue and Veronica Shoemaker Boulevard

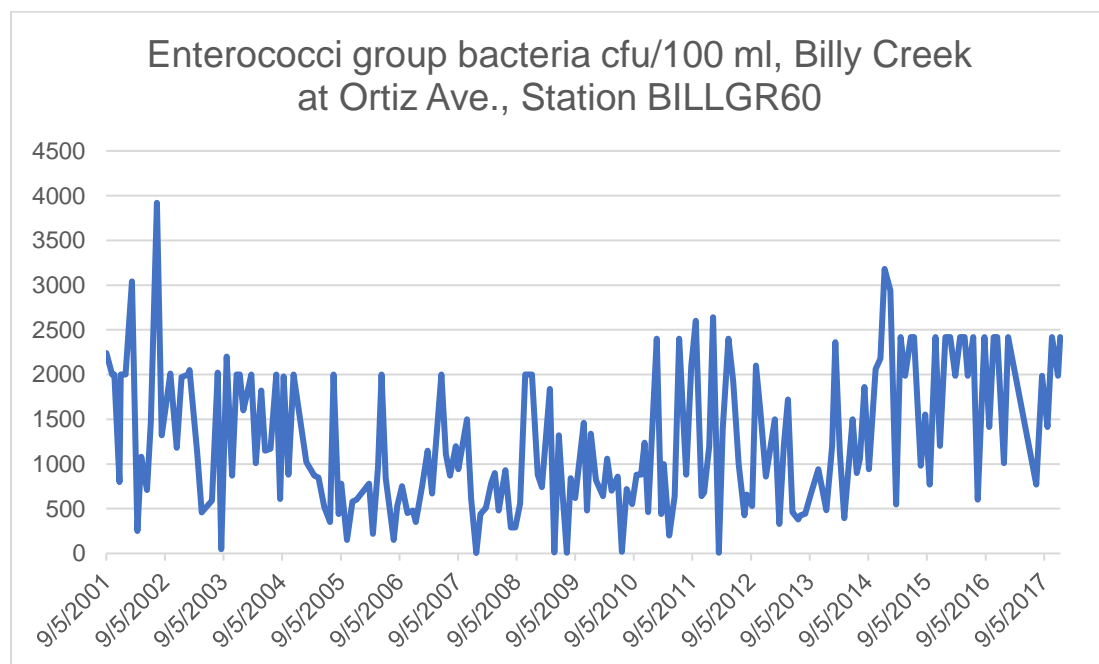
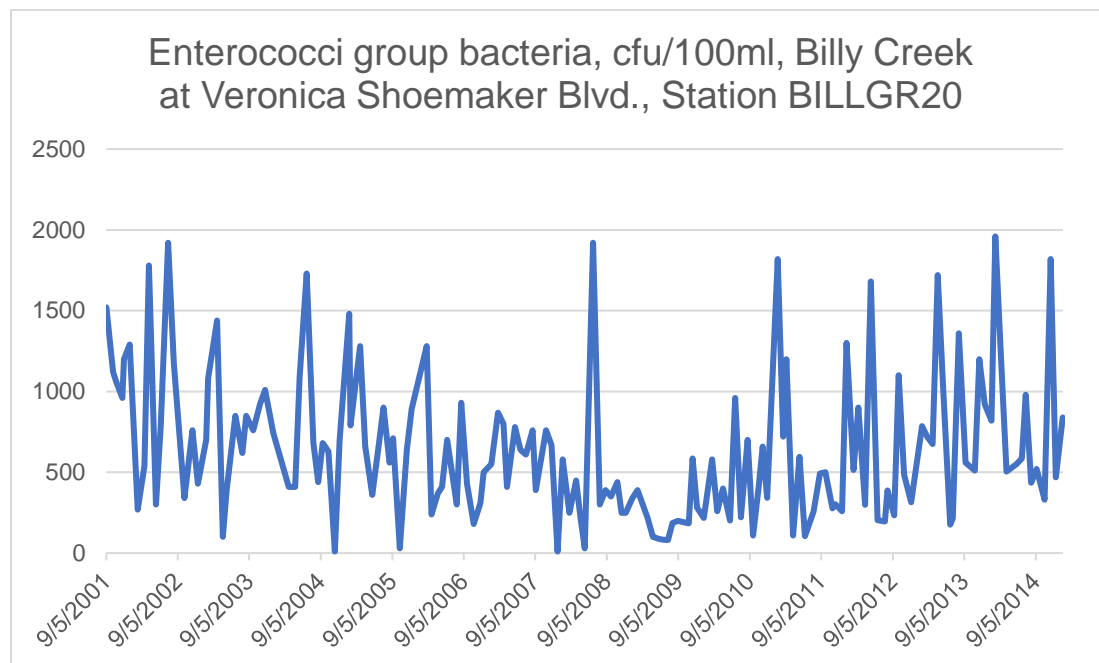


Table 1. Summarized EGB values at Billy Creek stations CFMBILLY1,3,4,6

Station	Period of Record	No. monthly samples	Mean EGB cfu/100ml
CFMBILLY1	2/8/05-6/17/10	67	556
CFMBILLY3	2/8/05-6/17/10	65	435
CFMBILLY4	2/8/05-6/17/10	68	750
CFMBILLY6	2/8/05-6/17/10	74	499

Boehm and Sassoubre 2014 reference citation

Alexandria B. Boehm and Lauren M. Sassoubre. 2014. Enterococci as Indicators of Environmental Fecal Contamination; *In*: Gilmore MS, Clewell DB, Ike Y, et al., editors. 2014. Enterococci: From Commensals to Leading Causes of Drug Resistant Infection [Internet].

<https://www.ncbi.nlm.nih.gov/books/NBK190421/>