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Recreational Water Quality Criteria Revision FACT SHEET

The Guam Recreational Beach Monitoring Program (RBMP) has collected bacteriological data of Guam's beaches since the early 1970s. The responsibility for administering and conducting the RBMP is carried out by the staff of the Environmental Monitoring and Analytical Services Division within Guam EPA. The goals of program are to monitor and assess Guam's recreational waters for microbiological contamination and then notify the public about the condition of those waters. The Recreational Water Quality Criteria (RWQC) guidelines that the current program follows were established in 1986 by the USEPA under the Clean Water Act (CWA).

The Beaches Environmental Assessment and Coastal Health (BEACH) Act of 2000 made significant amendments to the CWA and the recreational waters monitoring requirements. These amendments provided an additional source of funding to states and territories, and further directed the USEPA to conduct studies on the applicability of the approved fecal indicator bacteria and to establish new or revised criteria for these indicators based on those studies. The results of this work are presented in the USEPA's 2012 Recreational Water Quality Criteria (document 820-F-12-058 USEPA 2012b, (available at the USEPA's Recreational Water Quality Criteria webpage <http://water.epa.gov/scitech/swguidance/standards/criteria/health/recreation/>). The Revised Guam Recreational Water Quality Criteria are based on these new criteria. Guam EPA will be adopting these new criteria and revising the Guam Water Quality standards accordingly.

The USEPA 2012 RWQC establishes criteria that are based on the latest research and science in bacteria testing and epidemiology. Studies were even conducted in tropical environments. The 2012 RWQC prompted USEPA to establish the National Beach Guidance and Required Performance Criteria for Grants, 2014 (USEPA July 2014). Guam EPA will use the 2014 Beach Guidance since its two main goals are to: 1) provide performance criteria for adopting 2012 RWQS which will put in place public health protections, and 2) provide improved guidance to local states in identifying sources of fecal pollution, in public notification, and in determining site-specific solutions for protecting public health.

The 2012 RWQC offers two sets of numeric concentration thresholds, both of which would protect the designated use of primary contact recreation and, therefore, would protect the public from exposure to harmful levels of pathogens. Guam will be adopting the first set of recommended criteria, illustrated below.

This revised criteria corresponds to an illness rate of 36 gastrointestinal illness cases per 1,000 primary contact beach goers, based upon the National Epidemiological and Environmental Assessment of Recreational Water (NEEAR) definition and analyses. This rate is similar to the risk level associated with the 1986 criteria and is generally accepted by the public. The new criteria now provide similar protection for fresh and marine waters.

CRITERIA ELEMENTS	Recommendation 1: Estimated Illness Rate 36/1,000	
	GM (CFU/100 mL)	STV (CFU/100 mL)
Enterococci (marine & fresh)	35	130
<i>E. coli</i> (fresh)	126	410

The new Guam enterococci standard for all marine and surface waters will read as follows:

“Concentrations of enterococci bacteria shall not exceed 35 CFU/100 ml based upon the geometric mean of five (5) sequential samples taken over a period of thirty (30) days AND the Statistical Threshold Value (STV) of 130 CFU/100 ml should not be exceeded by more than 10 percent of the samples taken during the same thirty (30) day period.”

The new Guam *Escherichia coli* (*E. coli*) indicator standard for all surface waters will read as follows:

“Concentrations of *E. coli* shall be no greater than 126 CFU/100 ml based upon the geometric mean of five (5) sequential samples taken over a thirty (30) day period AND the Statistical Threshold Value (STV) OF 410 CFU/100 ml should not be exceeded by more than 10 percent of the samples taken during the same thirty (30) day period.”

The new criteria also provide similar protection for both surface and marine waters. There is no longer any distinction between the two types and there is no longer a separate criteria for different levels of beach use intensities.

The use of the statistical threshold value (STV) is the only major change for the Guam Criteria. The STV is a derived value that is the 90th percentile of the water quality distribution of the geometric mean (geomean) which should not be exceeded by more than 10% of samples taken within a 30-day period for a particular water body. It

replaces the term “Single Sample Maximum (SSM)”, which was the upper 75th percentile value of the geometric mean of the samples. The STV serves as the secondary level of concentration that along with the geomean, should better protect the public health and the designated use of primary contact recreation.

The Beach Action Value (BAV) is another recommended component of the guidance that serves as a conservative, precautionary measure for making beach notification decisions. It is the value that corresponds to the 75th percentile of the same distribution used to establish the above criteria. The use of the BAVs is not part of the recommended criteria and does not need to be adopted into a Guam’s Water Quality Standards. They are values that a state may use to assist in issuing beach notifications. Any single sample above the BAV would trigger a beach notification until the collection of another sample below the BAV. Guam EPA is currently researching if a Guam specific value is more appropriate then the recommend 75th percentile value. This value will be presented later this year in the scheduled revision for the RBMP.

Section 303 of the CWA requires that the Guam Water Quality Standards (GWQS) be reviewed at least once every three years, and revised or “updated” as appropriate. With the issuance of the 2012 RWQC, the GWQS are being revised to reflect these changes. The Guam EPA is responsible for maintaining the GWQS in compliance with these regulations, which are promulgated as the basis for enforcement of the CWA. The GWQS were last updated in 2001 and a complete update is overdue. Guam EPA expects to commence a complete revision this coming fiscal year.

In addition to the proposed updates listed here, there are a number of minor revisions proposed that are of a typographical nature, renumbering, etc., that are not detailed. All major revisions to the current GWQS (2001 Revision) are highlighted below.

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A. Numeric Water Quality Criteria for Marine and Surface Waters. [Page 16]

1. Microbiological Requirements	Applicable to
<p>a. All marine AND SURFACE water bodies require the use of enterococci bacterial indicator.</p> <p>i. Concentrations of enterococci bacteria shall not exceed 35 CFU/100 ml based upon the geometric mean of five (5) sequential samples taken over a period of thirty (30) days. No instantaneous reading shall exceed 104 enterococci/100 ml. AND THE STATISICAL THRESHOLD VALUE (STV) OF 130 CFU/100 ml should not be exceeded by more than 10 percent of the samples taken during the same thirty (30) day period.</p> <p>ii. Concentrations of enterococci shall not exceed 35 enterococci/100 ml based upon the geometric mean of five (5) sequential samples taken over a thirty (30) day period. No instantaneous reading shall exceed 276 enterococci/100m}</p>	<p>M-1, M-2, M-3 S-1, S-2, S-3</p> <p>M-3</p>

1. Microbiological Requirements (continued)	Applicable to
<p>b. For all surface waters, microbiological analysis may include the use of <i>Escherichia coli</i> (<i>E. coli</i>) indicator and/or enterococci indicator.</p> <p>i. Concentrations of <i>E. coli</i> shall be no greater than 126 CFU/100 ml based upon the geometric mean of five (5) sequential samples taken over a thirty (30) day period. No instantaneous reading shall exceed 235 CFU/100 ml AND THE STATISICAL THRESHOLD VALUE (STV) OF 410 CFU/100 ml should not be exceeded by more than 10 percent of the samples taken during the same thirty (30) day period.</p> <p>ii. Concentrations of enterococci shall be no greater than 33 CFU/100 ml based upon the geometric mean of five (5) sequential samples taken over a thirty (30) day period. No instantaneous reading shall exceed 61 CFU /100 ml.</p> <p>iii. Concentrations of <i>E. Coli</i> shall be no greater than 126 CFU/100 ml based upon the geometric mean of five (5) sequential samples taken over a thirty (30) day period, nor shall any instantaneous reading exceed 406 CFU /100 ml.</p>	<p>S-1, S-2, S-3</p> <p>S-1, S-2</p> <p>S-3</p>
1. Microbiological Requirements (continued)	Applicable to
<p>iv. Concentrations of enterococci shall be no greater than 33 CFU/100 ml based upon the geometric mean of five (5) sequential samples taken over a thirty (30) day period, nor shall any instantaneous reading exceed 108 CFU /100 ml.</p>	<p>S-3</p>

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Section 5105. Definitions. [Page 48]

77. **Secondary Treatment.** A level of sewage treatment that involves the introduction of bacteria which bind to solids and aid in their removal. The liquid wastewater is also partially disinfected.

78. **Sewage.** The water-carried waste products from the residences, public buildings, institutions or other buildings, including the excrement or other discharge from the bodies of human beings or animals, together with such ground water infiltration and surface water as may be present.

79. **Shellfish.** Mollusks, crustaceans and other forms of marine animal and plant life other than finfish, marine mammals and birds.

80. **Special Aquatic Sites.** Sites possessing special ecological characteristics and values, including wetlands, wildlife sanctuaries and refuges, mud flats, vegetated shallows, coral reefs, riffle and pool complexes.

81. **Statistical Threshold Value (STV).** The STV is a derived value that is the 90th percentile of the water quality distribution of the geometric mean (geomean) which should not be exceeded by more than 10% of samples taken within a 30-day period for a particular water body.

82.81. **Storm Water Runoff.** Water from rain which travels via flow across surfaces to storm drain systems or receiving waters. As it flows, it often picks up pollutants, such as soil, automobile fluids, animal wastes, pesticides and fertilizers.

83.82. **Surface Waters.** Any natural or artificial water source, including all streams, sinkholes, lakes, ponds, wetlands, impounding reservoirs, inland watercourses and waterways, springs, irrigation systems and all other inland water bodies or accumulated waters. For the purpose of this regulation, the term does not include coastal waters or those subject to the ebb and flow of tides.

84.83. **Thermal Discharge.** Discharge of water into the environment which has temperature component either above or below the temperature of the receiving body of water.

85.84. **Toxic.** Causing death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction) or physical deformations in organisms. The quantities and exposures necessary to cause these effects can vary widely.

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Appendix H.

Water Quality Criteria Documents. (continued) [page 114]

Chemical	NTIS Order No.	EPA Document No.
Aluminum	PB88-245998	EPA440/5-86-008
Ammonia	PB-85-227114	EPA440 /5-85-001
Ammonia (saltwater)	PB-89-195242	EPA440/5-88-004
Antimony	PB81-117319	EPA440/5-80-020
Antimony(III)-aquatic	resource center	
Arsenic -1980 -1984	PB81-117327 PB86-227445	EPA440/5-80-021 EPA440/5-84-033
Asbestos	PB81-117335	EPA440 /5-80-022
Bacteria- 1976 1984 2012	PB263943 PB86-158045	EPA440/9-76-023 EPA440/5-84-002 EPA 820-F-12-058
Barium	PB163943	EPA440/9-76-023
Benzene	PB81-117293	EPA440 /5-80-018
Benzidine	PB81-117343	EPA440 /5-80-023
Beryllium	PB81-117350	EPA440/5-80-024

Additional information:

<http://water.epa.gov/scitech/swguidance/standards/criteria/health/recreation/index.cfm>

<http://epa.guam.gov/beach-report/what-does-the-beach-report-tell-me/>

<http://water.epa.gov/scitech/swguidance/standards/wqslibrary/territories.cfm>