

**USE ATTAINABILITY ANALYSIS**  
**GREENVILLE-BANNING CHANNEL – TIDAL PRISM**



**October 4, 2013**

**Santa Ana Regional Water Quality Control Board**

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# **UAA ANALYSIS: GREENVILLE-BANNING CHANNEL – TIDAL PRISM**

## **1.0 Executive Summary**

This analysis demonstrates that the REC1 use does not exist and is not attainable in the Tidal Prism of the Greenville-Banning Flood Control Channel (GBC). REC2 use of the Tidal Prism exists and the Tidal Prism should be so designated. The REC1 and REC2 uses are described as:

Water Contact Recreation (REC1) waters are used for recreational activities involving body contact with water where ingestion of water is reasonably possible. These uses may include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, whitewater activities, fishing, and use of natural hot springs.

Non-contact Water Recreation (REC2) waters are used for recreational activities involving proximity to water, but not normally involving body contact with water where ingestion of water would be reasonably possible. These uses may include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, and aesthetic enjoyment in conjunction with the above activities.

The Tidal Prism is a concrete-lined box flood control channel. It is 60-feet wide with vertical walls that are 20-feet high. Public access is prohibited by law and prevented by chain link fencing and locked gates throughout its entire length. The Tidal Prism extends from the confluence with the Santa Ana River upstream to an inflatable dam and pump works, a distance of approximately 1.2 miles. During dry conditions, the inflatable dam diverts low flows from the channel to the Orange County Sanitation District and a nearby constructed wetland. As a result, the Tidal Prism is dominated by tidal flows from the Santa Ana River Tidal Prism. Water depths are generally shallow in this reach.

Extensive photographic evidence, field surveys and interviews of knowledgeable local authorities indicates that water contact recreation is not occurring and has not occurred in the Greenville-Banning Channel Tidal Prism. The REC1 use cannot occur in the Tidal Prism because flood control modifications and, at times, low flow conditions preclude attainment of these uses.

Analysis of historical water quality monitoring data indicates that the bacterial objectives are not being met. However, recreational uses cannot be attained by imposing more stringent effluent limitations or requiring additional Best Management Practices (BMPs) to control non-point sources because factors other than water quality will continue to preclude the REC1 use.

The tidal flows in the Tidal Prism provide the opportunity for viewing wildlife from the adjacent bicycle path. As a result, the REC2 use is attained. However, the REC1 use is not attained and should not be designated for the Tidal Prism of the Greenville-Banning Flood Control Channel.

## **2.0 Segment description**

### **2.1 Location**

The Greenville-Banning Channel watershed (approximately 9 mi<sup>2</sup>) is located in Orange County and includes portions of the Cities of Costa Mesa and Santa Ana. See Figure GB-1. The Channel is not now listed in the Basin Plan, and beneficial uses for the Channel have not yet been formally designated. Two reaches of the Channel are proposed to be identified and included in the Basin Plan: the proposed Tidal Prism reach, which is the subject of the UAA contained herein, and proposed Reach 1 of the Channel. A UAA for Reach 1 has also been conducted and reported in a separate document. These two reaches extend approximately 3.35 miles from the confluence of the channel with the Santa Ana River upstream to the California Street crossing in the City of Costa Mesa.

The Tidal Prism is subject to tidal influence due to its proximity to the Pacific Ocean and low elevation. The terminus of the Greenville-Banning channel is located approximately 1.3 miles upstream of the ocean at the confluence with the Santa Ana River just downstream of the Hamilton Avenue/Victoria Street Bridge in the City of Costa Mesa. The proposed Tidal Prism segment of the Greenville-Banning channel begins at the Santa Ana River confluence and extends upstream approximately 1.2 mile to the inflatable rubber dam operated by the Orange County Public Works Department. Dry weather flows that pool up behind the dam are diverted to the sanitary sewer system for treatment and to supply water to a constructed wetland. There are no tributaries to the Tidal Prism. See Figure GB-1, GB-2, and GB-5.

### **2.2 Proximate Land Use**

The Talbert Nature Preserve borders the eastern side of the proposed Tidal Prism. The Santa Ana River borders the tidal prism to the west. A bicycle trail lies adjacent to the entire length of the Tidal Prism. See Figure GB-5.

### **2.3 Channel Characteristics**

The area surrounding the current Greenville-Banning Channel originally drained to the Santa Ana River. The channelization of the Santa Ana River created flooding in the area in the early 1900's. A channel, known as the Talbert Ditch, was constructed in the early 1900's to resolve these flooding issues. In 1959 the Greenville-Banning Channel was completed as an earthen trapezoidal channel to replace the Talbert Ditch. Over time the Tidal Prism and Reach 1 sections of the channel were converted to concrete-lined.

The Tidal Prism is a vertical walled, fully concrete-lined channel. The channel is flat bottomed and 60 ft. in width. The walls are 20 ft. in height. The entire length of the Tidal Prism is fenced off on both sides of the channel by a six foot high chain link fence with one locked access gate and ramp. The inflatable dam, the upstream terminus of the tidal prism, is approximately 5 ft. in height when inflated. The dam is inflated during dry weather conditions that occurs the vast majority of the time during the year.



**Figure GB-1. Map of Greenville-Banning Channel watershed.** (Source: Use Attainability Analysis Technical Report for Greenville-Banning Channel, CDM, August 2010, Figure 2-1)



**Figure GB-2 Proposed Tidal Prism and Reach 1 of the Greenville-Banning Channel.** The Channel lies adjacent to the Santa Ana River from its confluence with the River to upstream of Gisler Avenue at the California Street crossing.



**Figure GB-3: Rubber dam diversion at Greenville-Banning Channel.** (Photograph from Orange County Public Works)



**Figure GB-4 Proposed Tidal Prism Reach of the Greenville-Banning Channel Facing Downstream.** The Santa Ana River (tidal prism), Pacific Coast Highway Bridge, and Pacific Ocean are in the distance. (Regional Board Staff photograph, June 2010)



**Figure GB-5: Proposed Tidal Prism Reach of the Greenville-Banning Channel, facing upstream.** The Santa Ana River Bicycle Trail and Talbert Nature Reserve are to the right and the Santa Ana River to the left of the channel. The inflatable dam is approximately 0.5 further upstream from this location. (Regional Board Staff Photograph, October 2010)

**Table GB-1: Channel Characteristics for Tidal Prism Reach of GBC**

Length	Boundaries	Description
1.2 miles	Low flow diversion dam (inflatable dam) to Santa Ana River Confluence	Fully concrete-lined, 60 ft. bottom width, 20 ft. high vertical walls.

## 2.4 Regulatory Status

### 2.4.1 Beneficial Use Designations

No portion of the Greenville Banning Channel (GBC) is currently identified or included in the Santa Ana Basin Plan. It is proposed that both the Tidal Prism and Reach 1 of the GBC be added to the Basin Plan. The following beneficial use designations or exceptions are recommended for the Tidal Prism:

- **MUN** (Municipal and Domestic Supply): MUN is not an existing use nor can this use be feasibly attained in the future. Total dissolved solids (TDS) levels exceed 3,000 mg/l. An exception from the MUN designation is appropriate pursuant to the Sources of Drinking Water Policy.
- **REC2** (Non-contact Water Recreation): The bicycle path adjacent to the channel offers opportunities for aesthetic enjoyment including wildlife viewing.
- **MAR** (Marine Habitat): The marine waters of the channel support a marine habitat that is interconnected with the tidal prism of the Santa Ana River and the Ocean. Marine organisms such as barnacles and mussels grow on the concrete walls of this reach. Marine fish such as sting rays are noted in the channel.
- **WILD** (Wildlife Habitat): Birds and fish from the adjacent tidal prism of the Santa Ana River and birds from area wetlands use the proposed tidal prism as habitat.
- **RARE** (Rare, Threatened, or Endangered Species): Per CDFW staff (personal communication with Regional Board staff), the proposed tidal prism provides foraging habitat for the federally listed California Least Tern (*Sterna antillarum*).

### 2.4.2 303 (d) Listings and Total Maximum Daily Loads (TMDLs)

The Greenville-Banning Channel is not listed on the 2010 303 (d) list of impaired waters for any pollutant. No TMDLs are required for this waterbody.

Elevated levels of bacteria indicators, including enterococcus, have been detected at Huntington Beach State Park, located downstream of the Channel, leading to the inclusion of the Park on the 2006 303 (d) list of impaired waters. The State Park was delisted in the 2010 303 (d) list for enterococcus and bacteria indicators because of an insufficient number of water samples that showed impairment.

In order to protect downstream water quality and prevent future impairment of beneficial uses near Huntington Beach State Park and coastal Newport Beach due to inputs from the Greenville-Banning Channel, the Orange County Public Works Department (OCPW) installed the inflatable dam (see Figure GB-3, above). This system diverts flows to the Orange County Sanitation District (OCSD) and an adjacent constructed wetland and riparian area. The diversion system is discussed in greater detail in Section 5 of this document.

### **3.0 Use Attainability Analysis- Factors Analysis**

#### **3.1 Regulatory Framework – UAAs and Beneficial Use Designations**

Section 101 (a)(2) of the CWA states that “it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983”. The CWA and implementing federal regulations provide special protection for these “fishable/swimmable” uses, including recreation. The statute and regulations create a rebuttable presumption that all waters support these uses and should be so-designated as part of the states’ water quality standards.

To overcome this presumption, the states are required to conduct a Use Attainability Analysis (UAA) and demonstrate that attaining the use(s) is not feasible based on one or more of the six factors identified in federal regulations (40 CFR 131.10(g)):

1. Naturally occurring pollutant concentrations prevent the attainment of the use; or
2. Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met; or
3. Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or
4. Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modifications in a way that would result in the attainment of the use; or
5. Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses: or
6. Controls more stringent than those required by sections 301 (b) (Effluent Limitations) and 306 (National Standards of Performance) of the Act would result in substantial and widespread economic and social impact.

A UAA is a structured scientific assessment of the factors affecting the attainment of the use(s), which can include physical, chemical, biological, and economic factors as described in 40 CFR 131.10 (g)(1)-(6), above.

Federal regulation at 40 CFR 131.10 (h) prohibits States from removing designated uses if:

1. They are existing uses, as defined in 40 CFR 131.3, unless a use requiring more stringent criteria is added; or

2. Such uses will be attained by implementing effluent limits required under sections 301 (b) and 306 of the Act and by implementing cost-effective and reasonable best management practices for nonpoint source control.

"Existing uses" are those uses actually attained in the water body on or after November 28, 1975 (the date of USEPA's initial water quality standards regulation), whether or not they are included in the water quality standards.<sup>1</sup> Guidance provided by USEPA in 1985 indicates that an "existing" primary contact recreational use<sup>2</sup> can be established by demonstrating that swimming has actually occurred since November 28, 1975, or that the water quality is suitable to allow such uses to occur, unless there are physical problems that prevent the use regardless of water quality.<sup>3</sup> Suitable water quality is demonstrated by consistent, not merely sporadic, attainment of applicable water quality objectives. More recent USEPA guidance states that EPA considers an "existing" use to mean the use and water quality necessary to support the use that have been achieved in the waterbody on or after November 28, 1975.<sup>4</sup> USEPA states that: "It is appropriate to describe the existing uses of a waterbody in terms of both actual use and water quality because doing so provides the most comprehensive means of describing the baseline conditions that must be protected."

USEPA has indicated that where there is very limited actual primary contact use and the physical and/or water quality characteristics of the water body do not and are not likely to support that use, then it would be appropriate to conclude the primary contact recreation is not an "existing" use.<sup>5</sup> In making such determinations, federal guidance recommends that states should consider a **suite of factors** such as the actual use (present and historic), existing water quality, potential water quality conditions, access, recreational facilities, location (e.g., proximity to suitable recreational alternatives), safety considerations, as well as the physical conditions of the water body.<sup>6</sup> However, states are not required to evaluate all six factors identified in 40 CFR 131.10(g) as part of every UAA.

In designating the uses of a water body, and in considering changes to those designations, states must take into consideration the water quality standards of downstream waters and ensure that water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters. (40 CFR 131.10(b)).

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<sup>1</sup> 40 CFR 131.3

<sup>2</sup> "Primary contact" recreation is equivalent to California's REC1 (water contact recreation) beneficial use

<sup>3</sup> USEPA. Questions & Answers on Antidegradation, August 1985. (USEPA Water Quality Standards Handbook, Second Edition. EPA-823-B-12-002. Appendix G)

<sup>4</sup> USEPA, Letter w/attachment from Denise Keehner (Director, Standards and Health Protection Division) to Derek Smithee, State of Oklahoma, September 5, 2008. (Cited as updated information in USEPA Water Quality Standards Handbook, Second Edition. EPA-823-B-12-002, Chapter 4)

<sup>5</sup> USEPA. 63 FR 36752 (July 7, 1998)

<sup>6</sup> USEPA. 63 FR 36756 (July 7, 1998)

Finally, decisions to remove or not designate REC1 uses for surface waters are subject to reconsideration as part of the Basin Plan Triennial Review process. Where new information and/or changed conditions warrant the REC1 designation, then the Basin Plan must be amended accordingly.

### **3.2 40 CFR 131.10 (g) Factor Assessment**

Based on the analyses described in the following sections of this report, Regional Board staff concluded that the Tidal Prism of the Greenville-Banning Channel is incapable of supporting water contact recreation (REC1) because:

Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modifications in a way that would result in the attainment of the use (see Section 3.2.1); and, under typical dry weather conditions,

Natural, ephemeral intermittent or low flow conditions or water levels prevent the attainment of the use (see Section 3.2.2).

#### **3.2.1. 40 CFR 131.10 (g) Factor 4: Dams, diversions or other types of hydrologic modifications preclude the attainment of the use**

##### **3.2.1.1 Methods and Fieldwork**

CDM (now CDM-Smith), serving as consultants to the SWQSTF, collected relevant data and prepared a UAA Technical Report that included an assessment and summary of key attributes of the Greenville-Banning channel morphology in June 2010.<sup>7</sup> Regional Board staff made nine field visits to the Greenville-Banning Channel between 2009 and 2013. During these reconnaissance surveys, Regional Board staff walked the entire length of the Channel to acquire first-hand knowledge of the depth, dimensions and dominant construction characteristics, as well as information concerning accessibility and evidence of recreational use. In addition, the Regional Board staff reviewed the original engineering documents describing the planned improvements when the Channel was being converted to a concrete-lined flood control facility.<sup>8</sup> OCPW provided more recent construction plans of the channel from March 2013.

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<sup>7</sup> CDM-Smith. Use Attainability Analysis Technical Report for the Greenville-Banning Channel. June, 2010

<sup>8</sup> County of Orange Environmental Management Agency. Greenville-Banning Channel Facility No. D03. August, 1989.

### **3.2.1.2 Findings and Conclusions**

The Greenville-Banning Channel Tidal Prism has been significantly modified for flood control purposes. As described above, the channel is completely vertical walled and concrete lined. The channel bottom is flat, causing tidal flows to spread out over the width of the channel, which acts also to reduce the depth. There are no areas that would become scoured out and deepened by flow as in earthen channels. The 20 ft. high vertical walls make it virtually impossible and extremely unsafe to gain access to the water. While it is theoretically possible to access the Tidal Prism from the Santa Ana River, it is extremely unlikely that anyone would elect to do so, given the difficulty of access to the River itself and the close proximity of far superior recreational areas (ocean beaches and the Santa Ana River). Indeed, no evidence of any recreational use at or in the vicinity of the mouth of the Channel at the River confluence was obtained as the result of the Task Force investigations, including field observations and photographic data collection. Representative photographs of the modified channel are shown in this report in Figures GB-3, GB-4, and GB-5.

It is not feasible to restore the water body to its original condition or to operate such modifications in a way that would result in the attainment of the use. The original condition of the channel was a flood control channel. The concrete lining of the channel was and remains necessary to keep the channel gradient in relation to the adjacent Santa Ana River channel and for flood control purposes, i.e., to accelerate flows downstream and prevent flooding in areas adjacent to the channel.

### **3.2.2. 40 CFR 131.10 (g) Factor 2 “Natural, Ephemeral, Intermittent or Low Flow Conditions or Water Levels prevent the attainment of the use**

#### **3.2.2.1 Methods and Fieldwork**

Water level data were collected during the reconnaissance field visits to the channel and during REC use surveys conducted on 5 summer weekends in 2011. There is no gauging station on the channel and access into the channel to measure depths directly was not possible for the most part as special logistical arrangements are required because of fencing and locked gates. Surveyors were asked to estimate depths as viewed from the bicycle path adjacent to the Channel.

Twice in April 2013, Regional Board staff arranged to enter the Channel and took water level measurements at four locations in the Tidal Prism: 1) the confluence with the Santa Ana River; 2) at the Victoria Street Bridge; 3) midway in the Tidal Prism; and 4) just downstream of the inflatable dam. At each location, in-channel measurements were taken at one-third, one-half, and two-thirds of the width of the channel.

### 3.2.2.2 Findings and Conclusions

As noted above, the proposed Tidal Prism is subject to tidal influence and, accordingly, the depth of flow in the channel in this area varies according to the tidal cycle. However, the depths are not typically deep enough to allow water contact activities where ingestion of water is reasonably possible. In April 2013 Regional Board staff measured depths at the Santa Ana River confluence, where depths in the Tidal Prism would be expected to be deepest, of 20 inches near low tide and three feet 1 inch near high tide. At the midway point of the Tidal Prism between the confluence and the inflatable dam, the average depth measured by staff was 11 inches. Just below the inflatable dam the average low and high tide depth was 1 inch. See Figure GB-6. Board staff has also observed that at low tides there can be no standing water for several yards downstream of the inflatable dam. Individuals who completed the REC use surveys estimated varying depths (from viewing the channel from the bicycle trail) of the Tidal Prism. The variation in these observations and comparisons to the measured depths reflect the difficulty of accurately determining the depth by observations of this kind<sup>9</sup>.

In conclusion, the shallow depths of the Tidal Prism that predominate in the majority of the Tidal Prism most of the time do not allow attainment of the REC 1 use<sup>10</sup>.

Finally, it is not feasible to attain the REC 1 use by the discharge of a sufficient volume of effluent discharges. First, even if practical to divert recycled water to the channel (and it is not), there is significant demand for recycled water for beneficial reuse (e.g., the Groundwater Replenishment System, operated by Orange County Water District in conjunction with the Orange County Sanitation District). Second, It would simply be nonsensical to discharge effluent, even if available, to the Greenville-Banning Channel in an effort to provide recreational opportunity, since recreational activities do not and have no reasonable probability to occur because of other considerations, e.g., access, safety and channel morphology.

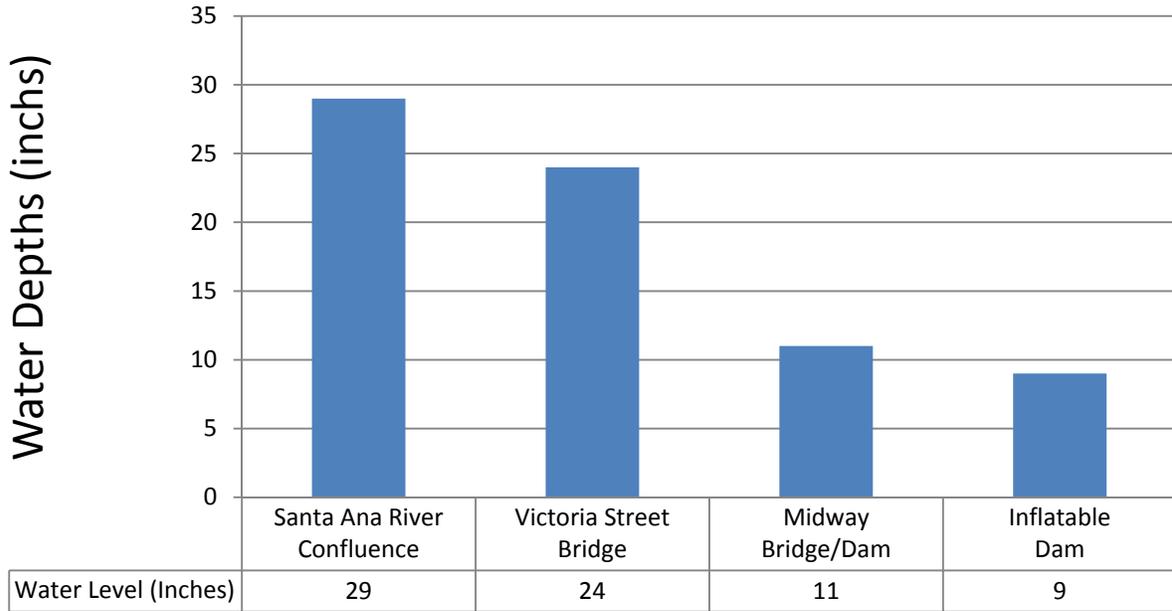
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<sup>9</sup> REC use surveyors have estimated the depth at the Santa Ana River confluence (downstream boundary of Tidal Prism) to be from 5 meters to 3 ft. while actual measurements showed much shallower depths as described above and shown on Figure GB-6.

<sup>10</sup> Federal Cooperative Instream Flow Service Group (members include: U.S. Fish & Wildlife Service, U.S. EPA, U.S. Heritage Conservation and Recreation Service, & U.S. Bureau of Reclamation). Methods of Assessing Instream Flows for Recreation. FWS/OBS-78/34 (June, 1978) pg. A-7.

## Figure GB-6 Water Depths Along Greenville-Banning Channel Tidal Prism

(plot derived from field data collected by staff April 2013,  
depths reflect average of high and low tide)



## **4.0 Existing Use Analysis**

As described in Section 3.1, federal law and regulation create the rebuttable presumption that all surface waters support “swimmable” uses (REC1). A UAA is required to overcome this presumption and justify the decision not to designate a surface waterbody as REC1 (or to de-designate the REC1 use for that waterbody). However, states must designate REC1 if that use is “existing” or if the recreational use can be attained by implementing effluent limits required under sections 301(b) and 306 of the Clean Water Act and by implementing cost-effective and reasonable Best Management Practices for non-point source control.<sup>11</sup> A formal analysis was conducted to evaluate these conditions.

### **4.1 Evaluation of Actual Recreational Activities**

#### **4.1.1 Assessment Methods**

This analysis consisted of numerous site visits by Regional Board and CDM staff, two summers of on-site weekend REC surveys, interviews of Orange County Public Works (OCPW) staff, Park Rangers, users of the bicycle trail, and a review of historical recreational use.

#### **4.1.2 Findings and Conclusions**

Task Force members visited the Greenville-Banning Channel during weekends in July, August, and into the fall of 2011 and in July and August 2006 to complete a recreational use survey along the Greenville-Banning Channel. Task Force members were asked to stay at a location for half an hour and record what recreational activities, if any, they observed. The Task Force members described the number and activity of people they saw in the area, the weather, depth and clarity of the water and any evidence of activity in the area and recorded the information on survey forms. In 2011 five surveys were completed in which the entire length of the Tidal Prism was observed. No individuals were reported to be in the water or inside the channel. During the recreational use surveys completed in 2006, the surveyors were asked to view the channel from the camera locations (see upcoming discussion on camera use survey). The camera locations were located in Reach 1 a short distance upstream of the Tidal Prism. From the camera locations the recreational use surveyors would have at least a view of the up-stream section of the Tidal Prism. Again these surveys reported no individuals in the water or within the channel. Since the recreational use survey instructions were to note any recreational activity in the channel, it is fair to assume that they looked into the tidal prism segment as well as in Reach 1. All survey reports note numerous people on the bike trail alongside the Tidal Prism segment of the Greenville-Banning Channel.

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<sup>11</sup> 40 CFR 131.10(h)

As described in detail in the Greenville-Banning Reach 1 UAA, a digital remote camera recreational use survey was completed in Reach 1. As just noted, two camera locations were located in Reach 1. Weekly surveys associated with maintenance of the digital cameras were completed by CDM staff. CDM staff completed a log for each visit to document any recreation use observed in the channel. As a result, a total of 28 weekly logs were completed in 2005. CDM staff had at least a view of the upper segments of the Tidal Prism. They stated that they looked both upstream and downstream of the cameras during each visit, as far as could be seen, not just in the direction the camera faced and documented any recreation activity they saw. Regional Board staff reviewed the maintenance logs which stated that no individuals were noted in any section of the channel from their viewpoint.

OCPW staff who regularly conduct maintenance activities on the channel have reported no incidents of individuals in the channel or inside the fences. OCPW staff regularly visit the area to operate the inflatable dam and diversion. In addition, Orange County Harbors, Beaches, and Parks employees working at the Talbert Nature Preserve have reported never observing any individuals in the channel in either the proposed Tidal Prism or Reach 1.

Finally, Regional Board staff made frequent visits, at least 12, to the Tidal Prism (and Reach 1) since the work of the Stormwater Quality Standards Task Force began. No individuals have been observed in the channel during those visits. In addition, during site visits Regional Board staff regularly asks individuals who are walking or biking on the bicycle trail if they have ever observed any recreational activities in the Channel. Long time regular bike trail users reported never seeing any one in the channel.

#### **4.1.3 Evidence of Historical Recreational Use**

To collect information regarding historical recreational use, CDM conducted inquiries to local jurisdictional agencies, online searches of California newspaper archives, databases (engineering and environmental trade journals), and search engines such as Google News archive and Lexis-Nexis to identify any accounts or reference to recreational activities in the channel. No historical use information was identified from these searches.

Finally, the Regional Board received no written comments and no public testimony during the public hearing process on the recreation standards amendments, of which this UAA was a part, documenting any past or present recreational activity in GBC.

#### **4.1.4 Probable Future Use**

In accordance with the State Water Resources Control Board recommendations, information regarding potential future recreational uses for the Greenville-Banning Channel was obtained by interviewing local parks and planning authorities.<sup>12</sup> The City of Costa Mesa was contacted as well as Orange County Public Works. From these agency inquiries, proposed use plans were identified. The City of Costa Mesa developed concept plans as part of the Blue Ribbon Committee for the Santa Ana River Trail Vision Study. These plans include improvements to the existing bicycle trail along the channel. Improvements include new access points to the existing bicycle trail, rest areas, improved signage, and pocket parks. The project is at a concept plan level and is not currently funded (via communication with Robert Staples, Fairview Park Plan Administrator, City of Costa Mesa, June 25, 2009). These plans do not include changes to improve access to or make any recreational improvements inside the Greenville-Banning channel itself.

Orange County Public Works was also contacted regarding any potential projects in the Greenville-Banning Channel. No additional projects were identified apart from the concept plans developed by the City of Costa Mesa. Per communications with Jeff Dickman, Regional Recreational Trail Coordinator, OC Public Works (April 22 and July 20, 2009), facilities supporting water contact recreational use are not planned for the channel.

Information concerning potential future recreational facilities was reviewed again in 2011 and no substantive changes were identified. Any updated information can be considered during subsequent triennial reviews.

#### **4.1.5 Summary – Evidence of Past, Present or Probable Future Recreational Use**

In summary, there is no evidence of actual current or historic REC1 use in the proposed Tidal Prism of the Greenville-Banning Channel. Surveys, field surveys and information provided by public agency staff members who routinely visit the proposed reaches of the Channel, particularly the Tidal Prism, provided no evidence of current REC1 use. Nor is there any evidence of historic use of the proposed reach for REC1 use.

The lack of REC1 use in the Tidal Prism is a reflection of the various characteristics of the channel described in detail above, including channel morphology, typical low flows and access and safety considerations.

While it is theoretically possible to enter the proposed Tidal Prism from the Santa Ana River, it is very unlikely that anyone would do so considering the lack of accessibility and the expected preference to remain at or near the ocean beach, which is approximately 1.3 miles from the mouth of the Greenville-Banning Channel. The conditions in the Tidal Prism also make recreating in the channel very unappealing.

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<sup>12</sup> SWRCB Res. No. 2005-0015

The tidal flows fill the flat bottomed channel with murky water providing no area to get out of the water (such as a shore or beach) and hazardous wading conditions (sting rays and sharp objects noted in the channel). In fact, no one has been observed paddling, wading, walking, or swimming in any section of the Greenville-Banning Channel.

## **4.2 Evaluation of Ambient Water Quality**

### **4.2.1 Assessment Methods**

Water quality samples were collected in the Greenville-Banning Channel from 2001 to 2004.

From May 16, 2001 to October 15, 2004 water quality samples were collected at 200 ft. upstream of the inflatable diversion dam and 200 ft. downstream of the diversion dam. The sampling location 200 ft. upstream of the diversion dam is in the proposed Reach 1 and the sampling location 200 ft. downstream of the diversion dam is in the proposed Tidal Prism segment of the Channel. Fecal coliform data for the Tidal Prism are presented in Tables GB-2 and GB-3. Enterococcus data are shown in Table GB-4.

Over the 2001-2004 time period, samples were collected on an approximate weekly basis. For a variety of reasons, sampling was not conducted during some weeks of this period and no sampling was conducted between October 2001 and May 2002. Sample analysis included total and fecal coliform.

Table GB-2 shows the results for fecal coliform for 2001-2004. When 5 or more samples were collected in a 30 day period (calendar month, not rolling 30 day periods), a geometric mean (geomean) was calculated and compared to the existing REC1 fecal coliform objective (200 organisms/100mL based on five or more samples/30 day period.) When, as in most cases, insufficient data were available to calculate geometric means, the fecal coliform data were compared generally to that part of the existing REC1 fecal coliform objective that specifies that not more than 10% of the samples exceed 400 organisms/100mL for any 30-day period.

Using the 2001-2004 data, fecal coliform geometric means were also calculated based on the results of running groups of 5 consecutive samples, collected over periods of 28-30 days. A total of 82 sets of 5 consecutive samples were evaluated. As shown in Table GB-3, the fecal coliform geometric mean objective was exceeded in 18 of these groups (22%). While direct comparison of many of these results to the established Basin Plan objective may be considered inappropriate given the less than 30-day period over which the samples were collected, the results are indicative of the likely frequency of violation of the geomean objective.

Table GB-2: Monthly Fecal Coliform Data Summary  
Greenville-Banning Channel, 2001-2004

Year & Month	Downstream (200' below diversion dam)			
	Count	Sample Results	% > 400	GeoMean
May-01	1	800	100%	
Jun-01	4	40; 300; 80; 4	0%	
Jul-01	4	4; 4; 4; 7	0%	
Aug-01	5	<2; 11; <2; 17; 2	0%	4
Sep-01	4	110; 8; <2; 8,000	25%	
May-02	2	70; 300	0%	
Jun-02	2	2; 2400	50%	
Jul-02	2	4; 300	0%	
Aug-02	4	30; 8; <2; 2;	0%	
Sep-02	5	8; 8; 11; 500; 110	20%	33
Oct-02	3	30; 23; 700	33%	
Nov-02	3	3000; 80; 40;	33%	
Dec-02	4	50; 700; 130; 270;	25%	
Jan-03	4	23; 80; 13; 23	0%	
Feb-03	4	4; 1100; 50; 80;	25%	
Mar-03	5	50; 4; 240; 170; 1700	20%	107
Apr-03	3	500; 8000; 700	100%	
May-03	4	800; 3000; 110; DRY; 50	40%	
Jun-03	2	DRY; 30; DRY; DRY; 7	0%	
Jul-03	2	DRY; DRY;7; 11	0%	
Aug-03	4	14; <20; <20; 17;	0%	
Sep-03	4	>160,000; 50; 40; 900;	50%	
Oct-03	5	130; 30; 110; 23; 5000	20%	138
Nov-03	4	2,400; 80; 270; 700	50%	
Dec-03	3	50; 23; 110	0%	
Jan-04	4	70; 70; 240; 11	0%	
Feb-04	4	220; 90; 300; 3000	25%	
Mar-04	5	300; 80; 20; 27; 50	0%	58
Apr-04	4	>16,000; 500; 24,000; 23	50%	
May-04	3	13; 4; 6	0%	
Jun-04	4	4; <2; 6;<2	0%	
Jul-04	3	17; 300; 2	0%	
Aug-04	2	4; 70; DRY	0%	
Sep-04	0	DRY	0%	
Oct-04	0	DRY	0%	
Total No. of Months with Violations:			16	0
Total No. of Months w/Samples:			33	33
Notes :			Percent:	48% ---

1. Units are colony forming units per 100 milliliters (CFU/100 mL) except for samples collected in 2001, which are reported as most probable number per 100 mL (MPN/100mL).
2. Reporting limit used for results above or below reporting limit when calculating geomean.
3. Geometric mean shown only for calendar months with 5 or more samples.
4. Basin Plan water quality objectives:
  - a) logmean, 200 organisms/100mL based on five or more samples/30 day period
  - b) Not more than 10% of samples exceed 400 organism/100 ml for any 30 day period

Table GB-3: Running 5-Sample Fecal Coliform Geometric Means that exceed Fecal Coliform Objective Greenville-Banning Channel, 2001-2004			
Downstream (200' below diversion dam)			
Date1	Date2	No. of Days	GeoMean
21-Mar-03	17-Apr-03	28	774
26-Mar-03	24-Apr-03	30	959
17-Apr-03	15-May-03	29	1081
24-Apr-03	23-May-03	30	656
1-May-03	29-May-03	29	339
8-May-03	4-Jun-03	28	255
25-Aug-03	22-Sep-03	29	345
4-Sep-03	1-Oct-03	28	518
9-Oct-03	3-Nov-03	26	247
16-Oct-03	10-Nov-03	26	300
22-Oct-03	20-Nov-03	30	359
31-Oct-03	28-Nov-03	29	711
3-Nov-03	1-Dec-03	29	283
2-Feb-04	1-Mar-04	29	351
9-Feb-04	8-Mar-04	29	287
17-Feb-04	15-Mar-04	28	212
22-Mar-04	19-Apr-04	29	207
29-Mar-04	27-Apr-04	30	200
Total No. of Geomeans > 200			18
Total No. of 5-Sample Data Sets:			82
Percent:			22%
Notes:			
1. Units are colony forming units per 100 milliliters (CFU/100 mL), except for samples collected in 2001, which are reported as most probable number per 100 mL (MPN/100 mL)			
2. Reporting limit used for results above or below reporting limit when calculating geomean			
3. Basin Plan water quality objective for REC 1: Logmean < 200 organism/100 mL based on five or more samples/30 day period			

The enterococcus data were evaluated using the criteria recommendations in USEPA's 2012 Recreational Water Quality Criteria. These new criteria include the geometric mean of 35 cfu/100mL for enterococcus, to be calculated based on the number of samples collected during any 30-day period (no minimum number of samples during that period is specified). In addition to the geometric mean, the 2012 Criteria include a Statistical Threshold Value (STV) of 130/100mL that is not to be exceeded in more than 10% of the samples collected during the same 30-day interval used to assess the geometric mean.

**Table GB-4 Monitoring Results for Enterococcus for GBC Channel Tidal Prism  
200' Downstream of Diversion (marine water)  
Exceedances of 2012 USEPA REC Criteria for Statistical Threshold Value (STV)  
and Geomean in Bold**

Year and Month	Count	Sample Results	Percent > 130cfu/100mL (STV)	Geomean (35cfu/100mL exceedances)
May /01	1	50	0%	
June/01	4	60; <10; 120; 10	0%	
July/01	4	20; <5; 23; 60	0%	
Aug/01	5	<20; 5; <5; 10; 10	0%	
Sept/01	4	25; <5; 15; 40	0%	
Aug/01	4	<20; 5; <5; 10; 10	0%	
Sept/01	2	25; <5; 15; 40	0%	
May/02	2	100; 60	0%	<b>77</b>
June/02	2	30; <b>630</b>	<b>50%</b>	<b>137</b>
July/02	2	10; <1	0%	
Aug/02	4	<b>740</b> ; <1; <10; 30	<b>25%</b>	
Sept/02	5	<b>150</b> ; <b>150</b> ; 20; 80; 50	<b>40%</b>	<b>71</b>
Oct/02	3	30; 30; <b>700</b>	<b>33%</b>	<b>86</b>
Nov/02	3	60; 70; <b>280</b>	<b>33%</b>	<b>106</b>
Dec/02	4	<b>240</b> ; <b>690</b> ; <b>580</b> ; <b>710</b>	<b>100%</b>	<b>511</b>
Jan/03	4	<b>220</b> ; 80; 80; 50	<b>25%</b>	<b>92</b>
Feb/03	4	10; 110; 60; 80	0%	<b>48</b>
March/03	5	100; 20; 50; 70; 15	0%	<b>40</b>
April/03	3	<10; <b>900</b> ; 60	<b>33%</b>	<b>81</b>
May/03	5	40; <b>500</b> ; 6; Dry; 12	<b>25%</b>	<b>35</b>
June/03	5	NA; 80; Dry; Dry; 60	0%	<b>69</b>
July/03	5	Dry; Dry; 30; 20; Dry	0%	
Aug/03	5	30; <20; 10; 70;	0%	
Sept/03	4	80; <10; 40; 20	0%	<b>39</b>
Oct/03	5	50; 10; 70; 10; <b>160</b>	0%	
Nov/03	4	63; 80; <b>530</b> ; 90	25%	<b>125</b>
Dec/03	3	20; 20; 60	0%	
Jan/04	4	20; 130; <b>240</b> ; 11	25%	<b>51</b>
Feb/04	4	<b>300</b> ; <b>900</b> ; 130; <b>2200</b>	75%	<b>527</b>
March/04	5	<b>300</b> ; <b>500</b> ; <b>500</b> ; 23; 23	60%	<b>132</b>
April/04	4	170; 50; 11; 21	0%	<b>37</b>
May/04	3	4; 8; 18;	0%	
June/04	4	80; 17; 23; 2;	0%	
July/04	3	<2; <2; 23	0%	
Aug/04	2	80; <b>470</b>	50%	<b>194</b>

**Notes:**

**Months >10% of samples exceed STV =15 (43% of the months monitored)  
19 months geomean exceeded (54% of the months monitored)**

## **4.2.2 Findings and Conclusions**

Table GB-2 indicates that in the Tidal Prism, the current Basin Plan objective for fecal coliform that specifies that no more than 10% of samples collected in a 30-day period are to exceed 400 organisms/100mL was violated in sixteen of the thirty-three months of samples, or 48% of the months sampled. The results presented in Table GB-3 indicate that there are frequent violations of the geometric mean fecal coliform objective in the Tidal Prism.

As shown in Table GB-4, there were frequent exceedances of both the geometric mean and STV components of USEPA's 2012 recommended criteria.

## **4.2.3 Probable Future Water Quality**

OCPW has conducted an extensive review of Best Management Practices (BMPs) for bacteria control (see Table GB-5). Very few BMPs provide the level of effectiveness required to achieve consistent compliance with water quality standards. Those BMPs that are most effective (e.g. percolation ponds and artificial wetlands) require large amounts of land that is not available in the fully-developed watershed draining to the Greenville-Banning Channel.

That said, BMPs are being and will be implemented in response to pertinent requirements in the Orange County Areawide Urban Storm Water Runoff Management Program NPDES permit (Order No. R8-2009-0033, NDPEs CA 8618030, as amended). BMPs evaluated and implemented by the Orange County MS4 Stormwater Program include wet ponds, wetlands and source control programs, including septic system inventory and assessment and portable toilet oversight. Again, the existing development in the drainage area limits the effectiveness of many of these BMPs. The area tributary to the Greenville Banning Channel is sewered and septic tanks are not considered a source of bacteria inputs. Sewer system leaks have not been demonstrated to be a contributor to bacteria densities in the Channel. In short, absent the dry weather diversion at the upper end of the Tidal Prism, significant water quality improvement that results in consistent compliance with bacteria quality objectives as the result of BMP implementation is likely to be highly problematic.

The inflatable dam and diversion works at the upper end of the Tidal Prism were installed because there was no feasible or practicable alternative to achieve water quality standards. Diversion to treatment provides the most effective means to improve downstream water quality and protect downstream uses.

Imposing stringent effluent limitations, pursuant to Section 301(b) and 306 of the Clean Water Act would have no effect on water quality in the Tidal Prism because there are no municipal or industrial wastewater discharges to the Greenville-Banning Channel.

Most important, even if water quality was in compliance with the bacterial objectives, REC1 use of the Tidal Prism would continue to be precluded by the hydrologic

modifications, predominant low flow conditions, and existing access/safety considerations. To protect public safety, the OCPW prohibits access to GBC. The entire length of channel is fenced and gated to deny entry.

The bicycle trail that parallels the Tidal Prism is separated from the channel by fencing and the 20-ft. vertical walls of the channel. Warning signs are displayed stating that access is prohibited and regular site visits by maintenance crews help ensure compliance. For these reasons, recreational uses cannot be attained by imposing more stringent effluent limitations or requiring additional BMPs to control non-point sources.

**Table GB-5: Evaluation of BMP Alternatives for Control of Bacteria**

Bacteria BMP Type	Parameter	Mean Influent #/100 mL	Mean Effluent #/100 mL	n	Percent Removal	Source
<b>Water Treatment BMPs</b>						
Wet Basins (Retention ponds, wet ponds, wet extended detention ponds, stormwater ponds, retention basins). Retains permanent pool.	FC	11700	100	NR	99	CalTrans (2004) study in SoCal
	FC	4400	20	NR	99	CalTrans (2004) study in SoCal
	FC	1929	515	9	73	BMP dB; Fremont, CA
	FC	58	5	24	91	BMP dB; Largo, FL
	FC	4231	2475	16	41.5	BMP dB; Valhalla, NY
	FC	NR	1779	10	90	Schueler (2000); ON
	FC	NR	2858	10	64	Schueler (2000); ON
	<i>E. coli</i>	NR	NR	10	86	Schueler (2000); ON
	<i>E. coli</i>	NR	NR	10	51	Schueler (2000); ON
	FC	152	63	84	58	Mallin et al. (2002); NC
Dry Basins (Dry ponds, detention or extended detention basins or ponds). Designed to empty within several days.	FC	900	2000	NR	-122	CalTrans (2004) study in SoCal; storm
	FC	6700	7500	NR	-12	CalTrans (2004) study in SoCal; storm
	FC	27	27	8	0	USGS (2004) study in USVI
	FC	3412	724	35	79	Harper et al. (1999) study in FL
	<i>E. coli</i>	563	515	18	9	MSAR (2009)
	FC	957	738	18	23	MSAR (2009)
	<i>E. coli</i>	149	204	12	-37	MSAR (2009)
	FC	380	490	12	-29	MSAR (2009)
Constructed Wetlands (Stormwater wetlands, wetland basins, shallow marshes, extended detention wetlands). "Essentially shallow wet basins."	FC	33.8	7.4	5	78	Hinds et al. (2004); Columbus
	FC	760	80	10	89	LN & COO (2004); Laguna Niguel
	FC	1915	116	9	94	LN & COO (2004); Laguna Niguel
	FC	5178	101	12	98	LN & COO (2004); Laguna Niguel
	<i>E. coli</i>	4163	27	10	99	LN & COO (2004); Laguna Niguel
	<i>E. coli</i>	1897	107	9	94	LN & COO (2004); Laguna Niguel

Table GB-5: Evaluation of BMP Alternatives for Control of Bacteria (cont.)						
Bacteria BMP Type	Parameter	Mean Influent #100mL	Mean Effluent #100 mL	n	Percent Removal	Source
<b>Water Treatment BMPs</b>						
	<i>E. coli</i>	630	73	9	88	LN & COO (2004); Laguna Niguel
Media Filters	FC	5800	1400	NR	76	CalTrans (2004) study in SoCal
	FC	NR	18528		-85	City of Austin (1997)
	FC	NR	NR		36	Glick et al. (1998); Austin, TX
Disinfection (UV, ozone, chlorine)	FC	32800**	16**		99.9%	**County of Orange (2008)
Diversion					100% of diverted fraction	RBF (2003)
Vegetated Swales or Channels (Grassed channels, dry swales, retention swales). Only includes those features with little to moderate soil infiltration.	FC	386	459	NR	-19	BMP dB; Altadena, Caltrans (2004)
	FC	84853	47	NR	99.9	BMP dB; Carlsbad, Caltrans (2004)
	FC	490	1122	NR	-129	BMP dB; Cerritos, Caltrans (2004)
	<i>E. coli</i>	20651	717	18	97	MSAR (2009); dry
	FC	16293	675	18	96	MSAR (2009); dry
	<i>E. coli</i>	2448	2904	12	-19	MSAR (2009); wet
	FC	3954	4196	12	-6	MSAR (2009); wet
	FC	65	105	NR	-62	BMP dB; Downey, Caltrans (2004)
	FC	9460	9168	NR	3	BMP dB; Lakewood, Caltrans (2004)
FC	1366	239	NR	82	BMP dB; Vista, CA, Caltrans (2004)	
<b>Volume Reduction BMPs</b>						
Infiltration Basins & Trenches	FC	80-5000	<23	9	>99	LASGRWC (2005)
	<i>E. coli</i>	20-1300	<6.9	9	>99	
	FC	500	ND-800	8		
	FC	ND-13000	11-110	8		
	<i>E. coli</i>	ND-120	ND	8	>99	

**Table GB-5: Evaluation of BMP Alternatives for Control of Bacteria (cont.)**

Bacteria BMP Type	Parameter	Mean Influent #100 mL	Mean Effluent #100 mL	n	Percent Removal	Source
Infiltration Basins & Trenches	FC	230	ND	5	>99	
					100% for infiltration fraction	USEPA (1999); Arvind & Pitt (2006)
Low Impact Development (LID)					No data	

NR = Not Reported; ND=Not detected

Shaded percent removal values were not statistically significant

## 5.0 Protection of Downstream Uses

### 5.1 Regulatory Requirements

In designating the uses of a water body, and in considering changes to those designations, states must take into consideration the water quality standards of downstream waters and ensure that water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters. The Greenville-Banning Channel is tributary to Reach 1 of the Santa Ana River which is designated (and will remain designated) REC1 and REC2. In addition, the Santa Ana River joins the Pacific Ocean just over a mile below the GBC confluence. Shoreline beaches are also designated (and will remain designated) REC1 and REC2. These downstream waters must continue to meet water quality objectives intended to protect primary contact recreation.

### 5.2 Compliance Strategies

Currently, BMPs are being employed to reduce fecal indicator bacteria, including fecal coliform, in the Greenville Banning Channel and downstream receiving waters. As previously discussed, in response to elevated concentrations of indicator bacteria detected in the late 1990's at Huntington Beach State Park, OCPW implemented the diversion of dry weather flows from the Greenville-Banning Channel. An inflatable dam was installed in the channel about 1.2 miles upstream of the confluence with the Santa Ana River. The dam is the upstream terminus of the proposed Tidal Prism. The impounded flows are transported via pipeline across the Santa Ana River to the Orange County Sanitation District treatment facility.

In anticipation of and during stormflow conditions, the dam is deflated and the diversion is stopped. As a result, flows in the channel pass unimpeded downstream into the Santa Ana River and thence the Pacific Ocean. Data from Orange County Public Works show that from January 2006 to October 2010 diversions occurred in 36 of the 58 months in that period and averaged approximately 400,000 gallons per day. On average, approximately 12, 200,000 gallons were diverted to the sanitary sewer during a month in which flows were diverted. The diversions reduce bacteria and nutrient<sup>13</sup> loading to downstream receiving waters, which include ocean coastal beaches that are heavily used for water contact recreation, particularly during the dry summer months.

In addition, starting in early 2013, flows impounded from the inflatable dam are also diverted to a wetland and riparian habitat area that was constructed in the adjacent Fairview Park. The flows are used to support a series of 6 ponds in the wetland area and 17 acres of riparian habitat. All flows diverted to the wetland and riparian area stay in the area; no flows are returned to the GBC. Between the two diversion sources most of the dry weather flows are diverted out of the channel.

As discussed in Section 4.2.3 Probable Future Water Quality, other BMPs are being and will be implemented in response to pertinent requirements in the Orange County Areawide Urban Storm Water Runoff Management Program NPDES permit (Order No. R8-2009-0033, NDPEs CA 8618030, as amended).

## **6.0 Triennial Review Requirements**

### **6.1 Regulatory Requirements**

Section 101(a)(2) of the Clean Water Act states: "it is the national goal that wherever attainable, an interim goal of water quality which provides for ... recreation in and on the water be achieved..." Federal regulations [40 CFR 131.6(a)] requires states to enact water quality standards and "use designations consistent with the provisions of section 101(a)(2)."

A Use Attainability Analysis (UAA) must be conducted when "the State designates or has designated uses that do not include the uses specified in section 101(a)(2) of the Act" [40 CFR 131.10(j)]. In addition, in accordance with 40 CFR 131.20(a)(1): "Any water body segment with water quality standards that do not include the uses specified in section 101(a)(2) of the Act shall be re-examined every three years to determine if any new information has become available. If such new information indicates that the uses specified in section 101(a)(2) of the Act are attainable, the State shall revise its standards accordingly."

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<sup>13</sup> Recent studies have shown that nutrients at excessive levels in urban runoff have been found to encourage regrowth of fecal indicator bacteria in streambed sediments and salt marshes (Grant et al. 2001 and Litton et al. 2010).

## **6.2 Reassessment Procedures**

If, pursuant to the evidence and recommendations presented in this report, the Tidal Prism of the Greenville-Banning Channel is not designated REC1, the Regional Board will re-examine this decision every three years as part of the regular Triennial Review process. The focus of this review will be to determine whether there has been any substantial change to the factors supporting the original determination. However, it is not necessary to conduct an entirely new UAA as part of this review.

In preparation for the Triennial Review, Regional Board staff will visit the Tidal Prism of the Greenville-Banning Channel to confirm that the existing hydromodifications and access restrictions remain in place and unaltered. In addition, staff will request the Orange County Flood Control District to provide data summarizing the flow diversions from the GBC to the Orange County Sanitation District. Finally, the Regional Board will solicit any new information concerning actual or potential recreational use of the Tidal Prism when public notice is given for the Triennial Review.

If new evidence indicates that recreation in or on the water may be attainable because one or more factors previously precluding the use have changed, the Regional Board may elect to: 1) designate the Tidal Prism REC1; or 2) require that a new UAA be conducted in order to determine whether the Tidal Prism should continue to not be designated REC1.

## 7.0 References

California Regional Water Quality Control Board, Santa Ana Region. January 12, 2012. Staff Report-Basin Plan Amendments – Revisions to Recreational Standards for Inland Fresh Surface Waters in the Santa Ana Region.

CDM. November 29, 2006. Technical Memorandum: Recreational Use Survey Data Report – Greenville Banning Channel.

CDM-Smith. June, 2010. Use Attainability Analysis Technical Report for the Greenville-Banning Channel.

CDM. August 2010. Santa Ana Watershed Project Authority. Use Attainability Analysis: Technical Report For Greenville-Banning Channel.

County of Orange Environmental Management Agency. Greenville-Banning Channel Facility No. D03. August, 1989.

Federal Cooperative Instream Flow Service Group (members include: U.S. Fish & Wildlife Service, U.S. EPA, U.S. Heritage Conservation and Recreation Service, & U.S. Bureau of Reclamation). Methods of Assessing Instream Flows for Recreation. FWS/OBS-78/34 (June, 1978) pg. A-7.

Goong, Stuart, PhD. County of Orange, Orange, CA. April 2009. “Stormwater Bacteria BMPs” (Excel spreadsheet and related references). Prepared for the Stormwater Quality Standards Task Force.

Grant, S. B., et. al. 2001. “Generation of Enterococci Bacteria in a Coastal Saltwater Marsh and Its Impact on Surf Zone Water Quality.” Environmental Science and Technology. Vol. 35, No. 12, 2001.

Litton, Rachel M., et. al. August 19, 2010. “Evaluation of Chemical, Molecular, and Traditional Markers of Fecal Contamination in an Effluent Dominated Urban Stream.” Environmental Science and Technology, Vol. 44, No. 19, 2010.

National Oceanic and Atmospheric Administration (NOAA). February 2011. “Elevations on Station Datum, Newport Beach, Newport Bay Entrance, CA: Epoch 1983-1991.”

Orange County. 2009. Orange County Areawide Urban Storm Water Runoff Management Program, NPDES Permit (Order No. R8-2009-0033, NPDES CA 8618030)

Orange County Public Works. August/September 2011. Greenville-Banning Channel Sampling Results August-September, 2011 Report.

Staples, Robert, City of Costa Mesa. April 2013. Personal Communication.

U.S. EPA. August 1985. Questions & Answers on Antidegradation. (USEPA Water Quality Standards Handbook, Second Edition. EPA-823-B-12-002. Appendix G).

U.S. EPA. September 5, 2008. Letter with attachment from Denise Keehner (Director, Standards and Health Protection Division) to Derek Smithee, State of Oklahoma. (Cited as updated information in USEPA Water Quality Standards Handbook, Second Edition. EPA-823-B-12-002, Chapter 4).