

This report is part of the Staff Report – Basin Plan Amendments- Revisions to Recreational Standards for Inland Fresh Surface Waters in the Santa Ana Region, January 12, 2012

5.6.5 UAA Analysis: Temescal Creek

The following discussion summarizes and references the August 2010, “Use Attainability Analysis Technical Report for Temescal Creek” CDM, August 2010 (TC Technical Report). Maps, tables, and photographs from the technical report are reproduced here directly or adapted and referenced appropriately. The text also describes Regional Board staff’s observations of Temescal Creek and analysis of data collected.

5.6.5.1 Waterbody Description/Location

The Temescal Creek watershed is located in Riverside County and is approximately 200 mi² in size (Figure TC-1). Temescal Creek extends approximately 28 miles from Lake Elsinore to the Prado Basin. The area of the Creek under study in this UAA is within what is currently identified in the Basin Plan as Temescal Creek, Reach 1, extending from Lincoln Avenue to the Riverside Canal¹ in the City of Corona (Basin Plan, Chapter 3, Table 3-1). Tributaries to Reach 1, which include Arlington Drain, Norco Channel and Main Street Channel, are not included in this UAA.

5.6.5.2 Reach Identification

For the purpose of designating recreation water quality standards, staff proposes that Reach 1 be subdivided into Reach 1a and 1b (see also Section 5.8 of the Staff Report).

Reach 1a: from Lincoln Avenue (33°53'29.904"N, 117°34'12.432"W) to the confluence with the Arlington Channel (identified in the TC Technical Report as the Arlington Drain) (approximately 33°52'51.204"N, 117°33'15.732"W);

Reach 1b: from the confluence with the Arlington Channel to approximately 1,400 feet upstream of Magnolia Avenue (approximately 33°52'1.992"N, 117°31'30.108"W).

Each of these areas is described below. First, however, it should be noted that the reach descriptions employed in the TC Technical Report differ from the Basin Plan and those proposed by Board staff. In the TC Technical Report, the area of UAA interest in Temescal Creek was divided into “Reach 1” and “Reach 2”. “Reach 1” essentially coincides with staff’s proposed Reach 1a, except that the downstream terminus of Reach 1a extends further (~0.5 mi.) to Lincoln Avenue, consistent with the current Basin Plan delineation. The TC Technical Report describes the downstream terminus of Reach 1 as approximately 100 ft. downstream of Cota Avenue (See Figure TC-2). As noted above, the Basin Plan identifies the upstream terminus of Reach 1 as the Riverside Canal, which no longer exists. Staff proposes that the upstream terminus of Reach 1b (or “Reach 2” in the TC Technical Report) be located 1400 feet upstream of Magnolia Avenue. This is the approximate location of the former Riverside Canal. While the reach designations differ, the data and analyses provided in the TC Technical Report with respect to channel morphology, surrounding land use, evidence of recreational activity, etc. in the channel are not substantively affected by this revised approach.

¹ The Riverside Canal has been abandoned and does not currently connect to or cross Temescal Creek.

Table TC-1 Reach Identification

Basin Plan	TC Technical Report	Regional Board Staff Proposed
Reach 1: Lincoln Avenue to Riverside Canal	Reach "1": 100 ft. downstream of Cota Avenue to confluence with Arlington Channel	Reach 1a: Lincoln Avenue (~0.5 mile downstream of Cota Ave) to confluence with Arlington Channel, a distance of ~3 miles.
	Reach "2": Arlington Channel confluence to 1,400 ft. upstream of Magnolia Street	Reach 1b: Arlington Channel confluence to 1,400 ft., upstream of Magnolia Street

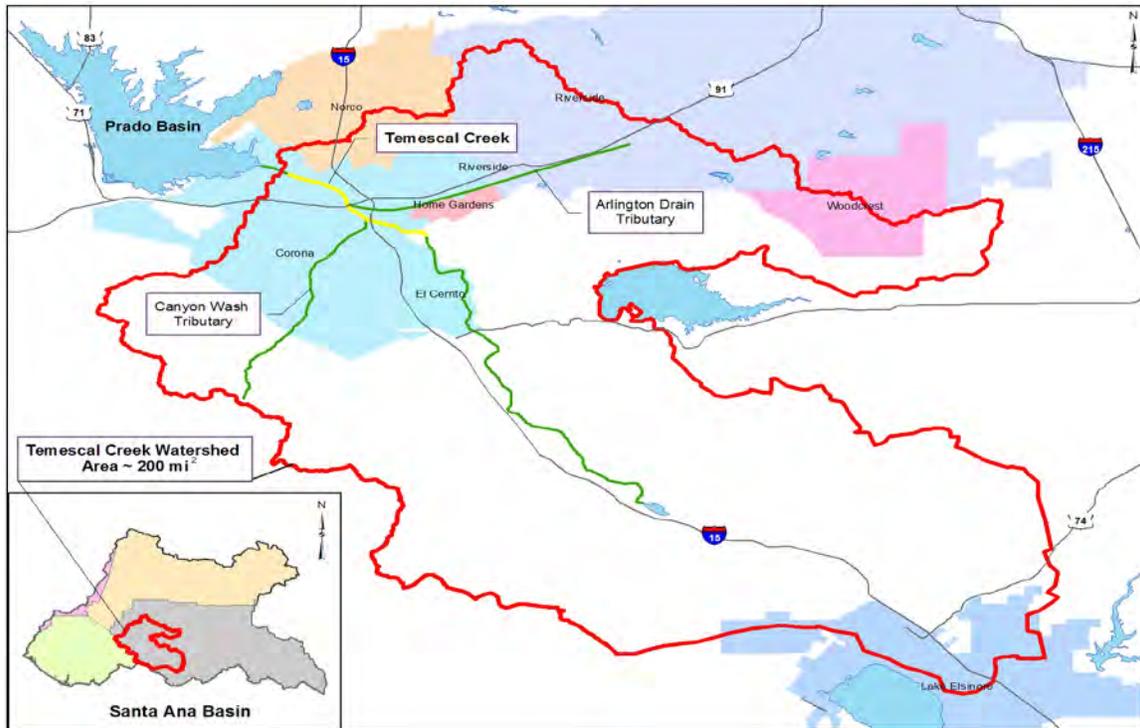


Figure TC-1, Map of Temescal Creek Watershed. Source: Use Attainability Analysis Technical Report for Temescal Creek, CDM, August 2010, Figure 2-1.

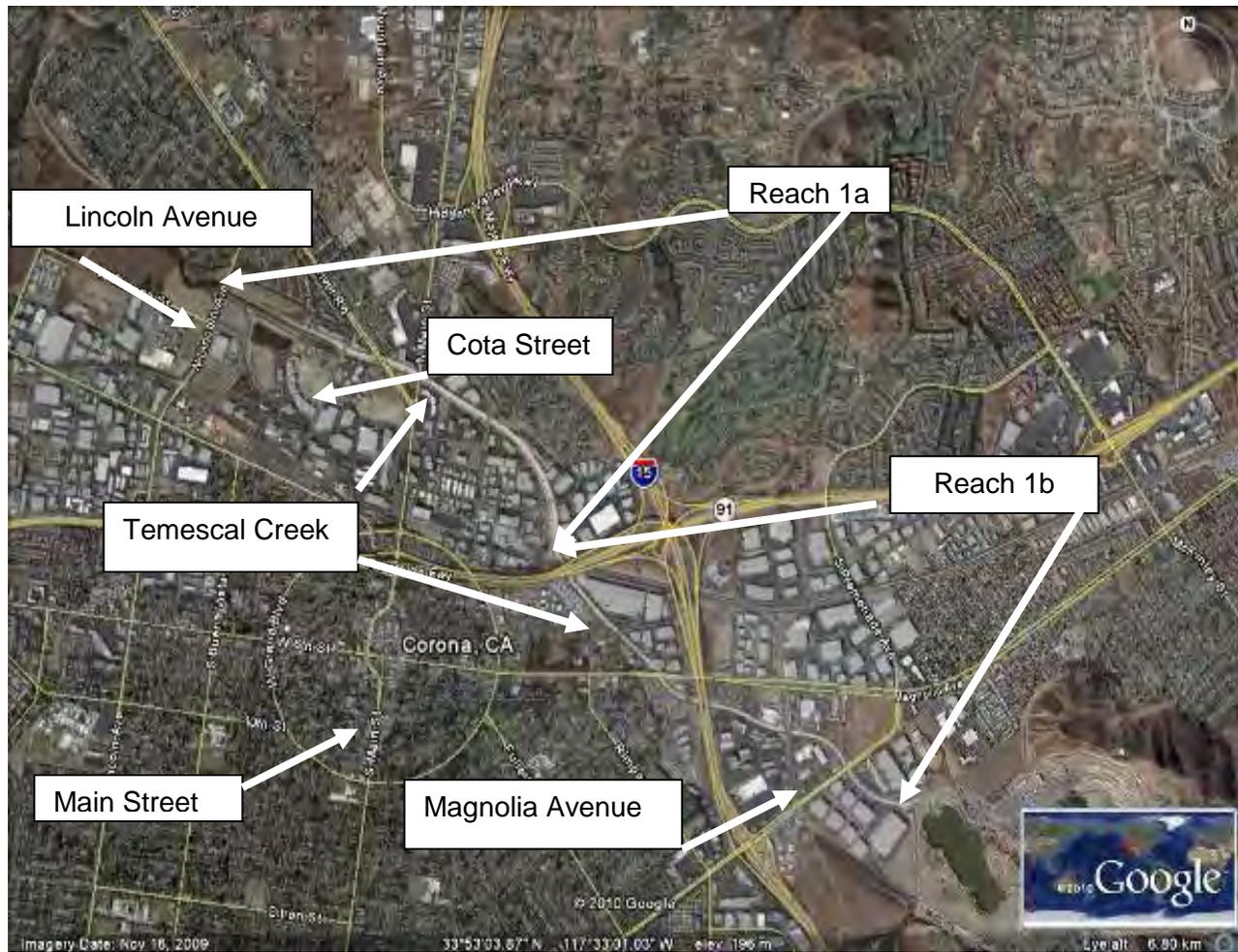


Figure TC-2. Proposed Reach 1a and 1b of Temescal Creek and Surrounding Area.

5.6.5.3 Reach Descriptions

Channel characteristics for each of the proposed reaches are summarized in Table TC-2. Representative photographs are included as Figures TC-3, 4, and 5. The TC Technical Report includes additional photographs of the channel (See TC Technical Report, Figures 2-8 through 2-13)

**Table TC-2
Temescal Creek, Proposed Reach 1a and 1b Channel Characteristics**

Reach No.	Extent	Description
Reach 1a	Lincoln Ave. to 100 ft. Downstream of Cota St.	Rip rap lined earthen channel (~0.5 mile in length)
Reach 1a	From 100 ft. downstream of Cota St. to Arlington Channel Confluence	Trapezoidal, fully concrete-lined; side slope (1.5:1); bottom width of 100 ft. with low flow channel (~3 miles in length)
Reach 1b	Arlington Channel confluence to ~1400 ft. (0.27 mile) upstream of Magnolia Avenue	Vertical walled, fully concrete-lined, bottom width of 84 ft. No low flow channel (~3 miles in length)

5.6.5.3.1 Reach 1a

The downstream section of Reach 1a, from Lincoln Avenue to Cota Street, consists of a channel with a trapezoidal configuration, featuring riprap covered side slopes and an earthen bottom (see Figure TC -3). (See also Figure 2-8 of the TC Technical Report for a photograph of this section of Reach 1a.) This section of the Reach is approximately 0.5 miles in length and has a channel bottom width of approximately 100 ft.

The remainder of Reach 1a is a trapezoidal, concrete lined channel. The walls are greater than a 45° slope (Figure TC-4). (See also Figures 2-9, 2-10, 2-11, 3-2, and 3-3 of the TC Technical Report for photographs of this section of Reach 1a.) The channel bottom is approximately 100 feet wide, with a narrow low flow channel in the center of the channel. The proposed Reach 1a terminates upstream at the confluence of the Arlington Channel, which is just downstream of the State Route 91 crossing and culvert. The total length of the proposed Reach 1a is approximately 3 miles.

Larger tributary channels that flow into Reach 1a include the Arlington Channel , which flows into Reach 1a approximately 400 feet downstream of the 91 Freeway Culvert, and Oak Street Channel, which flows into Reach 1a just upstream of Magnolia Avenue. Flows in the channel are perennial and consist of natural runoff, urban runoff, wet-weather POTW discharges, and occasional flood overflows from Lake Elsinore and its watershed.

5.6.5.3.2 Reach 1b

From the Arlington Channel confluence to the upstream terminus of the proposed Reach 1b, the channel remains concrete-lined, but transitions from a trapezoidal configuration to vertical walls (~14 ft. high). See Figure TC-5. At approximately 1400 ft. upstream of Magnolia Avenue, the concrete vertical-walled channel transitions to an earthen channel. This point is the upstream terminus of proposed Reach 1b. (See TC Technical Report Figures 2-12 and 2-13.) Reach 1b is approximately 3 miles in length. The Main Street Channel (identified in the TC Technical Report as Canyon Wash), a concrete-lined, vertical-walled channel, is a major tributary to Reach 1b.

By 1985, Reach 1a and Reach 1b, except for the segment of Reach 1a downstream of Cota Street, had been converted from earth lined channels to their present concrete-lined configuration.



Figure TC-3. Temescal Creek, Reach 1a – facing downstream (downstream of Cota Street, Lincoln Avenue Bridge in distance) Regional Board staff photograph, May 2011.



Figure TC-4. Temescal Creek, Reach 1a, at Cota Street looking upstream in the City of Corona. Regional Board staff photograph, December 2010.



Figure TC-5. Temescal Creek, Reach 1b facing downstream at Magnolia Avenue in the City of Corona. Regional Board staff photograph, May 2011.

5.6.5.4 Flow Conditions and Water Levels

Given the hydrologic patterns in Southern California, dry weather flow is the predominant condition in Temescal Creek. Precipitation-derived runoff typically occurs for only relatively short episodic periods during and shortly after rainfall events within the tributary watershed. These events are typically during the wet season (October 15 to April 15), although infrequent late summer monsoonal rainfall and runoff events do occur.

CDM processed USGS flow data for 1980 through 2008 to facilitate time series plotting and frequency distribution analyses. Hydrologic data used in the analyses were developed from the depth of flow in the channel recorded at 15-minute intervals at a gage located in Temescal Creek at Main Street (in proposed Reach 1a).

Depth of flow has been measured directly in the channel. The relationship between depth of flow and flow rate is defined by a rating curve, which may be used to convert continuous depth records to flow rates. Figure TC-6 presents a hydrograph of the USGS mean daily flow data for 1980 to 2008.

The continuous time series of measured depth and estimated flow was analyzed to assess the frequency of different conditions in the channel section. Cumulative frequency distributions show the likelihood of a particular flow condition occurring within the channel section.

Cumulative frequency curves of flow rate and depth from 1980 to 2008 were generated by CDM (Figures TC-7 and 8). Frequency distributions show that more than 90 percent of the time, flow rates and depths are characteristic of dry weather flow conditions. Flow depths during 1980 to 2008 were less than 2 feet approximately 99 percent of the time and less than 1 foot approximately 90 percent of the time (Figure TC-8).

Hydrographs showing the typical flow response in the Temescal Creek watershed during rain events of varying depths are shown in Figure TC-9. In this Figure, hydrographs resulting from ¼", ½", ¾", 1", 2" and 3" rainfall events at meteorological stations were overlaid to show similarities or differences in response based on rainfall depth. Analysis of the six storm events of different depths shows that near-dry-weather baseflow channel velocities (and associated depths) returned in as soon as 8 hours following a storm event (ranging from 8 to 30 hours in most cases).

The dry weather flows in the creek are a combination of nuisance flows from the surrounding urbanized area and treated effluent discharged upstream by the City of Corona (Wastewater Treatment Plant (WWTP) #3) and the Lee Lake Water District. At the present time, Corona discharges approximately 0.37 million gallons per day (mgd) and the District approximately 0.82 mgd. The District is building a large recycled water storage pond. Once the pond is in use, the District's discharge to the creek will be infrequent and possibly, only under emergency conditions. The City of Corona recently indicated its intent to cease operation of WWTP #3, since anticipated growth in the service area of the facility has not yet materialized. The treatment plant may be reopened if and when justified by sufficient development and wastewater flows.

Regional Board staff have observed that the dry weather flows typically fill the low flow channel in the concrete-lined section of the proposed Reach 1a to depths less than one foot. Board staff have also observed that in proposed Reach 1a near Lincoln Avenue, where the channel has an earthen bottom and no defined low flow channel, dry weather flows are shallow (less than one foot) and extend across more of the width of the channel (Figure TC-3). Proposed Reach 1b does not have a low flow channel; rather, the channel has a gently sloping V bottom. As a result, dry weather flows generally spread out across the middle of the channel bottom at shallow depth (less than one foot). (See Figure TC-5).

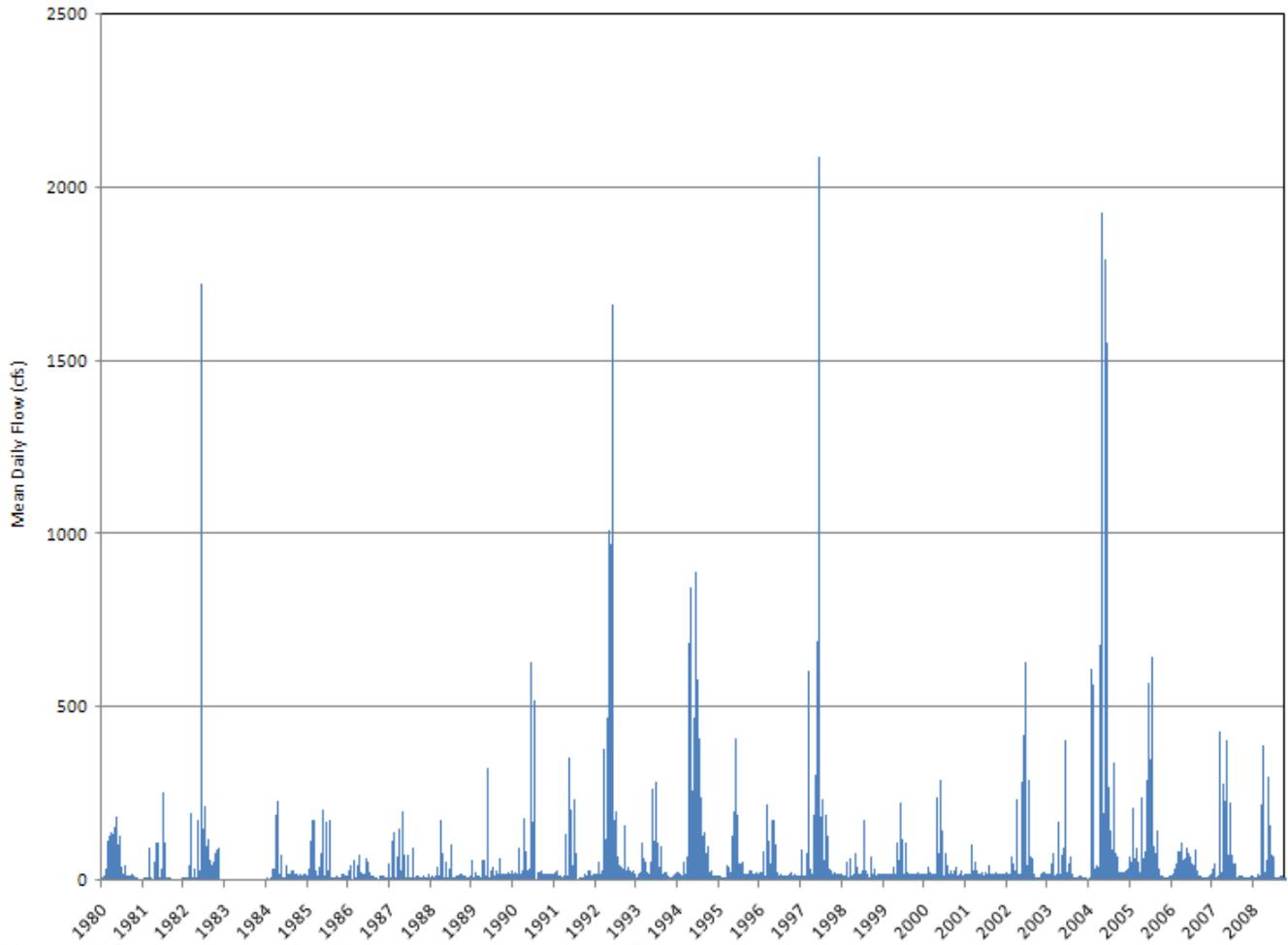


Figure TC-6. Mean Daily Flow in the Temescal Creek at Main Street (Source: Use Attainability Analysis Technical Report for Temescal Creek, CDM, August 2010, Figure 4-2)

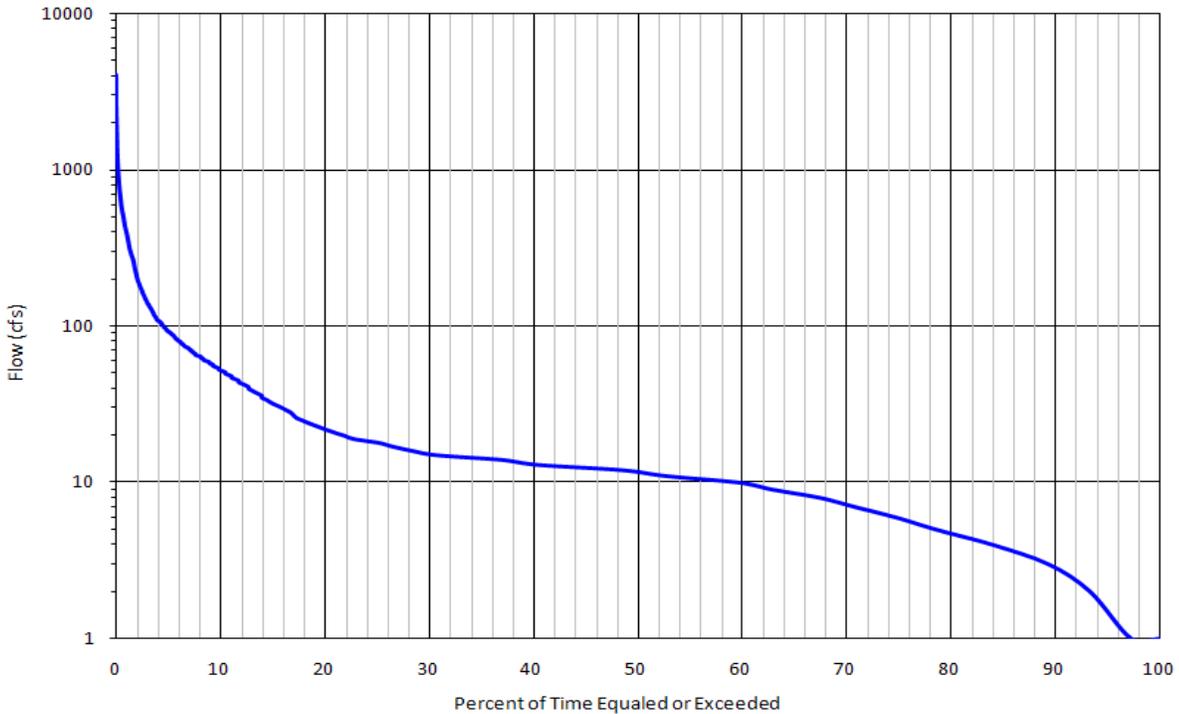
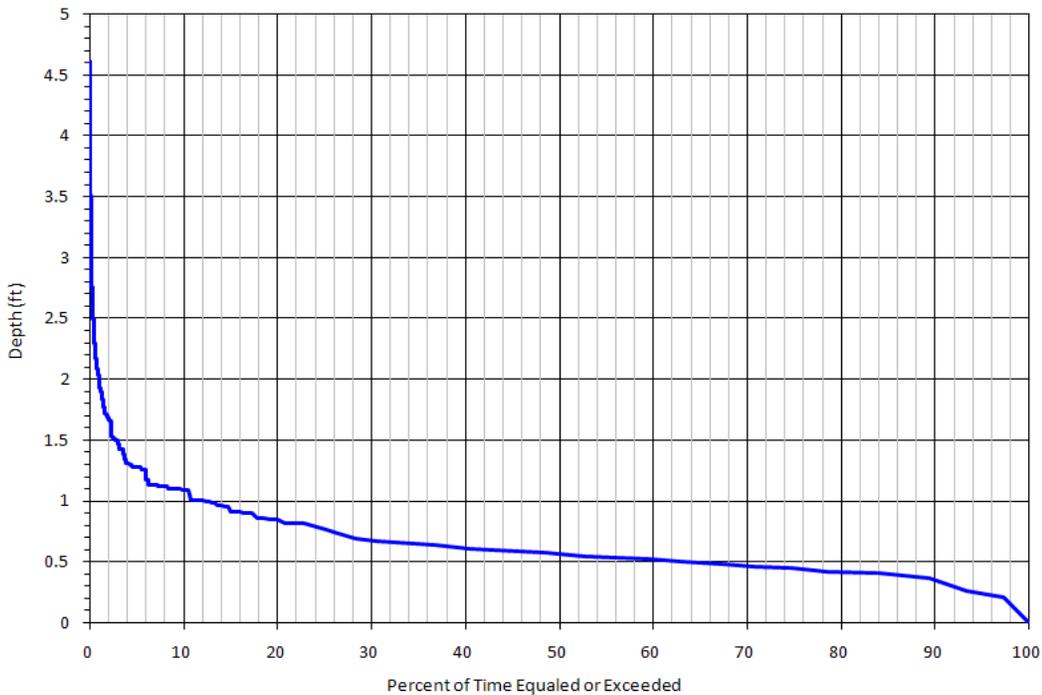


Figure TC-7 (above). Channel Flow Duration Curve for the Temescal Creek at Main Street (1980-2008)
Figure TC-8 (below). Channel Depth Curve for the Temescal Creek at Main Street (1980-2008)
 (Source for both Figures: Use Attainability Analysis Technical Report for Temescal Creek, CDM, August 2010, Figures 4-3 and 4-4, respectively)



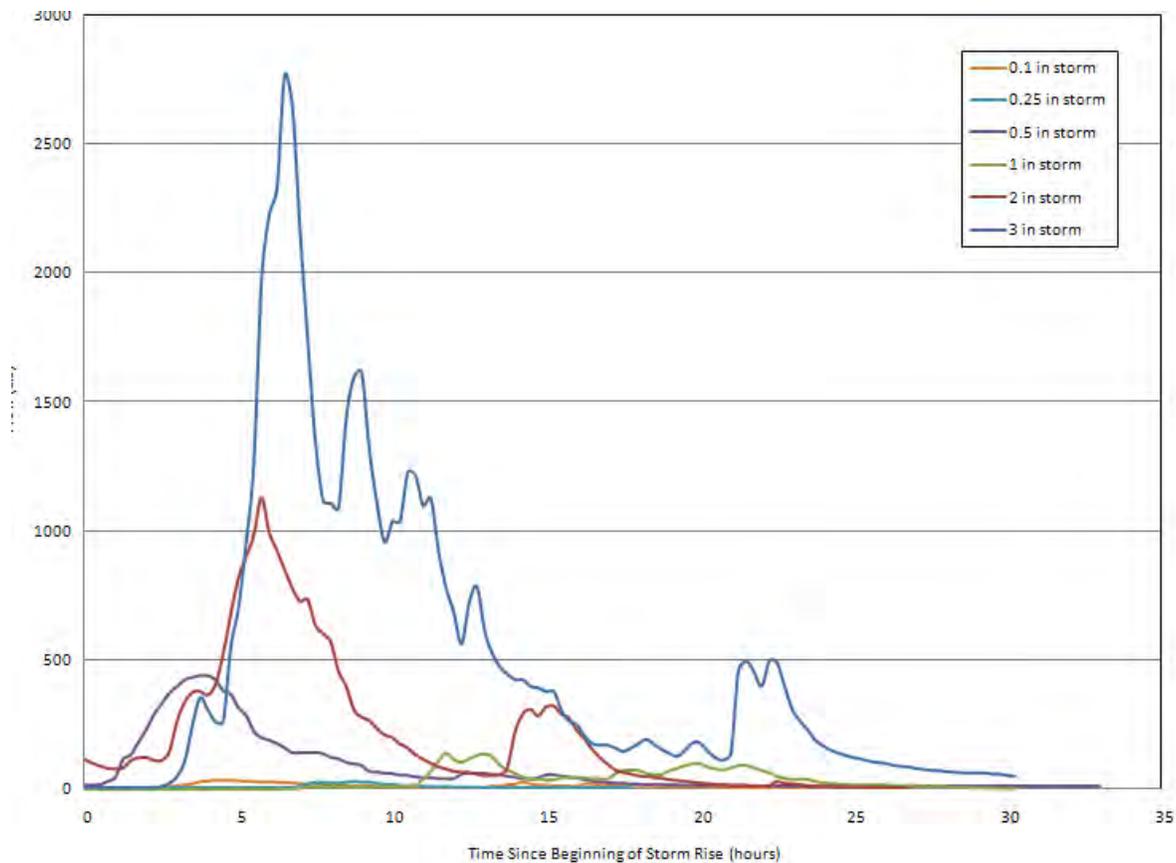


Figure TC-9 Event Hydrographs from the Temescal Creek Flow Record from 1980 to 2008 (Source: Use Attainability Analysis Technical Report for Temescal Creek, CDM, August 2010, Figure 4-5)

5.6.5.5 Access and Safety

The Riverside County Flood Control and Water Conservation District (County Flood Control District) prohibits access to their holdings and easements in proposed reaches 1a and 1b of Temescal Creek. The entire channel in proposed Reach 1a and 1b, including adjacent maintenance roads, is fenced and maintenance gates are locked to prevent access. In addition, the channel is posted with no trespassing signs. There are no bicycle, hiking, or other trails adjacent to Temescal Creek in these areas. (See Figure TC-10)



Figure TC-10. Temescal Creek, Reach 1a at Cota Street. Access is prohibited and the channel is fenced with locked gates. Regional Board staff photograph, May 2011.

5.6.5.6 Adjacent Land Use

The watershed adjacent to Temescal Creek, Reach 1a and 1b is largely developed as commercial/industrial, with pockets of residential areas. There are no schools or parks immediately adjacent to the creek in these areas. Limited open space remains adjacent to the Creek. See Figure TC-11.

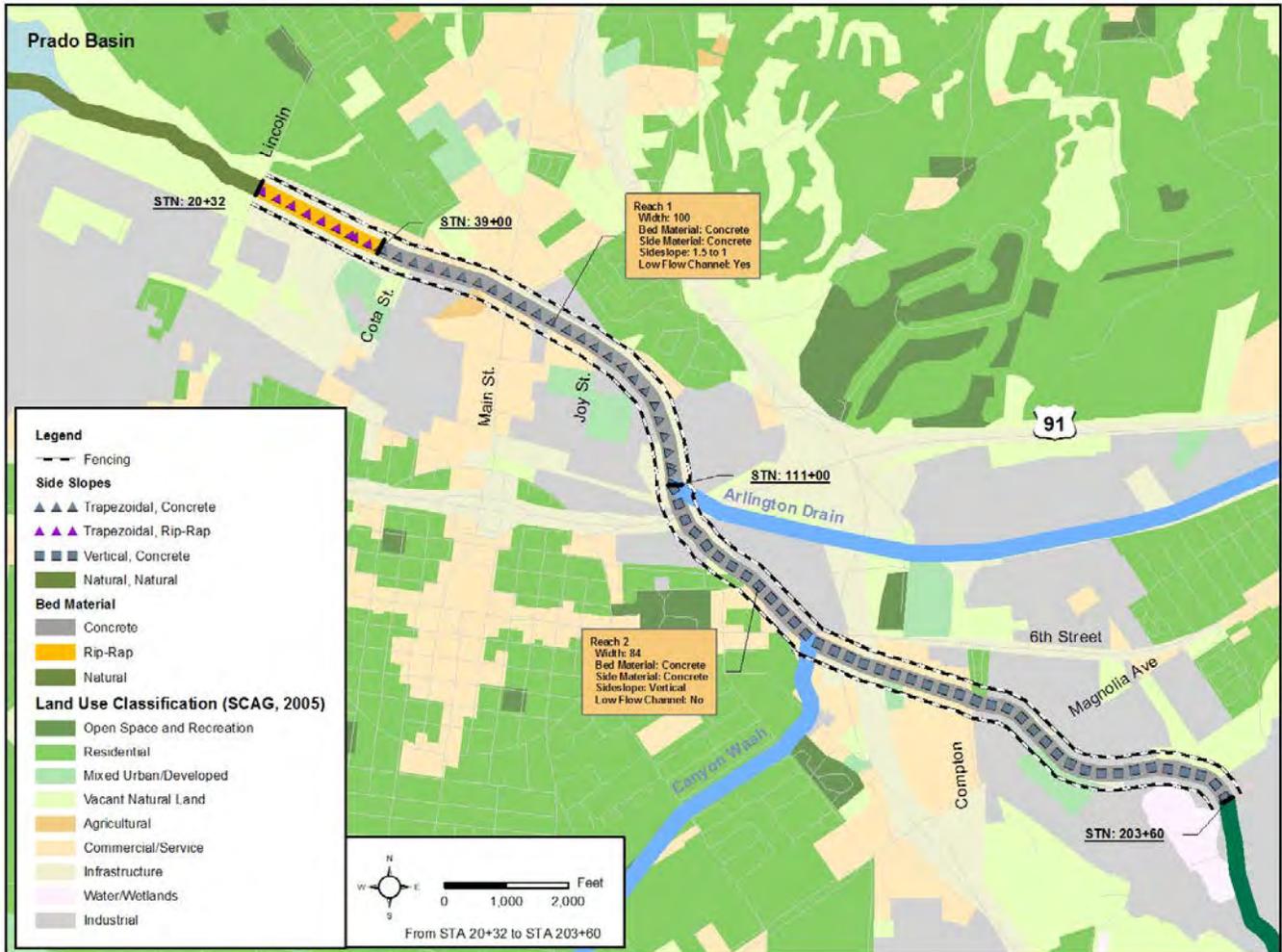


Figure TC-11. Temescal Creek: Channel Characteristics and Land Use. (Source: Use Attainability Analysis Technical Report for Temescal Creek, CDM, August 2010, Figure 2-5)

5.6.5.7 Water Quality Conditions

The Orange County Coast Keeper performed water quality monitoring in Temescal Creek at Lincoln Avenue, the downstream terminus of proposed Reach 1a (and the downstream terminus of Reach 1 of the Creek as now identified in the Basin Plan) from 2002 to 2004, and the Middle Santa Ana River TMDL Grant Project team conducted monitoring at this same location from 2007 to 2008. Samples were collected approximately monthly from 2002 to 2004 and analyzed for *E. coli* concentrations. Monitoring for both fecal coliform and *E. coli* was conducted on a more frequent basis from 2007 to 2008. The monitoring data are summarized in Table TC-3, below.

For fecal coliform, 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/30day period). When insufficient data were available to calculate geomeans, the fecal coliform data were compared generally to that part of the existing REC1 fecal coliform objective that specifies that no more than 10% of the samples exceed 400 organisms/100mL for any 30-day period. Similarly, geomeans were calculated for *E. coli* provided that five or more samples/30 day period had been collected. The *E. coli* geomeans were compared to the recommended *E. coli* geomean objective (126/100mL).

The analyses show that the existing REC1 fecal coliform objectives and the proposed REC1 *E. coli* objective are not consistently attained. One geomean values was calculated for fecal coliform (13,232 MPN per 100 m/L), which significantly exceeded the current Basin Plan fecal coliform geomean objective (200/100mL). A geomean was also calculated for *E. coli* (3,127 individuals per 100 m/l) that exceeded the proposed geomean objective of 126/100mL. Figure TC-12 presents fecal coliform concentrations from 2007 through 2008. As shown, more than half of the samples exceeded 400/100mL fecal coliform.

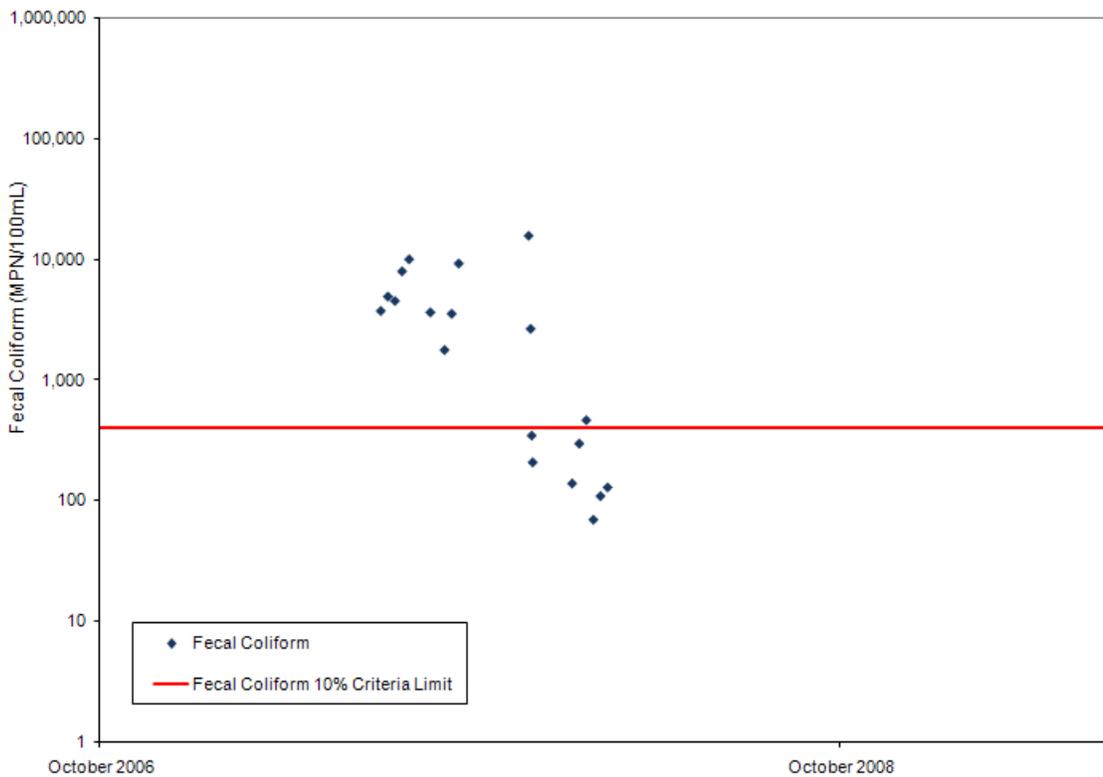


Figure TC-12 Time Series of Fecal Coliform Concentrations in the Temescal Creek from 2007 through 2008 (Source: Use Attainability Analysis Technical Report for Temescal Creek, CDM, August 2010, Figure 3-9)

Table TC-3.

Summary of Monthly Fecal Coliform and <i>E. coli</i> Data at Temescal Creek at Lincoln Avenue (2002-2008)								
(Source: Use Attainability Analysis Technical Report for Temescal Creek, CDM, August 2010. Table 3-3)								
Month and Year	Fecal colform				<i>E. Coli</i>			
	Number of Samples Collected	Minimum Value (MPN/100ml)	Maximum Value (MPN /100ml)	Geometric Mean (MPN /100ml)	Number of Samples Collected	Minimum Value (MPN /100ml)	Maximum Value (MPN /100ml)	Geometric Mean(MPN /100ml)
10/2002					1	100	100	
11/2002					1	410	410	
12/2002					1	970	970	
2/2003					2	200	1,460	
3/2003					1	1,220	1,220	
4/2003					1	100	100	
5/2003					1	410	410	
6/2003					1	520	520	
7/2003					1	100	100	
8/2003					1	200	200	
9/2003					1	200	200	
10/2003					1	100	100	
11/2003					2	200	520	
12/2003					1	100	100	
1/2004					1	200	200	
2/2004					2	200	1,480	
3/2004					1	1,100	1,100	
4/2004					3	690	1,000	
7/2007	3	3,800	5,000		2	200	290	
8/2007	2	8,100	10,200		5	500	410,00	3,127
9/2007	5	1,800	1,800,000	13,232	4	220	9,200	
12/2007	4	210	16,000		2	150	270	
1/2008	2	140	300		4	70	280	
2/2008	4	70	470					

(Source: Use Attainability Analysis Technical Report for Temescal Creek, CDM, August 2010, Table 3-3)

The data presented in Table TC-3 were used to calculate an antidegradation bacteria target for the proposed Reach 1a (see Section 5.2 of the Staff Report), which is proposed to be designated as a REC2 only water.

5.6.5.7.1 Expected Water Quality Improvement

This section describes programs developed by the Riverside County stormwater program to address pathogen inputs to surface waters that may result from urban runoff. The Stormwater Program was formed to meet the requirements of the Municipal Separate Storm Sewer System (MS4) Permit issued to the County. The County has developed and implemented a wide range of Best Management Practices (BMPs) focused on source control of pathogens and other

pollutants. Riverside County has developed a “Stormwater BMP Design Handbook”, which provides design procedures for structural BMPs for new development and redevelopment with the County. The Handbook includes a treatment control BMP matrix that describes the appropriate BMPs to select to address particular pollutants of concern. For pathogens, this matrix lists infiltration- and filtration- type BMPs as potentially providing “medium” or “high” levels of removal efficiency². While these BMPs are expected to have a beneficial effect, they are not expected to be sufficient by themselves to achieve full compliance with pathogen water quality objectives. Planning is underway to develop future management controls that specifically target pathogens.

BMP implementation in the Temescal Creek watershed is guided largely by the Middle Santa Ana River Watershed Bacteria Indicator TMDLs and MS4 Permit requirements relevant to those TMDLs.

The Regional Board adopted the Bacteria Indicator TMDLs for Reach 3 of the Santa Ana River and major tributaries, including Temescal Creek, in 2005. USEPA approved the TMDLs in 2007. To support TMDL implementation, the Middle Santa Ana River (MSAR) Task Force (stakeholders representing urban stormwater dischargers, agricultural operators and the Regional Board) was established. The TMDLs required urban stormwater dischargers in the MSAR watershed to (1) implement a watershed-wide compliance monitoring program; and (2) develop an Urban Source Evaluation Plan (USEP) for the purpose of identifying specific activities, operations, and processes in urban areas that contribute bacteria to MSAR waterbodies.

In 2006, the Santa Ana Watershed Project Authority, in cooperation with the San Bernardino County Flood Control District (SBFCD), Riverside County Flood and Water Conservation District (RCFWCD&WCD), and Orange County Water District (OCWD) submitted a successful Proposition 40 grant proposal to the State Board to support the implementation of TMDL requirements. The resulting grant project, MSAR Pathogen TMDL-BMP Implementation (Grant Project), was developed in part to initiate watershed-wide compliance monitoring and characterize urban bacteria sources within the watershed.

Implementation of the Grant Project has resulted in:

- The establishment of a watershed-wide compliance monitoring program;
- A Regional Board - approved USEP to guide activities that focus on (1) bacterial indicator source evaluation studies; and (2) evaluation of opportunities for implementation of BMPs dedicated to bacterial load reductions.

The Grant Project final report contained a BMP control strategy and is serving as a foundation for Comprehensive Bacteria Reduction Plans (CBRPs), which are required by the MS4 Permits. The CBRPs are intended to address bacteria reduction in the Middle Santa Ana River

² See also “Stormwater Bacteria BMPs” (Excel spreadsheet and related references). Prepared for the Stormwater Quality Standards Task Force, April 2009 – Prepared by Stuart Goong, PhD, County of Orange, Orange, CA

Watershed, including Reach 1 of Cucamonga Creek. Final Draft CBRPs were submitted in late December 2010 by Riverside and San Bernardino Counties to Regional Board staff for review. The CBRP is a long term plan designed to achieve compliance with dry weather condition (April 1- October 31) wasteload allocations for bacterial indicators established by the MSAR Bacterial Indicator TMDLs. The MS4 permits require compliance with the final water quality based effluent limitations (WQBELs) implementing the TMDLs no later than December 31, 2015. The final WQBELs may be the development and implementation of a CBRP that will achieve compliance with the urban wasteload allocations during dry weather. Alternatively, if the measures identified in the CBRP are not completed in a timely manner, then the urban wasteload allocations for dry weather conditions become the final WQBELs.

While implementation of the CBRP is expected to achieve the numeric wasteload allocations, it is also recognized that CBRP implementation will likely be an iterative and adaptive process, given inherent uncertainties regarding the efficacy of bacteria indicator control BMPs. Further, the CBRPs must be tailored to assure compliance with applicable water quality standards for Cucamonga Creek (and other waters). The intent of this UAA analysis is to document the basis for changes to recreational standards that, if approved, would likely affect the type and location of requisite BMPs and, in turn, the strategies identified in the CBRP.

5.6.5.8 Recreation Use Surveys

This section provides information on current, historical, and probable future recreational activity in Temescal Creek Reach 1a and 1b (as proposed).

5.6.5.8.1 Evidence of Actual Recreational Use

As described in Section 5.6.2.2 (SWQSTF UAA Methodology) extensive photographic evidence was gathered to assess whether and what type of existing recreational use occurs in the Santa Ana Delhi Channel. In addition, field surveys were conducted by members of the Task Force and the consultant staff responsible for camera installation and maintenance. Information was also obtained from county personnel responsible for monitoring and channel maintenance.

5.6.5.8.2 Digital Field Observation Camera Recreation Survey

In 2005 and 2006, recreational use surveys were performed to obtain information regarding current levels of recreational use. Digital field observation cameras and data transfer technology, coupled with weekly on-location physical surveys were used to collect the data. Two locations within Temescal Creek were surveyed. Both sites are in the proposed Reach 1a of the Creek.

- Temescal Creek at Main Street facing upstream (July / August 2005)
- Temescal Creek at City of Corona WWTP No. 2 facing downstream November 2005 to November 2006)

Camera views at the survey locations are shown in Figures TC-13 and TC-14.



Figure TC-13. Photo of the Camera View at the Recreational Use Survey Location for Temescal Creek at Main Street (Reach 1a) Facing Upstream (Source: Use Attainability Analysis Technical Report for Temescal Creek, CDM, August 2010, Figure 3-2)



Figure TC-14. Photo of the Camera View at the Recreational Use Survey Location for Temescal Creek at City of Corona WWTP No. 2 (Reach 1a)- Facing Downstream (Source: Use Attainability Analysis Technical Report for Temescal Creek, CDM, August 2010, Figure 3-3)

The survey duration and number of images collected for each location are shown in Table TC-4. An image was collected every fifteen minutes during daylight hours throughout the study duration unless signal strength fluctuations or equipment failures precluded collection and transmission. Images were not collected at night due to darkness.

Table TC-4 Recreational Use Survey Duration			
Survey Location	Start Date*	End Date*	Number of Images
Main Street ⁺	7/26/05	8/4/05	513
WWTP No. 2	11/1/05	11/1/06	10,653

+ Camera vandalized beyond repair on the ninth day of operation

* Due to signal strength fluctuation issues and other equipment functionality issues, periodic, short-term gaps in image collection occurred between the start and end dates. The gaps ranged from relatively minor single fifteen-minute interval image gaps (on numerous days) to gaps in image collection spanning several days. (See discussion in the *Recreational Use Survey Data Report – Temescal Wash (aka Temescal Creek)*, CDM, November 24, 2006)

(Source: Use Attainability Analysis Technical Report for Temescal Creek, CDM, August 2010, Table 3-1)

Any image containing a person or persons within creek fencing or boundaries was defined as a recreation event. If a person or persons were observed meeting these same conditions during on-site surveys, these were also considered events. An event could include one or more persons. For each event, each person’s activity (type), and the estimated duration of the event were logged. If an activity was captured on only one image, an activity duration was reported as <30 minutes. Likewise, if the same activity by the same person or persons was observed in two consecutive fifteen-minute interval images, the duration was reported as <45 minutes.

Table TC-5 presents a summary of the activity recorded at the Temescal Creek survey locations over the duration of the survey. The seasonal periods defined in southern California NPDES stormwater permits were used to categorize the observations by season (April 1 to September 30 for the dry season; October 1 to March 31 for the wet season). Full recreational use survey information can be found in the *Recreational Use Survey Data Report – Temescal Creek* prepared for the Task Force by CDM in November 2006³.

³ It should be noted that in this Recreation Use Survey Data Report (and those prepared for the other waters for which UAAs are discussed in this staff report), a use/activity protocol was employed to log and categorize any observed activity from both image and on-site physical surveys. Within this protocol, recreational events (if any) were differentiated as contact or non-contact events. Where it appeared that there was or might be contact activity in an image, the type of that contact was categorized as: incidental contact, contact below the ankle, contact between the ankle and waist, contact between the waist and neck, contact above the neck, or non-recreation contact. However, subsequent analyses, discussed in the TC Technical Report (and the other Technical Reports prepared for the UAAs addressed in this staff report), abandoned this characterization scheme. It was decided that the consultants’ determination in the recreational use survey reports of whether an event should be categorized as contact or non-contact imposed a pre-determination of the nature of the event that was intended instead to be considered by the Task Force. As reflected in Table TC-5 and noted in the preceding text, the characterization

**Table TC-5
Recreational Activity Recorded for Temescal Creek**

Location	Number of Individuals			Estimated Duration (min)	Types of Activity
	Total	Dry Season	Wet Season		
Main Street	4	4	0	120	Walking and biking
WWTP	29	20	9	840	Walking and biking

(Source: Use Attainability Analysis Technical Report for Temescal Creek, CDM, August 2010, Table 3-29)

As reflected in Table TC-5, the camera survey results indicate a very low frequency of human activity of any kind in Reach 1a of the Creek. While no camera survey was conducted in Reach 1b, it is reasonable to expect similar results (in fact, even less activity), given the channel morphology (vertical concrete walls and bottom; see Figure TC-5) and adjacent land use, which is largely industrial and commercial (see Figure TC-11). Of the 11,166 images collected at the camera survey locations in Reach 1a, only two suggested any type of water contact. In both cases, an individual was observed walking in shallow water in the low flow channel; the contact was limited to below the ankle and of short duration (less than 30 minutes). These images are included here as Figures TC-15 and 16. Thirty-one images showed a few individuals either walking or riding a bicycle in the channel, adjacent to the low flow channel, without body contact. This type of activity is depicted in Figure TC-17.

scheme employed in the TC Technical Report (and the other Technical Reports) employed a different approach, identifying recreation events and the type of activity witnessed, rather than asserting conclusions regarding the contact versus non-contact nature of those activities.



Figure TC-15. Photo of Activity at Temescal Creek at Main Street (proposed Reach 1a), 7/27/2005, 10:00 (Source: Use Attainability Analysis Technical Report for Temescal Creek, CDM, August 2010, Figure 3-4)



Figure TC-16. Photo of Activity at Temescal Creek at Corona WWTP (proposed Reach 1a), 7/1/2006, 13:30 (Source: Use Attainability Analysis Technical Report for Temescal Creek, CDM, August 2010, Figure 3-6)



Figure TC-17. Photo of activity at Temescal Creek at Corona WWTP (Proposed Reach 1a), 2/25/2006, 12:15. (Source: Use Attainability Analysis Technical Report for Temescal Creek, CDM, August 2010, Figure 3-7)

5.6.5.8.3 Physical Surveys and Other Information

In addition to the weekly physical surveys associated with maintenance of the digital cameras, SWQSTF members visited Temescal Creek at the Corona Wastewater Treatment Plant No. 2 on six weekends in July and August 2006. Task Force members were asked to stay at the location for half an hour and record what recreational activities they observed. The SWQSTF members described the number and activity of people they saw in the area, if any, the weather, depth and clarity of the water, and any evidence of activity in the area. No people were observed in the channel during this time period by Task Force members. The Task force members described the water depth as ankle deep or less, and at times murky.

Riverside County Flood Control District and city staff who conduct maintenance activities in or adjacent to the channel were surveyed and reported seeing no water contact activities in the proposed Reach 1a and Reach 1b. Finally, Regional Board staff have visited the proposed reaches of the channel for various purposes over a number of years and have witnessed from time to time individuals walking in proposed Reach 1a but never any water contact activity. Regional Board have never seen any individuals in proposed Reach 1b.

5.6.5.8.4 Evidence re Historical Recreational Use

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

5.6.5.8.5 Probable Future Use

Information regarding probable future recreational uses for Temescal Creek was obtained through discussions with local agencies. The City of Corona was contacted as well as the Riverside County Flood Control and Watershed Conservation District. Based on these agency inquiries, probable future uses have been documented. Subsequent triennial review may identify future probable uses.

The City's General Plan Land Use Atlas has Temescal Creek designated as Open Space / General, which includes lands permanently committed for public safety, including flood control channels. The City's Zoning Map indicates the creek as zoned for Flood Control with no other uses planned. The City of Corona reported that its general plan for existing and proposed bicycle trails does list the relevant reach of Temescal Creek as planned for a Class I Bicycle Path (completely separated from traffic). No immediate plans are in place to construct this bicycle path (communication with Michelle Hindersinn, Associate Engineer, City of Corona – Public Works, July 23, 2009).

The Riverside County Parks and Open Space District indicated that there are no immediate plans to construct bicycle paths along Temescal Creek due to a lack of funding. In addition, no water contact recreation use facilities are planned for the creek (Communication with Marc Brewer, Riverside County Parks and Open Space District, July 28, 2009). This information was confirmed in a more recent conversation with Mr. Brewer (September 29, 2011), who indicated that a bicycle trail is proposed for construction along the entire length of Temescal Creek from Lake Elsinore to the Santa Ana River. The proposed trail would lay atop the service road adjacent to the channel in the proposed Reach 1a and 1b. However, Mr. Brewer stated that there will very likely be no funding available for the next several years to initiate construction of this project.

5.6.5.8.6 Summary – Evidence of Recreational Use

5.6.5.8.6.1 REC1

In summary, there is no evidence of actual current, historic, or reasonable probable future REC1 use in the area of Temescal Creek addressed by this UAA (proposed Reach 1a and 1b). Intensive photographic surveys, field surveys and information provided by public agency staff members who routinely visit the the creek provided no evidence of current REC1 use. Nor is there any evidence of historic use of the proposed reaches for REC1 use.

The lack of REC1 use is a reflection of the various characteristics of the channel reaches described in detail in the preceding sections of this report. These include the morphology of the channel, which, with very limited exception (roughly between Cota Street and Lincoln Avenue), is characterized by heavily modified, steep trapezoidal or vertical concrete-lined walls. Coupled with fencing along the length of the channel on both sides, these channel characteristics make access generally difficult and dangerous. Flow conditions in the channel reaches are low under most conditions, making water contact leading to ingestion unlikely. High flows during storm events, which typically occur during the wet season, make recreational activity in the channel unsafe (temporary suspension of recreation standards during certain high flow conditions is proposed; see Section 5.5 of the Staff Report). There are very few residences and no schools in the vicinity of the proposed reaches. Much of Reach 1a and 1b are surrounded by commercial and industrial development, such that there is very limited views of and access to the creek for the public, particularly in the purposed Reach 1b. The fencing, channel morphology, flow conditions and the close proximity of recreational areas along the Santa Ana River Reach 3 or in public and private swimming pools of the area make recreational activity in the channel itself highly unlikely. Again, this is documented by the photographic and field survey information provided above.

Again taking into consideration this suite of factors, as well as master planning information, there is no evidence that REC1 use in the future is probable.

It should be noted again that determinations regarding the appropriate recreational use designations are subject to review and revision during future triennial reviews.

5.6.5.8.6.2 REC2

As shown in Table TC-5 and Figures TC-15, 16 and 17, there are some limited observations of individuals walking or biking in the proposed Reach 1a. Also as noted, Regional Board staff have on occasion observed individuals walking in the channel of Reach 1a. The evidence of any water contact is extremely limited. While it appears that the individuals observed may be using the channel as a travel route rather than as a recreational opportunity for aesthetic enjoyment, picnicking or other types of REC2 activities, it is possible that such activities are taking place. In view of this, Board staff recommends designating the REC2 beneficial use for the proposed Reach 1a. (This is consistent with the current Basin Plan REC2 designation for Reach 1 (as now defined in the Basin Plan) as a whole.)

There has been no observation of any individuals in Reach 1b. As noted, Reach 1b passes through an industrial area of the City of Corona, with very limited viewing opportunities and no access to the channel for the public. In addition, there are no sidewalks or bicycle trails that following any section of Reach 1b. The vertical walls and fencing make getting into Reach 1b

extremely difficult and dangerous. The flat concrete channel bottom provides very poor habitat for plants or wildlife, thereby significantly limiting wildlife viewing opportunities. Therefore, Board staff recommends that REC1b not be designated for this Reach.

5.6.5.9 UAA Factor Evaluation

As discussed in Section 5.6.2.1 of the Staff Report (Regulatory Background – UAAs),, per federal regulation at 40 CFR 131.10 (h), a designated use may be removed or modified to allow the application of less stringent water quality objectives provided that the use is not an “existing use” and that the use cannot be attained by implementing effluent limits on point source discharges and/or cost-effective and reasonable best management practices for nonpoint source control.

The preceding evidence demonstrates that REC1 is not an “existing use” for proposed Reach 1a and 1b of Temescal Creek. There is no evidence of actual REC1 use, either now or historically. Water quality objectives to protect REC1 have not been consistently attained.

POTW discharges to Reach 1 of Temescal Creek already receive tertiary treatment and are required to meet coliform bacteria limitations (2.2 MPN/100mL) that are significantly more stringent than the fecal coliform objectives established in the Basin Plan to protect REC1 uses (see Section 4.1 of the Staff Report). These POTW limitations in NPDES permits/Waste Discharge requirements are based on the recommendations of the California Department of Public Health (CDPH) to assure an essentially pathogen-free effluent and, thereby, the protection of the health of members of the public who may come into contact with the effluent⁴. As discussed above (“Expected Water Quality Improvement”), BMPs are being planned and implemented to address bacteria reductions in stormwater and nuisance runoff to Middle Santa Ana River tributaries, including Temescal Creek, pursuant to MS4 permit requirements. In locations such as proposed Reach 1a and 1b of Temescal creek, where there is no REC1 activity or the potential for it, then BMP implementation to assure strict compliance with REC1 objectives would be neither reasonable nor cost-effective. (However, it is recognized that any REC1 use downstream of such areas must be protect through appropriate BMPs.)

In short, the REC1 use cannot be attained in proposed Reach 1a or 1b by any more stringent limitations on POTW discharges. Evidence of the lack of actual and potential recreational use in proposed Reach 1a and 1b indicates that requirements for BMP implementation to achieve REC1 objectives in these waters would not be reasonable.

Since there is no evidence that REC1 is an “existing use”, and since there is now no evidence that the use could be attained through the implementation of effluent limitations or additional cost-effective and reasonable BMPs, then one or more of the UAA factors in 131.10(g) may

⁴ CDPH has developed wastewater disinfection guidelines for discharges of wastewater to surface waters where REC1 is a beneficial use (“Wastewater Disinfection for Health Protection, February 1987). The disinfection guidelines recommend the same treatment requirements for wastewater discharges to REC1 waters as those stipulated in the California Code of Regulations, Title 22, Division 4, Chapter 3 (Water Recycling Criteria) for supply of recycled water to nonrestricted recreational impoundments since the public health risks under both scenarios are analogous.

justify the removal of the REC1 use. As stated previously, the 131.10(g) factors define the circumstances under which designated “swimmable” (REC1) (and “fishable”) uses may be removed or subcategorized to allow the application of less stringent water quality objectives. The UAA factor evaluation is discussed next.

The following describes the evaluation of the data and information presented above relevant to two of the UAA factors identified in 40 CFR 131.10(g). These are:

- 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. (131.10(g)(2))
- 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. (131.10(g)(4))

5.6.5.9.1 Natural, Ephemeral, Intermittent or Low Flow Conditions or Water Levels [40 CFR 131.10(g)(2)]

Flow data and analyses are presented above and in the TC Technical Section 4.2.1). The dominant dry weather flows in the proposed Reach 1a and 1b create perennial flows that are less than 1 ft deep 90% of the time (See Figure TC-8). There are no sources of additional effluent discharges that could be used to augment the flows in proposed Reach 1a and 1b to enable the REC1 use be met. As noted, highly treated effluent is already discharged by Lee Lake Water District and the City of Corona to the Creek. However, effluent discharge plans are changing: the District is constructing a recycled water storage pond to promote recycled use of its effluent and the City of Corona will cease operation of and discharge from its WWTP #3, at least on an interim basis. These changes which will result in reduced discharges of treated effluent to Temescal Creek and, thereby, reduced flow levels in the Creek.

The predominant low flows in the Channel render the REC1 use unattainable, especially when considered in concert with the other relevant factors discussed above (access, safety, proximity to recreational areas, etc.).

5.6.5.9.2 Dams, Diversions or Other Types of Hydrologic Modifications [40 CFR 131.10(g)(4)]

Proposed Reach 1a and 1b of Temescal Creek have been very significantly modified for flood control purposes. As described above and summarized in Table TC-2, the channel in Reach 1a and 1b is concrete lined, except for the most downstream 0.5 mile segment of Reach 1a. Representative photographs of the modified channel are shown in this report in Figures TC-3-5 and 13-17 and additional images are provided in the TC Technical Report (Figs. 2-8 through 2-12 and 3-2 through 3-7). Given the existing level of development in the vicinity of the channel and ongoing urbanization, there is a continuing and increasing need to provide flood protection. Therefore, it is not considered feasible to restore the channel to its original condition or to operate the channel so as to attain the REC 1 use.

5.6.5.10 Conclusions and Recommendations

The preceding evidence and analyses demonstrate that:

- REC1 is not an “existing” use in either proposed Reach 1a or Reach 1b of Temescal Creek and the use cannot be attained by implementing effluent limits on point source discharges and/or cost-effective and reasonable best management practices for nonpoint source control. Therefore, neither Reach should be designated REC1.
- The REC2 designation is not justified for proposed Reach 1b.

Recommendations regarding the REC1 and REC2 designations for proposed Temescal Creek, Reach 1a and Reach 1b are summarized in Table TC-6.

Table TC-6

	Reaches	Reach Boundary	REC1	REC2	Current Basin Plan Beneficial Use Designation*
Temescal Creek	Reach 1a	Lincoln Avenue to Arlington Channel Confluence	No	Yes	REC1 and REC2
	Reach 1b	Arlington Channel confluence to 1,400 ft., upstream of Magnolia Avenue	No	No	REC1 and REC2

*The Basin Plan currently identifies Reach 1 of Temescal Creek, which is designated both REC1 and REC2. This Reach essentially coincides with proposed Reach 1a and 1b.

5.6.5.11 References

California Code of Regulations, Title 22, Division 4, Chapter 3 (Water Recycling Criteria).

California Department of Public Health (CDPH). February 1987. “Wastewater Disinfection for Health Protection.”

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 24, 2006. Technical Memorandum: Recreational Use Survey Data Report – Temescal Wash [aka Temescal Creek].

CDM. August 2010. Santa Ana Watershed Project Authority. Use Attainability Analysis Technical Report for Temescal Creek.

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.

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