

Technical Memorandum

To: Stormwater Quality Standards Task Force

From: CDM

Date: November 24, 2006

Subject: Recreational Use Survey Data Report – Temescal Wash

Introduction

To support Santa Ana River Basin Plan triennial review efforts, an evaluation of the appropriateness of REC-1 beneficial use designations and associated bacteria water quality objectives in the Santa Ana River Watershed is being performed by the Santa Ana Stormwater Quality Standards Task Force. The Task Force consists of representatives from a variety of stakeholder interests, including the Santa Ana Watershed Project Authority; the counties of Orange, Riverside, and San Bernardino; special districts; the Santa Ana Regional Water Quality Control Board; EPA Region 9; and local environmental groups, with assistance from CDM and Risk Sciences, Inc. As part of study efforts, recreational use surveys were performed upon select waterbodies to obtain information regarding current levels of recreational use. This report summarizes survey results conducted on Reach 2 of the Santa Ana River. This technical memorandum summarizes results from use surveys conducted at two locations on Temescal Wash.

Study Locations

Two locations were surveyed on Temescal Wash, including:

- Temescal Wash at Main Street
- Temescal Wash at the City of Corona WWTP No. 2

The Main Street camera was vandalized beyond repair on the ninth day of operation. A replacement camera was subsequently installed upstream of Main Street at the WWTP location and the survey at the Main Street location was abandoned. The WWTP location was selected because it was more secure and had the same general physical channel characteristics as the Main Street location. Figure 1 illustrates these survey locations and depicts the physical characteristics at each location on Temescal Wash. Photos show the general conditions of Temescal Wash in the vicinity of the survey locations (Figure 2).

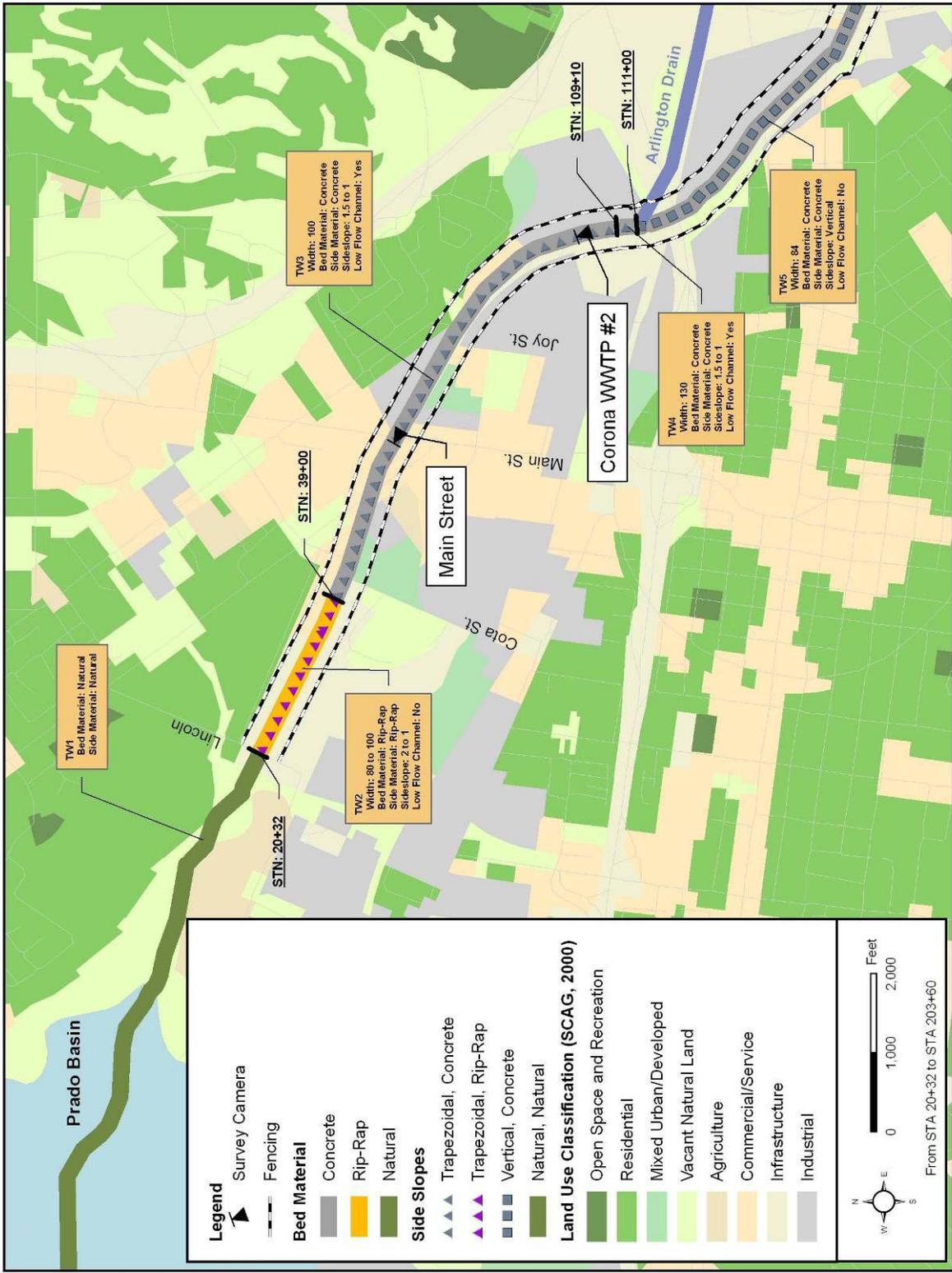


Figure 1
 Location of Recreational Use Surveys and Physical Characteristics for Temescal Wash



Figure 2a
Photo of Temescal Wash at Main Street Location



Figure 2b
Photo of Temescal Wash at the City of Corona WWTP No. 2 Location

Survey Design

Advanced digital cameras and data transfer technology, coupled with weekly on-location physical surveys were used to collect recreational use data. Observer IV™ cameras were equipped with cellular data transmission equipment to collect an image every fifteen minutes, and transfer the image to a secure data storage server via a file transfer protocol (FTP) site. Weekly site visits were conducted to log recreational use observations, and to monitor and maintain the image collection equipment. This survey design was selected to provide unprecedented levels of data to characterize recreational use. Figure 3 shows the final camera installation at each of the recreational use survey locations.

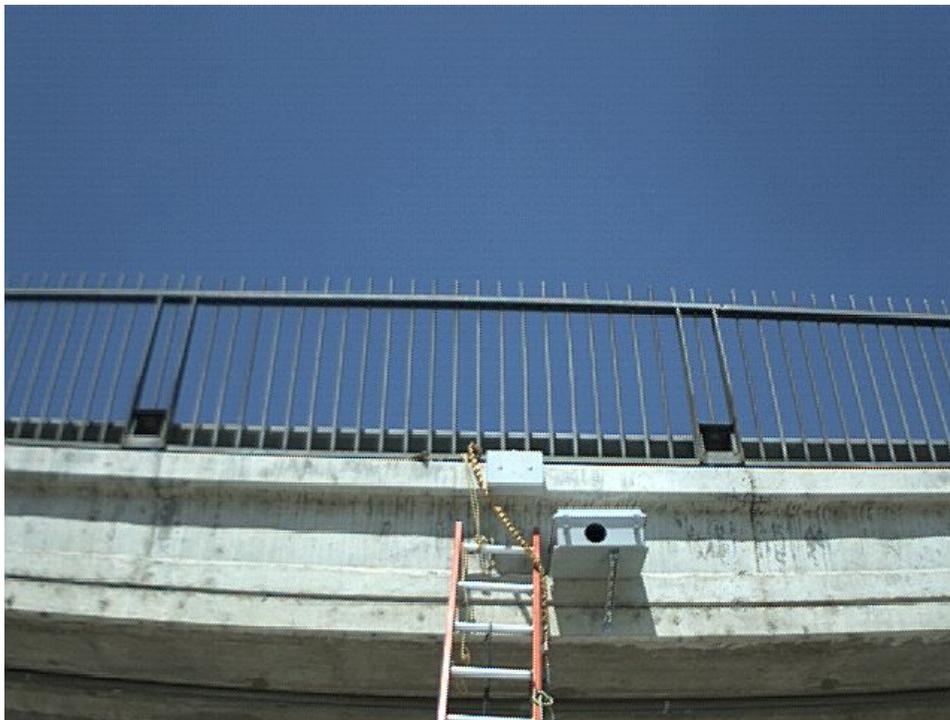


Figure 3a
Photo of the Recreational Use Survey Camera Installation for Temescal Wash at Main Street



Figure 3b
Photo of the Recreational Use Survey Camera
Installation for Temescal Wash at WWTP

The duration of survey and number of images collected from each location on Temescal Wash is shown in Table 1. An image was collected every fifteen minutes 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 1 Recreational Use Survey Duration			
Survey Location	Start Date	End Date	Number of Images
Main	7/26/05	8/4/05	512
WWTP	11/1/05	11/1/06	10,608

The image collection equipment and technology worked adequately throughout the survey period, but due to signal strength fluctuation issues and other equipment functionality issues, periodic, short term gaps in image collection occurred. These gaps ranged from relatively minor single, fifteen-minute interval image gaps, which occurred on numerous days, to gaps in image collection spanning several days. Table 2 summarizes the data gaps of one week or longer.

Images were stored and individually reviewed for activity. A use/activity categorization protocol was established for logging and categorizing observed activity from both image review and physical surveys. Within the protocol, information regarding water contact activity, including the type or magnitude of contact, and non-water contact activity, was collected and logged in the following categories:

- Date / Time
- Number of People
- Type of Contact
 - Incidental Contact
 - Contact Below Ankle
 - Contact Between Ankle and Waist
 - Contact Between Waist and Neck
 - Contact Above Neck
 - Non-Recreation Contact
- Non-Contact Activity

Table 2 Recreational Use Survey Data Gaps		
Location	Data Gap Period	Cause
Main	(none)	
WWTP	November 24 – December 7, 2005	Battery Failure
	January 13 – 19, 2006	FTP server down
	April 4 – 26, 2006	Camera Failure
	May 10 – 17, 2006	Camera Failure
	August 9 – 16, 2006	Camera Failure
	September 25 – October 4, 2006	Camera Failure

Images containing a person or persons within channel fencing or boundaries (and on-site surveys where a person or persons were observed) were considered “events”.

An event could include one or more persons. For each event, each person’s activity (type), and its duration and magnitude were logged per the established protocol. If an activity was captured within one image, an activity duration was reported as <30 minutes. Likewise, if an activity was observed within two consecutive fifteen-minute interval images, the duration was reported as <45 minutes.

Appendix A of this report contains images of all events that were counted as contact recreational use, and representative pictures of non-contact recreational use events. Some images included in Appendix A show examples of other types of activities, such as channel maintenance. Captured channel maintenance activities were observed in several images but not considered to be recreational use activity. These activities were only observed at the WWTP location, and primarily consisted of vehicles in the channel area.

Survey Results

Table 3 summarizes all water contact recreational events (individuals) observed for each of the survey locations and provides the date, potential duration, and magnitude of contact.

Table 3 Water Contact Recreation Events Recorded for Temescal Wash				
Location / Date	Time	Duration (min)	Magnitude of Contact	Image ID
<i>Temescal Wash at Main Street</i>				
7/27/2005	10:00	< 30	Below Ankle	Temescal-05-07-27-10-00
<i>Temescal Wash at the City of Corona WWTP No. 2</i>				
7/1/2006	13:30	< 30	Below Ankle	Temescal-06-07-01-13-30

Table 4 summarizes non-water contact types of recreational use. The total number of individuals recreating, estimated duration of recreation, and seasonal patterns are included in the summary table. The commonly used seasonal periods in southern California NPDES stormwater permits were used to categorize the observations by season (April 1 to September 30 for Summer, October 1 to March 31 for Winter).

Table 4 Non-Water Contact Recreation Events Recorded for Temescal Wash					
Location	Number of Individuals			Duration (min)	Types of Activities
	Total	Summer	Winter		
Main	3	3	0	90	Walking and biking
WWTP	28	19	9	810	Walking and biking

Summary of Findings

Approximately 11,000 recreational use data points (images) were collected over a one year duration from two locations along Temescal Wash with similar characteristics. Survey results indicate a very low frequency of water contact recreation, regardless of season. Two data points out of 11,166 collected indicated actual water contact. The duration was short, less than thirty minutes for both events. The magnitude of contact was always below the ankle, with no data points indicating full body contact or immersion.

Non-contact recreational activity, such as walking or biking in the channel area, was more frequent than contact activity, and results indicate an increase in the frequency of non-contact activity during the summer season near the City of Corona WWTP No. 2 location on Temescal Wash.

Appendix A
Select Photos from Temescal Wash Survey Locations

Temescal Wash at Main Street



No Activity: 7/28/2005 14:15



Contact Recreation: 7/27/2005 10:00



Non-Contact Recreation: 8/3/2005 8:00

Temescal Wash at WWTP



No Activity: 4/1/2006 13:30



Contact Recreation: 7/1/2006 13:30



Non-Contact Recreation: 2/25/2006 12:15



Maintenance: 9/19/2006 12:45