

# Monterey Urban Watch Report 2008

Prepared for  
**The City of Monterey, California**



This program was administered in partnership with the City of Monterey and the Monterey Bay National Marine Sanctuary

Report prepared by Maris Sidenstecker  
Water Quality Education Consultant

**PROGRAM OVERVIEW**

The City of Monterey Urban Watch storm drain monitoring program was initiated in June 1997 as a collaborative effort between the Coastal Watershed Council (CWC), the City of Monterey and the Water Quality Protection Program of the Monterey Bay National Marine Sanctuary. The purpose of this project is twofold: first is to serve as a tool for education and outreach to the general community regarding the impacts that the citizens have on local water quality; and secondly, to collect useful data to support local environmental management decisions. This is accomplished through the use of trained volunteers to monitor dry-season storm drain discharges at selected outflow areas from June through October-November of each monitoring year.

Working with staff from the City of Monterey Public Works Department, five sampling sites were selected based on drainage basin and safe access for volunteers. Figure 1 shows the locations of these sites. The five sampling sites are referred to as: (1) *Steinbeck Plaza* located at the end of Prescott Street on Cannery Row; (2) *Twin 51* located near the recreation trail at Heritage Harbor west of Fisherman’s Wharf; (3) *San Carlos* at San Carlos Beach near the Breakwater; (4) *El Dorado* aka Jack on Major Sherman Lane at El Dorado Street, north of Highway 1, Del Monte Shopping Center and Don Dahvee Park; and (5) *Library*, corner of Pacific Street and Madison Street.

Each site of the 2008 Urban Watch program is characterized as follows:

<b>Station Name</b>	<b>Station ID</b>	<b>Drainage Area (acres)</b>	<b>Primary Land Use</b>	<b>Description</b>	<b>Location</b>	<b>Receiving Water</b>
El Dorado (aka Jack) (Monterey)	MSD1		80% residential 20% commercial	Drainage ditch	Intersection of Major Sherman Lane at El Dorado Street	Lake
Twin 51 (Monterey)	MSD3	365	90% residential 10% commercial	Two 51' diameter concrete pipes	Below walking path at Heritage Harbor-adjacent to Wharf I, west ~500ft.	Ocean
San Carlos (Monterey)	MSD4	70	40% commercial 35% residential 25% public land	36' diameter concrete pipe	On the beach adjacent to the west side of Coast Guard pier.	Ocean
Steinbeck (Monterey)	MSD5	37	90% commercial 10% residential	36' diameter concrete pipe	At Steinbeck Plaza on Cannery Row at the end of Prescott Street	Ocean
Library (Monterey)	MSD6	467	100% residential	Drainage ditch	665 Pacific Street adjacent to the Monterey Public Library on the northeast side of Pacific Street.	Ocean

**PROGRAM DESIGN**

The program used the storm drain monitoring kit manufactured by the LaMotte Company (SSDK 7446) and designed in association with the City of Ft. Worth, Texas and the US Environmental Protection Agency (EPA) in 1990. The monitoring kit is designed to provide a method for volunteers to monitor dry-season storm drain discharges to identify common urban pollutants and contaminants within the study area. The kit was developed according to National Pollutant

Discharge Elimination System (NPDES) Phase I dry weather monitoring requirements and is designed to detect illegal storm drain connections and discharges. To this pre-assembled kit, we added the Oakton 'ECTestr' conductivity meters and a Hanna Instruments Low Reading Orthophosphate hand-held meter for measuring orthophosphates, and replaced the Oakton 'pHTestr' meter with pH strips for ease of use by volunteers.

Following a half-day training, fourteen volunteers were instructed to conduct sampling on a bimonthly schedule. Of the fourteen volunteers, four were returning veterans. Volunteers were divided into two teams: a day team that monitored during the morning hours and the evening team that monitored after 5:00pm. Each team had 6-8 members to contact for availability to monitor on selected days. Samples times and dates were randomized through a flexible schedule with the volunteers. Parameters monitored included detergent surfactants, orthophosphates, ammonia nitrogen, chlorine, turbidity, pH, conductivity, water and air temperature, odor, and color. Volunteers also noted if there was oil sheen, sewage, trash, and surface scum present. They also determined turbidity visually using a "Low-Medium-High" designation, as well as any other observations of note. Trash was collected and tabulated by the volunteers on each site visit. Table 1 includes information on each of the parameters monitored and methods used for monitoring.

The Urban Watch Program culminates with the First Flush monitoring wherein the volunteers capture water samples from the storm drains monitored for the Urban Watch program during the first significant rain of the wet season. This rain covers the streets and flushes the gutters and storm drains of collected materials and pollutants that accumulate throughout the dry-season. Infield measurements of water temperature, conductivity, pH, and an assessment of transparency are taken by volunteers at the site, and samples are collected and sent to a professional lab where analysis for nitrate, orthophosphates, zinc, copper, lead, hardness, total coliform and *E. coli.*, are performed. The results are compared to the Central Coast Ambient Monitoring Program's (CCAMP) Action Levels. These action levels are not for regulatory purposes. Rather, they provide guidance on potential impacts to the health of the marine ecosystem.

### **QUALITY ASSURANCE/QUALITY CONTROL PROGRAM**

The Quality Assurance/Quality Control (QA/QC) program included the following components:

- Training on monitoring concepts, safety, sampling methods, and hands-on use of equipment.
- Training in use of data sheets and data entry for volunteers.
- Periodic calibration of test equipment, calibration records are available.
- Use of Instrument ID numbers to track equipment used by teams
- Monitoring of reagent stores and expiration dates, waste management.
- Periodic review of data sheets to determine inconsistency in data entry.
- Continued supervision with the volunteers' sampling and analysis skills.
- Standard Operation Procedure for volunteers to use in the field while monitoring.
- Processing and analysis of data for report.

**Table 1: Water Quality Parameters**

<b>Parameter</b>	<b>Possible Sources</b>	<b>Associated Problems</b>	<b>Method/Accuracy</b>
Temperature	Illegal discharges, standing water, large paved surface areas	Affects rates of chemical and biochemical reactions in water.	Method - Digital thermometer Accuracy $\pm$ 1% full scale
Turbidity	Microorganisms, sediment, erosion	Interferes with fish and other aquatic life	Method - Visual Octa-Slide Viewer against turbidity standard slide bar
pH	Aerosols and dust in air, mineral substances, soils, sewer overflows, animal wastes, pesticides & fertilizers, photosynthesis	Interferes with fish and other aquatic life	Method – MacHery-Nagel pH-Fix 4.5-10.0 color-fixed indicator strips Accuracy $\pm$ 0.25 units Min detection: 4.5
Detergent surfactants	Illegal or unintended discharges, car washing, cleaning of screens and grills, leaking sanitary sewers	Can be toxic to many aquatic insects, plants, and fish; can lower dissolved oxygen available to aquatic life	Method - solvent extraction/ bromphenal blue indicator Accuracy $\pm$ 0.1 ppm Min detection: >0.1 ppm
Copper	Brake pads, copper architectural elements such as roofs or gutters; Illegal discharge into the storm drain system; also can occur naturally in surface waters	Concentrations over 0.025 parts per million are toxic to most freshwater fish	Not tested during dry weather Urban Watch monitoring season. Measured during First Flush by professional lab.
Chlorine	Illegal or unintended connection to a stormdrain or draining of a swimming pool; potable water line leaks	Toxic to aquatic life, can create a "sterile" environment	Method – DPD Octa-Slide Comparator against color standard. Accuracy $\pm$ 10% Min detection: >0.2ppm
Orthophosphate	Illegal or unintended discharges, car washing, cleaning of screens and grills, leaking sanitary sewers, fertilizers	Can be toxic to many aquatic insects, plants, and fish; can lower dissolved oxygen available to aquatic life	Hanna portable meter Accuracy $\pm$ 10%. Min detection: 0.0mg/L
Ammonia Nitrogen	Wildlife, fertilizers, illegal connections to stormdrain systems, poorly functioning septic systems	At certain concentrations can be toxic to aquatic organisms	Hanna portable meter Accuracy $\pm$ 0.04mg/L Min detection: 0.00 to 3.00mg/L
E. coli. bacteria	Wildlife, illegal connections to stormdrain systems, poorly functioning septic systems, wildlife	Detrimental to human health and marine organisms.	IDEXX Standard Method <sup>1</sup> 9223 b Duplicates within 95% confidence limits. Measured during First Flush by professional lab.
Conductivity	Discharges high in salts and minerals or metals, water moving through local geology	Possible agricultural, industrial or municipal wastewater runoff	Method –Electrode probe module. Accuracy $\pm$ 1% Min detection: 10 mS
Color	Tannins from plant material, soils, dyes or chemicals	Interferes with aquatic Insects	Method - Visual Borger Color System
Odor	Product of plant decomposition; illegal discharge sources; "clean" drainage water should have no distinctive odor	Can indicate presence of contaminants	Method - Scent
Oil sheen	Hydrocarbons such as oil,	Toxic to aquatic organisms	Method - Visual

	gasoline, and grease; decomposing plant materials (ie: eucalyptus); leaking underground petroleum storage tanks		
Trash, sewage, scum	Illegal discharge or illegal dumping; scum may be result of plant material decomposition	Interferes with fish and other aquatic life	Method - Visual

**VOLUNTEER TRAINING**

Bridget Hoover and Anna Holden of the Monterey Bay Sanctuary Citizen Monitoring Network provided a three-hour hands-on training for volunteers in May, 2008. Topics included monitoring concepts, sampling procedures, the meaning of each parameter monitored, use of kits in the field, and safety protocols.

Volunteers were placed in teams according to general skill level, interest and time availability. They were assigned one week per month and asked to monitor twice in that week. An experienced monitor, Maris Sidenstecker, the water quality education consultant for the City of Monterey accompanies each team in the field and runs the day-to-day aspects of the program.

All the data collected by the volunteers was reviewed by Maris before being entered into the Sanctuary data base.

**RESULTS**

Over the period of June 12, 2008 through October 29, 2008, the five sites were visited 22 times for a total of 110 site visits. The sites were monitored when water was flowing and out of the 110 visits a total of 98 individual monitoring events occurred. We are grateful for the fourteen volunteers that donated a total of 464.75 hours toward the program which would not function without them. Volunteer availability and other influencing factors, such as the lack of water flow, were taken into consideration throughout the program and not every parameter was tested on every site visit.

Of the five sites monitored throughout the program, most consistently exhibited flow and were monitored. The exceptions were Jack and San Carlos. Jack had no flow on 8/20/08, 8/21/08, all of September 2008 and most of October 2008 was dry with the exception of 10/29/08. San Carlos had no flow on 10/28/08. Ideally there should be no flow at the sites during the dry weather season.

The detection criteria for each parameter is based on the minimum detection limit for each respective test kit, see Table 1 (Method/Accuracy) for each parameter.

**Quantitative Parameters**

The parameters listed below were analyzed in the field using the LaMotte kit described in the Program Design section of this report. Volunteers divided up in teams and collected samples and then met back at a designated site to run the analysis with the LaMotte kit.

**Detergent Surfactants**

There were 98 samples tested for detergent from the five sampling sites. Of those, 17 tested positive for detergent. The site that detected the highest level of detergents was Steinbeck Plaza on 7/8/08 (2.4ppm). Steinbeck Plaza detergents were detected 14 times that measured greater than 0.1ppm. Detergents ranged between 0.2ppm to 2.4ppm at Steinbeck Plaza. Of the 14 detections, four were greater than 1.0 ppm and the remainder were between 0.2 ppm and 0.9 ppm. At Twin 51, detergents were identified once and measured 0.8ppm. At San Carlos, detergents were detected twice with results of 1.4ppm and 0.7ppm. At the remaining sites, Jack and Library, detergents were not detected during the monitoring period.

**Ammonia Nitrogen**

Ammonia values are reported as total ammonia (NH<sub>3</sub>-N). When converted to ammonia (NH<sub>3</sub>) the toxic form of ammonia none of the values exceeded the water quality objective of 0.025ppm NH<sub>3</sub>.

**Chlorine**

No chlorine was detected at any site during the monitoring program. All results were <0.2ppm or non-detect.

**Orthophosphates**

Of the 98 measurements taken, 95 of the samples indicated the presence of orthophosphates over the Water Quality Objective (WQO) criteria of 0.12 ppm. The highest detected value was 3.52ppm at Steinbeck on 10/2/08. The lowest value was 0.14ppm at the Library site on 10/2/08.

**pH**

The values for pH throughout the program averaged from 7.0 to 7.5. The highest measurement was 9.5 at Steinbeck on 10/2/08. The most common pH measurement for all five sites was 7.0, which was recorded 69 of 98 times.

***Measured Values*****Flow Presence**

Of the five storm drains that were visited, flow was detected in 98 of 110 site visits.

**Air Temperature**

Air temperature ranged between 13.0°C (Twin 51) and 29.0°C (Twin 51) for all sites throughout the program. The lowest recorded temperature was 13.0°C at the Twin 51 site on 6/14/08, and the highest recorded temperature was 29.0°C at Twin 51 on 9/3/08.

**Water Temperature**

Water temperature ranged between 13.1°C (Library) and 29.7°C (Twin 51) for all sites throughout the program. The lowest recorded temperature was 13.1°C at the Library site on 6/23/08, and the highest recorded temperature was 29.7°C at Twin 51 on 7/19/08.

**Conductivity**

Conductivity measurements were taken with the Oakton ECTester low range meter (0-1990  $\mu$ S) and with the Oakton ECTester high range meter (0-19.90 mS). A total of 98 samples were measured across all five sites. In the low range meter, the lowest recorded conductivity was 1130  $\mu$ S at Twin 51 site on 9/16/08 and the highest measurable conductivity value was 1990 $\mu$ S collected at San Carlos on 8/21/08 and Library on 6/12/08. Of the high range meter readings the low was 1.3mS at Twin 51 on 7/8/08, 7/9/08, 8/6/08 and 10/16/08. The high range was 12.9mS recorded at Steinbeck on 9/30/08.

### **Qualitative Parameters**

Volunteers were asked to make ‘presence or absence’ observations of the following parameters.

#### **Odor**

Odors were reported in 4 of 98 monitoring events at the five sites. All odors were recorded at Steinbeck on 7/9/08, 7/14/08, 8/6/08 and 9/3/08. Odors were recorded as ‘musty,’ ‘putrid’ or ‘sewage and sulfur’ smells.

#### **Color**

Water samples were compared to a Borger Color System (BCS) booklet used to identify colors in nature. Fifty-seven of the 98 samples were reported as colorless. Of the remaining samples, volunteers indicated the water samples to be a pale yellow and pale tan, to drab grays and drab browns.

#### **Oil sheen**

An oil spot was noted once on 8/5/08 at the Library site. This was the only observation of oil.

#### **Sewage**

Sewage and sulfur smell was noted once from Steinbeck on 7/9/08.

#### **Surface scum**

Surface scum was reported 22 times of 98 monitored events at the five sites. In most cases ‘bubbles,’ ‘soapy water’ and ‘foam’ were reported to be a component of the surface scum.

#### **Trash**

Trash was reported in most site visits. Trash was noted at all five sites with the highest frequency at Steinbeck followed by Twins, Library, San Carlos and Jack. The descriptions of the types of trash collected can be found in the monthly summaries in the following pages. The most common trash observations included Styrofoam, aluminum, cigarette butts, and plastic wrappers.

#### **Turbidity**

Out of the 98 samples, turbidity was consistently low for all sites during the monitoring season.

#### **Day of Week/Time of Day**

Volunteer monitoring occurred largely between Monday and Thursday. Weekend data was collected on 6/14/08, 6/28/08 and 7/20/08. Most events occurred in the middle of the week with the most common monitoring days being Tuesday-Thursday. The monitoring times varied; however, they were in the morning to early afternoon hours for the day team and after 5:00pm for the evening team.



Monterey Urban Watch Volunteers (day team) analyzing collected samples at San Carlos Beach.



Robert Armstrong, volunteer recording data at the Twin 51 site in Monterey.

# Monterey Urban Watch June 2008

**Dates Monitored: 6/12,08, 6/14/08, 6/23/08, 6/28/08**  
**Number of volunteers: 11**                      **Volunteer hours: 108**  
**Volunteer training hours: 30**  
**Total season volunteer hours: 138**  
**Team Leader: Maris Sidenstecker**

## Average Detection for June (ppm)

<u>Site</u>	<u>Chlorine</u>	<u>Detergent</u>	<u>Ammonia</u>	<u>Orthophosphate</u>
Steinbeck	0.2	0.62	0.35	0.84*
Twins	0.2	0.1	0.28	0.30*
San Carlos	0.2	0.1	0.00	0.12
Jack	0.2	0.1	0.06	0.12
Library	0.2	0.1	0.02	0.15*

**\*Indicates exceedence of CCAMP Water Quality Objective.**  
**Ammonia Recorded as Total Ammonia NH3-N**

**Fast Facts**

- 6/12 Replicate testing on all parameters was done on the San Carlos site as part of the QA testing. Ortho. with 50% dilution 2.52ppm.
- 6/13 Anna calibrated ammonia meters.
- 6/14 Detergent at Steinbeck was high at <0.9ppm. Ortho. with a 50% dilution yielded 1.87ppm x 2=3.74ppm.
- 6/28 Air quality awful due to Big Sur fires. Steinbeck ortho. with 50% dilution 4.20ppm.

**Trash Collected:** Volunteers cleaned up lots of litter at the 5 sites: paper, beer bottles, plastic drink, plastic hanger, plastic food wrappers, plastic top, styrofoam cup & plate, 2x4 with nail, tennis ball, cigarette butts, straws, sock, oragel tube.

Report by Maris Sidenstecker, Urban Watch Coordinator for the City of Monterey  
 (831) 899-9957 or orcamaris@earthlink.net

# Monterey Urban Watch July 2008

**Dates Monitored: 7/8/08, 7/9/08, 7/20/08, 7/22/08**  
**Number of volunteers: 11**                      **Volunteer hours: 93.75**

**Total season volunteer hours: 231.75**  
**Team Leader: Maris Sidenstecker**

## Average Detection for July (ppm)

Site	<u>Chlorine</u>	<u>Detergent</u>	<u>Ammonia</u>	<u>Orthophosphate</u>
Steinbeck	0.2	1.17*	2.14*	1.76*
Twins	0.2	0.1	0.00	0.20*
San Carlos	0.2	0.1	0.33	0.18*
Jack	0.2	0.1	0.21	0.15*
Library	0.2	0.1	0.34	0.17*

**\*Indicates exceedence of CCAMP Water Quality Objective.**  
**Ammonia Recorded as Total Ammonia NH3-N**

### Fast Facts

- 7/8 Still lots of smoke in air from Big Sur fires. Replicate testing on all parameters done at Library site as part of the QA testing. Steinbeck high detergent level >2.40ppm and Ortho. diluted 50% to get 8.32ppm. Ammonia not done as collection sample bag was dumped by accident.
- 7/9 Ammonia at Stein. Diluted 50% to get 4.32ppm. Ortho. at Stein diluted 25% to get 7.28ppm.
- 7/22 Steinbeck ammonia diluted 50% to get 2.96ppm and ortho. diluted 50% to get 4.40ppm.

**Trash Collected:** styrofoam pellets, cigarette butts, bottle tops, snack bags, plastic cutlery, coffee cups, coke can, candy wrappers, electrical cable, paper plate, styrofoam pellets, tennis ball, wooden spike, fishing line, pen, tape, fast food wrappers.

Report by Maris Sidenstecker, Urban Watch Coordinator for the City of Monterey  
 (831) 899-9957 or orcamaris@earthlink.net

# Monterey Urban Watch August 2008

Dates Monitored: 8/5/08, 8/6/08, 8/20/08, 8/21/08  
 Number of volunteers: 12 Volunteer hours: 59.5

Total season volunteer hours: 291.25  
 Team Leader: Maris Sidenstecker

## Average Detection for August (ppm)

Site	Chlorine	Detergent	Ammonia	Orthophosphate
Steinbeck	0.2	0.3	1.96	0.83*
Twins	0.2	0.1	0.54	0.24*
San Carlos	0.2	0.1	0.03	0.22*
Jack	0.2	0.1	0.43	0.11
Library	0.2	0.1	0.31	0.20*

\*Indicates exceedence of CCAMP Water Quality Objective.  
 Ammonia Recorded as Total Ammonia NH3-N

### Fast Facts

- 8/5 Replicate testing on all parameters was done at the Library site as part of the QA testing.
- 8/20 & 8/21 Water flow at Jack too low to collect samples.
- 8/21 Ortho. at Steinbeck 50% dilution to get 3.16ppm.

**Trash Collected:** beer can, tennis ball, styrofoam pellets & cup, cigarette butts, paper, broken bottle, bottles, disp. coffee cup, candy wrappers, aluminum cans, drink cups and lids, plastic pieces, straws, headband, plastic bag, hypodermic cap.

Report by Maris Sidenstecker, Urban Watch Coordinator for the City of Monterey  
 (831) 899-9957 or orcamaris@earthlink.net

# Monterey Urban Watch September 2008

Dates Monitored: 9/3/08, 9/4/08, 9/16/08, 9/18/08 & 9/30/08

Number of volunteers: 11

Volunteer hours: 93

Total season volunteer hours: 384.25

Team Leaders: Maris Sidenstecker/Carolyn Skinder

## Average Detection for September (ppm)

Site	Chlorine	Detergent	Ammonia	Orthophosphate
Steinbeck	0.2	0.42	2.34	1.06*
Twins	0.2	0.24	0.3	0.36*
San Carlos	0.2	0.1	0.32	0.41*
Jack	No Flow All Month			
Library	0.2	0.1	0.26	0.20*

**\*Indicates exceedence of CCAMP Water Quality Objective.**

**Ammonia Recorded as Total Ammonia NH3-N**

### *Fast Facts*

- No flow at Jack all month.

**Trash Collected:** paper, beer bottles, plastic drink, plastic top, styrofoam cups cigarette butts, straws.

Report by Maris Sidenstecker, Urban Watch Coordinator for the City of Monterey  
(831) 899-9957 or [orcamaris@earthlink.net](mailto:orcamaris@earthlink.net)

# Monterey Urban Watch October 2008

**Dates Monitored: 10/2/08, 10/15/08, 10/16/08, 10/28/08 & 10/29/08**

**Number of volunteers: 12                      Volunteer hours: 80.5**

**Total season volunteer hours: 464.75**

**Team Leader: Maris Sidenstecker**

## Average Detection for September (ppm)

<u>Site</u>	<u>Chlorine</u>	<u>Detergent</u>	<u>Ammonia</u>	<u>Orthophosphate</u>
Steinbeck	0.2	0.4	0.65	0.60*
Twins	0.2	0.1	0.13	0.22*
San Carlos	0.2	0.57	0.11	1.14*
Jack	0.2	0.1	NR	0.31*
Library	0.2	0.1	NR	0.18*

**NR=No Reagent**

**\*Indicates exceedence of CCAMP Water Quality Objective.**

**Ammonia Recorded as Total Ammonia NH3-N**

### Fast Facts

- No flow at Jack 10/2-10/28. Was flow 10/29.
- No Flow at San Carlos on 10/28.
- 10/2 ortho. at Stein. Diluted 25%=3.44ppm. Ortho. at SCarlos diluted 25% still out of range  
2.67ppm x 4 = 10.68ppm. SCarlos detergent < 1.4ppm.  
CCarlos conductivity very high 9.5mS. Ammonia not done due to no reagent "A". Color test not done on samples.
- 10/16 Ammonia done only on Stein. (out of reagent) & ortho. 50% dilution = 2.48ppm.
- 10/28/08 No ammonia reagents. No flow at SCarlos. Split inversion layer detergent Stein.
- 10/29/08 No ammonia reagent. Split inversion layer for Stein. detergent and SCarlos.

**Trash Collected:** styrofoam pellets, straws, cigarette butts, candy wrappers, plastic cups, plastic bag, paper plates, crack pipe, water bottle, toothpick, aluminum can top, pen, small auto part ring for hose, plastic juice bottle.

**Average Detection for June (ppm)**

Site	Chlorine	Detergent	Ammonia	Orthophosphate
Steinbeck	0.2	0.62	0.35	0.84
Twins	0.2	0.1	0.28	0.3
San Carlos	0.2	0.1	0	0.12
Jack	0.2	0.1	0.06	0.12
Library	0.2	0.1	0.02	0.15

**Average Detection for July (ppm)**

Site	Chlorine	Detergent	Ammonia	Orthophosphate
Steinbeck	0.2	1.17	2.14	1.76
Twins	0.2	0.1	0	0.2
San Carlos	0.2	0.1	0.33	0.18
Jack	0.2	0.1	0.21	0.15
Library	0.2	0.1	0.34	0.17

**Average Detection for August (ppm)**

Site	Chlorine	Detergent	Ammonia	Orthophosphate
Steinbeck	0.2	0.3	1.96	0.83
Twins	0.2	0.1	0.54	0.24
San Carlos	0.2	0.1	0.03	0.22
Jack	0.2	0.1	0.43	0.11
Library	0.2	0.1	0.31	0.2

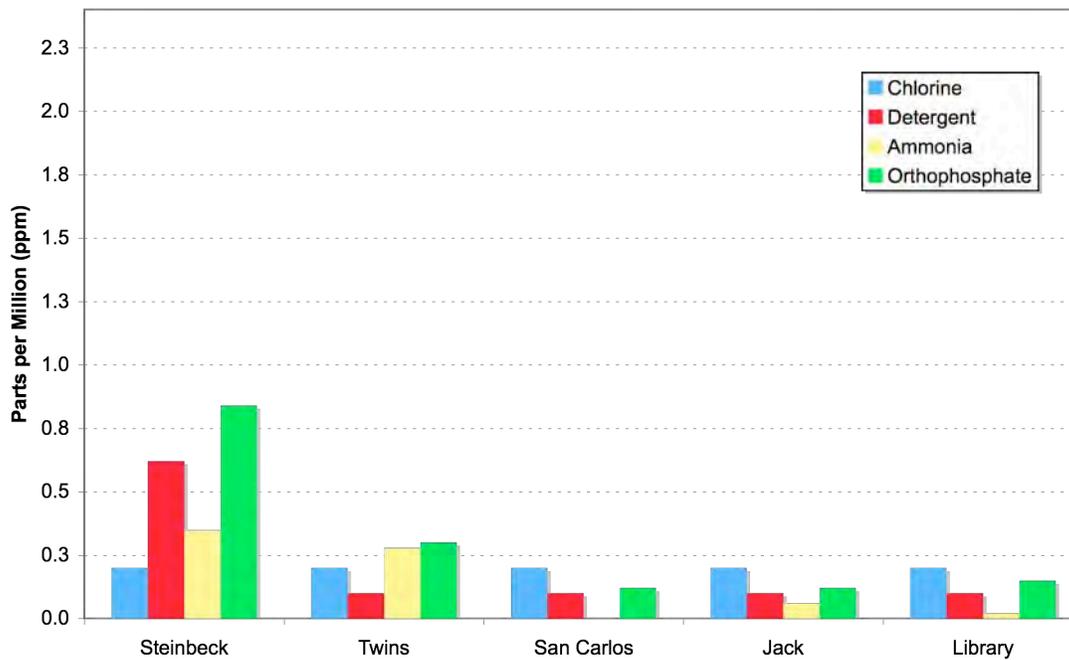
**Average Detection for September (ppm)**

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Twins	0.2	0.24	0.3	0.36
San Carlos	0.2	0.1	0.32	0.41
Jack	No Flow All Month			
Library	0.2	0.1	0.26	0.2

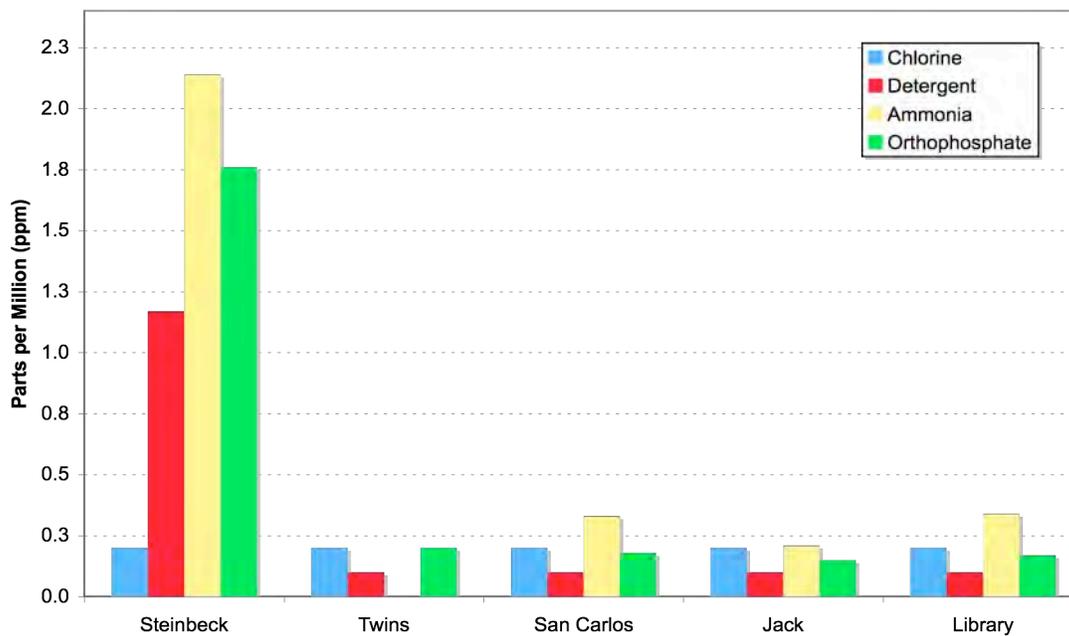
**Average Detection for October (ppm)**

Site	Chlorine	Detergent	Ammonia	Orthophosphate
Steinbeck	0.2	0.4	0.65	0.6
Twins	0.2	0.1	0.13	0.22
San Carlos	0.2	0.57	0.11	1.14
Jack	0.2	0.1	No Reagent	0.31
Library	0.2	0.1	No Reagent	0.18

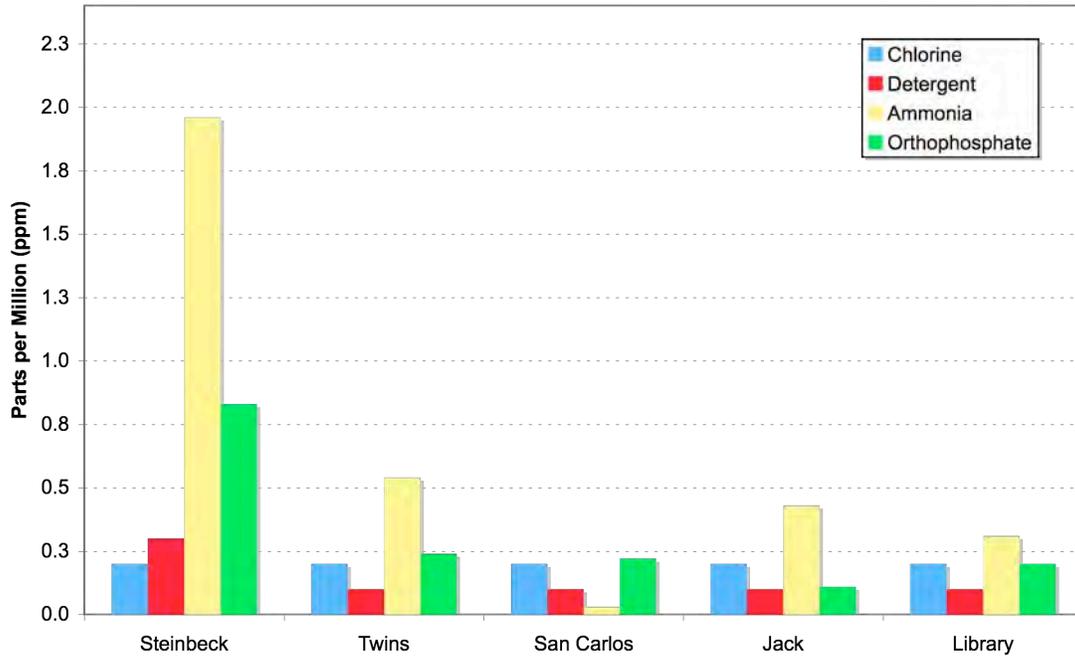
### June 2008 Average



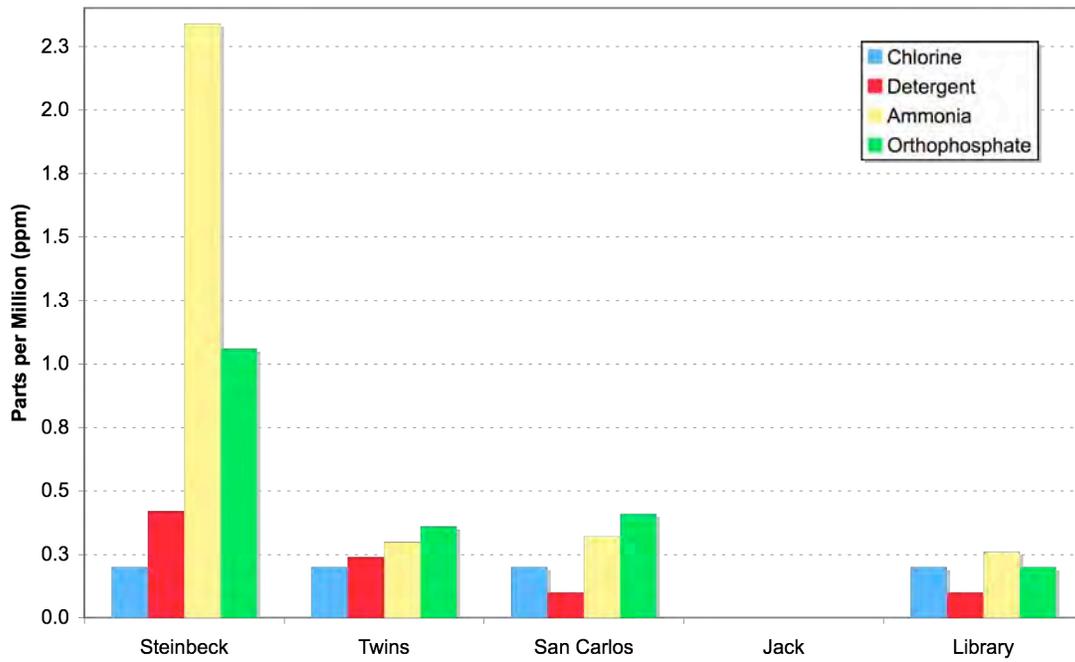
### July 2008 Average



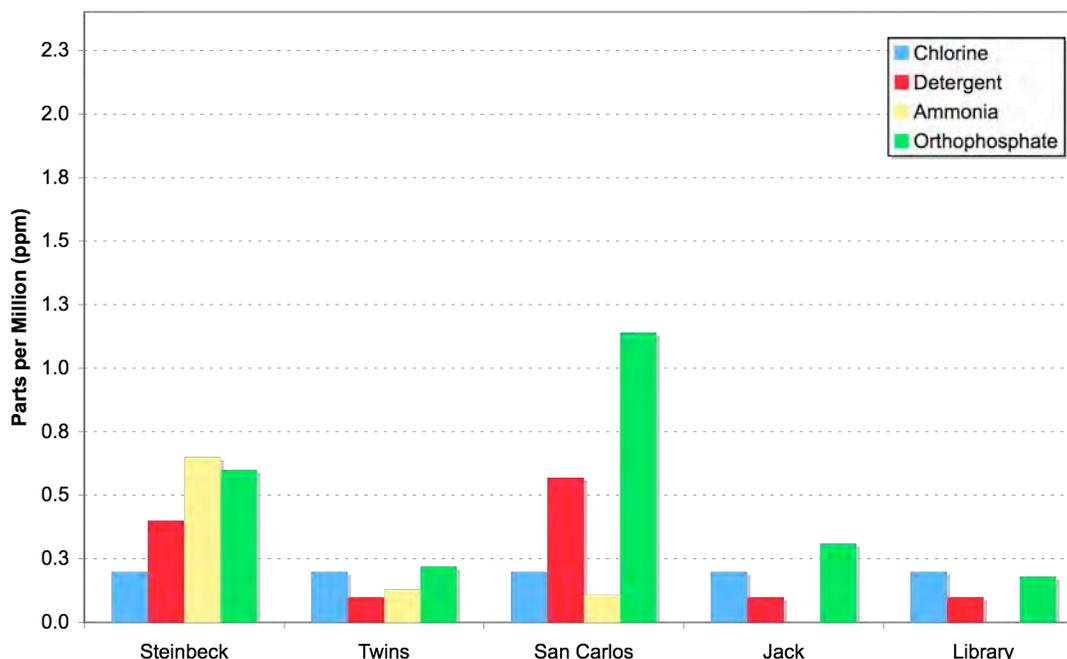
August 2008



September 2008



### October 2008 Average



### CONCLUSION

The five sites were visited 22 times for a total of 110 site visits and monitored (when flowing) for a total of 98 events from June 12, 2008 - October 29, 2008. In November, the first significant rain event of the season took place and Urban Watch officially ended. Most of the sites had random spikes of ammonia, detergent, and orthophosphate. Orthophosphate levels at almost all sites were generally above the WQO of 0.12 ppm. Once converted, none of the total ammonia values exceeded the ammonia-N WQO of 0.025ppm. No chlorine was detected at any sites.

Upstream source tracking is taking place for Steinbeck Plaza in 2009 to look for sources of detergent. Due to the location along Cannery Row and the many restaurants that surround the site several different avenues of educating restaurant owners have been tried. A DVD was made several years ago in English and Spanish to inform food service employees about proper Best Management Practices for cleaning practices. Presently these DVDs are being distributed with posters during the restaurant inspection process by the Monterey Regional Water Pollution Control Agency. In addition, workshops have been held on an annual basis over the last two years with the California Restaurant Association and the County of Monterey to encourage restaurant owners to become a Certified Green Business. As part of the Green Business Certification process managers have to educate their employees with the DVD followed by a survey.

Orthophosphate levels were high across all sites and source tracking of orthophosphate would be beneficial. Testing municipal tap water for orthophosphate in the past has revealed levels above the WQO exceedence value (from 0.39ppm-0.45ppm). This could answer the question of why there is orthophosphate detected at all the sites. Simply watering the lawn or hosing down driveways with municipal tap water could be a source for the levels.

The City of Monterey has a robust public outreach program in partnership with neighboring cities

and the County of Monterey as part of its Phase II National Pollution Discharge Elimination System (NPDES) storm water permit known as the Monterey Regional Storm Water Management Program (MRSWMP). Through MRSWMP, the City of Monterey does an excellent job utilizing marketing techniques (i.e., bus ads, posters, movie ads, radio ads, print ads, outreach at local events, school presentations and outreach to nurseries to use less toxic pesticides) and providing outreach materials as public education tools in pollution prevention. The program works with many local nonprofit partners and agencies to reach as many people as possible. To learn more about the MRSWMP permit visit [www.montereysea.org](http://www.montereysea.org)

In conclusion, it is recommended that the City of Monterey continue the Urban Watch next season and 1) conduct source tracking of pollutant sources for the Steinbeck site with the Sanctuary staff 2) continue outreach programs targeting local businesses, schools and residents to further reduce urban runoff pollution from entering the Monterey Bay National Marine Sanctuary.

Thanks to our volunteers, a large amount of trash was cleaned up from the areas around the five Monterey storm drains that were sampled. The monitoring program would not have been possible without the devoted volunteers. We wish to thank the following:

Robert Armstrong

Jeff Dee

Art Evjen – returning veteran

Derek Hayward

Fran Horvath- returning veteran

Jeff Johnson- returning veteran

Kathleen Million

Steve Million

Bob Petty

Kathy Petty

Christine Saxon

Mary Scannell- returning veteran

Carolyn Skinder

Lynda Zens

Annie Schmidt passed away in August 2008 from cancer. Annie was an enthusiastic and dedicated volunteer who participated in Urban Watch, First Flush and Snapshot Day monitoring events over the past 10 years. A ginkgo tree was planted in her memory by the Monterey Library.



