

# **Appendix A**

## **Carlsbad Watershed Activity Sheets**

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# **Water Quality Activity Sheets**

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**TITLE: RESIDENTIAL IRRIGATION RUNOFF REDUCTION**  
**ID #: CHU-WQA1**

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**ACTIVITY IMPLEMENTATION**

A pilot single family residential area in a sub-watershed will be selected to evaluate the load reduction potential related to reducing irrigation runoff. The expected results include reduction of any existing leaks or overspray at applicable residences, one-on-one education of residents in the pilot area, and reduction in irrigation runoff flow in the pilot area. Planned activities include:

- Use Dry Weather Monitoring Program results, BLTEA information, and field knowledge to select a pilot area.
- Collect pre-pilot flow data in pilot drainage area, and calculate estimated pollutant loads
- Work with volunteer residences and sites with irrigation runoff to review water usage, conduct water assessment and leak detection as necessary.
- Field reconnaissance to check for corrective action completion.
- Collect post-pilot flow measurements in pilot drainage area, and calculate estimated pollutant loads
- Measure effectiveness of overall program by calculating any reduction in pollutant loading through reduction in over-irrigation.
- Education to be coordinated through CHU-WQEA1

This activity was in the planning phase during FY 2008. Activities conducted during FY 2008 included researching potential pilot neighborhoods, field reconnaissance at outfalls, and development of draft outreach materials.

**TMDL APPLICABILITY**

This activity is not related to an existing TMDL.

**TIME SCHEDULE FOR IMPLEMENTATION**

Implementation will occur in FY 2009. The pilot neighborhood will be identified by October of 2008. Preparation of the outfall for flow monitoring will occur in November 2008. Pre-pilot flow measurement will occur in December 2008, pending dry weather. Flow measurement will not occur during rain events, but may occur after rain events provided that there is no rain included in flow measurements. The first outreach piece will be delivered to the neighborhood once flow measurements are completed, in December 2008 or January 2009 depending on rain. Once flow measurements and introductory outreach is completed, one-on-one work with volunteer residences and sites with irrigation runoff will begin.

Assessment will also occur in FY 2009 if the implementation steps listed above are completed. Estimated timeframe is May 2009.

**PARTICIPATING WATERSHED COPERMITTEES**

- City of Carlsbad
- All watershed members will participate during planning and measuring phases of this activity. City of Carlsbad personnel will participate in the implementation phase of the activity.

**OTHER PARTICIPATING AGENCIES**

Carlsbad Municipal Water District Employees

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria
- Nutrients
- Sediment

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation. This activity addresses high priority water quality problems and potential source of the problems within the watershed, therefore the activity is consistent with the Carlsbad WMA strategy.

**EFFECTIVENESS ASSESSMENT**

A reduction of flow after working with applicable residents is the targeted outcome of this activity and will be assessed by measuring irrigation runoff flow after the pilot is completed. Implementation effectiveness will be measured by evaluating pre and post-flow surveys (Level 4 Outcome). Since the pilot will be completed prior to the start of the 2009 dry season, the results will be analyzed within nine months following completion of the pilot. In FY 2008, because several pilot neighborhoods have been identified and draft outreach materials developed, the planning phase of this activity is considered effective.

**TITLE: LOMA ALTA CREEK ULTRAVIOLET RADIATION STORM WATER  
TREATMENT FACILITY**  
**ID #: CHU-WQA2**

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**ACTIVITY IMPLEMENTATION**

This project involves the construction of a filtration and ultraviolet (UV) radiation storm water treatment facility to be located adjacent to the Loma Alta Creek outlet in the City of Oceanside. One hundred percent of the dry weather creek flows (averaging 300 to 700 gallons per minute) will be intercepted at the outlet and diverted to the UV storm water treatment facility.

The treatment facility consists of piping flows from an existing diversion structure by gravity from the lagoon through a 2 micron fine screen to a wet well where the flow is pumped into two large sand filters followed by two UV disinfection units housed in a reinforced concrete building. Once treated, water will discharge through a pipe that will extend along the existing section of rip-rap that runs along the north side of the Loma Alta Creek outlet at Buccaneer Beach. During wet weather months, the lagoon would be opened to allow free flow to the ocean and the UV system would be bypassed.



This project is located where Loma Alta Creek discharges to the Pacific Ocean at Buccaneer Beach. The watershed is mostly in the City of Oceanside with the headwaters within the City of Vista. Buccaneer Beach is a family beach adjacent to a park that is heavily used during dry months. The City determined that a key source of bacteria and nutrients are urban runoff from the 6,400 acre Loma Alta Watershed, which is densely developed with residential, commercial and industrial land uses. While nutrients promote algae growth in the lagoon and cause nuisance odors, the high bacteria levels in the creek flow to the ocean directly impacts the ocean water quality at Buccaneer Beach. To reduce the numerous beach postings and closures at this popular beach the City decided to apply for a Clean Beach Initiative Grant to construct an UV treatment facility to treat the dry weather flows in the Loma Alta creek prior to discharging the water to the beach. A \$5,000,000 Proposition 40, Clean Beach Initiative Grant, was awarded to the City on January 24, 2007 to design and build the UV treatment facility.

The increased presence of bacteria and pathogens in the watershed poses a threat to REC-1 and REC-2 beneficial uses and results in increased number of beach closures at the Loma Alta Creek outlet at Buccaneer Beach. This project will address the bacterial issue through filtration and UV disinfection. The anticipated project goal is to eliminate beach closures during the dry months at Buccaneer Beach in Oceanside, California. This will be achieved by diverting the flow from the Loma Alta Lagoon through a UV treatment facility prior to discharging the flow onto the shoreline. The City will monitor the UV treated storm drain outlet and the surf zone for bacteria for the end of the 2008 and all of the 2009 AB411 period. The approved Monitoring Plan and Quality Assurance Project Plan developed for this project will be implemented

Prior to the construction, a Final Monitoring Plan and Quality Assurance Project Plan (QAPP) was developed and approved by the State Water Resources Control Board (SWRCB) in June of 2007. This plan listed the sample frequency, locations and methods for testing the effectiveness

of the treatment system. The monitoring plan would begin once the UV treatment facility was operational. The California Coastal Commission approved Permit No. 6-06-152 for construction of the outfall pipe associated with the UV treatment facility on June 14, 2007. Loma Alta Creek UV Treatment Facility project entered into the construction phase on August 13, 2007 when the official Notice to Proceed was issued to Orion Construction Corporation. The construction was completed in July 2008, testing ran through August 2008 and the UV treatment facility began discharging to the ocean in September 2008. All monitoring indicated that the system functions as expected and the surf zone samples all met AB411 limits. The facility was shut down for the wet season during the beginning of October as a storm approached the coast.

In May of 2009 the UV facility will be brought back online and will run until the first storm in September or October 2009. The QAPP monitoring program will run through the summer and a final report for the SWRCB will be completed by the end of 2009. The UV facility will be maintained and operated during the dry weather period for the next 20 years.

### **TMDL APPLICABILITY**

The RWQCB and Copermittees are developing a Bacteria-Impaired Waters TMDL Project II for Lagoons and adjacent beaches and creeks, which includes Loma Alta Creek slough. This project will assist in the implementation of this TMDL by reducing bacterial contamination in the impaired segment of Loma Alta Slough and the Pacific Ocean shoreline. Just over eight acres of the Loma Alta Slough are included on Section 303(d) of the federal Clean Water Act list of impaired water bodies for bacterial indicators and eutrophication within the slough and for 1.1 miles of coastline at the opening.

### **TIME SCHEDULE FOR IMPLEMENTATION**

This activity was scheduled for planning and construction during FY 2008. Construction was completed in July 2008. Implementation was planned for FY 2009 which appears to be on schedule with the UV facility being brought back on-line in May 2009. Because this facility will run during the summer months of 2009 the implementation phase will overlap both FY 2009 and FY 2010.

### **PARTICIPATING WATERSHED COPERMITTEES**

- City of Oceanside

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

The Carlsbad WMA collective watershed strategy identifies bacteria as a high priority water quality pollutant in the Loma Alta Creek Hydrologic Area (904.1). Residential, commercial, and industrial land uses have been identified as potential discharges of bacteria. This activity addresses a high priority water quality problem and potential source of the problem within the watershed, therefore the activity is consistent with the Carlsbad WMA strategy.

### **EFFECTIVENESS ASSESSMENT**

A Project Assessment and Evaluation Plan (PAEP) was developed to define how to measure the effectiveness of the UV treatment facility. A Final Monitoring Plan and Quality Assurance Project Plan (QAPP) defines the monitoring program that measures water quality prior to and during facility operation. Monitoring for total and fecal coliform and enterococcus will be conducted at several locations: In the lagoon prior to water entering the UV facility, within the plant prior to and after UV treatment, and at the shoreline at the discharge point and in the

coastal mixing zone (Level 5 and 6). After a complete dry season of testing (May through September 2009), a final effectiveness report will be generated using all of the data. The facility will be considered effective if the treated discharge from the UV facility meets the 30 day average Rec-1 Water Quality Standards set forth in the Ocean Plan. This will ensure that the surf zone will meet the same limits after mixing occurs.

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**TITLE: ETERNAL HILLS CEMETERY BMPS**  
**ID #: CHU-WQA3**

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**ACTIVITY IMPLEMENTATION**

The Eternal Hills Cemetery had an Urban Run-off Management Plan (URMP) approved in April 2005 and revised in March 2006. This URMP was developed at the request of the City of Oceanside and recommended various BMPs to minimize the release of fertilizers, pesticides, herbicides, fossil fuels, and sediment from the property. Some components of that plan had not been implemented and Oceanside issued enforcement notices to require correction of the problems and to implement and maintain the BMPs proposed in the URMP. With the facility proposing expansion, the city required the development of a new Storm Water Management Plan (SWMP) relative to the current operation and proposed expansion activities. This new SWMP required the use of additional BMPs and detention basins to attenuate peak flows and mitigate/reduce sedimentation from leaving the property. The expected benefit from this project was the implementation of recommended BMPs in the facility's new SWMP which will mitigate/reduce potential pollutants from leaving the cemetery property and reaching Loma Alta Creek.

During FY 2008 the following activities were completed:

- Conditions for approval of the Environmental Impact Report (EIR) for the facility expansion required Eternal Hills Cemetery to bring their Stormwater Management Plan (SWMP) up to current conditions as required by regulatory agencies and the City of Oceanside. Required resource agency permits were obtained and the EIR was approved on December 3, 2007. An amended SWMP was completed and approved on June 11, 2008.
- Prior to the rainy season in September 2007 Oceanside Code Enforcement (CE) staff conducted an initial inspection to determine if erosion control BMPs were in good repair. During that inspection it was noted that there were some BMP maintenance needs with regards to gravel bags and BMP placement around soil stock pile areas. No erosion was evident at the time of this inspection. A follow-up inspection determined that repairs had been made.
- The site was inspected after two rain events in both January and February 2008 and the erosion control BMPs were still in good repair and no soil erosion was evident.
- In March 2008 the site was inspected and it was determined that some BMPs were in need of repair and replacement. Subsequently the BMPs in need of repair were fixed and additional erosion control BMPs were placed on the site.
- During FY 2008 the following BMPs were installed on the Eternal Hills Cemetery Property: 1300 gravel bags; 20 yards of gravel; 1056 feet of new fiber rolls and 500 feet of replacement fiber rolls; 1000 feet of silt fence; 500 feet of burlap blankets for added erosion control on the stock pile areas; 8 acres of grass were dethatched to allow for water percolation and retention.

BMP maintenance for future years include: Additional acreage to be dethatched each quarter during FY 2009; BMPs will be inspected prior to each rain event; two yards of gravel and sixty gravel bags will be kept on-site for use where needed prior to rain events and for regular maintenance activities.

The City of Oceanside will continue to implement this activity , however, in the future the activity will be reported in the City's Jurisdictional Urban Runoff Management Program Annual Reports.

**TMDL APPLICABILITY**

This activity is not being implemented for compliance with a TMDL.

**TIME SCHEDULE FOR IMPLEMENTATION**

This activity was scheduled for implementation and assessment during FYs 2008 and 2009. This activity is on schedule according to the 5-year strategic plan submitted with the Carlsbad 2008 WURMP Update.

**PARTICIPATING WATERSHED COPERMITTEES**

- City of Oceanside

**OTHER PARTICIPATING ENTITIES**

- No other entities are participating on this project.

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria

**OTHER WATER QUALITY PROBLEM(S) ADDRESSED**

- Sediment
- Nutrients

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

The Carlsbad WMA collective watershed strategy identifies bacteria as a high priority water quality pollutant in the Loma Alta Creek Hydrologic Area (904.1). Sediment in creeks can provide a reservoir for bacteria. Commercial and industrial land uses have been identified as potential discharges of bacteria. This activity addresses a high priority water quality problems and potential source of the problem within the watershed. Therefore this activity is consistent with eh Carlsbad WMA strategy.

**EFFECTIVENESS ASSESSMENT**

Though there was erosion evident after the March 2008 rain events, the amount of sediment reaching the bottom of the drainage channel was significantly less than when there were little BMPs in place. The cemetery operators are knowledgeable of the need for BMPs associated with their facility and the need to implement them according to their SWMP (Level 2). The facility is implementing BMPs according to the SWMP (Level 3).

**TITLE: MYERS PROPERTY RESTORATION ASSESSMENT**  
**ID #: CHU-WQA4**

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**ACTIVITY IMPLEMENTATION**

The Myers Property and Adjacent Creek Habitat Restoration project was completed in March 2007. The City applied for and received funding through a Proposition 13 grant for restoration and erosion control of the 35 acre parcel. This property was identified as a significant source of sediment load into Loma Alta Creek due to off-road vehicle (ORV) use and illegal access to the site coupled with frangible, erodible soils, as well as spoil storage along the tributary by the Eternal Hills Cemetery, which surrounds the property on all sides.

The habitat restoration involved revegetation of trails damaged by ORV use and installation of stormwater Best Management Practice (BMP) devices. Revegetation was performed through a combination of broadcast seeding and land imprinting methods and installation of willow and mulefat cuttings/live stakings in a tributary drainage to Loma Alta Creek.

On January 29, 2008 biologists with a private consulting firm contracted by the City of Oceanside conducted a site survey to evaluate the performance of the habitat restoration, revegetation, and erosion control on the Myers Property in the City of Oceanside. Recovery of seeded areas outside of reclaimed trails was generally positive. But, soil erosion and poor BMP performance was observed on several of the reclaimed trails. The reclaimed trails on the Myers Property were seeded via land imprinting in January 2007, and again using hand-broadcasting methods in February 2007 prior to the onset of the majority of winter rains. Unfortunately the 2007 rainy season yielded significantly below average precipitation and most of the seed applied failed to germinate. As a result, the reclaimed trails demonstrated low total vegetation cover and low native species cover. Seed germination and native recruitment were significantly suppressed by the low moisture availability. Over time, installed BMPs in the trails deteriorated, resulting in exposed and erosive soil conditions.

On April 3, 2008 consultant biologists conducted a qualitative site assessment to evaluate the performance of the habitat restoration, revegetation, and erosion control on the Myers Property in the City of Oceanside. As a result of rainfall events in the winter of 2007/2008, temporary slope stabilization and erosion control BMPs (i.e. fiber rolls) installed in winter 2007 on the Myers Property were no longer performing as intended and required maintenance in order to function properly.

Sediment traps installed along the main trail were working, but required maintenance. Along with trail reseeding and slope stabilization, a full sediment trap located at the outfall of one of the major erosion gullies (near an unnamed ephemeral drainage tributary to Loma Alta Creek) near the western edge of the Myers Property required excavation because sediment levels within the trap were above capacity. Corrective action was needed within the unnamed ephemeral drainage tributary to Loma Alta Creek where one of three stream stabilization log dams was damaged by heavy flows. The damaged log dam was installed in spring 2007 to stabilize the eroded channel and reduce head cut erosion advancing upstream. Repair of the log dam device to its original design was conducted to achieve its function.

The following BMPs were installed between May 15 and May 22, 2008:

- 1,692 Gravel Bags
- 64 Fiber Rolls (25 feet long totaling 1,600 feet)
- 100 feet of silt fence
- Rip rap rock

Gravel bags were placed in down slopes of exposed soil areas to reduce the effective slope of the channel, thereby reducing the velocity of flowing water, allowing sediment to settle and reduce erosion.

Fiber rolls were installed in walking paths and roads that were originally bare of any plants when the restoration project began. These new rolls replaced fiber rolls that had been placed during the initial restoration.

100 feet of silt fence was placed at the southern end of the property on the property line between Eternal Hills Cemetery and this parcel. This was placed in this location to eliminate the introduction of sediment to the Myers Property.

Rip rap rock was placed around the edges of log check dams to prevent soil erosion in the areas where the log dams are secured to the ground. These log dams are in place to capture sediment in storm water runoff and attenuate peak flows to mitigate/reduce soil erosion.

On June 6, 2008 TAIC biologists conducted a site survey to evaluate the performance of the habitat restoration, revegetation, and erosion control BMPs. It was noted that several erosion control BMPs, including fiber rolls and gravel bags had replaced many of the original temporary slope stabilization and erosion control BMPs (i.e. fiber rolls) installed in winter 2007.

#### **TMDL APPLICABILITY**

This activity is not being implemented for compliance with a TMDL.

#### **TIME SCHEDULE FOR IMPLEMENTATION**

This activity was scheduled for implementation and assessment during FY 2008 and FY 2009. This activity is on schedule according to the 5-year strategic plan submitted with the Carlsbad 2008 WURMP Update.

#### **PARTICIPATING WATERSHED COPERMITTEES**

- City of Oceanside

#### **OTHER PARTICIPATING ENTITIES**

- A private consulting firm will be utilized to conduct the assessment and develop the annual report. A private contractor with the City installed/replaced the erosion and sediment control BMPs.

#### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria

#### **OTHER PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Sediment

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

The Carlsbad WMA collective watershed strategy identifies bacteria as a high priority water quality pollutant in the Loma Alta Creek Hydrologic Area (904.1). Sediment in creeks can provide a reservoir for bacteria. Landscaping land uses including open space areas and cemeteries have been identified as potential discharges of bacteria. This activity addresses a high priority water quality problem and potential source of the problem within the watershed. Therefore this activity is consistent with eh Carlsbad WMA strategy.

**EFFECTIVENESS ASSESSMENT**

The initial restoration project including seeding and erosion control BMP installation reduced the amount of sediment would have otherwise reached Loma Alta Creek if not completed. This restoration project reduced the area of exposed soil thereby reducing the amount of soil eroded during previous years. As expected and planned for, some of the BMPs needed replacement, which is currently a part of a regular maintenance plan managed by the City's Public Works Department. Some repairs were required for some of the permanent BMPs.

This water quality activity implemented several erosion control BMPs (Level 3). Sediment build up behind check log dams and other erosion control BMPs demonstrated that the BMPs did reduce sedimentation reaching Loma Alta Creek.

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**TITLE: SEPTIC TANK SOURCE IDENTIFICATION – FIRE MOUNTAIN**  
**ID #: CHU-WQA5**

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**ACTIVITY IMPLEMENTATION**

One of four isolated areas of Oceanside (Fire Mountain) has approximately 20 homes that utilize on-site sewage treatment facilities to handle wastewater, even though a sewer system was installed in nearby neighborhoods. Exceedances of Coastal Storm Drain Monitoring action levels from a storm drain that discharges from the Fire Mountain neighborhood to Buena Vista Lagoon has prompted upstream bacterial investigations. Several potential sources were identified including bats in the drainage pipe, restaurants and commercial urban runoff, and the area of homes with septic systems. To attempt to identify if the septic systems were contributing, a detergent indicator test known as the optical brightener method was proposed to be used within neighborhood storm water vaults to detect the presence of the additives in runoff water. This type of additive is commonly utilized in laundry detergents and could therefore help determine if the septic system runoff was seeping into the storm drain system. If this detergent was detected, the County of San Diego, Department of Environmental Health, would be requested to have home owners test the integrity of their septic system. The County of San Diego has the sole authority in San Diego County for permitting on-site sewage treatment facilities. If problems were detected then the property owner would be offered the option to correct the problem or hook up to the city sewer system. However, the county required a more definitive detection process than the optical brightener method.

In 2006 the City conducted two pilot studies in the Fire Mountain area to utilize the presence of optical brighteners for identification of possible bacterial contamination from septic tank seepage. A cotton pad was placed in two storm drains for seven days and then collected. Those pads, plus a control pad that was not exposed to sample water, were then placed under a hand-held ultraviolet light. Both pilot studies, one in July and one in August, had inconclusive results. During the July event, one outfall was positive, one was undetermined due to sediment buildup, and the negative control was negative. During the August event, one outfall pad was inexplicably lost, one was undetermined due to sediment buildup, and the negative control was positive.

During FY 2008, further research was conducted on optical brighteners as a bacterial source tracking method. The research papers and newsletters suggested that the preferred method of identifying optical brighteners in water was not by a presence/absence method (by a hand-held ultraviolet light), but by the use of a fluorometer. The cotton pad method has been shown to work only if they are placed very close to the source and the concentrations are sufficiently high to result in a detection of fluorescence. Even when using a fluorometer paired with indicator bacteria sampling, the results have still been contradictory.

Due to the inconclusive results of the pilot study and the further research, the City decided not to continue with the optical brightener study as planned during FY 2008. More definitive potential studies are being researched to identify human fecal presence, such as the QPCR method, for possible implementation in the 08/09 or 09/10 monitoring years, if funding becomes available.

Activities conducted during FY 2008

- Researched permitting records on file at the County of San Diego Department of Environmental Health creating a list of properties throughout Oceanside with on-site

sewage treatment facilities. These files were also reviewed for any failure information or additional permits for upgrading or modifications to the systems.

- Reviewed research papers and newsletters regarding the optical brightener test which determined that this method provides inconclusive results.
- Decision to discontinue this activity until funding is available to cover costs for a more definitive bacteria source tracking method.

### **TMDL APPLICABILITY**

The RWQCB and Copermittees are developing a Bacteria-Impaired Waters TMDL Project II for Lagoons and adjacent beaches and creeks, which includes Buena Vista Lagoon. This project was planned to assist in the implementation of this TMDL by reducing bacterial contamination in the impaired segment of Buena Vista Lagoon.

### **TIME SCHEDULE FOR IMPLEMENTATION**

Since the optical brightener method was determined to be an inconclusive method, this activity was not further pursued in FY 2008. A decision was made to discontinue this activity until funding is available to cover costs for a more definitive bacteria source tracking method.

### **PARTICIPATING WATERSHED COPERMITTEES**

- City of Oceanside
- County of San Diego

### **HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria

### **CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

The Carlsbad WMA collective watershed strategy identifies bacteria as a high priority water quality pollutant in the Buena Vista Hydrologic Area (904.2). Sewage treatment facilities have been identified as potential discharges of bacteria. This activity addresses a high priority water quality problem and potential source of the problem within the watershed. Therefore this activity is consistent with the Carlsbad WMA strategy.

### **EFFECTIVENESS ASSESSMENT**

If the on-site sewage treatment facilities in this isolated neighborhood are determined to be a bacteria source, then homeowners will be notified of the problems associated with their treatment system (Level 2). The City will require the homeowners to implement BMPs to eliminate the bacteria source (level 3). This in turn will create a bacteria load reduction (Level 4), and a potential change in discharge water quality (Level 5), and a change in receiving water quality (level 6).

**TITLE: ESCONDIDO CREEK RESTORATION**  
**ID #: CHU-WQA6**

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**ACTIVITY IMPLEMENTATION**

This restoration project is designed to improve water quality associated with Escondido Creek. The effort focuses on a segment of Escondido Creek located off Harmony Grove Road within unincorporated County of San Diego lands. The intent of the project is to implement bioengineering solutions to help correct stream bank and bed erosion on a segment of the creek known to exhibit severe erosion by installing gabion baskets and live plant material to stabilize the eroded bank.

The project was completed in early November 2008 and included the installation of gabion baskets with live biological material to stabilize the eroding creek wall. Moreover, the eroded stream bank was cut/excavated to take advantage of natural conditions revealed with grading. Gabion baskets filled with a combination of rock and soil were placed within the bank upon completion of the grading. During the infilling process of the baskets, native wetland trees and vines, including willow species, were placed within each layer of the gabions to serve as the live biological material.

Follow-up monitoring will occur during the first two consecutive winter storm periods in 2009 through 2013 to document the physical and biological performance of the project. The monitoring will include an assessment of channel morphology, sediment loss and accumulation, the condition of any structural or non-structural materials, biological habitat growth conditions, and the overall effectiveness in stream erosion stabilization and sediment capture. All of these characteristics will be evaluated against the performance of a similar untreated reference area monitored during the same period.

**TMDL APPLICABILITY**

This activity is planned for implementation in compliance with the TMDLs established for sediment associated with Escondido Creek.

**TIME SCHEDULE FOR IMPLEMENTATION**

The Escondido Creek Restoration effort will occur between spring 2008 and winter 2008.

**PARTICIPATING WATERSHED COPERMITTEES**

- City of Escondido.

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Sediment is a high-priority pollutant of concern within the Carlsbad Watershed. Implementation of this restoration effort will help reduce this pollutant through bank stabilization.

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

The Carlsbad WMA (WMA) collective watershed strategy identifies sediment, as a high priority water quality pollutant in the Escondido Creek Hydrologic Area (904.6). Stream bank and bed erosion have been identified as potential discharges of sediment. This activity addresses a high priority water quality problem and potential source of the problem within the watershed, therefore the activity is consistent with the Carlsbad WMA strategy.

**EXPECTED BENEFITS**

Copermittees expect that implementation of this restoration effort will result in the reduction of sediment in Escondido Creek and improve the overall condition of the habitat and waters of the creek.

**EFFECTIVENESS ASSESSMENT**

This restoration effort is designed to improve the condition of the habitat and waters of Escondido Creek and improve the water quality of downstream water bodies (Level 6).

The effectiveness of the effort will be assessed through the evaluation of data from continuing water quality monitoring efforts. Data collected after implementation of the restoration project will be compared with data from previous monitoring efforts and analyzed to determine potential reduction in associated pollutant loads.

**TITLE: STORMWATER QUALITY MASTER PLANS FOR SPECIAL DRAINAGE FEE AREAS**  
**ID #: CHU-WQA7**

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**ACTIVITY IMPLEMENTATION**

The County of San Diego is in the process of preparing Storm Water Quality Master Plans (SWQMPs) for ten Special Drainage Fee Areas (SDAs). The SWQMPs address water quality impacts within each area, and are being prepared concurrently with a GIS-based Drainage Facilities Master Plan (DFMP). The County has identified a need to replace or upgrade portions of the drainage systems within its SDAs to meet current drainage design standards. In the process of planning for the proposed drainage facility improvements, the County is seizing the opportunity to identify potential regional BMPs that would assist in improving watershed water quality and minimize associated drainage facility maintenance costs.

Ultimately, the SWQMPs will identify and prioritize a list of potential regional BMPs for implementation. BMPs could include extended detention basins, hydrodynamic separators, or other BMP types. Prioritization criteria will include considerations of cost, BMP type, location, land use, and funding. Construction of recommended BMPs is contingent upon the approval of SDA fee increases by the County Board of Supervisors.

SWQMPs with the potential to propose BMPs in the Carlsbad Watershed include:

- SDA 9 (San Dieguito)
- SDA 10 (North County Metro)

**TMDL APPLICABILITY**

This activity is not specifically planned for implementation in compliance with a TMDL

**TIME SCHEDULE FOR IMPLEMENTATION**

SWQMPs are in various stages of completion. Construction of recommended BMPs is contingent upon approval of SDA fee increases by the County Board of Supervisors. The Board is likely to consider fee increases in 2009. Construction is therefore unlikely to occur anytime before FY 2010.

**PARTICIPATING WATERSHED COPERMITTEES**

- County of San Diego

**OTHER PARTICIPATING ENTITIES**

- None

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

To be determined

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

To be determined

**EXPECTED BENEFITS**

The SWQMPs will recommend regional structures or devices intended to improve watershed water quality. Regional BMPs address large mixed-use watershed areas, rather than smaller watersheds from individual development projects.

**EFFECTIVENESS ASSESSMENT**

To be determined

**TITLE: NITRATE SOURCE IDENTIFICATION AND ABATEMENT: BUENA CREEK**  
**ID #: CHU-WQA8**

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**ACTIVITY IMPLEMENTATION**

The County of San Diego Departments of Public Works (DPW) and Agriculture, Weights, and Measures (AWM) continue to collaborate on a project to identify and abate the source(s) of elevated nutrient levels in Buena Creek. Nitrate concentrations have been observed to exceed dry weather action levels at the County's CAR 05 dry weather monitoring station (Buena Creek at Robelini Drive). The State of California, which collected data from a nearby location in 2002 as part of its Surface Water Ambient Monitoring Program (SWAMP), also identified nitrates as an issue of concern<sup>1</sup>. Buena Creek is listed as impaired for nitrates/nitrites on the 2006 Clean Water Act 303(d) List of Water Quality Limited Segments.

The following tasks were completed during FY 2008:

- Perform frequent water quality screenings for nitrate, dissolved oxygen, and other parameters at CAR 05. Field water quality activities were conducted on four dates throughout the year.
- Perform additional upstream water quality monitoring and source investigations as appropriate to identify potential sources of the elevated nitrate levels.
- Compilation of an inventory and map of potential nitrate sources in the CAR 05 drainage area. It was determined that there are 26 nurseries within the unincorporated area tributary to the CAR 05 monitoring station.
- Compilation of baseline information on BMP implementation and compliance history for nurseries within the CAR 05 drainage area. Of the 26 nurseries in this drainage area, eleven have been inspected by the County AWM Department. Seven of the eleven inspected nurseries had one or more violations.

The following tasks remain to be completed:

- Conduct targeted inspections to abate potential sources of nitrates. All 26 nurseries in the CAR 05 drainage area will be inspected during FY 08/09.
- Conduct targeted education activities as necessary to abate sources of nitrates. Education to nursery operations in the activity areas will focus on nitrate pollution, nutrient assessment, and fertilizer management. During inspections at identified nurseries in these areas, the operators will be supplied with information and tools to assess and manage fertilizer use at their site. The UC Co-operative Extension Service *Self-Assessment for Greenhouses and Nurseries* and *Management Options for Nonpoint Source Pollution, Greenhouse and Container Crop Industries* documents will be provided where appropriate and the sections on nutrients will be reviewed. *The Rainbow Creek Nutrient Reduction Management Plan* is another source of valuable information for nitrate pollution prevention that will be referenced as a tool for the operators. Presentations and outreach events with audiences from these identified areas will focus on information regarding nitrate pollution prevention.
- Conduct enforcement activities as necessary to abate sources of nitrates.

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<sup>1</sup> Southern California Coastal Water Research Project, *Surface Water Ambient Monitoring Program (SWAMP), Report on the Carlsbad Hydrologic Unit*, July 2007

**TMDL APPLICABILITY**

This activity is not specifically implemented in compliance with a TMDL

**TIME SCHEDULE FOR IMPLEMENTATION**

<b>Planned Tasks</b>	<b>FY 2008</b>	<b>FY 2009</b>	<b>Status</b>
Compile an inventory and map of potential nutrient sources in the CAR 05 drainage area.	X		Complete
Compile baseline information on BMP implementation and compliance history for facilities and other sources within the CAR 05 drainage area (for the purposes of tracking improvements over time).	X		Complete
Perform frequent water quality screenings for nutrients and other parameters at CAR 05	X	X	Ongoing
Perform additional upstream water quality monitoring and source investigations as appropriate to identify potential sources of the elevated nutrient levels.	X	X	Ongoing
Conduct targeted inspection activities as necessary to abate identified sources of nutrients.	X	X	To be completed in FY 08/09
Conduct targeted education activities as necessary to abate identified sources of nutrients.	X	X	To be completed in FY 08/09
Conduct targeted enforcement activities as necessary to abate identified sources of nutrients.	X	X	To be completed as necessary

**PARTICIPATING WATERSHED COPERMITTEES**

- County of San Diego

**OTHER PARTICIPATING ENTITIES**

- None

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Nutrients

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

This activity is consistent with the collective watershed strategy in that nutrients are identified as a high priority water quality problem in the Agua Hedionda Hydrologic Area (HA 904.3) and this activity is aimed at identifying and abating nutrient sources in the watershed.

**EFFECTIVENESS ASSESSMENT**

<b>Planned Tasks</b>	<b>Level</b>	<b>Targeted Outcome</b>	<b>Assessment Measures</b>
Compile an inventory and map of potential nutrient sources in the CAR 05 drainage area.	1	Completion	Yes
Compile baseline information on BMP implementation and compliance history for facilities and other sources within the CAR 05 drainage area (for the purposes of tracking improvements over time).	1	Completion	Yes
Perform frequent water quality screenings for nutrient and other parameters at CAR 05	1	4 field screenings / yr at CAR 05	Yes
	6	Reduction in exceedances of dry weather action level for nitrates measured at CAR 05 by 2012	TBD
Conduct targeted inspection activities as necessary to abate identified sources of nutrients.	1	Inspection of 100% of nurseries in the CAR 05 drainage area by June 2009	TBD
	3	Reduction in nursery BMP violations observed during nursery inspections in the CAR 05 drainage area by 2010	TBD
Conduct targeted education activities as necessary to abate identified sources of nutrients	2	Improvement in stormwater knowledge assessment scores administered to nursery staff in the CAR 05 drainage area by 2012	TBD

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**TITLE: FOCUSED INSPECTIONS ALONG SAN MARCOS CREEK**  
**ID #: CHU-WQA9**

**ACTIVITY IMPLEMENTATION**

During the reporting period, the City of San Marcos completed inspections of commercial properties along a direct tributary channel to San Marcos Creek known as Antique Village. The commercial/Industrial inspections occurred in the tributary area of San Marcos Creek from Grand Avenue to Via Vera Cruz. Fifteen properties were identified and inspected in January 2008. The inspections identified businesses that needed additional awareness of BMPs in order to abate potential pollutants into the channel. The purpose of the inspections was to identify any potential sources of elevated pollutants, such as nutrients. The inspections conducted in January 2008 consisted of inspections, follow up inspections, and enforcement as necessary. A follow up inspection with the same businesses will be conducted in 2009 to assess the effectiveness of the inspections ( Level 1) and any changes in awareness and implementation of BMPs ( Levels 2/3)

**TMDL APPLICABILITY**

While it may be supportive of TMDL goals, this activity is not specifically implemented as part of a TMDL compliance program.

**TIME SCHEDULE FOR IMPLEMENTATION**

The actual implementation schedule meets the time schedule established in the 5-year strategic plan.

**PARTICIPATING WATERSHED COPERMITTEES**

- City of San Marcos

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Nutrients

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

The Carlsbad WMA collective watershed strategy identifies nutrients as a high priority water quality pollutant in the San Marcos Creek Hydrologic Area (904.5). Commercial and industrial land uses have been identified as potential dischargers of nutrients. This activity addresses a high priority water quality problem and potential source of the problem within the watershed. Therefore, the activity is consistent with the Carlsbad WMA strategy.

**EFFECTIVENESS ASSESSMENT**

Planned Tasks	Level	Targeted Outcome	Assessment Measures
Conduct targeted inspections	1	Inspection of 100% of all business adjacent to tributary channel (Antique Village) to San Marcos Creek	% of businesses in inspected in Antique Village by 2008
Conduct targeted follow up inspections to abate nutrients	3	Reduction in Business violations or follow up inspections by 2009	% change in nursery BMP violations in by 2009

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**TITLE: PET WASTE BAG DISPENSER PROGRAM IN COUNTY PARKS**  
**ID #: CHU-WQA10**

**ACTIVITY IMPLEMENTATION**

The County of San Diego provides pet waste bag dispensers at County Parks. The County installs, maintains, and inventories pet waste bag dispensers in its parks throughout the year. Two important goals of this program are to reduce the amount of pet waste found in parks and to educate the public on the need to cleanup after their pets. Realization of these goals will result in the reduction of pollutant loads, particularly bacteria and nutrients.

The County maintains 16 dispenser stations at a total of two parks within the Carlsbad Watershed, including 12 new dispensers installed during the FY 07/08 reporting period. New dispenser installations took place at:

- San Elijo Lagoon Ecological Reserve (9 new dispensers, 11 total dispensers)
- San Dieguito County Park (3 new dispensers, 5 total dispensers)

**TMDL APPLICABILITY**

While it may be supportive of TMDL goals, this activity is not specifically implemented as part of a TMDL compliance program.

**TIME SCHEDULE FOR IMPLEMENTATION**

- Maintenance of existing pet waste dispensers – Ongoing
- Addition of new dispensers in County parks – Ongoing

**PARTICIPATING WATERSHED COPERMITTEES**

- County of San Diego

**OTHER PARTICIPATING ENTITIES**

- None

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria
- Nutrients

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Bacteria and nutrients have been identified as priority water quality problems in the Carlsbad Watershed. Parks, and pet waste in particular, are potential sources of bacteria and nutrients. Since this activity addresses a priority water quality problem and a priority source, it is consistent with the collective watershed strategy.

**EFFECTIVENESS ASSESSMENT**

Facility Name	FY 2008		
	# of Stations	# of Bags Used	Dog Waste Removed (lbs)
San Elijo Ecological Reserve	11	45,500	9,100
San Dieguito Park*	5	20,995	4,199
<b>Total</b>	<b>16</b>	<b>66,495</b>	<b>13,299</b>

\*San Dieguito County Park is counted in both the Carlsbad and San Dieguito HU Totals

Cumulatively, the County maintains 16 stations among the two County Parks within the Carlsbad Watershed. These stations distributed approximately 66,495 bags during the FY 07/08 reporting period, preventing an estimated 13,299 lbs of pet waste from entering the watershed. Bacteria load reduction estimates are based on the number of bags distributed and the following assumptions obtained from a 2004 study completed by the County at the San Elijo Lagoon Ecological Reserve:

- Assumption 1: The average weight of pet waste per bag is approximately 0.2 lbs
- Assumption 2: In addition to the bags taken from the County's dispensers, an additional 30% of pet waste bags are brought to the parks by the pet owners themselves.

**TITLE: LAND ACQUISITIONS**  
**ID #: CHU-WQA11**

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**ACTIVITY IMPLEMENTATION**

The San Diego County Board of Supervisors approved the Multiple Species Conservation Program (MSCP) in 1997 as an integral part of the County’s efforts to protect parks and open space. The goal of the MSCP (a 50-year program) is to maintain and enhance biological diversity in the region and maintain viable populations of endangered, threatened, and key sensitive species and their habitats. Land acquisition also provides a significant water quality benefit for the watersheds in which it occurs. MSCP acquisition precludes development from occurring and allows land to retain its natural perviousness.

The MSCP is a cooperative effort among the County and other local jurisdictions and the U.S. Fish and Wildlife Service and the California Department of Fish and Game (the Wildlife Agencies). These public partners work with various private landowners, conservation groups, and community planning groups, developers, and other stakeholders. An MSCP exists for the County of San Diego. Currently, the County of San Diego is planning for extending the MSCP into both the northern and eastern portion of the County. The northern subarea plan should be approved during the lifetime of the current stormwater permit. While this plan has yet to be approved by the County of San Diego, lands have been and will continue to be acquired from willing sellers.

**TMDL APPLICABILITY**

While it may be supportive of TMDL goals, this activity is not specifically implemented as part of a TMDL compliance program.

**TIME SCHEDULE FOR IMPLEMENTATION**

The County of San Diego acquires land on an ongoing basis from willing sellers.

**PARTICIPATING WATERSHED COPERMITTEES**

- County of San Diego

**OTHER PARTICIPATING ENTITIES**

- U.S. Fish and Wildlife Service
- California Department of Fish and Game
- Private land owners
- Conservation groups
- Community planning groups
- Developers

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- All

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Land acquisition is consistent with the collective watershed strategy in that it averts development, thereby eliminating the possibility of future sources in need of abatement or future pollutant loads in need of reduction.

**EXPECTED BENEFITS**

Acquisition preserves the land's perviousness and natural filtering capabilities. In this sense, it is preferable to either source abatement or pollutant load reduction because it avoids entirely the introduction of pollutant-generating activities to the watershed.

**EFFECTIVENESS ASSESSMENT**

Activity effectiveness will be measured by tracking the number and total acreage of land acquisitions within the watershed on an annual basis. It may also be possible to estimate pollutant loadings avoided as a result of these acquisitions. The County will consider presenting load reduction estimations in WURMP Annual Reports if it determines that they are helpful for the purposes of assessing overall program effectiveness.

**TITLE: LAKE SAN MARCOS TRIBUTARY WATERSHED BMP MASTER PLAN**  
**ID #: CHU-WQA12**

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**ACTIVITY IMPLEMENTATION**

Lake San Marcos is a man-made lake located in the County of San Diego that has been listed on the 2006 303(d) list as impaired for Ammonia (as N), Nutrients and Phosphorous. Water flowing in San Marcos Creek is impounded in the Lake by San Marcos Dam. Several jurisdictions are tributary to the Lake, including the Cities of San Marcos, Escondido and the County of San Diego. In addition, there are local home owners associations, golf courses and

The City of San Marcos will lead the WURMP activity to develop a Lake San Marcos Tributary Watershed (Tributary Watershed) BMP Master Plan. The process to develop the BMP Master Plan will include a stakeholder driven process to develop and implement a holistic approach to evaluate and identify potential solutions to the water quality problems in the Tributary Watershed

In FY 2008 the City of San Marcos will begin leading the following tasks, with stakeholder participation and input, as listed below:

- 1) Identify appropriate stakeholders in the Tributary Watershed
- 2) Convene and lead stakeholder meetings
- 3) Develop data needs (e.g., source characterization data, water quality data, etc.)
- 4) Develop data collection methods and standards
- 5) Host data storage
- 6) Develop Geographical Information Systems (GIS) layers to appropriately characterize the Tributary Watershed
- 7) Identify likely sources of the pollutants that are causing the impairments in Lake San Marcos
- 8) Based on the identified potential sources, develop a BMP Master Plan for the Tributary Watershed (*at this time – the Master Plan will be limited to the City of San Marcos jurisdiction*). The BMP Master Plan will be a road map for the City of San Marcos (and potentially other stakeholders) to begin implementing BMPs in a methodical manner starting with education and outreach and escalating to pollution prevention, source control, runoff reduction and the identification of potential treatment BMPs for implementation at a later stage.
- 9) Further tasks will be determined and reported on in future WURMP Annual Reports

**TMDL APPLICABILITY**

While it may be supportive of TMDL goals, this activity is not specifically implemented as part of a TMDL compliance program.

**TIME SCHEDULE FOR IMPLEMENTATION**

The City of San Marcos will begin implementation of this activity in FY 2008 and continue to implement the activity until at least FY 2012.

**PARTICIPATING WATERSHED COPERMITTEES**

- City of San Marcos (Activity Lead)
- County of San Diego
- City of Escondido

**OTHER PARTICIPATING ENTITIES**

- Other Tributary Watershed Stakeholders (e.g., private and other public entities) as appropriately identified and invited to participate

**HIGH PRIORITY WATER QUALITY PROBLEMS ADDRESSED**

- All

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

The development of a Tributary Watershed BMP Master Plan is consistent with the collective watershed strategy in that it will identify the water quality problems and likely sources of the pollutants potentially causing the water quality problems and develop a plan to abate the sources or significantly reduce the pollutant loading from the sources.

**EXPECTED BENEFITS**

The expected benefits of the activity are, with respect to the water quality issues and pollutants of concern: 1) increased awareness of the stakeholders and general public; 2) changes in behavior and BMP implementation; 3) reductions in pollutant loads in discharges; 4) improved water quality discharged from the MS4; and, 5) improved water quality in Lake San Marcos.

Another highlighted benefit is that the final work product and documented process may lead to full HA or WMA implementation.

**EFFECTIVENESS ASSESSMENT**

Because the BMP Master Plan will be fairly comprehensive, activity effectiveness will be measured all six levels of the effectiveness assessment schema developed by the San Diego Regional Copermittees in October 2003. At this time, specific targeted outcomes and measures have not been identified. These will be reported in future WURMP Annual Reports.

# **Education Activity Sheets**

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**TITLE: RESIDENTIAL IRRIGATION RUNOFF REDUCTION EDUCATION**  
**ID #: CHU-WQEA1**

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**ACTIVITY IMPLEMENTATION**

A pilot single family residential area in a sub-watershed will be selected to evaluate the load reduction potential related to reducing irrigation runoff – please refer to CHUWQA1. The expected results include reduction of any existing leaks or overspray at applicable residences, one-on-one education of residents in the pilot area, and reduction in irrigation runoff flow in the pilot area. This activity will focus on education of area residents related to water quality impacts of irrigation runoff. Planned activities include:

- mailer to residents to let them know of our pilot work, ask for voluntary participation, and notify that if over-irrigation or leaks are suspected, we will contact them directly.
- fact sheet/water use report issued to homeowners with results of the assessment and recommendations for improvement.
- mailer to residents to thank them and invite them to participate in a website survey
- website survey to measure educational program effectiveness.

This activity was in the planning phased during FY 2008. Activities conducted during FY 2008 included researching potential pilot neighborhoods, field reconnaissance at outfalls, and development of draft outreach materials.

**TMDL APPLICABILITY**

This activity is not related to an existing TMDL.

**TIME SCHEDULE FOR IMPLEMENTATION**

Implementation will occur in FY 2009. The pilot neighborhood will be identified by October of 2008. Preparation of the outfall for flow monitoring will occur in November 2008. Pre-pilot flow measurement will occur in December 2008, pending dry weather. Flow measurement will not occur during rain events, but may occur after rain events provided that there is no rain included in flow measurements. The first outreach piece will be delivered to the neighborhood once flow measurements are completed, in December 2008 or January 2009 depending on rain. Once flow measurements and introductory outreach is completed, one-on-one work with volunteer residences and sites with irrigation runoff will begin.

Assessment will also occur in FY 2009 if the implementation steps listed above are completed. Estimated timeframe is May 2009.

**PARTICIPATING WATERSHED COPERMITTEES**

- City of Carlsbad
- All watershed members will participate during planning and measuring phases of this activity. City of Carlsbad personnel will participate in the implementation phase of the activity.

**OTHER PARTICIPATING AGENCIES**

Carlsbad Municipal Water District Employees

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria
- Nutrients
- Sediment

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

The Carlsbad WMA collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation. This activity addresses high priority water quality problems and potential sources of the problems within the watershed, therefore the activity is consistent with the Carlsbad WMA strategy.

**EXPECTED BENEFITS**

Expected benefits include educating residents about pollution prevention and water conservation, load reduction and/or source abatement of high priority pollutants, and reduction of water usage.

**EFFECTIVENESS ASSESSMENT**

Targeted outcomes for this activity include increased awareness of irrigation runoff, impacts to water quality, and the reduction of flow after working with applicable residents. Implementation effectiveness will be measured by evaluating survey results (Level 2 Outcome) and reviewing any water use changes (Level 3 Outcome). Since the pilot will be completed prior to the start of the 2009 dry season, the results will be analyzed within nine months following completion of the pilot. In FY 2008, because several pilot neighborhoods have been identified and draft outreach materials developed, the planning phase of this activity is considered effective.

**TITLE: PILOT RESTAURANT BINDER/CD DISTRIBUTION**  
**ID #: CAR-WQEA2**

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**ACTIVITY IMPLEMENTATION**

The Restaurant Binder/CD Distribution activity aims to increase knowledge and awareness of stormwater quality and the implementation of BMPs at eating and drinking establishments by distributing a binder of educational materials and organizational tools for restaurant managers and their staff. The binder also includes a short instructional video (CD-ROM) of the most common Best Management Practices for restaurants. The goal of this activity is to improve water quality through increased awareness of stormwater issues and increased implementation of BMPs at restaurants.

The City of Encinitas initiated a pilot distribution of the Restaurant Binder and CD during FY 2007 restaurant inspections. Approximately 180 binders and CDs were distributed during routine restaurant inspection activities. The binders were designed to assist restaurant owners and managers in educating their employees about Stormwater Best Management Practices and tracking their routine stormwater maintenance activities. Each binder included a vicinity map, BMP information specific to restaurant operations, and sections to record training, inspection, and maintenance activities. The intent of the binder is to support restaurant owners and staff to ensure that proper BMPs are utilized to eliminate non-stormwater discharges.

The binders and CDs were hand delivered during routine stormwater inspections. During the site visit, the City’s stormwater inspector reviewed the binder with the restaurant manager or lead staff and explained its intended use and application. Restaurant staff were expected to immediately begin using the binder/CD. Changes in attitude, knowledge, awareness, or behavior were anticipated to predominantly occur in FY 2008. Therefore this Watershed Activity was in active implementation phase in FY 2008. Subsequently, assessment of the success of the binder/CD was conducted towards the end of FY 2008 in order to best characterize the magnitude of changes in knowledge and awareness and/or behavior change (see time schedule below).

During FY 2008, the City of Encinitas augmented their restaurant inspection forms in order to survey the implementation of the binder/CD by restaurant staff. This survey was used to 1) determine if and how the binder was utilized at each restaurant and 2) get feed back from the restaurants about the usefulness of the binder and CD. Additional discussion regarding the assessment survey can be found in the Effectiveness Assessment section below.

**TMDL APPLICABILITY**

This activity is not currently planned for implementation in compliance with a TMDL.

**TIME SCHEDULE FOR IMPLEMENTATION**

Activity	Implementing Party	Mar-07	Apr-07	May-07	Jun-07	Jul-07	Aug-07	Sep-07	Nov-07	Dec-07	Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08	FY 2009	
Binder/CD Distribution	City of Encinitas																	
Utilization of Binder/CD	Restaurant Facilities																	
Assessment of Binder/CD Use	City of Encinitas																	
Expansion of Binder/CD Pilot Program*	All Cities and County in Carlsbad HU																	

\* Expansion of Binder/CD distribution to the rest of the Carlsbad HU is dependant upon the success of the pilot project.

**PARTICIPATING WATERSHED COPERMITTEES**

City of Encinitas

**OTHER PARTICIPATING ENTITIES**

None

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Bacteria

**OTHER WATER QUALITY PROBLEM(S) ADDRESSED**

- Trash
- Oil/Grease

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

The Carlsbad WMA collaborative watershed strategy identified bacteria as a high priority water quality pollutant in the San Marcos (904.5) and Escondido Creek (904.6) hydrologic areas. Eating and drinking establishments have been identified as likely dischargers of bacteria. This activity addresses a high priority water quality problem and likely source of the problems within the watershed, therefore the activity is consistent with the Carlsbad WMA strategy.

**EXPECTED BENEFITS**

- Increased knowledge and awareness among restaurant employees about storm water quality issues
- Changes in behavior among restaurant managers and their employees (i.e. improved BMP implementation and on-site stormwater management)
- Load reductions of trash and bacteria downstream of restaurants

**EFFECTIVENESS ASSESSMENT**

In FY 2008, the City of Encinitas evaluated the overall effectiveness of the binder/CD distribution using three assessment measures, 1) a targeted binder/CD use survey, 2) a knowledge level comparison from FY 06-07 to FY 2008 and 3) BMP implementation comparison from FY 2007 to FY 2008.

Below is a summary of the findings.

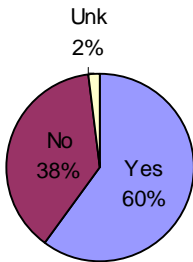
1. Targeted Binder/CD Use Survey

Inspection staff conducted a survey of binder and CD usage in order to determine the general success and effectiveness of the restaurant binder distribution program. Commercial facility inspection forms were augmented to evaluate the use of the binder and CD the previous year. The following questions were used to evaluate the effectiveness of the effort:

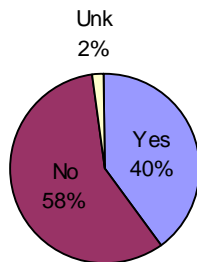
- 1) Is the binder still at the facility?
- 2) Was the binder used within the last year?
- 3) Was the CD used within the last year?
- 4) Did the restaurant manager find the binder/CD to be a useful tool for stormwater management?
- 5) Any additional comments?

A total of 57 restaurants (33% of those that received binders and CDs) were surveyed. Based on the survey results, less than half of the binders that were distributed were put into use and almost 80% of the CD distributed were never viewed by employees. When asked their opinion of the usefulness of the binder, manager's results were evenly distributed between positive and negative responses. The following diagrams summarize the results of the survey.

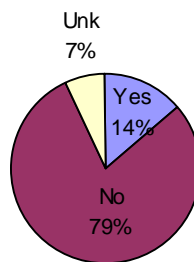
Was the binder at the facility?



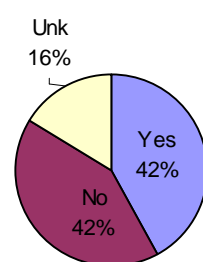
Was the binder utilized?



Was the CD utilized?



Did manager find binder/CD useful?



Notable and frequent comments on the binder and CD from restaurant staff surveyed included:

- “Makes job easier.”
- “CD was lost.”
- “Good that it is in Spanish.”
- “CD was played at quarterly meeting.”
- “Did not know binder existed.”
- “If it was explained, it could be a useful tool.”
- “Corporate policy already addresses issues. Suggest using calendar.”
- “Did not like binder. Thought it was a waste of money.”
- “Read binder after issued NOV for grease.”
- “Manager was let go, new manager does not know about binder.”
- “Binder not on site, staff was unaware of binder.”

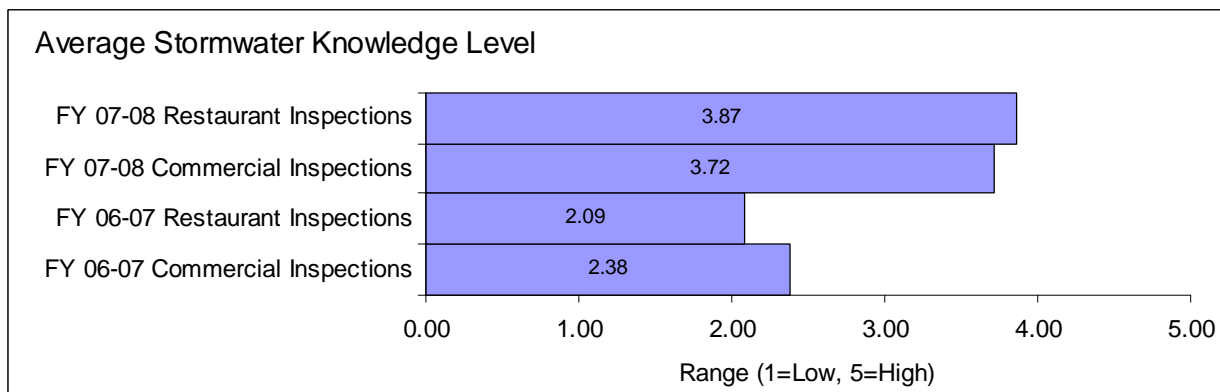
Based on the survey, it appeared that the most common reason for restaurant staff not using the binder/CD may have been ineffective transfer of knowledge between restaurant staff. The binders and CDs were originally distributed during routine restaurant inspections. The City of

Encinitas conducts commercial inspections on a “drop-in” basis to observe typical operations. General Managers and/or restaurant owners are not always on the premises at the time of the inspection. In addition, restaurant management tends to change on a relatively frequent basis. New managers are likely to be unaware that the binder and CD were distributed for use. In addition, the CD may not have been used very often because many restaurants (especially smaller restaurants) do not have facilities to play the CD for their employees.

**2. Stormwater Knowledge Assessment**

In FY 06-07, the City of Encinitas stormwater inspectors began assessing the commercial facility’s level of knowledge of stormwater issues during routine inspections. After each inspection, the inspector rated the manager’s level of BMP knowledge on a scale of 1 to 5. With two years of data, a comparison of restaurant managers’ stormwater knowledge for FY 06-07 to FY 2008 could be conducted. As shown in the graph below, the average level of stormwater knowledge of restaurant managers increased from 2.09 in FY 06-07 to 3.87 in FY 2009.

Since the binder/CD was distributed from March to June of 2007, this comparison provides a good indication of how distribution and use of the binder/CD may have affected restaurant manager’s knowledge of stormwater issues. As depicted in the graph, restaurant manager’s average level of stormwater knowledge increased by an even greater amount than commercial facility managers’ knowledge. Although other factors could have also contributed to this marked improvement, the principle difference in the City’s Commercial Component of the Clean Water Program was the implementation of the binder/CD distribution program. Even though the use of the binder/CD could be classified as marginal, reading the educational material provided in the binder and watching the CD conceivably helped contribute to the 1.49 point increase in knowledge level.



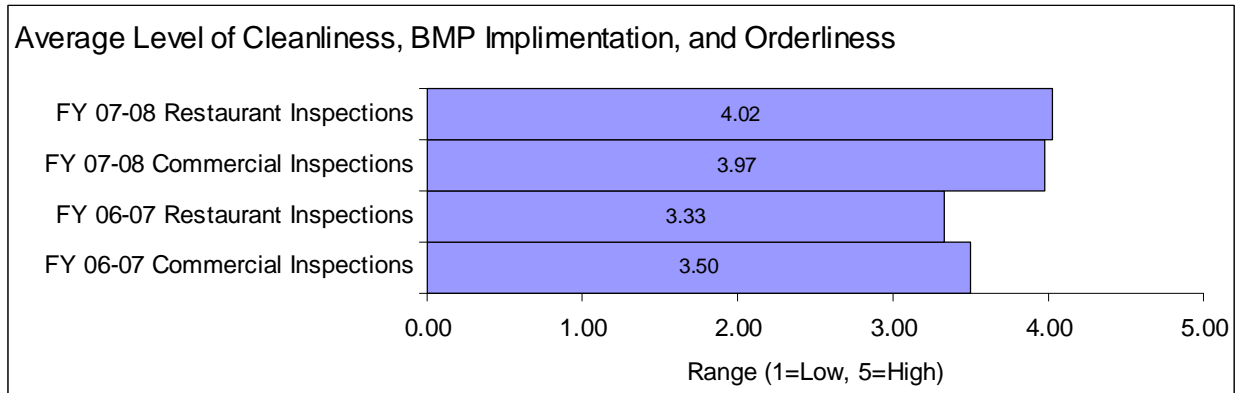
**3. Behavioral Changes and BMP Implementation Assessment**

Behavioral changes were measured by 1) evaluating the use of the binder/CDs as a “BMP”, 2) assessing the level of BMP implementation from year to year, 3) reviewing the answers to routine commercial inspection questions.

Use of the binder/CD as a new stormwater BMP is summarized in the pie charts above. Although, the use of the binder/CD was not wholly adopted by restaurant owners and managers, any use could be considered a success. Challenges that hindered utilization of the CD could have included: lack of facilities to play the CD or the fact that the educational video was in CD-ROM format (as opposed to DVD). Actions that could improve the binder/CD implementation could include: a better orchestrated promotional campaign to accompany the

binder/CD distribution and/or the implementation of a mechanisms by which to reward those facilities that used the binder/CD.

In conjunction with the knowledge level assessment, stormwater inspectors rate the facility manager's level of BMP implementation. The rating takes into account not only the facility's BMP implementation, but also the level of cleanliness and orderliness of the site. The following graph compares the average level of BMP implementation for restaurants and all commercial inspections from FY 06-07 to FY 2008.

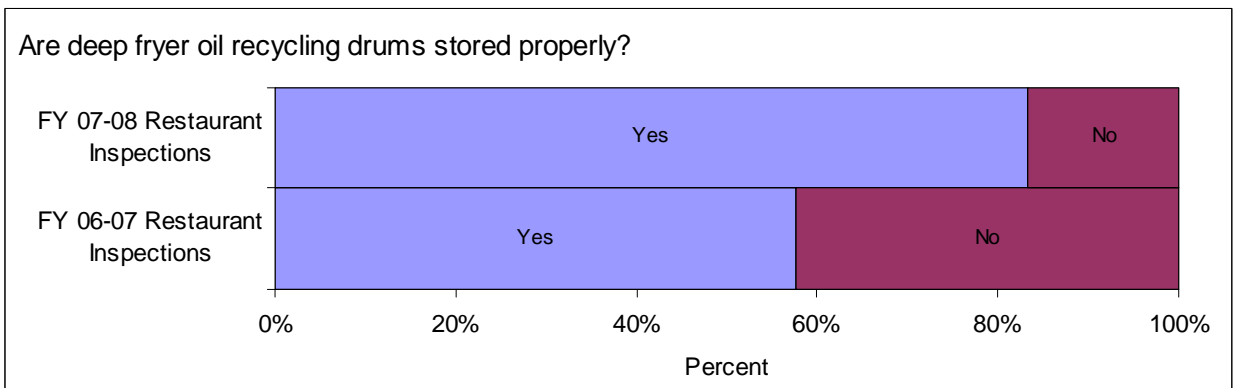
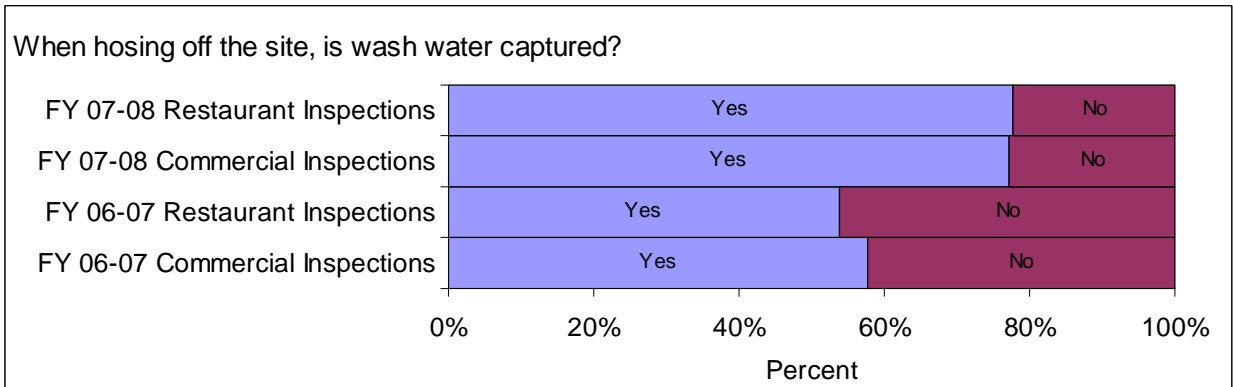
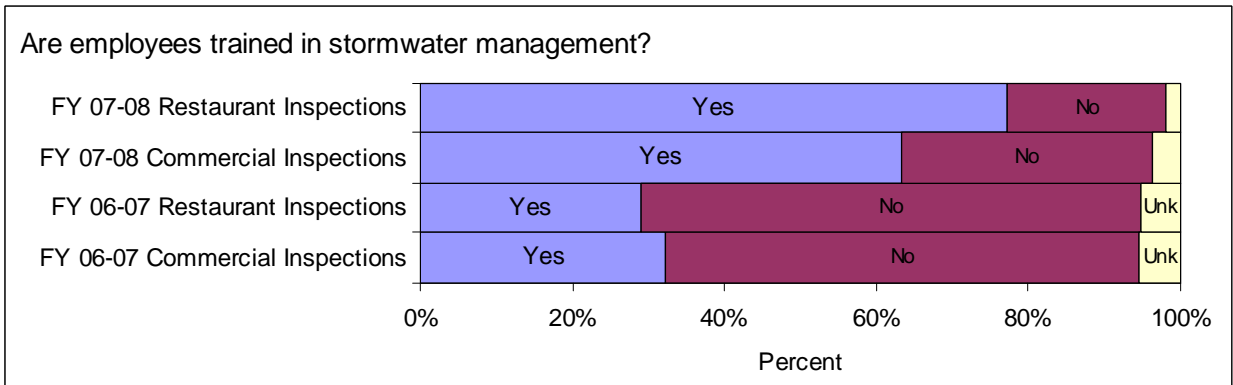
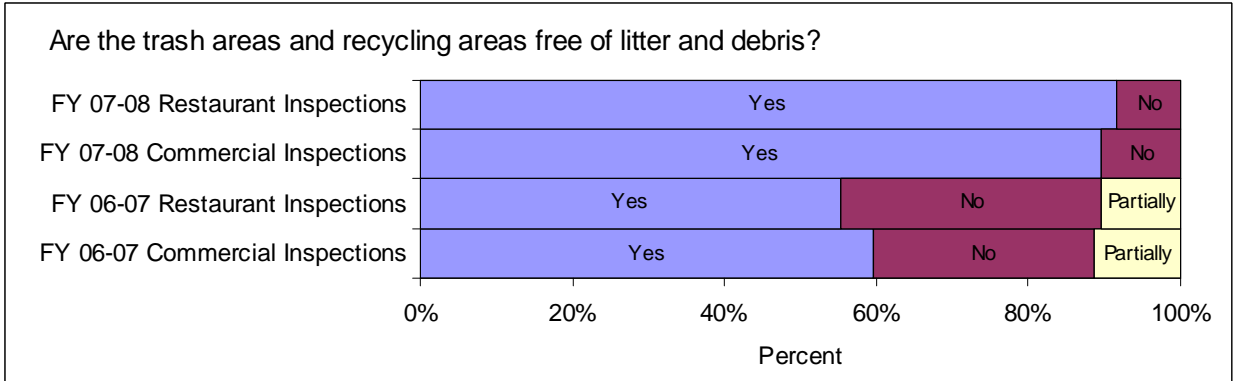


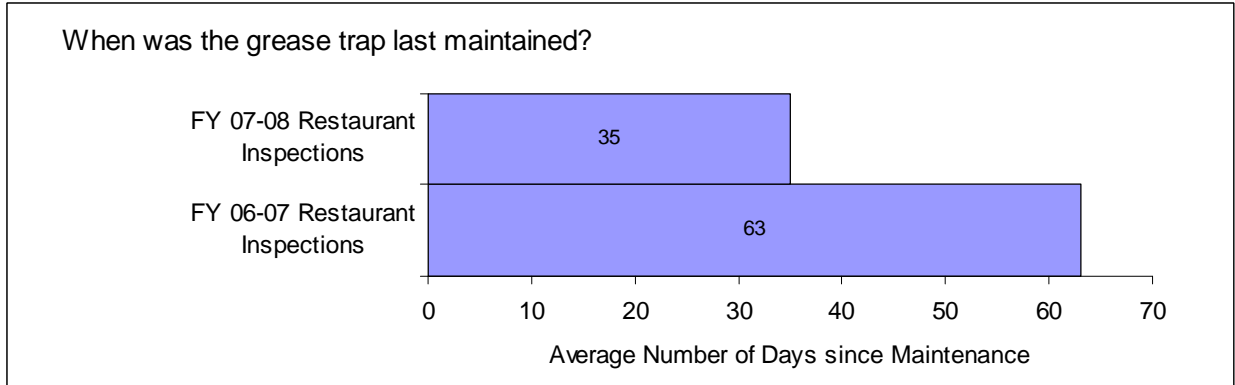
Similar to knowledge level, the average level of BMP implementation by restaurants increased from FY 06-07 to FY 2008 by an even greater amount than all commercial facilities combined. This increase in the level of BMP implementation could be attributed to the binder/CD distribution program, since this was the only significant change in the Commercial Component of the Clean Water Program in FY 06-07.

During routine commercial inspections, stormwater inspectors ask facility managers a series of questions relating to the BMPs that are conducted on site. These questions are then recorded in the City's inspection database system. Several of the most common BMPs implemented at commercial facilities were highlighted in the binder and/or CD that were distributed to restaurants in FY 06-07. BMPs that were highlighted included:

- employee training
- trash area cleaning
- capturing of wash water
- storage of fryer oil
- grease trap maintenance

The following graphs provide a summary of some of the BMP implementation questions asked during commercial and restaurant facility inspections. A comparison of the results from FY 06-07 to FY 2008 shows that restaurant facilities consistently improved upon BMP implementation to a greater extent than all commercial facilities combined. In addition, grease management, a function only performed by restaurants, also improved greatly.





The inspection results summarized in these graphs shows that there was a clear increase in BMP implementation at restaurants from FY 2007 to FY 2008.

**EFFECTIVENESS ASSESSMENT**

A summary of the assessment of the Stormwater Restaurant Binder and CD Distribution Program can be found in the following table. In general, the assessment shows that although a restaurant manager survey demonstrated marginal utilization of the binder and CD, marked improvements in stormwater knowledge and BMP implementation from FY 06-07 to FY 2008 suggest that distribution of the binder/CD were a beneficial endeavor which could improve water quality. With some modifications of the City of Encinitas pilot program, the binder/ CD could prove to be a useful educational tool for the rest of the Carlsbad Watershed.

Level	Targeted Outcome	FY 2008 Measured Outcome
<b>Level 1</b> Compliance with Activity-based Permit Requirements	Distribute 175 binders and CDs	172 binders and CDs were distributed.
<b>Level 2</b> Changes in Knowledge/Awareness	Increase knowledge and awareness of stormwater issues among restaurant staff (Knowledge level assessment)	Knowledge level increased from an average of 2.09 to 3.87 for restaurant facilities from FY 06-07 to FY 2008, respectively.
<b>Level 3</b> Behavioral Changes/BMP Implementation	1) Utilization of binders and CDs for stormwater management 2) Increase BMP implementation and level of cleanliness (BMP level assessment) 3) General increase in implementation of all other stormwater BMPs	1) Utilization of binders and CDs was marginal 2) Level of BMP implementation increased from 3.33 to 4.02 from FY 06-07 to FY 2008, respectively. 3) BMPs highlighted by the binder and CD were implemented on a much more frequent basis in FY 2008.

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for reproduction purposes.*

**TITLE:** WATER QUALITY RUNOFF MANAGEMENT AND AGRICULTURAL  
WAIVER WORKSHOP FOR NURSERIES AND AGRICULTURAL  
BUSINESSES  
**ID #:** CHU-WQEA3

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**ACTIVITY IMPLEMENTATION**

This free educational workshop targeted nurseries and agricultural businesses and was held at the San Diego County Farm Bureau in Escondido on March 27, 2008. Four speakers provided the owners and operators a better understanding of water quality runoff management issues related to their operations. Growers from north San Diego County watersheds were invited to attend (San Luis Rey, San Dieguito, Santa Margarita, and the Carlsbad Hydrologic Unit).

Topics covered during the workshop were as follows:

- Water quality runoff regulations and BMPs for pollution prevention.
- Irrigated Agricultural Waivers.
- Storm water quality issues and typical inspection elements.
- Federal assistance for development of conservation management plans and other programs to assist operations in complying with water quality regulations.

Respective speakers for the topics above were as follows:

- Dr. Valerie Mellano, University of California Cooperative Extension
- Wayne Chiu – Regional Water Quality Control Board
- Nancy Appel – County of San Diego Ag, Weights and Measures
- Victor Smothers – USDA, Natural Resources Conservation Service

A total of 48 people were in attendance at the workshop including workshop organizers and speakers: 29 agricultural related and 19 governmental/jurisdictional. A breakdown of attendees of the workshop was as follows:

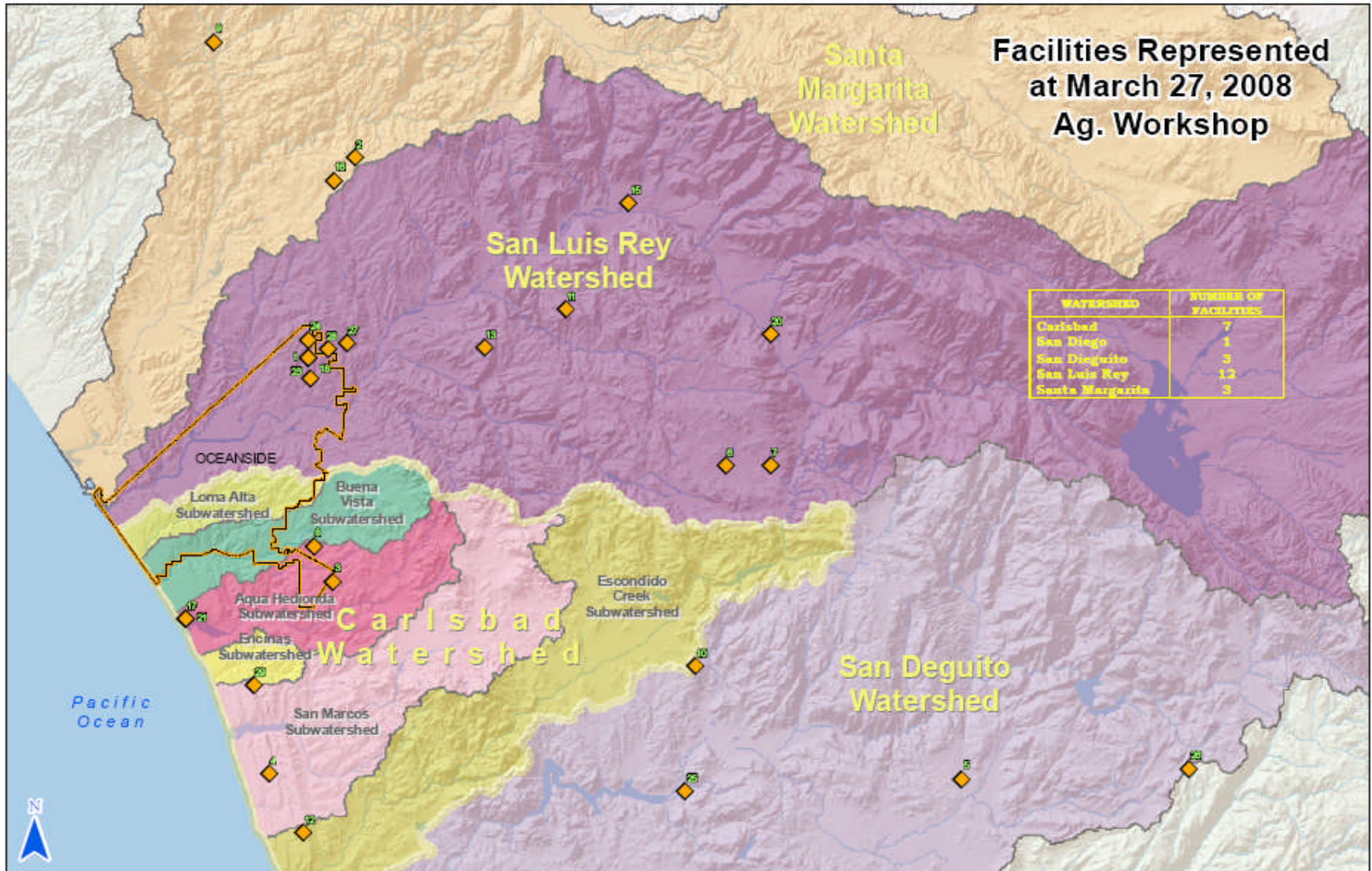
<b>Agricultural (29)</b>	<b>Other (19)</b>
5 - Advisors/Grove Care	Governmental - 13
1 - Farm Supplier	Jurisdictional - 6
6 - Grove (Avocado or other)	
2 - Hatchery	
8 - Nursery	
1 - Range Livestock	
6 - Combination Nursery and Grove	

See Figure 1 below for a map of the facilities represented at the workshop.

Prior to and after the completion of the workshop each attendee was given a pre- and post-test to determine their knowledge of the topics covered during the workshop. A total of 23 attendees took both the pre-test and post-test (some attendees arrived after the pre-test was given or left before the post-test was given). This test included seven questions that were provided by the speakers. The average pre-test score was 2.91. The average post-test score was 6.04. These scores represent a 150% increase in knowledge of the topics reviewed during the workshop.

One of the speakers provided the attendees with a Runoff & Nonpoint Source Pollution Self-Assessment (assessment) form for assessing potential runoff from their operation. Approximately seven months after the workshop, agricultural growers who attended the workshop were called to see if they conducted the assessment and to get feedback about the

Figure 1 – Facilities Represented at the Agricultural Workshop



workshop as a whole. Following is a summary of answers from the agricultural growers who were contacted after the workshop.

- Did you utilize the self-site assessment form: All answered yes.
- Did you make changes to your operation as a result of conducting the assessment: All confirmed that their operations had BMPs in place. Two businesses added additional BMPs based on the assessment.
- Did you contact any of the agencies who presented at the workshop? All of the operations had been in contact with at least one of the representing agencies either prior to or after the workshop. Some businesses had developed detailed tail water recovery systems as a result of working with the NRCS and UC Cooperative Extension. Some of the workshop participants contacted the agencies after the workshop in regards to the following topics: tail water recovery systems, grove road erosion issues, water quality monitoring co-op, and the individual waiver program.
- Was the assessment helpful to the operation? All answered yes.
- Was the workshop itself helpful to the operation. All answered yes, and stated that the topics were timely and of great interest.
- Recommendations for future workshop topics: Topics of interest to the attendees include water quantity cutbacks, monitoring program for growers, and the use of recycled/reclaimed water.

Answers to these questions will help Copermittees focus on timely topics of interest to agricultural growers for future workshops. Since all of the operations stated that they had BMPs already in place demonstrates that they had prior knowledge of runoff related issues. The assessment form confirmed that the operations had BMPs in place and/or there was a need for additional BMPs. Some growers contacted the representative agencies for information specific to the agency. And, the growers provided specific topics that would be of interest to them for future workshops.

#### **TMDL APPLICABILITY**

This activity is not planned for implementation in compliance with a TMDL.

#### **TIME SCHEDULE FOR IMPLEMENTATION**

This workshop was initially scheduled for October 27, 2007. Due to fires in the San Diego County area during that time the workshop was postponed until March 27, 2008. This workshop is planned to be implemented in FY 2009-10.

#### **PARTICIPATING WATERSHED COPERMITTEES**

All watershed Copermittees within the WMA (Carlsbad, Encinitas, Escondido, Oceanside, Poway, San Marcos, Vista, and the County of San Diego) disseminated information to constituents in their jurisdictions. The City of Oceanside secured speakers, developed workshop announcement materials, paid for materials printing and moderated the workshop. The Upper San Luis Rey Resource Conservation District provided refreshments for the workshop. Other Copermittees provided support during the workshop itself.

#### **OTHER PARTICIPATING ENTITIES**

- University of California Cooperative Extension
- Regional Water Quality Control Board
- USDA, Natural Resources Conservation Service
- San Diego County Farm Bureau
- Upper San Luis Rey Resource Conservation District

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Organics
- Sediment
- Pesticides
- Nutrients
- Bacteria

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

The Carlsbad WMA collective watershed strategy identifies bacteria, sediment and nutrients as high priority water quality pollutants in various hydrologic areas throughout the watershed. Nursery and Agricultural operations have been identified as potential dischargers of bacteria, sediment, and nutrients. This activity addresses high priority water quality problems and potential sources of the problems within the watershed. Therefore the activity is consistent with the Carlsbad WMA strategy.

**EFFECTIVENESS ASSESSMENT**

A total of 23 attendees took both the pre-test and post-test which included seven questions that were provided by the speakers. The average pre-test score was 2.91 and the average post-test score was 6.04. This demonstrates an increase in knowledge and awareness of the topics presented (Level 2).

All growers who answered post-workshop follow-up questions stated that they had implemented the self-site assessment form. Most stated that this form helped confirm that their operation had appropriate BMPs in place while two growers stated that they increased BMPs as a result of conducting the assessment. If appropriate BMPs were not in place they were then installed (Level 3).

**TITLE: LID AND WATERSHED PLANNING EDUCATION FOR COMMUNITY PLANNING AND SPONSOR GROUPS**  
**ID #: CHU-WQEA4**

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**ACTIVITY IMPLEMENTATION**

The LID and Watershed Planning Education activity involves educating local planning and sponsor groups throughout the unincorporated County on Low Impact Development (LID) and watershed planning principles, practices, and requirements. Since the recommendations of local planning and sponsor groups have some influence over whether, and under what conditions, development projects are approved, this education is intended to aid these groups in making informed recommendations on aspects of development projects that would affect watershed water quality.

During training, members of the planning or sponsor groups were provided copies of the LID handbook, including the Management Strategies, the Appendices and the Literary Guide. Advisory groups and audience members who wished to participate were also given a pre- and post- survey to assess their general knowledge of watershed planning and LID both before and after the presentation was given. The training sessions average fifty minutes depending upon the amount and type of questions asked during and after the presentation.

Staff began presenting the education activity during FY 2008, with the first presentation made to the Hidden Meadows Community Sponsor group on June 26, 2008, at the local community center. The sponsor group consists of 9 members, all of whom were present. Three audience members from the community were also present for the presentation. Including County staff, a total of 14 people were present for the presentation.

**TMDL APPLICABILITY**

This activity is not specifically implemented in compliance with a TMDL.

**TIME SCHEDULE FOR IMPLEMENTATION**

- Develop Education Program – FY 2008
- Begin Education Efforts – FY 2008
- Complete Education Efforts – FY 2009

The Watershed Planning and Low Impact Development training program was successfully developed during the spring of FY 2008, on schedule. The program consists of a PowerPoint presentation formally made to each of the planning and sponsor groups located within the unincorporated County, with a specific focus on the watershed(s) within which the community lies.

Local planning and sponsor groups to be trained within the Carlsbad Watershed during FY 2009 include:

- Twin Oaks (7/16/2008)
- San Dieguito (8/14/2008)
- Elfin Forest / Harmony Grove Town Council (A community within the San Dieguito Planning Area) (11/5/2008)

**PARTICIPATING WATERSHED COPERMITTEES**

- County of San Diego

**OTHER PARTICIPATING ENTITIES**

- None

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

This activity focuses on impacts to the watershed as a result of new and re-development. Specifically, impacts from increased impervious cover and any types of pollutants associated with runoff (both urban runoff and stormwater runoff) as it traverses a variety of types of land uses.

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

New development has been identified as having potentially significant impacts on watershed health. As such, this activity is consistent with the collective watershed strategy.

**EFFECTIVENESS ASSESSMENT**

Activity effectiveness is assessed by tracking the number of presentations conducted, the number of participants in attendance, and the number and type of materials distributed during the presentation (Level 1 Outcome). Pre- and post-presentation survey evaluation forms are also provided to participants, which assesses whether the participants learned something valuable during the presentation (Level 2 Outcome). The 9 members of the Hidden Meadows Sponsor group and 2 audience members participated in both the pre- and post surveys during the presentation time.

The pre- and post- survey form consists of (the same) 5 multiple choice questions and a 6<sup>th</sup> open answer section which asks the participant to provide information on drainage within the community planning area (CPA). The survey results are calculated to obtain a mean average (in percentage) of the overall results of the survey. The pre- and post- survey results are then compared, with the anticipated result being a higher percentage obtained on the post-survey to show an increase in knowledge of watershed planning principles and LID.

The pre- and post- survey results for the Hidden Meadows Sponsor group showed a *decrease* in knowledge after the presentation was given. Survey results for the pre- survey scored an average of 69% and for the post- survey an average of 67%, showing an average 2% decrease in knowledge. Because two of the questions (questions 2 and 5) were consistently answered incorrectly in the post survey, staff reviewed the questions and found the wording may have caused confusion with the reader. Subsequently, questions 2 and 5 were modified slightly to clarify their intent. All future trainings will provide pre- and post- surveys with the modified questions.

**TITLE: LID FEATURES IN SAN ELIJO NATURE CENTER**  
**ID #: CHU-WQEA5**

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**ACTIVITY IMPLEMENTATION**

In November 2007, the County of San Diego began construction on a two-story, 5,525 square foot, state-of-the art nature center that replaces the former visitor center located at the San Elijo Lagoon Ecological Reserve in Encinitas. The new facility, which will open in early 2009, is designed to be constructed and commissioned in accordance with the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) program and is expected to achieve Gold or Platinum certification. LEED credit 6 is specific to stormwater management and is achieved by maintaining the pre-development 24-hour peak discharge rate in the post-development environment if existing impervious surfaces are 50% or less.

The building design incorporates low impact development (LID) techniques which include a green roof with low water use native plants, a bioswale to aid in infiltration of runoff from the site, radiant floor heating, recycled cotton insulation, certified renewable lumber, photovoltaics that will provide 52% of energy requirements, natural daylighting and ventilation, stormwater filtering, native vegetation and recycled water used for irrigation, and extraordinary efforts to minimize area of disturbance. In addition to the many "Green" qualities designed into the building, the Nature Center's exhibits will showcase a series of high quality professional photographs and high-tech, interactive educational kiosks for visitors of all ages.

The goal for the San Elijo Visitor Center is to utilize the gold certification to educate the public on environmentally friendly building design and to present a "practice what we preach" public facility, demonstrating conservation of natural resources, use of recycled and environmentally friendly construction materials and reduced pollution and water use. A section of the exhibits will educate visitors on what and where watersheds are, the causes of water pollution and its destructive impact on habitat and endangerment and extinction of species, clean drinking water, water conservation, water reuse, etc. This facility will serve to promote future sustainable design in the San Diego region and educate citizens about ways in which they can reduce pollutants, including bacteria, sediment and nutrients, from entering the watershed.

**TMDL APPLICABILITY**

This activity is not specifically implemented in compliance with a TMDL

**TIME SCHEDULE FOR IMPLEMENTATION**

November 2007 – Groundbreaking

December 2007 – Establish minimized area of disturbance, begin demolition of existing facilities

October 2008 – Installation of Exhibits

December 2008/January 2009 – Building Commissioning

January 2009 – Grand Opening

**PARTICIPATING WATERHED COPERMITTEES**

- County of San Diego

**OTHER PARTICIPATING ENTITIES**

- None

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- Sediment

- Nutrients
- Bacteria

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

Bacteria, sediment and nutrients have been identified as priority water quality problems in the Carlsbad Watershed. Parks have been identified as potential sources of bacteria and nutrients. Since this activity addresses a priority water quality problem and a high priority source, it is consistent with the collective watershed strategy.

**EFFECTIVENESS ASSESSMENT**

As indicated in the March 2008 WURMP, activity effectiveness will be measured by successful implementation of the LID features described (Level 1 Outcome). There is no post-construction water quality monitoring planned for this site.

**TITLE: UPDATED SAN DIEGO REGION MODEL SUSMP WORKSHOP / TRAINING**  
**ID #: CHU-WQEA6**

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**ACTIVITY IMPLEMENTATION**

As required in Water Quality Order No. 2007-0001 (San Diego Municipal Stormwater Permit), the San Diego County Stormwater Copermittees must update the San Diego Region Model Standard Urban Stormwater Management Plan (SUSMP). Approval of the San Diego Region updated Model SUSMP by the RWQCB is anticipated for the Spring of 2009. After the document is accepted by the RWQCB, Copermittees are required to adopt local SUSMPs within the following year. The Carlsbad Watershed Copermittees recognize that both municipal staff (engineers, planners, program managers, etc.) and the development community (planners, engineers, architects, etc.) play an integral role in ensuring that all development plans for new development and redevelopment projects properly address SUSMP requirements.

In order to promote consistent implementation and ease the transition of meeting the new SUSMP requirements, the Carlsbad Watershed Copermittees determined that a collaborative approach to educating the public about recent advancements in development planning would be a beneficial strategy for the watershed. Sharing education and information between jurisdictions (as compiled and incorporated into the training) will help to ensure adequate consideration of watershed-level problems and solutions.

A presentation and educational materials will be developed for the proposed SUSMP workshop / training event. Topics presented at the event may include: watershed principles, pollutants generated by land use type, the adopted Model SUSMP, SUSMP implementation, priority project categories, Low Impact Development, source control and treatment control Best Management Practices, hydromodification management, and operation and maintenance responsibilities.

The workshop will be planned subsequent to formal acceptance of the model SUSMP by the RWQCB and adoption by the Carlsbad WURMP Copermittees. Municipal staff, and local planning, engineering, and architectural firms and other development professionals will be solicited and informed of the workshop training opportunity through various mechanisms, which may include: direct mailing, website notification, and advertisement at public buildings.

**TMDL APPLICABILITY**

This activity is not currently planned for implementation in compliance with a TMDL.

**TIME SCHEDULE FOR IMPLEMENTATION**

FY 2009      Develop SUSMP presentation and training materials; secure speakers  
FY 09-10      Conduct presentation(s)\*  
FY 10-11      Effectiveness assessment

\*Actual timing of presentation(s) contingent upon RWQCB approval of the Copermittee's final Model SUSMP.

**PARTICIPATING WATERSHED COPERMITTEES**

All watershed Copermittees within the WMA (County of San Diego, Carlsbad, Encinitas, Escondido, Oceanside, Poway, San Marcos, Solana Beach and Vista) will assist in disseminating information to development professionals working in the region. The City of Encinitas will secure speakers, develop workshop training and announcement materials, and moderate the workshop. Other Carlsbad Watershed Copermittees may provide support throughout the development of the training and during the workshop itself.

**OTHER PARTICIPATING ENTITIES**

- Developers
- Land use planners
- Civil Engineers
- Architects and Landscape Architects
- Property Owners

**HIGH PRIORITY WATER QUALITY PROBLEM(S) ADDRESSED**

- All

**CONSISTENCY WITH THE COLLECTIVE WATERSHED STRATEGY**

This activity addresses all high priority water quality problems and likely sources of the problems within the watershed, therefore the activity is consistent with the Carlsbad WMA strategy.

**EXPECTED BENEFITS**

The expected benefits of this watershed education activity include increased awareness of SUSMP requirements and improved implementation of SUSMP BMPs on development and redevelopment projects. Installation of permanent BMPs at priority development project sites will reduce pollutant runoff and lead to improved water quality in downstream receiving waters.

**EFFECTIVENESS ASSESSMENT**

Activity effectiveness will be assessed by tracking the number of presentations conducted, the number of participants in attendance, and the number and type of materials distributed during the presentation (Level 1 Outcome). A pre- and post-presentation survey evaluation form will also be provided to participants. The survey will help determine whether the participants learned something valuable during the presentation (Level 2 Outcome).