STORM WATER MANAGEMENT PLAN
FOR
10418 King Sanday Lane
APN 129-212-24

Valley Center, California
County of San Diego

PREPARED FOR:
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7/3/08

DOUGLAS E. LOGAN, RCE 39726 **DATE**

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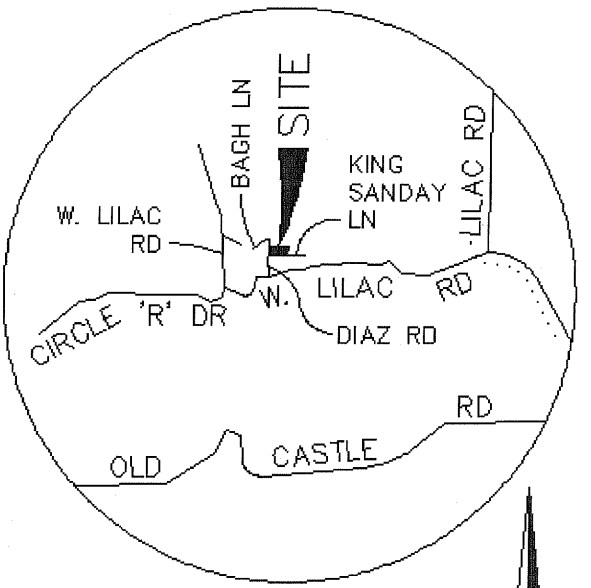
1.0 INTRODUCTION

This Storm Water Management Plan (SWMP) is required under the County of San Diego Watershed Protection, Stormwater Management, and Discharge Control Ordinance (section 67.817). The purpose of this SWMP is to address the water quality impacts from the proposed Tentative Parcel Map. Best Management Practices (BMPs) will be utilized to provide a long-term solution to water quality. This SWMP is also intended to ensure the effectiveness of the BMPs through proper maintenance that is based on long-term fiscal planning. The SWMP is subject to revisions as needed by the engineer.

1.1 Project Description

The proposed project site is located off of the east of I-15, north of Old Castle Road in Valley Center. More specifically the proposed project site is located north of Circle R Drive, Spearhead Trail, and West Lilac Road, south of Lavender Lane, east of Diaz Road and west of Airlfight Drive, and is located off the north side of King Sanday Lane as shown on the vicinity map below.

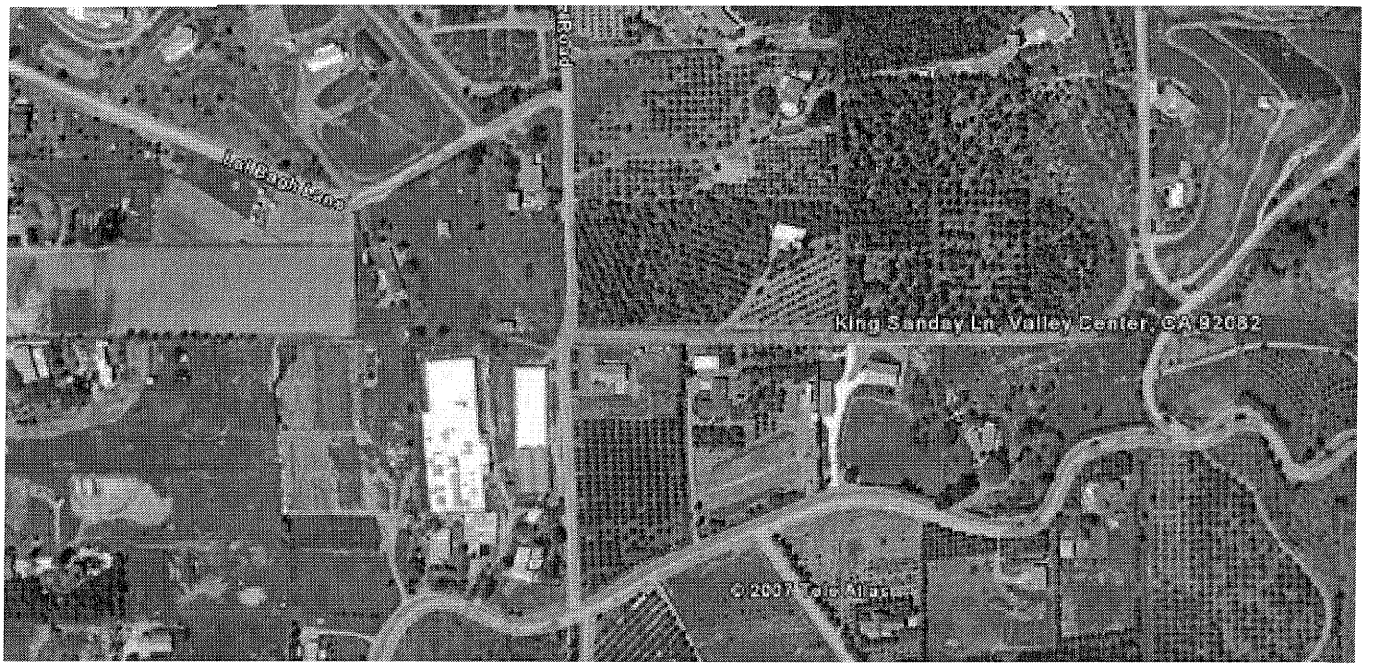


VICINITY MAP
NOT TO SCALE
T.B. PG. 1069, E3

The existing project site consists of a single parcel; the westerly portion of the parcel is vacant and appears it may have been utilized for agricultural operations at one time,

and is now landscaped; the easterly portion of the parcel consists of existing improvements to support an existing mobile home.

Drainage from the existing site is primarily conveyed in one direction; the project site drains to King Sanday Lane in a southwesterly direction across the project site. Runoff collected in King Sanday Lane drains to the west to an existing drainage culvert crossing Diaz Road located at the southwesterly corner of the project site. Ultimately storm water discharge form the project site is conveyed overland in a southwesterly direction until it confluences with Moosa Canyon, which discharges into the San Luis Rey River near Bonsall. A recent aerial photo of the surrounding area is included below.



Diaz Road has a high point roughly 200 feet south of the intersection of King Sanday Lane and Diaz Road, and the road is improved with asphalt paving only, no edge treatment or curb exists. Diaz Road has a varying cross slope with no crown, south of the high point the road slopes to the east side, while north of the high point the road slopes to the west. The pictures on the following pages illustrate the existing conditions of the project site:

(looking north at the intersection of King Sanday Lane and Diaz Road)

(looking east at the intersection of King Sanday Lane and Diaz Road)

The proposed project design consists of subdividing the existing parcel into two lots and construction of an additional residential parcel with a single family residence. The project design proposes the construction a single private driveway, the grading of a new residential pad suitable for the construction of a new single family residence, as well as the typical improvements associated with residential developments (i.e. water, gas and electric utilities, driveways, storm drain and sewer septic system).

The project design also proposes the improvement of Diaz Road to provide from West Lilac Road to King Sanday Lane. The access easement over Diaz Road is only 25 feet wide and the proposed paved section is required to be 24 feet wide.

The drainage of the proposed development will essentially maintain the same flow patterns as the existing condition. A proposed brow ditch to the north of the proposed structure is intended to intercept and convey storm water from offsite areas to the north and direct drainage around the structure and discharge it on-site either to the east or west of the proposed structure. Concrete and earthen swales will be utilized to direct storm water on site safely away form the proposed structures. These brow ditches will re-direct storm water on-site only and the ultimate point of discharge from the project

site will remain the same as in the existing condition. The intent of storm drain system design was to maintain the existing conditions to the maximum extent practicable.

Storm water generated on-site, flows in a southwesterly manner. On-site runoff will initially sheet flow and either then be collected in a grass lined swale or an earthen brow ditch. Ultimately all storm water generated on-site or tributary to the project site flows to the intersection of King Sanday Lane and Diaz Road. Along King Sanday Lane a BMP treatment swale is proposed and is designed to intercept and convey all stormwater generated on site to the existing culvert at the southwesterly corner of the project site.

To address storm water quality goals for the proposed project BMPs have also been considered for the improvement to Diaz Road. As indicated previously the project design also proposes the improvement of Diaz Road to provide from West Lilac Road to King Sanday Lane. The access easement over Diaz Road is only 25 feet wide and the proposed paved section is required to be 24 feet wide. This requirement obviously limits the available space to construct typical above ground treatment devices. The proposed design incorporates the use of infiltration trenches along Diaz Road. These infiltration trenches will consist of a crushed stone trench wrapped in filter fabric and constructed with an underdrain pipe system. The trenches will encourage infiltration of stormwater generated or tributary Diaz Road which get collected in the trench. The trenches will not likely have the capacity to infiltrate the total volume of runoff generated from less frequent storm events. In this case we expect the underdrain system to convey stormwater in the trench to an infiltration basin. This basin is constructed at the low point of the infiltration trench in a larger area and like the infiltration trench is comprised of crushed stone wrapped in filter fabric and constructed with an underdrain pipe system. In addition the underdrain system is constructed with a riser section in the middle of the basin. The riser is intended to act as an overflow release device, as pressure builds in the area drain system stormwater will escape the riser.

Storm water discharged from the project site is not anticipated to disrupt the natural downstream drainage course. The peak discharge from the site will not be increased in comparison to that of the existing condition; therefore the potential for erosion related to an increase peak flow and an overburdening of the downstream systems is reduced and negligible.

1.2 Hydrologic Unit Contribution

The project is located in the San Luis Rey Hydrologic Unit (903 HA) and more specifically a portion of the site is within the Moosa Canyon Hydrologic Subarea (903.13 HSA) and the remaining portion of the site is located within the Moosa Canyon Hydrologic Subarea (903.12 HSA). The project area is characterized by residential development, open space areas, and areas that are or potentially may have been utilized for agricultural purposes historically. The storm water tributary and generated on the project site will discharge to the intersection of King Sanday Lane and Diaz Road. At which point storm water flows in a westerly-southwesterly direction to an unnamed existing natural channels and eventually into Moosa Canyon Creek, then into the San Luis Rey River and ultimately into the Pacific Ocean at the mouth of the San Luis Rey

River. The proposed project will not alter existing drainage patterns on the site, nor will the proposed project alter the hydrologic or hydraulic characteristics of the unnamed existing natural channels.

2.0 WATER QUALITY ENVIRONMENT

2.1 Beneficial Uses

As stated in the previous section, 1.2, the proposed project site is located in the Moosa Canyon Hydrologic Subarea (903.13 HSA) and Moosa Canyon Hydrologic Subarea (903.12 HSA). The beneficial uses for the hydrologic unit are outlined in the San Diego Basin Plan, as shown below:

AGR - Agricultural Supply: Includes uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.

IND – Industrial Services Supply: Includes uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well re-pressurization.

REC1 – Contact Recreation: Includes uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and SCUBA diving, surfing, white water activities, fishing, or use of natural hot springs.

REC2 – Non-Contact Recreation: Includes the uses of water for recreational involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, camping, boating, tide pool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.

WARM – Warm Freshwater Habitat: Includes uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish or wildlife, including invertebrates.

WILD – Wildlife Habitat: Includes uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife, (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

The Moosa Canyon Hydrologic Subarea (903.13 HSA) and Moosa Canyon Hydrologic Subarea (903.12 HSA) are also listed with the following excepted beneficial uses:

MUN – Municipal and Domestic Supply: Includes uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1,2]	Hydrologic Unit Basin Number	BENEFICIAL USE															
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Luis Rey River Watershed - continued																	
unnamed intermittent streams	3.16	+	●	●					●	●		●		●		
Moosa Canyon	3.14	+	●	●					●	●		●		●		
Moosa Canyon	3.13	+	●	●					●	●		●		●		
Turner Lake	3.13	See Reservoirs & Lakes- Table 2-4														
South Fork Moosa Canyon	3.13	+	●	●					●	●		●		●		
Moosa Canyon	3.12	+	●	●					●	●		●		●		
Gopher Canyon	3.12	+	●	●					●	●		●		●		
South Fork Gopher Canyon	3.12	+	●	●					●	●		●		●		
San Luis Rey River	3.11	+	●	●					●	●		●		●	●	
Pilgrim Creek	3.11	+	●	●					●	●		●	●	●	●	
Windmill Canyon	3.11	+	●	●					●	●		●	●	●		
Tuley Canyon	3.11	+	●	●					●	●		●		●		
Lawerence Canyon	3.11	+	●	●					●	●		●		●		
Mouth of San Luis Rey River	3.11	See Coastal Waters- Table 2-3														
San Diego County Coastal Streams																
Loma Alta Creek	4.10	+							O	●		●		●		
Loma Alta Slough	4.10	See Coastal Waters- Table 2-3														

● Existing Beneficial Use

O Potential Beneficial Use

\+ Excepted From MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed seperately.

The beneficial uses of ground waters for Hydrologic Subarea (903.10) *Lower San Luis Rey* are included below:

MUN – Municipal and Domestic Supply: Includes uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.

AGR - Agricultural Supply: Includes uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.

IND – Industrial Services Supply: Includes uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well re-pressurization.

Table 2-5. BENEFICIAL USES OF GROUND WATERS

Ground Water	Hydrologic Unit Basin Number	BENEFICIAL USE: MUN	AGR	IND	PRO	FRSH	WRG
SANTA MARGARITA HYDROLOGIC UNIT	**2.00**						
Ysidora HA [2]	2.10	●	●	●	●		
Deluz HA	2.20	●	●	●			
Murrieta HA	2.30	●	●	●	●		
Alud HA	2.40	●	●	●			
Pechanga HA	2.50	●	●	●			
Wilson HA	2.60	●	●	O			
Cave Rocks HA	2.70	●	●				
Aguanga HA	2.80	●	●	●			
Oakgrove HA	2.90	●	●				
SAN LUIS REY HYDROLOGIC UNIT	**3.00**						
Lower San Luis HA [2]	3.10	●	●	●			
Monserate HA	3.20	●					
Pala HSA	3.21	●	●	●			
Pauma HSA	3.22	●	●	●			
La Jolla Amago HSA	3.23	●	●	●	●		
Warner Valley HA	3.30	●					
Warner HSA	3.31	●	●	●		●	
Combs HSA	3.32	●	●	●			

[2] These beneficial uses do not apply westerly of the easterly boundary of the right-of-way of Interstate Highway 5 and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of the hydrologic area are as shown.

● Existing Beneficial Use

O Potential Beneficial Use

Table 2-5
BENEFICIAL USES

2.2 303(d) Status

According to the California 1998 and 2002 CWA 303d list published by the San Diego Regional Water Quality Control Board shown below, there are no impaired water bodies that are directly associated with the Moosa Canyon Hydrologic Subarea (903.13 HSA) and Moosa Canyon Hydrologic Subarea (903.12 HSA).

The project location and watersheds have been compared to the current published 303d list of impaired water bodies. There are no impaired or water quality limited segments directly associated with the project site. Drainage from the site is conveyed in a westerly manner, and eventually into Moosa Canyon Creek, then into the San Luis Rey River and ultimately into the Pacific Ocean at the mouth of the San Luis Rey River. The Pacific Ocean at the San Luis Rey River Mouth is identified as being impaired by bacterial stressors, and the lower portion of the San Luis Rey River is identified as being impaired by chloride and total dissolved solids. The project site is roughly 21 miles from the impaired waterbody.

	River, Upper				
[17] Gavilan HSA (902.22)	Sandia Creek	lower 1.5 miles	Total Dissolved Solids	lower 1.5 mile	2002
[18] Wolf HSA (902.52)	Murrieta Creek		Phosphorus	12 miles	2002
[19] San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River Mouth	Bacterial Indicators[E]	0.5 miles	1998
[20] Mission HSA (903.11)	Lake Guajome		Eutrophic	33 acres	1998
[21] Mission HSA (903.11)	San Luis Rey River	lower portion	Chloride	lower 13 miles	2002
			Total Dissolved Solids	lower 17 miles	2002
[22] Loma Alta HA (904.10)	Pacific Ocean Shoreline	at Loma Alta Creek Mouth	Bacterial Indicators[E]	1.1 mile	1998
[23] Loma Alta HA (904.10)	Loma Alta Slough		Bacterial Indicators[E]	8 acres	1998
			Eutrophic		
[24] Buena Vista Creek HA (904.20)	Pacific Ocean Shoreline	at Buena Vista Creek	Bacterial Indicators[E]	1.2 miles	1998
		Carlsbad City Beach at Carlsbad Village Drive			
		Carlsbad State Beach at Pine Avenue			

3.0 CHARACTERIZATION OF PROJECT RUNOFF

3.1 Existing and Post-Construction Drainage

The hydrologic model of the project site, in both the existing and developed condition, incorporates the analysis of storm water discharge at one location. The complete hydrologic analysis of existing and developed condition can be found in the ***Preliminary Hydrology Report for 10418 King Sanday Lane***, dated August 21, 2007 prepared by HL Engineering and Surveying.

In the hydrologic model presented in the Preliminary Hydrology report, the pre-developed and post-developed conditions of the proposed project site was developed to analyze the project site includes one point of analysis. The Preliminary Hydrology report illustrates that the watershed area in the pre-developed condition is equal to 6.1 acres, has a time of concentration (Tc) equal to 12.06 minutes and has a peak discharge in the 100-year 6 hour storm event of 11.49 cfs. The table below illustrates the model analysis input and output based on the existing conditions:

Exisiting Conditon 100-year storm Characteristics:

NODE (#)	**H** (feet)	**L** (feet)	**C**	**Tc** (minutes)	**I** (in/hr)	**A** (acres)	**Q100** (cfs)
1	5	140	0.36	8.714	6.44	0.11	0.26
2	57	803	0.36	3.35	5.225	6.00	11.29
3				**12.06**		**6.11**	**11.49**

In the post-developed condition hydrologic analysis in the Preliminary Hydrology report illustrates that the watershed area is equal to 6.11 acres, has a time of concentration (Tc) equal to 12.17 minutes and has a peak discharge in the 100-year 6 hour storm event of 11.42 cfs. The table on the following page illustrates the model analysis input and output based on the developed conditions:

Developed Conditon 100-year storm Characteristics:

NODE (#)	H (feet)	L (feet)	C	Tc (minutes)	I (in/hr)	A (acres)	Q100 (cfs)
1	5	140	0.36	8.714	6.444	0.11	0.26
2	38	405.12		1.47			
10	5	100	0.36	7.79	6.928	0.05	0.12
11	6.2	89.73		0.38			
12	11.8	86.3	0.36	0.82	6.318	0.1	0.23
13	5	73.65		0.31			
3	19	410.34		2.12	6.18	0.26	0.58
20	5	100	0.36	7.79	6.928	0.05	0.12
21	7.5	86.7		0.33			
22	24.5	240.06	0.36	2.05	5.836	0.25	0.53
23	10	319.74	0.36	2.01	5.195	5.5	10.29
4				**12.17**		**6.11**	**11.42**

The post-developed condition 85th percentile water quality flow required to be treated by either flow based or volume based BMPs is typically limited to the area within the project site proposed for development. Since the offsite area tributary is not impacted by the project site, no treatment of this area is required; however due to the limited impervious surfaces within the watershed sub-basin this report has taken a more conservative approach to determining the treatment flow, by including the entire watershed basin area into account. The following spreadsheet illustrates the calculations utilized in determining the 85th percentile runoff flow required for treatment.

Storm Water Management Plan for
10418 King Sanday Lane, Valley Center

85TH PERCENTILE PEAK FLOW AND VOLUME DETERMINATION
Modified Rational Method - Effective for Watersheds < 1.0 mi^2

Note: Only Enter Values in Boxes - Spreadsheet Will Calculate Remaining Values

Project Name	Gangavalli
Work Order	2007-81
Jurisdiction	City of Valley Center

BMP Location

85th Percentile Rainfall = **0.85** inches
(from County Isopluvial Map)

Developed Drainage Area =	6.1	acres
Natural Drainage Area =	0.0	acres
Total Drainage Area to BMP =	**6.1**	acres

Dev. Area Percent Impervious =	10	%
Overall Percent Impervious =	**10**	%

Dev. Area Runoff Coefficient =	0.36
Nat. Area Runoff Coefficient =	0.30
Runoff Coefficient =	**0.36**

Time of Concentration = **12.1** minutes
(from Drainage Study)

RATIONAL METHOD RESULTS

Q = CIA where
- Q = 85th Percentile Peak Flow (cfs)
- C = Runoff Coefficient
- I = Rainfall Intensity (0.2 inch/hour per RWQCB mandate)
- A = Drainage Area (acres)

V = CPA where
- V = 85th Percentile Runoff Volume (acre-feet)
- C = Runoff Coefficient
- P = 85th Percentile Rainfall (inches)
- A = Drainage Area (acres

Using the Total Drainage Area:

C =	0.36
I =	0.2 inch/hour
P =	0.85 inches
A =	6.1 acres
Q =	**0.44 cfs**
V =	**0.16 acre-feet**

Using Developed Area Only:

C =	0.36
I =	0.2 inch/hour
P =	0.85 inches
A =	6.1 acres
Q =	**0.44 cfs**
V =	**0.16 acre-feet**

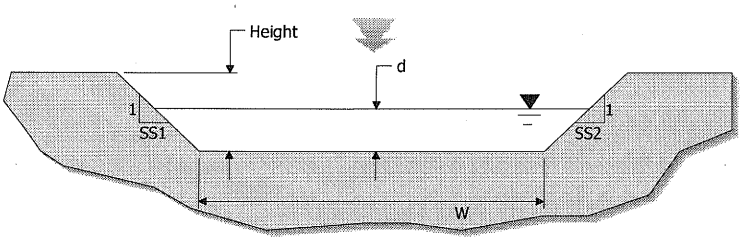
From the spreadsheet on the previous page, the calculated required 85th percentile flow was found to be 0.44 cfs, and if volume based BMPs are chosen to be utilized a volume of 0.16 acre-feet would be required to be treated.

The BMP design and layout will be finalized with proposed grading plans approval. As stated in section 7.0 of this report presently the primary BMP that will be utilized to meet the post-construction treatment requirements will be Biofilters, otherwise commonly referred to as grass lined swales. Layout, design and verification that the proposed biofilter swales are sized appropriately to handle the treatment flow tributary to each device will be completed with the improvement and grading plans. However to ensure that a biofilter swale is a feasible and appropriate BMP, the following sizing spreadsheet has been included:

Grassy Swale Design Spreadsheet

Given:

Design flow	0.44 cfs
Residence time (req)	10 minutes



Trapezoid Channel Design Parameters:

y	0.25 feet
t	6 feet
w	4 feet
SS1:SS2	4 ft/ft
A	1.25 sq ft

Find Qmax of channel:

Q=	(1.49/n) * A * R^(2/3) * s^.5
n	0.2
s	0.07 ft/ft (long. Slope)
r	0.217391 ft
Q=	0.890793 cfs

Find Velcoity in channel
V=Q/A
Therefore:
V = 0.352 fps

Required Length of Channel:
L=vt
Therefore:
L= 211.2
PROJECT DESIGN TO USE: L= 220

3.2 Existing and Post-Construction Drainage

There are no sampling data available for the existing site condition, although the storm water discharge in the pre-developed condition is expected to have high concentration of nutrients, pesticides and herbicides. In addition, the proposed project is not expected to generate significant amounts of non-visible pollutants. However, the table on the following page illustrates constituents that are commonly found on similar developments and could affect water quality:

TYPICAL POST-CONSTRUCTION POLLUTANTS

	General Pollutant Categories								
Priority Project Categories	Sediments	Nutrients	Heavy Metals	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Detached Residential Development	X	X			X	X	X	X	X
Attached Residential Development	X	X			X	P(1)	P(2)	P	X
Commercial Development >100,000 ft^2	P(1)	P(1)		P(2)	X	P(5)	X	P(3)	P(5)
Automotive Repair Shops			X	X(4)(5)	X		X		
Restaurants					X	X	X	X	
Hillside Development >5,000 ft^2	X	X			X	X	X		X
Parking Lots	P(1)	P(1)	X		X	P(1)	X		P(1)
Streets, Highways & Freeways	X	P(1)	X	X(4)	X	P(5)	X		
Retail Gas Outlets			X	X(4)	X		X		

X = anticipated
P = potential
(1) A potential pollutant if landscaping exists on-site.
(2) A potential pollutant if the project includes uncovered parking areas.
(3) A potential pollutant if land use involves food or animal waste products.
(4) Including petroleum hydrocarbons.
(5) Including solvents.

The following table lists products that are commonly used in the construction of residential developments and identifies the pollutants that can potentially result if these products are exposed to rain water or storm water runoff:

CATAGORY	PRODUCT	POLLUTANTS
Adhesives	Adhesives, Glues Resins, Epoxy Synthetics Calks, Sealers, Putty, Sealing Agents Coal Tars (Naptha, Pitch)	Phenolics, Formaldehydes Phenolics, Formaldehydes Asbestos, Phenolics, Formaldehydes Benzene, Phenols, Naphthalene
Cleaners	Polishes (Metal, Ceramic, Tile) Etching Agents Cleaners, Ammonia, Lye, Caustic Sodas Bleaching Agents Chromate Salts	Metals Metals Acidity/Alkalinity Acidity/Alkalinity Chromium
Plumbing	Solder (Lead, Tin), Flux (Zinc, Chloride) Pipe Fitting (Cut Shavings) Galvanized Metals (Nails, Fences) Electric Wiring	Lead, Copper, Zinc, Tin Copper Zinc Copper, Lead
Painting	Paint Thinner, Acetone, MEK, Stripper Paints, Lacquers, Varnish, Enamels Turpentine, Gum Spirit, Solvents Sanding, Stripping Paints (Pigments), Dyes	VOC's Metals, Phenolics, Mineral Spirits VOC's Metals Metals
Woods	Sawdust Particle Board Dusts (Formaldehyde) Treated Woods	BOD Formaldehyde Copper, Creosote
Masonry & Concrete	Dusts (Brick, Cement) Colored Chalks (Pigments) Concrete Curing Compounds Glazing Compounds Cleaning Surfaces	Acidity, Sediments Metals Asbestos Acidity
Floors & Walls	Flashing Drywall Tile Cutting (Ceramic Dusts) Adhesives*	Copper, Aluminum Dusts Minerals
Remodeling & Demolition*	Insulation Venting Systems Dusts (Brick, Cement, Saw, Drywall)	Asbestos Aluminum, Zinc
Air Conditioning & Heating	Insulating Coolant Reservoirs Adhesives*	Asbestos Freon
Yard O & M	Vehicle and Machinery Maintenance Gasoline, Oils, Additives Marking Paints (Sprays) Grading, Earth Moving Portable Toilets Fire Hazard Control (Herbicides) Health and Safety Wash Waters* (Herbicides, Concrete, Oils, Greases)	Oils and Grease, Coolants Benzene & Derivatives, Oils & Grease Vinyl Chloride, Metals Erosion (Sediments) BOD, Disinfectants (Spills) Sodium Arsenite, Dinitro Compounds Rodenticides, Insecticides
Landscaping & Earthmoving	Planting, Plant Maintenance Excavation, Tilling Masonry & Concrete* Solid Wastes (Trees, Shrubs) Exposing Natural Lime or Other Mineral Deposits Soils Additives Revegetation of Graded Areas	Pesticides, Herbicides, Nutrients Erosion (Sediments BOD Acidity/Alkalinity, Metals Aluminum Sulfate, Sulfur Fertilizers
Materials Storage	Waste Storage (Used Oils, Solvents, Etc.) Hazardous Waste Containment Raw Material Piles	Spills, Leaks Spills, Leaks Dusts, Sediments

* See above categories.
Note: VOC = Volatile Organic Compounds. BOD = Biochemical Oxygen Demand due to the use of oxygen by decomposing materials.
References: USEPA, 1973. Processes, Procedures, and Methods to Control Pollution Resulting From Construction Activity. Office of Air and Water Programs, EPA

THESE MATERIALS TYPICALLY USED AT A CONSTRUCTION SITE HAVE THE POTENTIAL TO CONTRIBUTE TO THE DISCHARGE OF POLLUTANTS OTHER THAN SEDIMENT IN STORM WATER.

3.3 Soil Characteristics

The project area consists of soil type C, per the Soils Group Map included in the County Hydrology Manual.

4.0 MITIGATION MEASURES TO PROTECT WATER QUALITY

To address water quality for the project, BMPs will be implemented during construction and post-construction.

4.1 Construction BMPs

A detailed description of the construction BMPs will be developed during the Grading Plan and Improvement Plan Engineering. Since the project is in the preliminary development phase only a listing of potential types of temporary BMPs are available. This includes the following:

- Silt Fence
- Fiber Rolls
- Street Sweeping and Vacuuming
- Storm Drain Inlet Protection
- Stockpile Management
- Solid Waste Management
- Stabilized Construction Entrance/Exit
- Dewatering Operations
- Vehicle and Equipment Maintenance
- Desilting Basin
- Gravel Bag Berm
- Sandbag Barrier
- Material Delivery and Storage
- Spill Prevention and Control
- Concrete Waste Management
- Water Conservation Practices
- Paving and Grinding Operations
- Permanent Revegetation of All disturbed uncovered areas
- Erosion Control Mats and Spray-on Applications

Construction BMPs for this project will be selected, constructed, and maintained so as to comply with all applicable ordinances and guidance documents.

4.2 Post-construction BMPs

Pollutants of concern as noted in the table titled ***TYPICAL POST CONSTRUCTION POLLUTANTS***, in section 3.2 will be addressed through the utilization of three types of BMPs. These types of BMPs are Site Design, Source Control and Treatment Control.

The proposed development site design will have a significant role in not only minimizing the potential discharge of suspended pollutants in storm water, but will dramatically improve the storm water quality of the storm water discharged from the entire project site. The abandoning of agricultural operations and reducing the area that will be utilized in the development, as compared to the agricultural area currently being utilized

will reduce the potential for pollutant discharge from the site. In addition to the change in the project site usage, the proposed project is designed to minimize the use of impervious area, in fact only 0.14 acres (approximately 2% of the total developed area) of the proposed development will be impervious surfaces at this time. Soil stabilization of the slopes and disturbed areas are incorporated into the project design. The landscaping on the site will consist of both native and non-native plants. The goal is to achieve plant establishment expeditiously to reduce erosion. The irrigation system for these landscaped areas will be monitored to reduce over irrigation.

The homeowner's will have the responsibility of ensuring that the source control BMP's are effective. Homeowner's will be provided with literature containing standard language provided by the Region Water Quality Control Board to educate them on the importance of minimizing the use and discharge of pollutants (source control) and means to do so.

In addition to Site Design and Source Control BMPs, the proposed project site design incorporates the use of Treatment control BMP's that will be implemented to address water quality goals:

- Landscaping
- Bio-Filters (grassy swales)
- Infiltration trenches and infiltration pits

Placements of the BMP's are noted on the project Grading Plans.

4.2.1 Landscaping

Permanent Landscaping and irrigation will be installed on all graded areas, in order to prevent erosion of un-stabilized soils. Landscaping will not only act as an anchor to lock sediment and soil in place along the slope, but will also act as a protective barrier from the direct impact of rainfall. The landscaping will intercept rainfall with its branches and leaves and the water will not come in contact with soil with the same magnitude of force it would if the rainfall were to fall directly on to the soil surface unimpeded by any natural or foreign object.

4.2.2 Bio Filters

Bio Filtration strips, also known as vegetated buffer strips or grassy swales, are vegetated sections of land over which storm water flows as overland sheet flow. The biofiltration system proposed for this project utilizes slope rounding berms, ditches and the existing natural drainages as shown on the attached project plans. Pollutants are removed by filtration through the existing soils and vegetation. Biofiltration swales are mainly effective at removing debris and solid particles, although some dissolved constituents are removed by absorption onto the soil. The drainage swales shown on the Preliminary Grading Plan for the Gangavalli Tentative Parcel Map, are to be constructed with a grass lining.

4.2.3 Infiltration Trenches and Infiltration Pits

Infiltration trenches and infiltration pits are areas designed to infiltrate stormwater into the ground. In this case these devices are located in areas tributary to stormwater runoff and are constructed with crushed stone, filter fabric, and perforated 6-inch PVC piping. These devices are positioned such that stormwater will be intercepted and provide the opportunity for stormwater to percolate into the ground. In the event the ground is saturated and the infiltration pits reach there storage capacity, the PVC piping will act as an underdrain system and will direct storm water to an infiltration pit. The infiltration pits are constructed with crushed stone and filter fabric, similar to the infiltration trench but are larger in area and provide more area to encourage infiltration.

5.0 OPERATION AND MAINTENANCE PROGRAM

5.1.1 Bio-Filters

The operational and maintenance needs of a Bio-filter Swale are:

- Vegetation management to maintain adequate hydraulic functioning and to limit habitat for disease-carrying animals.
- Animal and vector control.
- Periodic sediment removal to optimize performance.
- Trash, debris, grass trimmings, tree pruning, and leaf collection and removal to prevent obstruction of a Swale and monitoring equipment.
- Erosion and structural maintenance to prevent the loss of soil and maintain the performance of the Swale.

Functional Maintenance

Functional maintenance has two components:

Preventive maintenance
Corrective maintenance

Preventive Maintenance

Preventive maintenance activities to be instituted at a Bio-filter Swale are:

- Trash and Debris. During each inspection and maintenance visit to the site, debris and trash removal will be conducted to reduce the potential for inlet and outlet structures and other components from becoming clogged and inoperable during storm events.

- Sediment Removal. Sediment accumulation, as part of the operation and maintenance program at a Swale, will be monitored once a month during the dry season, after every large storm (0.50 inch), and monthly during the wet season. Specifically, if sediment reaches a level at or near plant height, or could interfere with flow or operation, the sediment will be removed. If accumulation of debris or sediment is determined to be the cause of decline in design performance, prompt action (i.e., within ten working days) will be taken to restore the Swale to design performance standards. Removal of Standing Water. Standing water must be removed if it contributes to the development of aquatic plant communities or mosquito breeding areas.

- Fertilization and Irrigation. The vegetation seed mix has been designed so that fertilization and irrigation is not necessary. Fertilizers and irrigation will not be used to maintain the vegetation.

- Elimination of Mosquito Breeding Habitats. The most effective mosquito control program is one that eliminates potential breeding habitats.

Corrective Maintenance

Corrective maintenance is required on an emergency or non-routine basis to correct problems and to restore the intended operation and safe function of a Bio-filter Swale. Corrective maintenance activities include:

- Removal of Debris and Sediment. Sediment, debris, and trash, which impede the hydraulic functioning of a Swale and prevent vegetative growth, will be removed and properly disposed.

- Structural Repairs. Once deemed necessary, repairs to structural components of a Swale and its inlet and outlet structures will be done within 10 working days.

- Embankment and Slope Repairs. Once deemed necessary, damage to the embankments and slopes of Swales will be repaired within 10 working days).

- Erosion Repair. Where a reseeding program has been ineffective, or where other factors have created erosive conditions (i.e., pedestrian traffic, concentrated flow, etc.), corrective steps will be taken to prevent loss of soil and any subsequent danger to the performance of a Swale. There are a number of corrective actions than can be taken. These include erosion control blankets, riprap.

Hazardous Waste

Suspected hazardous wastes will be analyzed to determine disposal options. Hazardous wastes generated onsite will be handled and disposed of according to applicable local, state, and federal regulations. A solid or liquid waste is considered a hazardous waste if it exceeds the criteria list in the CCR, Title 22, Article 11.

5.1.2 Infiltration Devices

The operational and maintenance needs of an Infiltration device are:

- Underdrain management to maintain adequate hydraulic functioning and to limit habitat for disease-carrying animals.
- Animal and vector control.
- Periodic sediment removal to optimize performance.
- Trash, debris, grass trimmings, tree pruning, and leaf collection and removal to prevent obstruction of infiltration and capture.

- Erosion and structural maintenance to prevent the loss of crushed stone and maintain the performance of the infiltration device.

Functional Maintenance

Functional maintenance has two components:

Preventive maintenance
Corrective maintenance

Preventive Maintenance

Preventive maintenance activities to be instituted at an Infiltration device are:

- Trash and Debris. During each inspection and maintenance visit to the site, debris and trash removal will be conducted to reduce the potential for components to become clogged and inoperable during storm events.

- Sediment Removal. Sediment accumulation, as part of the operation and maintenance program at an Infiltration device, will be monitored once a month during the dry season, after every large storm (0.50 inch), and monthly during the wet season. Specifically, if sediment is visibly evident, or could interfere with flow or operation, the sediment will be removed. If accumulation of debris or sediment is determined to be the cause of decline in design performance, prompt action (i.e., within ten working days) will be taken to restore the Infiltration device to design performance standards. Removal of Standing Water. Standing water must be removed if it contributes to the development of aquatic plant communities or mosquito breeding areas.

- Elimination of Mosquito Breeding Habitats. The most effective mosquito control program is one that eliminates potential breeding habitats.

Corrective Maintenance

Corrective maintenance is required on an emergency or non-routine basis to correct problems and to restore the intended operation and safe function of a Infiltration device. Corrective maintenance activities include:

- Removal of Debris and Sediment. Sediment, debris, and trash, which impede the hydraulic functioning of an Infiltration device will be removed and properly disposed.

- Removal of Vegetation, leaves, etc. Vegetation which impedes the hydraulic functioning of an Infiltration device will be removed and properly disposed.

- Structural Repairs. Once deemed necessary, repairs to structural components of an Infiltration device and its inlet and outlet structures will be done within 10 working days.

- Erosion Repair. Areas in the vicinity of an Infiltration device should have be stabilized to limit erosion, in particular areas upstream of an Infiltration device. Sediment laden stormwater will likely deposit sediment within an infiltration device. Minimizing the potential for erosion in areas near an Infiltration device will improve the performance and functional lifespan of the device . There are a number of corrective actions than can be taken. These include erosion control blankets, riprap.

Hazardous Waste

Suspected hazardous wastes will be analyzed to determine disposal options. Hazardous wastes generated onsite will be handled and disposed of according to applicable local, state, and federal regulations. A solid or liquid waste is considered a hazardous waste if it exceeds the criteria list in the CCR, Title 22, Article 11.

5.2 Maintenance Category

Bio-swales and Infiltration Devices: Category 1

As described in the County Stormwater Maintenance Plan, bio-filters (grassy swales) and infiltration devices within the project site fall within the "First Category". The maintenance of the bio-filters (grassy swales), used as pad treatment, will be the responsibility of the individual private land owner. The County should have only minimal concerns for ongoing maintenance. The proposed Bio-filter and Infiltration Devices inherently "take care of themselves", or property owners can naturally be expected to do so as an incident of taking care of their property.

5.3 Annual Cost of Maintenance

ANNUAL COST ESTIMATE:

Grassy swale Bio-filter BMP and Infiltration Devices maintenance - $2972.42

TOTAL: $2,972.42

TWO-YEAR COST ESTIMATE:

Grassy swale Bio-filter BMP and Infiltration Devices maintenance - $5944.84

TOTAL: $5,944.84

TEN-YEAR COST ESTIMATE:

Grassy swale Bio-filter BMP and Infiltration Devices maintenance - $29724.20

TOTAL: $29,724.20

6.0 FISCAL RESOURCES

The maintenance of the landscaping berm will be performed as necessary by the private land owner. The land owner will be subject to all applicable ordinances referenced herein.

The maintenance of the biofiltration swales and infiltration devices will be performed as necessary by the land owner and the site managers and once the development is complete the homeowner will assume all financial responsibility for ensuring that the treatment devices are maintained. The land owner and the site managers will be subject to all applicable ordinances referenced herein.

7.0 SUMMARY/CONCLUSIONS

This SWMP has been prepared in accordance with the Watershed Protection, Stormwater Management, and Discharge Control Ordinance and the Stormwater Standards Manual. This SWMP has evaluated and addressed the potential pollutants associated with this project and their effects on water quality. The following is a summary of the facts and findings associated with this project and the measures addressed by this SWMP.

The storm water quality goals established for the proposed project will be primarily addressed through Site Design BMPs. The conversion of the existing site into a residential development will not deteriorate the storm water quality of storm water runoff from the site.

The primary method of treatment to meet the developed condition storm water quality goals set for this project will be facilitated through the design of grass lined swales or Biofilters. These grass lined swales will be located at upstream of all the points of discharge of "urban runoff", essentially all runoff that comes in contact with the disturbed areas associated with this development will be treated in a grass lined swale. The required treatment flow, the 85th percentile storm water runoff flow is found to be 0.44 cfs for the entire site.

As indicated previously the project design also proposes the improvement of Diaz Road to provide from West Lilac Road to King Sanday Lane. The access easement over Diaz Road is only 25 feet wide and the proposed paved section is required to be 24 feet wide. This requirement obviously limits the available space to construct typical above ground treatment devices. The proposed design incorporates the use of infiltration trenches along Diaz Road. These infiltration trenches will consist of a crushed stone trench wrapped in filter fabric and constructed with an underdrain pipe system. The trenches will encourage infiltration of stormwater generated or tributary Diaz Road which get collected in the trench. The trenches will not likely have the capacity to infiltrate the total volume of runoff generated from less frequent storm events. In this case we expect the underdrain system to convey stormwater in the trench to an infiltration basin. This basin is constructed at the low point of the infiltration trench in a larger area and like the infiltration trench is comprised of crushed stone wrapped in filter fabric and constructed with an underdrain pipe system. In addition the underdrain system is constructed with a riser section in the middle of the basin. The riser is intended to act as an overflow release device, as pressure builds in the area drain system stormwater will escape the riser.

In addition to the proposed grass lined swales and infiltration devices, storm water quality will be improved due to the fact that storm water will be discharged form the site by utilizing existing natural channels which will provide/promote further settlement of suspended pollutants and filtration by the existing vegetation. The combination of site design, source control and the treatment control BMPs, in this case grass lined swales, storm water quality issues are addressed.

In conclusion the combination of proposed construction and permanent BMP's will reduce, to the maximum extent practicable, the expected project pollutants and will not adversely impact the beneficial uses of the receiving waters.

This Stormwater Management Plan has been prepared under the direction of the following Registered Civil Engineer. The Registered Civil Engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.

Douglas E. Logan
REGISTERED CIVIL ENGINEER

DATE

APPENDIX A
County of San Diego Storm Water Management Plan for Priority Project (Major SWMP)

Storm Water Management Plan
For Priority Projects
(Major SWMP)

Project Name:	10418 Kina Sandra Lane - Valley Center
Permit Number (Land Development Projects):	
Work Authorization Number (CIP):	
Applicant:	Ramazan Gangavalli
Applicant's Address:	10418 Kina Sandra Lane, Valley Ca 92082
Plan Prepare By (*Leave blank if same as applicant*):	Rancho Coastal Engineering, 1635 S. Rancho Santa Fe, Suite 204, San Marcos, CA 92078
Date:	9/11/2007
Revision Date (If applicable):	6/23/2008 → 7/29/2008 Revised to include LID information

The County of San Diego Watershed Protection, Storm Water Management, and Discharge Control Ordinance (WPO) (Ordinance No. 9424) requires all applications for a permit or approval associated with a Land Disturbance Activity must be accompanied by a Storm Water Management Plan (SWMP) (section 67.804.f). The purpose of the SWMP is to describe how the project will minimize the short and long-term impacts on receiving water quality. Projects that meet the criteria for a priority project are required to prepare a Major SWMP.

Since the SWMP is a living document, revisions may be necessary during various stages of approval by the County. Please provide the approval information requested below.

Project Review Stage	Does the SWMP need revisions?		If YES, Provide Revision Date
	YES	NO	
TPM - 1ST Submittal	√*		
TPM - 2ND Submittal		✓	
→ RE Submit SWMP		✓**	

* - Revisions likely pursuant to Revisions to Grading Plan and TPM.

** - 7/29/08 Revisions TP include LID.

Instructions for a Major SWMP can be downloaded at http://www.co.san-diego.ca.us/dpw/stormwater/susmp.html.

Completion of the following checklist and attachments will fulfill the requirements of a Major SWMP for the project listed above.

PROJECT DESCRIPTION

Please provide a brief description of the project in the following box. For example:
The 50-acre RC Ranch project is located on the south side of San Miguel Road in the County of San Diego (See Attachment 1). The project is approximately 1.0 mile east of the intersection of San Miguel Avenue and San Miguel Road and 1 mile south of the Sweetwater Reservoir. This project will consist of a planned residential community comprising of 45 single-family homes 72 and multi-unit dwellings.

The existing project site consists of a single parcel; the westerly portion is vacant and appears it may have been utilized for agricultural operations at one time, and is now landscaped; the easterly portion of the parcel consists of existing improvements to support an existing mobile home. Drainage from the existing site is conveyed in one direction; the project site drains to King Sanday Lane in a southwesterly direction across the project site. Ultimately storm water discharge form the project site is conveyed overland in a southwesterly direction until it confluences with Moosa Canyon, which discharges into the San Luis Rey River near Bonsall. The proposed project design consists of subdividing the existing parcel into two lots and construction of an additional residential parcel with a single family residence. The project design proposes the construction a private driveway, the grading of a new residential pad suitable for the construction of a new single family residence, as well as the typical improvements associated with residential developments (i.e. water, gas and electric utilities, driveways, storm drain and sewer septic system).

PRIORITY PROJECT DETERMINATION

Please check the box that best describes the project. Does the project meet one of the following criteria?

PRIORITY PROJECT	YES	NO
Redevelopment within the County Urban Area that creates or adds at least 5,000 net square feet of additional impervious surface area	✓	
Residential development of more than 10 units		✓
Commercial developments with a land area for development of greater than 100,000 square feet		✓
Automotive repair shops		✓
Restaurants, where the land area for development is greater than 5.000 square feet		✓
Hillside development, in an area with known erosive soil conditions, where there will be grading on any natural slope that is twenty-five percent or greater, if the development creates 5,000 square feet or more of impervious surface		✓
Environmentally Sensitive Areas: All development and redevelopment located within or directly adjacent to or discharging directly to an environmentally sensitive area (where discharges from the development or redevelopment will enter receiving waters within the environmentally sensitive area), which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10% or more of its naturally occurring condition.		✓
Parking Lots 5,000 square feet or more or with 15 parking spaces or more and potentially exposed to urban runoff		✓
Streets, roads, highways, and freeways which would create a new paved surface that is 5,000 square feet or greater	✓	

Limited Exclusion: Trenching and resurfacing work associated with utility projects are not considered priority projects. Parking lots, buildings and other structures associated with utility projects are subject to SUSMP requirements if one or more of the criteria above are met.

If you answered **NO** to all the questions, then **STOP**. Please complete a Minor SWMP for your project.

HYDROMODIFICATION DETERMINATION

The following questions provide a guide to collecting information relevant to hydromodification management issues.

Table 2

	QUESTIONS	YES	NO	Information
1.	Will the proposed project disturb 50 or more acres of land? (Including all phases of development)		✓	If YES, continue to 2. If NO, go to 6.
2.	Would the project site discharge directly into channels that are concrete-lined or significantly hardened such as with rip-rap, sackcrete, etc, downstream to their outfall into bays or the ocean?		✓	If NO, continue to 3. If YES, go to 6.
3.	Would the project site discharge directly into underground storm drains discharging directly to bays or the ocean?		✓	If NO, continue to 4. If YES, go to 6.
4.	Would the project site discharge directly to a channel (lined or un-lined) and the combined impervious surfaces downstream from the project site to discharge at the ocean or bay are 70% or greater?		✓	If NO, continue to 5. If YES, go to 6.
5.	Project is required to manage hydromodification impacts.			Hydromodification Management Required as described in Section 67.812 b(4) of the WPO.
6.	Project is not required to manage hydromodification impacts.			Hydromodification Exempt. Keep on file.

An exemption is potentially available for projects that are required (No. 5. in Table 2 above) to manage hydromodification impacts: The project proponent may conduct an independent geomorphic study to determine the project's full hydromodification impact. The study must incorporate sediment transport modeling across the range of geomorphically-significant flows and demonstrate to the County's satisfaction that the project flows and sediment reductions will not detrimentally affect the receiving water to qualify for the exemption.

EXCEPTIONAL THREAT TO WATER QUALITY DETERMINATION

Complete the checklist below to determine if a proposed project will pose an "exceptional threat to water quality," and therefore require Advanced Treatment Best Management Practices.

Table 6

No.	CRITERIA	YES	NO	INFORMATION
1.	Is all or part of the proposed project site within 200 feet of waters named on the Clean Water Act (CWA) Section 303(d) list of Water Quality Limited Segments as impaired for sedimentation and/or turbidity? Current 303d list may be obtained from the following site: http://www.swrcb.ca.gov/tmdl/docs/303dlists2006/approved/r9_06_303d_reqt mdls.pdf		✓	If YES, continue to 2. If NO, go to 5.
2.	Will the project disturb more than 5 acres, including all phases of the development?		✓	If YES, continue to 3. If NO, go to 5.
3.	Will the project disturb slopes that are steeper than 4:1 (horizontal: vertical) with at least 10 feet of relief, and that drain toward the 303(d) listed receiving water for sedimentation and/or turbidity?		✓	If YES, continue to 4. If NO, go to 5.
4.	Will the project disturb soils with a predominance of USDA-NRCS Erosion factors k_f greater than or equal to 0.4?		✓	If YES, continue to 6. If NO, go to 5.
5.	Project is not required to use Advanced Treatment BMPs.		✓	Document for Project Files by referencing this checklist.
6.	Project poses an "exceptional threat to water quality" and is required to use Advanced Treatment BMPs.		✓	Advanced Treatment BMPs must be consistent with WPO section 67.811(b)(20)(D) performance criteria

Exemption potentially available for projects that require advanced treatment:
Project proponent may perform a Revised Universal Soil Loss Equation, Version 2 (RUSLE 2), Modified Universal Soil Loss Equation (MUSLE), or similar analysis that shows to the County official's satisfaction that advanced treatment is not required

Now that the need for treatment BMPs has been determined, other information is needed to complete the SWMP.

If you answered **YES** to any of the questions, please continue.

The following questions provide a guide to collecting information relevant to project stormwater quality issues. Please provide a description of the findings in text box below.

	QUESTIONS	COMPLETED	NA
1.	Describe the topography of the project area.	✓	
2.	Describe the local land use within the project area and adjacent areas.	✓	
3.	Evaluate the presence of dry weather flow.	✓	
4.	Determine the receiving waters that may be affected by the project throughout the project life cycle (i.e., construction, maintenance and operation).	✓	
5.	For the project limits, list the 303(d) impaired receiving water bodies and their constituents of concern.	✓	
6.	Determine if there are any High Risk Areas (municipal or domestic water supply reservoirs or groundwater percolation facilities) within the project limits.	✓	
7.	Determine the Regional Board special requirements, including TMDLs, effluent limits, etc.	✓	
8.	Determine the general climate of the project area. Identify annual rainfall and rainfall intensity curves.	✓	
9.	If considering Treatment BMPs, determine the soil classification, permeability, erodibility, and depth to groundwater.	✓	
10.	Determine contaminated or hazardous soils within the project area.		✓

Please provide a description of the findings in the following box. For example:
The project is located in the San Diego Hydrologic unit. The area is characterized by rolling grassy hills and shrubs. Runoff from the project drains into a MS4 that eventually drains to Los Coches Creek. Within the project limit there are no 303(d) impaired receiving water and no Regional Board special requirements.

The project is located in the San Luis Rey Hydrologic Unit (903 HA) and more specifically the Moosa Canyon Hydrologic Subarea (903.13 HSA). The project area is characterized by residential development, open space areas, and areas that are or potentially may have been utilized for agricultural purposes historically. The storm water from the project site will discharge to the intersection of King Sanday Lane and Diaz Road. At which point storm water flows in a westerly-southwesterly direction to an unnamed existing natural channels and eventually into Moosa Canyon Creek, then into the San Luis Rey River and ultimately into the Pacific Ocean at the mouth of the San Luis Rey River. According to the California 1998 and 2002 CWA 303d list published by the San Diego Regional Water Quality Control Board shown below, there are no impaired water bodies that are directly associated with the unnamed intermittent streams Hydrologic Subarea (903.13 HSA).

Complete the checklist below to determine if Treatment Best Management Practices (BMPs) are required for the project.

No.	CRITERIA	YES	NO	INFORMATION
1.	Is this an emergency project		✓	If YES, go to 6. If NO, continue to 2.
2.	Have TMDLs been established	✓		If YES, go to 5.

No.	CRITERIA	YES	NO	INFORMATION
	for surface waters within the project limit?			If NO, continue to 3.
3.	Will the project directly discharge to a 303(d) impaired receiving water body?		✓	If YES, go to 5. If NO, continue to 4.
4.	Is this project within the urban and environmentally sensitive areas as defined on the maps in Appendix B of the *County of San Diego Standard Urban Storm Water Mitigation Plan for Land Development and Public Improvement Projects*?		✓	If YES, continue to 5. If NO, go to 6.
5.	Consider approved Treatment BMPs for the project.	✓		If YES, go to 7.
6.	Project is not required to consider Treatment BMPs			Document for Project Files by referencing this checklist.
7.	End			

Now that the need for a treatment BMPs has been determined, other information is needed to complete the SWMP.

WATERSHED

Please check the watershed(s) for the project.

☐ San Juan	☐ Santa Margarita	☑ San Luis Rey	☐ Carlsbad
☐ San Dieguito	☐ Penasquitos	☐ San Diego	☐ Pueblo San Diego
☐ Sweetwater	☐ Otay	☐ Tijuana	

Please provide the hydrologic sub-area and number(s)

Number	Name
903.13 / 903.12	Moosa Canyon HSA
903.10	Lower San Luis Rey *

* - For Groundwater

Please provide the beneficial uses for Inland Surface Waters and Ground Waters. Beneficial Uses can be obtained from the Water Quality Control Plan For The San Diego Basin, which is available at the Regional Board office or at http://www.swrcb.ca.gov/rwqcb9/programs/basinplan.html.

SURFACE WATERS	Hydrologic Unit Basin Number	MUN	AGR	IND	PROC	GWR	FRESH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Inland Surface Waters																
Mossa Canyon	903.13	*	X	X					X	X		X		X		
Mossa Canyon	903.12	*	X	X					X	X		X				
Ground Waters																
Lower San Luis Rey	903.10	X	X	X												

X Existing Beneficial Use
0 Potential Beneficial Use
* Excepted from Municipal

POLLUTANTS OF CONCERN

Using Table 1, identify pollutants that are anticipated to be generated from the proposed priority project categories. Pollutants associated with any hazardous material sites that have been remediated or are not threatened by the proposed project are not considered a pollutant of concern.

Table 1. Anticipated and Potential Pollutants Generated by Land Use Type

	General Pollutant Categories								
Priority Project Categories	Sediments	Nutrients	Heavy Metals	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Detached Residential Development	X	X			X	X	X	X	X
Attached Residential Development	X	X			X	P[1]	P[2]	P	X
Commercial Development >100,000 ft^2	P[1]	P[1]		P[2]	X	P[5]	X	P[3]	P[5]
Automotive Repair Shops			X	X[4][5]	X		X		
Restaurants					X	X	X	X	
Hillside Development >5,000 ft^2	X	X			X	X	X		X

	General Pollutant Categories								
Priority Project Categories	Sediments	Nutrients	Heavy Metals	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Parking Lots	P(1)	P(1)	X		X	P(1)	X		P(1)
Streets, Highways & Freeways	X	P(1)	X	X(4)	X	P(5)	X		

X = anticipated
P = potential
(1) A potential pollutant if landscaping exists on-site.
(2) A potential pollutant if the project includes uncovered parking areas.
(3) A potential pollutant if land use involves food or animal waste products.
(4) Including petroleum hydrocarbons.
(5) Including solvents.

Note: If other monitoring data that is relevant to the project is available. Please include as Attachment C.

CONSTRUCTION BMPs

Please check the construction BMPs that may be used. The BMPs selected are those that will be implemented during construction of the project. The applicant is responsible for the placement and maintenance of the BMPs selected.

- ☑ Silt Fence
- ☑ Fiber Rolls
- ☐ Street Sweeping and Vacuuming
- ☑ Storm Drain Inlet Protection
- ☑ Stockpile Management
- ☑ Solid Waste Management
- ☑ Stabilized Construction Entrance/Exit
- ☑ Dewatering Operations
- ☐ Vehicle and Equipment Maintenance
- ☑ Desilting Basin
- ☑ Gravel Bag Berm
- ☑ Sandbag Barrier
- ☑ Material Delivery and Storage
- ☑ Spill Prevention and Control
- ☑ Concrete Waste Management
- ☑ Water Conservation Practices
- ☑ Paving and Grinding Operations

☑ Any minor slopes created incidental to construction and not subject to a major or minor grading permit shall be protected by covering with plastic or tarp prior to a rain event, and shall have vegetative cover reestablished within 180 days of completion of the slope and prior to final building approval.

SITE DESIGN

To minimize stormwater impacts, site design measures must be addressed. The following checklist provides options for avoiding or reducing potential impacts during project planning. If

YES is checked, it is assumed that the measure was used for this project. If NO is checked, please provide a brief explanation why the option was not selected in the text box below.

	OPTIONS		YES	NO	N/A
1.	Can the project be relocated or realigned to avoid/reduce impacts to receiving waters or to increase the preservation of critical (or problematic) areas such as floodplains, steep slopes, wetlands, and areas with erosive or unstable soil conditions?		✓		
2.	Can the project be designed to minimize impervious footprint?		✓		
3.	Conserve natural areas where feasible?		✓		
4.	Where landscape is proposed, can rooftops, impervious sidewalks, walkways, trails and patios be drained into adjacent landscaping?		✓		
5.	For roadway projects, can structures and bridges be designed or located to reduce work in live streams and minimize construction impacts?				✓
6.	Can any of the following methods be utilized to minimize erosion from slopes:				
	6.a.	Disturbing existing slopes only when necessary?	✓		
	6.b.	Minimize cut and fill areas to reduce slope lengths?	✓		
	6.c.	Incorporating retaining walls to reduce steepness of slopes or to shorten slopes?	✓		
	6.d.	Providing benches or terraces on high cut and fill slopes to reduce concentration of flows?	✓		
	6.e.	Rounding and shaping slopes to reduce concentrated flow?	✓		
	6.f.	Collecting concentrated flows in stabilized drains and channels?	✓		

Please provide a brief explanation for each option that was checked N/A or NO in the following box.

NO ROADWAYS PROPOSED. PROPOSED DRIVEWAY DOES NOT CONFLICT W/ EXISTING DRAINAGE COURSES.

If the project includes work in channels, then complete the following checklist. Information shall be obtained from the project drainage report.

No.	CRITERIA	YES	NO	N/A	COMMENTS
1.	Will the project increase velocity or volume of downstream flow?		✓		If YES go to 5.
2.	Will the project discharge to unlined channels?	✓			If YES go to 5.
3.	Will the project increase potential sediment load	✓			If YES go to 5.

No.	CRITERIA	YES	NO	N/A	COMMENTS
	of downstream flow?				
4.	Will the project encroach, cross, realign, or cause other hydraulic changes to a stream that may affect upstream and/or downstream channel stability?		✓		If YES go to 7.
5.	Review channel lining materials and design for stream bank erosion.			✓	Continue to 6.
6.	Consider channel erosion control measures within the project limits as well as downstream. Consider scour velocity.	✓			Continue to 7.
7.	Include, where appropriate, energy dissipation devices at culverts.	✓			Continue to 8.
8.	Ensure all transitions between culvert outlets/headwalls/wingwalls and channels are smooth to reduce turbulence and scour.			✓	Continue to 9.
9.	Include, if appropriate, detention facilities to reduce peak discharges.	✓			
10.	"Hardening" natural downstream areas to prevent erosion is not an acceptable technique for protecting channel slopes, unless pre-development conditions are determined to be so erosive that hardening would be required even in the absence of the proposed development.			✓	Continue to 11.
11.	Provide other design principles that are comparable and equally effective.	✓			Continue to 12.
12.	End				

SOURCE CONTROL

Please complete the following checklist for Source Control BMPs. If the BMP is not applicable for this project, then check N/A only at the main category.

		BMP	YES	NO	N/A
1.		**Provide Storm Drain System Stenciling and Signage**			✓
	1.a.	All storm drain inlets and catch basins within the project area shall have a stencil or tile placed with prohibitive language (such as: "NO DUMPING – DRAINS TO _____") and/or graphical icons to discourage illegal dumping.	✓		
	1.b.	Signs and prohibitive language and/or graphical icons, which prohibit illegal dumping, must be posted at public access points along channels and creeks within the project area.	✓		
2.		**Design Outdoors Material Storage Areas to Reduce Pollution Introduction**			✓
	2.a.	This is a detached single-family residential project. Therefore, personal storage areas are exempt from this requirement.	✓		

- AT PRESENT NO INLETS OR CB's → will utilize SIGNAGE IN EVENT THEY ARE WITH MASTER PLAN INCLUDES INLETS.

		BMP	YES	NO	N/A	
	2.b.	Hazardous materials with the potential to contaminate urban runoff shall either be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.	✓			- CONSTRUCTION MATERIALS ONLY
	2.c.	The storage area shall be paved and sufficiently impervious to contain leaks and spills.			✓	
	2.d.	The storage area shall have a roof or awning to minimize direct precipitation within the secondary containment area.			✓	
3.	**Design Trash Storage Areas to Reduce Pollution Introduction**				✓	- NO TRASH STORAGE AREAS PROPOSED
	3.a.	Paved with an impervious surface, designed not to allow run-on from adjoining areas, screened or walled to prevent off-site transport of trash; or,			✓	
	3.b.	Provide attached lids on all trash containers that exclude rain, or roof or awning to minimize direct precipitation.	✓			
4.	**Use Efficient Irrigation Systems & Landscape Design**					
	The following methods to reduce excessive irrigation runoff shall be considered, and incorporated and implemented where determined applicable and feasible.		✓			
	4.a.	Employing rain shutoff devices to prevent irrigation after precipitation.	✓			
	4.b.	Designing irrigation systems to each landscape area's specific water requirements.	✓			
	4.c.	Using flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.	✓			
	4.d.	Employing other comparable, equally effective, methods to reduce irrigation water runoff.	✓			
5.	**Private Roads**					
	The design of private roadway drainage shall use at least one of the following					
	5.a.	Rural swale system: street sheet flows to vegetated swale or gravel shoulder, curbs at street corners, culverts under driveways and street crossings.	✓			
	5.b.	Urban curb/swale system: street slopes to curb, periodic swale inlets drain to vegetated swale/biofilter.		✓		
	5.c.	Dual drainage system: First flush captured in street catch basins and discharged to adjacent vegetated swale or gravel shoulder, high flows connect directly to storm water conveyance system.		✓		
	5.d.	Other methods that are comparable and equally effective within the project.	✓			
6.	**Residential Driveways & Guest Parking**					
	The design of driveways and private residential parking areas shall use one at least of the following features.		✓			
	6.a.	Design driveways with shared access, flared (single lane at street) or wheelstrips (paving only under tires); or, drain into landscaping prior to discharging to the storm water conveyance system.	✓			
	6.b.	Uncovered temporary or guest parking on private residential lots may be: paved with a permeable surface; or, designed to drain into landscaping prior to discharging to the storm water conveyance system.		✓		
	6.c.	Other features which are comparable and equally effective.	✓			
7.	**Dock Areas**				✓	

		BMP	YES	NO	N/A
	Loading/unloading dock areas shall include the following.				✓
	7.a.	Cover loading dock areas, or design drainage to preclude urban run-on and runoff.			✓
	7.b.	Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.			✓
	7.c.	Other features which are comparable and equally effective.			✓
8.	**Maintenance Bays**				✓
	Maintenance bays shall include the following.				
	8.a.	Repair/maintenance bays shall be indoors; or, designed to preclude urban run-on and runoff.			✓
	8.b.	Design a repair/maintenance bay drainage system to capture all wash water, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.			✓
	8.c.	Other features which are comparable and equally effective.			✓
9.	**Vehicle Wash Areas**				✓
	Priority projects that include areas for washing/steam cleaning of vehicles shall use the following.				✓
	9.a.	Self-contained; or covered with a roof or overhang.			✓
	9.b.	Equipped with a clarifier or other pretreatment facility.			✓
	9.c.	Properly connected to a sanitary sewer.			✓
	9.d.	Other features which are comparable and equally effective.			✓
10.	**Outdoor Processing Areas**				
	Outdoor process equipment operations, such as rock grinding or crushing, painting or coating, grinding or sanding, degreasing or parts cleaning, waste piles, and wastewater and solid waste treatment and disposal, and other operations determined to be a potential threat to water quality by the County shall adhere to the following requirements.				✓
	10.a.	Cover or enclose areas that would be the most significant source of pollutants; or, slope the area toward a dead-end sump; or, discharge to the sanitary sewer system following appropriate treatment in accordance with conditions established by the applicable sewer agency.			✓
	10.b.	Grade or berm area to prevent run-on from surrounding areas.			✓
	10.c.	Installation of storm drains in areas of equipment repair is prohibited.			✓
	10.d.	Other features which are comparable or equally effective.			✓
11.	**Equipment Wash Areas**				
	Outdoor equipment/accessory washing and steam cleaning activities shall be.				✓
	11.a.	Be self-contained; or covered with a roof or overhang.			✓
	11.b.	Be equipped with a clarifier, grease trap or other pretreatment facility, as appropriate			✓
	11.c.	Be properly connected to a sanitary sewer.			✓
	11.d.	Other features which are comparable or equally effective.			✓
12.	**Parking Areas**				
	The following design concepts shall be considered, and incorporated and implemented where determined applicable and feasible by the County.				✓
	12.a.	Where landscaping is proposed in parking areas, incorporate landscape areas into the drainage design.			✓

		BMP	YES	NO	N/A
	12.b.	Overflow parking (parking stalls provided in excess of the County's minimum parking requirements) may be constructed with permeable paving.			✓
	12.c.	Other design concepts that are comparable and equally effective.			✓
13.	**Fueling Area**				✓
	Non-retail fuel dispensing areas shall contain the following.				✓
	13.a.	Overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area. The fueling area shall drain to the project's treatment control BMP(s) prior to discharging to the storm water conveyance system.			✓
	13.b.	Paved with Portland cement concrete (or equivalent smooth impervious surface). The use of asphalt concrete shall be prohibited.			✓
	13.c.	Have an appropriate slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of urban runoff.			✓
	13.d.	At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.			✓

Please list other project specific Source Control BMPs in the following box. Write N/A if there are none and briefly explain.

HOMEOWNER WILL BE PROVIDED WITH "GOOD HOUSEKEEPING" LITERATURE RELATED TO MAINTENANCE, SPILL CONTROL, EFFICIENT IRRIGATION, ETC.

TREATMENT CONTROL

To select a structural treatment BMP using Treatment Control BMP Selection Matrix (Table 2), each priority project shall compare the list of pollutants for which the downstream receiving waters are impaired (if any), with the pollutants anticipated to be generated by the project (as identified in Table 1). Any pollutants identified by Table 1, which are also causing a Clean Water Act section 303(d) impairment of the receiving waters of the project, shall be considered primary pollutants of concern. Priority projects that are anticipated to generate a primary pollutant of concern shall select a single or combination of stormwater BMPs from Table 2, which **maximizes pollutant removal** for the particular primary pollutant(s) of concern.

Priority projects that are <u>not</u> anticipated to generate a pollutant for which the receiving water is Clean Water Act Section 303(d) impaired shall select a single or combination of stormwater BMPs from Table 2, which are effective for pollutant removal of the identified secondary pollutants of concern, consistent with the "maximum extent practicable" standard.

Table 2. Treatment Control BMP Selection Matrix

Pollutant of Concern	*Treatment Control BMP Categories*						
	Biofilters	Detention Basins	Infiltration Basins[2]	Wet Ponds or Wetlands	Drainage Inserts	Filtration	Hydrodynamic Separator Systems[3]
Sediment	M	H	H	H	L	H	M
Nutrients	L	M	M	M	L	M	L
Heavy Metals	M	M	M	H	L	H	L
Organic Compounds	U	U	U	M	L	M	L
Trash & Debris	L	H	U	H	M	H	M
Oxygen Demanding Substances	L	M	M	M	L	M	L
Bacteria	U	U	H	H	L	M	L
Oil & Grease	M	M	U	U	L	H	L
Pesticides	U	U	U	L	L	U	L

(1) Copermittees are encouraged to periodically assess the performance characteristics of many of these BMPs to update this table.
(2) Including trenches and porous pavement.
(3) Also known as hydrodynamic devices and baffle boxes.

L: Low removal efficiency:
M: Medium removal efficiency:
H: High removal efficiency:
U: Unknown removal efficiency

Sources: *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* (1993), *National Stormwater Best Management Practices Database* (2001), *Guide for BMP Selection in Urban Developed Areas* (2001), *and Caltrans New Technology Report (2001).*

A Treatment BMP must address runoff from developed areas. Please provide the post-construction water quality values for the project. Label outfalls on the BMP map. Q_{WQ} is dependent on the type of treatment BMP selected for the project.

Outfall	**Tributary Area (acres)**	**Q_{100} (cfs)**	**Q_{WQ} (cfs)**
9	6.11	11.42	0.44

Please check the box(s) that best describes the Treatment BMP(s) selected for this project.

Biofilters

☑ Grass swale
☐ Grass strip
☐ Wetland vegetation swale
☐ Bioretention

Detention Basins

☐ Extended/dry detention basin with grass lining
☐ Extended/dry detention basin with impervious lining

Infiltration Basins
☑ Infiltration basin
☑ Infiltration trench
☐ Porous asphalt
☐ Porous concrete
☐ Porous modular concrete block
Wet Ponds or Wetlands
☐ Wet pond/basin (permanent pool)
☐ Constructed wetland
Drainage Inserts (See note below)
☐ Oil/Water separator
☐ Catch basin insert
☐ Storm drain inserts
☐ Catch basin screens
Filtration
☐ Media filtration
☐ Sand filtration
Hydrodynamic Separator Systems
☐ Swirl Concentrator
☐ Cyclone Separator
☐ Baffle Separator
☐ Gross Solids Removal Device
☐ Linear Radial Device

Note: Catch basin inserts and storm drain inserts are excluded from use on County maintained right-of-way and easements.

Include Treatment Datasheet as Attachment E. The datasheet should include the following:	COMPLETED	NO
1. Description of how treatment BMP was designed. Provide a description for each type of treatment BMP.	✓	
2. Engineering calculations for the BMP(s)	✓	

Please describe why the selected treatment BMP(s) was selected for this project. For projects utilizing a low performing BMP, please provide a detailed explanation and justification.

GRASS LINED SWALES WERE CHOSEN FOR POLLUTANT REMOVAL EFFICIENCY, EASE AND LOW COST OF MAINTENANCE AND THE FACT THAT THE BMP'S ARE ABLE AROUND AND INSPECTION OF BMP IS FACILITATED BY THIS. INFILTRATION DEVICES UTILIZED IN AREAS WHERE LIMITED SPACE CONSTRAINTS FORCED ALTERNATIVE DESIGN OPTIONS

MAINTENANCE

Please check the box that best describes the maintenance mechanism(s) for this project.

CATEGORY	SELECTED	
	YES	NO
First	✓	
Second		✓
Third		✓
Fourth		✓

Please briefly describe the long-term fiscal resources for the selected maintenance mechanism(s).

BMP's proposed in Heeenty "take care of themselves"; however homeowner will be financially responsible for maintenance and repair

ATTACHMENTS

Please include the following attachments.

	ATTACHMENT	COMPLETED	N/A
A	Project Location Map	✓	
B	Site Map	✓	
C	Relevant Monitoring Data		
D	Treatment BMP Location Map	✓	
E	Treatment BMP Datasheets	✓	
F	Operation and Maintenance Program for Treatment BMPs	✓	
G	Engineer's Certification Sheet	✓	

Note: Attachments A and B may be combined.

LOW IMPACT DEVELOPMENT (LID)

Each numbered item below is a LID requirement of the WPO. Please check the box(s) under each number that best describes the Low Impact Development BMP(s) selected for this project.

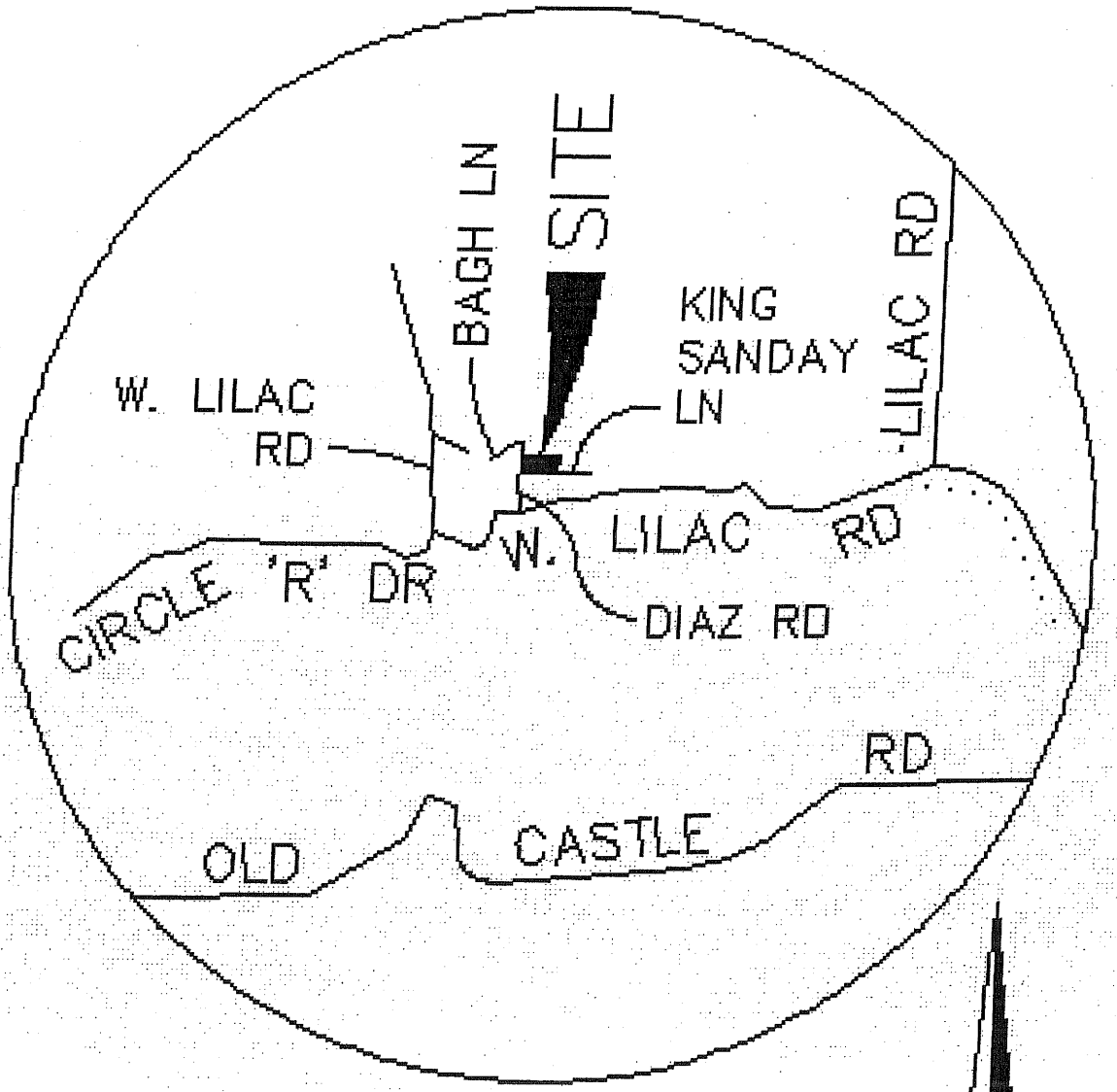
Table 8

1. Conserve natural Areas, Soils, and Vegetation-County LID Handbook 2.2.1
☑ Preserve well draining soils (Type A or B)
☑ Preserve Significant Trees
☐ Other. Description:
☐ 1. Not feasible. State Reason:
2. Minimize Disturbance to Natural Drainages-County LID Handbook 2.2.2
☑ Set-back development envelope from drainages
Restrict heavy construction equipment access to planned green/open space areas
☐ Other. Description:
☐ 2. Not feasible. State Reason:
3. Minimize and Disconnect Impervious Surfaces (see 5) -County LID Handbook 2.2.3
☐ Clustered Lot Design
☑ Items checked in 5?
☐ Other. Description:
☐ 3. Not feasible. State Reason:
4. Minimize Soil Compaction-County LID Handbook 2.2.4
☑ Restrict heavy construction equipment access to planned green/open space areas
☑ Re-till soils compacted by construction vehicles/equipment
Collect & re-use upper soil layers of development site containing organic materials
☐ Other. Description:
4. Not feasible. State Reason:
5. Drain Runoff from Impervious Surfaces to Pervious Areas-County LID Handbook 2.2.5

LID Street & Road Design
☐ Curb-cuts to landscaping
☑ Rural Swales
☐ Concave Median
☐ Cul-de-sac Landscaping Design
☐ Other. Description:
LID Parking Lot Design
☐ Permeable Pavements
☑ Curb-cuts to landscaping
☐ Other. Description:
LID Driveway, Sidewalk, Bike-path Design
☐ Permeable Pavements
☑ Pitch pavements toward landscaping
☐ Other. Description:
LID Building Design
☐ Cisterns & Rain Barrels
☑ Downspout to swale
☐ Vegetated Roofs
☐ Other. Description:
LID Landscaping Design
☐ Soil Amendments
☐ Reuse of Native Soils
☑ Smart Irrigation Systems
☐ Street Trees
☐ Other. Description:
☐ 5. Not feasible. State Reason:

ATTACHMENT A

LOCATION MAP



VICINITY MAP

NOT TO SCALE

T.B. PG. 1069, E3

ATTACHMENT B

PROJECT SITE MAP

PRELIMINARY GRADING PLAN – RPL. #1

TENTATIVE PARCEL MAP 21101

LEGAL ACCESS

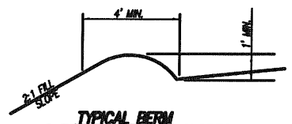
ACCESS FROM WEST LILAC ROAD, A COUNTY MAINTAINED ROAD, IS BY RECORDED PRIVATE ROAD EASEMENT HAVING A MINIMUM WIDTH OF 25 FEET. SAID EASEMENT IS FOR THE BENEFIT AND USE OF THE SUBJECT PROPERTY.

LEGAL DESCRIPTION

PARCEL 1 OF PARCEL MAP 1086, RECORDED IN THE COUNTY OF SAN DIEGO ON NOVEMBER 2, 1972.

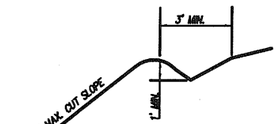
LEGEND

ITEM	SYMBOL
CUT SLOPE (2:1 MAX. UNLESS OTHERWISE NOTED)	
FILL SLOPE (2:1 MAX.)	
DRAINAGE SWALE (1% MIN.) (PER CALTRANS SS-9)	
EXISTING CONTOUR	1050
PROPOSED GRADE	704
APPROXIMATE CUT/FILL LINE	CUT / FILL
EARTHEN BROW DITCH (PER DETAIL THIS SHEET)	
PROPOSED TREATMENT SWALE	
SUBDIVISION BOUNDARY	
EASEMENT LINE	
EX. CHAIN LINK FENCE	X X
EX. PAVEMENT	
EX. WATER LINE	W
EX. FIRE HYDRANT	
EX. WATER METER	W
EX. WATER VALVE	
EX. POWER POLE	



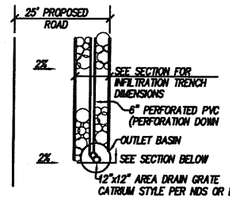
TYPICAL BERM @ TOP OF ALL FILL SLOPES

NOT TO SCALE

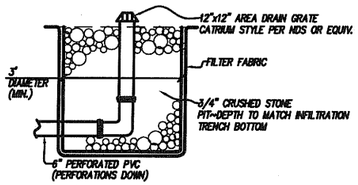


EARTH BROW DITCH @ TOP OF CUT SLOPES

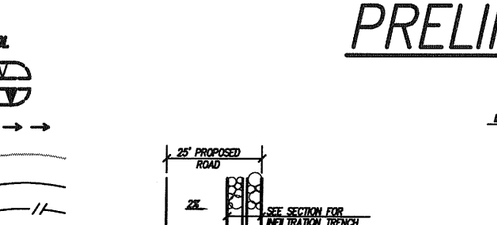
NOT TO SCALE



INFILTRATION TRENCH DETAIL PLAN VIEW

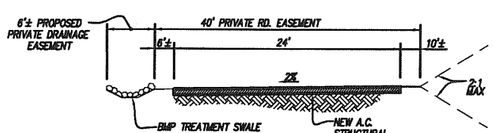


INFILTRATION TRENCH OUTLET SECTION VIEW



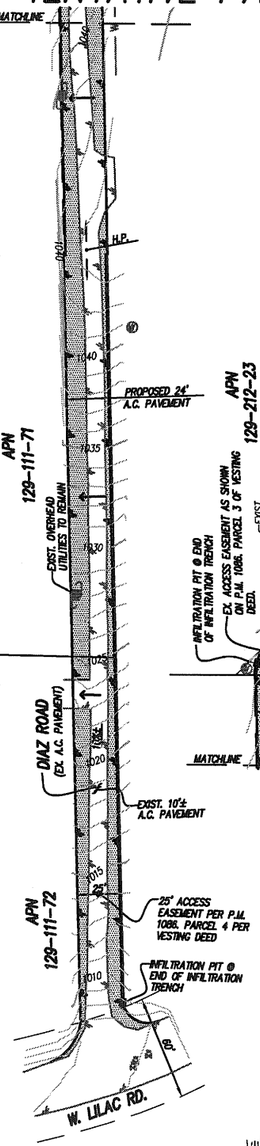
DIAZ ROAD 24' PRIVATE ROAD SECTION OFF-SITE

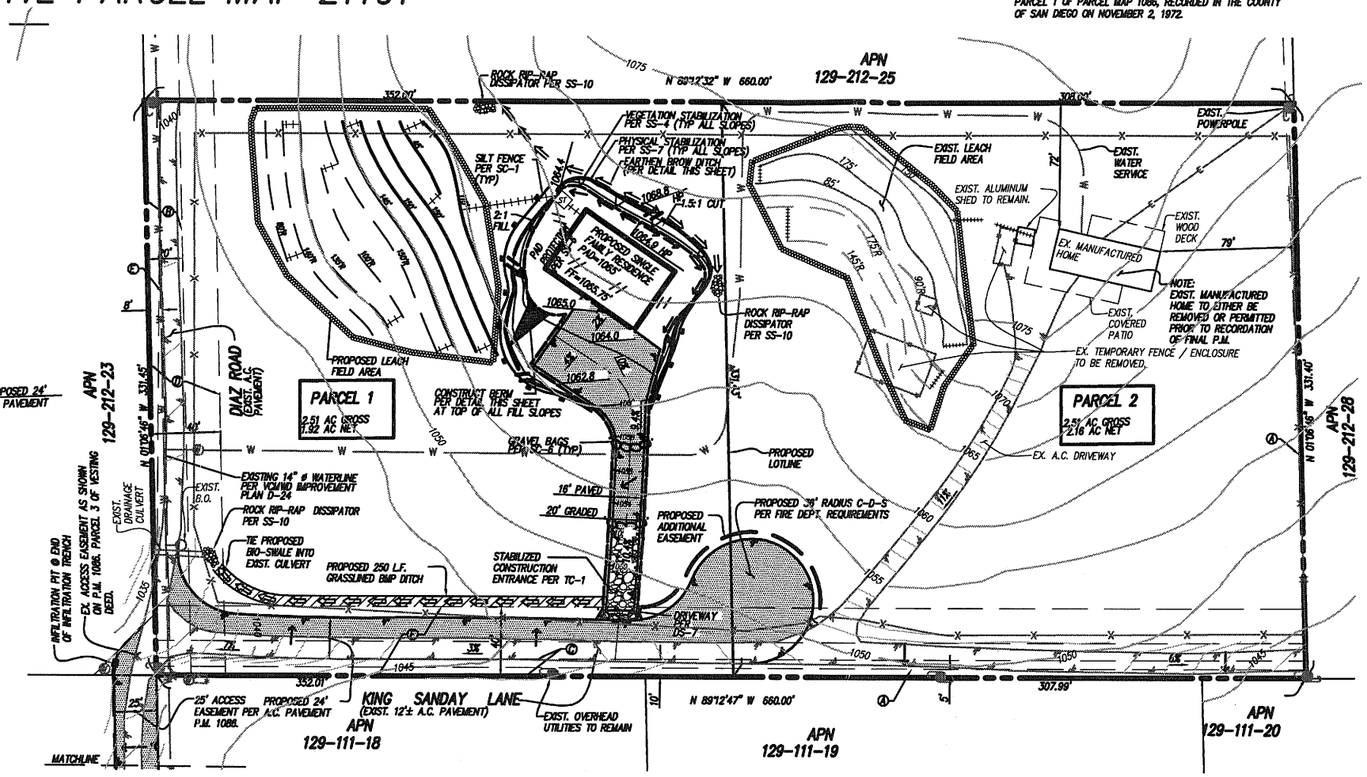
NOTE: SECTION IS REVERSE FROM HIGH POINT IN ROAD TO THE NORTH.

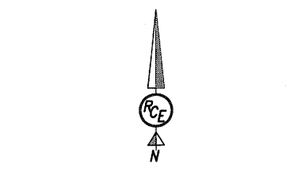


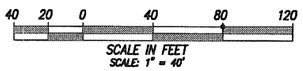
KING SANDAY LANE 24' PRIVATE ROAD SECTION ON-SITE

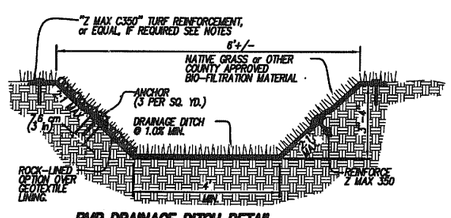
NOT TO SCALE











BMP DRAINAGE DITCH DETAIL

NO SCALE

NOTES:

1. CONFIGURATION OF DITCH MAY BE SLIGHTLY MODIFIED TO FIT FIELD CONDIONS, WITH APPROVAL OF ENGINEER AND INSPECTOR.
2. TURF REINFORCEMENT MAY BE OMITTED IF IT IS DETERMINED THAT VELOCITY OF DRAINAGE IN "AS-GRADED" DITCH IS NOT EROSIVE.
3. TO BE PRIVATELY MAINTAINED & NOT TO BE MODIFIED w/o COUNTY PERMIT.

GENERAL NOTES:

1. ALL EASEMENTS SHOWN HEREON PER TITLE REPORT FROM CHICAGO TITLE PER ORDER NO. 608004327.

EXISTING EASEMENTS

(A) C/L EXIST. 12' WIDE PUBLIC UTILITY ESMT. IN FAVOR OF SDG&E PER DOC. REC. 05-09-1958 IN BK. 7074, PG. 21 OF O.R.

(B) EXIST. WATERLINE ESMT. IN FAVOR OF VCMWD PER DOCS. REC. 08-22-1960 AS FILE NO. 170480 AND REC. 11-15-1965 AS FILE NO. 206824, BOTH OF O.R.

(C) EXIST. WATERLINE ESMT. IN FAVOR OF VCMWD PER DOC. REC. 02-20-1961 AS FILE NO. 29918

(D) EXIST. PVT. ROAD ESMT. PER DOC. REC. 05-24-1962 AS FILE NO. 88740 OF O.R. & AS SHOWN ON PARCEL MAP NO. 1086.

(E) EXIST. PUBLIC UTILITY ESMT. IN FAVOR OF SDG&E PER DOC. REC. 01-25-1966 AS FILE NO. 14998 OF O.R.

(F) EXIST. PVT. ROAD ESMT. PER DOC. REC. 11-24-1972 AS FILE NO. 314139 OF O.R. & AS SHOWN ON PARCEL MAP NO. 1086.

EARTHWORK QUANTITIES:

EXCAVATION:	250	CUBIC YARDS
FILL:	250	CUBIC YARDS
IMPORT:	0	CUBIC YARDS
EXPORT:	0	CUBIC YARDS

SOURCE OF TOPO

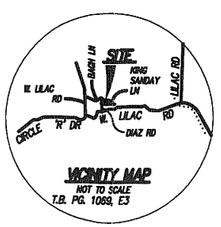
BASIS OF ELEVATIONS & CONTOURS IS FROM COUNTY TOPO 402-1737.

WORK TO BE DONE:

GRADING AND DRAINAGE WORK CONSIST OF THE FOLLOWING WORK TO BE DONE ACCORDING TO THESE PLANS, THE CURRENT SAN DIEGO AREA REGIONAL STANDARD DRAWINGS, THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 1997 EDITION AND PER THE SAN DIEGO COUNTY GRADING ORDINANCE.

NOTE:

THIS PLAN IS PROVIDED TO ALLOW FOR FULL AND ADEQUATE DISCRETIONARY REVIEW OF A PROPOSED DEVELOPMENT PROJECT. THE PROPERTY OWNER ACKNOWLEDGES THAT ACCEPTANCE OR APPROVAL OF THIS PLAN DOES NOT CONSTITUTE AN APPROVAL TO PERFORM ANY GRADING SHOWN HEREON, AND AGREES TO OBTAIN VALID GRADING PERMISSIONS BEFORE COMMENCING SUCH ACTIVITY.



VICINITY MAP

NOT TO SCALE
T.B. PG. 1068, E3

REGISTERED PROFESSIONAL ENGINEER DOUGLAS E. LOGAN C 39728 Exp. 12/31/09 CIVIL STATE OF CALIFORNIA

OWNER'S/PERMITTEE'S

NAME: RAMARAO GANGAVALLI
ADDRESS: P.O BOX 454, DELHI, NY 13753
TELEPHONE NO.: (607) 743-7736
SITE ADDRESS: 10418 KING SANDAY LANE, VALLEY CENTER, CA 92082
A.P.N. NO.: 129-212-24

PRIVATE CONTRACT

SHEET 1 | COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS | 1 SHEETS

PRELIMINARY GRADING PLAN FOR:

TENTATIVE PARCEL MAP 21101

CALIFORNIA COORDINATE INDEX 402-1737

APPROVED: BY:

ENGINEER OF WORK: DOUGLAS E. LOGAN R.C.E. 39728

GRADING PERMIT NO:

RANCHO COASTAL ENGINEERING
Single Source Development Consultant
1635 S. RANCHO SANTA FE RD., SUITE 204
SAN MARCOS, CA (760) 510-3152

PRELIMINARY GRADING PLAN(S)
ENGINEER'S NAME: RANCHO COASTAL ENGINEERING, INC
PHONE NO. (760) 510-3152

Z:\Projects\5869\5869-BMP-LID PLAN-1.dwg Jul 30, 2008 10:38am
Xrefs: 5869PGP00; 5869TOPO; 5869BASE; 5869MAP

ATTACHMENT C

RELEVANT MONITORING DATA

(NOTE: PROVIDE RELEVANT WATER QUALITY MONITORING DATA IF AVAILABLE.)

3.2 Existing and Post-Construction Drainage

There are no sampling data available for the existing site condition, although the storm water discharge in the pre-developed condition is expected to have high concentration of nutrients, pesticides and herbicides. In addition, the proposed project is not expected to generate significant amounts of non-visible pollutants. However, the table on the following page illustrates constituents that are commonly found on similar developments and could affect water quality:

TYPICAL POST-CONSTRUCTION POLLUTANTS

	General Pollutant Categories								
Priority Project Categories	Sediments	Nutrients	Heavy Metals	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Detached Residential Development	X	X			X	X	X	X	X
Attached Residential Development	X	X			X	P(1)	P(2)	P	X
Commercial Development >100,000 ft^2	P(1)	P(1)		P(2)	X	P(5)	X	P(3)	P(5)
Automotive Repair Shops			X	X(4)(5)	X		X		
Restaurants					X	X	X	X	
Hillside Development >5,000 ft^2	X	X			X	X	X		X
Parking Lots	P(1)	P(1)	X		X	P(1)	X		P(1)
Streets, Highways & Freeways	X	P(1)	X	X(4)	X	P(5)	X		
Retail Gas Outlets			X	X(4)	X		X		

X = anticipated
P = potential
(1) A potential pollutant if landscaping exists on-site.
(2) A potential pollutant if the project includes uncovered parking areas.
(3) A potential pollutant if land use involves food or animal waste products.
(4) Including petroleum hydrocarbons.
(5) Including solvents.

The following table lists products that are commonly used in the construction of residential developments and identifies the pollutants that can potentially result if these products are exposed to rain water or storm water runoff:

CATAGORY	PRODUCT	POLLUTANTS
Adhesives	Adhesives, Glues	Phenolics, Formaldehydes
	Resins, Epoxy Synthetics	Phenolics, Formaldehydes
	Calks, Sealers, Putty, Sealing Agents	Asbestos, Phenolics, Formaldehydes
	Coal Tars (Naptha, Pitch)	Benzene, Phenols, Naphthalene
Cleaners	Polishes (Metal, Ceramic, Tile)	Metals
	Etching Agents	Metals
	Cleaners, Ammonia, Lye, Caustic Sodas	Acidity/Alkalinity
	Bleaching Agents	Acidity/Alkalinity
	Chromate Salts	Chromium
Plumbing	Solder (Lead, Tin), Flux (Zinc, Chloride)	Lead, Copper, Zinc, Tin
	Pipe Fitting (Cut Shavings)	Copper
	Galvanized Metals (Nails, Fences)	Zinc
	Electric Wiring	Copper, Lead
Painting	Paint Thinner, Acetone, MEK, Stripper	VOC's
	Paints, Lacquers, Varnish, Enamels	Metals, Phenolics, Mineral Spirits
	Turpentine, Gum Spirit, Solvents	VOC's
	Sanding, Stripping	Metals
	Paints (Pigments), Dyes	Metals
Woods	Sawdust	BOD
	Particle Board Dusts (Formaldehyde)	Formaldehyde
	Treated Woods	Copper, Creosote
Masonry & Concrete	Dusts (Brick, Cement)	Acidity, Sediments
	Colored Chalks (Pigments)	Metals
	Concrete Curing Compounds	
	Glazing Compounds	Asbestos
	Cleaning Surfaces	Acidity
Floors & Walls	Flashing	Copper, Aluminum
	Drywall	Dusts
	Tile Cutting (Ceramic Dusts)	Minerals
	Adhesives*	
Remodeling & Demolition*	Insulation	Asbestos
	Venting Systems	Aluminum, Zinc
	Dusts (Brick, Cement, Saw, Drywall)	
Air Conditioning & Heating	Insulating	Asbestos
	Coolant Reservoirs	Freon
	Adhesives*	
Yard O & M	Vehicle and Machinery Maintenance	Oils and Grease, Coolants
	Gasoline, Oils, Additives	Benzene & Derivatives, Oils
	Marking Paints (Sprays)	& Grease
	Grading, Earth Moving	Vinyl Chloride, Metals
	Portable Toilets	Erosion (Sediments)
	Fire Hazard Control (Herbicides)	BOD, Disinfectants (Spills)
	Health and Safety	Sodium Arsenite, Dinitro
	Wash Waters* (Herbicides, Concrete, Oils, Greases)	Compounds
		Rodenticides, Insecticides
Landscaping & Earthmoving	Planting, Plant Maintenance	Pesticides, Herbicides, Nutrients
	Excavation, Tilling	Erosion (Sediments
	Masonry & Concrete*	
	Solid Wastes (Trees, Shrubs)	BOD
	Exposing Natural Lime or Other Mineral Deposits	Acidity/Alkalinity, Metals
	Soils Additives	Aluminum Sulfate, Sulfur
	Revegetation of Graded Areas	Fertilizers
Materials Storage	Waste Storage (Used Oils, Solvents, Etc.)	Spills, Leaks
	Hazardous Waste Containment	Spills, Leaks
	Raw Material Piles	Dusts, Sediments

* See above categories.

Note: VOC = Volatile Organic Compounds. BOD = Biochemical Oxygen Demand due to the use of oxygen by decomposing materials.

References: USEPA, 1973. Processes, Procedures, and Methods to Control Pollution Resulting From Construction Activity. Office of Air and Water Programs, EPA

THESE MATERIALS TYPICALLY USED AT A CONSTRUCTION SITE HAVE THE POTENTIAL TO CONTRIBUTE TO THE DISCHARGE OF POLLUTANTS OTHER THAN SEDIMENT IN STORM WATER.

ATTACHMENT D

LID AND TREATMENT BMP LOCATION MAP

PRELIMINARY GRADING PLAN – RPL. #1

TENTATIVE PARCEL MAP 21101

LEGAL ACCESS

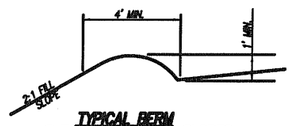
ACCESS FROM WEST LILAC ROAD, A COUNTY MAINTAINED ROAD, IS BY RECORDED PRIVATE ROAD EASEMENT HAVING A MINIMUM WIDTH OF 25 FEET. SAID EASEMENT IS FOR THE BENEFIT AND USE OF THE SUBJECT PROPERTY.

LEGAL DESCRIPTION

PARCEL 1 OF PARCEL MAP 1086, RECORDED IN THE COUNTY OF SAN DIEGO ON NOVEMBER 2, 1972.

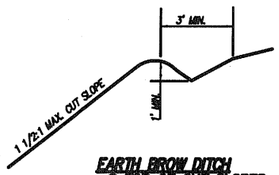
LEGEND

ITEM	SYMBOL
CUT SLOPE (2:1 MAX. UNLESS OTHERWISE NOTED)	
FILL SLOPE (2:1 MAX.)	
DRAINAGE SWALE (1% MIN.) (PER CALTRANS SS-9)	
EXISTING CONTOUR	1050
PROPOSED GRADE	704
APPROXIMATE CUT/FILL LINE	CUT / FILL
EARTHEN BROW DITCH (PER DETAIL THIS SHEET)	
PROPOSED TREATMENT SWALE	
SUBDIVISION BOUNDARY	
EASEMENT LINE	
EX. CHAIN LINK FENCE	
EX. PAVEMENT	
EX. WATER LINE	W
EX. FIRE HYDRANT	
EX. WATER METER	W
EX. WATER VALVE	W
EX. POWER POLE	



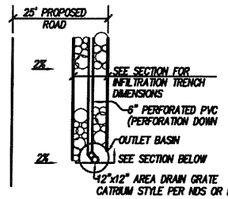
TYPICAL BERM @ TOP OF ALL FILL SLOPES

NOT TO SCALE

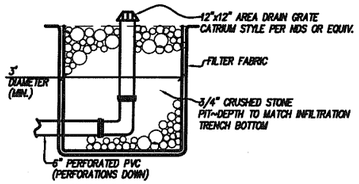


EARTH BROW DITCH @ TOP OF CUT SLOPES

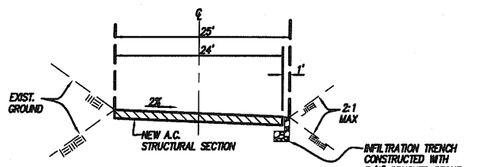
NOT TO SCALE



INFILTRATION TRENCH DETAIL PLAN VIEW

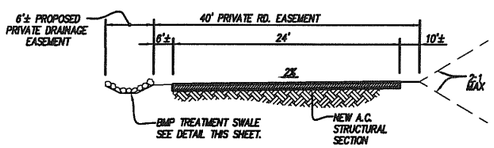


INFILTRATION TRENCH OUTLET SECTION VIEW



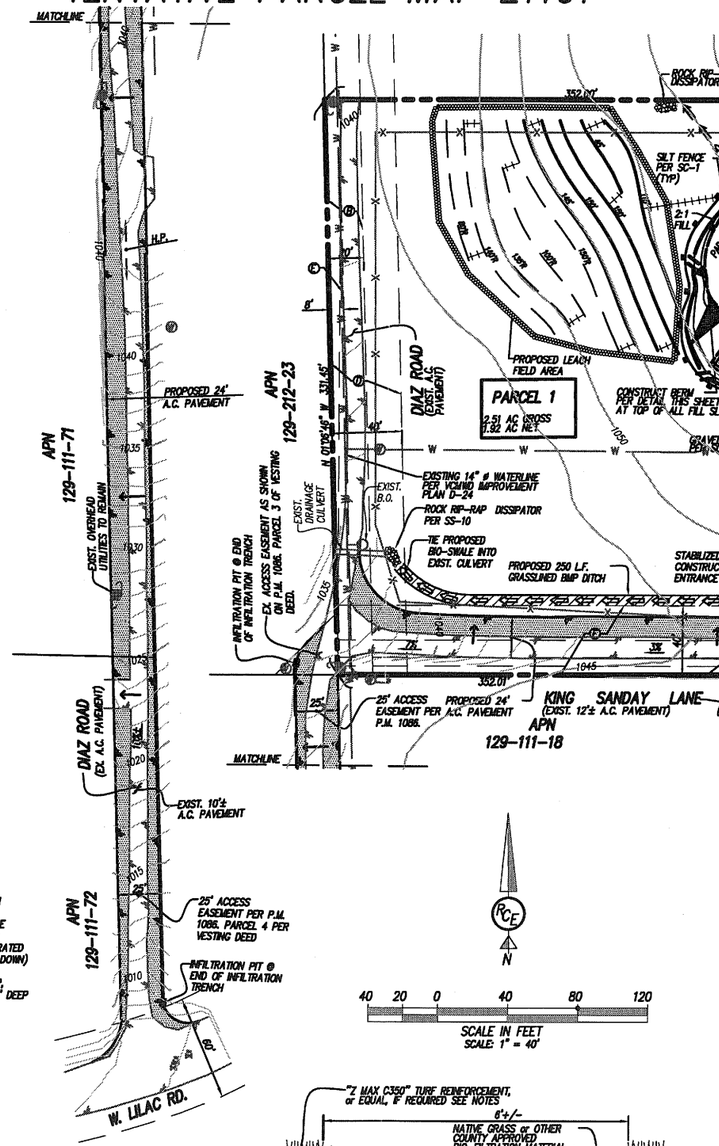
DIAZ ROAD 24' PRIVATE ROAD SECTION OFF-SITE

NOTE: SECTION IS REVERSE FROM HIGH POINT IN ROAD TO THE NORTH.

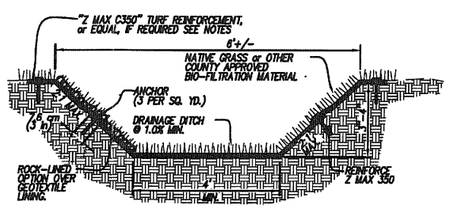


KING SANDAY LANE 24' PRIVATE ROAD SECTION ON-SITE

NOT TO SCALE



NOTE:
EXIST. MANUFACTURED HOME TO EITHER BE REMOVED OR PERMITTED PRIOR TO RECORDATION OF FINAL P.M.



BMP DRAINAGE DITCH DETAIL

NO SCALE

NOTES:

1. CONFIGURATION OF DITCH MAY BE SLIGHTLY MODIFIED TO FIT FIELD CONDIONS, WITH APPROVAL OF ENGINEER AND INSPECTOR.
2. TURF REINFORCEMENT MAY BE OMITTED IF IT IS DETERMINED THAT VELOCITY OF DRAINAGE IN "AS-GRADED" DITCH IS NOT EROSIVE.
3. TO BE PRIVATELY MAINTAINED & NOT TO BE MODIFIED w/o COUNTY PERMIT.

EARTHWORK QUANTITIES:

EXCAVATION:	250	CUBIC YARDS
FILL:	250	CUBIC YARDS
IMPORT:	0	CUBIC YARDS
EXPORT:	0	CUBIC YARDS

SOURCE OF TOPO

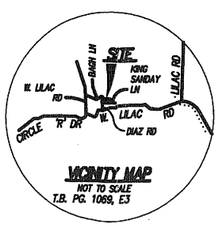
BASIS OF ELEVATIONS & CONTOURS IS FROM COUNTY TOPO 402-1737.

WORK TO BE DONE:

GRADING AND DRAINAGE WORK CONSIST OF THE FOLLOWING WORK TO BE DONE ACCORDING TO THESE PLANS, THE CURRENT SAN DIEGO AREA REGIONAL STANDARD DRAWINGS, THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 1997 EDITION AND PER THE SAN DIEGO COUNTY GRADING ORDINANCE.

NOTE:

THIS PLAN IS PROVIDED TO ALLOW FOR FULL AND ADEQUATE DISCRETIONARY REVIEW OF A PROPOSED DEVELOPMENT PROJECT. THE PROPERTY OWNER ACKNOWLEDGES THAT ACCEPTANCE OR APPROVAL OF THIS PLAN DOES NOT CONSTITUTE AN APPROVAL TO PERFORM ANY GRADING SHOWN HEREON, AND AGREES TO OBTAIN VALID GRADING PERMISSIONS BEFORE COMMENCING SUCH ACTIVITY.



VICINITY MAP

NOT TO SCALE
T.B. PG. 1069, E3

GENERAL NOTES:

1. ALL EASEMENTS SHOWN HEREON PER TITLE REPORT FROM CHICAGO TITLE PER ORDER NO. 608004327.

EXISTING EASEMENTS

(A) C/L EXIST. 12' WIDE PUBLIC UTILITY ESMT. IN FAVOR OF SDG&E PER DOC. REC. 05-09-1958 IN BK. 7074, PG. 21 OF O.R.

(B) EXIST. WATERLINE ESMT. IN FAVOR OF VCMWD PER DOCS. REC. 08-22-1960 AS FILE NO. 170480 AND REC. 11-15-1965 AS FILE NO. 206824, BOTH OF O.R.

(C) EXIST. WATERLINE ESMT. IN FAVOR OF VCMWD PER DOC. REC. 02-20-1961 AS FILE NO. 29918

(D) EXIST. PVT. ROAD ESMT. PER DOC. REC. 05-24-1962 AS FILE NO. 88740 OF O.R. & AS SHOWN ON PARCEL MAP NO. 1086.

(E) EXIST. PUBLIC UTILITY ESMT. IN FAVOR OF SDG&E PER DOC. REC. 01-25-1966 AS FILE NO. 14998 OF O.R.

(F) EXIST. PVT. ROAD ESMT. PER DOC. REC. 11-24-1972 AS FILE NO. 314139 OF O.R. & AS SHOWN ON PARCEL MAP NO. 1086.

RANCHO COASTAL ENGINEERING
Single Source Development Consultant
1635 S. RANCHO SANTA FE RD., SUITE 204
SAN MARCOS, CA (760) 510-3152

REGISTERED PROFESSIONAL ENGINEER
DOUGLAS E. LOGAN
C 39728
Exp. 12/31/08
CIVIL
STATE OF CALIFORNIA

OWNER'S/PERMITEE'S

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VALLEY CENTER, CA 92082
A.P.N. NO.: 129-212-24

PRIVATE CONTRACT

SHEET	COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS	SHEETS
1		1

PRELIMINARY GRADING PLAN FOR:
TENTATIVE PARCEL MAP 21101
CALIFORNIA COORDINATE INDEX 402-1737

APPROVED:
BY:
ENGINEER OF WORK
DOUGLAS E. LOGAN R.C.E. 39728
GRADING PERMIT NO:

PRELIMINARY GRADING PLAN(S)
ENGINEER'S NAME: RANCHO COASTAL ENGINEERING, INC
PHONE NO. (760) 510-3152

Z:\Projects\5869\5869-BMP-LID PLAN-1.dwg Jul 30, 2008 10:38am
Xrefs: 5869PDP00, 5869TOPO, 5869BASE, 5869MAP

ATTACHMENT E

TREATMENT BMP DATASHEET

*(**NOTE:** POSSIBLE SOURCE FOR DATASHEETS CAN BE FOUND AT WWW.CABMPHANDBOOKS.COM. INCLUDE ENGINEERING CALCULATIONS FOR SIZING THE TREATMENT BMP.)*

Storm Water Management Plan for
10418 King Sanday Lane, Valley Center

85TH PERCENTILE PEAK FLOW AND VOLUME DETERMINATION
Modified Rational Method - Effective for Watersheds < 1.0 mi^2

Note: Only Enter Values in Boxes - Spreadsheet Will Calculate Remaining Values

Project Name	Gangavalli
Work Order	2007-81
Jurisdiction	City of Valley Center
BMP Location	

85th Percentile Rainfall = **0.85** inches
(from County Isopluvial Map)

Developed Drainage Area =	6.1	acres
Natural Drainage Area =	0.0	acres
Total Drainage Area to BMP =	**6.1**	acres

Dev. Area Percent Impervious =	10	%
Overall Percent Impervious =	**10**	%

Dev. Area Runoff Coefficient =	0.36
Nat. Area Runoff Coefficient =	0.30
Runoff Coefficient =	**0.36**

Time of Concentration = **12.1** minutes
(from Drainage Study)

RATIONAL METHOD RESULTS

Q = CIA where
- Q = 85th Percentile Peak Flow (cfs)
- C = Runoff Coefficient
- I = Rainfall Intensity (0.2 inch/hour per RWQCB mandate)
- A = Drainage Area (acres)

V = CPA where
- V = 85th Percentile Runoff Volume (acre-feet)
- C = Runoff Coefficient
- P = 85th Percentile Rainfall (inches)
- A = Drainage Area (acres

Using the Total Drainage Area:

C =	0.36
I =	0.2 inch/hour
P =	0.85 inches
A =	6.1 acres
Q =	**0.44 cfs**
V =	**0.16 acre-feet**

Using Developed Area Only:

C =	0.36
I =	0.2 inch/hour
P =	0.85 inches
A =	6.1 acres
Q =	**0.44 cfs**
V =	**0.16 acre-feet**

Grassy Swale Design Spreadsheet

Given:

Design flow	0.44 cfs
Residence time (req)	10 minutes

Trapezoid Channel Design Parameters:

y	0.25 feet
t	6 feet
w	4 feet
SS1:SS2	4 ft/ft
A	1.25 sq ft

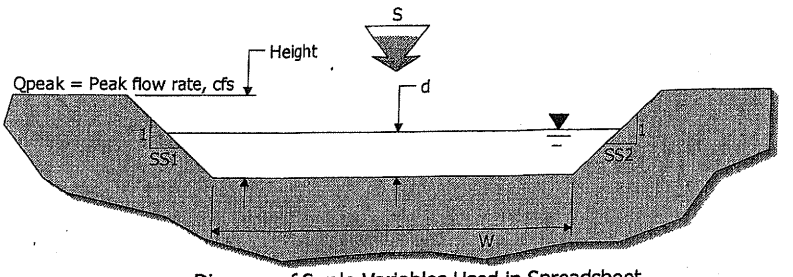

Diagram of Swale Variables Used in Spreadsheet

Find Qmax of channel:

Q=	(1.49/n) * A * R^(2/3) * s^.5
n	0.2
s	0.07 ft/ft (long. Slope)
r	0.217391 ft
Q=	0.890793 cfs

Find Velcoity in channel
V=Q/A
Therefore:
V = 0.352 fps

Required Length of Channel:
L=vt
Therefore:
L= 211.2
PROJECT DESIGN TO USE: L= 220

ATTACHMENT F

OPERATION AND MAINTENANCE PROGRAM FOR TREATMENT BMP

*(**NOTE:** INFORMATION REGARDING OPERATION AND MAINTENANCE CAN BE OBTAINED FROM THE FOLLOWING WEB SITE: HTTP://WWW.SDCOUNTY.CA.GOV/DPW/WATERSHEDS/LAND_DEV/SUSMP.HTML.)*

4.0 MITIGATION MEASURES TO PROTECT WATER QUALITY

To address water quality for the project, BMPs will be implemented during construction and post-construction.

4.1 Construction BMPs

A detailed description of the construction BMPs will be developed during the Grading Plan and Improvement Plan Engineering. Since the project is in the preliminary development phase only a listing of potential types of temporary BMPs are available. This includes the following:

- Silt Fence
- Fiber Rolls
- Street Sweeping and Vacuuming
- Storm Drain Inlet Protection
- Stockpile Management
- Solid Waste Management
- Stabilized Construction Entrance/Exit
- Dewatering Operations
- Vehicle and Equipment Maintenance
- Desilting Basin
- Gravel Bag Berm
- Sandbag Barrier
- Material Delivery and Storage
- Spill Prevention and Control
- Concrete Waste Management
- Water Conservation Practices
- Paving and Grinding Operations
- Permanent Revegetation of All disturbed uncovered areas
- Erosion Control Mats and Spray-on Applications

Construction BMPs for this project will be selected, constructed, and maintained so as to comply with all applicable ordinances and guidance documents.

4.2 Post-construction BMPs

Pollutants of concern as noted in the table titled ***TYPICAL POST CONSTRUCTION POLLUTANTS***, in section 3.2 will be addressed through the utilization of three types of BMPs. These types of BMPs are Site Design, Source Control and Treatment Control.

The proposed development site design will have a significant role in not only minimizing the potential discharge of suspended pollutants in storm water, but will dramatically improve the storm water quality of the storm water discharged from the entire project site. The abandoning of agricultural operations and reducing the area that will be utilized in the development, as compared to the agricultural area currently being utilized will reduce the potential for pollutant discharge from the site. In addition to the change in the project site usage, the proposed project is designed to minimize the use of impervious area, in fact only 0.14 acres (approximately 2% of the total developed area) of the proposed development will be impervious surfaces at this time. Soil stabilization of the slopes and disturbed areas are incorporated into the project design. The landscaping on the site will consist of both native and non-native plants. The goal is to achieve plant establishment expeditiously to reduce erosion. The irrigation system for these landscaped areas will be monitored to reduce over irrigation.

The homeowner's will have the responsibility of ensuring that source control BMPs are effective. Homeowner's will be provided with literature containing standard language provided by the Region Water Quality Control Board to educate them on the importance of minimizing the use and discharge of pollutants (source control) and means to do so.

In addition to Site Design and Source Control BMPs, the proposed project site design incorporates the use of Treatment control BMP's that will be implemented to address water quality goals:

- Landscaping
- Bio-Filters (grassy swales)

Placements of the BMP's are noted on the project Grading Plans.

4.2.1 Landscaping

Permanent Landscaping and irrigation will be installed on all graded areas, in order to prevent erosion of un-stabilized soils. Landscaping will not only act as an anchor to lock sediment and soil in place along the slope, but will also act as a protective barrier from the direct impact of rainfall. The landscaping will intercept rainfall with its branches and leaves and the water will not come in contact with soil with the same magnitude of force it would if the rainfall were to fall directly on to the soil surface unimpeded by any natural or foreign object.

4.2.2 Bio Filters

Bio Filtration strips, also known as vegetated buffer strips or grassy swales, are vegetated sections of land over which storm water flows as overland sheet flow. The biofiltration system proposed for this project utilizes slope rounding berms, ditches and the existing natural drainages as shown on the attached project plans. Pollutants are removed by filtration through the existing soils and vegetation. Biofiltration swales are mainly effective at removing debris and solid particles, although some dissolved constituents are removed by absorption onto the soil. The drainage swales shown on the Preliminary Grading Plan for the Gangavalli Tentative Parcel Map, are to be constructed with a grass lining.

5.0 OPERATION AND MAINTENANCE PROGRAM

5.1 Bio-Filters

The operational and maintenance needs of a Bio-filter Swale are:

- Vegetation management to maintain adequate hydraulic functioning and to limit habitat for disease-carrying animals.
- Animal and vector control.
- Periodic sediment removal to optimize performance.
- Trash, debris, grass trimmings, tree pruning, and leaf collection and removal to prevent obstruction of a Swale and monitoring equipment.
- Erosion and structural maintenance to prevent the loss of soil and maintain the performance of the Swale.

Functional Maintenance

Functional maintenance has two components:

Preventive maintenance
Corrective maintenance

Preventive Maintenance

Preventive maintenance activities to be instituted at a Bio-filter Swale are:

- Trash and Debris. During each inspection and maintenance visit to the site, debris and trash removal will be conducted to reduce the potential for inlet and outlet structures and other components from becoming clogged and inoperable during storm events.

- Sediment Removal. Sediment accumulation, as part of the operation and maintenance program at a Swale, will be monitored once a month during the dry season, after every large storm (0.50 inch), and monthly during the wet season. Specifically, if sediment reaches a level at or near plant height, or could interfere with flow or operation, the sediment will be removed. If accumulation of debris or sediment is determined to be the cause of decline in design performance, prompt action (i.e., within ten working days) will be taken to restore the Swale to design performance standards. Removal of Standing Water. Standing water must be removed if it contributes to the development of aquatic plant communities or mosquito breeding areas.

- Fertilization and Irrigation. The vegetation seed mix has been designed so that fertilization and irrigation is not necessary. Fertilizers and irrigation will not be used to maintain the vegetation.

- Elimination of Mosquito Breeding Habitats. The most effective mosquito control program is one that eliminates potential breeding habitats.

Corrective Maintenance

Corrective maintenance is required on an emergency or non-routine basis to correct problems and to restore the intended operation and safe function of a Bio-filter Swale. Corrective maintenance activities include:

- Removal of Debris and Sediment. Sediment, debris, and trash, which impede the hydraulic functioning of a Swale and prevent vegetative growth, will be removed and properly disposed.

- Structural Repairs. Once deemed necessary, repairs to structural components of a Swale and its inlet and outlet structures will be done within 10 working days.

- Embankment and Slope Repairs. Once deemed necessary, damage to the embankments and slopes of Swales will be repaired within 10 working days).

- Erosion Repair. Where a reseeding program has been ineffective, or where other factors have created erosive conditions (i.e., pedestrian traffic, concentrated flow, etc.), corrective steps will be taken to prevent loss of soil and any subsequent danger to the performance of a Swale. There are a number of corrective actions than can be taken. These include erosion control blankets, riprap.

Hazardous Waste

Suspected hazardous wastes will be analyzed to determine disposal options. Hazardous wastes generated onsite will be handled and disposed of according to applicable local, state, and federal regulations. A solid or liquid waste is considered a hazardous waste if it exceeds the criteria list in the CCR, Title 22, Article 11.

5.2 Maintenance Category

Bio-swales: Category 1

As described in the County Stormwater Maintenance Plan, bio-filters (grassy swales) within the Tam TPM fall within the "First Category". The maintenance of the bio-filters (grassy swales), used as pad treatment, will be the responsibility of the individual private land owner. The County should have only minimal concerns for ongoing maintenance. The proposed Bio-filter inherently "take care of themselves", or property owners can naturally be expected to do so as an incident of taking care of their property.

ATTACHMENT G

FISCAL RESOURCES

5.3 Annual Cost of Maintenance

ANNUAL COST ESTIMATE:

Grassy swale Bio-filter Bmp maintenance -	$2972.42
	TOTAL: $2,972.42

TWO-YEAR COST ESTIMATE:

Grassy swale Bio-filter Bmp maintenance -	$5944.84
	TOTAL: $5,944.84

TEN-YEAR COST ESTIMATE:

Grassy swale Bio-filter Bmp maintenance -	$29724.20
	TOTAL: $29,724.20

6.0 FISCAL RESOURCES

The maintenance of the landscaping berm will be performed as necessary by the private land owner. The land owner will be subject to all applicable ordinances referenced herein.

The maintenance of the biofiltration swales will be performed as necessary by the land owner and the site managers and once the development is complete the homeowner will assume all financial responsibility for ensuring that the treatment devices are maintained. The land owner and the site managers will be subject to all applicable ordinances referenced herein.

ATTACHMENT H

CERTIFICATION SHEET

This Stormwater Management Plan has been prepared under the direction of the following Registered Civil Engineer. The Registered Civil Engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.

JOHN C. ENGINEER
REGISTERED CIVIL ENGINEER

DATE

Storm Water Management Plan for
10418 King Sanday Lane, Valley Center

This Stormwater Management Plan has been prepared under the direction of the following Registered Civil Engineer. The Registered Civil Engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.

Douglas E. Logan
REGISTERED CIVIL ENGINEER

7/29/08
DATE

REGISTERED PROFESSIONAL ENGINEER
DOUGLAS E. LOGAN
C 39726
Exp. 12-31-09
CIVIL
STATE OF CALIFORNIA

ATTACHMENT I

ADDENDUM