

# University of California Santa Cruz

## Storm Water Management Plan



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**Acronyms and Abbreviations**

2300 Delaware	UCSC owned property in the city of Santa Cruz at 2300 Delaware Avenue
B&US	Building / Utility Services
BMP	Best Management Practice
EIR	Environmental Impact Report
CDFG	California Department of Fish and Game
CLRDP	Costal Long Range Development Plan
CLUMAC	Campus Land Use Management Advisory Committee
CUHS	College and University Housing Services
CUHS–Dining Services	College and University Housing Services Dining Services
CUHS-Facilities	College and University Housing Services Facilities
Delaware	same as 2300 Delaware
EH&S	UCSC Environmental Health and Safety
Fire Department	UCSC Fire Department
FONR	Fort Ord Natural Reserve
Grounds	Physical Plant Grounds Services
IPM	Integrated Pest Management
LML	Long Marine Laboratories
LRDP	Long Range Development Plan
MCM	Minimum Control Measure
MBEST	Monterey Bay Education, Science and Technology Center
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
MSC	Marine Science Center
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
PP	Physical Plant
PP&C	Physical Planning and Construction
PP-Custodial Services	Physical Plant Custodial Services
PP-Electrical Services	Physical Plant Electrical Services
PP-Grounds Services	Physical Plant Grounds Services
PP-HVAC Services	Physical Plant Heating Ventilating and Air Conditioning
PP-Plumbing Services	Physical Plant Plumbing Services
RWQCB	Regional Water Quality Control Board
SWPPP	Storm Water Pollution Prevention Plan
SWM	Storm Water Manager
SWMP	Storm Water Management Plan

## List of BMPs (BMPs are fully described in Appendix A: BMP Details)

BMP Number	BMP Name
1	Electronic Brochures and Flyers: General Storm Water Awareness and Targeted Topics
2	Reserved
3	Reserved
4	Reserved
5	Reserved
6	Reserved
7	Reserved
8	Storm Water Survey
9	Reserved
10	Reserved
11	Reserved
12	Web Page
13	Mark Storm Drains
14	Access to SWMP
15	BMP Development Team: Illicit Discharge Detection and Elimination
16	BMP Development Team: Construction Sites
17	BMP Development Team: New Development
18	BMP Development Team: Food Service Facilities
19	BMP Development Team: Parking Services
20	BMP Development Team: Grounds Services
21	Reserved
22	Reserved
23	BMP Development Team: Management Controls to Prevent Illicit Discharges
24	Reserved
25	BMP Development Team: Investigation of Non-Storm Water Discharges
26	Reserved
27	Reserved
28	Reserved
29	Reserved
30	Reserved
31	Reserved
32	Reserved
33	Reserved
34	BMP Development Team: Building Exterior Maintenance
35	Storm Water Advisory Committee
36	Reserved
37	University Neighbors
38	Site Stewardship Program
39	Volunteers and Internships
40	Water Protection Policy
41	Dry Weather Outfall Screening Program
42	Management Controls to Prevent Cross Connections
43	Management Controls to Prevent Illicit Discharges
44	Storm Drain System Maps
45	Illicit Discharge Reporting System

BMP Number	BMP Name
46	Illicit Discharge Brochures and Flyers
47	Review of Non-storm Water Discharges
48	Campus Standards Handbook and Construction Contracts for Storm Water Management
49	Reserved
50	Reserved
51	Construction Site Inspection Procedures
52	Plan Review for Storm Water Quality Impacts
53	Reserved
54	Construction Site Storm Water BMP Training
55	Main Campus Planning and Design Requirements for Storm Water Management and Watershed Protection
56	Pervious Paving Pilot Project
57	MSC Planning and Design Requirements for Storm Water Management and Watershed Protection
58	MBEST Planning and Design Requirements for Storm Water Management and Watershed Protection
59	Staff Training on Hydromodification and Low Impact Development
60	Operation and Maintenance of New Development BMPs
61	Reserved
62	BMP Training
63	Equipment and Materials Storage Areas
64	Washing University Owned Vehicles
65	Reserved
66	Reserved
67	Reserved
68	Street and Parking Lot Maintenance in Faculty/Staff Housing
69	Food Service BMPs
70	Reserved
71	Reserved
72	Reserved
73	Reserved
74	Reserved
75	Fleet Services BMPs from SWPPP
76	Integrated Pest Management Program
77	Cleaning Streets and Parking Lots
78	Storm Drain Systems Inspection and Preventative Maintenance
79	Campus Refuse/Recycling Program
80	Reserved
81	Grounds Services: Landscape Maintenance and Turf Management
82	Maintenance of Fountains and Decorative Water Bodies
83	Household Hazardous Waste Minimization
84	Reserved
85	Custodial Services BMPs
86	Building Exterior Maintenance BMPs
87	Reserved
88	Reserved

BMP Number	BMP Name
89	Reserved
90	Water Line Flushing
91	Vehicle Maintenance Prohibitions
92	Reserved
93	Pet Prohibitions
94	Homeless Encampments
95	Hazardous Waste Management Program
96	Hazardous Materials Emergency Response Organization
97	Reserved
98	Reserved
99	Reserved
100	Stormwater Infrastructure Improvements
101	Water Quality Monitoring
102	Reserved
103	Reserved
104	Encourage Alternative Transportation
105	Reserved
106	Reserved
107	Existing Storm Water System Review
108	Annual Program Review



## 1 Introduction

### 1.1 Regulatory Background

This Storm Water Management Plan (SWMP) is required under federal Environmental Protection Agency (EPA) Phase II Storm Water regulations, promulgated under the Clean Water Act, and implemented in California by the California Water Resources Control Board's General Permit for the Discharge of Storm Water from Small Municipal Separate Storm Sewer Systems (MS4) (WQ Order No. 2003-0005-DWQ).

The regulations are needed because chemicals and sediment in storm water runoff can be transported to municipal separate storm sewer systems (MS4s) and ultimately discharged into local waterways (rivers, streams, lakes, and bays) without treatment. The deposition of chemicals and sediment in waterways discourages the recreational use of the resource and interferes with the habitat for fish, other aquatic organisms, and wildlife. Common constituents of concern include oil and grease from roadways and parking lots; fertilizers, herbicides and pesticides from lawns; sediment from construction sites; and carelessly discarded trash, such as cigarette butts, paper wrappers and plastic bottles. EPA's Storm Water Phase II Rule establishes an MS4 storm water management program that is intended to improve the nation's waterways by reducing the quantity of contaminants that storm water picks up and carries into storm sewer systems during storm events.

In 1990, EPA promulgated rules establishing Phase I of the NPDES storm water program. The Phase I program for MS4s requires operators of "medium" and "large" MS4s, that is, those that generally serve populations of 100,000 or greater, to implement a storm water management program as a means to control discharges from these MS4s. The Storm Water Phase II Rule extends coverage of the NPDES storm water program to certain "small" MS4s but takes a slightly different approach to how the storm water management program is developed and implemented.

NPDES Phase II regulations require operators of small MS4s to develop a program in order to:

- Reduce the discharge of pollutants to the "maximum extent practicable" (MEP);
- Protect water quality; and
- Satisfy the appropriate water quality requirements of the Clean Water Act and Regional Water Quality Control Board Basin Plan.

### 1.2 Purpose of the SWMP

This document has been developed to comply with EPA Phase II NPDES requirements promulgated under the Clean Water Act as well as the California Water Resources Control Board's requirements under the General Permit for the Discharge of Storm Water from Small Municipal Separate Storm Sewer Systems (MS4) (WQ Order No. 2003-0005-DWQ).

The purpose of the SWMP is: (1) to identify potential contaminant sources and other water quality issues of concern potentially affecting the quality and quantity of storm water discharges; (2) to provide Best Management Practices (BMPs) to be implemented by UC Santa Cruz students, faculty, administration, staff and contractors and; (3) provide measurable goals for the implementation of the BMPs. The intent of the SWMP is to facilitate comprehensive management of storm water quality and to subsequently enhance UCSC's environmental stewardship.

This SWMP covers UC Santa Cruz's main campus and its off-site facilities situated in urban areas.

While the SWMP documents the many activities that UCSC is pursuing to protect and improve storm water quality, it should be noted that UCSC is committed to numerous additional activities to further an institutional commitment to environmental stewardship. Some of these other activities include:

- The UCSC Sustainability Assessment (<http://sustainability.ucsc.edu/>),
- A Climate Action Compact signed by UCSC, the City of Santa Cruz and the County of Santa Cruz (<http://sustainability.ucsc.edu/climate-action-compact>)
- A Chancellor's Council on Climate Change. The council is currently working on a Climate Action Plan for the campus, which will set a target date for climate neutrality by quantifying emission sources, identifying projects to reduce those emissions, and implementing the projects.
- Sustainable agriculture research and training through [The Center for Agroecology and Sustainable Food Systems \(CASFS\)](#).
- A campus [Food Systems Working Group \(FSWG\)](#), that works to bring sustainable food to campus and to educate the community throughout the year.
- UC Policy on Sustainable Practices:  
<http://www.ucop.edu/ucophome/coordrev/policy/PP032207policy.pdf> and  
<http://www.ucop.edu/ucophome/coordrev/policy/PP032207guidelines.pdf>

## 2 Site Information

UC Santa Cruz (UCSC) is one of ten UC campuses governed by the Regents of the University of California and is an internationally recognized public teaching and research institution.

This SWMP covers all facilities in urbanized areas owned and operated by UC Santa Cruz (which includes the main campus, the Marine Science Campus, the 2300 Delaware Facility and the UC Monterey Bay Education, Science and Technology (MBEST) Center). Off-site facility operations vary widely and not all BMPs in this SWMP may apply at each off-site location. Conversely, off-site areas may require the development of new BMPs specific to unique operations of the off-site facility.

There are two UCSC affiliated facilities in non-urbanized areas. The James Lick Observatory, part of the University of California Observatory System, is located on top of Mt. Hamilton outside of San Jose. The Big Creek Reserve, part of the University of California Natural Reserves System, is located at Big Creek, south of Big Sur, on the Big Sur coast.

Current three-quarter average student enrollment data and faculty and staff data for 2007-08 have not been published, but are expected to be about 15,000 students and 3,350 faculty and staff, for a total main campus population of approximately 18,350\*. A student enrollment projection for 2017-18 is approximately 18,522\*\* which represent growth during this period of 23%.

*\*Sources: Third-week enrollment reports for 2007-08. UCSC Institutional Research and Policy Studies: <http://planning.ucsc.edu/IRPS/ENROLLMT/3rdwk/WINTER2008.pdf>; and UCSC Student, Faculty and Staff Headcount Projections for Transportation, August 2007 (Dettman Office of Planning and Budget)(unpublished)*

*\*\*Straightline projection of student enrollment growth based on 2005 LRDP projection of 19,500 enrollment in 2020-21*

### 2.1 Fundamental Differences between a Traditional MS4 and UCSC

A traditional MS4 is typically a local agency serving a diverse population of residential homeowners, residential renters, retailers, small business service providers, industries, numerous school-aged children, and so on.

In contrast, UCSC is the only landowner for residential, commercial and institutional uses. UCSC actually employs or contracts for the services of virtually every person in its community who might

impact storm water quality through construction activities, new development activities, building maintenance, landscape maintenance, vehicle maintenance, etc.; UCSC is the landlord for all housing; and UCSC is primarily a teaching and research institution. UCSC's community of faculty and students provides unique resources for public involvement.

These differences significantly alter the crafting of an effective SWMP:

- This community is more connected: often through employment or through enrollment in academic programs.
- Construction and new development are carried out at the request of and under contract to UCSC. This means that illicit connections are highly unlikely as connections are overseen by persons knowledgeable about the various plumbing systems and there is no incentive for making such illicit connections. Construction activities and new development are under contract to UCSC so that UCSC is involved as the owner, the standards enforcer and the construction activity general permit holder.
- Nearly every member of the UCSC community is connected with an @ucsc.edu email address and there is an exceptionally high rate of connection and use of the internet. This enables electronic outreach unparalleled in most communities.
- By the nature of being a university, there is significant turnover in the student residential population and the student population in general. This calls for an unceasing, but evolving, outreach program to involve new students in program development and in understanding storm water issues.
- By nature of being a university, there are few school-aged children in the population and no K-12 classrooms. This limits the feasibility and usefulness of programs aimed at school-aged children, a significant component of most traditional MS4 programs.
- Student interns are a strong resource for high-level involvement.
- A traditional MS4 is subject to the Brown Act when implementing Requirement D.2.b. of the Phase II NPDES General Permit for Discharges of Storm Water from Small Municipal Separate Storm Sewer Systems (General Permit). UC, like the State and Regional Water Boards, is subject to an alternate law, Bagley-Keene. However, Bagley-Keene does not apply to the development or adoption of a storm water management plan by a UC campus. While each UC campus will implement a locally appropriate public involvement and public participation program, regulatory requirements for public notice are not applicable.
- UC does not have the authority to adopt ordinances. Instead, UC adopts policies and procedures.
- Control over the potentially polluting activities of the community is exercised in very different ways.

Potentially polluting activities such as landscape maintenance, building maintenance, and food facility operation are performed by a relatively small number of organizations and/or people all under employment or contract to the university. Reaching these influential persons and obtaining desired outcomes is made easier. For example, reducing unwanted impacts from herbicide and pesticide use does not require the attention (education and behavior modification) of every member of the community. Rather, it involves outreach to a relative few individuals involved in landscape and building maintenance who can be expected to both craft and implement an effective program.

Because the entire MS4 is the property of UCSC, certain controls that do not exist in a traditional community are present. For instance, vehicle maintenance on campus is prohibited in all locations except the Central Garage facility. This eliminates the need to conduct outreach, inspection and enforcement at numerous vehicle repair facilities. It changes residential outreach. Residents are not generating waste automotive fluids that must be properly collected. However, they must know about the UCSC vehicle maintenance prohibition and that prohibition must be enforced.

A traditional municipality must promulgate an ordinance to ensure building owners, developers, tenants, homeowners, etc. do not make illicit connections or discharge illegal substances to the municipality's storm sewer system.

Although UC does not have the authority to adopt ordinances, UC has much greater control over actions of the campus community: residents are UC tenants, commercial enterprises and construction contractors operate under contract to UC, and employees are employees of UC.

Illicit connections can generally be prevented and in all instances corrected through implementation of university policies and procedures. Illicit discharges can generally be avoided by implementing the contents of this SWMP. Should an improper or illicit discharge occur, most corrective actions can be achieved through an initial dialog. If necessary, appropriate actions will be taken as provided for in the appropriate jurisdiction: the appropriate personnel policy for employees; the student policies for students; or contract law for tenants, vendors and construction contractors. The University Police can be called upon for enforcement of extremely grievous acts violating state or Federal law. Most problems are worked out cooperatively and do not require punitive measures to have corrective actions implemented.

Because UC serves as both the public agency and project proponent for construction sites on University properties, a successful Construction Site Storm Water Runoff Control Program will vary from the type of program generally established by entities serving as only the public agency.

The Campus Standards Handbook serves many of the same purposes as municipal building codes and ordinances. The Campus Standards Handbook incorporates significant language to ensure erosion and sediment controls as well as construction site waste controls.

Additional controls over the construction process result from the construction contract, which is a legally binding document between the contractor and UC.

Since primary control of construction sites belongs to the Contractor during construction, UC uses the construction contract document package to ensure that adequate storm water controls are in place.

An extensive plan review process is utilized prior to issuing the Contract, and construction contract administration procedures as well as on-site university inspectors are used to ensure contract compliance.

The UCSC SWMP has been crafted to acknowledge and leverage this unique community.

## **2.2 Facilities Descriptions**

### **2.2.1 Main Campus**

#### Location Description

The UCSC main campus is located at 1156 High Street, Santa Cruz, CA 95064. The UCSC main campus is situated in Santa Cruz, California, in Santa Cruz County. The approximately 2,000-acre main campus is located 75 miles south of San Francisco at the northwest extreme of the city of Santa Cruz. It is bounded on the south by the city's upper west side neighborhoods on High Street, on the east by Henry Cowell Redwoods State Park and Pogonip City Park, on the north by private rural residential land, and on the west by Wilder Ranch State Park and the Cave Gulch neighborhood on Empire Grade Road.

#### Facility Operations

UCSC employs maintenance, custodial, and grounds staff for day-to-day operations. This includes building maintenance (cleaning, painting, repairs), completion of department work requests, daily cleaning of common buildings, grounds maintenance, small construction jobs, and various repair and maintenance activities. Campus Physical Plant staff and outside contractors do electrical, plumbing, roofing, asphalt work, exterior building painting, sewer line cleaning, utility repairs, and janitorial duties.

### Climate and Rainfall

Meteorological conditions at UCSC are influenced by its proximity to Monterey Bay, the Pacific Ocean, and the Santa Cruz mountain range. Average annual daily temperatures range from 51 degrees Fahrenheit (°F) in the winter, to 68 °F in the summer. Rainfall averages approximately 38 inches per year. Over the past 25 years, annual precipitation has ranged from 15 inches in 1989 to 59.8 inches in 1983. Rainfall levels vary considerably on campus with elevation; the lower campus receives an average of 30 inches of rainfall annually, while the upper campus receives 40 to 45 inches. Average evapotranspiration is estimated to be 19.7 inches per year. Mean annual runoff on the campus is estimated to vary from 8 inches on the lower campus to 16 inches on the upper campus.

### Geology

The UCSC main campus lies on the southeastern end of Ben Lomond Mountain, a major ridge of the Santa Cruz Mountains. Ben Lomond Mountain rises in a series of step-like terraces from sea level in the city of Santa Cruz to an elevation of almost 2,600 feet at the summit to the northwest. The UCSC campus spans a number of these marine terraces, with elevations ranging from less than 300 feet at the southern campus boundary along High Street to a maximum elevation of approximately 1,200 feet at the northwestern campus boundary.

Campus bedrock consists of two major types: a marble/schist terrane that underlies most of the campus, including the central, developed portion of campus, and a granitic terrane that underlies the area north of the Cave Gulch neighborhood and forms intrusions into marble bedrock in several north-central and southern campus locations. Karst topography, characterized by the absence of an integrated drainage system and sinkholes, is evident in the lower and main campus. "Mima mounds" are an unusual geologic feature found in the northwestern and southwestern portions of the campus. These low, flattened mounds, 30 to 60 feet in diameter, are separated from each other by depressions that form vernal pools during the rainy season, and which remain moist into mid-summer.

Although campus bedrock is highly faulted, there is no evidence that campus faults have been active in Holocene times (within the last 10,000 years). Earthquake fault rupture and soil liquefaction are not considered campus geologic hazards. However, campus structures could be expected to undergo severe shaking during earthquakes centered on the nearby San Andreas Fault (12 miles to the northeast of the campus) or on the San Gregorio-Hosgri fault system (ten miles to the southwest).

### General Watershed Descriptions and Facility Drainage

#### Overview

The UC Santa Cruz main campus slopes upward in a series of marine terraces from an elevation of 300 feet at its southern boundary on High Street to an elevation of about 1,200 feet at its northwestern boundary. The average north-south gradient is slightly greater than 5 percent. Along the eastern and western flanks of the campus and along the numerous

stream drainages that cross the campus, gradients generally range from about 25 to about 70 percent.

The geology of the northern one-third of the campus consists of weathered schist and granitic rocks, which are overlain in some areas by thin (5- to 30-foot) eroded remnants of the Santa Margarita sandstone and other marine terrace deposits. The hydrologic system of this portion of the campus is dominated by the broad, gently sloping topographic surfaces that form most of the area. Surface drainage from these areas occurs as overland flow and rills. Drainage divides are poorly defined. Surface flow eventually collects in a few well-defined drainages along the margins of the flats. The dispersed surface flow encourages percolation of rainwater, recharging a shallow groundwater system, which in turn feeds springs and seeps located throughout the area.

The southern two-thirds of the campus consist of marble, granite and schist bedrock overlain by deposits of residual soils and colluvium, where karst topography has developed as a result of the dissolution of marble. This portion of the campus is cut up by several steep-walled north-south flowing streams, but an integrated drainage system is not present because of sporadic stream capture by sinkholes and swallow holes. As a result, very little storm water is conveyed by surface streams to channels downstream of the campus. Instead, storm water is captured by the subsurface karst aquifer, stored and transmitted through a complex formation of fractures, channels and caves.

The campus relies heavily on the natural drainages to manage storm water. Within the developed portions of the campus, storm drains have been installed to capture and convey storm water. These are generally small systems that convey locally captured runoff to a detention basin. Water leaving the detention basin is discharged to the nearest permeable slope or drainage. In some areas the collected water is discharged without detention. The potential for erosion on campus by storm water runoff is generally high due to the presence of steep gradients, fractured rocks and soils highly susceptible to erosion.

The sections that follow discuss the surface water resources and the groundwater hydrology of the campus in more detail.

#### Watersheds on the UC Santa Cruz Campus

The campus is located within the Big Basin Hydrologic Unit, as defined by the Central Coast Regional Water Quality Control Board. The campus is drained through both surface and subsurface drainages by watersheds that originate within the campus boundaries. It should be noted that the assignment of surface water runoff to a particular watershed is based on topographic features of the campus; however, flows captured by the subsurface drainage system may be transferred from one watershed to another.

Three watersheds, Cave Gulch, Moore Creek and Jordan Gulch, drain approximately 1,100 acres in the central portion of the approximately 2,000-acre campus. All three of these watersheds drain into ravines. The three main stream channels are aligned north-south and are controlled by the major geologic fracture systems on the campus. About ¼ of the campus, approximately 510 acres, drains to the San Lorenzo-Pogonip watershed. The San Lorenzo-Pogonip watershed is east of Hagar drive and discharges into a series of gullies that slope eastward. Cave Gulch, which drains the northwestern portions of the campus, drains to sinkholes. The Baskin Tributary and Kresge Tributary drain to sinkholes or swallow holes. Lower Moore Creek, which drains the central portions of the campus, flows in a southwesterly direction and discharges into Antonelli's Pond, near the coast. Jordan Gulch drains the eastern central portions of the campus to sinkholes.

As noted earlier, the karst geomorphology of the central and lower campus has created unique surface drainage conditions on the campus. As a result of the karst conditions,

several of the tributaries of the main campus drainages do not discharge into the main stream channels and instead discharge into sinkholes or in-stream swallow holes. Most flow in the two main drainages on the campus, Moore Creek and Jordan Gulch, is captured by sinkholes or swallow holes in the lower campus. The karst features intercept most of the surface flow, even during extreme rainfall events. As a result, surface runoff from the campus is usually low overall compared to other areas with similar rainfall.

The rest of the campus is drained by a number of creeks and gullies that originate along the campus boundary. Much of the western boundary of the campus, including portions of the upper campus, is drained by Wilder Creek. Four small drainages occur along the southern campus boundary. From west to east these are: a western tributary of Moore Creek that discharges to Moore Creek downstream from the UC Santa Cruz campus boundary, the headwaters of Arroyo Seco, hillslope drainage onto High Street, and drainage into Kalkar Quarry. The northeastern and eastern boundary of the campus is drained mainly by hillslope drainages within the San Lorenzo River watershed.

Each of the major campus watersheds is described below. Sinkholes and swallow holes break up the campus into more than 50 sub-watersheds.

#### Watersheds on the UC Santa Cruz Campus

Watershed	Total Area <sup>1</sup> (acres)	On-Campus (acres)	Area On-Campus as Percent Total
Wilder Creek	3,000	192	6%
Cave Gulch	460	336	73%
Moore Creek	920	321	35%
Moore Creek Western Tributary	320	98	31%
Jordan Gulch	1,380	440	32%
Arroyo Seco	260	44	17%
High Street	60	24	39%
Kalkar Quarry	60	56	94%
San Lorenzo River	74,000	509	0.7%
<b>Total</b>		<b>2,020</b>	

<sup>1</sup>Source: Johnson 1988; URS 2005

#### Wilder Creek Watershed

Wilder Creek has a watershed of approximately 3,000 acres. The headwaters of Wilder Creek, about 192 acres, are located in the northern and western portions of the campus. Campus lands within this watershed are not developed with facilities except for limited portions of gravel service roads.

#### Cave Gulch Watershed

The western and northwestern portions of the main campus drain to Cave Gulch, a tributary to the Wilder Creek watershed. The on-campus drainage area of Cave Gulch is about 336 acres, which is about 73 percent of the total watershed. The on-campus portions of the Cave Gulch system are steep to moderately-steep with channel gradients ranging from roughly 1 to 10 percent.

There are two main tributaries to Cave Gulch on the campus. The Porter tributary is located to the west of the Porter Infill Apartments and Family Student Housing complex, and drains about 30 acres. Two sinkholes located north of Family Student Housing capture runoff from the Porter Tributary. The Pump Station tributary is located approximately 1 mile north of the west entrance to the campus on Empire Grade Road. This tributary drains runoff from a roadside ditch along Empire Grade Road.

In general, campus lands that presently discharge into the Cave Gulch drainage system are largely undeveloped and contain only a few service roads used for recreation and emergency vehicles access and a one-million-gallon water tank in the upper campus. The few developed areas within the watershed are a portion of the Campus Trailer Park, the western half of Kresge College, and a portion of Porter College and Family Student Housing.

#### Moore Creek Watershed

Moore Creek has a drainage area of about 920 acres above Antonelli's Pond. Of this, approximately 320 acres are located on the campus. On campus, the watershed extends from the northern portions of the campus, north of Baskin Engineering to the Arboretum Dam and south to the campus's southern boundary.

The Moore Creek drainage system consists of the main stem and several tributaries. The Baskin and Science Hill tributaries drain the northwestern portions of the Science Hill area of the campus, whereas Kresge tributary drains the area between Kresge College and Heller Drive. Both the Kresge tributary and the Baskin tributary end in sink holes (the Kresge sinkhole and the Baskin sinkhole respectively) and do not always discharge into the Moore Creek main stem. During water year 2004, two rainfall events were observed that had short duration rainfall intensities less than for a 2-year recurrence interval. While the Baskin sinkhole did not spill in water year 2004, spilling from the Kresge sinkhole was observed. Moore Creek main stem (also referred to as the East Fork) originates near University House and flows south to the East Dam. A sinkhole is present within the impoundment of the East Dam. Moore Creek Middle Fork originates south of Oakes College and also flows to the East Dam. The last on-campus tributary is the West Entrance Fork that originates just south of the intersection of Koshland Way and Heller Drive and flows in a southerly direction down to the West Dam. A sinkhole is present in this channel just upstream of the West Dam.

The Arboretum Dam was constructed on Moore Creek by the City between 1880 and 1890 and was used to impound water for the City's North Coast water supply. The East and West dams were constructed upstream of the Arboretum Dam and were intended to serve as sediment catch basins above the reservoir and/or to provide additional storage capacity. The use of the Arboretum Pond for water supply was abandoned in 1948 as the city determined that up to 750,000 gallons of water per day were being lost to the subsurface due to the presence of sinkholes in the channel of Moore Creek and the West Entrance Fork. All three dams are earthen embankment dams. The East dam does not have a spillway; however, the West Dam has a 30-inch pipe to serve as a spillway for excess flows. Originally the Arboretum Dam did not have a spillway and the dam only released discharge through a 14-inch pipe installed through the base of the dam. In the 1990s a sleeve was installed that narrowed the diameter of the outlet pipe to 12 inches. In 2001, a 4-foot pipe was installed below the dam crest to act as a spillway. Both the 4-foot spillway pipe and the 12-inch outlet pipe discharge to a culvert under Empire Grade Road that carries runoff to Moore Creek. The total area of Moore Creek watershed above the Arboretum Dam is about 305 acres but about 110 acres of this drainage area drain in upstream sink/swallow holes. The Arboretum Pond and the two basins created by the East and West Dams have a reported combined capacity of about 35 acre-feet below the elevation of the Arboretum Dam spillway pipe, the West Dam outlet, and the crest of the East Dam. This capacity is large enough to contain runoff from a 50-year storm when all existing sinkholes are plugged, or a 100-year storm when the existing sinkholes remain open. Typically, water remains in the Arboretum Pond well into the dry season.



Approximately 15 acres of the campus lands south of the Arboretum Dam drain directly into Moore Creek south of the campus.

Developed areas within the Moore Creek watershed on campus include most of the Campus Trailer Park, the western two-thirds of the Science Hill area, Kresge and Graduate Apartments, eastern portion of Kresge College, western portion of the Arts area, all of Porter, Oakes and College Eight, and most of the Family Student Housing complex.

#### Jordan Gulch Watershed

The Jordan Gulch watershed is the largest watershed on the campus with a drainage area of about 440 acres. The on-campus portion of the watershed extends from the northern portions of the campus, north of Colleges Nine and Ten, south to near the main campus entrance at the intersection of High and Bay Streets.

Similar to the Moore Creek watershed, several critical sinkholes are located in the Jordan Gulch watershed including McLaughlin Drive sinkhole (also known as the Chinquapin sinkhole), Middle Fork sinkhole, Upper Quarry sinkhole, McHenry Library sinkhole, and the Lower Quarry sinkhole. These sinkholes break up the drainage system into sub-watersheds and as a result of these sinkholes, almost all the water in the Jordan Gulch watershed enters the subsurface drainage system. Surface runoff from only a limited area (about 40 acres) near the main entrance of the campus flows as overland flow and enters Jordan Gulch south of the campus where the creek continues down in the median of Bay Street as a spring-fed stream.

Jordan Gulch East Fork originates just east of College Nine, flows south between Crown College and College Ten, and terminates in McLaughlin sinkhole. Jordan Gulch Middle Fork originates in the area west of College Nine near Spring Road, flows south in a deep canyon dividing the campus core into approximately two halves, to its confluence with the Jordan Gulch main stem just west of the East Field area. Both the East and the Middle Forks are fed by springs in the northern portion of the campus associated with the Santa Margarita sandstone formation. Jordan Gulch main stem originates just south of McLaughlin Drive, flows south through the developed Quarry Plaza area, and then further south in a deep incised canyon to terminate in two sinkholes just north of the Lower Quarry. South of the Lower Quarry, the Jordan Gulch main stem flows as a surface stream down to the area just west of the Hagar/Coolidge Drive intersection.

Developed areas within the Jordan Gulch watershed on campus include the eastern one-third of the Science Hill area, the eastern half of the Arts area, Colleges Nine and Ten, the Quarry Plaza area, the Hahn Student Services area, small portions of Crown and Merrill Colleges, and Cowell College. Even though most of Crown and Merrill Colleges, and all of the East Field House complex are outside the Jordan Gulch watershed, storm water from these areas is directed to and discharged in Jordan Gulch.

#### San Lorenzo Watershed

The San Lorenzo watershed has a combined total on-campus drainage area of about 510 acres. In general, the San Lorenzo watershed drains most of the eastern portion of the campus east of Hagar Drive from north of the Crown-Merrill Apartments south to the Faculty Housing area. The watershed is divided into several sub-watersheds associated with a number of gullies that drain to the east. Some of the gullies in the northern portion of this watershed are fed by springs that discharge in the north campus. Several sinkholes are located on campus property within this area. Apart from runoff lost to the subsurface, runoff also percolates in the permeable hillslope soils. The percolated runoff, as well as runoff lost to the subsurface via sinkholes, contributes groundwater to the karst aquifer.

The San Lorenzo River is included on the Clean Water Act section 303(d) list of impaired waterbodies for both fecal indicator bacteria and sediment.

#### Other Local Drainages

The far southwestern corner of the campus west of Empire Grade Road has low relief and lacks a well-defined drainage pattern. The central and eastern portions of this area drain into a western tributary of Moore Creek.

Arroyo Seco is a canyon located south of Meder Street and east of Western Drive. The headwaters of this drainage (about 44 acres) are located on campus between Jordan Gulch and Moore Creek.

Kalkar Quarry is an old quarry just east of the campus near the Faculty Housing area, which has developed a pond that is fed by an underlying spring and by a series of culverts that drain the southeastern portion of the campus, including a portion of the Faculty Housing area.

#### Soil Description

Campus soils are characteristically derived from underlying rock. Calera soils are marble-derived clay loams found in wooded areas of the western campus. Granite-derived Diamond Springs and Holland loams located in the northern campus and the area immediately south of the Cave Gulch neighborhood support grasses, oaks, and pines. Pinto loams, derived from Quaternary marine deposits, are commonly found in the lower campus meadows, with scattered patches occurring in the central campus meadows and forests. Sandy loams, derived from sandstone, are found in northern campus lands supporting chaparral, oaks, and pines. Felton loams, derived from mica schists, support both grasslands and forests in the main campus.

In general, testing for soil properties on the eastern portion of the central campus revealed that the clay and cohesive soils have varied expansive potential, mostly from a moderate to a high potential. Surface soils are classified as moderately to highly erodible. Much of the north campus is underlain by soils with slight to moderate erosion potential. Significant areas of the upper, central, and lower campus have high to very high erosion potential. Expansive soils are present on parts of the campus. The distribution of expansive soils is highly variable across the campus and even across building sites.

Storm water infiltration near developed areas of campus has limited potential, due to the existence of underlying erodible soils and marble features and a significant presence of clay.

#### Land Use

The developments within the UC Santa Cruz campus watershed areas are dominated by institutional activities. The central campus includes buildings, parking lots, small lawn and open areas, as well as roadways and walkways.

Under the current (2005) campus Long Range Development Plan, the campus has designated several land uses, including three land use categories with little or no development. The Campus Natural Reserve is established to protect natural features with teaching and research value to the campus. Protected Landscapes are established to maintain special campus landscapes and to protect environmental resources (including wildlife corridors and vegetation with ecological or aesthetic importance). Campus Resource Land, located primarily in the upper campus and west of Empire Grade, is established as an area that may be developed in the future but is to be maintained almost entirely in its natural state. Two areas on campus are designated as Campus Habitat Reserve and are managed for Ohlone tiger beetle and California red-legged frog under the terms of a 2005 Habitat

Conservation Plan and Implementing Agreement between the University and the U.S. Fish & Wildlife Service.

Development of the campus includes institutional, residential, commercial and recreational land uses that make up about 600 acres (30%) of the campus watershed area.

<b>UCSC Main Campus Designated Land Use Areas</b>	<b>Acres</b>
Academic Core	132
Colleges/Student Housing	228
PE and Recreation	86
Campus Support	85
Employee Housing	69
Site Research & Support	154
Campus Natural Reserve	410
Protected Landscape	505
Campus Resource Land	335
Campus Habitat Reserve	25
<b>TOTAL</b>	<b>2029</b>

### Vegetation

Three broadly defined vegetation communities predominate on campus: grasslands, forests (mixed evergreen and redwood), and chaparral. No rare plant species registered by state or federal agencies are found on campus. One state-listed endangered plant is found on campus. Rolling, gently sloping grasslands divided by two north-south canyons with densely forested slopes dominate the lower campus. Redwood forest predominates in areas between buildings in the central, developed campus, with patches of grassland and mixed evergreen vegetation also occurring. Mixed evergreen and redwood forests are found on the steeply sloped land immediately to the north of the developed campus, and numerous springs and seeps in the area support distinctive assemblages of plant species. Oaks, bays, tan oaks, madrones, and Douglas fir dominate mixed evergreen forests on campus.

## **2.2.2 Marine Science Campus**

### Location

The Marine Science Campus is located at 100 Shaffer Road, Santa Cruz, CA 95060. The lab sits on a 98-acre parcel located on the southwestern edge of the City of Santa Cruz. Southern Pacific Railroad and Raytek Corporation border the property to the north, Monterey Bay and the Pacific Ocean to the south, De Anza Mobile Home Park and undeveloped property to the east and row crop farmland to the west.

### Facility Description

The Marine Science Campus includes UCSC facilities, a facility ground leased to the Department of Fish and Game, a federal in-holding for the National Oceanic and Atmospheric Administration Facility, along with other research and support facilities and infrastructure.

Over the past 25 years of the Long Marine Lab's existence, there have been hundreds of research projects undertaken and still ongoing due to the availability of high quality seawater and research lab and pool space. The use of high quality seawater ranges from the more visible pool research involving dolphins, sea lions, seals, sea otters, sharks and fish, to the invertebrate research that takes place in the seawater labs focused on a wide variety of marine invertebrate organisms.

The UCSC Marine Science Campus is currently developed with 140,160 gross square feet (GSF) of research and educational facilities operated by UC or its affiliates. The facilities are summarized in the table below.

*Existing Buildings*

<i>Facility</i>	<i>Size (GSF)</i>
Research Support Building	6,200
Younger Building	3,700
Service Building	2,300
Temporary Modular Offices	3,000
Seymour Marine Discovery Center	20,000
Ocean Health Building	23,000
Avian Facility	2,160
Caretaker Units	1,400
Seawater Facility	5,000
<b>SUBTOTAL</b>	<b>66,760</b>
<b>Ground-leased Operations:</b>	
Fish and Game Marine Wildlife Center	20,000
<b>Federal In-holding:</b>	
National Marine Fisheries Service Laboratory	53,400
<b>TOTAL</b>	<b>140,160</b>

UCSC buildings including Seymour Marine Discovery Center, the Center for Ocean Health building, the Avian Facility, and other buildings listed above comprise the current program operations for the Institute of Marine Sciences, an organized research unit (ORU) managed by UCSC for the University of California and other research affiliates. The Seymour Marine Discovery Center is an educational facility promoting public understanding of the importance of marine science.

Two affiliates of the Institute of Marine Sciences are located within facilities at the project site. The Marine Wildlife Center, operated by the California Department of Fish and Game (CDFG) at the project site since 1997, is currently housed in three one-story structures in the middle of the site. In addition, in the area south of the CDFG are greenhouses that contain UCSC and leased operations.

### Facility Operations

UCSC employs skilled trades, grounds, and custodial staff for day-to-day operations of its facilities. This includes office and laboratory reconditioning (cleaning, painting, repairs) and daily cleaning of common buildings. Typical duties cover interior priming and painting, laboratory maintenance and repair, animal husbandry operations, minor plumbing and electrical repairs, clogged sewer line clean outs, appliance repair and removal, grounds maintenance, irrigation repairs, minor street repairs, maintenance and operation of the seawater facility and trash pick-up.

### Climate and Rainfall

Meteorological conditions at the Marine Science Campus are monitored at a local weather station. The site is influenced by its proximity to Monterey Bay, the Pacific Ocean, and the Santa Cruz Mountains of the coast range. Average annual daily temperatures range from 51 °F in the winter, to 68 °F in the summer. Average total precipitation for Santa Cruz is 29 inches annually, with approximately 86% of the annual rainfall occurring during November through March.

### Drainage Description

The terrace portion of the property slopes gently to the south, terminating in 30-foot mudstone cliffs at the edge of Monterey Bay. There is a total of 7.65 acres of delineated wetlands on the terrace portion of the site and around 18.7 acres of wetland and riparian habitat in the Younger Lagoon Reserve west of the terrace area. There is a wetland complex north and west of the existing access road, a large seasonal pond south of the NOAA facility and smaller wetlands scattered elsewhere on the site.

The 140-acre Younger Lagoon watershed drains largely agricultural lands to the west of the Marine Science Campus as well as some of the Marine Science Campus on the terrace. Rain, agricultural runoff, and groundwater from the surrounding terraces are primary inflow sources. The beach and bedrock shelf below the beach limit salt and fresh water movement in and out of the Lagoon. However, flushing during storms does occur periodically during winter months, creating alternating conditions in the lower lagoon.

The terrace portion of the Marine Science Campus area is largely a closed drainage system with only limited surface flows entering the site. The northwestern portion of the site contains a small north-south drainage ditch that channels drainage from a culvert, located under the railroad tracks. The drainage ditch also drains adjacent agricultural fields west of the site. Water that enters the drainage ditch flows directly to Younger Lagoon Reserve and is an important source of water for the lagoon.

Aside from the drainage ditch, storm water that flows through the site comes from rainfall in the winter months. Rainfall leaves the site primarily through evaporation, evapotranspiration, and groundwater that flows to De Anza Mobile Home Park, the ocean cliffs, and to the slopes above Younger Lagoon Reserve.

### Soils

The Marine Science Campus and its surrounding area is a coastal terrace underlain by Santa Cruz mudstone and overlain with Watsonville clay and Elkhorn sandy clay loam at depths of approximately 3' - 9' below grade surface (bgs). Soils are primarily silty and clayey sands with some gravelly sand and sandy silt. The general gradient is south, toward the ocean, with local north and west anomalies. Shallow (4'-9' bgs) groundwater is perched on top of the mudstone.

### Vegetation

Vegetation on the terrace portion of the site consists primarily of non-native grassland and coyote brush scrub-grassland, coastal bluff vegetation and wet area plant species. In the Younger Lagoon Reserve there are eleven vegetation types typical of coastal upland and coastal lowland vegetation communities.

## **2.2.3 2300 Delaware Avenue**

### Location

The 2300 Delaware Avenue Facility is located at: 2300 Delaware Avenue, Santa Cruz, CA 95060, at the corner of Delaware Avenue and Natural Bridges Drive in the City's west side area. These two roadways form the eastern and southern boundaries of the site. The site is designated Industrial in the City's General Plan and zoned General Industrial.

To the east of Natural Bridges Drive across from the site is vacant land that is undeveloped and designated Industrial in the City of Santa Cruz General Plan. To the south of Delaware Avenue across from the site is the Natural Bridges State Beach. To the north of the site is the Union Pacific Railroad right-of-way. North of the railroad tracks are offices of the Santa Cruz City School District and a commercial enterprise. To the west of the site is Antonelli's Pond and Moore Creek corridor. The De Anza Mobile Home Park is to the southwest of the site and the UC Santa Cruz Marine Science Campus (Long Marine Laboratory and other facilities) is further west of the site at the western end of Delaware Avenue.

### Facility Description

2300 Delaware Avenue property is a level, 18.4-acre improved parcel, currently developed with three large interconnected former industrial buildings. The site includes two paved parking lots which accommodate a total of 277 vehicles, two outdoor service yards located to the north and east of Building C, an unpaved public access trail along the western property boundary adjacent to Antonelli's Pond, and tennis courts and a volleyball court located in the rear (eastern part) of the property. Areas that are not developed with buildings, parking or other facilities are landscaped with lawns. The site is surrounded by a landscaped earthen berm about 6 to 8 feet high, which encloses the buildings, parking lots, and surrounding landscaping. Two entrances pierce the berm, one on Delaware Avenue, the other on Natural Bridges Drive.

The developed facilities are summarized in the table below.

*Existing Buildings*

<i>2300 Delaware Facility</i>	<i>Size (GSF)</i>
Building A	36,200
Building B	20,720
Building C	177,220
TOTAL	234,140

Facility Operations

The 2300 Delaware Facility employs skilled trades, grounds, and custodial staff for day-to-day operations. This includes office maintenance (cleaning, painting, repairs) and daily cleaning of common buildings. Typical duties cover interior priming and painting, office maintenance and repair, minor plumbing and electrical repairs, clogged sewer line clean outs, appliance repair and removal, grounds maintenance, irrigation repairs, minor street repairs, and trash pick-up.

Campus Physical Plant

Campus services staff and outside contractors do electrical, plumbing, roofing, asphalt work, exterior building painting, sewer line cleaning and all utility repairs.

Climate and Rainfall

Meteorological conditions at the 2300 Delaware are influenced by its proximity to Monterey Bay, the Pacific Ocean, and the Santa Cruz mountain range. Average annual daily temperatures range from 51 degrees Fahrenheit (°F) in the winter, to 68 °F in the summer. Average total precipitation for Santa Cruz is 29 inches annually, with approximately 86% of the annual rainfall occurring during November through March.

Drainage Description

The project site is currently supplied with a functioning storm drainage system that serves the existing facilities and surrounding impervious areas. Storm water from the facility joins the outfall from Antonelli's Pond near the southwest corner of the property, which drains into Natural Bridges State Beach.

Soils

The geology and soils of the 2300 Delaware Avenue area share the typical characteristics of the surrounding coastal terrace. Soils are classified as Pleistocene, semi-consolidated, generally well-sorted sand with a few thin, relatively continuous layers of gravel (USGS Map). The potential for erosion is slight because of the level topography. There are no natural watercourses on the project site, and no rock outcrops. No sinkholes have been reported on the 2300 Delaware Avenue site.

### Vegetation

Areas that are not developed with buildings, parking or other facilities are landscaped with lawns. The site is surrounded by a landscaped earthen berm about 6- to 8-feet high, which encloses the buildings, parking lots and surrounding landscaping.

## **2.2.4 MBEST Center and Fort Ord Natural Reserve**

### Location Description

The address of the UC Monterey Bay Education, Science and Technology (MBEST) Center and Fort Ord Natural Reserve is 3239 Imjin Road, Suite 101, Marina, CA 93933.

Both the UC MBEST Center and the Fort Ord Natural Reserve ("FONR") are located on the former Fort Ord in Monterey County, near the Monterey peninsula. The MBEST Center consists of five polygons totaling 484 acres. Four of these are located adjacent to Reservation Road near Imjin Road and are referred to as the West Campus, Central North Campus, Central South Campus and East Campus. A 47-acre polygon, known as the Eighth Street Parcel, is adjacent to Eighth Street near Imjin Road. The FONR totals 605 acres in three polygons, known as the North Reserve, Corridor Reserve, and South Reserve, all adjacent to Reservation Road near Imjin Road.

### Facility Operations

The UC MBEST Center employs contractors for day-to-day operations. This includes building maintenance (cleaning, painting, repairs), completion of work requests, biweekly cleaning of buildings, weekly grounds maintenance, small construction jobs, and various repair and maintenance activities.

### Climate and Rainfall

The proximity of Monterey Bay moderates seasonal temperatures. Mean monthly daytime temperatures range from 52 degrees Fahrenheit in the winter to 63 degrees Fahrenheit in the summer. Average total precipitation is 20 inches annually, with approximately 90 percent falling during November through April.

### Geology

The site is located approximately two miles from the shores of Monterey Bay. Topography consists of gently rolling land ranging from 2 to 15 percent slope, with elevations ranging from approximately 130 feet to 200 feet above sea level. The surface geology is classified as Pleistocene Stabilized Dunes (Marina Airport EIR, 1995) or Holocene dune sand, the majority of which is stabilized with vegetation (Steven Raas Geotechnical Feasibility Investigation, 1995).

The subsurface geology consists of a down-dropped granitic basement block that forms the Monterey embayment. Granitic and metamorphic basement rocks, which crop out at elevations of more than 2,000 feet above sea level some ten miles to the south of the MBEST Center, occur at depths of a few thousand feet or more beneath the MBEST Center. Overlying the granitic basement are Miocene- to Pleistocene-age sedimentary rocks a few thousand feet thick (Marina General Plan EIR, 2000).

A fault, known variously as the King City, Gabilan, or Reliz fault, has been postulated along the southwest side of the Salinas Valley, where it is presumed to be responsible for a few thousand feet of elevation difference between the valley floor on the northeast and the crest of the Sierra de Salinas, to the southwest. Many researchers have projected this fault



northward in the vicinity of Reservation Road, although the topographic relief that is the principal evidence for this fault ends abruptly about ten miles south of the MBEST Center. To date, there is no known discrete physical evidence for the location or existence of the fault in the vicinity of the MBEST Center, based either on surface features or subsurface data (Marina General Plan EIR, 2000).

#### General Watershed Descriptions and Facility Drainage

Due to the excessively well-drained nature of the soils, all rainfall is absorbed by the soil resulting in no natural runoff and no stream courses. There are also no ephemeral ponds or wetlands on the site. To the northwest of the site the land drops approximately 100 feet at a bluff to the Salinas River floodplain.

As the MBEST Center is developed, all storm water will be retained on site. One exception is a single 1.4-acre parcel that is currently developed as a parking lot and drains to the Marina Municipal Airport storm drain system.

#### Soil Description

Soil types consist of Baywood over the majority of the site and Oceano loamy sand in the East Campus and the southern tip of the Eighth Street parcel. Both Baywood and Oceano soils are described as excessively well-drained soils (Marina General Plan EIR, 2000, and Raas, 1995). These soils are derived from ancient dune sand. Although these soils have a high percolation rate and typically do not permit excessive runoff, if water is concentrated due to development or other circumstances, significant water erosion can occur. These soils are characterized as having moderate erosion potential due to runoff, with a moderate to high piping potential. These soils are moderately susceptible to wind erosion unless vegetation is removed and the ground surface is disturbed, in which case the soils are highly susceptible to wind erosion. Shrink-swell potential is low.

#### Land Use

The MBEST Center currently consists primarily of undeveloped land. A former flight simulator building and 1.4-acre parking lot constructed by the Army are being used to house the MBEST Administrative Offices as well as educationally-related and research-oriented businesses. A new building constructed by the University of California houses a small business incubator, adult education classrooms, administrative offices, and small research-related businesses. Approximately 4,000 feet of roadway and utilities have been constructed to serve future growth within the Central North campus. A 170-acre organic farm operates on the East Campus, and an asphalt- and concrete-recycling operation operates on five acres in the Central South campus.

The 484-acre MBEST Center is designated in the Fort Ord Reuse Plan as Planned Development Mixed Use District, allowing a wide variety of commercial, residential, retail, professional services, cultural and entertainment activities. The UC MBEST Center Master Plan sets forth allowed land uses throughout the Central North, West, Central South, and East campuses. Some uses, such as education and research and development, are allowed on any parcels, whereas others, such as light industrial/service commercial and commercial mixed-use, are allowed only where designated. The following table indicates land uses designated in the MBEST Center Master Plan for the Central North, West, Central South, and East campuses.

**UC MBEST Build-out Program by Land Use  
Central North and West Campuses**

Designated Land Use <sup>(1)</sup>	Development Area				Total	
	West		Central North			
	Acres	GSF <sup>(2)</sup>	Acres	GSF	Acres	GSF
Research and Development	10.29	134,516	38.52	541,158	<b>48.81</b>	<b>675,673</b>
Light Industrial/Service Commercial	29.07	326,116	0.00	0	<b>29.07</b>	<b>326,116</b>
Commercial Mixed-Use	4.21	45,354	18.51	241,881	<b>22.72</b>	<b>287,235</b>
Open Space	7.39	N/A	4.87	N/A	<b>12.26</b>	<b>N/A</b>
In-Tract Roads <sup>(3)</sup>	6.88	N/A	10.77	N/A	<b>17.65</b>	<b>N/A</b>
<b>Total Designated Development</b>	<b>57.84</b>	<b>505,986</b>	<b>72.67</b>	<b>783,039</b>	<b>130.51</b>	<b>1,289,025</b>

**Notes:**

**(1)** Educationally related uses and Research and Development uses are permitted on all development sites, up to 100% of the total allowed square footage.

**(2)** G.S.F. denotes gross square feet of built space allowed within each land use type

**(3)** Whereas the total figure for "In-tract Roads" is printed on the Tentative Map, the portion assignable to each campus is estimated.

The East Campus is the subject of a new planning study that will evaluate the feasibility of adding commercial and residential uses to the R&D uses designated in the MBEST Center Master Plan.

The Eighth Street Parcel has not yet been planned, although the Marina General Plan allows 330 housing units and commercial uses.

All developments will include buildings, parking lots, landscaped areas, roadways and walkways.

The 605-acre FONR is generally undeveloped. Several dirt roads and paths cross the FONR as a result of previous Army activity and current patrolling and maintenance activities. The South Reserve is bisected by a dirt road used by the Marina Coast Water District to regularly service a well, pump house, chlorinator, and storage tank. Both the South Reserve and the North Reserve include several monitoring wells installed and maintained by the Army to survey the extent of existing groundwater contamination from former Army activities. The North Reserve includes several extraction wells and a water treatment facility for remediating groundwater contamination.

Vegetation

The MBEST Center grounds contain coastal scrub, annual grassland, ruderal grassland, coast live oak woodland, maritime chaparral, and developed land. The FONR contains live oak woodland, maritime chaparral, coastal scrub, annual grassland, and ruderal/disturbed lands. Sand gilia (*Gilia tenuiflora* ssp. *arenaria*), a state-listed threatened species, Seaside bird's-beak (*Cordylanthus rigidus* ssp. *littoralis*), a state-listed endangered species, and

Monterey spineflower (*Chorizanthe pungens* var. *pungens*), a federally-listed threatened species, are known to occur within the MBEST Center and the FONR.

### 3 Potential Sources for Constituents of Concern

A portion of the UCSC main campus drains indirectly to the San Lorenzo River, via overland flow across the Pogonip, as can be seen in the watershed map found in Appendix C. The San Lorenzo River is listed as an impaired waterbody for sediment and fecal indicator bacteria. The following table links potential sources for these constituents of concern with selected BMPs to control the identified sources.

#### Priority Constituents of Concern: Re. San Lorenzo River Water Quality Concerns

Constituent of Concern	Potential Source or Generating Activity	Selected BMPs to Control	
Fecal Matter	pets	93	Pet Prohibitions
	illicit sewer connections	42	Management Controls to Prevent Cross Connections
	homeless encampments	94	Homeless Encampments
	sewer overflows		This potential source is subject to the California Water resources Control Board Sewer System Management Plan Regulations
	leaking septic systems		UCSC does not have septic systems
Sedimentation	construction activities	1	Electronic Brochures and Flyers: General Storm Water Awareness and Targeted Topics
		16	BMP Development Team: Construction Sites
		45	Illicit Discharge Reporting System
		48	Campus Standards Handbook and Construction Contracts for Storm Water Management
		51	Construction Site Inspection Procedures
		52	Plan Review for Storm Water Quality Impacts
		54	Construction Site Storm Water BMP Training
		1	Electronic Brochures and Flyers: General Storm Water Awareness and Targeted Topics
		55	Main Campus Planning and Design Requirements for Storm Water Management and Watershed Protection
	56	Pervious Paving Pilot Project	
	59	Staff Training on Hydromodification and Low Impact Development	
	60	Operation and Maintenance of New Development BMPs	
	78	Storm Drain Systems Inspection and Preventative Maintenance	
	100	Stormwater Infrastructure Improvements	
	104	Encourage Alternative Transportation	
107	Existing Storm Water System Review		
	utility line maintenance	90	Water Line Flushing

The following table, links additional potential constituents of concern with selected BMPs to control the identified concerns.

**Other Potential Concerns:**

<b>Constituent of Concern</b>	<b>Potential Source or Generating Activity</b>		<b>Selected BMPs to Control</b>
Wash water, paint chips, cleaning products, dirt and sediment	Building maintenance (washing, graffiti abatement)	34	BMP Development Team: Building Exterior Maintenance
		86	Building Exterior Maintenance BMPs
Various: cleaning compounds, diesel, paint, hazardous materials and vehicle fluids	Chemical spills	1	Electronic Brochures and Flyers: General Storm Water Awareness and Targeted Topics
		13	Mark Storm Drains
		45	Illicit Discharge Reporting System
		62	BMP Training
		69	Food Service BMPs
		85	Custodial Services BMPs
		91	Vehicle Maintenance Prohibitions
		95	Hazardous Waste Management Program
Concrete, drywall, paint, sediment and soil amendments	Construction activities	1	Electronic Brochures and Flyers: General Storm Water Awareness and Targeted Topics
		16	BMP Development Team: Construction Sites
		45	Illicit Discharge Reporting System
		48	Campus Standards Handbook and Construction Contracts for Storm Water Management
		51	Construction Site Inspection Procedures
		54	Construction Site Storm Water BMP Training
Sediment, organic matter or increased flow rate and volume	Impervious area runoff	1	Electronic Brochures and Flyers: General Storm Water Awareness and Targeted Topics
		16	BMP Development Team: Construction Sites
		17	BMP Development Team: New Development
		48	Campus Standards Handbook and Construction Contracts for Storm Water Management
		51	Construction Site Inspection Procedures
		52	Plan Review for Storm Water Quality Impacts
		54	Construction Site Storm Water BMP Training
		55	Main Campus Planning and Design Requirements for Storm Water Management and Watershed Protection
		56	Pervious Paving Pilot Project
		57	MSC Planning and Design Requirements for Storm Water Management and Watershed Protection
		58	MBEST Planning and Design Requirements for Storm Water Management and Watershed Protection
		59	Staff Training on Hydromodification and Low Impact Development
		60	Operation and Maintenance of New Development BMPs
		62	BMP Training
68	Street and Parking Lot Maintenance in Faculty/Staff Housing		
77	Cleaning Streets and Parking Lots		

Constituent of Concern	Potential Source or Generating Activity		Selected BMPs to Control
		78	Storm Drain Systems Inspection and Preventative Maintenance
		81	Grounds Services: Landscape Maintenance and Turf Management
		90	Water Line Flushing
		100	Stormwater Infrastructure Improvements
		107	Existing Storm Water System Review
Wash-water, food residue and FOG (fats, oil and grease)	Food service operations	1	Electronic Brochures and Flyers: General Storm Water Awareness and Targeted Topics
		18	BMP Development Team: Food Service Facilities
		69	Food Service BMPs
Green waste, fuel, oil, fertilizers, pesticides, herbicides and sediment	Grounds maintenance and irrigation runoff	1	Electronic Brochures and Flyers: General Storm Water Awareness
		20	BMP Development Team: Grounds Services
		62	BMP Training
		78	Storm Drain Systems Inspection and Preventative Maintenance
		81	Grounds Services: Landscape Maintenance and Turf Management
		82	Maintenance of Fountains and Decorative Water Bodies
Litter and debris	Litter and debris	1	Electronic Brochures and Flyers: General Storm Water Awareness and Targeted Topics
		13	Mark Storm Drains
		51	Construction Site Inspection Procedures
		77	Cleaning Streets and Parking Lots
		78	Storm Drain Systems Inspection and Preventative Maintenance
		79	Campus Refuse/Recycling Program
		81	Grounds Services: Landscape Maintenance and Turf Management
		94	Homeless Encampments
Petroleum products and vehicular contaminants	Loading/unloading areas	1	Electronic Brochures and Flyers: General Storm Water Awareness and Targeted Topics
		13	Mark Storm Drains
		48	Campus Standards Handbook and Construction Contracts for Storm Water Management
		51	Construction Site Inspection Procedures
		55	Main Campus Planning and Design Requirements for Storm Water Management and Watershed Protection
		57	MSC Planning and Design Requirements for Storm Water Management and Watershed Protection
		78	Storm Drain Systems Inspection and Preventative Maintenance
Sand, soil and mulch	Outdoor storage of raw materials	48	Campus Standards Handbook and Construction Contracts for Storm Water Management
		51	Construction Site Inspection Procedures
		54	Construction Site Storm Water BMP Training
		62	BMP Training

Constituent of Concern	Potential Source or Generating Activity		Selected BMPs to Control
		81	Grounds Services: Landscape Maintenance and Turf Management
Paint, wash water and paint thinner	Painting (indoor)	1	Electronic Brochures and Flyers: General Storm Water Awareness and Targeted Topics
		23	BMP Development Team: Management Controls to Prevent Illicit Discharges
		43	Management Controls to Prevent Illicit Discharges
		48	Campus Standards Handbook and Construction Contracts for Storm Water Management
		51	Construction Site Inspection Procedures
Oil/grease, litter and heavy metals	Parking lot runoff	13	Mark Storm Drains
		19	BMP Development Team: Parking Services
		20	BMP Development Team: Grounds Services
		55	Main Campus Planning and Design Requirements for Storm Water Management and Watershed Protection
		57	MSC Planning and Design Requirements for Storm Water Management and Watershed Protection
		60	Operation and Maintenance of New Development BMPs
		77	Cleaning Streets and Parking Lots
		78	Storm Drain Systems Inspection and Preventative Maintenance
		91	Vehicle Maintenance Prohibitions
		104	Encourage Alternative Transportation
		107	Existing Storm Water System Review
Raw sewage	Sewer line blockages		This source is subject to the Sewer System Management Plan
Organic materials, hazardous materials and litter	Trash storage areas	1	Electronic Brochures and Flyers: General Storm Water Awareness and Targeted Topics
		18	BMP Development Team: Food Service Facilities
		43	Management Controls to Prevent Illicit Discharges
		55	Main Campus Planning and Design Requirements for Storm Water Management and Watershed Protection
		69	Food Service BMPs
		85	Custodial Services BMPs
Oil/grease, vehicle fluids and cleaning products	Fleet Maintenance and Repair	1	Electronic Brochures and Flyers: General Storm Water Awareness and Targeted Topics
		75	Fleet Services BMPs from SWPPP
		91	Vehicle Maintenance Prohibitions
Cleaning products, oil/grease and vehicle fluids	Vehicle and equipment washing	15	BMP Development Team: Illicit Discharge Detection and Elimination
		25	BMP Development Team: Investigation of Non-Storm Water Discharges
		62	BMP Training
		75	Fleet Services BMPs from SWPPP
		91	Vehicle Maintenance Prohibitions
Sediment and water disinfecting agents	Utility line maintenance and repairs	1	Electronic Brochures and Flyers: General Storm Water Awareness and Targeted Topics
		43	Management Controls to Prevent Illicit Discharges

Constituent of Concern	Potential Source or Generating Activity		Selected BMPs to Control
	(water/irrigation/ sewer)	47	Review of Non-storm Water Discharges
		62	BMP Training
		81	Grounds Services: Landscape Maintenance and Turf Management
		90	Water Line Flushing

The BMPs listed above are described in Section 4.2 and in Appendix A.

#### 4 Control Measures for Storm Water Management

##### 4.1 What are Minimum Control Measures, MEP, and BMP?

"Minimum Control Measure" or MCM is the EPA organization of the SWMP into six program areas:

1. Public Education and Outreach on Storm Water Impacts
2. Public Involvement/Participation
3. Illicit Discharge Detection and Elimination
4. Construction Site Storm Water Runoff Control
5. Post-Construction Storm Water Management in New Development and Redevelopment, and
6. Pollution Prevention/Good Housekeeping for Municipal Operations.

UCSC has elected to implement seven control measures and will therefore drop the word minimum and simply refer to "control measures". The seven control measures are:

- 4.2.1 Public Education and Outreach on Storm Water Impacts
- 4.2.2 Public Involvement/Participation
- 4.2.3 Illicit Discharge Detection and Elimination
- 4.2.4 Construction Site Storm Water Runoff Control
- 4.2.5 New Development Design Requirements for Storm Water Management
- 4.2.6 Pollution Prevention for Operations and Maintenance
- 4.2.7 UCSC Specific Measures to Reduce Storm Water Impacts

The goal of the Storm Water Management Plan (SWMP) is to reduce the discharge of constituents of concern to the Maximum Extent Practicable (MEP)<sup>1</sup>, and to identify activities or structural improvements that help improve the quality of the storm water runoff. These activities and structural improvements are referred to as Best Management Practices or BMPs. BMPs have been developed for the SWMP to reduce the discharge of constituents of concern to the storm drain system to the MEP. BMPs will be updated as appropriate to increase their effectiveness or to comply with any additions or changes to NPDES permit requirements.

<sup>1</sup> MEP: Maximum Extent Practicable. In discussing the MEP standard, the State Board has said the following: "There must be a serious attempt to comply, and practical solutions may not be lightly rejected. If, from the list of BMPs, a permittee chooses only a few of the least expensive methods, it is likely that MEP has not been met. On the other hand, if a permittee employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit to be derived, it would have met the standard. MEP requires permittees to choose effective BMPs, and to reject applicable BMPs only where other effective BMPs will serve the same purpose, the BMPs would not be technically feasible, or the cost would be prohibitive."

## 4.2 Implementing BMPs to Meet MEP Requirements

The selected BMPs are to be implemented primarily by UC Santa Cruz staff and outside contractors, and to a lesser extent by students, faculty and other members of the UCSC community. Whenever UC Santa Cruz staff or contractors perform work at UC Santa Cruz, steps outlined in each relevant BMP, or other proven techniques that reach the same goal, must be used in order to ensure compliance with storm water discharge regulations.

UC Santa Cruz has already initiated many of the listed BMPs. In some cases, the measure has not been formalized into a written plan or program. The SWMP will formalize and document these Control Measures and associated BMPs. Full development and implementation of BMPs will be completed through the five-year implementation plan as presented in Appendix A: BMP Details. The remainder of Section 4 provides an introduction to each control measure and a list of selected BMPs. All BMPs are detailed in Appendix A: BMP Details.

### 4.2.1 Public Education and Outreach on Storm Water Impacts

#### Introduction

The Phase II NPDES General Permit for Discharges of Storm Water from Small Municipal Separate Storm Sewer Systems (General Permit) requires that the Storm Water Management Plan (SWMP) incorporate “a public education program to distribute educational materials to the community or conduct equivalent outreach activities about the impacts of storm water discharges on water bodies and the steps that the public can take to reduce pollutants in storm water runoff.”

The “public” for non-traditional Permittees, such as UCSC, may be defined as the employee/user population. The UCSC “public” includes staff employees, academic employees, students, faculty and staff residents, student residents and visitors.

At UCSC, reaching the “public” for Public Education and Outreach overlaps significantly with other control measures such as pollution prevention and construction site controls. The entire public for potentially polluting activities such as construction, landscape maintenance, building maintenance, and food facility operation is a relatively small number of organizations and/or people all under employment or contract to the university. Reaching these influential persons is significantly accomplished by providing training described in BMPs #54, #59, #62, #69 and #85.

UCSC’s intent is to implement a public education and outreach program that demonstrates the interrelatedness of good storm water management to good site stewardship and targets our unique public in ways that can enable them to be effective SWMP implementers. The goals for this Control Measure are to:

1. Educate the UCSC community on the local storm water concerns
2. Change behaviors that negatively impact watersheds
3. Promote community involvement in site stewardship

The written communications will primarily be provided only in English because most segments of the UCSC public are comfortable with communications in English. However, two departments (Dining Services and Custodial Services) have a number of employees who may prefer to receive communications in Spanish. For these two departments, the written materials will also be translated into Spanish.

All pollution prevention training / public education and outreach documents will discuss permissible and impermissible activities as well as how to report concerns.



Selected BMPs:

BMP #1	Electronic Brochures and Flyers: General Storm Water Awareness and Targeted Topics
BMP #2	Reserved
BMP #3	Reserved
BMP #4	Reserved
BMP #5	Reserved
BMP #6	Reserved
BMP #7	Reserved
BMP #8	Storm Water Survey
BMP #9	Reserved
BMP #10	Reserved
BMP #11	Reserved
BMP #12	Web Page
BMP #13	Mark Storm Drains
BMP #14	Access to SWMP

Related BMPs:

BMP #38	Site Stewardship Program
BMP #39	Volunteers and Internships
BMP #45	Illicit Discharge Reporting System
BMP #46	Illicit Discharge Brochures and Flyers
BMP #54	Construction Site Storm Water BMP Training
BMP #59	Staff Training on Hydromodification and Low Impact Development
BMP #62	BMP Training
BMP #69	Food Service BMPs
BMP #85	Custodial Services BMPs

The BMPs listed above are fully described in Appendix A: BMP Details.

Electronic Brochures and Flyers (BMPs #1 and 46)

In an effort to reduce offsite storm water impacts associated with paper production, UCSC will rely primarily on electronic brochures and flyers. The unique UCSC public generally has ready access to the internet and all materials will be printable, as needed. Additionally, EH&S has email access to much of the UCSC public.

Whenever useful, the brochures and flyers will rely on existing material developed for other storm water management programs. However, in some areas the existing level of effort exceeds commonly utilized BMPs. For example, existing Grounds Services practices include sophisticated irrigation management, integrated pest management, regular mulching, etc. Most readily available programs will not be useful to this public.

As discussed in Control Measure #2, Public Participation and Involvement, most BMPs have been or will be developed by BMP development teams composed primarily of the affected public. The BMPs developed by the teams will be incorporated in the brochures/flyers. EH&S is responsible for brochure/flyer design and content coordination with affected BMP Development Teams.

**4.2.2 Public Involvement / Participation**Introduction

Public involvement and participation are important components of UCSC's Storm Water Management Program (SWMP). The UCSC "public" is the campus community, which

includes staff employees, academic employees, students, faculty and staff residents, student residents and visitors. The success of the SWMP largely depends on acceptance and support from these sectors.

With its unique public, UCSC is able to add a few twists to conventional Public Involvement and Participation. One is to create BMP Development Teams where affected employees select their own BMPs; another is to utilize our spectacular setting to encourage participation; and another is to utilize the UCSC research and teaching components to connect student interns and volunteers into potentially wide-ranging storm water education, outreach, monitoring or other activities.

The Phase II NPDES General Permit for Discharges of Storm Water from Small Municipal Separate Storm Sewer Systems (General Permit) requires UCSC to comply with State and local public notice requirements when implementing a public involvement/participation program. Unlike traditional MS4 (Municipal Separate Storm Sewer System) operators, UCSC is not subject to the same public notice requirements for developing and implementing the SWMP. Because adoption of an SWMP does not require approval of the UC Regents, the public meeting notice requirements of the Bagley-Keene Act (Cal. Gov't. Code §§ 11120-11132) do not apply. Nevertheless, UCSC will take multiple steps, as described in the following BMPs, to ensure public involvement and participation.

The objectives of the Public Participation Program are:

- To involve the public in the SWMP development and implementation processes.
- To generate support for storm water pollution prevention efforts.

#### Selected BMPs:

BMP #15	BMP Development Team: Illicit Discharge Detection and Elimination
BMP #16	BMP Development Team: Construction Sites
BMP #17	BMP Development Team: New Development
BMP #18	BMP Development Team: Food Service Facilities
BMP #19	BMP Development Team: Parking Services
BMP #20	BMP Development Team: Grounds Services
BMP #21	Reserved
BMP #22	Reserved
BMP #23	BMP Development Team: Management Controls to Prevent Illicit Discharges
BMP #24	Reserved
BMP #25	BMP Development Team: Investigation of Non-Storm Water Discharges
BMP #26	Reserved
BMP #27	Reserved
BMP #28	Reserved
BMP #29	Reserved
BMP #32	Reserved
BMP #33	Reserved
BMP #34	BMP Development Team: Building Exterior Maintenance
BMP #35	Storm Water Advisory Committee
BMP #36	Reserved
BMP #37	University Neighbors
BMP #38	Site Stewardship Program
BMP #39	Volunteers and Internships

#### Related BMPs:

BMP #12	Web Page
BMP #13	Mark Storm Drains

BMP #14	Access to SWMP
BMP #45	Illicit Discharge Reporting System

The BMPs listed above are fully described in Appendix A: BMP Details.

#### BMP Development Teams (BMPs #15-20, 23, 25 and 34)

In an effort to select appropriate and effective BMPs, BMP development teams were used during the development of the SWMP. As described in Appendix A: BMP Details, the teams for BMP #23, #25 and #34 will meet during the permit term. All other teams have completed their BMP development tasks. The teams are primarily composed of employees from affected departments. BMP Development Team participants are indicated by department or affiliation in the field Implementers in Appendix A: BMP Details.

### **4.2.3 Illicit Discharge Detection and Elimination**

#### Introduction

To comply with the General Permit requirements to detect and eliminate illicit discharges, UCSC must<sup>2</sup>:

1. Develop, implement and enforce a program to detect and eliminate illicit discharges into the storm drain system;
2. Develop, if not already completed, a storm drain system map showing the location of all outfalls and the names and locations of all waters of the U.S. that receive discharges from those outfalls;
3. To the extent allowable under State or local law, effectively prohibit, through ordinance or other regulatory mechanism, non-storm water discharges into the storm drain system and implement appropriate enforcement procedures and actions;
4. Develop and implement a plan to detect and address unauthorized non-storm water discharges, including illegal dumping, to the storm drain system that are not authorized by a separate NPDES permit;
5. Inform students, faculty, and staff of the hazards that are generally associated with illegal discharges and improper disposal of waste;
6. Address the following categories of non-storm water discharges or flows (i.e., authorized non-storm water discharges) which the Executive Officer of the Central Coast Regional Water Quality Control Board has determined may be a significant contributor of constituents of concern to the storm drain system:
  1. Water Line Flushing
  2. Landscape Irrigation
  3. Diverted Stream Flows
  4. Rising Groundwaters
  5. Uncontaminated Groundwater Infiltration
  6. Uncontaminated Pumped Groundwater
  7. Potable Water Discharges
  8. Foundation Drains
  9. Air-Conditioning Condensation
  10. Irrigation Water
  11. Springs
  12. Water From Crawl Space Pumps
  13. Footing Drains
  14. Lawn Watering
  15. Individual Residential Car Washing

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<sup>2</sup> Some of the language has been carefully modified from the language found in the General Permit. This has been done to facilitate understanding by the many users of the SWMP. The intent of the original language has been preserved.

16. Riparian Habitat and Wetlands Flow
17. De-Chlorinated Swimming Pool Discharges

Illicit discharge is any discharge to a storm drain system that is:

- not composed entirely of storm water, or is
- not an allowable discharge specifically permitted under an NPDES permit, or is
- not a discharge from fire-fighting activity, or is
- a discharge from one of 17 listed categories (see General Permit section D.2.c.6) of non-storm water discharge and which has been determined to be a significant source of pollutants or a threat to beneficial uses of receiving waters.

UCSC currently has one discharge specifically permitted under an NPDES permit. This is the discharge of flow-through seawater from the marine animal tanks and all other seawater use at the Marine Science Campus. These discharges are permitted under WDR R3-2002-0076, NPDES General Permit for Discharges from Aquaculture and Aquariums.

Characterization of the 17 flows identified in item 6 above is addressed by the BMP #47: Review of Non-Storm Water Discharges.

Examples of illicit discharges include raw sewage, waste water from custodial cleaning, oil and vehicle fluids, laundry waste water, and household toxics. Illicit discharges may enter the system through either direct connections (e.g., waste water piping either mistakenly or deliberately connected to the storm drain) or indirect connections (e.g., infiltration into the storm drain system from a cracked sewer line or spills that migrate into a storm drain inlet).

Illicit discharges are considered "illicit" because storm drain systems are not designed to accept, process, or discharge such non-storm water activities. These untreated discharges may contribute contaminants, including heavy metals, toxics, oil and grease, solvents, nutrients, viruses, and bacteria to receiving water bodies. Contaminant levels from illicit discharges have been shown in EPA studies to be high enough to significantly degrade receiving water quality and threaten aquatic ecosystems, wildlife, and human health.

The methods used to prohibit the public from making illicit discharges at a non-traditional MS4 such as UCSC are different from those of a traditional municipality. A traditional municipality promulgates an ordinance in order to require its public of building owners, developers, tenants, homeowners, businesses and others to comply with discharge prohibitions. A non-traditional municipality has different relationships with its public and therefore directs the conduct of that public differently. At UCSC, contracts and policies direct conduct of students, faculty, staff, vendors and contractors.

#### Selected BMPs:

BMP #40	Water Protection Policy
BMP #41	Dry Weather Outfall Screening Program
BMP #42	Management Controls to Prevent Cross Connections
BMP #43	Management Controls to Prevent Illicit Discharges
BMP #44	Storm Drain System Maps
BMP #45	Illicit Discharge Reporting System
BMP #46	Illicit Discharge Brochures and Flyers
BMP #47	Review of Non-Storm Water Discharges

#### Related BMPs:

BMP #1	Electronic Brochures and Flyers: General Storm Water Awareness and Targeted Topics
BMP #13	Mark Storm Drains

BMP #15	BMP Development Team: Illicit Discharge Detection and Elimination
BMP #23	BMP Development Team: Management Controls to Prevent Illicit Discharges
BMP #25	BMP Development Team: Investigation of Non-Storm Water Discharges
BMP #51	Construction Site Inspection Procedures
BMP #54	Construction Site Storm Water BMP Training
BMP #62	BMP Training
BMP #63	Equipment and Material Storage Areas
BMP #64	Washing University Owned Vehicles
BMP #69	Food Service BMPs
BMP #75	Fleet Services BMPs from SWPPP
BMP #76	Integrated Pest Management Program
BMP #77	Cleaning Streets and Parking Lots
BMP #78	Storm Drain Systems Inspection and Preventative Maintenance
BMP #79	Campus Refuse/Recycling Program
BMP #81	Grounds Services: Landscape Maintenance and Turf Management
BMP #82	Maintenance of Fountains and Decorative Water Bodies
BMP #83	Household Hazardous Waste Minimization
BMP #85	Custodial Services BMPs
BMP #86	Building Exterior Maintenance BMPs
BMP #90	Water Line Flushing
BMP #91	Vehicle Maintenance Prohibitions
BMP #95	Hazardous Waste Management Program
BMP #96	Hazardous Materials Emergency Response Organization

The BMPs listed above are fully described in Appendix A: BMP Details.

#### **4.2.4 Construction Site Storm Water Runoff Control**

##### Introduction

The Phase II NPDES General Permit for Discharges of Storm Water from Small Municipal Separate Storm Sewer Systems (General Permit) states that the Storm Water Management Plan (SWMP) must incorporate a “program to reduce pollutants in any storm water runoff to the small MS4 (Municipal Separate Storm Sewer System) from construction activities that result in a land disturbance of greater than or equal to one acre. Reduction of storm water discharges from construction activity disturbing less than one acre must be included ... if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more.”

The General Permit requirements for this Control Measure include six parts:

1. An ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions, or other effective mechanisms, to ensure compliance, to the extent allowable under State or local law;
2. Requirements for construction site operators to implement appropriate erosion and sediment control BMPs (Best Management Practices);
3. Requirements for construction site operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality;
4. Procedures for site plan review which incorporate consideration of potential water quality impacts;
5. Procedures for receipt and consideration of information submitted by the public; and
6. Procedures for site inspection and enforcement of control measures.

Because UCSC serves as both the public agency and project proponent for construction sites on University properties, a successful Construction Site Storm Water Runoff Control Program

will vary from the type of program generally established by entities serving as only the public agency. The Process Flow Chart for Planning, Design and Construction on page 39 illustrates the level of University involvement and oversight throughout the process. The Campus Standards Handbook serves many of the same purposes as municipal building codes and ordinances. The Campus Standards Handbook incorporates significant language to ensure erosion and sediment controls as well as construction site waste controls. For further detail, refer to BMP #48. Additional controls over the construction process result from the construction contract, which is a legally binding document between the contractor and UCSC.

Since primary control of construction sites belongs to the Contractor during construction, UCSC uses the construction contract document package to ensure that adequate storm water controls are in place. This too is further described in BMP #48.

An extensive plan review process is utilized prior to issuing the Contract, and construction contract administration procedures as well as on-site university inspectors are used to ensure contract compliance.

A portion of the eastern side of the UCSC Main Campus drains to the San Lorenzo River watershed. The developed areas draining toward this watershed include the Crown Merrill Apartments and portions of Crown College, Merrill College and Stevenson College. The San Lorenzo River has been designated under the Clean Water Act as an impaired water body for sediment and pathogens. Restrictions, intended to improve water quality in the San Lorenzo River, have been established to limit sediment from construction activities<sup>3</sup> and will be implemented as BMPs. These same BMPs will be used throughout the campus, regardless of watershed.

#### Selected BMPs:

BMP #48	Campus Standards Handbook and Construction Contracts for Storm Water Management
BMP #51	Construction Site Inspection Procedures
BMP #52	Plan Review for Storm Water Quality Impacts
BMP #53	Reserved
BMP #54	Construction Site Storm Water BMP Training

#### Related BMPs:

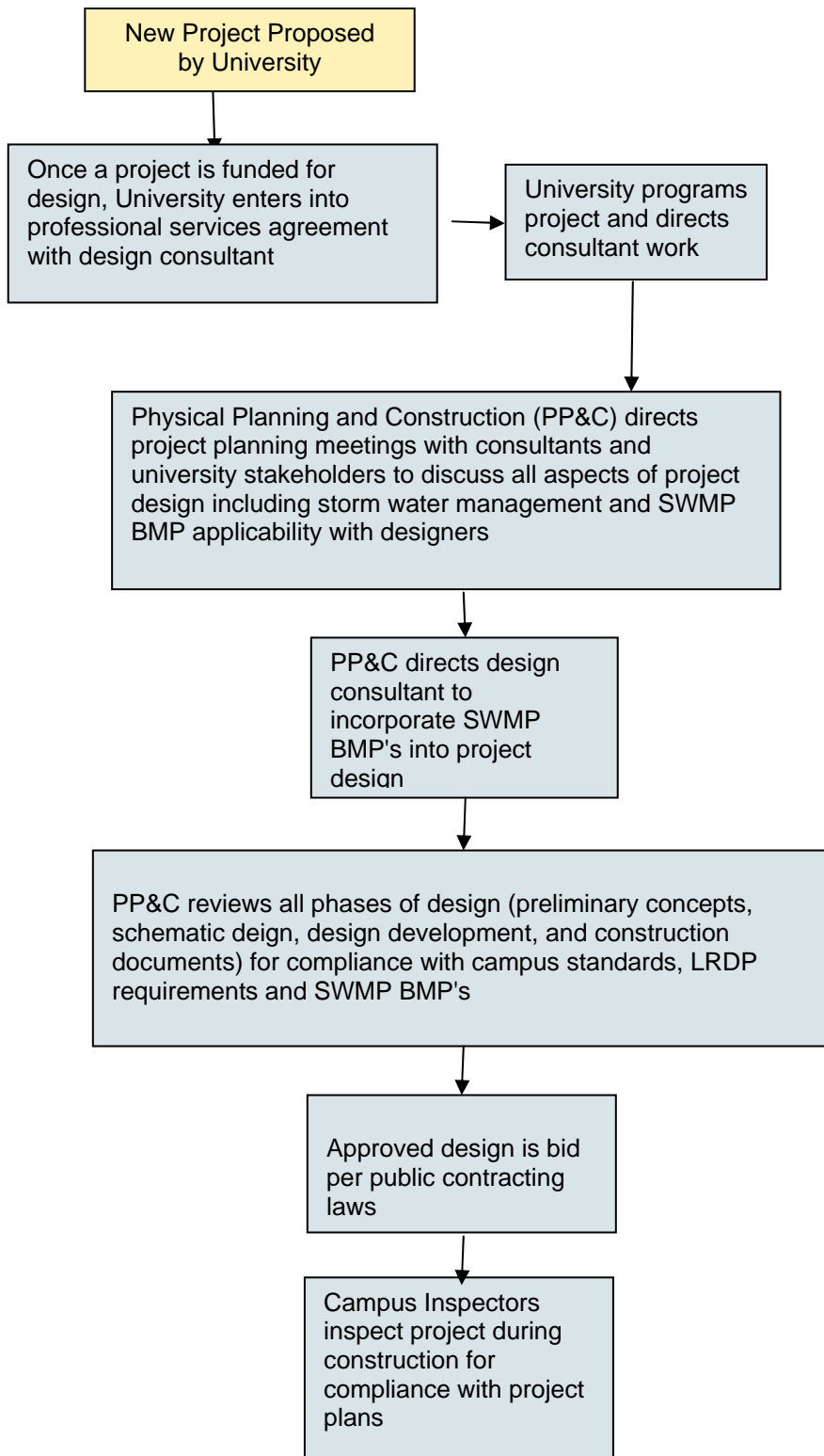
BMP #1	Electronic Brochures and Flyers: General Storm Water Awareness and Targeted Topics
BMP #16	BMP Development Team: Construction Sites
BMP #45	Illicit Discharge Reporting System

The BMPs listed above are fully described in Appendix A: BMP Details.

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<sup>3</sup> Restrictions, referred to as TMDLs, for pathogens are described elsewhere in this plan.

**Process Flow Chart for Planning, Design and Construction**



#### **4.2.5 New Development Design Requirements for Storm Water Management**

##### Introduction

To ensure that future development has less impact on storm water quality than prior development, the Phase II NPDES General Permit for Discharges of Storm Water from Small Municipal Separate Storm Sewer Systems (General Permit) requires permittees to<sup>4</sup>:

1. Develop, implement, and enforce a program to prevent or minimize water quality impacts in storm water runoff from development projects that disturb an acre or more, including projects less than one acre that are part of a larger development or sale;
2. Develop and implement strategies that include a combination of structural and/or non-structural BMPs appropriate for the community;
3. Use an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State or local law. For storm drain systems serving a population over 50,000 or that are subject to high growth, the requirements must at least include the design standards contained in Attachment 4 of the General Permit or a functionally equivalent program that is acceptable to the appropriate RWQCB; and
4. Ensure adequate long-term operation and maintenance of structural and non-structural BMPs.

UCSC does not meet the definition of a high growth area (refer to Section 2.0) and therefore is not required to include the design standards found in Attachment 4. However, UCSC has included locally appropriate design standards in the new development BMPs.

##### **4.2.5.1 Introduction to the UCSC Approach to New Development and Redevelopment**

Since its founding in 1963, a strong commitment to environmental stewardship has been a core feature of the UCSC campus vision. The original vision included a core principle that the "site will constantly be respected, and preserved as it is as much as possible, ...Open spaces will be retained, and handled as wilderness, park, scenic, and buffer areas."<sup>5</sup> This vision which strove to incorporate the natural environment and systems to the maximum extent possible included a recharge system to manage storm water runoff by using natural drainage channels as much as possible. Clusters of buildings were surrounded by as much undisturbed environment as possible and storm water was transported by disconnected short runs of pipe to natural vegetation where it was reintegrated into natural flows. This approach continued as UCSC grew from an initial enrollment of 650 students in 1965 to its current enrollment, 40 years later, of nearly 15,000 students in 10 residential colleges. It is a unique approach not replicated elsewhere in California.

By 1988, the campus had grown to about 8,500 students and 7 residential colleges. It became apparent that despite the special attention given to the overall environment, erosion in the campus drainages was occurring. UCSC recognized that the replacement of natural vegetation with impermeable surfaces was increasing the flows in the drainages and leading to erosion. Commitments to maintaining critical landscapes were reaffirmed and strengthened and a requirement for new development to detain and slowly release peak flows was added. While this new detention requirement improved the management of flows from new construction, it did not necessarily provide corrections for what had already been built. A campus drainage plan was prepared as part of the 1988 Long-Range Development plan that identified a number of problem areas and recommended solutions

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<sup>4</sup> Some of the language has been carefully modified from the language found in the General Permit. This has been done to facilitate understanding by the many users of the SWMP. The intent of the original language has been preserved.

<sup>5</sup> 1963 UC Santa Cruz Long-Range Development Plan



to repair the problems. In 1990 a three phase approach to implementing erosion control projects was developed and the campus began to develop and implement the projects. By 2004, a follow-up study was completed that took a thorough look at existing conditions in the various campus watersheds. The study also included recommendations for correcting conditions and additional controls on new construction. The campus is implementing these recommendations as further described in the section on storm water Infrastructure. As these new recommendations are implemented, the campus will continue to evaluate and refine its storm water management practices to ensure the continuing protection of this unique environment for learning, research and public service.

#### **4.2.5.2 Overview of Planning and Development Framework for UCSC**

Development at each UC campus is guided by a Long-Range Development Plan (LRDP). The LRDP typically guides development over a 15 -20 year time-frame. The LRDP is a physical development and land-use planning document. The LRDP provides a framework for physical development and is not a mandate to grow.

The LRDP is subject to CEQA and each LRDP Environmental Impact Report (EIR) includes a discussion of potentially significant impacts and identifies mitigation measures that are required to be implemented with development to address the impacts.

The LRDP land use plan is used to guide the siting of potential projects. The actual development of projects is also governed by a funding process and by design requirements. Each project is subject to project-level CEQA review, which may result in identification of project-specific mitigation measures that must be implemented, in addition to LRDP EIR mitigation measures that apply to the project.

The extended planning, design and funding process for projects means that there may be a significant lag time between the adoption of the project's budget and the actual determination of the design requirements in a built project.

##### **Capital Projects State Funding Cycle / Schedule**

- Campus maintains a rolling five-year list of campus Major Capital Projects.
- The Governor approves State funds in one year increments; campus guaranteed state-project funding is limited to 12 months at a time.
- State Funded Project process:
  - Campus develops project description and preliminary design elements to facilitate project budget estimate determination (development of Project Planning Guide - PPG): year one – budget.
  - UCOP incorporates project into UC funding package to state for approval by Governor: year two – approval.
  - If funding is approved, projects may be able to complete design and initiate construction within one year, however, most projects require two or more years before construction can start.

Consequently, changes in development design standards may not be expressed in construction projects for three or four years. New development design standards will apply to projects funded for design on or after the dates indicated in the specific tasks of BMP #55.

The Process Flow Chart for Planning, Design and Construction on page 39 illustrates the level of University involvement and oversight throughout the process.

Current site design and building requirements are found in the Campus Standards Handbook (<http://ppc.ucsc.edu/standards>). In conjunction with various studies and improving knowledge, the Campus Standards have been periodically amended. *BMP #55 Main Campus Planning and Design Requirements for Storm Water Management and*

*Watershed Protection* provides additional detail of existing and planned Campus Standards for storm water runoff volume and rate control, source control, and long-term watershed protection.

The Campus Standards are design guidelines given to University contracted consultants. Design consultants enter into a contract with the University called an Executive Design Professional Agreement. This contract allows the University control over the design. The following are sections from the contract that provide enforcement for compliance:

**2.1.11** Design Professional shall prepare Construction Documents in compliance with applicable laws, codes, rules, regulations, ordinances, and standards including, without limitation, those listed in Exhibit C.

**2.4.9** The Construction Documents submittals shall either incorporate any changes or corrections required by University or review agencies as a result of their review of the 50% and 100% completed Construction Documents or be accompanied by a written statement as to why such changes were not incorporated. University may reject Design Professional's explanation and require Design Professional to make the changes or corrections to the Construction Documents as previously requested by University.

#### **4.2.5.3 An Ongoing Commitment to Environmentally Sensitive Development in the Main Campus LRDP**

The first UCSC LRDP was approved in 1963. It was updated in 1971, 1978, 1988 and 2005. While the specifics and terminology have evolved, each LRDP has espoused environmental principles as key components of development. The 1988 and the current 2005 LRDP demonstrate UCSC's long standing commitment to many facets of environmentally sensitive development including practices that are consistent with Low Impact Development and strategies for watershed protection.

##### "Low Impact Development" Principles Incorporated into 1988 LRDP

The organizing principles guiding the allocation and configuration of land uses for the 1988 LRDP include the following:

- Continuation of the general development pattern of the campus (a core of administration and science buildings surrounded by an arch of colleges and other student housing facilities) to minimize travel time between the core and colleges and create stronger connections between adjacent colleges.
- Reliance on infill and clustering of facilities; and efficiency of land use to be achieved partly by reducing building footprints and increasing building height.
- Making the campus as "pedestrian-friendly" as possible.

The 1988 LRDP identified a total of about 1200 acres of land (out of 2000 total acres, about 60%) not designated for development. The selection of these areas was based on a variety of factors including protection of slopes greater than 20% from substantial development; protection of ravines and canyons from disturbance; maintenance of extensive contiguous grasslands; protection of major springs and seep zones; protection of areas of underdrained depressions; protection of year-round streams; and protection of various biological resources including representative stands of dwarf redwoods and giant chinquapins, plant communities associated with springs, seeps, and underdrained depressions, and riparian vegetation.

The lands protected from development were placed under three land use designations.

The Environmental Reserve, which was established to protect some of the natural features and processes of the campus for teaching and research, consists of about 400 acres to be maintained in their natural state as much as possible. The Environmental Reserve includes, where possible, forest springs and upper portions

of watersheds; includes some major campus drainages. Only limited construction of fire roads, bridges, or utility accesses, and of facilities necessary for maintenance of the area as a teaching reserve, are permitted in this area.

The designation of Protected Landscape maintains over 300 acres in an undeveloped state as much as possible. Development is allowed in areas assigned this designation only if it does not impinge on their overall character or prevent the functioning of identified wildlife corridors.

Campus Resource Lands consist of just under 500 acres, primarily in the northern part of the campus, and were not planned for development under the 1988 LRDP. Only small projects such as construction of a water storage tank or a roadway were permitted.

Organizing principles of the 1988 LRDP included reliance on infill and clustering of development to the maximum extent feasible, and efficiency of land use to be achieved in part by reducing building footprints and increasing building height (without exceeding height of tree canopy).

The 1988 LRDP also proposed a variety of measures to reduce the number of vehicle trips to campus. These measures included improvements to the pedestrian system to make campus "pedestrian friendly;" construction of bicycle lanes on new and existing roads; and a Transportation System Management program. The 1988 LRDP set specific parking ratios to determine the maximum number of new spaces to be constructed. The 1988 LRDP specified that construction of new parking was to be contingent upon utilization of existing spaces, implementation of Transportation System Management measures, and promotion of remote parking through differential fees.

Under the 1988 LRDP, the campus has developed an extensive and continually evolving Transportation Demand Management program, which, in part, implements several 1988 LRDP and project EIR mitigation measures. The program includes commuter bike shuttle, subsidized public transit passes for employees, service contract with SCMTD that allows for improved service to campus, carpool parking permits, vanpools, and parking management. The campus substantially exceeds the goal set in the 1988 LRDP EIR of diverting at least 40 percent of all passenger trips to and from campus to alternatives to the single-occupant automobile.

The 1988 LRDP proposed a number of guidelines to limit the environmental impacts of future development. As feasible and appropriate, they were adopted as campus standards and informed environmental review of individual projects. These guidelines included:

- Avoid disturbing known sinkholes but if development over sinkholes is necessary, allow sinkholes to function as natural drainages.
- Avoid direct and indirect alterations of the solution cavities.
- Protect subterranean solution cavities from alterations of storage capacity.
- Maintain high levels of absorption in water recharge areas.
- Avoid overdrawing groundwater supplies.
- Protect major drainage channels from substantial erosion or siltation.
- Protect the limited occurrence of riparian vegetation from harmful erosion or siltation.
- Require special erosion control measures on slopes greater than the angle of repose necessary for natural erosion control.
- Avoid an increase or decrease to natural surficial drainage patterns of a magnitude that would cause harm to natural vegetation or would increase erosion substantially.
- Several guidelines to ensure the use of native plants and predominantly drought-tolerant species in campus landscaping.

“Low Impact Development” Principles and Watershed Protection in the 2005 LRDP

The 2005 LRDP land use map is based on a number of the same planning principles and guidelines as the 1988 LRDP. Principles underlying the land-use patterns include: preserving open space as much as possible; relying on careful infill and clustering of new facilities; integration of the natural and built environment; maintaining a core of academic and administrative buildings surrounded by residential colleges and other housing and support facilities, to facilitate pedestrian and bicycle travel; locating new colleges as close to the core as possible without compromising sites for future development; and reducing building footprints and increase building height where feasible (but not protruding above surrounding tree canopy).

The land use plan also takes into account a number of guidelines for preservation of natural resources, including: development sensitive to preservation of ravines, major grasslands, chaparral, and areas of redwood and mixed evergreen forest; maintaining continuity of wildlife habitats; favoring the use of native plants in landscaping as much as possible; maintaining natural surface drainage flows as much as possible; using financially viable sustainable design strategies to manage storm water, thereby preserving groundwater supplies, major springs, seep zones, year round springs, and major drainage channels, while at the same time preventing slope erosion.

The 2005 LRDP also promotes a walkable campus through improvements to pathways, bicycle and transit; expansion of Transportation Demand Management to encourage alternatives to the single-occupancy vehicle; and consolidation of parking facilities at perimeter campus locations to promote non-auto transportation in core.

The 2005 LRDP land use plan protects over 1200 acres from development. This includes Campus Resource Land, Campus Natural Reserve (formerly Environmental Reserve); Protected Landscape; and Campus Habitat Reserve. The latter is to be managed for two federally listed species, the California red-legged frog and Ohlone tiger beetle.

The 2005 LRDP maintains open expanse of grassland and meadows. Within the current developed areas of the campus, the ravines and other natural open spaces are retained between development clusters. The envisioned new north campus development will also have development clusters surrounded by unbuilt landscape. The upper campus area remains undeveloped open space.

Like the 1988 LRDP the 2005 LRDP links implementation of planned expansion and construction of parking facilities to actual and projected parking utilization rates. The 2005 LRDP also envisions a number of pedestrian, bicycle and roadway improvements to facilitate pedestrian and bicycle travel on campus, to reduce the number of vehicle trips to campus and to allow additional restriction of automobile traffic in the core.

As indicated above, the campus has several land use designations which are not planned for development under the 2005 LRDP. Most wetlands and riparian lands are included in these designations. To the limited extent that development is allowed in or near riparian and wetland areas, the 2005 LRDP requires mitigation of potential impacts associated with riparian areas, wetlands, and provides buffer zones as needed. The development that might occur in these areas is limited to projects such as bridge crossings and drainage improvement projects. The mitigations found in the 2005 LRDP Final EIR would be required for these developments.

During the LRDP process, qualified biologists and resources specialists surveyed the campus to identify and map natural resources in order to determine to potential location of open space and development. The resource maps informed both the types and the extent of the land use areas for the LRDP. The maps were used by the campus LRDP committee,

which included broad-based constituents, including representatives from the campus, the City of Santa Cruz, the County of Santa Cruz during the LRDP preparation. During the environmental analysis of the LRDP, the biologists assessed the potential impacts to sensitive habitats, including riparian and wetland areas from the potential LRDP development. This assessment assisted in the development of the suite of required mitigations.

The implementation of the LRDP is realized over time and incrementally. As projects under the LRDP are proposed the campus initiates a planning process to program, site, design, and construct new facilities. Part of that process is a focused look at the specific area of the campus in the form of an area plan.

The intent of an area plan is to take the academic programmatic goals of a division(s) and ascertain how best to achieve those goals within the LRDP land use designations and the physical opportunities and constraints of the campus. In addition to analyzing elements associated with development in an area, an area plan is often used to site a proposed building or development. Through the planning process the area plan considers other issues such as capacity of building sites, pedestrian/bike/vehicular circulation, access, topography, natural resources/landscape, service/fire/utility requirements, etc. All area plans will consider healthy watersheds and determine adequate buffers from riparian areas.

#### **4.2.5.4 Main Campus Storm Water Infrastructure: Overview, Assessment, Rehabilitation and New Development Design Requirements**

Main Campus development has not relied upon an extensive centralized system of underground piping to manage storm water. Rather in conjunction with preserving natural drainages the system was originally conceived to manage storm water as close to the source as possible by seeking to divert water from built elements and returning it to natural drainages as close to the source as possible. More than 40 years of development have shown that even at this local scale of management the quantity of runoff increases with development and therefore additional management of runoff is needed to ensure drainages are not experiencing increased soil erosion.

Over the years, UCSC has conducted studies and improved system requirements to prevent and/or offset storm water runoff impacts. The most recent of these studies is the Stormwater & Drainage Master Plan dated September 2004 (2004 SDMP). This document assessed conditions in watersheds across the Main Campus. The assessment looked at then current conditions in drainages, and focused on specific drainages for hydrologic modeling, sinkhole capacity assessments, and stream stability. Among the key recommendations from the assessment is a series of drainage area rehabilitation projects to correct and improve conditions in the drainages. This group of projects is being undertaken by the University and is part of the Infrastructure Improvements Project. In conjunction with re-establishing balance in the drainages through the Infrastructure Improvements Project, Section 10 of the assessment lays out recommendations for future development which are intended to maintain the restored conditions.

The campus has received funding for Phase 1 of the Infrastructure Improvements Project which includes campus storm water improvements. UCSC is implementing the storm water portion of the project to correct and improve conditions in the drainage channels through both source control projects and in-drainage improvements identified in the 2004 SDMP. The actual list of identified sites is evolving during the design and construction phase but is intended to address condition issues based upon current knowledge. Progress reports are required by *BMP #100 Stormwater Infrastructure Improvements*.

Based upon the assessment of local conditions and implementation of the Infrastructure Improvements Project the 2004 SDMP also included recommendations for future

development. The multiple measures the campus is taking to implement these recommendations are described primarily in *BMP #55 Main Campus Planning and Design Requirements for Storm Water Management and Watershed Protection*.

*BMP#107 Existing Storm Water System Review* also provides for a future assessment of sinkholes to determine if additional source control measures may be needed.

#### **4.2.5.5 New Development Design Requirements for Storm Water Management at the Marine Science Campus**

The 98-acre Marine Science Campus is covered by a separate LRDP, known as the CLRDP (Coastal Long Range Development Plan). The CLRDP and related documents are available on the web at <http://ppc.ucsc.edu/cp/projects/11407>. After an extensive planning process and approval by the California Coastal Commission, the CLRDP contains comprehensive provisions for storm water management and watershed protection as the Marine Science Campus is developed. Included in the CLRDP are policies, policy implementation measures, a Resource Management Plan and a Drainage Concept Plan that taken together will ensure that development will protect and in some areas enhance the watershed. The Drainage Concept Plan, which provides more detail on how to affect the policies, has six key components:

1. Use of natural and engineered treatment/filtration BMPs in concert with source control and operational BMPS in a "treatment train" approach designed to effectively remove typical urban contaminants from site runoff and to allow the filtered and treated runoff to be used to maintain and enhance habitat areas.
2. Maintenance of pre-development drainage peak flows in the post-development drainage system.
3. Treatment of stormwater and other runoff
4. Maintenance of BMPs and monitoring of filtered and treated stormwater and other runoff to ensure that the drainage system is able to provide effective control of water quantity and quality consistent with plan objectives.
5. Maintenance of groundwater recharge at pre-CLRDP levels to the maximum extent practicable.
6. Correction of erosion and sedimentation problems in Younger Lagoon Reserve caused by drainage from the terrace portion of the site.

The Drainage Concept Plan serves a number of purposes including providing required performance standards and BMPs for storm water management. These are detailed in section B.4.2 of the Drainage Concept Plan.

#### **4.2.5.6 New Development Design Requirements for Storm Water Management at the MBEST Center**

The MBEST Center produces no natural runoff, as it is located on stabilized ancient sand dunes where storm water percolates rapidly to an aquifer located approximately 80 feet below ground surface. As a consequence, the property has no natural water courses, riparian areas, or wetlands. The MBEST Center Master Plan requires that all new development drain to on-site 10-year retention basins and that overflow be directed to the street storm drain system, which is designed to drain to 100-year retention basins.

One parcel, 1.4 acres in size, which is the site of a parking lot constructed by the U.S. Army in the 1960's, drains to a storm drain serving the adjacent Marina Municipal Airport. When the existing Army parking lot is redeveloped, a 10-year retention basin will be constructed on site.

Selected BMPs:

BMP #55	Main Campus Planning and Design Requirements for Storm Water Management and Watershed Protection
BMP #56	Pervious Paving Pilot Project
BMP #57	MSC Planning and Design Requirements for Storm Water Management and Watershed Protection
BMP #58	MBEST Planning and Design Requirements for Storm Water Management and Watershed Protection
BMP #59	Staff Training on Hydromodification and Low Impact Development
BMP #60	Operation and Maintenance of New Development BMPs

Related BMPs:

BMP #17	BMP Development Team: New Development
BMP #100	Stormwater Infrastructure Improvements
BMP #104	Encourage Alternative Transportation
BMP #107	Existing Storm Water System Review

The BMPs listed above are fully described in Appendix A: BMP Details.

#### **4.2.6 Pollution Prevention for Operations and Maintenance**

Introduction

The Phase II NPDES General Permit for Discharges of Storm Water from Small Municipal Separate Storm Sewer Systems (General Permit) includes the following pollution prevention requirements:

- Develop and implement an operation and maintenance program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations: and
- Using training materials that are available from the U.S. EPA, the State, or other organizations, the program must include employee training to prevent and reduce storm water pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and storm water system maintenance.

Control Measure #6: Pollution Prevention for Operations and Maintenance is a collaborative effort among many UCSC departments, including: Transportation and Parking Services (TAPS), Physical Plant Grounds (PP-Grounds), Physical Plant Custodial (PP-Custodial), Fleet Services, the Police, and College and University Housing Services (CUHS-Dining Services and CUHS-Facilities).

At UCSC, pollution prevention overlaps significantly with other control measures such as public education and illicit discharge because operations and maintenance activities encompass a significant percentage of the potentially polluting activities including all landscape maintenance, all building maintenance, and all food facility operations within the MS4.

All pollution prevention training / public education and outreach documents will discuss permissible and impermissible activities as well as how to report concerns.

Selected BMPs:

BMP #61	Reserved
BMP #62	BMP Training
BMP #63	Equipment and Material Storage Areas
BMP #64	Washing University Owned Vehicles
BMP #65	Reserved
BMP #66	Reserved
BMP #67	Reserved
BMP #68	Street and Parking Lot Maintenance in Faculty/Staff Housing
BMP #69	Food Service BMPs
BMP #70	Reserved
BMP #71	Reserved
BMP #72	Reserved
BMP #73	Reserved
BMP #74	Reserved
BMP #75	Fleet Services BMPs from SWPPP
BMP #76	Integrated Pest Management Program
BMP #77	Cleaning Streets and Parking Lots
BMP #78	Storm Drain Systems Inspection and Preventative Maintenance
BMP #79	Campus Refuse/Recycling Program
BMP #80	Reserved
BMP #81	Grounds Services: Landscape Maintenance and Turf Management
BMP #82	Maintenance of Fountains and Decorative Water Bodies
BMP #83	Household Hazardous Waste Minimization
BMP #84	Reserved
BMP #85	Custodial Services BMPs
BMP #86	Building Exterior Maintenance BMPs
BMP #87	Reserved
BMP #88	Reserved
BMP #89	Reserved
BMP #90	Water Line Flushing
BMP #91	Vehicle Maintenance Prohibitions
BMP #92	Reserved
BMP #93	Pet Prohibitions
BMP #94	Homeless Encampments
BMP #95	Hazardous Waste Management Program
BMP #96	Hazardous Materials Emergency Response Organization
BMP #97	Reserved
BMP #98	Reserved
BMP #99	Reserved

Related BMPs:

BMP #1	Electronic Brochures and Flyers: General Storm Water Awareness and Targeted Topics
BMP #18	BMP Development Team: Food Service Facilities
BMP #19	BMP Development Team: Parking Services
BMP #20	BMP Development Team: Grounds Services
BMP #34	BMP Development Team: Building Exterior Maintenance
BMP #44	Storm Drain System Maps

The BMPs listed above are fully described in Appendix A: BMP Details.



#### 4.2.7 UCSC Specific Measures to Reduce Storm Water Impacts

##### Selected BMPs:

BMP #100	Stormwater Infrastructure Improvements
BMP #101	Water Quality Monitoring
BMP #102	Reserved
BMP #103	Reserved
BMP #104	Encourage Alternative Transportation
BMP #105	Reserved
BMP #106	Reserved
BMP #107	Existing Storm Water System Review
BMP #108	Annual Program Review

The BMPs listed above are fully described in Appendix A: BMP Details.

## 5 Record Keeping and Reporting

### 5.1 SWMP Updating

The SWMP will be reviewed annually and UC Santa Cruz will update the SWMP whenever changes in activities or operations occur that may significantly affect the discharge of storm water constituents of concern.

### 5.2 SWMP Public Access

This SWMP is meant for use by the UC Santa Cruz community and is a public document. When approved, the document will be available at the UCSC McHenry Library, the UCSC Environmental Health and Safety (EH&S) Office, and on the UCSC Storm Water Management Program website: <http://cleanwater.ucsc.edu>. Requests for a copy of the SWMP should be directed to Administrative Records, 1156 High Street, Santa Cruz, CA 95064.

### 5.3 SWMP Annual Reports

EH&S will complete and submit annual reports regarding the implementation of the SWMP and measurable goals to the Central Coast Regional Water Quality Control Board, Region 3.

The annual report will be in compliance with all the requirements of General Permit Section F.1. The annual report will be developed in accordance with BMP #108 Annual Program Review. The annual report is due on September 15 of each year. The annual report will summarize the activities performed throughout the permit year. The permit year is July 1 through June 30. The first annual report is expected to include a summary of activities performed over a longer period. This period would start at the time the SWMP is approved by the RWQCB, continue through June 30 and conclude with a full permit year.

Annual reports will be available at the UCSC Mc Henry Library, the UCSC Environmental Health and Safety (EH&S) Office, and on the UCSC Storm Water Management Program website: <http://cleanwater.ucsc.edu>. Requests for a copy of a SWMP annual report should be directed to Administrative Records, 1156 High Street, Santa Cruz, CA 95064.