

# MONTEREY COUNTY



DEPARTMENT OF HEALTH LEN FOSTER, Director

ADMINISTRATION  
ANIMAL SERVICES  
BEHAVIORAL HEALTH

CLINIC SERVICES  
COMMUNITY HEALTH  
EMERGENCY MEDICAL SERVICES

ENVIRONMENTAL HEALTH  
OFFICE OF THE HEALTH OFFICER  
PUBLIC ADMINISTRATOR/PUBLIC GUARDIAN

December 23, 2008

Henrietta Stern, Project Manager  
Monterey Peninsula Water Management District  
5 Harris Court, Bldg. G  
Post Office Box 85  
Monterey, CA, 93942-0085

Dear Ms Stern:

This letter is the Monterey County Health Department, Environmental Health Division's (EHD) formal response regarding the proposed gray water reuse system at the proposed Monterey Bay Shores Eco Resort (MBSER). EHD approves this type of usage for gray water, i.e. subsurface irrigation, as indicated in the letter and flow chart from Raphael Garcia of Rana Creek – Living Architecture, dated December 23, 2008.

The California Regional Water Quality Control Board, Central Coast Region (RWQCB), California Department of Health Services (DHS), and other state and federal regulatory agencies have established regulations regarding gray water reuse. The MBSER must comply with the most restrictive of these regulations during construction of the project and during operation.

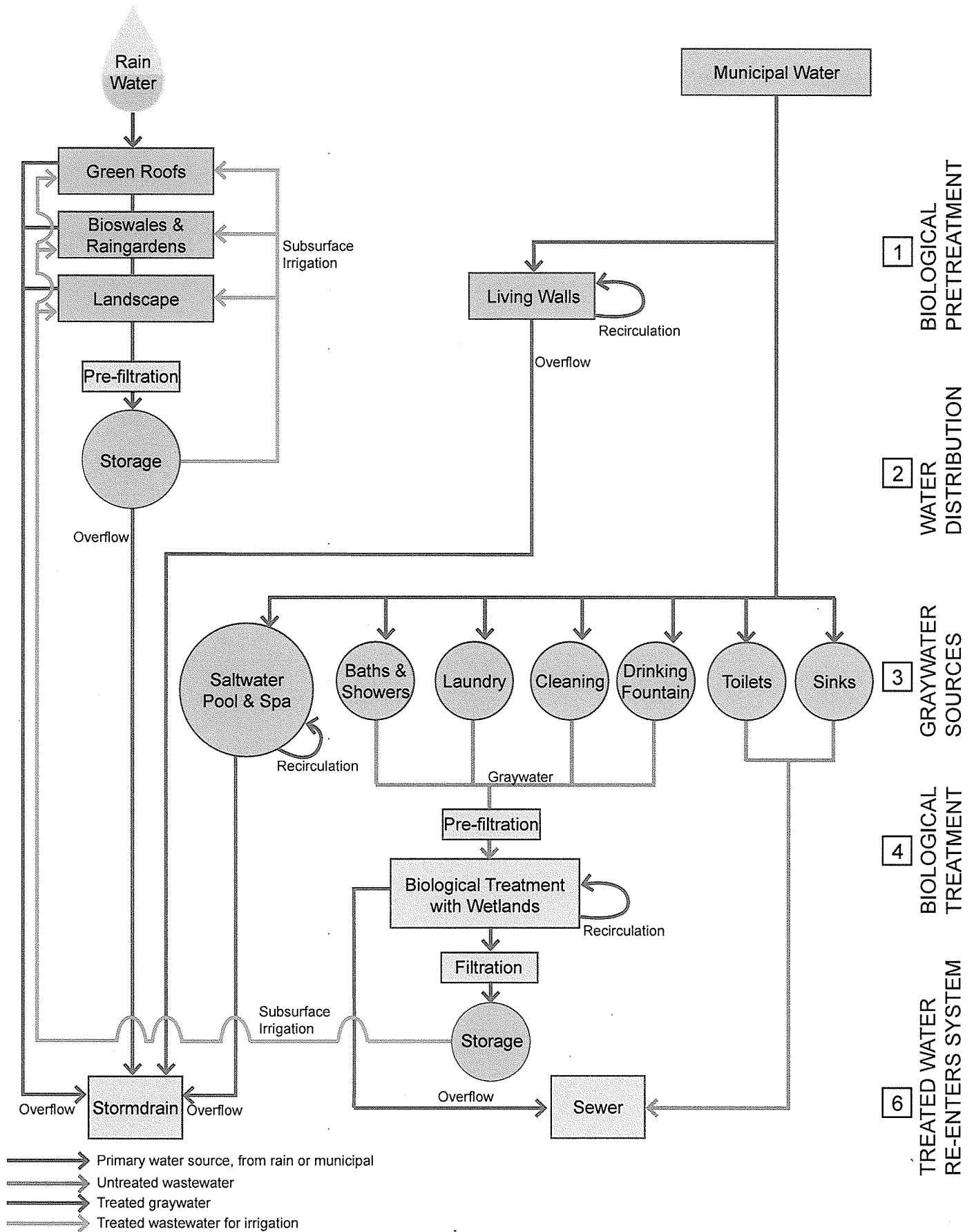
EHD looks forward to working with Rana Creek, MBSER, RWQCB, DHS and others in the development and advancement of gray water reuse and recycled water to achieve conservation of our dwindling potable water resources.

If you have any question please call me at 755-4763.

Sincerely,

Roger Van Horn, R.E.H.S.  
Senior Environmental Specialist

Cc Allen Stroh, Director, Environmental Health  
Richard LeWarne, Assistant Director, Environmental Health  
Paul Kephart, Rana Creek – Living Architecture  
Raphael Garcia, Rana Creek – Living Architecture  
Ed Ghandour, SNG



**MONTEREY BAY SHORES ECO RESORT  
WATER PROCESS FLOW DIAGRAM SUMMARY  
DECEMBER 23<sup>RD</sup>, 2008  
PREPARED BY: RANA CREEK  
PREPARED FOR: MONTEREY COUNTY ENVIRONMENTAL HEALTH DEPARTMENT  
(MCEHD)**

This project proposes to collect and store stormwater runoff that falls on landscaped areas including vegetated roofs. This water will be filtered to applicable standards and reused for subsurface irrigation. Graywater, used building water (excluding toilet water and water sources high in organics), will be mechanically and biologically treated for supplemental subsurface landscape irrigation. Please see the PROCESS FLOW DIAGRAM SUMMARY below for detailed description of proposed processes.

The following Water Quality Standards are being used in the design for this system:

Graywater reuse is allowed by California law for commercial, industrial, and residential use. The Building Standards Commission has revised state laws, to provide the document Appendix G, allowing graywater reuse in subsurface irrigation. The subsurface irrigation will be at least 9 inches below the surface, and the graywater is not permitted to reach the surface. According to state laws, the public is allowed to walk on landscaped grounds irrigated with graywater. Soils with approved infiltration rates will ensure that no graywater will surface. Additionally, adequate site drainage will be provided to ensure that rainwater mixing with the graywater will not surface. High percolation rates on the project site will ensure appropriate infiltration.

In order to use graywater in areas of public contact, the water must meet Title 22 regulations of California Health Laws. At no time shall the public come into contact with graywater. Therefore Title 22 regulations do not apply to this project for graywater reuse.

Plants, gravel, and beneficial bacteria associated with the landscape will biologically filter graywater, removing nutrients, heavy metals, and volatile organic compounds. A filter will remove particulates as well as many bacteria that remain in the water. This water can then be used for sub-surface irrigation in the landscape, bioswales and living roof.

The rainwater storage system will be designed in conformance with all applicable codes and standards. These standards include, but are not limited to, the following: Uniform Plumbing Code, American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), NSF Protocol P151 and the American Public Health Association.

#### **GRAYWATER TREATMENT SYSTEM**

The Monterey Bay Shores project proposes to reuse reclaimed graywater. Graywater does not include waste generated from toilets, dishwashers, washing machines cleaning diapers, or kitchen sink water; these sources are termed black water.

#### **PROCESS FLOW DIAGRAM SUMMARY**

The goal of this design is to implement sustainable water saving strategies by employing both biological and mechanical systems to treat water to acceptable standards in order to lower the cost of potable water inputs and wastewater outputs while saving water for other beneficial uses. The following will be sourced from the municipal supply: sinks, drinking fountains, toilets, laundry, baths and showers, cleaning and pools. In step 4 of the diagram, the runoff from the previously mentioned building functions is then delivered to the treatment system as graywater. This approach allows rainwater and graywater to be reused onsite for irrigation in lieu of releasing it into the local watershed. It also greatly reduces the water demand from the municipal water supply.

Please refer to the attached Water Process Flow Diagram with regard to the following items:

1) Biological Pretreatment

Rainwater falls on vegetated catchment areas including the living roof. These features reduce the rate of runoff and improve the quality of the water by removing suspended solids. Some of the water is infiltrated into the soil, recharging the groundwater or used by plants. Large particles settle out of the water when slowed down by plants and swales. Some pathogens and toxins are retained in the soil where they will be broken down by beneficial bacteria in the substrate. Any water that will not be absorbed by the roof will then flow to bioswales and rain gardens. Landscaped areas will also be used as collection surfaces for rainwater. Any rainwater that is not infiltrated into the soil and used by plants will be mechanically filtered and stored in a tank. The living walls will be irrigated with potable water, as they will have a surface irrigation system. To reduce the demand of potable water, runoff from the living wall may be reused for irrigation.

2) Water Distribution

As described above, the stormwater and graywater is stored and reused for subsurface irrigation of the landscape only.

3) Graywater Source

Graywater sources on this project may include: drinking fountains, facility cleaning, baths and showers, and laundry. Graywater sources do not include dishwashers, toilets, or kitchen sinks. The building will be piped to collect graywater at several locations.

4) Biological Treatment

Before biological treatment, a filter screens out: organic matter, paper, and other wastes. Next, chemical treatment of the graywater may be necessary if cleaning products such as bleach are introduced into the system. Then, filtered graywater enters into the wetland or "constructed ecosystem." In these wetlands, the root systems provide surface areas for beneficial bacteria to remove unwanted nutrients and other impurities in the wastewater. This is achieved by dissimilating the water's constituents into forms that are taken up or consumed by bacteria, plants and higher order organisms or released into the atmosphere. This process destroys pathogens, reduces biological oxygen demand, filters out particles, reduces or uses up nitrogen and phosphorous and stabilizes or disposes of toxins.

5) Treated Water Reused For Irrigation

After being biologically treated, the water will be mechanically filtered to remove any remaining particles. This treated and filtered water will then be stored in a graywater storage tank, and subsequently re-circulated back into vegetated surfaces of the site and used for subsurface irrigation as needed. Irrigation will occur at a minimum of 9" below the surface of the soil.