Jeremy Haas
California Regional Water Quality Control Board
San Diego Region 9
9174 Sky Park Court, Suite 100
San Diego, CA 92123

April 23, 2007

RE: Tentative Order No. R9-2007-0002 NPDES, No. CAS0108740
Supplemental Comments

The members of the community of South Laguna represented by the South Laguna Civic Association, established in 1946, recognizes urban runoff is directly the result of dry weather flows. SLCA objects to the continued discharge of urban runoff through Co-Permitees regional storm drain systems. In doing so, Co-Permitees knowingly and willfully create and sustain ocean pollution in our coastal village.

California Water Code, Division 7, Sections 13000 & 13529.2 prohibit the "minor discharge of recycled water" and asserts "the use of potable" for irrigation "is a waste". Section 13142.5, moreover, provides specific protections for water quality and the coastal marine environment.

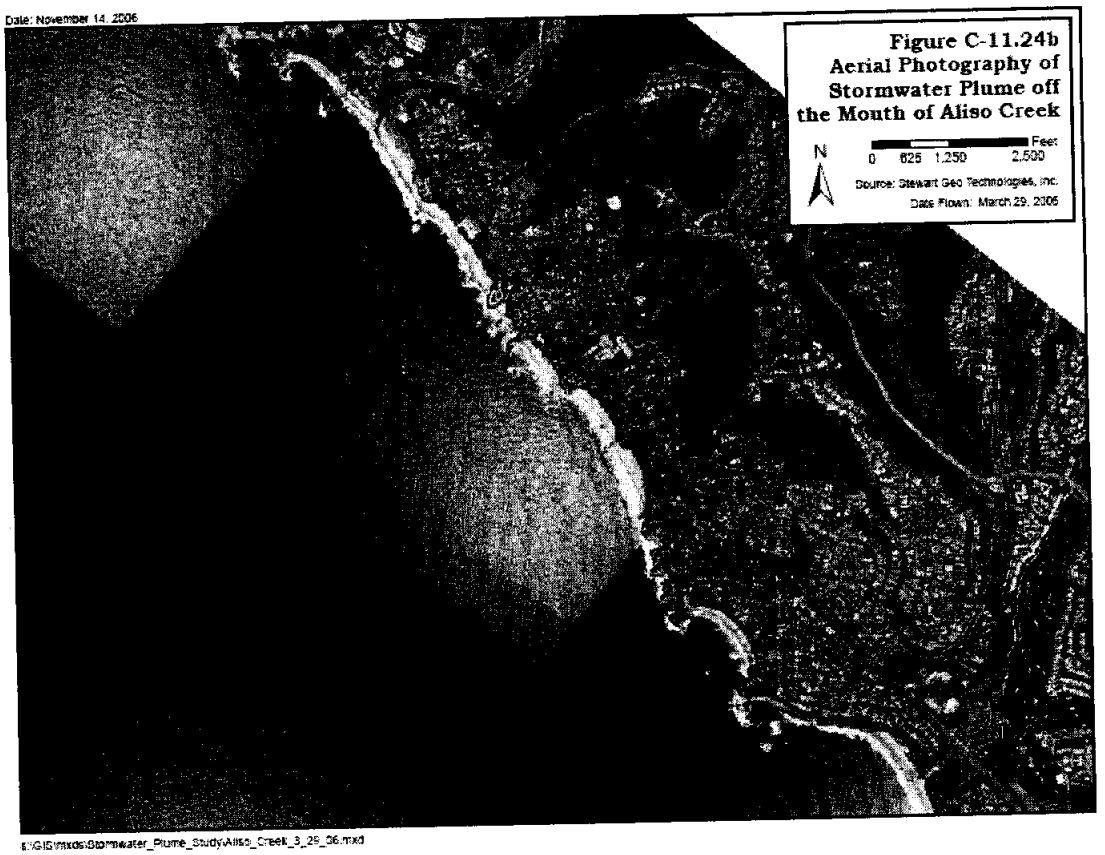
> Section 13142.5: In addition to any other policies established pursuant to this division, the policies of the state with respect to water quality as it relates to the coastal marine environment are that: (a) Wastewater discharges shall be treated to protect present and future beneficial uses, and, where feasible, to restore past beneficial uses of the receiving waters. Highest priority shall be given to improving or eliminating discharges that adversely affect any of the following:
> (1) Wetlands, estuaries, and other biologically sensitive sites.
> (2) Areas important for water contact sports.
> (3) Areas that produce shellfish for human consumption.
> (4) Ocean areas subject to massive waste discharge.
> Ocean chemistry and mixing processes, marine life conditions, other present or proposed outfalls in the vicinity, and relevant aspects of area wide waste treatment management plans and programs, but not of convenience to the discharger, shall for the purposes of this section, be considered in determining the effects of such discharges. Toxic and hard-to-treat substances should be pretreated at the source if such substances would be incompatible with effective and economical treatment in municipal treatment plants."

Clean Water Act, Article 4, Chapter 3, Section 60310(e) of Title 22, California Code of Regulations requires " any irrigation water shall be confined…". "Waste includes sewage and any and all substances associated with human habitation or human origin " such as, urban runoff. The California Constitution (Section 2, Article X) mandates "All waters of the State be put to beneficial use".

Taken together, these laws and regulations provide a framework to challenge the present practices of Co-Permitees to illegally utilize the MS4 System to discharge irrigation runoff originating from recycled or potable water supplies.

Clearly, the majority of residential development projects and associated commercial and municipal facilities in the Aliso Watershed have seriously defective runoff management programs. Mandated "Best Management Practices" over the past twenty years have made water quality in creek and coastal receiving waters worse. Throughout the watershed, development runoff detention basins and retention basins are improperly maintained and fail to capture dry season flows or storm events as designed, engineered and installed. In this respect, most Development Conditions of Approval are presently non-compliant.

The Co-Permitees have expended in excess of $20 million over the past 15 years to unsuccessfully address the water pollution problems associated with urban runoff. This enormous waste of limited taxpayer revenues suggests the need for more aggressive regulatory actions by the SDRWQCB to cleanup and abate urban runoff flows in this particular watershed. Indeed, present practices by Co-Permitees to abuse the MS4 system have led to an exponential increase of toxic flows to coastal receiving waters to peak levels of 6,000,000 million gallons per day from earlier levels of 0 to 1 million gallons per day.



As the above aerial photo illustrates, the Aliso Watershed Urban Runoff Ocean Plume, indicated by the green algae bloom, extends more than one mile offshore into the South Laguna State Marine Refuge, established in 1968, southerly to Three Arch Bay. Co-Permitees and the SDRWQCB routinely omit mapping and monitoring of the toxic ocean plume in contravention to State mandates to protect and preserve coastal receiving waters for beneficial use. This program deficiency intentionally masks the full impacts of urban runoff pollution to the detriment of the health and safety of residents of South Laguna and visitors to the area.

Water Quantity: A New Determinant Water Quality Variable

As the science of urban runoff evolves, traditional concerns for water quality are beginning to consider the role of water flow rates or "*water quantity*" in mobilizing, transporting and distributing a variety of pollution constituents. Whether the source of contamination is pet fecal matter, herbicides, pesticides or automotive residues, water quality is influenced by the amount of water present to transport contaminates into natural watershed resources including creek, riparian, wetland, estuarine, tidepool and nearshore coastal habitats.

Water Quality or Water Quantity

Every molecule of water has an affinity to bond. As water becomes mobile urban runoff, it will attempt to bond to harmful herbicide residues, pesticides, fertilizers, automobile exhaust particulate matter and a toxic spectrum of chemicals. When urban runoff reaches natural creeks, streams, and rivers, contaminated water will also bond to soil thereby increasing streambank erosion and coastal sedimentation.

The "sediment transport quotient" of water, which constitutes urban runoff, is satisfied when each molecule of water achieves bonding stasis. More water entering the urban runoff flow rate will require increased bonding opportunities and, in the case of natural settings, more soil erosion leading to distressed if not completely dysfunctional natural habitats.

What are some of the known effects of elevated urban runoff flows? At the extreme, elevated urban runoff flows can literally flood at entire habitat and community. High flows in deforested terrain are responsible for surficial slope failures and deadly mudslides. Among ecologically oriented restoration projects in a semi-arid setting such as the Aliso Watershed, elevated flows contribute to stream bank erosion exposing and undermining the vast root network of ancient oaks and sycamores. This eliminates natural shade cover that would otherwise insure lower creekwater temperatures and, hence, less algae and bacterial growth.

Elevated flows influence the breath, depth and duration of contact between urban runoff and established resources of streambed and stream bank sediment, foliage, wildlife habitats and infrastructure (i.e. bridges, subterranean sewer lines, pipes, etc.).

Hydromodification by development engineers to create and sustain large quantities of summer nuisance flows saturate and soften stream banks. Saturated soil, in turn, promotes development of harmful root fungus to weaken crucial stands of trees and vegetation. When annual storm

events do occur, these pre-saturated areas rapidly collapse to accelerate "head-cutting" and carve wider, steeper stream banks to undermine the root structure of protective tree cover.

Ecology Now

The popular use of terms like "ecological" and "ecosystem" to describe restoration efforts has lead to some confusion and inappropriate projects. Ecology "deals with the relationship between living organisms and their environment". By environment, there is an implication of a natural setting rather than an artificially created habitat. Every "natural" environment is water dependent. Too little water will dehydrate resources leading to extinction. Likewise, too much water will literally drown plant and animal life. A credible ecological approach must therefore define the natural water conditions and adjust flows to best replicate ideal flow rates.

In the case of the Aliso Watershed, historical records from 1960 or earlier can be used to quantify monthly flow rates in this definitive semi-arid ecology. From pre-development baseline data, restoration efforts can proceed to calibrate project flow rates to approximate historical flow levels. In some instances, a given restoration effort may seek to mitigate loss of habitat due to development by increasing aquatic resources. A "proximate natural flow rate" to contribute an additional 10% beyond historic creek flows will achieve the twin goals of ecological creek stabilization and mitigation measures to add water resources that promote the welfare of animal species in the area. A balanced formula of water quantity levels can be monitored to sustain genuine semi-arid ecological restoration.

"New Water" Resources

While wetland restoration projects can successfully metabolize water quality contaminates and even reduce some water quantity flow rates through evapotransporation at a given site, post project flows or "tailing water" will continue to deteriorate sensitive downstream aquatic habitats. Post project flows are gaining credibility in producing relatively clean water but are unable to significantly reduce overall watershed flow rates. Consequently, localized Army Corp of Engineer Section 206 aquatic habitat restoration projects may actually aggravate and contribute to regional, downstream deterioration.

As the previous discussion notes, water quantity impacts observed within a given restoration site often apply to the same features among downstream, post project settings. Accelerated erosion and stream bank destabilization downstream will inevitably impact natural coastal estuaries dependent on low creekwater inputs. Elevated downstream flows are also responsible for transporting sediment and contaminates to beach, tidepool and nearshore settings. Silt deposition functions to seal and "smother" estuary creek sandbeds to inhibit seepage and groundwater recharge while spawning stagnate, bacteria laden ponds. Sedimentation also blankets critical rock substrata along nearshore coastal habitats with adverse consequences for sealife and the ability of kelp to anchor holdfasts necessary for their survival. The downstream and coastal threats to public health and safety coupled with impacts to local economies are obvious.

As elevated urban post project flows accumulate, naturally protective beach sand berms are flooded and breached to discharge silt and sediment into tidepool habitats with devastating

consequences. Likewise, post project flows create a "freshwater lense" effect to elevate nearshore seawater temperatures and salinity while feeding toxic algae or "red tide" blooms rendering ancient kelp forests to extinction. For these many reasons, excess post project urban runoff water that will negatively impact and erode downstream settings is recently being reframed as a potential, feasible source for irrigation and groundwater recharging strategies.

Public Policy Implications

Fragmented governance can lead to unintended consequences for downstream aquatic restoration projects. Coastal wetland recovery, a major priority for state and federal agencies, is impossible in the presence of continuous flows of elevated water quantities, i.e., a combination of non-native urban runoff from upstream restoration tailing water mixed with traditional known point sources among stormdrains at inland residential, recreational, municipal and commercial developments.

A genuinely ecological approach will incorporate strategies, techniques and technologies in a "Bioregional Watershed Management Program" (see attached) to scientifically account for all ecological and social ecological variables influencing the overall health of a region. Key to a bioregional program is accurate baseline mapping of flow rates throughout the watershed as well as above, below and within a targeted Section 206 aquatic habitat restoration project site. Likewise, watershed creek flow rates and water quantities at strategic monitoring stations from the headwaters to golf courses to the beach and ocean urban runoff plume will track and reveal negative aquatic habitat impacts and potential restoration sites.

Applying the efficacious foundations of the recycling paradigm to a bioregional watershed program suggests a number of direct and in-direct benefits to water harvesting strategies. Downstream impacts, as noted, are dramatically reduced when Section 206 post project tailing waters are harvested and redeployed for beneficial reuse opportunities. The costs to polish this new source of local water are mitigated through resale as reclaimed water for irrigation and other uses as mandated by the Porter Cologne Act (e.g., dual plumbing in commercial and municipal buildings for toilets and air conditioners, irrigation, internal and external fire sprinkler systems, local emergency/crisis water supplies, etc.). A four-step water purification process at the Orange County Water District uses microfiltration, reverse osmosis, ultraviolet light and natural filtration. Recent scales of efficiencies fueled by an increased demand for water filtration technologies has created compact fleets of Mobilized Urban Runoff Filtration (MURF) Units capable of 96 hour deployment to capture, harvest, filter and redistribute up to 1 MGD to protect creeks and coasts from urban runoff pollution.

Additional economic benefits are acquired by electrical credits on the regional power grid. As noted by OCWD Board President Philip Anthony, "water purification uses one-half the energy required to bring water here from Northern California" or the Colorado River. Incentives and subsidies from the Metropolitan Water District, grants from the State Water Resources Control Board and numerous coastal conservancy groups and wetland mitigation banks can support initial three-year pilot demonstration projects to launch and refine sustainable, long-term urban runoff harvesting projects across the country and around the world.

Public agencies collaborating with progressive, ecologically oriented engineers, dedicated environmental groups and the emerging water filtration industry are harvesting urban runoff to locally produce reclaimed and even potable water supplies. Decentralized neighborhood cisterns capture storm water and dry weather urban runoff flows to create local sources of water and ease cumulative runoff pressure on the creeks and coast of a given area. Each new project generates significant, verifiable field data to advance bioregional watershed management programs and beneficial reuse opportunities. Regulatory agencies are wise to support these creative initiatives as water quantity assumes a key determinant role in successful water quality endeavors.

Actions by the SDRWQCB must adhere to the precautionary principle in protecting coastal communities from upstream water quality and water quantity impacts arising from the illegal use by Co-Permitees of MS4 infrastructure to convey dry weather flows to the coast.

Recommended Actions

1. The pattern of negligence and waste characterizing systematic failed measures by Co-Permitees demands intervention by the SDRWCB to institute Cleanup and Abatement measures aimed at numerical reductions of contaminated flow rates in a prompt, specific timetable at known inland MS4 facilities.

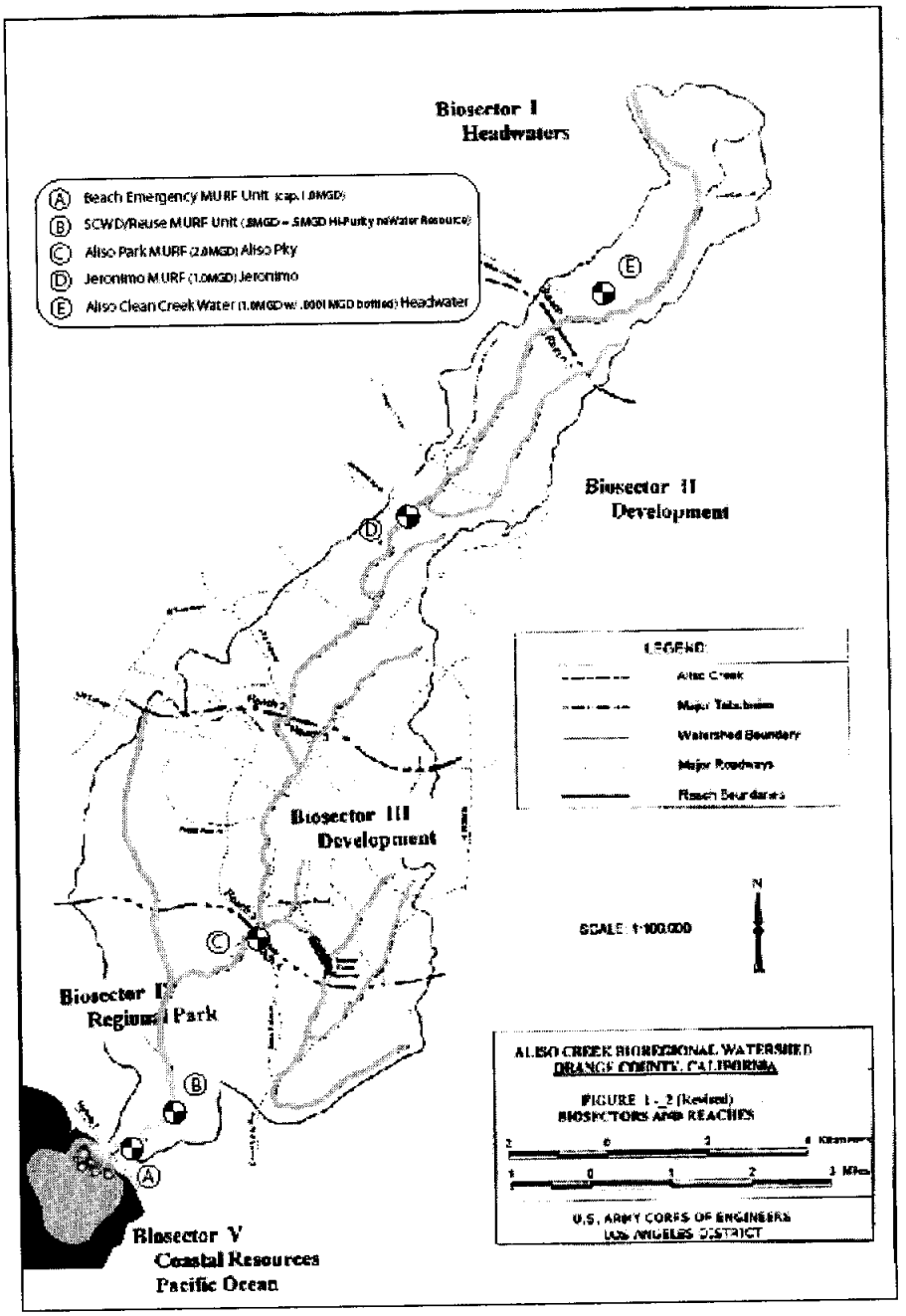
2. Issue citations against Co-Permitees for creating and perpetuating an attractive public nuisance by knowingly allowing inland dry weather MS4 discharges to accumulate and pollute a coastal estuarine wetland, Aliso Beach and the South Laguna State Marine Refuge.

Illegal breaching of natural beach sand berm
to create attractive public nuisance

3. SDRWQCB interventions can include:

    - Diversions to inland SOCWA facilities for treatment and reuse as reclaimed water

    - Strategic capture of MS4 discharges for filtration and local beneficial reuse until Co-Permitees demonstrate measurable results over the next 3 to 10 years capable of removing dry weather urban runoff.



- Fines levied against offending subwatershed, cities, homeowner associations, golf courses and others with elevated dry season discharge rates detected during monitoring activities

- Fines levied against offending inland water districts for failing to control urban runoff (i.e." imported water byproduct") through monitoring, punitive pricing structure and more aggressive recycled water programs

4. During the permit period, Co-Permitees have failed to achieve measurable reductions in MS4 discharges. SDRWQCB must exercise authority and assume control over the present, clearly defective watershed management programs. Private subcontractor services can be retained with stipulations for numerical reductions of flows and constituents within time certain performance parameters. Funds for such services can be recovered by reallocating funds presently wasted by failed Co-Permitee watershed management practices.

5. As mitigation for a pattern of failed watershed management programs that flood creek and coastal waters , Co-Permitees should be directed to restore the Aliso Coastal Estuary Wetlands to 1970 water levels for the reintroduction of the federally listed tidewater goby.

Conclusion

Twenty years and $20 million represents too much time and too much money wasted on mismanagement of dry weather urban runoff pollution contaminating Aliso Creek, Aliso Beach and the South Laguna State Marine Refuge. Water quality laws and regulations are not intended to be implemented for the convenience of Co-Permitees and their cohorts among the Residential Development and Building Industries. Dry weather MS4 discharges are directly attributable to the collective practices of these entities and constitutes an industrial wastewater byproduct.

Arguments to perpetuate and allow ongoing water pollution based upon "Maximum Extent Practicable", while being a scientifically imprecise concept, does not on balance take into account "practical" protection of irreplaceable coastal wetlands and ocean resources unnecessarily flooded by dry weather MS4 discharges. Nor does this argument account for the "unpractical" and costly poisoning of local sea mammals, birds and humans with water borne illnesses.

The San Diego Watershed Treatment System, supervised by the Santa Ana Regional Water Quality Control Board, demonstrates the effectiveness of strategic interventions sited among known inland point sources. Removing harmful dry weather urban runoff water quality constituents and elevated flows is possible through aggressive leadership by Regional Boards.

The South Laguna Civic Association appreciates the efforts by the San Diego Regional Water Quality Control Board to consider the enormous impacts of uncontrolled MS4 dry weather urban runoff pollution before approving a genuinely effective Storm Drain Permit Program for the Aliso Watershed.

Respectfully submitted,

Michael Beanan, Director
South Laguna Civic Association

Attachment: Bioregional Watershed Management Program

ALISO CREEK

BIOREGIONAL WATERSHED MANAGEMENT PROGRAM

INTRODUCTION

Today, many coastal and inland cities are involved in pioneering efforts to understand the impacts of urban development on the rivers and creeks that flow within their boundaries. Identified as bioregional watershed studies, these efforts attempt to look at a river, creek, bay or cove, measuring water quality at every major sector including storm drains, and extending into receiving waters with significant impacts on irreplaceable, fragile habitats.

The data derived from these efforts can be used to identify a contaminated area or condition. This provides the foundation for intervention(s) under a watershed management program. Overcoming institutional thinking within and beyond the local government agencies that insist upon cheap, short term and politically expedient solutions, which ultimately fail, still remains a significant hurtle in advancing ecological interventions.

The Aliso Creek Bioregional Watershed provides a unique area to implement a comprehensive and integrated action plan using a delicate partnership of government officials, academic scientists, business leaders, environmentalists and individual citizens.

BACKGROUND

The Aliso Creek Bioregional Watershed represents a semi-arid coastal canyon ecology in serious distress. The dual impact of pollutants and increased erosion from urban runoff is evidenced in beach contamination and the degradation of coastal waters. In addition, native flora and fauna has been negatively affected and in some cases displaced or lost. The water quality of urban runoff in Aliso Creek has been a problem for many years.

Health warning signs are often placed at the terminus of the creek into the Pacific Ocean because of water quality concerns. The principal problem concerns bacteria levels exceeding safe water quality standards in the creek and at its discharge across the beach. Other contaminants such as, domoic acid poisoning, thermal pollution and alterations in salinity, remain undetected and studies of the urban runoff impacts to estuarine, tide pool and near shore kelp forest habitats are not integrated in government watershed projects.

Contaminated discharge will subsequently be broadcast in waters utilized by migrating marine mammals and absorbed by game fish popular among commercial and recreational anglers. As littoral currents distribute the toxic discharge, surrounding beaches at Aliso Beach County Park,

Treasure Island Beach, Thousand Steps Beach and locally designated marine life refuges suffer severe, increased degradation and dangers to public health.

Many of the summer nuisance toxins contribute to birth defects and the incidence of cancer. Over the years, Aliso Creek has deposited silt to smother fragile coastal life forms. The federally protected tidewater goby is extinct and Aliso Beach is presently posted as a public health hazard. Once abundant kelp forests have greatly diminished or disappeared altogether, and the immune system of local coastal dolphins has reportedly been compromised by ongoing runoff pollution.

A comprehensive Bioregional Watershed Management Plan represents a deepening respect for the value of water as a precious life resource. Pilot Projects and coordinated Demonstration Programs can test emerging sound ecological science and distribute new findings to concerned agencies and organizations. The new water paradigm shift is drawing together local strategies, tactics and technologies to meet current and future water needs, based on sound ecological science.

PROJECT SUMMARY

The 5-R goals of urban runoff intervention and watershed management include and embrace:

- **Reduction** of point sources flows, such as excessive landscape watering.

- **Removal** and treatment of contaminants for discard, dilution and reuse.

- **Reuse** of treated runoff as New-Water for landscape/golf and other uses.

- **Revenues** enhancement as a result of New-Water subsidies and user fees.

- **Restoration** of damaged habitats, and of public awareness/use of resources.

The proposed Bioregional Watershed Management Program is conceptualized in Three Phases with generalized budgets estimated as follows:

Phase One	Site Selection/ Tech. Assessments/ 5-day Field Sampling/ Flow Analysis/ Testing Assumptions - each @ $2,000	$30,000

Phase Two	90 Day Pilot Testing @100 GPM	72,000
Phase Three	Three Year Demonstration Project (offset by revenue)	$ 625,000

Concurrent projects and activities in support of goals, and as byproducts of separate Phases:

Marine Refuges:	Restoration of Abalone and Garibaldhi habitats	$ 250,000
Public Education:	Outreach and Education Events	25,000

The goal seeks partnership funding and/or pro bono grants to provide for initial investment costs, and for increased new water revenue sources to cover ongoing costs on a sustainable basis.

ALISO CREEK BIOREGIONAL WATERSHED MANAGEMENT PROGRAM

PHASE I: 30 Day Site Selection and Flow Rate/Water Quality Analysis

Pre-Project Elements	Subtotal
A) Site Selection – Review potential project sites to confirm adequate, infrastructure support (i.e. power sewer & reclaimed water lines, stormdrain outlets, etc.) in selecting ideal situs	$ 2,500
B) Water Contracts – Negotiate and secure water reuse contracts with local Water Districts to supplement and improve existing reclaimed water supplies. Identify any water rights requirements	2,500
C) Water Quality Analysis - Conduct series of water quality samplings and analysis panel to confirm pollution constituent at three locations: 100 yards upstream of project site; project site; 100 yards downstream	7,500
D) 5-Day Equipment test – Deploy field test and decommission filed test of project technologies. Conduct bi-hourly WQ sampling at principal filtration ports	12,000
E) Public Education – Organize and host press event to highlight pilot project goals, objectives and preliminary field results	1,500

F) Pre-Project Reports – Consolidate and analyze WQ sampling , infrastructure and equipment field test Results to finalize Phase II Protocols	1,800
TOTAL	$ 27,000

PHASE II: 90-Day Assessment and Pilot Test Budget Estimate

Pilot Project Elements	Subtotal
A) 90 day pilot test - The selected treatment system will be operated for a period of 90 days treating creek water, to attain Rec (1) standard for human contact. Treated water will be released back to creek.	$ 15,000
B) Treated water analysis - Treated water samples will undergo laboratory analysis to timely determine the effectiveness of the treatment effort.	10,000
C) Develop public awareness strategy - Investigate alternatives to provide area residents with information relative to intervention measures being undertaken. Contact local homeowner associations to enlist support and sponsorship of runoff reduction/habitat restoration initiatives.	3,000
D) Identify regulatory issues - Analyze potential beneficial impact of various regulations and requirements if properly implemented.	2,000
E) Local agency contacts – Continue initial contacts to secure necessary permits and project cooperation.	2,000

F) Water reuse evaluation - Examine possible alternatives to reintroducing the water to the creek including further treatment and reuse. 3,000

G) Contingent Water Capture – Capture and pump on temporary basis accumulated urban runoff @creek/beach terminus (in excess of 12" pond depth) to existing municipal sewer lift 5,000

H) Program Planning – Prepare planning documents, activities and timelines for Three to Five Year Demonstration Project. Scale treatment system requirements, establish water reuse alternatives, draft grants for state/federal funds, design program evaluation model. 4,000

I) Project Management – Administer operations, approve fund dispersals, coordinate with city, community, industry and related organizations, media relations, project evaluation and reports. 5,000

Total $50,000

Project Overview – Phase Three and Concurrent Projects

With the successful completion of Phase Two activities, the Three Year Demonstration Project will provide:

Strategies, Technologies and Services - Field utilization and evaluation of existing and emerging technologies, strategies, products and services in a controlled application

Outreach and Education – Sustain and increase overall participation and support for runoff reduction / removal & reuse / restoration efforts from a variety of populations in the private and public sectors

Project Organizational Management – Coordinate all activities and capital, labor, material resources. Conduct weekly staff team meetings and reconcile all financial accounts. Prepare and submit project reports, grants, exhibits, etc.

Operations are designed to complement existing and proposed sources of funding and in-kind contributions from the public and private sectors to avoid duplication of services and create synergy among otherwise disparate interventions.

A. STRATEGIES, TECHNOLOGIES AND SERVICES

1. RUNOFF REDUCTION

In coordination with current activities by public jurisdictions within the bioregional watershed, water agencies, developers and environmental organizations, the Demonstration Project will field test, apply and evaluate existing and emerging urban runoff reduction and water quality enhancement strategies and technologies across significant levels of analysis:

Residential

Install remote monitored irrigation sensors

Household toxin/fertilizer replacement program

Two-tier water rate incentive structure

Neighborhood/Development

Herbicide, Pesticide, Fertilizer reduction/replacement

Street/Park debris clean up

Flow rate and water quality monitoring/sampling/testing program for each storm drain/creek outlet

Drain pack filters at all storm drain inlets

Biofiltration ponds, parks, basins to metabolize target contaminants and evapotranspiration 10%(+-) of flow rate

Weekly sampling/testing at watershed sector boundaries

2. TREATMENT

Urban runoff treatment will incorporate strategies to address flows from point sources as well as accumulations of nuisance water at the neighborhood and biosector levels.

Residential

Recontour properties to retain/absorb on-site low flow domestic and first flush runoff water

Introduce dual plumbing for landscape and sewage disposal use

Enrollments in home water conservation program and rebates

Neighborhood/Development

Biofiltration for wetland ponds, parks, groundwater replenishment wells and pre-treatment for filtration technology

Bioregional

Multiple Urban Runoff Recycling Integrated Treatment (MURF) system to filter and remove contaminants to Rec (1+) standards

Release limited flows of treated water to maintain proximate natural creek flows/habitat

Polish surplus water w/ Reverse Osmosis (RO) & Ultraviolet (UV) Light Technology for new water redistribution system

3. RESTORATION

Reduce contamination and excessive runoff flows to support habitat mitigation/restoration programs in riparian, creek, beach and ocean habitats:

Pre-project Baseline Data Mapping

Video survey, field inventory and GIS map pre-project key habitat profiles @ gully, creek, beach, tide pool and underwater sites

Literature review of flora/fauna history in preparation of historical habitat maps

Habitat restoration design, schedule, budget parameters for native riparian, coastal and underwater flora/fauna program

Preliminary Restoration

Removal of non-native plants; hillside and riparian contouring

Construction and grading of water quality wetlands; installation of earthen swales, watercourses; and replanting of native plant habitats in creek, beach, ocean sites per plan

Habitat Restoration Program

Urban stream park planting, irrigation, maintenance

Underwater kelp reforestation park, mariculture sites (e.g. abalone, scallops, lobsters, crabs, etc.) and maintenance

Docent guided tours to creek , tide pool and underwater restoration sites

B. OUTREACH AND EDUCATION

1. MEDIA OUTREACH

A series of newspaper articles, television interviews, human-interest stories and one press conference have established a sound foundation for Phase Three activities. Project team members continue to network with their affiliate groups and organizations to inform and refine the overall goals and objectives of the watershed management program. Additional relationships through private meetings are in place to nurture a sense of group ownership in not only the watershed but in opportunities for bioregional strategies elsewhere.

Future news articles promoting runoff recovery/treatment/reuse to achieve habitat restoration are planned to stimulate a new public perception in recycled water opportunities. Pilot applications of water reuse to irrigate golf courses appear to have widespread appeal.

2. EDUCATION

Significant momentum to improve watershed management is now underway as a key component in developing public awareness and cooperation. Specific activities contemplated to support outreach and education include:

- Design, produce and present to a variety of education, community, professional, government groups a twenty minute 2D power point overview and accompanying pamphlet of Bioregional Watershed concepts and strategies with text and basic illustrations.
- Organize and conduct small enrollment, after school and Saturday workshop format education/training program to familiarize participants with academic underpinnings of social ecological interventions while providing regular hands-on field training exposure to riparian, coastal and ocean restoration techniques for academic credit at affiliated schools and colleges.
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- Design and produce banners and coloring book artwork by Orange Coast College students working with elementary students to educate children and parents of the uniqueness of kelp forest, tide pool and riparian ecosystems.
- Multimedia exhibit featuring ocean thematic art at local galleries.
- Junior water monitor program modeled after Hartford Life Insurance Company's Junior Fire Marshal Programs at local elementary schools to identify and inventory residential household toxins. Semi-annual round-up of household contaminants and replacement with nature friendly alternatives.
- Additional projects emerging from Project Team input and recommendations from the watershed community.

3. COMMUNITY OUTREACH

Regular distribution of outreach/education information can occur in conjunction with parallel efforts by the County of Orange, Surfrider Foundation and OC Coastkeeper to include:

Mailings
Local Residents
Environmental Organizations
Water Agencies and Institutes
Elected officials
Schools and Colleges

Media
Monthly Press Updates
Special Topics and Human Interest Stories
Exhibits/ Press Conferences

Meetings
Officials
Environmental Groups
CommunityGroupsand Homeowners' Associations

Schools and Colleges

4. EVALUATION

A comprehensive program evaluation utilizing multi-variable analysis will assess the impacts of the above outreach and education interventions. Among indices to identify and track will be:

- Type and number of participants in each project component.
- Changes in measurable behavior relative to runoff reduction, reuse and restoration activities.
- Water conservation enhancements, such as reduced flow rates and improved water quality.
- Non-proliferation of herbicides, pesticides and similar contaminants in targeted neighborhoods.

The Outreach/Education Program Evaluation Component will be coordinated with researchers from the School of Social Ecology, UC Irvine to generate independent quarterly summary reviews and to supplement data in the Annual Phase Three Project Report.