# WR NEWS

**Office of Water Reclamation, City of Los Angeles**

**Volume 2, Issue 3** **October 1991**


## Reclaimed Water... What's the Risk?

The State of California's *Wastewater Reclamation Criteria*-- the regulations that define the treatment process and safeguard the healthfulness of reclaimed water--are currently under review. As part of this effort, a recent study* by top scientists and Public Health Officials targeted two primary questions: what is the concentration range of viruses likely to be in reclaimed water and what infection risk do they pose, if any?

The study drew on existing data compiled by wastewater treatment facilities throughout California between 1975 and 1989. Researchers developed four exposure scenarios to index the risk of virus infection to humans from reclaimed water: recreational use in lakes and reservoir, golf course irrigation, food crop irrigation, and groundwater recharge. When the technical analyses of these data were evaluated against the present Criteria, the results proved impressive. The existing Criteria protect the public health quite

**(see Risks?, p.5)**

## Financing Water Reclamation

**By**

**Timothy F. Brick, Director, Metropolitan Water District**

The potential of reclaimed water to meet Southern California's future water needs will be severely diminished unless the Metropolitan Water District aggresively pursues its commitment to provide capital funding for local water reclamation projects.

In 1981, when the Met's Local Projects Program was established, Metropolitan provided capital funding for projects up to $300 per acre foot. Then, because of a cash crunch in 1983, the Local Projects Program was suspended. When it was reauthorized in 1986, MWD staff proposed support based on the yield of the project, funding for operations rather than capital. Our board, however, insisted that capital funding be retained as an option. We realized that the yield formula would benefit newly developing areas. Without the capital option, however, established areas of Southern California and smaller entities with limited capital resources would be left out. Although the MWD Board authorized both options, unfortunately no new projects have gone forward with capital support since the program was reinstated.

MWD projections of an additional 300,000 acre feet of reclaimed water by the year 2010 cannot be met without capital support. As many as one hundred new or expanded reclamation projects costing more than $1 billion must be developed to meet this goal. This is a tremendous and unreasonable burden for local agencies which often lack the experience and resources necessary to undertake capital financing. Furthermore, putting the burden of financing on the local agencies puts all the risk on small local agencies, while the benefits of such projects

**(see Financing, p.6)**

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# Water Reuse Liability is Zero!

**Bahman Sheikh**

Agencies new to water reuse always ask the same fearful question: what's the potential liability of getting into the water reclamation business? The answer is NONE. In the most litigious state in the Union, not one plaintiff has succeeded linking imagined injuries to exposure from reclaimed water. There have been a few unsuccessful attempts.

Given that some 200 agencies state-wide have been providing reclaimed water to 850+ multi-use sites for several decades, this record is remarkable! Reclaimed water is produced and used so safely in California, that not a single agency in the state has ever been held liable. The record speaks for itself!

So how can risk managers address their clients' concerns about liability without jeopardizing the potential use of this important resource? We recommend the following: 1) examine the litigation record, including cases that never came to a decree; 2) research case law and 3) talk to the experts. Once done, these three steps will show: settlements in favor of defendants, weak cases without preceedent or foundation, and a growing legion of experts who testify for reclamation. We in Southern California have an opportunity to develop water reclamation to meet our dire water needs. Let's not allow fear of a non-existent liability to stand in our way.

# A Busy Year for Water Reclamation

By the Year 2010, the City of Los Angeles is committed to recycling 40% of its wastewater beneficially. City departments have been busy during fiscal year 1990-1991 making sure this goal becomes a reality. Here's an update on their activities:

The Los Angeles Greenbelt Project: Now off the drawing boards and underway, this $4 million dollar 5 mile pipeline will carry reclaimed water from the Los Angeles-Glendale Water Reclamation Plant to several irrigation locations. It's estimated that this pipeline alone will free-up over 521 million gallons of potable water each year and save those using potable water for landscape irrigation 20% off their water cost. This system should be operational by the end of 1991.

In an allied effort, the City of Glendale, with financial assistance from the City of Los Angeles, has broken ground for an additional pipeline to transport reclaimed water to

**(see Reclamation Year, p.7)**

**OWR NEWS** is published by the **Office of Water Reclamation**, Room 366, City Hall, 200 N. Spring St.,Los Angeles, CA 90012; (213) 237-0887. We welcome submissions of articles and story ideas. The Office of Water Reclamation reserves all editorial rights. Special thanks to our contributors this issue: Tim Brick, Bill Lauer, Ken Thompson, Jim Edmondson



**OOPS: We erred, when we wrote in the last issue of OWR NEWS that "...the City expects to receive a rebate of $154 per acre foot from the Metropolitan Water District's Local Projects Program." In fact, Los Angeles's application has not been submitted in final form yet, much less approved. The "expectation" is somewhere between the director's wishful thinking and an informal assessment of our probability of success once our application has been completed. Apologies to our readers who may have been led to believe that the rebate was a done deal!**

SPOTLIGHT

# Denver Potable Reuse Looks Successful

By

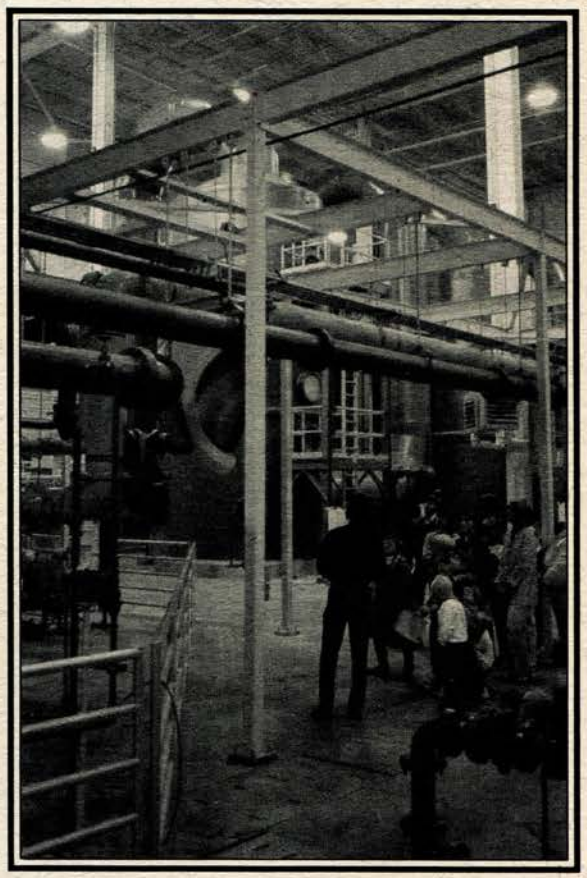
**William C. Lauer, Reuse Project Manager, Denver Water Department**

Denver's landmark Direct Potable Reuse Demonstration Project completed its plant operations phase after more than eight years. The world's most complex water treatment plant continuously processed 1 mgd of unchlorinated secondary wastewater converting it to potable water quality. The plant utilized the following treatment processes during the final two years of operation: high pH lime clarification, recarbonation, filtration, ultraviolet irradiation, activated carbon adsorption, reverse osmosis or ultrafiltration, air stripping, ozonation, and chloramination. Several alternative treatments were investigated prior to selection of this sequence which was used during the health effects study period (e.g.,ion exchange and advanced oxidation processes as well as several other combinations).

***...all results collected thus far indicate that the reclaimed wastewater consistently achieved a purity far better than water currently provided by any municipal supply.***

The final two years provided samples for chronic toxicity and carcinogenicity studies on rats and mice, and the reproductive toxicity study on rats. Since the animal feeding portion of these unprecedented evaluations have been completed, it was no longer necessary to continue operation of the treatment plant. The facility has now been closed and a decision on its future is still pending.

The results from the animal studies, as well as those from the comprehensive water analysis program, will be combined and used to determine the relative safety of reclaimed wastewater compared to Denver's current drinking water. Due to the complexity of the data, a final report is not expected until 1992. However, all results collected thus far indicate that the reclaimed wastewater consistently achieved a purity far better than water currently provided by any municipal supply.



**Denver's Potable Water Reuse Demonstration Plant**
**Denver Water Department**
**(303) 628-6000**

# Gray Water Groundbreaking!

It's official--the Los Angeles Gray Water Pilot Project is under way! On August 29th, the first of eight gray water systems was installed at the Lutheran Home, an apartment complex for the aged. During September the four contractors installing the gray water systems will be busy at the other seven designated sites around the within the city. In a speech to mark the first installation at the Lutheran home, Councilwoman Joan Milke Flores stressed that City policy makers will take a long hard look at the Project's results before allowing the future use of Gray Water for L.A. homes.

The OWR will be coordinating the data collection for this informed decision. Under the direction of Dr. Bahman Sheikh, a specialist in water recycling, soil and water samples will be collected and analyzed from each test site. Since the success of this project depends on complete and accurate data, all parties involved are invited to contribute. Your continuing input and support has been and will continue to be invaluable.

As information becomes available, regular updates will appear in *OWR NEWS* . Please feel free to provide data or ask questions. Call or write Gary Ghiaey, the project manager for the gray water pilot project.

# San Francisco Goes For Dual Plumbing

San Francisco's City and County Board of Supervisors is now contemplating a dual plumbing ordinance that shares similar features with that proposed for the City of Los Angeles. The proposed ordinance and the map that defines the prospective reclaimed water service area is currently undergoing environmental review. If passed, non-residential and residential high rises exceeding 40,000 square feet would be mandated to use reclaimed water for toilet flushing by 1/92 and 1/2000 respectively. New construction, such as the massive Mission Bay Project, would be affected and required to use dual plumbing and reclaimed water for non-potable water needs. Many California communities have already adopted dual plumbing requirements. Los Angeles and San Francisco are sending a strong pro-water reclamation signal to the rest of urban California.

# The Color Purple

The color purple is now officially associated with reclaimed water transmission pipelines, pumps, controllers and other related materials. A committee of water reuse officials from around Los Angeles County, called LACRWAC* meets for lunch once a month at different locations to discuss topics of interest to this fast expanding professional group. In recent meetings they adopted a specific hue of the color purple (Pantone 512C) to be used uniformly by all agencies on signs, pipes, cabinetry, etc. related to reclaimed water. They also agreed on wording of signs and special warnings to prevent people from drinking from reclaimed water.

* Los Angeles County Reclaimed Water Advisory Committee

## Reclaimed Water Restores Endangered Habitat

Southern California coastal streams, wetlands and estuaries have been reduced to a fraction of their abundance due to regional population growth and development over the past century. Area steelhead trout (Oncorhynchus mykiss) have marched into extinction along with this growth. The removal of streamflows for out-of-stream uses is primarily responsible for this deterioration. Malibu Creek today represents the southern boundary of this species existence along the Pacific coast. A wastewater reclamation plant has partially enhanced Malibu Creek streamflows that are responsible for the maintenance of this remnant fish population. However

(see Habitat, p.7)

# Zen of Reuse

Irrigation of half of the Japanese Gardens adjacent to the Tillman Water Reclamation Plant was converted from potable water to reclaimed water during September. This is a very important though small step in the City's efforts to put water reuse into practice. The Japanese Gardens were constructed as an integral part of the Tillman Reclamation Plant in 1985 and were always intended to be irrigated with reclaimed water from the Plant. We are very pleased to report that reclaimed water use at the Gardens is now a reality and will expand as plant personnel gain experience and comfort with it.

**Tillman Reclamation Plant Japanese Gardens**

## Risks?

**(from p.1)**

adequately.

Dr. Bahman Sheikh interpretting these findings, emphasized that, "The infection risk from swimming in filtered reclaimed water is so low as to be negligible. Compared to this standard, golf course irrigation is 100 times safer, spray irrigation of food crops is 10,000 times safer and groundwater recharge is 100,000 times safer still! One might even ask if the standards are too high?"

To obtain copies of the study contact: Dr. Takashi Asano, Water Reclamation Specialist, State Water Resources Control Board, Office of Water Recycling, 2014 T Street, P.O. Box 944212, Sacramento, CA 94244-2120.

*Asano, T., L.Y.C. Leong, M.G. Rigby, and R.H. Sakaji, "Evaluation of the California Wastewater Reclamation Criteria Using Enteric Virus Monitoring Data, " to be presented at Water Quality International '92, International Association on Water Pollution Research and Control (IAWPRC), Sixteenth Biennial Conference and Exhibition, Washington, D.C. 24 -30 May , 1992.

# San Diego Potable Reuse

**By Ken Thompson, Water Production Superintendent, City of San Diego**

San Diego depends on imported water for at least 90% of its supply. Recognizing that its available water supplies will fall short of the projected needs by the year 2000, San Diego has been working since the 1950's on ways to meet future water demands. Early attempts to use secondary treated wastewater for irrigation and distilling ocean water into a potable supply were unsuccessful.

Since 1981, the City has been experimenting with an aquatic system for the secondary treatment of wastewater. The aquatic system, based on the use of water hyacinths (Eichornia crassipes), is an integral part of the City's Total Resource Recovery Program.

**(see San Diego Reuse, p. 6)**

## Financing

(from p.1)

are truly regional. Reclaimed water projects may qualify as Met's most reliable source of supply, but, because of the capital financing difficulties of local agencies, many worthy projects will go unbuilt.

State support for reclamation projects will continue to be vital, but the MWD as the regional water supply agency is uniquely suited to provide planning assistance and financing for such projects. Providing both options for local agencies is the best way to go. Those agencies which need assistance with operating expenses can choose the yield option, while those which need capital financing can get that. The MWD must also ensure that capital and operating support keeps pace with rapidly escalating water prices which will triple in the next ten years.

The MWD has a central role to play in the development of reclaimed water for Southern California. This water is as vital as flows from the Colorado River or from Northern California or from groundwater programs. If the MWD is to fulfill our mandate to provide for the future needs of Southern California, we must take the lead in promoting public acceptance of reclaimed water, help overcome institutional barriers, provide regional planning resources, and promote dual piping requirements for new annexations and subdivisions. Capital financing, however, is the key to promoting reclaimed water development in Southern California.

## San Diego Reuse

(from p.5)

This program is an experimental activity undertaken by the City to study the technical issues associated with, and to develop a strategy for, wastewater reclamation. The goal of the program is the complete recycling of a portion of the City's water.

Based on the positive results obtained with the experimental system, an expanded aquatic treatment process with a capacity of 1.0 million gallons per day is now in the first stages of construction.

To achieve this goal, an innovative aquatic treatment system (6 ponds with water hyacinths) to provide secondary treatment was constructed. Secondary effluent from the aquatic system is further treated in an advanced water treatment plant consisting of coagulation, filtration, ultraviolet light disinfection, reverse osmosis, and granular activated carbon adsorption. If, after an exhaustive health effects study, the health risks for the water from the advanced process are found acceptable relative to the existing raw water sources it is proposed to return the treated water to storage reservoirs. Data for Phase I of this study (July 1987-June 1990) has been collected and is being evaluated for a report to be released in early 1992. There the treated water will be mixed with imported water and stored for a period of approximately two years. The mixed water could then be used as a raw water source. At the present time we sell chlorinated secondary effluent to the State for use in irrigating highway landscaping and for dust control at City construction sites.

Based on the positive results obtained with the experimental system, an expanded aquatic treatment process with a capacity of 1.0 million gallons per day is now in the first stages of construction. It is anticipated that the expanded aquatic system will be in operation by late 1992.

## 1991 Reclamation Year

(from p.2)

Forest Lawn Memorial Park and Elysian Park. Construction began in June. When completed, over 113 billion gallons per year of potable water will be made available for other uses.

Sepulveda Basin Project: In another cooperative pipeline project, the Departments of Public Works and Recreation and Parks have joined forces with the LADWP. The first stage is an interim pipeline, slated for start-up by January 1992. Not only will this pipeline deliver 391 million gallons of reclaimed water to the Basin for landscape and golfcourse irrigation, it will also fill the recreational lake with an additional 3 billion gallons per year of reclaimed water. A permanent reclaimed water distribution system with a 2.2 billion gallon capacity per year will follow.

Other Online Plans and Projects:

o Last January, the LADWP began a two year study that examines the feasibility of diverting the water discharged into the Los Angeles River by the Tillman Water Reclamation Plant to recharge the groundwater basin north of Griffith Park.

o If the East Valley Water Reclamation Project has its way, the Eastern portion of the San Fernando Valley will have access to reclaimed water by 1995. This ambitious undertaking moved ahead in August when the DWP certified the Environmental Impact Report. The path is now clear for the project's technical planning.

o The West Basin Municipal Water District and the City of Los Angeles have reached an agreement that will allow the City to sell secondary effluent to the District. In exchange, the District will sell the City reclaimed water for irrigation and industrial uses.

o As OWR's gray water pilot project gets off the ground, the LADWP is providing the technical lab work required for the ongoing analysis of the soil and water samples taken from the gray water test sites.

City Hall Ordinances: Two ordinances are currently before the City Council awaiting enactment. The first mandates the use of dual plumbing in all new highrises to facilitate the future use of reclaimed water. The second proposes a ban on automatic water softeners. These devices tend to discharge salts that tend to degrade the source quality of reclaimed water.

## Habitat

(from p.4)

increased freshwater inflows to the lagoon have negative effects. With the anticipated continued growth in Southern California's population - and wastewater reclamation - new opportunities now exist to restore degraded coastal streams and wetlands regionwide. No clear public guidelines on the beneficial uses of this new water source exist. This paper summarizes the experience gained at Malibu Creek and makes recommendations towards developing an enlightened governmental policy on the beneficial uses of reclaimed water.

**reprinted from:**

"Restoring Southern California Coastal Streams and Wetlands Through the Allocations of Reclaimed Water: The Malibu Creek (Los Angeles Co.) Experience,"

Jim Edmondson
California Trout, Inc.
San Franciso, CA 94102

## TERMS IN H2@ RECYCLING

**available water -** The portion of water in soil that can be readily absorbed by plant roots.

**BOD -** Biochemical oxygen demand. A standard test used in assessing wastewater strength.

**evapotranspiration -** The combined loss of water from a given area and during a specified period of time by evaporation from the soil surface and transpiration from plants.

**leaching fraction -** The fraction of water applied to soil that leaches below a depth of interest such as the root depth

**permeability -** The ease with which gas and liquids penetrate or pass through a soil.

# CALENDAR

**"International Symposium on Wastewater Reclamation and Reuse,"** September 24 - 26, 1991. Castell Platja d'Aro, Gerona Spain.

**"Water Pollution Control Federation,"** 64th Annual Conference, October 6 - 10, 1991, Toronto, Canada.

**"Seawater Desalination,"** Major Processes and their Prospects in Municipal Water Supplies, October 9-10, 1991, Santa Barbara, CA (805) 893-4200

**"Reclamation/Recycle/Reuse,"** Symposium 1991, WateReuse Association of California, October 30-November 1, Newport Beach,CA (916) 442-2746

**"California Water Policy: Toward a New Consensus,** "November 8-9, 1991, The Biltmore Hotel, Los Angeles. Sponsored by the Local Government Commission of California. Contact Debbie Dodson, (916) 448-1198.

**"Hydrotop '92, Scientific and Technical Colloquim,"** April 8-10, 1992 Marseille, France.

**"Water Quality International '92,"** 24-30 May 1992, Washington D.C.

**"Desalting and Recycling, Meeting Today's Water Challenges,"** 1992 Biennial Conference, August 23-27, 1992, Newport Beach, CA

# RESOURCES

"Big Fears, Little Risks" a videotape narrated by Walter Cronkite discussing the safety of municipal water supplies and the relative risks of minute concentrations of contaminants. This film may be borrowed from OWR, call 213 237-0887.

"Restoring Southern California Streams and Wetlands Through the Allocations of Reclaimed Water: The Malibu Creek (Los Angeles Co.) Experience "
Jim Edmondson, California Trout Inc. San Francisco, CA 94102. Copies may be obtained from OWR, call 213 237-0887.

**OWR NEWS**
**Newsletter of the**
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**Room 366, City Hall**
**200 North Spring Street**
**Los Angeles, CA 90012**

**TO:**

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# CITY OF LOS ANGELES
CALIFORNIA

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October 24, 1991

Rafael Mujeriego
Universidad Politecnica de Cataluna
Gran Capitan, s/n
08034 Barcelona
Spain

Dear Mr. Mujeriego,

It was a pleasure participating with you at the first international water reclamation and reuse symposium in Spain. It was an excellent symposium and provided great opportunities for learning, exchange of information, expressions of opinion and motivation for active furtherance of water reuse throughout the world.

In the hope that you may be interested in continuing this exchange, I am enclosing a copy of the latest issue of OWR NEWS, the newsletter of the City of Los Angeles Office of Water Reclamation for your use. Please share the newsletter with your colleagues who may be interested in water resue. If you are interested in receiving future issues, please write or send back the enclosed post card. We would like to receive any newsletters or reports that your own agency has prepared or is publishing, even if there is a charge involved. We would also be very interested in including news of water reclamation from your agency for the interest of our readers in the City of Los Angeles. Please send us a draft of proposed articles and photographs whenever you have newsworthy items.

Your response to this inquiry will be much appreciated.

Sincerely,

Bahman Sheikh, Ph.D., P.E.
Director
Office of Water Reclamation

Enc.