

EXHIBIT L

14

Monday, November 13, 2006

To: Richard R. Rudnansky, Special Counsel
Of Subject Report

Cc: Modesto-CA City Council

Mayor Jim Ridenour

Vice Mayor, Will O'Bryant

Bob Dunbar, Council Member

Brad Hawn, Council Member

Janice Keating, Council Member

Garrard March, Council Member

Kristin Olsen, Council Member

Mr George Britton, Modesto-CA City Manager

Jean Morris, Modesto City Clerk

Subject: City of Modesto PUBLIC NOTICE published in Modesto Bee
'displayed unreadable font type size'. This is an INEFFECTIVE way to
solicit Comment for inclusion/considerations to "Draft Review of Water
Utility Costs of Service Rate Study".

--- Danny Gottlieb, local Water RatePayer / Taxpayer

Contact: food_farmer@sbcglobal.net or tel 529-8832

The Wednesday 10/18 Modesto Bee published 'Public Notice' by City of
Modesto concerning a '20 days only' call for Public Comment on the
Costs of Water supplied by Modesto Water System was 'unreadable' due
to 'to small type' in Ad.

What is our Modesto City government trying to hide, or avoid with these
'to small to read' legal Public NOTICES'?

In the beginning of Public Notices 2005 yr soliciting Public to meetings
on Water plant expansion and retrofitting, readable font sized 10-12
Public Notices were published in front, inside pages of newspaper; and
not buried/lost in the middle of Classified Ads, in unreadable print size.

Modesto City Council & City Manager need to quickly 'clean house' on
this illicit matter of Public Notices being 'UNREADABLE' when published
in newspapers.

The City of Modesto PURCHASING DEPT. needs a new, or revised SOP spelling out the minimum legal FONT SIZE for any, to be published' City 'Legal NOTICE'

Please consider the 'font size' in many City of Modesto 'Legal' NOTICES appear not to meet the minimum requirement of 'font size 12' requirements of The Americans with Disabilities Act of 1990 (ADA).

Who in City government allows the waste of Tax Payers' thousands of dollars budgeted for READABLE Public Notices by signing off on unreadable ad copy for Public Notices? Even worse, the 'hidden issue', because we fail to read a Legal Notice, may unduly Cost us all not required millions!

Please review copy of State of CA - Resource Agency Exhibit attached to this Cover before concluding changes for the Better Published Communications with Public, especially the ADA legal considerations.

Danny
--Danny G.

Very READABLE & properly formatted!

Unreadable!

NOTICE

The City of Modesto will receive written comments on the recently released Draft Report on Review of Water Utility Costs of Service Rate Study.

All said written comments shall be provided to the Modesto City Clerk's office on or before November 7, 2006.

The City Council directed Special Counsel Richard R. Rudensky of Meyers Nove to review and investigate the 2004 Water Utility Costs of Service Study which was the basis for water rate increases which commenced on January 1, 2005 and determine:

- (i) whether the projected revenues from the Water Utility Cost of Service Rate Study and the accepted water rates are, and/or will be, more or less than what has actually been received to date and what is anticipated to be received in the future; and
- (ii) if the conclusion is that revenues were significantly more or less, determine why this discrepancy occurred.

As part of this review the City Council directed that the public be given an opportunity to present written comments on a Draft Report addressing these issues. Any such written comments must be submitted to the City Clerk on or before November 7, 2006. The Draft Report with Exhibits has been completed and is currently on file for review at the City Clerk's office. Copies of the Draft Report on any services thereof may be obtained upon request and payment of copy costs to the City Clerk.

The Draft Report will be discussed at the City Council meeting of November 8, 2006 that will commence at 5:28 a.m.
OCTOBER 12X, NOVEMBER 1 2006

Notice of MID Public Hearing

The Modesto Irrigation District (MID) Board of Directors will hold a public hearing on proposed changes to MID's electric rates and service rules on Tuesday, November 14, 7 p.m., MID Board Room, 1231 11th Street, Modesto.

Proposed changes will be introduced at the November 7 MID Board meeting, 9 a.m. 1231 11th Street, Modesto. The proposal will be available at the meeting, from the Office of the Board Secretary after the meeting (209/526-7360 or 1231 11th St., Modesto, Mon.-Fri., 8 am-5 pm), or on the MID web site, www.mid.org. MID will be closed Friday, November 10, to observe Veterans Day.

The public may comment at the November 14 hearing, by mail to MID Board of Directors, PO Box 4060, Modesto, CA 95352-4060 or through MID's web site, www.mid.org. The Board will consider adoption of a rate package at its November 28 Board meeting, 9 a.m. in the MID Board Room, 1231 11th Street, Modesto.



State of California - The Resources Agency CALIFORNIA STATE PARKS		MANUAL
DEPARTMENTAL NOTICE No. 2000-07		Operations
SUBJECT		CHAPTER
ACCESSIBILITY AND PUBLICATIONS POLICY		DOM 1800 (new)
ISSUED	EXPIRES	REFERENCE
October 19, 2000	When Incorporated	

DPR 375 (Rev. 11/07) (Form 12/3/07)

WHEN APPLICABLE, ENTER THE NUMBER AND DATE OF THIS DEPARTMENTAL NOTICE IN THE MARGIN OF THE MANUAL PAGE, ADJACENT TO THE SECTION(S) AFFECTED BY IT.

This Departmental Notice has been re-created for transmittal in electronic format. The original notice was signed by Mark Schrader, Chief, Park Design and Construction Division; and Dick Troy, Deputy Director, Park Operations.

INTRODUCTION

Communicating park information to the public is essential to the mission of the California Department of Parks and Recreation. This communication often takes the form of publications. The Americans with Disabilities Act of 1990 (ADA) requires that public entities' publications are accessible to people with disabilities; therefore, the Department must ensure that its communications with individuals with disabilities are as effective as its communications with others. Regulatory references: 28 CFR 35.160-35; Title II TAM 11-7.000.

This Departmental Notice establishes a policy to ensure that the Department's publications comply with the law and also establishes clear standards to follow in producing accessible publications throughout the Department. In addition to being accessible, publications must provide accurate information about accessible facilities and programs.

ACCESSIBILITY AND PUBLICATIONS

All new or reprinted Department publications shall be prepared using the following parameters based on the Americans with Disabilities Act of 1990 (ADA). This policy applies to publications developed at the Headquarters, District or Unit level, including items produced by cooperating associations and concessionaires, and park program materials. Publications include brochures, booklets, books, announcements, advertisements, park maps, campground maps, plans, technical reports and newsletters.

1. Public Information

- A. Publications shall integrate information about accessible features with general descriptive information regarding park sites and facilities. A standard symbol of accessibility shall be used to locate accessible features on maps and to identify the location of accessibility information within the publication text.



B. Publications shall state the availability of a teletypewriter (TTY), if available. If a TTY is not available, the publications shall include the following statement: "To use the California Relay Service with TTY, call (888) 877-5378 or without TTY, call (888) 877-5379."

C. Publications shall incorporate the following standardized accessibility statement: "California State Parks does not discriminate against individuals with disabilities. Prior to arrival, visitors with disabilities who need assistance should contact — (contact and phone number)."

This statement encourages visitors to request assistance, such as American Sign Language (ASL) interpretation for the deaf. There are other languages that are used, including Signed Exact English (SEE), Manual Coded English (MCE), or Pidgin Signed English (PSE). A visitor may prefer Real Time Captioning.

D. When applicable, publications shall state: "This publication is available in alternate formats by contacting — (contact and phone number)."

Alternate formats include audio tape recordings, large print, Braille, electronic file, and the Internet.

2. Standard Type Font Size

A. Standard type font size for brochure text is 12 point. Fonts should be easy to read and may be either serif or sans serif.

This is an example of 12-point type font (Arial).

3. Large Print

A. Printed park visitor information shall be available upon request in large print format.

B. Large print materials shall be at least 18-point size in sans serif type font. "Sans serif" means without any short lines stemming from and at an angle to the upper and lower ends of the strokes of a letter. See examples below:

This is 18-point size.

This is Arial – an acceptable sans serif font.

This is Times New Roman – an unacceptable font for Large Print formats.

4. Contrast

A. To enhance readability, dark print or graphics should be used on a light background. Reversed light print with a dark background may also be acceptable, if there is high contrast.

5. Symbols

A. International recreation symbols should be used on park maps, whenever possible, to identify areas, facilities, or points of interest.

6. Readability

A. Publications shall be easy to read. Concise sentences without slang or academic jargon should be used whenever possible.

7. Compliance Review

A. All new or redesigned publications of park visitor information, such as the California State Parks Official Map, the Reservations Brochure and individual park brochures, shall be reviewed by the Accessibility Section before printing. This review shall be scheduled to coincide with the appropriate stage of review during design of each publication. The Accessibility Section will review for content on accessible features, type and other items mentioned in this notice.

If you have questions regarding this notice, please contact Linda McDonald, at (916) 654-2442 or CALNET 454-2442.

Signed by

Mark Schrader
Chief, Park Design and Construction Division

Signed by

Dick Troy
Deputy Director, Park Operations

14

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Mr George Britton, Modesto-CA City Manager

Wayne Padilla, Finance Director

Jean Morris, Modesto City Clerk

Subject: Comments for inclusion/considerations to "Draft Review of Water Utility Costs of Service Rate Study"

-- Danny Gottlieb, local Water RatePayer / Taxpayer

Contact: food_farmer@sbcglobal.net or tel 529-8832

A Water Delivery Efficiency Program, including a robust water system Leak Detection and Repair Program are key to Accurate Billing of measured/delivered utility treated water from the Modesto-CA Water System...including near 100 wells and one surface water treatment plant.

Attached to this cover are a few examples of a common problem all cities have with water system 'leakage'. Examples show approx. 20 to 30 percent of utility waters can be lost to 'leakage'.

Please use high tech Meter Calibration instruments and statistically accurate 'flow studies' to determine ALL water meters at well heads and at beginning of transmission line from surface water treatment plant are in calibration. This 'process water audit' should allow for arriving at verified accurate, monthly 'baseline water transmitted numbers'. Also, tracking individual meters with reliable monthly calibration checked Meter Reading(s) should result in reliable billings as far as 'water inventory control' persists.

Somewhere before final deliveries to end-users, much 'leakage' occurs and history even records intentionally stolen water through mischievous piping exists!

The American Water Works Assoc., California Water Resources Dept., and/or Private Companies offer workshops on 'leakage' detection and delivery efficiency.

A tweaked up Leak Detection Team should start at the Surface Water Treatment plant. How does MID bill City of Modesto for Water?...based after Meters and transmission begins, or on some other Rate of Treating Waters? It should be monthly confirmed that these highest volume meters are perfectly calibrated by factory technicians in presence of 'leak detection team'. In other words, think of this as like Money flowing through several bank branches, and there should be no losses detected, at the beginning of setting up the Cash Flow at each branch. Near 100 wells need to go through the same rigid calibration checks!

There certainly is an early Payback to Water RatePayers if an accurate Leak Detection Program is part of your gov't Water delivery program. Water RatePayers should be assured that there is No significant in their Water Delivery System. Nor, should they have to pay due to neglect to install optimum system operations, or to errors in proper billing!

The current Draft of subject report appears to not include any outline of 'leakage' as it affects accurate billing. Please include a simple outline of a 'leak detection & repair', Meter calibrations & Repair program' by final Report.

Please review the examples and descriptions attached to help get the program REALLY going!

Thank You for expressing in dialogue about what's REALLY needed on above subject, and participating in consensus for operation of accurate water delivery efficiencies.

Danny G. 

My Personal Experience/Observations
about
LEAKAGE in Water Lines on
Street I live on:

- In Modesto, there is an 'Urban Forest' program that requires every New Home to have 2 City TREES planted in each front yard. Unfortunately, so called Modesto City Tree EXPERTS had picked wrong variety of tree to plant [e.g. the American Hackberry tree looks beautiful and shades homes on one side of the street [..if street runs through North & South], but underground, the root systems extend far out to the tree edge drip-line, and penetrating far-out under the street where water/sewer/gas lines are under attack by these strong root systems. On the short street where I live, we have had eleven (11) MAJOR water line repairs, or partial replacements. Tree root caused broken water lines let water gush up to service, where it looks like someone has washed their vehicle, in street, everyday. Sometimes, it takes a few days before someone recognizes that the huge puddle is 'leakage, and finally reports to City Public Utilities Service.

I've watched some of the extensive 5' dig-downs where massive holes are made to reach the 'tree root wrapped & broken water pipes'. Huge crews, several trucks hauling dirt & asphalt, and water suction trucks removing ponds, and 1/2 dozen or more city workers spend better part of a day repairing/replacing damaged water lines. Also, several of my Neighbors have had to get major repair of their front yard located Sewer line damages to 'leakage' by older city tree roots.

The Urban Forest dept. needs to get in-sync with the Utilities 'engineers' on what is the best, shortest rooted trees to install on lawns, and where is best 'tree position' in front of a home away from Sewer and Water lines.

I'm not sure where the Monies come from for repairing street damage and utilities piping from 'tree root intrusions'? In the future, from the BONDING Monies for Water Expansion or Retrofit, a major reason for part of the Price hikes to Water RatePayers?

---Danny G. 529-8832

**The Potential for Extensive 'LEAKAGE'
from City of Modesto Treated Water Delivery Pipes
if
Installing 60,000 + New or Retrofit
Water Meters**

Consider this:

Over the next 15 years, it's planned by Public Works dept. of City of Modesto to install 42,000 to 80,000 'New' or 'Retrofit uncalibratable Meters'.

Each meter will require a minimum of 2 fittings to connect pipe to meters, and each fitting has 2 ends subject to leaking if not permanently fitted to meter...in other words, 4 chances for 'leakage' if not properly fitted.


In actuality, a meter installation has a few more 'bends & turns' requiring 'more fittings' before the new meter is actually properly installed.

The above 'expanded potential for street water line leakage' is probably one major reason that City Councils, for over 100 Years, maintained a 'flat rate' water delivered billing system for Single Family homes.

And now, it appears current Council has thrown that Wisdom out? ...for their past lack of further recognition and considerations to maximize Leak Prevention.

There will be a NEED to expand 'leak detection and repairs program' as meter connections begin to leak water!

--- Danny G.



AWWA
American Water Works Association

Anniversary
125 Years of Safe Water

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WaterWiser

Water Loss Control

- [Apparent and Real Losses](#)
- [Water Audit Methodology](#)
- [How to Get Started](#)
- [Free Water Audit Software](#)


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- [WiserWatch/News](#)

Water Loss Control

Conservation by Water Suppliers

With the need for water conservation greater than ever, many drinking water utilities now offer their customers tips on curbing water consumption in the home and workplace. But water utilities also need to conserve water in their day-to-day operations. Water utilities not only bring us the water we need, but they also consume large volumes of water and - without proper controls - can waste or lose track of huge amounts of water.



With pressures mounting on our water resources, we need to be water-efficient throughout the entire lifecycle of man's water use. With new methods of water auditing and loss control, water utilities hold the potential to recapture large volumes of treated water as well as additional revenues. Water Loss Control - conservation by water suppliers - is an essential function of the drinking water industry.

What is Water Loss Control?

Water Loss Control represents the efforts of drinking water utilities to provide stewardship and accountability in their operations by reliably auditing their supplies and keeping their system losses to a reasonable minimal level.

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Free Water Audit Software

http://www.awwa.org/WaterWiser/waterloss/Docs/WaterAuditSoftw..

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WaterWiser Free Water Audit Software

Water Loss Control

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- [Water Audit Methodology](#)
- [How to Get Started](#)
- [Free Water Audit Software](#)

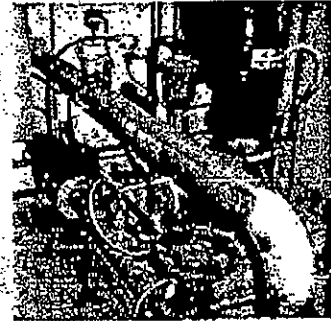
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AWWA Water Loss Control Committee

The AWWA Water Loss Control Committee is pleased to announce the release of its own Water Audit Software, available free to all users.

This page provides a gateway for your water utility and any other interested parties to download, utilize, and comment upon the Water Audit Software as approved by the AWWA Water Loss Control Committee. The committee members hope you will find this software to be a useful and easy way to begin your audit process. Not intended as a full audit, it is provided in an effort to place utilities on the road to more standardized and transparent water audit systems.



How the Water Audit Software Works

The Water Audit Software package includes five worksheets in a spreadsheet file. The first worksheet provides instructions on the use of the software. The majority of data is entered on a reporting worksheet and prompts the user to enter standard water supply information such as the volume of water supplied, customer consumption, and quantities of losses.

Knowing that many water utilities don't typically tabulate all of this data, the software allows the user to enter either known (measured) or estimated (quantities that must be approximated) values. The software then calculates a variety of performance indicators which are useful in making performance comparisons among water utilities.

How to Download the Water Audit Software

Download the Water Audit Software by reviewing and accepting the [Terms of Use Agreement](#). (Note that this link opens a PDF file in a new window. If your browser uses a pop-up blocker, you may need to configure it to allow new windows on AWWA.org or bypass the restriction by holding down your Ctrl key while clicking the link.) When the spreadsheet opens, choose File - Save As and designate a location on your computer's file system to save a copy.

Please note, you will need to have Microsoft® Excel installed to view this software. Alternatively, you may download an Excel viewer from the [Microsoft website](#).

Need to See an Example?

An [example in PDF format](#) shows two completed water audits:

1. The City of Philadelphia (U.S.A.) audit shows units of million gallons (US)
2. The Region of Peel (Canada) shows metric units of thousand cubic meters.

Questions or Comments?

Water Loss Control Committee members provide support for the software. We are eager to answer your questions regarding the use or function of the software and appreciate any user feedback. Please [forward your questions or comments](#) regarding the Water Audit Software. Would you like to be notified directly about updates to the software and related developments? If so, [provide your contact information](#). Please provide your name, telephone number, email address, your organization, and (for water utilities) the number of billed customer accounts served.

The Committee maintains a listing of Water Audit Software users in order to provide updates and track the extent of use of the Software. Submitting this information is entirely voluntary.

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**Examples of Utilities Treated Water Delivery LEAKAGE
Negatively Affecting WATER DELIVERY EFFICIENCY;
Thus, Resulting In Inaccurately Measured Amounts of Water Produced and
Presumably Delivered To Water RatePayers
Resulting In Falsely Calculated Monthly BILLINGS**

Examples:

- A leak detection/correction program in Sillery, Quebec in 1977 uncovered daily losses of 3.8 million litres of treated potable water – 35% of their treatment plant's total production.
- Calgary initiated a leak detection and repair program in 1980. Since then, water main leakage has been reduced from 30% of annual production to 12%, and the average daily per capita consumption has decreased by a third. It was estimated that the program has saved \$4.1 million in operating costs.

Ref: http://www.ec.gc.ca/water/en/info/pubs/action/e_action.htm

On the domestic water supply side, mainly in the case of the municipal distribution systems, there remains potential for conserving water. As noted earlier, unaccounted-for water is now 23% of the total domestic sector. Although these figures compare favourably with the average "losses" in developed countries (25%) and for developing countries (40%), it is far too high for a water-scarce country like Cyprus, and has to be reduced. A 7% reduction in overall annual losses, i.e., reducing leakage to 16%, would imply a water saving of close to $4 \times 10^6 \text{ m}^3/\text{yr}$.

REQUEST

City of Modesto Water System Needs a Pro-Active, professionally trained Water Delivery Efficiency Team. Their major Skills and Duties would initially be applied to an intense program to, with the aid of also an investment in technology, to audit water treatment plant & near 100 City wells plus 1'000s of water transmission lines to determine non-leakage integrity. The Team would be trained at Workshops offered by CA Water Resources Board and/or American Water Works Association, or by outside company specializing in 'leakage detection'.

The Team would also be trained, proficient, and have active schedule of annual scheduled testing of all Water Meters install on City of Modesto water transmission lines. The Water Meters repair program and verified re-installations would be under the Teams operations.

Suggested by: Danny Gottlieb 11/12/06

LEAK DETECTION WITHOUT DESTRUCTION

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Leak Facts

- A 1/8 inch hole in a metal pipe, at 40 psi, leaks 2,500 gallons of water in 24 hours.
- A leak the size of a pinhead can waste 360,000 gallons per year, enough to fill 12,000 bathtubs to the overflow mark.
- A leaking toilet can use 90,000 gallons of water in 30 days.
- A dripping faucet/hose bibb can lose up to 180 gallons a month or 2,160 gallons per year.
- Approximately 1 in every 20 pools has a leak.
- Approximately 1 in every 318 homes or buildings has a leak.
- A typical toilet leak at today's rate can add \$500 to a single water bill.
- One trip through a car wash uses 150 gallons of drinking water.
- Collecting water for gardening from the faucet while waiting for hot water saves about 250 gallons of water a month.
- Using a broom to clean the sidewalk instead of a hose saves 150 gallons of water.
- Using a pool cover prevents about 1,000 gallons per month from evaporating.
- American Leak Detection - three decades in business discovering over 1.4 million leaks.



Contact the Original Leak Specialist

You will be contacted promptly. * denotes a required field.

*First Name:

*Last Name:

Address:

City:

State: Zip:

*Phone:

E-mail:

*Briefly describe the symptoms:

Privacy Policy:

To answer your questions or comments, American Leak Detection only collects personal information that you voluntarily provide to us. We do not sell or share this information with any third parties outside of the ALO system.

Facts provided by American Leak Detection and Water Online.

U.S. Location Finder
Enter Zip Code

- Residential
- Commercial
- Municipal

US Locations
Worldwide Locations

Ask the Leak Specialist
Need Help?

Contact the Leak Specialist nearest you.

Tips to Use

- Leak Facts
- Signs and Symptoms
- Water Conservation
- The Bucket Test
- The Meter Test
- Prevent West Nile Virus

What's New

Stop the Spread of West Nile Virus: Remove Standing Water: ...

AWWA 2006 ACE The World's Water Event

Franchise Industry Leader Looks at Trends

Employment

View our Employment Opportunities.

Customer Feedback

Some Leak Facts

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Water Audit Methodology

Definitions and Performance Indicators for IWA/AWWA Method

In 1997 the Water Loss Task Force, a five-country group formed by the International Water Association (IWA), launched its effort to develop a workable water audit structure for drinking water utilities. AWWA participated on this task force, which published its results in 2000 as part of the IWA publication *Performance Indicators for Water Supply Services*. The format of the water balance of this method is given in Figure 1.

How does the IWA/AWWA Water Audit Method work?

The IWA/AWWA Water Audit Method is effective because it features sound, consistent definitions for the major forms of water consumption and water loss encountered in drinking water utilities. It also has a set of rational performance indicators that evaluate utilities on system-specific features such as the average pressure in the distribution system and miles of water main.

These features allow water utilities to make a meaningful assessment of their water loss standing, benchmark themselves with other water utilities and set performance targets. The water audit tells us how much of each type of loss occurs and how much it is costing the water utility. The key concept around this method is that no water is "unaccounted-for". All water supplied is accounted for in the components listed by using either measured or estimated quantities. A quantity is determined for the major components of water consumption and water loss, and a cost is placed on each component in order to assess its financial impact to the water utility. See Table 1.

In 2003 the AWWA Water Loss Control Committee began the effort to rewrite the AWWA M36 publication *Water Audits and Leak Detection* to provide guidance on the IWA/AWWA Water Audit Method, including the means to calculate the performance indicators. (See Table 2.) The new publication should be available in 2006.

Figure 1 IWA/AWWA Water Balance (All data in volume for the period of reference, typically one year)

System Input Volume (corrected for known errors)	Authorized Consumption	Billed Authorized Consumption	Billed Metered Consumption (including water exported)	Revenue Water
		Unbilled Authorized Consumption	Billed Unmetered Consumption	
Water Losses		Apparent Losses	Unbilled Metered Consumption	
			Unbilled Unmetered Consumption	
			Unauthorized Consumption	
			Customer Metering Inaccuracies	Non-Revenue Water (NRW)
			Data Handling Errors	
			Leakage on Transmission and Distribution Mains	
		Real Losses	Leakage and Overflows at Utility's Storage Tanks	
			Leakage on Service Connections up to point of Customer metering	

Table 1: Components and Definitions of the IWA/AWWA Water Balance

Water Balance Component Definition

System Input Volume	The annual volume input to the water supply system
Authorized Consumption	The annual volume of metered and/or unmetered water taken by registered customers, the water supplier and others who are authorized to do so

Water Losses	The difference between System Input Volume and Authorized Consumption, consisting of Apparent Losses plus Real Losses
Apparent Losses	Unauthorized Consumption, all types of metering inaccuracies and data handling errors
Real Losses	The annual volumes lost through all types of leaks, breaks and overflows on mains, service reservoirs and service connections, up to the point of customer metering.
Revenue Water	Those components of System Input Volume which are billed and produce revenue
Non-Revenue Water (NRW)	The difference between System Input Volume and Billed Authorized Consumption

Table 2: Performance Indicators for Non-revenue Water and Water Losses

Performance Indicator	Function	Comments
Volume of Non-revenue water as a percentage of system input volume	Financial - Non-revenue water by volume	Can be calculated from a simple water balance; good only as a general financial indicator
Volume of Non-revenue water as a percentage of the annual cost of running the water system	Financial - Non-revenue water by cost	Allows different unit costs for Non-revenue water components
Volume of Apparent Losses per service connection per day	Operational - Apparent Losses	Basic but meaningful indicator once the volume of apparent losses has been calculated or estimated
Real Losses as a percentage of system input volume	Inefficiency of use of water resources	Unsuitable for assessing efficiency of management of distribution systems
Normalized Real Losses - Gallons/service connection/day when	Operational: Real Losses	Good operational performance indicator for target-setting for real

the system is
pressurized

loss reduction

Unavoidable Annual
Real Losses (UARL)

$$\text{UARL (gallons/day)} = (5.41L_m + 0.15N_c + 7.5L_p) \times P$$

A theoretical reference value representing the technical low limit of leakage that could be achieved if all of today's best technology could be successfully applied. A key variable in the calculation of the Infrastructure Leakage Index (ILI)

where

L_m = length of water mains, miles

N_c = number of service connections

L_p = total length of private pipe, miles = $N_c \times$ average distance from curbstop to customer meter

It is not necessary that systems set this level as a target unless water is unusually expensive, scarce or both

P = average pressure in the system, psi

Infrastructure Leakage Index (ILI)

Operational: Real Losses

Ratio of Current Annual Real Losses (CARL) to Unavoidable Annual Real Losses (UARL); good for operational benchmarking for real loss control.

NOTATIONS: LEAKAGE reduction GOALS for Policy reference/selective adaptation:

5.40. Given that the development of technologies for leakage detection and repair continues unabated, we believe that leakage levels in England and Wales should be reduced further. We recommend that Ofwat replaces ELL with a broader concept of "sustainable level of leakage". This would encompass economic impacts, but would also take greater account of the environmental and social implications—in each water company's area—of providing additional supply instead of reducing leakage further. The sustainable level of leakage for each company should be determined in conjunction with the regional boards, as outlined in Chapter 3, taking full account of environmental impact assessments and agreed social priorities, balanced with the cost-effectiveness of resource development.

5.41. Setting a "sustainable level of leakage" would, by factoring in environmental considerations, lead to more stringent leakage targets for companies and therefore offset some of the need for new resource development. We believe that it would also help to increase consumers' trust in the water companies and reduce their resentment at being told to save water when so many water utilities are still losing such a large amount through leakage.

39. We agree with the Committee that the ELL should incorporate economic, environmental and social aspects of leakage reduction. Although the name may suggest otherwise, the ELL already takes account of these factors. Our 2002 tripartite report, which we undertook jointly with the Environment Agency and Defra, identified ELL as the most appropriate way of setting leakage targets. Since then companies have undertaken a fully integrated appraisal of the financial, social and environmental aspects of their leakage reduction and other operations to ensure efficient use of water resources now and in the future. However, we are now reviewing the concepts in the light of the Committee's report to ensure that these aspects are fully addressed.

40. The water companies in England and Wales manage water distribution networks with a total length of approximately 335,000 km – enough to go around the equator eight times. In addition, there are almost 24 million connections to properties and associated customer supply pipes, which all have the capacity to leak. Eliminating leakage would be virtually

impossible and enormously expensive. It would have a significant impact on customers' bills and raise further issues of affordability. But equally **leakage** cannot be allowed to go unchecked. A balance must be struck in setting targets for **leakage** that take account of the needs of customers and the environment, and how these change over time. This is what the ELL was designed to do, and it has led to a reduction in **leakage** of around (30%) in a decade. In 2005-06 the overall level of **leakage** in England and Wales was close to 3,600 Ml/d, compared to nearly 5,000 Ml/d just a decade earlier.

41. ELL is a dynamic concept that should be seen as a profile over a number of years rather than a single spot figure. The level depends on a wide range of factors that will vary between companies and over time. For example the cost of detecting and repairing leaks will fall as new technology is introduced. This may cause the ELL to fall or at least allow companies to maintain current levels of **leakage** at lower cost. Equally during a drought the value of water rises, making **leakage** reduction cheaper to undertake relative to other conservation measures and therefore lowering the ELL. It is also important that companies should show a clear lead to customers who are being asked to conserve water.

42. Where companies fail to properly manage their **leakage**, we are ready to take stringent enforcement action. The statutory undertaking recently required of Thames Water is a case in point. It will now spend an extra £150 million to replace additional leaking water mains to the benefit of its customers, but at the expense of its shareholders.

43. While we have confidence in our current approach to **leakage**, we also firmly believe that we need to build on it going forward. We have accepted the need to review our approach to ensure it reflects a sustainable level of **leakage**. We aim to produce conclusions that are meaningful to all stakeholders as well as revisiting the guidance on defining and using social and environmental costs. We have also identified further issues that would benefit from review, such as how companies manage **leakage** in response to short-term and unexpected environmental changes and how our advice on **leakage** supports our work to meet our sustainability duty. Initially, we are seeking stakeholders' views so that we have a full appraisal of the issues involved. The new approach will inform the forthcoming review of price limits in 2009.

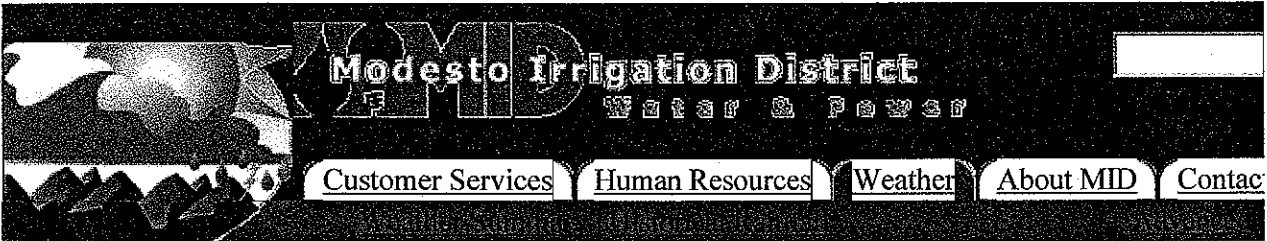
In November 2000 and June 1996, the District hosted a Water Audit and Leak Detection Seminar developed by the state Department of Water Resources. Targeted at water agencies and retailers in Northern California, this two-day seminar taught participants how to perform a water audit of their distribution systems and techniques in which they could detect leakage.

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Historical Rainfall Statistics (July 1 - June 30)

Lowest rainfall year total Highest rainfall year total
 Yr: 1912/13 = 4.30 inches Yr: 1982/83 = 26.01 inches

Average rainfall by month: Annual rainfall totals:

January	2.36"	2005-2006	13.28"
February	2.06"	2004-2005	16.00"
March	1.94"	2003-2004	8.56"
April	0.95"	2002-2003	9.40"
May	0.51"	2001-2002	10.53"
June	0.09"	2000-2001	12.99"
July	0.02"	1999-2000	16.57"
August	0.03"	1998-1999	10.63"
September	0.21"	1997-1998	24.60"
October	0.61"	1996-1997	13.49"
November	1.35"	1995-1996	15.30"
December	2.09"	1994-1995	20.18"
Historical Average	12.22"	1993-1994	9.97"

If you are interested in rainfall data from one year or a 118-year summary or a spe of temperatures, please use our [contact form](#) to send a request to [Customer Service](#) your fax or mailing address plus details on what information and year you are inter