

**2004 WATER USE EFFICIENCY
PROPOSAL FOR PROPOSITION 50
GRANT APPLICATION**

SECTION A: URBAN WATER USE EFFICIENCY
IMPLEMENTATION PROJECT

“Smart” Irrigation Management System Upgrade
For 100 Municipal Acres of Parks, Medians and Landscaped Areas

PRESENTED TO:
STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
OFFICE OF WATER USE EFFICIENCY
1416 NINTH STREET, ROOM 338
SACRAMENTO, CA 95814
Attention: Debra Gonzales

Submitted by:

City of Beverly Hills
Department of Public Works
Robert Beste
Director of Public Works
Tel: 310-285-2467
Email: rbeste@beverlyhills.org

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APPENDIX A: Project Information Form

Applying for:

Urban

Agricultural

1. (Section A) **Urban or Agricultural Water Use Efficiency Implementation Project**

(a) implementation of Urban Best Management Practice # 5 Large Landscape Conservation

(b) implementation of Agricultural Efficient Water Management Practice, # _____

(c) implementation of other projects to meet California Bay-Delta Program objectives, Targeted Benefit # or Quantifiable Objective #, if applicable

(d) Specify other: _____

2. (Section B) **Urban or Agricultural Research and Development; Feasibility Studies, Pilot, or Demonstration Projects; Training, Education or Public Information; Technical Assistance**

(e) research and development, feasibility studies, pilot, or demonstration projects

(f) training, education or public information programs with statewide application

(g) technical assistance

(h) other

3. Principal applicant (Organization or affiliation) City of Beverly Hills, Department of Public Works

4. Project Title: “Smart” Irrigation Management System Upgrade

5. Person authorized to sign and submit proposal and contract:

Name: Robert Beste,
Title: Director of Public Works

Mailing address: 345 Foothill Road
Beverly Hills CA 90210

Telephone: 310-285-2467

Fax: 310-278-1838

E-mail: rbeste@beverlyhills.org

6. Contact person (if different):	Name, title:	Renee Schrader, Sustainability Programs Manager
	Mailing address:	345 Foothill Road Beverly Hills CA 90210 310-288-2807
	Telephone:	310-278-1838
	Fax:	rschrader@beverlyhills.org
	E-mail	_____

7. Grant funds requested (dollar amount): <i>(from Table C-1, column VI)</i>	\$281,301.47
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8. Applicant funds pledged (dollar amount):	\$292,783.17
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9. Total project costs (dollar amount): <i>(from Table C-1, column IV, row n)</i>	\$574,084.63
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10. Percent of State share requested (%) <i>(from Table C-1)</i>	49.0%
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11. Percent of local share as match (%) <i>(from Table C-1)</i>	51.0%
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12. Is your project locally cost effective? <i>Locally cost effective means that the benefits to an entity (in dollar terms) of implementing a program exceed the costs of that program within the boundaries of that entity.</i> <i>(If yes, provide information that the project in addition to Bay-Delta benefit meets one of the following conditions: broad transferable benefits, overcome implementation barriers, or accelerate implementation.)</i>	<input checked="" type="checkbox"/> (a) yes <input type="checkbox"/> (b) no
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11. Is your project required by regulation, law or contract? (a) yes
 If no, your project is eligible. (b) no

If yes, your project may be eligible only if there will be accelerated implementation to fulfill a future requirement and is not currently required.

Provide a description of the regulation, law or contract and an explanation of why the project is not currently required.

12. Duration of project (month/year to month/year): 36 months

13. State Assembly District where the project is to be conducted: 42

14. State Senate District where the project is to be conducted: 23

15. Congressional district(s) where the project is to be conducted: 30

16. County where the project is to be conducted: Los Angeles County

17. Location of project (longitude and latitude) 34° 423'' North &
118° 23'58'' West

18. How many service connections in your service area (urban)? 10,647 Urban Connections

19. How many acre-feet of water per year does your agency serve? 12,805.13 Acre Feet

20. Type of applicant (select one): (a) City
 (b) County
 (c) City and County
 (d) Joint Powers Authority
 (e) Public Water District
 (f) Tribe

- (g) Non Profit Organization
- (h) University, College
- (i) State Agency
- (j) Federal Agency
- (k) Other
 - (i) Investor-Owned Utility
 - (ii) Incorporated Mutual Water Co.
 - (iii) Specify _____

21. Is applicant a disadvantaged community? If 'yes' include annual median household income.
(Provide supporting documentation.)

- (a) yes, _____ median household income
- (b) no

2004 Water Use Efficiency Proposal Solicitation Package
APPENDIX B: Signature Page

By signing below, the official declares the following:

The truthfulness of all representations in the proposal;

The individual signing the form has the legal authority to submit the proposal on behalf of the applicant;

There is no pending litigation that may impact the financial condition of the applicant or its ability to complete the proposed project;

The individual signing the form read and understood the conflict of interest and confidentiality section and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant;

The applicant will comply with all terms and conditions identified in this PSP if selected for funding; and

The applicant has legal authority to enter into a contract with the State.

Signature

Robert Beste, Director of Public Works
Name and title

January 6, 2004
Date

SECTION ONE—STATEMENT OF WORK: RELEVANCE AND IMPORTANCE

Purpose, Goals, And Objectives

In order to successfully achieve multiple benefits across CALFED program elements, which are dedicated to increasing the state's water supply through innovative conservation methods; the City of Beverly Hills is requesting a grant to assist in the purchase, installation and implementation of a weather-based, centrally-controlled "smart" irrigation system that would deliver and control water to 100 acres of parks, medians and landscaped areas throughout the city. The primary purpose for instituting a "smart" irrigation management system is that "indirect" water wasting of the CALFED and regional water sources would be greatly reduced and that "direct" water usage would be monitored to support a local "water-mass balance". The goal would be to demonstrate a local cost benefit to the community which would serve as an example of the value of resource conservation and would further make visible the city's conservation efforts. The opportunity to showcase water conservation through technical innovation exists since much of the irrigated land is noted as world tourist destinations.

The first objective of the large landscape irrigation conservation project is to upgrade the municipal system with state-of-the-art computer software and the replacement of outdated, manually-operated controllers. A second objective would be to provide to the community the message of environmental sustainability by demonstrating how managed irrigation assists in the welfare of the urban ecosystem and its metabolism. This environmental message would be conveyed through community education and outreach efforts linked to the software program located in the City's upcoming education center. "Irrinet" program software would be linked to a demonstration computer that would instruct the visitors to the education center detailing how the "Smart" irrigation management system is applied and how the benefits can be tracked. Additional outreach activities such as reports in the Community Environmental Programs newsletter, and liaisons with the Beverly Hills Unified School District would also be implemented.

The entire municipal irrigation system upgrade is proposed to take place in three phases. The first phase is the installation of a Motorola Irrinet software program, estimated at a cost of \$16,000 dollars. Phase One **is not a part of the grant request**, has since been approved by the City Council and is presently being upgraded. The grant request is solely to assist in Phase Two of the upgrade. The total cost for Phase Two is projected at \$574,084.63 dollars. A portion of this amount is requested to purchase and install 85 centrally controlled flow meters, delivering water to a total of 1387 stations. It is anticipated that the replacement and upgrade of 85 of the total controllers, which records show a total consumption of 202.34 acre feet used from the period from 07-01-03, to 06-30-04, would show a significant decrease in water usage (acre feet per year). Studies have shown that approximately 25%-30% of acre feet per year usage could be saved with the implementation of a "Smart" Irrigation Management System.

The third phase of the upgrade would replace the irrigation system's decaying galvanized infrastructure with PVC piping and is **not included in this grant solicitation**. The distribution and replacement of sprinkler heads would also be addressed in this phase as the desire is to establish uniformity of irrigation components.

The grant assistance would allow the City's Recreation and Parks Department in conjunction with the Public Works Department to attain the conservation objectives stated with an efficient, managed "smart" irrigation system servicing the city's park and municipal properties. In summary, it is anticipated that the state monies that would be granted would help fund all of the stated objectives in Phase Two.

Need for the Project

The concept of conservation as pertains to a landscape irrigation project is born from the belief that life is sustained by the natural biophysical environment. Water is the medium in which all of life's functions occur. The environment which supports life on earth consists of an interdependent play of forces which hold water in some form. Terrestrial life is dependent on the following four water conducting systems: (1) the Atmosphere, (2) the Lithosphere, (3) the Hydrosphere, and (4) the Biosphere. It can be concluded that water is the single most essential component to our health and safety, to our commercial welfare, and which critically determines the quality of life for the citizens of California. Furthermore, it can be concluded the implementation of advancements in technologies which further efficient water delivery, proven water savings, and measurability of water usage should be installed as quickly as is possible given the startling water debt currently documented for the state.

Presently the City of Beverly Hills irrigates its planted parks and municipal properties with an outdated manually operated controlling system that does not allow command of individual settings or provide adjustment for weather changes which would monitor the quantity of water that is sprayed. The result is an ongoing waste of water supply reaching annual amounts as high as 60.702 acre feet per year and \$75,105.30 annual dollar savings. In addition, at least \$30,000 dollars per year, (\$10,000 for additional lost time in salaries, up to \$20,000 for equipment wear and purchases) would be saved in labor, in equipment purchase, in the cost of identifying breaks and leakages, and in a reduced cost to both the wear on adjacent hardscape and to the wastewater treatment of irrecoverable urban runoff. Moreover the ability to centrally control water via a citywide computerized system would allow for greater water efficiency in the event of a hillside fire emergency; saving water, decreasing hillside erosion, preserving wildlife habitats, and sustaining human life and property.

The replacement of existing outdated and water wasteful devices would additionally serve as an example to the community and could be utilized as a training and educational tool especially when installed in such a widespread fashion. Currently the city's financial demographic is such that conservation in terms of financial rewards can easily be dismissed. In order to successfully convey the urgent message of the daily decreasing water supply reality, the municipal properties should institute a system and monitor that system to report to the community in large numbers the water saved and the long term environmental objectives that will be met .

Rationale for the project is also found in state's government code. As per Title 7, Div. 1, Ch. 3, Article 10.8 (d) and (e) of the Government Code: "Landscapes are essential to the quality of life in California" and "Landscape design, installation, and maintenance can and should be water efficient".

As further stated in the Code:

“The California State Legislature recognizes the importance of landscaping for recreation, fire protection, erosion control, enhancing environmental conditions and replacing ecosystems in areas of development. However, California faces a real challenge to meet the water needs of a growing population with a limited supply of water. To meet this challenge, water use in landscapes must become more efficient. There are many ways to accomplish this goal and even modest improvements can have a cumulative effect in saving a great deal of water.”

The need for the project can be summarized in the following three statements: (1) as a result of the proliferation of status landscapes in the community where water conservation is not practiced in terms of financial incentive, the city desires to demonstrate the value of water conservation through a larger environmental scope, (Outreach & Education). (2) It is mandated by State Codes to become more water use efficient, and finally, (3) it would simply save water.

Project Description

Phase One

Phase One is already underway and not a part of this grant solicitation. However, it is the first step and is necessary to prepare the foundation for Phase Two which is the project under consideration for grant funding. The first phase consists of a pilot program to test the viability of a wireless irrigation control system. Phase One includes an upgrade to a computerized management station, and its associated antennae upgrade and installation. It includes replacing outdated manually controlled flow meters with the installation of eight (8) Motorola “Irrinet” controllers. It also includes the necessary staff training in the operation and maintenance of the system. “Irrinet” is the name of the irrigation management station software program that will enable the Park and Recreation Department to monitor water delivery. The Motorola “Irrinet” management station will be linked to the California Irrigation Management Information System (CIMIS), which will allow the station to adjust irrigation, based on weather patterns. A link to the weather station maintained by the Beverly Hills Fire Department will also be explored and evaluated during Phase One.

A remote control hydrometer with a master valve will be programmed through the “Irrinet” software to indicate how many gallons per minute (GPM) each clock (controller) uses. This device allows detection of breaks and leaks in the system which sometimes lose up to 1000 gallons before these can be identified and manually disabled using the existing outdated system. This new Irrinet system will also provide the computer program database which will monitor monthly water usage to serve as a tool for locating water waste.

The park sites and landscaped areas that are already equipped with flow meters and that will be involved in the first phase of the Irrinet upgrade are the following 8 (eight) sites: Beverly Gardens Park, Coldwater Canyon Park, Greystone Park, Maltz Park, Reeves Park, Rodeo Drive, Will Rogers Park and the landscaped areas surrounding the City’s Water Treatment facility. The location of the base station will be evaluated during Phase One to determine if it should remain at Greystone Park, or be moved to a more secure location with greater accessibility to field personnel. Testing will be performed to determine whether the main station can be relocated and still maintain connectivity to the remote irrigation sites. To summarize Phase One; an existing outdated manually operated system is currently being upgraded to a radio controlled standalone

system operation as a pilot to study how well it works for an approximate cost of \$16,000, a cost that is not incurred in this grant request.

Phase Two

Phase two will include removing the remaining 85 irrigation controllers located throughout the City and replacing or upgrading them with Motorola Irrinet controllers. Phase Two, (which is part of this grant request), will require an intensive labor replacement of irrigation controllers, many of which are more than 15 years old (see attached photographs on page 15). During Phase Two a monitoring plan will be developed to test and study the equipment for five years. The life expectancy of the proposed controller equipment is conservatively estimated to be ten years. Phase two of the project is expected to take approximately 36 months to complete, given that much of the installation labor, contingencies, and training transitions will be accomplished entirely “in-house”. A consultant will be hired with expertise in radio frequency to install, adjust, and interpret the computer program readings of the management station when needed.

Water Mass Balance

Phase two also includes a proposal to potentially create a “water-mass balance” study using a model spreadsheet which is included. Models for this study have not yet been utilized by the City, however staff believes that this would be the most effective monitoring tool to quantify the long range benefits of a citywide “smart” irrigation management system (SIMS). The Environmental Protection Agency has instituted water mass balance studies in the past for the purposes of gathering effluent and toxicity data for regional and longitudinal purposes. The EPA Office of Water Science has analytical methods for creating water mass balance models. In this grant solicitation City staff has generated an original example of a spreadsheet that could be utilized to monitor evaporation and evapo-transpiration lost to the atmosphere and excess water lost to run-off. It is anticipated that this original idea would qualify for the innovation portion of the grant application requirement.

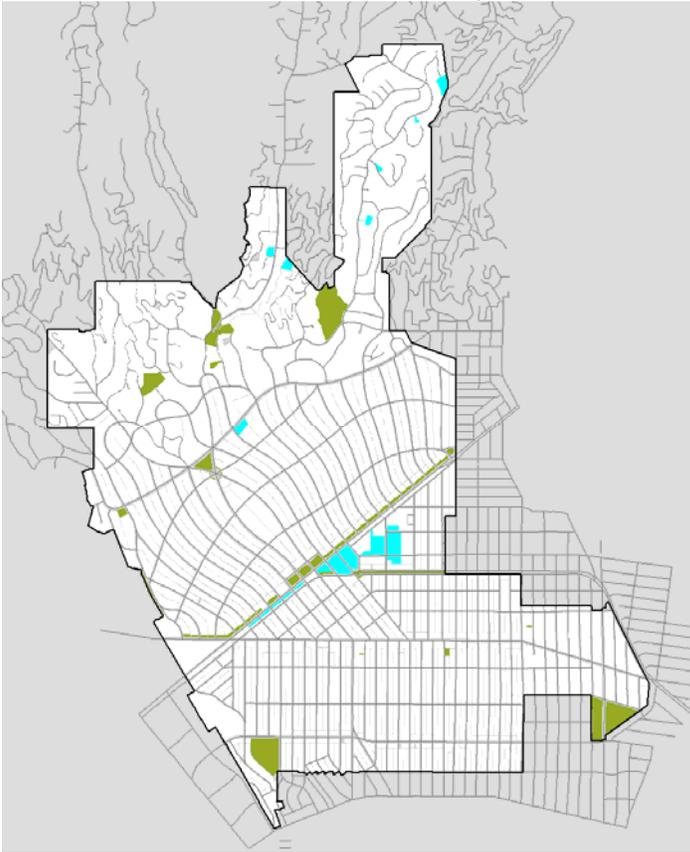
Phase Three

The remaining portion of the project would bring completely to date the entire irrigation infrastructure and would replace all the aging pipes with new PVC pipes. The cost for this phase is not yet been determined and is not a part of this solicitation but bears mentioning as it will impact the over all efficiency of the system in the long run.

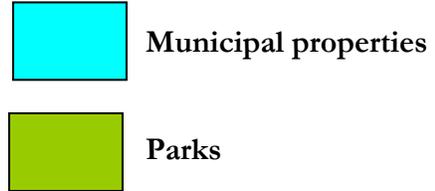
Location

The following locations for the remaining 85 controllers (Phase Two of the project) include the following City parks and landscaped municipal areas: City Hall, La Cienega Park, Mini-Parks (Arnaz, Crescent, Hamel Park, Oakhurst, Rexford), Roxbury Park, Burton Way, Sunset Boulevard, Trousdale Entrance, the newly installed landscape improvements in the business triangle and various parking facilities. Notably the following locations (included in both Phase One and Phase Two of the project), are also identified on the City’s website as tourist destinations: Beverly Gardens Park, Greystone Mansion Greystone Park La Cienega Park Roxbury Park And Will Rogers Memorial Park. These properties are considered “Landmarks” viewed on the travelling bureau visitor webpages of the following sponsors: “Things To Do in Los Angeles” (travel.yahoo.com/p-travelguide), “Beverly Hills Conference and Visitors Bureau” (www.beverlyhillsbehere.com), “Seeing Stars” (www.seeing-stars.com/Live/BeverlyHills), and Beverly Hills Fact Sheet (www.wemweb.com/traveler/towns/39beverl/factsht), to name a few.

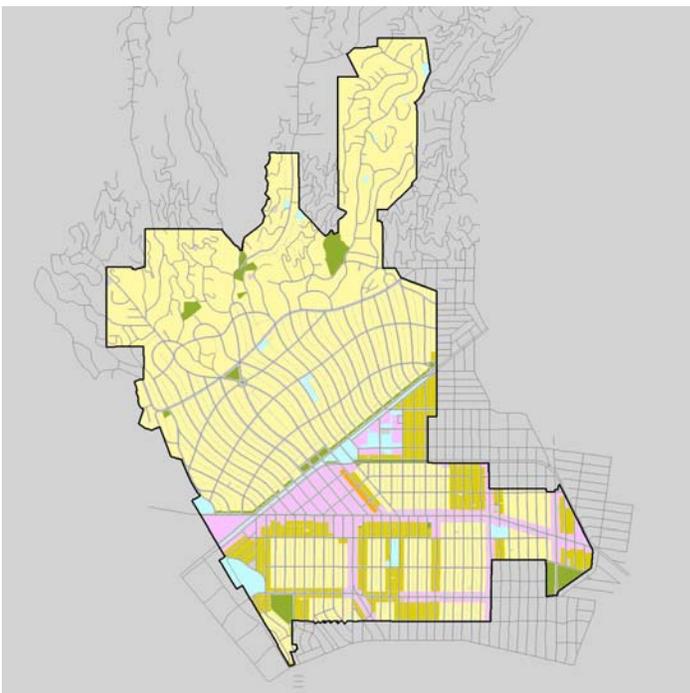
These landmark properties render a highly visible impact and make a potentially global impression of the conservation efforts that the city exerts.



This map of the parks and municipal areas in the city shows the context of the project within the City’s boundaries. The City’s parks are shown in green and the City’s municipally irrigated properties are shown in blue.



Additional properties in the commercial area that are not shown on the map but are included in the system upgrade include the newly installed urban design landscape improvements in the business triangle and the landscape median along Rodeo Drive. The twelve (12) Wilshire medians and islands, and the Whittier islands are not included in the above illustration. But are included in a map that follows showing the locations of the equipment change-outs.



This map illustrates the City’s land uses. It is inserted to demonstrate the amount of single and multi family residential areas. It is estimated that the residential irrigation usage is approximately 65% of the monthly bill. The City of Beverly Hills is renowned for its lush gardens and tree-lined streets.



The City would use the opportunity to demonstrate to the community the benefits of implementing a “smart” irrigation management system to conserve water.

Need for and priority of projects to achieve multiple benefits to the Bay Delta;

Phase Two of the system upgrade would programmatically fulfill the following CALFED objectives:

- Preserve local flexibility - ...maintaining the flexibility of implementing water use management and efficiency improvements at the local level while exploring regional programs to maximize benefits. The project would allow at the local level an opportunity for tracking water use. And because there would be computer records this information can be shared with the other member agencies and signatories of the California Urban Water Management Council Memorandum of Understanding.
- Reduce existing irrecoverable losses – by reducing losses currently unavailable for reuse (because they flow to salt sink, inaccessible or degraded aquifer, or the atmosphere). As the system becomes implemented the loss of water for example that occurs when the soil is water logged by malfunctioning valves, or from the over watering during a rain storm event can be prevented. Ordinarily this water loss percolates to the local water table. The City of Beverly Hills has a well system consisting of 4 of wells. Currently the city processes through a reverse osmosis treatment system 135 acre feet of ground water each month. And blends this amount with the retail water delivery from the Metropolitan Water District of Southern California.
- Build on existing water use efficiency programs, enhancing the positive momentum established by the existing programs. The Metropolitan Water District of Southern California has incentivized water credits for commercial and industrial landscapes which use programs that account for water savings. Because the request for the grant funds are to expedite the change out of irrigation equipment, the city is requesting the funds from a larger fund source.

Activities identified in the City's Urban Water Management Plan

The Beverly Hills Urban Water Management Plan, approved by the Department of Water Resources in the year 2000, details conservation activities specific to large municipal landscapes on page 17. It states as follows:

“Landscape Irrigation

As capital improvements programs are implemented by the City, computerized, the Parks Division is installing radio-controlled irrigation systems in conjunction with drought resistant planting to reduce water consumption.”

Due to budget deficits the Smart Irrigation Management System (SIMS) project has been placed in a low priority status. However, the city would like to request funding assistance in order to execute the project soon. The upcoming edition of the City of Beverly Hills Urban Water Management Plan currently in revision will identify conservation activities at both the passive level (legislation-based codes) and at the active level (individual choice). It is anticipated that the City will also be authoring a landscape ordinance codifying specific irrigation design components in accordance with the California Urban Water Conservation Council recommendations.

Consistency with local regional water management plans or other resource management plans

Strategies for water conservation using landscape irrigation methods appear under the umbrella of the Metropolitan Water District plans and include the Integrated Resource Plan, the MWD Urban Water Management Plan, and the MWD Conservation Strategy Draft Document (July 2004). Extensive documentation by the MWD, too prolific for this report, can be found to quantify and promote all regional efforts and the MWD's conservation efforts at the regional level.

How the SIMS project will implement existing or planned water management activities

Metropolitan has funded residential and large landscape audits since 1993, retrofit of landscapes with centralized irrigation controllers since 1998, and rebates for weather-based irrigation. The City of Beverly Hills anticipates using the computer database tracking software to report its BMP #5 compliance with the California Urban Water Conservation Council. With this tool data can be recorded in order to participate in additional funding programs, and can be shared with other water-supplying entities so that conservation studies can be collaborated.

SECTION TWO—STATEMENT OF WORK: TECHNICAL/SCIENTIFIC MERIT, FEASIBILITY

Ultimate objective is to minimize water supplied to community from Metropolitan Water District's imported sources. The Metropolitan Water District of Southern California provides 2.4 million acre feet per year to the region from outside locations. Current figures show approximately 700,000 acre feet per year come from the Colorado River, the remaining 170,000 acre feet per year are imported from the State Water Project. In total the Metropolitan delivers 4,000,000 acre feet per year to its regional demand. City of Beverly Hills has 97 water meters that measure irrigation of the city parks and municipal areas. For the period from July 1, 2003 to June 30, 2004 records show a total consumption of 202.34 acre feet used for irrigation in a fiscal year. The City of Beverly Hills estimates the total dollar amount is \$250,351.00 dollars for parks and municipal land irrigation recorded from each of the 97 meters, with a possible 2% to 3% over/under estimation. A conservative estimate of dollar savings benefit for the installation of a "smart" irrigation management system would be approximately 30% or \$75,105.30 annual dollar savings. Over a three year period (the duration of the state funds if granted) the total monetary benefit would be \$225,315.90 dollars and 60.702 acre feet per year.

The project would allow the City to keep a master computer slaved to the monthly tracking of parks and municipal property irrigation use. The Irrinet controllers and master computer software would allow a 24 x 7 tracking of water, energy and labor. The system operates in a "distributed" fashion. The field units perform the real-time process and the central computer the functions of :

- Alarm reporting: Smart field units report in without the need for polling and log of events is maintained for viewing and reporting.
- Closed loop response: allows for monitoring the water level in a storage reservoir . It can also take actions such as reducing the flow of water depending on the water level.
- Automatic download or programs/Instructions Like setting an alarm clock the central will wake up and performs actions the City has planned ahead of time for example turning off the water in advance of a special event.
- Optional paging in response to alarms: the information on system problems can be delivered on a timely basis to key personnel and their pager.

Description of methods, procedures, equipment and facilities

The city is planning to upgrade or replace all of the remaining 85 controllers and associated equipment that appear on table 1A. In some cases the locations are multiple-station installations in other cases only an upgrade to the radio frequency is necessary. The City of Beverly Hills has equipment that is over 15 years old. The following photographs illustrate the decaying system and the old lines that require connection to the new Irrinet system as part of Phase Two of the project.



Old lines



Standalone unit



Standalone unit



Irrinet unit

The following map corresponds to the station locations described on Tables 1A, 1B, and 1C. (This map is provided in larger view with proposal attachments). The following Tables; 1A, 1B, and 1C correspond to itemized locations and costs, tasks designations, and project task time frames.

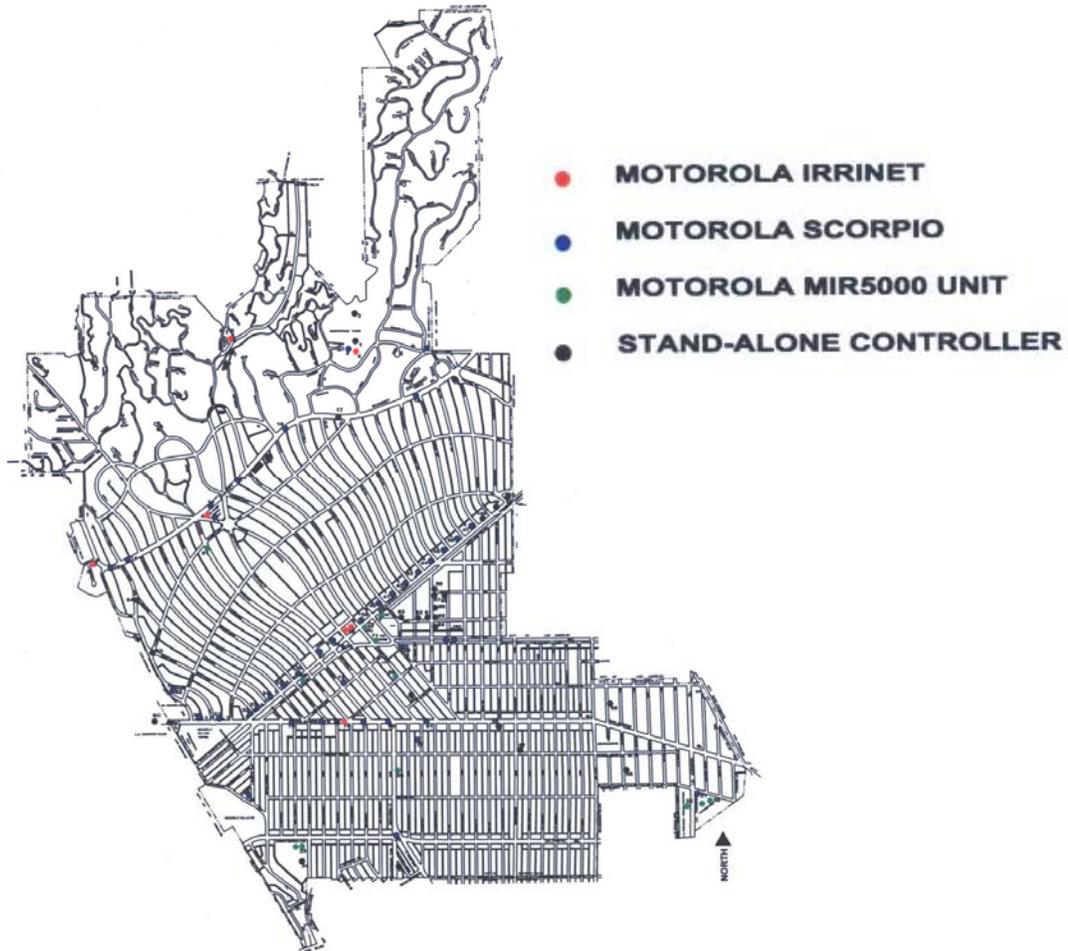


TABLE 1A. ITEMIZED COST ESTIMATE AND EQUIPMENT DESCRIPTION

Site Number on Location Map	Description of location	Number of stations at location	Equipment	Equipment List Cost	Labor cost	Extended price quote from vendor
1	Greystone Bathroom	34	Stand-alone	\$ 8,462.70	\$(1,252.27)	\$ 9,714.97
2	Greystone Upper Parking Lot	12	Stand-alone	\$4,511.75	\$1,420.87	\$ 3,090.88
3	Greystone upper Parking Lot	64	4ea. 16 sta Scorpios	\$ 2,330.00	\$ (110.64)	\$ 2,440.64
4	Greystone Mansion	32	32 sta. Irrinet FIU	\$ 7,400.00	\$ 2,466.67	\$ 4,933.33
5	Trousdale Estates	8	Scorpio 8 sta	\$ 3,480.75	\$ 1,104.05	\$ 2,376.70
6	Coldwater Park	16	Irrinet	\$ 6,867.95	\$ 2,091.89	\$4,776.06
7	Coldwater Park North	23	Stand-alone	\$ 9,148.10	\$ 2,457.24	\$ 6,690.86
8	Fire Station South	8	Stand-alone	\$ 6,617.10	\$ 1,946.63	\$4,670.47
9	Maltz Park	16	Irrinet	\$ 5,803.75	\$ 1,878.67	\$ 3,925.08
10	Sunset Median	1	DC Scorpio 8	\$ 5,859.75	\$ 1,897.33	\$ 3,962.42
11	Sunset Median #2	8	Scorpio 8	\$ 7,726.75	\$ 2,199.45	\$ 5,527.30
12	Rogers Park	64	Irrinet 48/Scorpio 16	\$ 7,733.75	\$ 2,521.69	\$5,212.06
13	Sunset/Rexford Median #4	16	Scorpio 16	\$ 3,197.75	\$ 1,009.69	\$ 2,188.06
14	Sunset Median	8	DC Scorpio 8	\$ 4,600.00	\$ 1,533.33	\$ 3,066.67
15	Reservoir	24	Stand-alone	\$ 11,257.70	\$ 2,927.48	\$ 8,330.22
16	Sunset Median # 5	1	DC Scorpio 8	\$ 5,012.00	\$ 1,670.37	\$ 3,341.63
17	Sunset Median # 6	16	Stand-alone	\$ 6,742.75	\$ 1,874.22	\$4,868.53
18	Sunset Median # 7	16	Scorpio 16	\$ 9,281.70	\$ 2,527.55	\$ 6,754.15
19	Sierra Mini Park	6	Stand-alone	\$ 10,476.70	\$ 2,922.83	\$ 7,553.87
20	La Cienega Park	91	2 ea. MIR 5000	\$17,562.75	\$ 2,998.11	\$ 14,564.64
21	La Cienega Park	16	Scorpio 16	\$ 4,863.75	\$ 2,656.82	\$ 2,206.93
22	La Cienega Tennis Center	52	MIR 5000	\$ 10,842.15	\$ 3,124.35	\$ 7,717.80
23	Roxbury Park	71	2 ea. MIR5000/1 ea Stand-alone	\$19,222.78	\$ 3,310.32	\$ 15,912.46
24	Roxbury Park	13	MIR5000	\$ 3,886.75	\$ 1,235.87	\$ 2,650.88
25	Beverwill Mini Park	4	Stand-alone	\$ 10,493.35	\$ 2,975.82	\$ 7,517.53
26	Olympic/Beverly Mini Park	16	Scorpio 16	\$ 6,039.35	\$ 1,836.06	\$ 4,203.29
27	Reeves Park	16	Scorpio 16	\$ 5,385.50	\$1,601.65	\$ 3,783.85
28	South Beverly Parking Structure	3	MIR5000	\$ 3,502.75	\$ 1,108.30	\$ 2,394.45
29	Beverly Gardens	32	1 ea.IRRINET 32 1 ea. IRRInet	\$ 3,107.75	\$ 708.00	\$ 2,399.75
30	Beverly Gardens # 21	16	Scorpio 16		\$ -	
31	Beverly Gardens # 20	16	Scorpio 16		\$ -	
32	Beverly Gardens # 19	16	Scorpio 16		\$ -	
33	Beverly Gardens # 18	14	Scorpio 16		\$ -	

Site Number on Location Map	Description of location	Number of stations at location	Equipment	Equipment List Cost	Labor cost	Cost quotation from vendor
34	Beverly Gardens # 17	16	Scorpio 16		\$ -	
35	Beverly Gardens # 16	16	Scorpio 16		\$ (18,055.11)	\$18,055.11
36	Beverly Gardens # 15	8	Scorpio 8		\$ -	
37	Beverly Gardens # 14	24	1 ea.Scorpio 16 1 ea. Scorpio 8		\$ -	
38	Beverly Gardens # 13	24	1 ea.Scorpio 16 1 ea. Scorpio 8		\$ -	
39	Beverly Gardens # 12	16	Scorpio 16		\$ -	
40	Beverly Gardens # 11	16	Scorpio 16	\$ 2,717.75	\$ 2,717.75	
41	Beverly Gardens # 10	16	Scorpio 16	\$ 3,497.75	\$ 1,109.69	\$ 2,388.06
42	Beverly Gardens # 9	16	Scorpio 16	\$ 3,497.75	\$ 1,109.69	\$ 2,388.06
43	Beverly Gardens # 8	16	Scorpio 16	\$ 3,497.75	\$ 1,109.69	\$ 2,388.06
44	Beverly Gardens # 7	16	Scorpio 16	\$ 3,497.75	\$1,109.69	\$ 2,388.06
45	Beverly Gardens # 6	16	Scorpio 16	\$ 2,830.00	\$ 943.02	\$ 1,886.98
46	Beverly Gardens # 5	16	Scorpio 16	\$ 2,830.00	\$ 943.02	\$1,886.98
47	Beverly Gardens # 4	16	Scorpio 16	\$ 2,730.00	\$ 909.69	\$ 1,820.31
48	Beverly Gardens # 3	16	Stand-alone	\$12,376.10	\$ 3,562.80	\$8,813.30
49	Beverly Gardens # 2	16	Stand-alone	\$ 13,420.10	\$ 3,910.08	\$ 9,510.02
50	Beverly Gardens # 1	16	Stand-alone	\$ 8,920.10	\$ 2,410.08	\$ 6,510.02
51	North Rodeo	16	MIR5000	\$ 5,992.10	\$ 1,761.63	\$ 4,230.47
52	Santa Monica 5 Parking Structure	38	MIR5000	\$ 10,376.75	\$ 2,618.95	\$ 7,757.80
53	Old Post Office	10	3 ea. Stand-alone	\$ 7,337.10	\$ 1,892.83	\$ 5,444.27
54	Rexford Mini Park	16	Scorpio 16	\$ 2,997.75	\$ 943.02	\$ 2,054.73
55	Arnaz Mini Park	8	Stand-alone	\$ 6,419.90	\$ 1,958.42	\$ 4,461.48
56	Hamel Mini Park	8	Stand-alone	\$ 3,502.75	\$1,108.30	\$ 2,394.45
57	Fire Station # 3	8	Stand-alone	\$ 4,127.75	\$ 1,293.30	\$ 2,834.45
58	Oakhurst Mini Park	6	Stand-alone	\$ 3,930.55	\$ 1,305.09	\$2,625.46
59	Beverly Hills Market Parking	8	MIR5000	\$ 3,502.75	\$ 1,108.30	\$2,394.45
60	Market	14	2 ea.Stand-alone (2 locations)	\$ 13,873.10	\$ (487.74)	\$14,360.84
61	3rd & Foothill	4	Stand-alone	\$ 6,617.10	\$ 1,946.63	\$4,670.47
62	City Yard # 2	2	Stand-alone	\$ 4,127.75	\$1,293.30	\$2,834.45
63	Sanitation Yard	5	Stand-alone	\$ 7,397.10	\$1,902.85	\$5,494.25
64	Sanitation Yard # 2	6	Stand-alone	\$ 6,617.10	\$1,946.63	\$4,670.47
65	Virgin Records	6	Stand-alone	\$ 9,807.10	\$3,009.96	\$6,797.14
66	Virgin Records	8	Stand-alone	\$ 5,992.10	\$1,761.63	\$4,230.47
67	342 N. Foothill	6	Stand-alone	\$ 6,617.10	\$1,946.63	\$4,670.47
68	Public Works Yard	6	Stand-alone	\$ 6,617.10	\$1,946.63	\$4,670.47

Site Number on Location Map	Description of location	Number of stations at location	Equipment	Equipment List Cost	Labor cost	Extended price quote from vendor
69	400 N. Foothill	5	Stand-alone		\$(4,230.47)	\$4,230.47
70	City Hall North Parking	25	MIR5000	\$ 11,901.30	\$3,900.67	\$8,000.63
71	Fire Station #1 City Hall	20	MIR5000	\$ 15,740.65	\$4,569.90	\$11,170.75
72	Police Department	25	MIR5000	\$ 9,853.35	\$ 3,107.70	\$6,745.65
73	Burton Way	24	1 ea. Scorpio 16 1 ea. Scorpio 8	\$3,014.30	\$ 948.32	\$2,065.98
74	Wilshire/Camden Median	16	IRRInet 32	\$ 6,720.30	\$ 2,183.97	\$4,536.33
75	Rodeo Drive/Brighton	8	Scorpio 8	\$ 3,497.75	\$ 1,109.69	\$2,388.06
76	High School Median	8	DC Scorpio 8		\$	
77	Wilshire/Rodeo	8	MIR5000	\$ 4,201.75	\$ 1,341.29	\$2,860.46
78	Wilshire Median	8	Scorpio 8		\$	
79	Wilshire Median	8	Scorpio 8	\$ 8,322.10	\$ 2,107.48	\$6,214.62
80	Wilshire Median	8	Scorpio 8		\$	
81	Wilshire Median	8	Scorpio 8		\$	
82	Whittier Islands # 1	8	Scorpio 8	\$ 2,330.00	\$ 776.35	\$1,553.65
83	Whittier Islands # 2	2	Stand-alone	\$ 7,719.00	\$ 2,242.80	\$5,476.20
84	Whittier Islands # 3	2	Stand-alone	\$ 7,719.00	\$ 2,242.80	\$5,476.20
85	Motorola Software					\$5,354.69
	Subtotals	1387		\$468,105.33	\$105,979.30	\$367,480.72
	Labor to install 1,387 stations averaged at \$76.40 per station over three year period = \$105,973.30			Total Labor	\$105,979.30	
				Total Equip	\$468,105.33	
				Total Project Cost	\$574,084.63	

Tasks, Deliverables, and Complete Project Plan Schedule

The tasks which can be completed over a three year period can be described in the following fashion: all “standalone” units will be upgraded to either Motorola “Irrinet” or “Scorpio” controllers. All existing Irrinet and Scorpio equipment will be upgraded to correspond with the proposed computerized system. The following table (TABLE 1B) illustrates the task location and the number of stations involved for each set of change outs.

TABLE 1B. EQUIPMENT, TASKS AND DELIVERABLES

Task	Site Number on Location Map	Description of location	Number of stations at location	Existing Equipment
TASK 1	73	Burton Way	24	1 ea. Scorpio 16 1ea. Scorpio 8
TASK 1	29	Beverly Gardens	32	1 ea.IRRINET 32 1 ea. IRRInet
TASK 1	38	Beverly Gardens # 13	24	1 ea.Scorpio 16 1 ea. Scorpio 8
TASK 1	37	Beverly Gardens # 14	24	1 ea.Scorpio 16 1 ea. Scorpio 8
TASK 1	20	La Cienega Park	91	2 ea. MIR 5000
TASK 1	23	Roxbury Park	71	2 ea. MIR5000/1 ea Stand-alone

TASK 1	4	Greystone Mansion	32	32 sta. Irrinet FIU
TASK 1	3	Greystone upper Parking Lot	64	4ea. 16 sta Scorpios
TASK 1	76	High School Median	8	DC Scorpio 8
TASK 1	10	Sunset Median	1	DC Scorpio 8
TASK 1	14	Sunset Median	8	DC Scorpio 8
TASK 1	16	Sunset Median # 5	1	DC Scorpio 8
TASK 1	6	Coldwater Park	16	Irrinet
TASK 1	9	Maltz Park	16	Irrinet
TASK 1	74	Wilshire/Camden Median	16	IRRIInet 32
TASK 1	12	Rogers Park	64	Irrinet 48/Scorpio 16
TASK 1	22	La Cienega Tennis Center	52	MIR 5000
TASK 1	59	Beverly Hills Market Parking	8	MIR5000
TASK 1	70	City Hall North Parking	25	MIR5000
TASK 1	71	Fire Station #1 City Hall	20	MIR5000
TASK 1	51	North Rodeo	16	MIR5000
TASK 1	72	Police Department	25	MIR5000
TASK 1	24	Roxbury Park	13	MIR5000
TASK 1	52	Santa Monica 5 Parking Structure	38	MIR5000
TASK 1	28	South Beverly Parking Structure	3	MIR5000
TASK 1	77	Wilshire/Rodeo	8	MIR5000

Task	Site Number on Location Map	Description of location	Number of stations at location	Existing Equipment
TASK 2	41	Beverly Gardens # 10	16	Scorpio 16
TASK 2	40	Beverly Gardens # 11	16	Scorpio 16
TASK 2	39	Beverly Gardens # 12	16	Scorpio 16
TASK 2	35	Beverly Gardens # 16	16	Scorpio 16
TASK 2	34	Beverly Gardens # 17	16	Scorpio 16
TASK 2	33	Beverly Gardens # 18	14	Scorpio 16
TASK 2	32	Beverly Gardens # 19	16	Scorpio 16
TASK 2	31	Beverly Gardens # 20	16	Scorpio 16
TASK 2	30	Beverly Gardens # 21	16	Scorpio 16
TASK 2	47	Beverly Gardens # 4	16	Scorpio 16
TASK 2	46	Beverly Gardens # 5	16	Scorpio 16
TASK 2	45	Beverly Gardens # 6	16	Scorpio 16
TASK 2	44	Beverly Gardens # 7	16	Scorpio 16
TASK 2	43	Beverly Gardens # 8	16	Scorpio 16
TASK 2	42	Beverly Gardens # 9	16	Scorpio 16
TASK 2	21	La Cienega Park	16	Scorpio 16
TASK 2	26	Olympic/Beverly Mini Park	16	Scorpio 16
TASK 2	27	Reeves Park	16	Scorpio 16
TASK 2	54	Rexford Mini Park	16	Scorpio 16

TASK 2	18	Sunset Median # 7	16	Scorpio 16
TASK 2	13	Sunset/Rexford Median #4	16	Scorpio 16
TASK 2	36	Beverly Gardens # 15	8	Scorpio 8
TASK 2	75	Rodeo Drive/Brighton	8	Scorpio 8
TASK 2	82	Whittier Islands # 1	8	Scorpio 8
TASK 2	78	Wilshire Median	8	Scorpio 8
TASK 2	79	Wilshire Median	8	Scorpio 8
TASK 2	80	Wilshire Median	8	Scorpio 8
TASK 2	81	Wilshire Median	8	Scorpio 8
TASK 2	11	Sunset Median #2	8	Scorpio 8
TASK 2	5	Trousdale Estates	8	Scorpio 8 sta

Task	Site Number on Location Map	Description of location	Number of stations at location	Existing Equipment
TASK 3	67	342 N. Foothill	6	Stand-alone
TASK 3	61	3rd & Foothill	4	Stand-alone
TASK 3	69	400 N. Foothill	5	Stand-alone
TASK 3	55	Arnez Mini Park	8	Stand-alone
TASK 3	50	Beverly Gardens # 1	16	Stand-alone
TASK 3	49	Beverly Gardens # 2	16	Stand-alone
TASK 3	48	Beverly Gardens # 3	16	Stand-alone
TASK 3	25	Beverwill Mini Park	4	Stand-alone
TASK 3	62	City Yard # 2	2	Stand-alone
TASK 3	7	Coldwater Park North	23	Stand-alone
TASK 3	57	Fire Station # 3	8	Stand-alone
TASK 3	8	Fire Station South	8	Stand-alone
TASK 3	1	Greystone Bathroom	34	Stand-alone
TASK 3	2	Greystone Upper Parking Lot	12	Stand-alone
TASK 3	56	Hamel Mini Park	8	Stand-alone
TASK 3	58	Oakhurst Mini Park	6	Stand-alone
TASK 3	68	Public Works Yard	6	Stand-alone
TASK 3	15	Reservoir	24	Stand-alone
TASK 3	63	Sanitation Yard	5	Stand-alone
TASK 3	64	Sanitation Yard # 2	6	Stand-alone
TASK 3	19	Sierra Mini Park	6	Stand-alone
TASK 3	17	Sunset Median # 6	16	Stand-alone
TASK 3	65	Virgin Records	6	Stand-alone
TASK 3	66	Virgin Records	8	Stand-alone
TASK 3	83	Whittier Islands # 2	2	Stand-alone
TASK 3	84	Whittier Islands # 3	2	Stand-alone
TASK 3	60	Market	14	Stand-alone (2 locations) 2 ea.
TASK 3	53	Old Post Office	10	Stand-alone 3 ea.

TABLE 1C. DELIVERABLES AND TIME FRAME

Equipment	Location	Tasks	Completion Date/Deliverables
Irrinet MIR 5000 and Motorola software	All locations on preceding table listed under TASK 1 and TASK 4	<ul style="list-style-type: none"> • TASK 1 • Depending on Model year all will be upgraded to Scorpio • Cabinet replacements and master valve flow meters 	<ul style="list-style-type: none"> • Quarterly reporting assignments to DWR • Installation completed one year from contract award date
Motorola Scorpio	All locations on the preceding table listed TASK 2	<ul style="list-style-type: none"> • TASK 2 • Irrinets control all Scorpions from Irrinet computer • Upload software and upgrade radio and update to new radio frequency 	<ul style="list-style-type: none"> • Quarterly reporting assignments to DWR • Installation completed two years from contract award date
Stand alone stations	All locations on the on the preceding table listed TASK 3	<ul style="list-style-type: none"> • TASK 3 • All standalones stations need to be upgraded to either Irrinet or Scorpio stations with 	<ul style="list-style-type: none"> • Quarterly reporting assignments to DWR • Installation completed three years from contract award date

Plan for required CEQA/NEPA compliance

In accordance with the Californian Environmental Quality Act (CEQA) Title 14 “California Code of Regulations”, Chapter 3 “Guidelines for the Implementation of the California Environmental Quality act”, Article 19 “Categorical Exemptions”, Section 15301. “Existing Facilities”, the project would not require compliance actions and would be deemed to be “not a project”. A Categorical Exemption would be filed with the Sate of California in accordance with CEQA as pertains to the two following class exemptions:

15301. Existing Facilities

Class 1 consists of the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or private structures, facilities, mechanical equipment, or topographical features, involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination. The types of "existing facilities" itemized below are not intended to be all inclusive of the types of projects which might fall within Class 1. The key consideration is whether the project involves negligible or no expansion of an existing use. Examples include but are not limited to: (a) Interior or exterior alterations involving such things as interior partitions, plumbing, and electrical conveyances. The following class exemption would also apply:

15302. Replacement or Reconstruction

Class 2 consists of replacement or reconstruction of existing structures and facilities where the new structure will be located on the same site as the structure replaced and will have substantially the same purpose and capacity as the structure replaced, including but not limited to: (c) Replacement or reconstruction of existing utility systems and/or facilities involving negligible or no expansion of capacity.

SECTION THREE—STATEMENT OF WORK: MONITORING AND ASSESSMENT***Monitoring methodologies and data to be collected to assess project results***

Once the stations are upgraded and connected to the “smart” irrigation management system, monthly reports will be generated by the program software. The watering “clocks” will be timed according to planting types, i.e., annuals, shrubs, turf, etc. The controllers will be programmed to allow for weather changes including overcast periods during the summer month of June, for example. Locations will be studied to ascertain excessive watering. On an annual basis the City will present the monthly reports of that year’s water savings to the City Council.

A description of how pre-project conditions and data baselines will be determined, the basic assumptions being used, and the anticipated accuracy of the data to be produced

The staff will start with a fixed mode of reference based on the current manual program adjustments and adjust where each field unit’s main lines and valves are displayed to schematically develop our own user maps as time allows. When creating our maps we will have the ability to create screens, import graphic files, (bitmaps, jpegs., etc.), place navigation buttons on a screen, (zoom to another screen function), place input or outputs on top of the map (show valves and sensors all or selected ones), place icons representing Areas and Filed Units on top of the map and finally create and label fields on top of the map.

The Irrinet Control Center (ICC) is software linked to the central management system which exports data to Microsoft Exel for customized reporting. On screen displays show everything at a glance: graphic maps, “events” logs, and system organization (similar to windows Explorer). The system supports multiple central files allowing more than one “Irrinet” Filed Unit (FIU) to run on the same system. Every table allows a report to be printed. Flow meters will show gallons automatically and will download that information through the irrigations controller and will send all usage back to the central computer. Spread sheets will be generated that will show the outputs of each valve. Gallons lost to malfunctioning valves or breaks will be reported. The “Irrinet” program software will allow enhanced graph plotting allowing us to perform calculations and analysis. Sensor measurements may be taken by the ICC. It allows staff to interface with the field unit and can measure PSI or atmospheric units and allow us to read an actual numeric value matching the gauge readings in the field. The CIMIS system will be able to regulate the weather factors that indicate the evapo-transpiration rates.

How the data will be used to evaluate success in relation to project goals and objectives.

This data can potentially be fed into the models that would study the community “water-mass balance”. It is anticipated that the data would allow the City to draft a landscape ordinance with quantifiable objectives. Overall the conservations goals, and the objectives of long term water savings and raised awareness would be met through technological water delivery tools.

Reporting methods to DWR and others

Monthly spreadsheets and graphs will be presented to the Department of Water Resources and made available to all other agencies associated the California Urban Water Conservation Council.

Estimated costs associated with the implementation of monitoring

Consultant costs are figured into the labor estimate. An almost zero in-house cost to generate reports and administer record keeping is anticipated.

QUALIFICATIONS OF APPLICANT & COOPERATORS

Rob Beste, Director of Public Works

Mr. Beste is a Professional Engineer registered with the State of California, and was appointed Director of the Department of Public Works in the year 2003. Prior to his assignment as Director, Mr. Beste served as the City Engineer. In the year 2003, the Public Works Department participated in the City's General Plan update and convened over an Environmental Sustainability General Plan Topic Committee. This group was comprised of concerned and qualified citizens who studied various state of the art methods for conservation on the many levels that might affect long term well being of the City. Water conservation factored heavily in their final recommendations to the City Council. Mr. Beste's resume is included at the conclusion of the proposal.

Renée Schrader, Sustainability Programs Manager

Ms. Schrader holds graduate degrees in Landscape Architecture and Urban Planning. She served as a City Planner prior to her assignment as Sustainability Programs Manager with the Department of Public Works. Ms. Schrader is dedicated to the study and policy implementation of sound environmental practices, especially with respect to the biological-sociological value that landscape and open space play in the urban fabric. Ms. Schrader will serve as the Project Manager. Ms. Schrader's resume is included at the conclusion of the proposal.

David Garrard, General Park Maintenance Supervisor

Mr. Garrard was a self employed landscape contractor with an emphasis on landscape construction and maintenance for several years. He served as the Manager of the Horticulture Department at Disneyland (Anaheim) for five and half years prior to coming to the City of Beverly Hills as General Park Maintenance Supervisor. Mr. Garrard will supervise the installation of the project.

Performance in Prior Programs

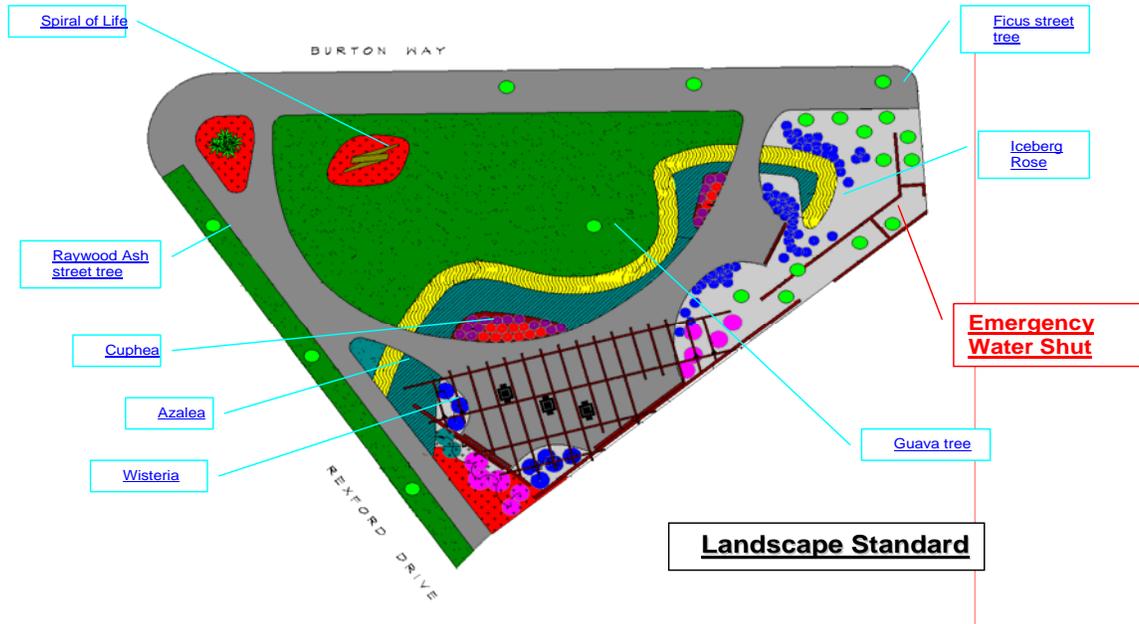
While the City of Beverly Hills has not formerly participated in DWR grant application, staff aspires to build the momentum of a dedicated conservation programs approach. In September 2004 the City of Beverly Hills became a signatory to the California Urban Water Conservation Council. Since then staff's efforts to increase conservation awareness has been met with City Council's signature of a Master Agreement with MWD Residential Rebate Program. The Sustainability Programs Manager is writing an RFP for the design and construction of an Community Water Conservation Education Center in the new Public Works building, where water education displays will be showcased for the community, schoolchildren and it is anticipated visitors from the region and tourists from all nations.

OUTREACH, COMMUNITY INVOLVEMENT AND ACCEPTANCE

Plan for public outreach

The Irrinet computer program will allow for an interactive component that will be downloaded to a computer in the Community Education Center. A graphic has been provided on the next page which shows call outs for a small pocket park known as Rexford Park. As can be seen the call outs represent the location of various plant species and a Public Art piece called "The Spiral of Life". These call outs when selected pop up with more graphics and text describing the plant or

Art piece. Also indicated is the location of the master valve (labeled “Emergency Water Shut”) enabling a school child to turn it on and off from the computer screen. The City’s Recreation and Parks Department would like to create a few more of these interactive displays and link them to the Master computer controllers. Separate monitors can be set up to show the water as it goes on and off. The Irrinet system could also display Educational data on a touch screen promoting landscape design using California Friendly Plant species. In this way the public has a complete hands-on accessible learning experience. Community Environmental Programs newsletter, and liaisons with the Beverly Hills Unified School District would also be implemented.



Support and opposition

Presently there is great support for a “Smart” irrigation management project. A Public Service Announcement taped by our City’s local Cable station and delivered by Rob Beste, Director of Public Works, was generated at the request of a City Council member to urge citizens to stop watering during the rainy weather as a conservation message. Advertising in the local papers and a notice on the City’s website also appeared. While the City has been slow to implement these types of technologies it is eager to be part of a regional conservation mission.

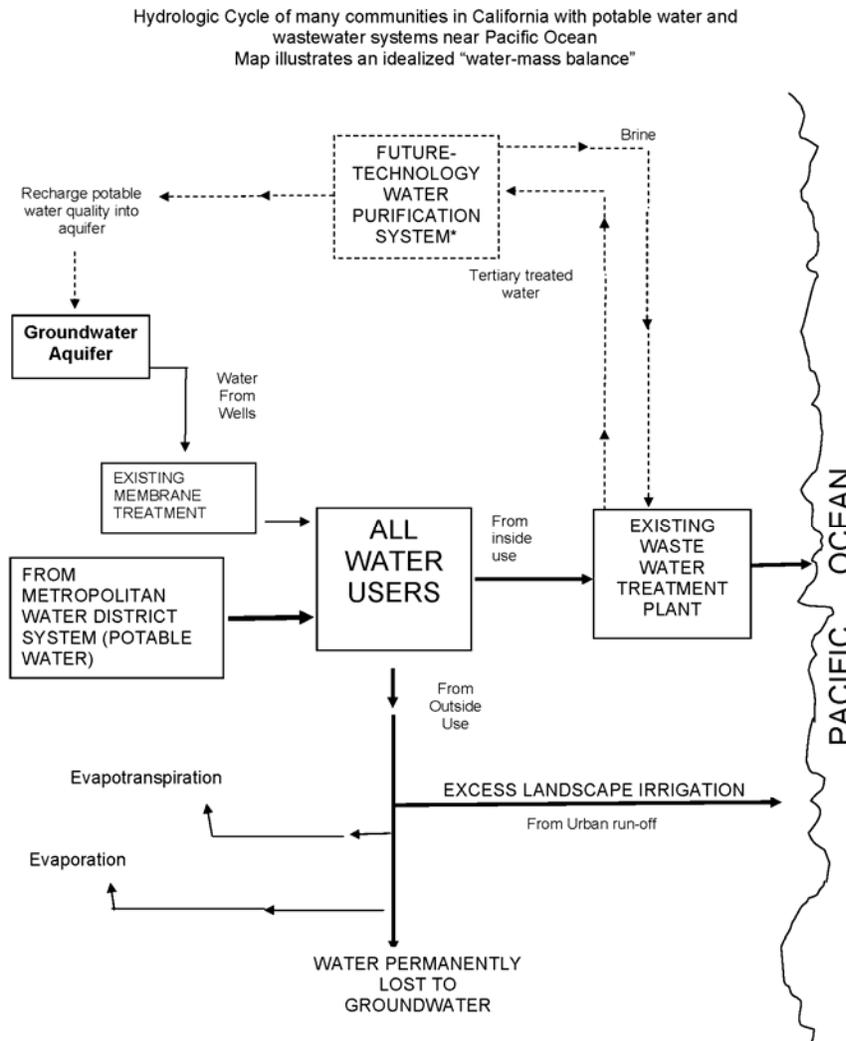
How does the project fit into local and regional plans?

Regionally, the upgrade to a “Smart” irrigation management system would serve as a model. Over time the results would be utilized to further conservation efforts and to build data that would inform a landscape ordinance. The installation of a smart irrigation management system would allow the city to participate regionally by sharing data.

INNOVATION

A schematic of the Hydrological Cycle of many communities in California with potable water & wastewater systems near the Pacific Ocean is illustrated on the following page. This schematic is presented in order to illustrate that value of water-mass balance thinking. (See graphic)

The idea of water mass balance, which has been modeled by water scientist is a way of measuring how well your doing in terms of water “waste” and water “usability”, and is usually spoken in terms of flow. In the graphic below the flow model illustrates schematically how much water is imported from outside sources how much is used and how much is treated and returned either to the system as “usable” or the ocean as “waste”. Water returned to the atmosphere is also not “usable”.



Innovative technologies and methodologies that could be employed

A few examples of how it might be possible to apply the “water-mass balance” thinking are submitted for consideration. These spreadsheets are useful in determining the amount of water saved therefore the annual cost saving to the city, the payback period for the investment, and the benefit cost ratio can easily be derived. It provides a basis for determining the pathways, flows and amounts of water in the water cycle.

Columns A through E determine the amount of potable water used by the community. Columns F-I determine the amount of water used inside and water used outside whether residential commercial or industrial.

SPREADSHEET TO CALCULATE IMPACT OF "SMART IRRIGATION MANAGEMENT SYSTEM" (SIMS)							City of Beverly Hills Page 1 of 2	
A	B	C	D	E	F	G	H	I
Given	From US Census	Based on recent studies	B * C	D / 1,000,000	Based on recent studies of water mass balance of community	Based on recent studies of water mass balance of community	E * F/100	E * G/100
YEAR	CALCULATE AMOUNT OF POTABLE WATER USED BY COMMUNITY (INSIDE USE PLUS OUTSIDE USE)				DISTRIBUTION OF POTABLE WATER USED BY CITY OF BEVERLY HILLS			
	POPULATION (capita)	PER CAPITA USE (gal/day/cap)	AMOUNT OF POTABLE WATER USED BY COMMUNITY (INSIDE AND OUTSIDE)		PERCENTAGE SPLIT (PROJECTIONS OF SPLIT BASED ON ESTIMATED IMPACTS OF WATER CONSERVATION EFFORTS BY CITY OF BEVERLY HILLS)		AMOUNT OF WATER SPLIT	
			(gal/day)	(MGD)	INSIDE USE (%)	OUTSIDE USE (%)	INSIDE USE (MGD)	OUTSIDE USE (MGD)
2000	60,000	220	13,200,000	13.20	50	50	6.60	6.60
2005	62,000	215	13,330,000	13.33	51	49	6.80	6.53
2010	63,000	212	13,356,000	13.36	52	48	6.95	6.41
2015	65,000	200	13,000,000	13.00	53	47	6.89	6.11
2020	68,000	198	13,464,000	13.46	54	46	7.27	6.19
2025	70,000	196	13,720,000	13.72	55	45	7.55	6.17

Columns K through N calculate the amount of water saved for any particular year, and therefore the annual savings by implementing SIMS in column P. **The figures are hypothetical and would require further investigation to enter specific data to the spread sheet.**

The payback period can therefore be determined with columns P, Q and R and the total annual cost can be found using columns S, T and U. An additional column can easily derive the cost benefit ration by dividing the values of P over U, (column P divided by column U).

SPREADSHEET TO CALCULATE IMPACT OF "SMART IRRIGATION MANAGEMENT SYSTEM" (SIMS)											City of Beverly Hills Page 2 of 2	
J	K	L	M	N	O	P	Q	R	S	T	U	
Given	Estimated	$I * K/100$	Based on industry - wide research	$L * M/100$	From operating records. Assume inflation rate at 2% /yr	$N * O * 365$	Estimated. Assume inflation rate at 2% /yr	Q / P	$Q * 0.1359$	Estimated. Assume inflation rate at 2% /yr	S + T	
YEAR	CALCULATE AMOUNT OF POTABLE WATER USED BY CITY OF BEVERLY HILLS FOR LANDSCAPE IRRIGATION OF PARKS, ETC		CALCULATE AMOUNT OF POTABLE WATER SAVED BY IMPLEMENTATION OF SMART IRRIGATION MANAGEMENT SYSTEM		CALCULATE ANNUAL SAVINGS IN COST WITH IMPLEMENTATION OF SMART IRRIGATION MANAGEMENT SYSTEM		CALCULATE "PAYBACK PERIOD"		CALCULATE TOTAL ANNUAL COST FOR IMPLEMENTATION OF SIMS			
	% of total community total outside use (%)	City of BH lanscape irrig of parks, etc. (MGD)	Per cent of lanscape irrig. water saved by implementation of SIMS (%)	Water saved (MGD)	UNIT COST FOR POTABLE WATER DELIVERED TO CITY OF BEVERLY HILLS (\$ / MG)	ANNUAL COST SAVINGS (\$ / year)	CAPITAL COST OF SIMS (\$)	PAYBACK PERIOD (years)	ANUALIZED CAPITAL COST (Using 10 yr life and 6% int., capital rec. factor is 0.1359) (\$ / year)	ANNUAL OPERATION & MAINT. COST (\$ / year)	TOTAL ANNUAL COST (\$ / year)	
2000	6	0.396	0	0.000	1000.00	0	0					
2005	6	0.392	30	0.118	1100.00	47,205	80,000	1.69	10,872	9,000	19,872	
2010	6	0.385	30	0.115	1200.00	50,543	0					
1015	6	0.367	30	0.110	1350.00	54,193	97,500	1.80	13,250	11,000	24,250	
2020	6	0.372	30	0.111	1490.00	60,629	0					
2025	6	0.370	30	0.111	1640.00	66,524	120,000	1.80	16,308	13,000	29,308	

J	K	L	M	N	O	P	Q	R	S	T	U
Given	Based on recent studies of water mass balance of community				$I * (L + M) / 100$	Based on industry-wide research	$O * P / 100$	From operating records	$Q * R * 365$	Estimated based on recent information	S / T
YEAR	DISTRIBUTION OF OUTSIDE WATER USE (Note: Implementation of SIMS in Yr 2005)				CALCULATE AMOUNT OF POTABLE WATER SAVED BY IMPLEMENTATION OF SIMS			CALCULATE AMOUNT OF ANNUAL COST SAVINGS BY IMPLEMENTATION OF SIMS		CALCULATE BENEFIT / COST RATIO	
	TO URBAN RUNOFF (EXCESS LAND-SCAPE IRRIGATION) (%)	TO EVAPORATION ON GROUND (%)	TO EVAPO-TRANSPIRATION (%)	LOST TO GROUND-WATER (%)	POTABLE WATER LOST TO EVAPORATION & EVAPO-TRANSPT'N (MGD)	PER CENT SAVINGS WITH SIMS (%)	AMOUNT OF POTABLE WATER SAVED WITH SIMS (MGD)	COST OF POTABLE WATER (\$/MG)	ANNUAL COST SAVINGS (\$ /yr)	CAPITAL COST OF SIMS INSTAL-LATION (\$)	BENEFIT COST RATIO (Ratio)
2000	20	30	20	30	3.30	30	0.99	550	198,743	0	
2005	30	23	15	32	2.48	30	0.7446	560	152,199	100,000	1.52
2010	33	20	13	34	2.12	30	0.63	570	132,045	0	
2015	35	19	11	35	1.83	30	0.55	580	116,414	120,000	0.97
2020	36	18	10	36	1.73	30	0.52	590	112,036	0	
2025	37	17	9	37	1.61	30	0.48	600	105,464	140,000	0.75

The additional table presents a different format to look at distribution of water uses outside that would include urban run-off , evapo-transpiration, evaporation from the ground, and loss to ground water. This is a holistic way of looking at water conservation. A model could be implemented utilizing the spreadsheet Data from the Irrinet software.

CONCLUSION

In conclusion the city of Beverly hills would like to request funding assistance in order to purchase, program and implement a “Smart irrigation management system to irrigate 100 acres of Parks and Municipals lands. The city represents a heightened opportunity to showcase these technologies. A work plan for the subsequent there year that incorporate the upgrading of 1387 stations has been submitted. The estimated water volume saved is targeted at approximately 60.7 acre feet per year. (326,000 gal. x 60.7 = 19,788,200 gallons saved).

By incorporating this technology the City would be able to educate and outreach to the community via newsletters and education center. Reporting of results and tracking would be made viable via CD and hard coy tot eh Department of Water resources. CD’s would be viable to share with other agencies. The City of Beverly Hills is requesting grant funds to begin building the momentum of water conservation awareness.

APPENDIX C Cost Benefit Tables