PROPOSITION 50 WATER USE EFFICIENCY
SECTION B GRANT APPLICATION

Police Athletic League (PAL) Sports Complex
Alternative Surface Irrigation Demonstration Project

January 11, 2005

Prepared for: California Department of Water Resources
Office of Water Use Efficiency
1416 Ninth Street, Room 338, Sacramento, CA 95814
Attention: Debra Gonzalez

Prepared by: The Department of Parks, Recreation and Neighborhood Services
The Environmental Services Department

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I. Project Information Form

2004 Water Use Efficiency Proposal Solicitation Package

Applying for: ☒ Urban ☐ Agricultural

1. (Section A) **Urban or Agricultural Water Use Efficiency Implementation Project**
   - ☐ (a) implementation of Urban Best Management Practice, #_____
   - ☐ (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 San José

4. Project Title: Police Athletic League Sports Complex Alternative Surface Irrigation Demonstration Project

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

Name, title	Del Borgsdorf, City Manager
Mailing address	801 North 1st Street, Rm. 436
	San Jose, CA 95110
	(408) 277-5849
Telephone	(408) 277-3131
Fax.	
E-mail	del.borgsdorf@sanjoseca.gov

6. Contact person (if different):

Name, title.	Scott Reese, Deputy Director
Mailing address.	170 W. San Carlos St.
	San Jose, CA 95113-2005
	(408) 794-1337

Telephone	(408) 297-3108
Fax.	scott.reese@sanjoseca.gov
E-mail	

7. Grant funds requested (dollar amount): *(from Table C-1, column VI)*	**$1,000,000**
8. Applicant funds pledged (dollar amount):	$500,000
9. Total project costs (dollar amount): *(from Table C-1, column IV, row n)*	$1,500,000
10. Percent of State share requested (%) *(from Table C-1)*	67 %
11. Percent of local share as match (%) *(from Table C-1)*	33 %

12. Is your project locally cost effective?

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.

(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.)

☐ (a) yes

☒ (b) no

11. Is your project required by regulation, law or contract?

If no, your project is eligible.

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.

☐ (a) yes

☒ (b) no

12. Duration of project (month/year to month/year):	**12/05 to 11/08**
13. State Assembly District where the project is to be conducted:	**District # 23**
14. State Senate District where the project is to be conducted:	**District # 13**

15. Congressional district(s) where the project is to be conducted: District # 16

16. County where the project is to be conducted: Santa Clara County

17. Location of project (longitude and latitude) 37° 20' 36" North by 121° 50' 55" West

18. How many service connections in your service area (urban)? >200,000

19. How many acre-feet of water per year does your agency serve? >150,000 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, $53,833 median household income – See EXHIBITS E, F
- ❑ (b) no

II. Signature Page

2004 Water Use Efficiency Proposal Solicitation Package

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	Name and title	Date

III. Statement of Work: Relevance and Importance

Describe how this project will contribute toward or support California Bay-Delta Program goals. Provide estimates of total expected water savings for proposals that are designed to lead to quantifiable water savings. Provide an explanation for all assumptions, methodologies, and computations used to arrive at the values. Provide a plan for project monitoring and evaluation that will be used to document the benefits to mark progress and to determine the success of the project in relation to project goals and objectives.

The proposed "Police Athletic League (PAL) Sports Complex Alternative Surface Irrigation Demonstration Project" accomplishes a number of objectives critical to the CALFED program and supportive of local, regional and statewide goals, including reduced water use, reduced water loss, transfer of water conservation technology. In addition, the project provides complementary benefits of reducing urban runoff as well as reducing pollution of urban creeks and streams, enhancing both water quantity and water quality.

The PAL Demonstration Project consists of a full-scale comparative study of alternative irrigation methods to provide a practical basis for selecting among various water efficient turf designs for athletic fields. The demonstration project will occupy approximately 3.1 acres on an existing 14.2-acre park owned by the City of San Jose. The park currently includes a 2.4-acre soccer field, a 2.5-acre baseball field and a 1.0-acre softball field operated by the San Jose Police Athletic League (see attached Exhibit B-1).

The proposed project will provide for installation of an innovative subsurface irrigation system in the baseball field and installation of a conventional surface spray irrigation system (with moisture control) at an adjacent softball field. As described in more detail in Section 2 (Technical/Scientific Merit, Feasibility), use of subsurface irrigation is expected to water demand between 40% and 60% when compared with sprinkler irrigation. Based on previous year's water usage, outdoor irrigation of the site currently consumes approximately 17 ac-ft per year (7500 ccf), or an average of 3.4 feet per acre (about 40 inches per year) which is average for spray irrigation of outdoor landscape in this area. Assuming a reduction in water use of 50% for the baseball fields due to subirrigation, and a 20% reduction for the softball field due to improved control, annual water savings from this portion of the demonstration project alone will amount to about 1700 ccf or over 1 million gallons per year.

To confirm water savings from the demonstration project, the real-time, full-scale comparison will include monitoring water use, dry weather and wet-weather runoff and surface playability. The project will also include a detailed record of installation and maintenance costs and methods. In addition, the project will include installation of a 2,000-gallon cistern on site to demonstrate the potential for reuse of urban runoff in the subsurface irrigation system to further reduce water use.

In addition, the PAL Demonstration Project also provides for monitoring surface conditions and leachate quality from the synthetic turf planned to replace natural grass on the soccer field, funded through the City's Capital Improvement Program. The monitoring program will assess water demand for cooling and potential for groundwater pollution from synthetic turf leachate. Notwithstanding the current popularity of synthetic turf as a water conservative replacement of natural turf, significant issues have been raised recently related to the playability of the surface during hot weather as well as the potential for groundwater pollution from leachate. As detailed in Sections IV and V, The PAL Demonstration Project will evaluate field temperature, cooling requirements and subsurface water quality.

In summary, the proposed "PAL Alternative Surface Irrigation Demonstration Project" will contribute to CALFED Bay-Delta goals in a number of important ways including:

- Demonstration of an innovative technique to reduce irrecoverable evaporative losses from irrigation of a local athletic field through the use of appropriate conservation technologies (subsurface evaporative irrigation)
- Onsite water reduction of 4acre-feet, or over 1 million gallons per year based on use of subsurface irrigation and improved moisture control of spray irrigation at the demonstration site
- Magnification of water savings through the development and promulgation of sound technical information to facilitate selection of innovative subsurface irrigation technology at other athletic fields and parks throughout California.

Besides the specific CALFED benefits identified above, the proposed project will also demonstrate the potential for reducing runoff through subsurface irrigation, as well as by reusing runoff for subsurface irrigation. In addition, the evaluation of leachate potential from synthetic turf will contribute to protecting water quality in the Bay-Delta area by reducing potential pollution from urban creeks and streams.

These projects are consistent with the City of San Jose's Water Policy and the Santa Clara Valley Water District (SCVWD) 2001 Urban Water Management Plan[1] which states, "Water conservation was identified as an important component of the Integrated Water Resources Plan Preferred Strategy" including providing incentives for Large Landscape Conservation.

The PAL Demonstration Project is also consistent with the CALFED Water Use Efficiency (Proposition 50—Chapter 7, Part B) solicitation for "feasibility studies, pilot or demonstration projects" that "explore new technologies and water management practices to improve water use efficiency" and "evaluate the water conservation, environmental benefits and overall cost/benefits of artificial turf."

[1] Santa Clara Valley Water District, "Urban Water Management Plan." San Jose: SCVWD Technical Report, 2001

IV. Statement of Work: Technical/Scientific Merit, Feasibility Relevance and Importance

Describe methods, procedures, equipment, and facilities. Provide enough information to permit evaluation of the feasibility and technical adequacy of the approach to satisfy the objectives and the applicant's readiness to proceed.

The proposed "Police Athletic League (PAL) Sports Complex Alternative Surface Irrigation Demonstration Project" will compare two types of irrigation systems (overhead spray and subsurface evaporative irrigation), and will also identify potentially significant issues associated with the use of synthetic turf. The project provides for recording pertinent details at each step (installation, startup, operation and maintenance) and regular monitoring of water conservation and other aspects of performance. The following summary provides details about each of the surfaces and irrigation types, including methods, procedures, equipment, and facilities.

Natural Turf--Overhead Spray Irrigation

The 0.95-acre softball field will be converted to a natural turf-overhead spray demonstration site, of which approximately 0.8 acre will be turf and the remaining 0.15 will be stripped infield. In order create an appropriate control comparison to the adjacent subsurface evaporative irrigation site, the site will be re-sodded with a sand-based rye-fescue blend rolled on native soil for quick propagation. Irrigation will be accomplished with approximately thirty (30) rotary sprinklers (Hunter I-60 or equal) on 45-ft centers, with an average irrigation rate of 10 gpm per sprinkler (see attached Exhibits B-2 and B-3).

Based on prior experience on this site, it is projected that the site would normally require about ½ in/wk during the winter (about 11,000 gallons/week) and about 1-1/2 in wk during the summer (33,000 gallons/week) for a total demand of about 850,000 gallons/year. However, in addition to the updated irrigation system, the project will include soil-moisture monitoring and control. Soil monitoring will be accomplished with either time domain reflectometry (TDR) or tensiometric instrumentation: while TDR meters are more accurate at low water levels, tensiometers have proved reliable in conditions similar to those anticipated at the demonstration site.[2] Either technology has been demonstrated to produce water savings in the range of 15-30% compared to time-based irrigation methods.

Installation of the system will be photographed, and installation and startup issues will be logged, and their resolution recorded. Cost accounting for all sites will include tracking extensive (unit) and intensive costs, and comparing estimated and actual costs with industry standards. Monitoring will include initial turf condition and soil density, soil moisture (in conjunction with moisture control of irrigation), and metered water use. In addition, after all sprinklers are adjusted to minimize drift and overspray, areas of runoff will be periodically estimated by inspection to calculate water waste.

Throughout the proposed two-year study period field use will be logged and turf conditions monitored for playability. Bare areas will be measured and tracked prior to re-seeding, and maintenance costs will be included in the overall site performance comparison.

Natural Turf—Subsurface Evaporative Irrigation

The 2.5-acre baseball field will be converted to a natural turf—subsurface evaporative irrigation demonstration site, of which approximately 2.25 acre will be turf and the remaining 0.25 will be

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[2] Smajstria, Allen G. and Dalton Harrison. "Tensiometers for Soil Moisture Measurement and Irrigation Scheduling." Circular 487, Agricultural & Biological Engineering Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. April, 1998.

stripped infield (see attached Exhibit B-4). The subsurface system will consist of a network of subsurface pipes under a constructed soil profile of washed sand to create a uniform capillary zone above a subsurface reservoir providing constant irrigation of turf roots without reducing surface playability. Since this technology is relatively new, there are only four athletic fields in California using subsurface flood irrigation, although there are a number of others (including golf courses) in other parts of the arid west (Nevada, New Mexico).

Conventional subsurface irrigation consists of distribution of water below the surface, either through perforated pipes (as is sometimes practiced in developing countries) or through subsurface emitters (e.g. Netafim, Wick). Because of reduced evaporation, subsurface irrigation can significantly reduce water use compared with overhead spray irrigation. On the other hand, subsurface pipes and emitters are prone to clogging and can result in uneven application of water. Also, when emitters or pipes are placed too far from the surface they can fail to provide adequate irrigation unless even more water is provided, reducing or eliminating any potential water savings. This problem is solved, however, by replacing the underlying soil with a close-grained material (washed sand) whose capillary action is sufficient to move water to the surface without the need for additional piping. This technology is currently available from Evaporative Control Systems (Reno, NV), which has agreed to provide in-kind services in support of the demonstration project.[3]

Reconstruction of the subsurface of the baseball field is detailed in Exhibit B-5. Existing turf will be removed along with native soil to a depth of approximately thirteen inches, laser-leveled and compacted to 90% Proctor. An impermeable liner will be installed to form the base of the subsurface reservoir and four-inch diameter water distribution pipes will be installed on supporting blocks around the perimeter of the field approximately two inches above the liner. 1-½ inch-diameter water feeder pipes will extend from the mains to the open reservoir pipes with their slotted shrouds. The site is then leveled with two inches of #10 gravel and approximately eleven inches of washed sand to grade. Finally, the site will be re-sodded with a sand-based rye-fescue blend.

As with the first site, installation of the system will be photographed, and installation and startup issues will be logged, and their resolution recorded. Cost accounting for all sites will include tracking extensive (unit) and intensive costs, and comparing estimated and actual costs with industry standards. Monitoring will include initial turf condition and soil density and soil moisture and metered water use; however, since the subsurface irrigation provides a continuous reservoir of available water moisture control is not required. Based on previous studies, it is estimated that water use at this site will be reduced by 40-60%.[4,5] Assuming 50% conservation, estimated water savings will average about 3.4 acre-feet per year, or over 1 million gallons annually.

One novel feature of this system is that during storm events the feeder pipes serve as drain pipes conveying excess storm water away from the surface. In addition, facilities have been included to collect storm water runoff from the adjacent field in a 2000-gallon cistern to

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[3] Sipaila, Jonas Z. "Subsurface fluid distribution apparatus and method" US Patent No. 5,921,711 (1997)

[4] Leinauer, B. *Water Savings Through Subirrigation.* **Golf Course Management** October 1998, 65-69.

[5] Leinauer, B. and .J Makk. *Effect of Greens Type, Irrigation Type, and Root Zone Material on Irrigation Efficeincy, Turfgrass Quality and Water Use on Putting Greens in the Southwest.* Report to US Department of Agriculture, Agreement No. 2001-45046-01149.

augment the irrigation supply (see attached Exhibit B-6). This feature will be implemented only after the first year of operation, when a direct comparison of water use between the two fields has been completed. Throughout the proposed two-year study period field use will be logged and turf conditions monitored for playability. Bare areas will be measured and tracked prior to re-seeding, and maintenance costs will be included in the overall site performance comparison.

Synthetic Turf Monitoring (Temperature Measurement and Leachate Analysis)

As part of the City of San Jose Parks, Recreation and Neighborhood Services Capital Improvement Program, the City has plans to replace natural grass on the 2.3-acre soccer field with synthetic turf to increase playability and reduce water use. The synthetic turf system will consist of a base of sand and rubber and a top carpet of polyethylene fiber "grass." In contrast to the other two sites, water use is not a concern with this site except insofar as supplemental water may be required to lower playing temperatures, reducing expected water savings. However, leachate that passes through the synthetic turf surface will be collected and analyzed for potentially toxic constituents that might otherwise discharge to urban creeks and streams.

Existing turf will be removed along with native soil to a depth of approximately two feet, laser-leveled and compacted. A network of drainage pipes will be installed above the compacted subgrade and a permeable geotextile liner will be installed to form the base of the compound sand and rubber matrix. Finally, the fiber surface mats will be placed and sewn together to form a continuous playing surface.

Use of synthetic turf is becoming more common in the vicinity of the northern California CALFED project area; during the past year, at least ten schools in the service area of the San Jose/Santa Clara Water Pollution Control Plant converted their playing fields to synthetic turf. Assuming that minimal a amount of water will be required to maintain the synthetic surface, estimated water savings will average about 2.5 million gallons annually, or nearly 100%. However, notwithstanding its current popularity as a water-saving replacement, some potential problems with synthetic turf have been identified. As a result, site monitoring for the synthetic turf field will include temperature measurement during warm weather periods and collection and analysis of leachate after storm events.

Recent studies indicate that summer temperatures of artificial turf can reach as high as 160 ºF, nearly double the surface temperature of natural turf under similar conditions. As a result, some installations have been required to add auxiliary irrigation systems to provide water for cooling during excessively hot periods, significantly reducing expected water savings. Although incidents of elevated temperatures have been well documented, [6] many installations have experienced no uncomfortably high surface temperatures requiring cooling, suggesting that additional monitoring under ambient conditions in different areas may be useful to validate the suitability of this material.

In addition, some jurisdictions have expressed doubts about the quality of the leachate that percolates through the sand and rubber underlayment of synthetic turf surfaces. Agencies responsible for protecting surface water and ground water quality have been particularly

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[6] Williams, Frank C. and Gilbert E. Pulley. "Synthetic Surface Heat Study." Rolling Meadows, IL: Turfgrass Producers International. Presentation. 2004

concerned about pollution from metals (especially cadmium) as well as volatile or semi-volatile organics that might migrate through the synthetic turf into the underlying ground water. Recent studies by the State of Washington showed elevated levels of cadmium, but not to the extent that the leachate proved toxic in bioassay tests.[7]

Turf replacement is not included in the present grant proposal. Grant funds from this program will be used only to monitor surface performance and leachate quality. It is anticipated that regular measurement of field temperatures during warm weather and collection and analysis of leachate for metals and organics will provide useful information to help validate the appropriate use of this surface which is becoming more common in our area.

Task List and Project Schedule.

Provide a task list and schedule. Provide a project plan and work schedule with tasks, deliverable items, start and end dates, and projected costs for each task. This plan will form the basis of the required quarterly and annual project fiscal and programmatic reports. Should a project be awarded a grant, these items will be used in development of the contract and used for project tracking purposes.

See **Exhibit A**, Project Plan for a detailed work schedule.

Preliminary Plans and Specifications and Certification Statements

Submit Final Plans and Specifications or Preliminary Plans and Specifications for the proposed project if Final Plans and Specifications are not complete. The Preliminary Plans should indicate, at a minimum, types and quantities of materials, dimensions, and location. Certification Statements verify that the project is feasible. A California registered civil engineer must prepare the Plans and Specifications and Certification Statements.

See **Exhibit B** for Preliminary Engineering Plans. A certification statement is not required for demonstration projects and have not been included in this application.[8]

Environmental Documentation

Include a plan for compliance with all applicable environmental requirements. The plan should address all the potential environmental, social and economic impacts of the proposed project, including mitigation, required under the California Environmental Quality Act (CEQA) and, if applicable, the National Environmental Policy Act (NEPA). The plan should also address compliance with local, county, State, and federal permitting requirements.
Submit the following items:

- *A detailed plan for compliance with all applicable environmental laws.*
- *A schedule for completion of all appropriate environmental documentation.*

The City of San Jose is the lead agency for environmental review of the proposed construction project. The formal review process provides for an initial determination by the Environmental Review Division of the City of San Jose Planning Department as to whether a project is exempt or non-exempt, and if it requires an Initial Study to evaluate potential impacts. The Initial Study includes components required by the California Environmental Quality Act (CEQA) and Government Code Section 15071. If the IS identifies potentially significant effects, the project is amended with specific mitigation measures at which point the State Clearinghouse circulates a Draft Mitigated Negative Declaration for public review. If a significant unavoidable impact is not mitigated, a complete Environmental Impact Review (EIR) may be needed to justify the project. Upon conclusion of the public review period the City as lead agency adopts the Mitigated Negative Declaration, and files a Notice of Determination (NOD). Subject to further appeals by the affected public, the project is then allowed to go forward to construction.

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[7] Talasaea Consultants. "Toxicity Evaluation of Storm Water Sample" Woodinville, WA. Technical Report prepared for King County (WA) Land Resources Division. 2003

[8] Per Debra Gonzales, telephone communication January 7, 2005.

The City of San Jose Planning Department has determined that the proposed project does not require an Initial Study, since it involves in-kind replacement of turf and irrigation system in an existing development. A negative declaration is anticipated.

V. Statement of Work: Monitoring and Assessment

Provide a plan for project monitoring and evaluation that will be used to document water savings and other Bay-Delta system benefits (identified in Table C-5) to mark progress and to determine the success of the project. Monitoring and evaluation costs are expected to be an integral part of each project and may be assigned as a Bay-Delta Benefit. (See Table C-8). Monitoring plans should include:

- *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.*
- *An explanation of the monitoring methodologies that will be used and the project monitoring data that will be collected to assess project results.*
- *An explanation of how the above data will be used to evaluate success in relation to project goals and objectives.*
- *A description of how external factors such as changes in weather, cropping programs, or social conditions will be taken into account.*
- *Information about how the data and other information will be handled, stored, and reported and made accessible to DWR and others.*
- *The estimated costs associated with the implementation of the monitoring and evaluation plan. Applicants will be asked to re-evaluate project cost/benefit analysis as part of the final report. Applicants will also be asked to submit annual reports of benefits and costs for five years after the completion of the project.*

Turf Irrigation Monitoring

The project provides for a "side-by-side" comparison of irrigation methods at adjacent fields to determine water conserved by subsurface irrigation relative to surface irrigation with soil moisture control. In addition, both systems will be compared to water use by the existing timer-controlled irrigation facilities.

Baseline irrigation was determined from meter records that indicate the facility used 7,543 hundred cubic feet (ccf) or water in 2004 to irrigate 5.4 acres of athletic fields, of which baseball and softball fields comprised 3.1 acres (56%). By calculation, these two facilities used about 4,241 ccf of water, or 9.74 acre-feet, during the past year. Anticipated water conservation will result from two factors: 1) reduce water use on the softball field by 0.50 acre-feet due to soil-moisture control of irrigation which will prevent over-watering common to timer-controlled devices; and 2) reduce water use on the baseball field by 3.61 acre-feet due to subsurface evaporative irrigation which significantly cuts evaporative losses and eliminates runoff and overspray. If subsurface irrigation were installed during renovation on the City's remaining 44 acres of athletic fields it would save 70 af/year, or over 22 million gallons annually in San Jose alone.

In addition to measuring water use, monitoring will include measuring overspray and inspecting playability as indicated by of turf coverage and condition, and logging turf use. Since this is a demonstration project, it is equally important to document facility construction by photographing site development and noting issues occurring during installation and startup and their resolution. In conjunction with accurate water use and cost information, a detailed description of implementation will allow other agencies to evaluate the use of subsurface irrigation at their sites. Project managers will keep a running log and photographic record of all pertinent site activities that will be updated on the web for inspection by interested parties. Total cost of this portion of the monitoring program is estimated to be about $20,000 over the course of two years.

In addition, subsurface irrigation presents a unique opportunity to reuse collected storm water runoff, further reducing water use and preventing pollution to urban creeks and streams. The proposed project provides a 2,000-gallon cistern for collection of storm runoff that will be redirected to subsurface distribution pipes for reuse during the second year of the project.

Synthetic Turf Monitoring

Water conservation from synthetic turf use is not the focus of this study; on the contrary, additional monitoring is proposed to determine if problems related to surface playability and groundwater pollution significantly diminish benefits from the use of this material. After the City has completed installation of synthetic turf at the soccer field (funded through a separate program), the turf monitoring portion of the proposed work will consist of measuring field temperatures and collecting and analyzing leachate to identify disadvantages to the use of this surface which is becoming more common in our area.

Air temperatures above the turf will be measured with infrared thermometers, while soil thermometers will be used to measure the temperature of the turf surface and the underlayment. Temperature measurements will be taken during periods of warm weather, and comparative temperatures will be taken simultaneously at the adjacent natural turf fields.

Leachate will be collected through sample ports connected to the synthetic turf field underdrain. Sampling will be performed after storm events through the use of portable samplers (e.g. ISCO, Sigma) metals and organics will provide useful information. Collected leachate from the underdrain will be analyzed for heavy metals (cadmium, chromium, copper, lead, nickel, silver and zinc) as well as for volatile and semi-volatile organics (EPA Method 624/625). Simultaneously, control samples will be collected and analyzed from the two turf fields.

Total cost for temperature measurement and water quality sampling is projected to be about $55,000 over the course of two years. However, if for any reason the installation of the synthetic turf is delayed such that this element of the monitoring program cannot be completed within the time period for performance of the grant, these funds should be reallocated to support the subsurface irrigation implementation and monitoring portion of the project.

VI. Qualifications of the Applicants and Cooperators

1. *Include a resume(s) of the project manager(s). Resumes may be attached to the end of the proposal and shall not exceed two pages.*
2. *Identify and describe the role of any external cooperators that will be used for this project.*
3. *Describe briefly any previous water use efficiency grant projects in which the applicant has participated. Consideration will be given to the applicant's performance in prior water use efficiency programs.*
4. *If applicant is a disadvantaged community, provide geographic scope and the source of information documenting annual median household income.*

Management of the work proposed in this grant proposal will be performed under the direction of Scott Reese, Deputy Director of Parks, Recreation and Neighborhood Services. Simeon Mercado, P.E., Park Manager, will serve as project manager for the project. He is assisted by by Mr. David Tucker, Laboratory Supervisor who will be responsible for water quality analyses including site monitoring and preparation of reports. Resumes for these individuals are attached (Exhibit D).

VII. Outreach, Community Involvement, and Acceptance

Applicants are encouraged to coordinate prior to submitting a proposal with local governments and other local entities such as community based organizations and watershed groups. The proposal shall describe a plan for public outreach to the groups or individuals that may be affected by the project. Identify which local groups or other interested organizations are aware of the project and their level of support or opposition. Identify any potential third party impacts. Estimate the number of people or organizations that are expected to receive training, employment, or other social or economic benefits from the project. Describe any opposition to the proposed project.

The PAL Alternative Surface Irrigation Demonstration Project will provide quantifiable data on water use efficiency and quality that will be transferable to other parts of California and the nation. The City of San José will disseminate project results to sports facility managers and suppliers such as:

- Turfgrass Council
- Sports Turf Association
- Turfgrass Producers International
- California Park and Recreation Society
- Professional Grounds Management Society
- University of California Water Resources Center
- National Recreation and Park Association
- National Association of Police Athletic Leagues
- Sports Turf Managers Association and 26 Chapter organizations

The City of San José will develop a website with quarterly updates on the project to include pictures, construction details, and evaluation and testing design and results. A summary of the project and website link will be emailed to a list of interested individuals and associations (including the ones mentioned above). In addition to technical outreach to the professional community, outreach will also extend to the neighborhood community in the form of informational displays about the project located onsite, emphasizing the importance of water conservation in our chronically water-short state, as well as regular updates about the project on the city's website.

VIII. Innovation

Describe innovative technologies or methodologies to be employed in the project that could contribute to improved efficiencies in projects throughout the State.

Soil Moisture Irrigation Control

The use of soil moisture to regulate the timing and duration of spray irrigation has resulted in water savings as high as 40% when compared to timer-based systems, for which reason the Office of Water Use Efficiency has consistently funded development and implementation of irrigation control technology. For this study, soil moisture controllers have been selected over the more sophisticated ET controllers due to the regular maintenance of the area and the ability of the soil moisture meters to compare moisture in the softball field with soil moisture monitored (but not used for control) in the adjacent subsurface irrigation system.

Subsurface Evaporative Irrigation

Subsurface irrigation has historically been the least utilized method of irrigation, despite its potential to significantly reduce evaporation and virtually eliminate water waste. Problems associated with subsurface irrigation include fouling and breaks in subsurface water distribution piping and uneven transport of water to surface plants. As noted above, the Evaporative Control Systems design solves both these problem by creating a subsurface reservoir that conducts water evenly to the root zone through a constructed soil profile of graded sand. Results from university studies indicate that this technology has tremendous potential for water savings on the order of 50-60%, and the proposed project will be only the fifth site in California to demonstrate its use. Since most cities and school districts manage multiple athletic fields that average one to two acres each in area, widespread application of subsurface irrigation in athletic fields throughout the state could potentially save thousands of acre-feet of water per year.

In addition to the use of subsurface irrigation alone, the demonstration project also develops information on the use of urban runoff to augment irrigation supplies. Subsurface irrigation is uniquely suitable for use of urban runoff in that the system operates at low pressure and is resistant to fouling. In addition, unlike spray irrigation, subsurface irrigation water is kept out of the public space, reducing treatment costs and eliminating health concerns that might otherwise be associated with storm water runoff reuse.

Synthetic Turf Surface Temperature Measurement and Leachate Monitoring

While synthetic turf is commonly installed as a means of increasing field playability and reducing water consumption, little attention has been paid to two problems that have emerged with its use: surface temperature elevation and leachate contamination. Test fields in in Utah recorded temperatures in excess of 160 ºF, while recent studies in California and Washington state point to increased levels of metals in synthetic turf leachate (especial cadmium and zinc). The proposed project will be one of a handful of studies providing important information about the performance of this product from full-scale facilities.

IX. Benefits and Costs

The focus of this grant program is to fund projects that achieve direct or indirect in-stream flow and timing, water quantity, and water quality benefits to the Bay-Delta System. All applicants must provide a qualitative description, and where available a quantitative assessment of the project's local and Bay-Delta system benefits. Provide a brief explanation for the labor costs (including consultants), equipment, supplies, and travel included in the budget. Provide information about the amount of cost sharing for each element as well as direct and indirect costs. Describe the potential benefits and information to be gained in terms of water use efficiency. Compare the potential benefits and anticipated information to be gained to the anticipated costs.

Benefits derived from the proposed subsurface irrigation program include local water use reduction with the potential for significant state-wide reductions of water diverted from the Sacramento-San Joaquin River Delta. In addition to immediate water savings of more than 1 million gallons per year, implementation of subsurface irrigation in San Jose will create a local knowledge base about this technology the Bay-Delta region that can serve as a model for other areas. Assuming a 50% reduction in water use, potential water savings state-wide could be as high as 5,000 acre-feet per year if as few as 500 athletic fields (2.5 ac/field) by converting to subsurface irrigation. By comparison, during the past two years, nearly 200 California athletic fields replaced their natural turf surfaces with synthetic turf at considerable expense.

With respect to the synthetic turf monitoring, the primary benefit will be the development of important information about the performance of synthetic turf at a time when more and more cities, school districts and private institutions are replacing natural turf with this material.

The major costs associated with this proposal are for construction of the subsurface irrigation demonstration facilities ($1.18 million), of which a local match of 36% has been proposed ($0.43 million). Consulting costs of approximately $140,000 have been identified for design and construction management; monitoring and testing is estimated to cost approximately $75,000. The balance of the costs are for administration, implementation verification, permitting etc. as detailed in Exhibit C-1.

Exhibit A. Project Plan

Police Athletic League (PAL) Sports Complex Alternative Surface Irrigation Demonstration Project

TASK	DELIVERABLE	START	FINISH	COST
I. PROJECT DESIGN				
Project Management and Administration	Quarterly and annual project reports	1-Dec-05	31-Jul-06	$33,500
Site survey and base mapping	Existing conditions map by City Surveyor in AutoCAD format	15-Dec-05	31-Jan-06	$10,000
35% Design Completion	35% complete plans and specifications submittal	1-Feb-06	28-Feb-06	$46,000
Environmental Clearance (CEQA Approval)	CEQA exemption application	1-Mar-06	30-Mar-06	$250
50% Design Completion	50% complete plans and specifications submittal	1-Apr-06	30-Apr-06	$45,000
95% Design Completion	95% complete plans and specifications submittal	1-May-06	30-Jun-06	$22,500
100% Design Completion	100% complete plans and specifications for bid	1-Jul-06	31-Jul-06	$11,350
II. BID AND CONTRACT AWARD				
Project management and administration	Quarterly and annual project reports	1-Aug-06	15-Jan-06	$3,000
Advertise bid for construction project	Project bid advertised on City's internet "Bid Hotline"	17-Aug-06	8-Sep-06	$2,000
Receive and evaluate bids	Bid summary sheet	9-Sep-06	16-Sep-06	$0
Submit recommendation of bid award to City Council	City Council memo recommending project award	17-Sep-06	25-Oct-06	$0
Contract Award	Council action	25-Oct-06	25-Oct-06	$0
Contract Execution	Signed and fully executed construction contract	26-Oct-06	15-Jan-06	$0
III. CONSTRUCTION				
Project management and administration	Quarterly and annual reports	16-Jan-06	31-Dec-06	$92,000
Site preparation	Inspection report	1-Feb-06	15-Mar-06	$92,000
Storm Water Pollution Prevention Plan	inspection report verifying work complete	1-Feb-06	15-Mar-06	$6,000
Earthwork	Inspection report	16-Mar-06	15-May-06	$439,000
Storm Drainage System	Inspection report	16-May-06	31-Jul-06	$305,000
Irrigation System	Inspection report	1-Aug-06	30-Sep-06	$99,000
Planting	Inspection report	1-Oct-06	30-Oct-06	$99,000
Miscellaneous Items	Inspection report	1-Nov-06	30-Nov-06	$80,000
Landscape Maintenance	Inspection report	1-Nov-06	31-Dec-06	$8,000
Construction Contingency	Inspection report	16-Jan-06	31-Dec-06	$56,400
IV. EVALUATION AND TESTING				
Project management and admin.	Quarterly and annual reports	1-Jan-07	1-Nov-08	$10,000
Project montoring and reporting	Quarterly and annual reports	1-Jan-07	30-Sep-08	$35,000
Project summary and outreach	Web posting and direct outreach	1-Oct-04	1-Nov-08	$5,000
			PROJECT TOTAL	$1,500,000

Exhibit B. Maps and Drawings

Exhibit C. Costs and Benefits Tables (Required)

Complete Project Costs Tables C-1 and C-5 in Appendix C. All major assumptions, methodologies, computations and other relevant information must be documented.

Table C-1: Project Costs (Budget) in Dollars)

	Category (I)	Project Costs $ (II)	Conting. % (ex. 5 or 10) (III)	Project Cost + Cont. $ (IV)	Applicant Share $ (V)	State Share Grant $ (VI)
	Administration[1]					
	Salaries, wages	$68,500	0	$68,500	$68,500	$0
	Fringe benefits	$0	0	$0	$0	$0
	Supplies	$0	0	$0	$0	$0
	Equipment	$0	0	$0	$0	$0
	Consulting services	$0	0	$0	$0	$0
	Travel	$0	0	$0	$0	$0
	Other	$0	0	$0	$0	$0
(a)	Total Administration Costs	$68,500		$68,500	$68,500	$0
(b)	Planning/Design/Engineering	$136,850	0	$136,850	$0	$136,850
(c)	Equipment Purchases/Rentals/Rebates/Vouchers	$0	0	$0	$0	$0
(d)	Materials/Installation/Implementation	$0	0	$0	$0	$0
(e)	Implementation Verification	$35,000	0	$35,000	$0	$35,000
(f)	Project Legal/License Fees	$0	0	$0	$0	$0
(g)	Structures	$0	0	$0	$0	$0
(h)	Land Purchase/Easement	$0	0	$0	$0	$0
(i)	Environmental Compliance/Mitigation/Enhancement	$250	0	$250	$0	$250
(j)	Construction	$1,128,000	$56,400	$1,184,400	$431,250	$753,150
(k)	Other (Specify)	$0	0	$0	$0	$0
(l)	Monitoring and Assessment	$75,000	0	$75,000	$0	$75,000
(m)	Report Preparation	$0	0	$0	$0	$0
(n)	**TOTAL**	$1,443,600		$1,500,000	$500,000	$1,000,000
(o)	Cost Share -Percentage				33	67

1- excludes administration O&M.

Table C-5 Project Annual Physical Benefits (Quantitative and Qualitative Description of Benefits)

Qualitative Description - Required of all applicants[1]

	Description of physical benefits (in-stream flow and timing, water quantity and water quality) for:	*Time pattern and Location of Benefit*	*Project Life: Duration of Benefits*	*State Why Project Bay Delta benefit is Direct[3] Indirect [4] or Both*	*Quantified Benefits (in-stream flow and timing, water quantity and water quality)*
Bay Delta	Widespread applicability of subsurface irrigation to turf and landscape use throughout Bay-Delta area	Greatest reduction (volume and %) during summer months (May-September)	20-year service life of subsurface irrigation system; soil moisture control system 10-year service life.	Use of subsurface irrigation in areas currently withdrawing water from Sacramento and San Joaquin Rivers will directly increase Bay-Delta flows (direct), while use elsewhere in state reduces demand on state water (indirect)	Annual water savings statewide could reach 5,000 acre-feet per year if as few as 500 athletic fields (2.5 ac/field) converted to subsurface irrigation
Local	Water conservation ranging from 40-60% compared with surface sprinkler irrigation.	Greatest reduction (volume and %) during summer months (May-September)	20-year service life of subsurface irrigation system; soil moisture control system 10-year service life.	**Not applicable.**	Annual local water savings of 4.1 af (1.3 MG)

[1] The qualitative benefits should be provided in a narrative description. Use additional sheet.
[2] Direct benefits are project outcomes that contribute to a CALFED objective within the Bay-Delta system during the life of the project.
[3] Indirect benefits are project outcomes that help to reduce dependency on the Bay-Delta system. Indirect benefits may be realized over time.
[4] The project benefits that can be quantified (i.e. volume of water saved or mass of constituents reduced) should be provided.

Exhibit D. Resumes

Exhibit D-1. Scott Reese, ASLA

Scott Reese

Parks, Recreation and Neighborhood Services Department
Community Facilities Development Division
170 West San Carlos Street
San Jose, CA 95113
408-794-1337 (P)
408-297-3108 (F)
scott.reese@sanjoseca.gov

Overview

Advanced multidisciplinary education
Thirty-five (35) Years of responsible executive level experience
In public administration of municipal and special district organizations involving:

- Resource Management
- Landscape Architecture
- Urban Planning
- Leisure Services
- Personnel Administration
- Grant Administration
- Fiscal Management
- Government Relations
- Community Relation

Experience

2003-2005 City of San Jose San Jose, CA
Deputy Director Parks, Recreation and Neighborhood Services
Community Facilities Division, Parks, Recreation and Neighborhood Services Department

1988-2003 City of Glendale Glendale. CA
Assistant Director Parks, Recreation and Community Services
Parks, Recreation and Community Services Department

1982–1988 City of Woodburn Woodburn, OR
Director of Parks and Recreation
Parks and Recreation Department

1980–1982 City of Portland Portland, OR
Parks Planning and Development Manager
Parks, Planning and Development Division, Portland Parks Bureau

1978–1980 Schaumberg Park District Schaumburg, IL
Superintendent of Parks Planning and Development Manager
Parks Planning and Design Division

1973–1978 Naperville Park District Naperville. IL
Superintendent of Planning and Park Resources
Planning and Parks Resources Division

Education

1971–1973 University of Illinois Champaign, IL
Master of Landscape Architecture (Department of Landscape Architecture and Planning)
Special Studies: Department of Recreation and Parks Administration

1966–1971 Southern Illinois University Carbondale, IL
Bachelor of Arts Environmental Design (School of Design)

Exhibit D-2. Simeon Mercado, PE

Simeon A. Mercado, Jr.

Professional Engineer- City of San José Department of Parks, Recreation and Neighborhood Services

Experience

2004-present Parks Manager CSJ, PRNS Department
Presently responsible for the overall management of multiple CIP projects, such as community centers and sports park facilities, in the $228 million Parks Bond Program.

1990-2004 Project Manager CSJ, Public Works Department
Has 14 years of diversified experience in project programming, project design and construction management. Knowledgeable in City's contracting processes and procedures necessary for successful project planning and implementation. Extensive experience in supervising and mentoring staff and technical personnel and in dealing with contractors, consultants and the general public.
Effectively helped managed the construction of key projects such as the $25-million Los Lagos Golf Course, $45-million Bailey Avenue Extension and the $150-million South Bay Water Recycling program.

1988-1990 Civil Engineer I/II CSJ, Public Works Department
Assisted the Project Manager in the design and construction of City's capital improvement projects, including sanitary sewers, roads, bridges and storm facilities.

Project Engineer EEI, Manila, Philippines
Supervised construction of civil construction projects both in the Philippines and in Saudi Arabia.

Education

National University, San Diego, California
Master in Business Administration, October 1993
FEATI University, Manila, Philippines
Bachelor of Science in Civil Engineering, April 1978

Certification

Registered Civil Engineer in California: Certificate #45069
Publication
Jack and Bore Challenge: Installation of an 84-inch Sewer Pipe Under the San Francisco Water Delivery System, North American Society for Trenchless Technology, 2003 No-Dig International Conference, Las Vegas, Nevada.

Affiliations

San Jose Management Association, Board member
American Society of Civil Engineers, Member
Filipino-American Association of City Employees (FACEs), Board member and Past President

Exhibit D-3. David Tucker, MS

David W. Tucker

City of San Jose, California Environmental Services Department

David W. Tucker has worked for the past 15 years as the Environmental Laboratory Manager for the City of San Jose's Environmental Services Department. Mr. Tucker's areas of expertise include developing state, federal, and local environmental regulatory programs; implementing water quality attainment programs; and managing scientific research and development initiatives in the water quality arena. Mr. Tucker currently chairs the Technical Committee of the Clean Estuary Partnership and the Technical Review Committee of the San Francisco Estuary Regional Monitoring Program. He is a member on the Standard Methods Committee and the State Water Resources Control Board's TMDL Public Advisory Group.

Background:

Prior to joining the City of San Jose, David Tucker served as a Postgraduate Fellow at NASA's Ames Research Center working in the atmospheric and planetary sciences, studying particle interactions in space and atmospheric planetary evolution. David possesses Bachelor and Master of Science degrees in Environmental Science/Chemistry from the Florida Institute of Technology. Doctorial studies at Texas A&M University emphasized trace elemental analyses of aqueous solutions using Inductively Coupled Plasma (ICP) spectrometric techniques. Doctorial studies at Arizona State University emphasized empirical studies of theoretical instrument operating conditions of the ICP for trace metal analysis.

Education

Florida Institute of Technology, Melbourne, FL
B.S. Environmental Science (June, 1980)
Florida Institute of Technology, Melbourne, FL
M.S. Environmental Science (August, 1982)
Texas A&M University, College Station, TX
Doctoral Studies in Chemistry (1982-83)
Arizona State University, Tempe, AZ
Doctoral Studies in Chemistry (1984-1988)
University of California, Santa Cruz, CA
Professional Certificate in Hazardous Materials Management (January, 1994)
United States Environmental Protection Agency, Office of Water
Water Quality Standards Academy (May, 1994)

Professional Experience

LABORATORY SUPERVISOR, City of San Jose Environmental Services (July, 1989 - Present)

Duties include managing water/wastewater laboratory and professional staff of 47 biologists, chemists and laboratory technicians; developing and administering program budget of approximately five million dollars; developing state, federal and local environmental regulatory programs; implementing the water quality standards program; developing and implementing industrial pretreatment and wastewater treatment plant compliance policies and programs; and managing scientific research and development initiatives.

CHEMIST, **City of San Jose Water Pollution Control, (February, 1988 - July, 1989)**

Duties included developing and implementing an aquatic biomonitoring laboratory; conducting wet chemical and instrumental analytical analyses; directing laboratory technicians; assisting in laboratory

budget development; analyzing regulatory policies and programs; and writing scientific and technical reports.

\GRADUATE FELLOWSHIP, NASA Ames Research Center, Moffett Field, CA (1985-1988)
Duties included developing scientific research programs with regard to planetary atmospheric formation and evolution; analyzing technical documents and scientific literature; developing agency materials and scientific publications; and presenting experimental results to the space science community.

Publications (Partial List)

Yee, Don, Hoenicke, Rainer, Hansen, Eric, Lee, Ken and David W Tucker, 2001. Atmospheric Deposition of Trace Metals in the San Francisco Bay Area. Presented at WEFTEC 2001, Atlanta, GA.

Mills, Bill, Stephen Cliffen, John Loh, Tom Grieb, George Bowie and David Tucker, 2000. Conceptual Model of Copper in Lower South San Francisco Bay. Presented at WATERSHED 2000, Vancouver, BC.

Tucker, D.W., 2000. "TMDL's" via "Watershed Management" resulting in a "New Regulatory Roadmap". Presented at AMSA's 2000 Summer Technical Conference, Louisville, KY.

Tucker, David W., Dan Bruinsma and Kirsten Struve, 1999. The TMDL: A Roadmap Toward Watershed Management. Presented at WEFTEC 1999, New Orleans, LA.

Tucker, D.W. and D. Bruinsma, 1997. From Command and Control to Cooperation and Concensus: An Environmental Partnership Model. Presented at AWWA/WEF Joint Management Conference, San Francisco, CA.

Schafer, P., S. Osborn, D. Arnold, D.W. Tucker, and D. Watson, 1996. Development of a Site-Specific Water-Effect Ratio for Copper In South San Francisco Bay. Presented at 17th Annual Conference of the Society of Environmental Toxicology and Chemistry, Washington, DC.

Tucker, D.W., Ellen D. Ryan and D. Bruinsma, 1995. San Jose's Common Sense Approach to a Clean Environment: The Clean Bay Strategy. Presented at 88th Annual Meeting & Exposition of the Air and Waste Management Association, San Antonio, TX.

Professional Affiliations
American Chemical Society
American Society for Testing and Materials
American Water Works Association
Bay Protection and Toxic Cleanup Program Advisory Committee (State Water Resources Control Board appointment)
Standard Methods Advisory Committee- Section 3020 Chair
TriTAC - Water Quality Committee

Exhibit E. Median Household Income

The project service area within one mile of the PAL Sports Complex is the home of approximately 46,000 residents living in 9 different Census Tract Areas. Although the median income for this area of $53,833 exceeds the statewide median household income, it should be noted that it is significantly lower than the median income of the City of San José ($74,413) and the County of Santa Clara ($74,335). In fact, the median income for this project service area is 72 percent of the median income for the County of Santa Clara per the 2000 U.S. Census Data. Areas of less than 80 percent of the median income are considered as low to very-low income areas. The PAL project service area is considered as a low-income area. Please see the "Project Service Area Data Table."

Also see Exhibit F for census information.

PROJECT SERVICE AREA DATA TABLE

	P015001	P001001	Income	
Census Tract	Households: Total	Total population: Total	Median Income	% of Santa Clara County Median
Census Tract 5015.01, Santa Clara County, California	1,057	4,232	$ 42,136	57%
Census Tract 5031.10, Santa Clara County, California	964	4,883	$ 42,535	57%
Census Tract 5015.02, Santa Clara County, California	990	4,392	$ 44,489	60%
Census Tract 5036.02, Santa Clara County, California	1,155	4,745	$ 53,520	72%
Census Tract 5037.02, Santa Clara County, California	1,711	8,349	$ 53,833	72%
Census Tract 5037.03, Santa Clara County, California	866	4,662	$ 61,140	82%
Census Tract 5034.01, Santa Clara County, California	999	5,796	$ 63,710	86%
Census Tract 5035.04, Santa Clara County, California	1,110	6,666	$ 66,377	89%
Census Tract 5035.07, Santa Clara County, California	346	2,335	$ 70,543	95%
TOTAL	9,198	46,060	$ 53,833	72%
Santa Clara County			$ 74,335	

Exhibit F: Census figures for San José

Exhibit G: Letters of Support

Exhibit G-1: San José District 5 Council Member Nora Campos
Exhibit G-2: San José District 8 Council Member Dave Cortese
Exhibit G-3: San José Chief of Police Robert Davis
Exhibit G-4: Police Athletic League President William Meiss

APPENDIX B: Project Costs and Benefits Tables

Table B- 1: Project Implementation Costs (Budget)

Table B- 2: Annual Operations and Maintenance Costs

Table B- 3: Total Annual Project Costs

Table B-4: Capital Recovery Factor

Table B- 5: Project Annual Physical Benefits (Quantitative and Qualitative Description of Benefits)

Table B- 6: Project Annual Local Monetary Benefits

Table B- 7: Project Local Monetary Benefits and Project Costs

Table B- 8: Applicant's Cost Share and Description

APPENDIX B: PROJECT IMPLEMENTATION COSTS TABLE
APPLICANT: City of San José
Project Title: Police Athletic League (PAL) Sports Complex **Alternative Surface Irrigation Demonstration Project**

Table B-1: Project Costs (Budget)

	Category (I)	Project Costs $ (II)	Contingency % (ex. 5 or 10) (III)	Project Cost + Contingency $ (IV)	Applicant Share $ (V)	State Share Grant $ (VI)	Life of investment (years) (VII	Capital Recovery Factor (VIII)	Annualized Costs $ (IX)
	Administration1								
	Salaries, wages	$68,500	0	$68,500	$68,500	$0	0	0.0000	$0
	Fringe benefits	$0	0	$0	$0	$0	0	0.0000	$0
	Supplies	$0	0	$0	$0	$0	0	0.0000	$0
	Equipment	$0	0	$0	$0	$0	0	0.0000	$0
	Consulting services	$0	0	$0	$0	$0	0	0.0000	$0
	Travel	$0	0	$0	$0	$0	0	0.0000	$0
	Other	$0	0	$0	$0	$0	0	0.0000	$0
(a)	Total Administration Costs	$68,500		$68,500	$68,500	$0			$0
(b)	Planning/Design/Engineering	$136,850	0	$136,850	$0	$136,850	0	0.0000	$0
(c)	Equipment	$0	0	$0	$0	$0	10	0.0000	$0
(d)	Materials/Implementation	$0	0	$0	$0	$0	0	0.0000	$0
(e)	Implementation Verification	$70,000	0	$70,000	$0	$70,000	0	0.0000	$0
(f)	Project Legal/License Fees	$0	0	$0	$0	$0	0	0.0000	$0
(g)	Structures	$0	0	$0	$0	$0	0	0.0000	$0
(h)	Land Purchase/Easement	$0	0	$0	$0	$0	0	0.0000	$0
(i)	Environmental Compliance	$250	0	$250	$0	$250	0	0.0000	$0
(j)	Construction	$1,128,000	56400	$1,184,400	$431,250	$753,150	0	0.0000	$0
(k)	Other (Specify)	$0	0	$0	$0	$0	0	0.0000	$0
(l)	Monitoring and Assessment	$40,000	0	$40,000	$0	$40,000	0	0.0000	$0
(m)	Report Preparation	$0	5	$0	$0	$0	0	0.0000	$0
(n)	**TOTAL**	$1,443,600		$1,500,000	$500,000	$1,000,000			$0
(o)	Cost Share -Percentage				33	67			

1- excludes administration O&M.

Applicant: The City of San José

Table B-5 Project Annual Physical Benefits (Quantitative and Qualitative Description of Benefits)

	Qualitative Description - Required of all applicants 1				**Quantitative Benefits - where data are available 2**
	Description of physical benefits (in-stream flow and timing, water quantity and water quality) for:	*Time pattern and Location of Benefit*	*Project Life: Duration of Benefits*	*State Why Project Bay Delta benefit is Direct3 Indirect 4 or Both*	*Quantified Benefits (in-stream flow and timing, water quantity and water quality)*
Bay Delta	Widespread applicability of subsurface irrigation to turf and landscape use throughout Bay-Delta area	Greatest reduction (volume and %) during summer months (May-September)	20-year service life of subsurface irrigation system; soil moisture control system 10-year service life.	Use of subsurface irrigation in areas currently withdrawing water from Sacramento and San Joaquin Rivers will directly increase Bay-Delta flows (direct), while use elsewhere in state reduces demand on state water (indirect)	Annual water savings statewide could reach 5,000 acre-feet per year if as few as 500 athletic fields (2.5 ac/field) converted to subsurface irrigation
Local	Water conservation ranging from 40-60% compared with surface sprinkler irrigation.	Greatest reduction (volume and %) during summer months (May-September)	20-year service life of subsurface irrigation system; soil moisture control system 10-year service life.	**Not applicable.**	Annual local water savings of 4.1 af (1.3 MG)

1 The qualitative benefits should be provided in a narrative description. Use additional sheet.

2 Direct benefits are project outcomes that contribute to a CALFED objective within the Bay-Delta system during the life of the project.

3 Indirect benefits are project outcomes that help to reduce dependency on the Bay-Delta system. Indirect benefits may be realized over time.

4 The project benefits that can be quantified (i.e. volume of water saved or mass of constituents reduced) should be provided.