

**TO:** James L. App, City Manager  
**FROM:** Joseph M. Deakin, Public Works Director  
**SUBJECT:** Kinetics Services, Inc.- Energy Conservation Proposal  
**DATE:** November 18, 2003

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**NEEDS:** For the City Council to consider a contract with Kinetics Services, Inc. to design and build energy saving modifications for City facilities.

**FACTS:**

1. Kinetics presented an unsolicited proposal to design and build energy retrofit projects. The projects proposed conserve and/or generate energy for City facilities. On August 18, 2003, the City Council reviewed the proposal, appointed an Ad Hoc Committee to develop the proposal into a draft agreement for consideration.
2. The agreement was reviewed by the Ad Hoc Committee, and the City attorney.
3. Hiring an energy conservation contractor is provided for under California Government Code § 4217.12 and § 4217.13, wherein a sole-source selection can be made by the City Council pursuant to a Public Hearing. The City announced the Public Hearing in accordance with the Code (14 days in advance).

**ANALYSIS  
AND**

**CONCLUSION:** Kinetics Services, Inc., a California corporation headquartered in Santa Clara, specializes in mechanical contracting. Kinetics was recently selected by the City of San Luis Obispo for similar services similar to those they are offering to the City of Paso Robles. In brief, Kinetics Services proposes to install more efficient electrical controllers, retrofit light fixtures, and install two small cogeneration systems at select City facilities. The retrofits and installations will reduce electrical energy consumption and/or generate power for utility operations. The retrofit is scheduled to cost \$2,300,512. Kinetics Services guarantees that projected electrical cost savings will offset the implementation costs over a period of 7 years.

The guarantees offered by Kinetics assure that annual utility savings would at least equal financing costs. It breaks down as follows:

1. Savings in energy costs are projected to equal facility retrofit payback costs in the first 7 years following implementation. In brief, the proposal does not indicate a net savings for the first seven years.
2. The City will acquire its own financing. Seven-year rates are 3.5%. The seven-year payback term (see above) is based upon the projected financing rate of 3.5%; improvements would cost \$315,700 annually (including financing costs), nearly matching the projected annual energy cost savings identified in the proposal (\$315,700).

The proposed energy conservation improvement projects proposed by Kinetics appear feasible – the construction elements are straightforward, and the opportunity to reduce energy consumption is clear. By Kinetics proposal, cost savings on energy usage would be utilized to pay debt service on the financed improvements, and the City would realize savings in excess of costs only after the improvement financing is paid off, i.e., after 7 years. This assumes the retrofitted improvements operate as projected, or that Kinetics would provide the City with monetary assurance.

**POLICY**

**REFERENCE:** California Government Code § 4217.12 and § 4217.13

**FISCAL**

**IMPACT:** The retrofit energy conservation improvement costs are identified as \$2,300,512. With the rebate from PG&E of \$355,000, the net improvement costs to the City are \$1,925,512. It is estimated that a seven-year financing term would garner an interest rate at 3.5%. However, the City would seek financing quotations from three or more firms to assure the lowest possible cost.

At these terms, the City's annual debt service obligation would be \$315,700. The Kinetics' contract guarantees electrical cost savings after installation of \$324,000 annually for seven years a net positive deviation of \$8,300 in favor of the City.

- OPTIONS:**
- a. The City Council to dissolve the Ad Hoc Committee formed to develop the proposal submitted by Kinetics Services, Inc. into an agreement that acceptable to both the City and Kinetics; and adopt Resolution No. 03-xxx; approving a contract with Kinetics Services, Inc. to design and build energy saving modifications for City facilities.
  - b. Amend, modify or reject the above option.

**Attachments (3):**

- 1) Resolution
- 2) Energy Services Agreement – Installation
- 3) Energy Services Agreement - Guarantee

RESOLUTION NO. 03-

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF PASO ROBLES  
APPROVING A CONTRACT WITH KINETICS SERVICES, INC.  
TO DESIGN AND BUILD ENERGY SAVINGS MODIFICATIONS FOR CITY FACILITIES

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WHEREAS, Kinetics presented an unsolicited proposal to design and build energy retrofit projects to conserve and/or generate energy for City facilities; and

WHEREAS, upon review of the proposal, the City Council appointed an Ad Hoc Committee to develop the proposal into a draft agreement; and

WHEREAS, the Agreement has been drafted and reviewed by the City Attorney; and

WHEREAS, the hiring an energy conservation contractor is provided for under California Government Code § 4217.12 and § 4217.13, wherein a sole-source selection can be made by the City Council pursuant to a Public Hearing; and

WHEREAS, the proposed energy conservation improvement projects proposed by Kinetics appear feasible – the construction elements are straightforward, and the opportunity to reduce energy consumption is clear.

THEREFORE, BE IT RESOLVED AS FOLLOWS:

SECTION 1. The City Council of the City of El Paso de Robles does hereby approve a contract with Kinetics Services, Inc. to design and build energy savings modifications for City facilities.

PASSED AND ADOPTED by the City Council of the City of Paso Robles this 18<sup>th</sup> day of November 2003 by the following vote:

AYES:

NOES:

ABSTAIN:

ABSENT:

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Frank R. Mecham, Mayor

ATTEST:

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Sharilyn M. Ryan, Deputy City Clerk



9 Marconi  
Irvine, CA 92618

PROPOSAL # 3454.1A  
EFFECTIVE DATE: Oct. 22, 2003

**CUSTOMER:** City of Paso de Robles

**SERVICES PROVIDED AT:** See Attachment "E" Scope of Work for a complete listing of facilities.

**SERVICES TO BE PERFORMED:** Energy Services Agreement - Installation  
See Attachment "E" Scope of Work for a complete listing of the work to be performed.

**PRICE:** See Attachment A "Price, Payment Schedule and Warranty Schedule."

This Agreement and the Attachments listed below shall constitute the contract (the "Agreement") between the parties only upon signature in the spaces provided below for the City of Paso de Robles (the "City") and Kinetic Systems, Inc. ("Kinetics"). Only an individual duly authorized by Kinetics may change, waive, alter or modify this Agreement. Any change, waiver, alteration, or modification must be in writing and agreed to by the City.

ATTACHMENT A	Price, Payment Schedule and Warranty + Lifecycle Schedule
ATTACHMENT B	Terms and Conditions
ATTACHMENT C	Certificate of Insurance
ATTACHMENT D	Performance and Payment Bonds
ATTACHMENT E	Scope of Work

**Contractor:**  
KINETIC SYSTEMS, INC.

By: \_\_\_\_\_  
Hal Brey

Title: \_\_\_\_\_  
Vice President

Date: \_\_\_\_\_

**Customer:**  
CITY OF PASO DE ROBLES

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

## ATTACHMENT A

### PRICE, PAYMENT SCHEDULE & WARRANTY SCHEDULE

#### General Conditions

Kinetics shall provide the City of Paso Robles with a complete turnkey energy retrofit project, as identified in the following detailed scope of work. Kinetics is responsible for the design, engineering, permits, fees, approvals, project management, installation, startup, checkout, warranty, insurance and bonding specifically associated with the work to be performed. Kinetics is not responsible for any equipment, systems, controls, comfort problems, balancing, etc. not specifically included in this agreement.

All work will be completed by Kinetics or by subcontractors mutually agreed upon by both Kinetics and the City's representative. Kinetics will provide submittals and engineered drawings (where required), for the City's technical review, prior to initiating construction. All construction and associated cleanup shall be scheduled so as minimize any disruption to ongoing City activities.

The principal project amount is **\$2,300,512.00.** Assuming project approval and financing are completed prior to December 1, 2003, construction will be completed by July 1, 2004. The progress payment schedule is as follows:

#### Planned Payment & Completion Schedule

DATE	% Paid	MILESTONE	\$ PAID	% COMPLETE
December 1, 2003	15%	Project Development & Energy Analysis	\$342,077	Due At Startup
February 1, 2004	10%	Progress Payment & Site Mobilization	\$228,051	Due At 25% Completion
March 1, 2004	20%	Progress Payment	\$456,102	Due At 45% Completion
April 1, 2004	20%	Progress Payment	\$456,103	Due At 65% Completion
May 1, 2004	20%	Progress Payment	\$456,102	Due At 85% Completion
June 1, 2004	10%	Progress Payment	\$228,051	Due At 95% Completion
July 1, 2004	5%	Final Payment	\$134,026	Due 30 Days After Acceptance
		TOTAL	\$2,300,512	

## **WARRANTY & LIFECYCLE SCHEDULE**

<i><b>New Equipment</b></i>	<i><b>Term</b></i>	<i><b>Coverage</b></i>	<i><b>Lifecycle</b></i>
<b>Lamps</b>	<b>1 Year</b>	<b>Parts</b>	<b>20,000 Hrs.</b>
<b>Ballasts</b>	<b>5 Years</b>	<b>Parts</b>	<b>70,000 Hrs.</b>
<b>Microturbine &amp; Fuel Treatment</b>	<b>7 Year</b>	<b>7 Year Parts and Labor</b>	<b>30 Years</b>
<b>Heat Exchanger</b>	<b>7 Year</b>	<b>7 Year Parts and Labor</b>	<b>24 Years</b>
<b>Variable Frequency Drive</b>	<b>1 Year</b>	<b>Parts</b>	<b>15 Years</b>
<b>DDC/EMS Controls</b>	<b>1 Year</b>	<b>Parts and Labor</b>	<b>15 Years</b>

1. Kinetics will coordinate and facilitate all warranty claims with the manufacturer for all newly installed equipment listed above.
2. Kinetics will provide assurance of replacement parts availability throughout the term of this Agreement.
3. Warranty period shall begin at the completion of the project.

## **ATTACHMENT B**

### **TERMS & CONDITIONS**

**1. SUPERVISION AND INSTALLATION PROCEDURES** Kinetics shall be responsible for providing supervision and direction of the Project. Kinetics shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and will coordinate all portions of the Project under the Agreement, unless contract documents give other specific instructions concerning these matters.

Kinetics shall be responsible for the observation of portions of Work already performed under this Agreement to determine that such portions are in proper condition to receive subsequent Work. Notwithstanding anything to the contrary stated above, Kinetics shall not be responsible for any concealed or unknown conditions which could not have been discovered upon reasonable investigation or observation.

**2. LABOR AND MATERIALS** Unless otherwise provided in the contract documents, Kinetics shall provide and pay for labor, materials, equipment, tools, construction equipment, machinery, heater, heat utilities, transportation, and other facilities and services necessary for proper execution and completion of the Project, whether temporary or permanent and whether or not incorporated or to be incorporated in the Project.

Kinetics shall enforce strict discipline and good order among its employees and other persons carrying out the Agreement. Kinetics shall not permit employment of unfit person or persons not skilled in tasks assigned to them.

**3. WARRANTY** Kinetics warrants to the City that materials and equipment furnished under the Agreement will be of good quality and new unless otherwise required or permitted by the contract documents that the Project will be free from defects not inherent in the quality required or permitted for a period of one year from completion of the Project. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. This warranty excludes remedy for damage or defect caused by abuse or, modifications not executed by Kinetics. Kinetics disclaims all implied warranties, including merchantability and fitness for a particular purpose. City's sole and exclusive remedy under this provision is Kinetics' prompt repair or replacement of the defective Work.

**4. PERMITS, FEES AND NOTICES** Kinetics shall secure and pay for the building permit and other permits and governmental fees, licenses and inspections necessary for proper execution and completion of the Project.

**5. PROJECT MANAGEMENT** Kinetics shall employ a competent Project Manager and necessary assistants who shall be in attendance at the Project site during performance of the Project. Important communications shall be confirmed in writing.

**6. CONSTRUCTION SCHEDULES** Kinetics, promptly after being awarded the Agreement, shall prepare and submit, for the City's review and approval, a construction schedule for the Project. The schedule shall not exceed time limits current under the contract documents, shall be revised at appropriate intervals as required by the conditions of the Work and project, shall be related to the entire Project to the extent required by the contract documents, and shall provide for expeditious and practicable execution of the Project.

**7. USE OF SITE** Kinetics shall confine operations at the site to areas permitted by law, ordinances, permits and the contract documents and shall not unreasonably encumber the site with materials or equipment.

**8. CLEANING UP** Kinetics shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by its operations under the Agreement. At completion of the Project, Kinetics shall remove from and about the Project waste materials, rubbish, tools, construction equipment, machinery and surplus materials.



**9. SAFETY PRECAUTIONS AND PROGRAMS** Kinetics shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with its performance of the Project under this Agreement.

In the event Kinetics encounters on the site material reasonably believed to be asbestos or polychlorinated biphenyl (PCB) which has not been rendered harmless, Kinetics shall immediately stop Work in the area affected and report the condition to the City in writing. The Work in the affected area shall not thereafter be resumed except by written agreement of the City and Kinetics if in fact the material is asbestos or polychlorinated biphenyl (PCB) and has not been rendered harmless. The Work in the affected area shall be resumed when it has been rendered harmless and the City has provided written notice to Kinetics in the absence of asbestos or polychlorinated biphenyl (PCB).

Kinetics shall not be required to perform without consent any Work relating to asbestos or polychlorinated biphenyl (PCB).

To the fullest extent permitted by law, the City shall indemnify and hold harmless Kinetics, its agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorney's fees, arising out of or resulting from performance of the Work in the affected area if in fact the material is asbestos or polychlorinated biphenyl (PCB) and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, but only to the extent caused in whole or in part by negligent acts or omissions of the City, anyone directly or indirectly employed by the City or anyone for whose acts the City may be liable. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person.

**10. SAFETY OF PERSONS AND PROPERTY** Kinetics shall take reasonable precautions for safety of, and shall provide protection to prevent damage, injury or loss to:

- A. Kinetics employees or their subcontractors on the Worksite;
- B. The Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of Kinetics or Kinetics' subcontractors or sub-subcontractors; and
- C. Other property at the site or adjacent thereto, such as trees, shrubs, lawns walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.
- D. City Personnel

**11. INSURANCE AND BONDS: CONTRACTOR'S LIABILITY INSURANCE** Kinetics shall purchase from and maintain in a company or companies that are California admitted insurers such insurance as will protect Kinetics and the City from claims which may arise out of or result from the Project and for which Kinetics may be legally liable, whether such operations be by Kinetics or by its subcontractors or by anyone directly or indirectly employed by any of them, or by anyone for whose acts may be liable.

The insurance required shall be written for not less than limits of liability specified in Attachment C. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from date of execution of the Agreement until completion of the project. The City shall be named an additional insured.

**12. PERFORMANCE BOND AND PAYMENT BOND** Kinetics shall furnish a 100% faithful performance bond and a 100% payment bond on the date of execution of the Agreement.

Upon the request of any person or entity appearing to be a potential beneficiary of bonds arising under the Agreement, Kinetics shall promptly furnish a copy of the bonds or shall permit a copy be made.





**13. GENERAL ASSIGNMENTS** The City or Kinetics may not assign its rights or delegate its obligations under this Agreement, in whole or in part. Kinetics may assign its right to receive payment to a third party.

**14. MALFUNCTION** The City will promptly notify Kinetics in writing of any malfunction in the system(s) which comes to the City's attention and Kinetics will respond immediately to remedy the malfunction.

**15. LIMITATION OF LIABILITY** Kinetics will not be liable for damages caused by delay in installation or interrupted service due to fire, flood, strike, lockout, war, acts of God such as lightning or delays caused by City.

Kinetics' responsibility for damage or injury to persons or property that may be caused by or arise through furnishing, installing, maintaining, servicing, monitoring or performing any obligation under the Agreement will be limited only to the extent caused by Kinetics' negligence. In no event will either party be liable for consequential damages.

Kinetics' total liability to City for any claims, liabilities, demands, losses, expenses or damages whatsoever, arising out of or in any way related to work performed by Kinetics under this agreement from any cause or causes, including, without limitation, for breach of any representation, warranty claims, and all claims for indemnity, all whether based in contract or tort or any other theory of liability, shall not exceed one hundred percent (100%) of the Project Cost.

**16. CHANGES** City shall pay Kinetics for costs associated with any City's changes to the scope or schedule, including, but not limited to, labor, equipment, tools, materials, supplies, including reasonable profit and overhead.

**17. PAYMENT TERMS** City shall pay all invoices Net 30 from date of invoice. All payments due and unpaid shall bear interest at the rate 1.5% per month or at the legal rate prevailing where the Project is located, whichever is greater.

**18. DISPUTE RESOLUTION** The disputing party shall give the other party written notice of the dispute. Both parties will attempt in good faith to resolve any controversy or claim arising out of or relating to this Agreement promptly by negotiations between senior executives of the parties who have authority to settle the controversy.

If the parties cannot resolve their dispute, each party is free to pursue its remedies by law or equity.

**19. ATTORNEY'S FEES** If any legal action is initiated concerning this Agreement, the prevailing party shall be entitled to costs of litigation/arbitration, interest and reasonable attorney's fees, in addition to any other recovery obtained, if ordered by the court.

**20. DRAWINGS** Drawings, specifications, and other documents and electronic data furnished by Kinetics for the project are property of the City.

**21. COMPLETE AGREEMENT** This Agreement constitutes the complete and entire Agreement between the parties and supersedes any previous communications, representations or agreements, whether oral or written, with respect to the subject matter hereof. The waiver by either party of any default by, or requirement imposed on, the other party shall not be deemed a waiver by the first party of any other default or requirement. Attachments A through E are incorporated into this agreement.

**22. GOVERNING LAW** The laws of the State of California shall govern this Agreement.

**23. INDEMNIFICATION** Hold Harmless. Kinetics agrees to and does hereby indemnify, hold harmless and defend the CITY and its Board of Trustees, officers, employees and agents from every claim or demand made and every liability, loss, damage or expense, of any nature whatsoever, which may be incurred by reason of:



Liability for damages for (1) death or bodily injury to person; (2) injury to, loss or theft of property; or (3) any other loss, damage or expense arising out of (1) or (2) above, sustained by KINETICS or any person, firm or corporation employed by KINETICS, either directly or by independent contract, upon or in connection with the services called for in this AGREEMENT, however caused, except for liability for damages referred to above which result from the sole negligence or willful misconduct of the CITY or its officers, employees or agents.

- a) Any injury to or death of any person(s), including the CITY's officers, employees and agents, or damage to or loss of any property caused by any act, neglect, default, or omission of KINETICS, or any person, firm or corporation employed by KINETICS, either directly or by independent contract, arising out of, or in any way connected with, the services covered by this AGREEMENT, whether said injury or damage occurs either on or off CITY's property, except for liability for damages which result from the sole negligence or willful misconduct of the CITY or its officers, employees or agents.

**24. INDEPENDENT CONTRACTOR** KINETICS, in the performance of this AGREEMENT, shall be and act as an independent contractor. KINETICS understands and agrees that it and all of its employees shall not be considered officers, employees or agents of the CITY, and are not entitled to benefits of any kind or nature normally provided by employees of the CITY and/or to which the CITY's employees are normally entitled, including but not limited to, State Unemployment Compensation or Workers' Compensation. KINETICS assumes the full responsibility for the acts and/or omissions of its employees or agents as they relate to the services to be provided under this AGREEMENT. KINETICS shall assume full responsibility for payment of all federal, state and local taxes or contributions, including unemployment insurance, social security and income taxes with respect to KINETICS' employees.

**25. NOTICE** All notices or demands to be given under this AGREEMENT by either party to the other shall be in writing and given wither by: (a) personal service or (b) by U.S. mail, mailed wither by registered or certified mail, return receipt requested, with postage prepaid. Service shall be considered given when received if personally served, or if mailed, on the third day after deposit in any U.S. Post Office. The address to which notices or demands may be given by either party may be changed by written notice given in accordance with the notice provisions of this section. At the date of this AGREEMENT, the addresses of the parties are as follows:

**CITY:**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**KINETICS:**

\_\_\_\_\_  
Hal Brey, Vice President  
\_\_\_\_\_  
7 Marconi  
\_\_\_\_\_  
Irvine, CA 92618  
\_\_\_\_\_

**26. COMPLIANCE WITH APPLICABLE LAWS** The services completed herein must meet the approval of the CITY and shall be subject to the CITY's general right of inspection to secure the satisfactory completion thereof. KINETICS agrees to comply with all federal, state and local laws, rules, regulations and ordinances that are now or may be in the future become applicable to KINETICS. KINETICS' business, equipment, and personnel engaged in services covered by this AGREEMENT or accruing out of the performance of such services.

**27. TERMINATION** CITY may, at any time, with or without reason, terminate this AGREEMENT and compensate KINETICS only for services satisfactorily rendered to the date of termination. Written notice by CITY shall be sufficient to stop further performance of services by KINETICS. Notice shall be deemed given when received by KINETICS or no later than three days after the day of mailing, whichever is sooner.

CITY may terminate this AGREEMENT upon giving of written notice of intention to terminate for cause. Cause shall include: (a) material violation of this AGREEMENT by KINETICS; or (b) any act by KINETICS exposing the CITY to liability to others for personal injury or property damage; or (c) KINETICS is adjudged a bankrupt, KINETICS makes a general assignment for the benefit of creditors or a receiver is appointed on account of KINETICS' insolvency.



Written notice by CITY shall contain the reasons for such intention to terminate and unless within thirty (30) days after service of such notice the condition or violation shall cease, or satisfactory arrangements for the correction thereof be made, this AGREEMENT shall upon the expiration of the thirty (30) days cease and terminate. In the event of such termination, the CITY may secure the required services from another contractor. If the cost to the CITY exceeds the cost of providing the service pursuant to this AGREEMENT, the excess cost shall be charged to and collected from KINETICS. The foregoing provisions are in addition to and not a limitation of any other rights or remedies available to CITY. Written notice by CITY shall be deemed given when received by the other party, or no later than three days after the day of mailing, whichever is sooner.



**ATTACHMENT C**

**CERTIFICATE OF INSURANCE**

To be inserted here



**ATTACHMENT D**

**PERFORMANCE AND  
PAYMENT BONDS**

To be inserted here

## **ATTACHMENT E**

### **SCOPE OF WORK**

#### **Support Services**

##### **All Sites:**

Supervise the complete turnkey installation of the scope of work that follows, including compliance with all state and local codes.

Facilitate paperwork for any valuable utility incentive(s).

Provide project closeout documentation, warranty compliance and Staff training on all newly installed systems.

Provide energy savings audits on a semi-annual basis. Reconcile guaranteed savings annually to insure budget integrity.

#### **Index of Energy Conservation Measures**

##### **ECM-1: Lighting**

###### **Facilities Included:**

Airport  
Barney Schwartz Park  
Centennial Park  
City Hall  
Municipal Pool  
Senior Center  
Traffic Intersections  
Train Depot  
Veterans Building  
Wastewater Treatment Plant

##### **ECM-2: EMS / Controls**

###### **Facilities Included:**

Barney Schwartz Park  
Centennial Park  
Gymnasium  
Senior Center  
City Hall  
Public Safety Center

##### **ECM-3: Cogeneration**

###### **Facilities Included:**

City Hall  
Public Safety Center  
Centennial Park  
Municipal Pool  
Wastewater Treatment Plant

## **ECM-1: Lighting**

### **Airport**

#### **ECM-1: Lighting**

##### **Scope of Work**

Retrofit (17) existing fluorescent fixtures with T8 lamps and electronic ballast, per the lighting detail that follows.

#### **ECM-2: EMS / Controls**

None at this site

#### **ECM-3: Cogeneration**

None at this site

### **Barney Schwartz Park**

#### ***Existing Conditions***

The existing park complex consists of sports fields, concession stands, restroom buildings and a pond with a waterfall feature. The sports lighting is manually controlled and procedurally is rarely left on when the fields are not in use. The walkway lighting (which is significant) is controlled by simple 24-hour time clocks that do not take advantage of photocell control. Two 15 hp pumps provide the circulation and filtration (respectively) for the pond system. The facility is new and very popular locally.

#### **ECM-1: Lighting**

None at this site

#### **ECM-2: EMS / Controls**

See ECM-2

#### **ECM-3: Cogeneration**

None at this site

### **Centennial Park**

#### ***Existing Conditions***

The park center consists of a large pool and minor support buildings combined with an adjacent senior citizens facility and large gymnasium. The pool is currently heated by direct-fired gas boiler systems. The boilers have recently been replaced and are in good operational condition. The pool pump and filter system runs 24/7 yet represents a small portion of the total electrical load.

The senior center and gym have their air conditioning needs served by 19 gas/electric air conditioning units with outdoor economizer sections. These units are controlled by programmable thermostats and are in good operational condition.

During our site survey, all areas were conditioned with the units running and most of the facility was unoccupied. The incorporation of occupant controls such as over-ride requests or run timers would have significant energy and operational savings.

## **ECM-1: Lighting**

### **Scope of Work**

Replace (19) existing exit signs with new LED signs with battery backup (where needed), per the lighting detail that follows.

Retrofit (21) incandescent fixtures with compact fluorescent, per the lighting detail that follows.

Retrofit (222) existing fluorescent fixtures with T8 lamps and electronic ballast, per the lighting detail that follows.

Install (38) new T5 light fixtures to replace antiquated metal halide fixtures in the gymnasium, per the lighting detail that follows.

Install (15) occupancy sensors and controls to more closely match lighting runtime and room occupancy, per the detailed lighting sensor report that follows.

## **ECM-2: EMS / Controls**

See ECM-2

## **ECM-3: Cogeneration**

See ECM-3

## **City Hall**

### ***Existing Conditions***

The City Hall is heated and cooled with an outdoor central plant consisting of an air cooled chiller and gas fired water boiler that provide tempered water to air handling units in the building. The system is in very good operational condition and is of sufficient capacity. The system is controlled by the newly installed facility management system in the Public Safety Building. The existing boiler should operate approximately 1500 hours per year.

Our survey team observed operation of the City Hall boiler during a 90-degree day. This suggests that actual boiler runtime is substantially longer than necessary.

## **ECM-1: Lighting**

### **Scope of Work**

Retrofit (49) incandescent fixtures with compact fluorescent, per the lighting detail that follows.

Install (7) occupancy sensors and controls to more closely match lighting runtime and room occupancy, per the detailed lighting sensor report that follows.

## **EM-2: EMS / Controls**

See ECM-2

## **ECM-3: Cogeneration**

See ECM-3



## **Municipal Pool**

### **ECM-1: Lighting**

#### **Scope of Work**

Retrofit (66) existing fluorescent fixtures with T8 lamps and electronic ballast, per the lighting detail that follows.

### **ECM-2: EMS / Controls**

None at this site

### **ECM-3: Cogeneration**

See ECM-3

## **Public Safety Center**

### ***Existing Conditions***

The Public Safety Center is heated and cooled with an outdoor central plant consisting of an air cooled chiller and gas fired water boiler that provide tempered water to air handling units in the building. The system is in very good operational condition and is of sufficient capacity. The system is controlled by the newly installed facility management system in the Public Safety Building. The existing boiler should operate approximately 3500 hours per year.

### **ECM-1: Lighting**

#### **Scope of Work**

None at this site

### **EM-2: EMS / Controls**

See ECM-2

### **ECM-3: Cogeneration**

See ECM-3

## **Senior Center**

### **ECM-1: Lighting**

#### **Scope of Work**

Install (5) occupancy sensors and controls to more closely match lighting runtime and room occupancy, per the detailed lighting sensor report that follows.

### **ECM-2: EMS / Controls**

None at this site

### **ECM-3: Cogeneration**

None at this site

## **Traffic Intersections**

### **ECM-1: Lighting**

#### **Scope of Work**

Retrofit (82) 8" incandescent amber balls with LED, per the lighting detail that follows.  
Retrofit (82) 8" incandescent green balls with LED, per the lighting detail that follows.  
Retrofit (82) 8" incandescent red balls with LED, per the lighting detail that follows.  
Retrofit (58) 12" incandescent amber arrows with LED, per the lighting detail that follows.  
Retrofit (65) 12" incandescent green arrows with LED, per the lighting detail that follows.  
Retrofit (50) 12" incandescent red arrows with LED, per the lighting detail that follows.  
Retrofit (129) 12" incandescent amber balls with LED, per the lighting detail that follows.  
Retrofit (129) 12" incandescent green balls with LED, per the lighting detail that follows.  
Retrofit (129) 12" incandescent red balls with LED, per the lighting detail that follows.  
Retrofit (130) 16" incandescent ped/hand combinations with LED, per the lighting detail that follows.

### **ECM-2: EMS / Controls**

None at this site

### **ECM-3: Cogeneration**

None at this site

## **Train Depot**

### **ECM-1: Lighting**

#### **Scope of Work**

Retrofit (12) existing fluorescent fixtures with T8 lamps and electronic ballast, per the lighting detail that follows.

Install (4) occupancy sensors and controls to more closely match lighting runtime and room occupancy, per the detailed lighting sensor report that follows.

### **ECM-2: EMS / Controls**

None at this site

### **ECM-3: Cogeneration**

None at this site

## **Veterans Building**

### **ECM-1: Lighting**

#### **Scope of Work**

Install (5) occupancy sensors and controls to more closely match lighting runtime and room occupancy, per the detailed lighting sensor report that follows.

### **ECM-2: EMS / Controls**

None at this site

### **ECM-3: Cogeneration**

None at this site

## **Wastewater Treatment Plant**

### ***Existing Conditions***

The water treatment facility is a secondary treatment plant with current operation averaging about 2.5 MGD. The plant has trickling filters and pumping system that represents the substantial portion of the plant electric load. The two digesters produce approximately 40-50k cubic feet of high quality methane that is used to fire an existing hot water boiler dedicated to one digester. The excess gas not required for the digester boiler is wasted to a flare. The second digester is heated by a natural gas fired boiler. Both boilers are in good operational condition.

### **ECM-1: Lighting**

#### **Scope of Work**

Install (12) new fluorescent fixtures with T8 lamps and electronic ballast to replace antiquated ones, per the lighting detail that follows.

Retrofit (57) existing fluorescent fixtures with T8 lamps and electronic ballast, per the lighting detail that follows.

Install (6) occupancy sensors and controls to more closely match lighting runtime and room occupancy, per the detailed lighting sensor report that follows.

### **ECM-2: EMS / Controls**

None at this site

### **ECM-3: Cogeneration**

See ECM-3

## **ECM-2: EMS / Controls**

### **Barney Schwartz Park**

#### **Scope of Work**

Expand the existing walkway lighting controls to include photocell control of the lighting system. The controls shall include seven-day schedules and photocell interlock. Control of these systems will reduce energy consumption and extend lamp life.

Provide and install a variable frequency drive to operate the filter pump at reduced speed during periods where the filter system is lightly loaded. This will occur during winter and evenings in the spring and fall. This pump currently runs continuously year round.

The second water feature pump, which also runs continuously, will be controlled to run during occupied periods only (staff adjustable) or when the pond system needs additional filtration.

### **Centennial Park**

#### **Scope of Work**

Expand the existing energy management system serving the City's other buildings to include: Direct digital control of the existing roof mounted package air conditioning units serving the Senior Center and Gym buildings. The controls shall include a digital controller, space temperature sensor with override and warm/cool adjustment and all required interconnection wiring for each gas/electric air conditioning unit. Provide one-year manufacturer warranties on all newly installed equipment.

### **City Hall**

#### **Scope of Work**

Integrate the new co-generation hot water heating system into the existing controls. The existing boiler system shall operate in a stand-by position in the event that the co-generation system fails or fails to provide sufficient heating.

### **Public Safety Center**

#### **Scope of Work**

Integrate the new co-generation hot water heating system into the existing controls. The existing boiler system shall operate in a stand-by position in the event that the co-generation system fails or fails to provide sufficient heating.

### **ECM-3: Cogeneration**

#### **Centennial Park**

##### **Pool Co-generation - Scope of Work**

Electricity will be generated to run part or all of the building loads, while the waste heat from the generation process will be recovered and turned into useful heat to heat the swimming pool water. This system reduces or eliminates the demand on the pool heaters. The total system efficiency is more than seventy percent.

Provide and install a complete co-generation system including associated gas piping, pool water supply and return piping. The co-generation system includes a 60kW Capstone micro turbine generator with high pressure fuel kit, gas booster pump, heat exchanger, ducting kit, transfer switch, electric wiring, concrete pad and underground work. The proposed location for this equipment will be coordinated with site staff.

The micro turbine service includes all normal service and any required repairs (parts and labor) for a period of seven (7) years from project acceptance. This warranty shall be a prepaid service contract provided by an authorized Capstone service provider.

#### **City Hall**

##### **Co-generation - Scope of Work**

Electricity will be generated to run part or all of the building loads, while the waste heat from the generation process will be recovered and turned into useful heat to heat the building heating water loop. This system reduces or eliminates the demand on the gas fired water boiler.

Provide and install a complete 60 kW co-generation system including associated gas piping, hot water supply and return piping. The co-generation system includes one 60kW Capstone type micro turbine generator at the central plant with gas booster pump, heat exchangers, transfer switch, electric wiring and concrete pad. Also includes all related piping to allow the existing boiler to operate in a stand-by mode. The proposed location for this equipment will be coordinated with site staff.

The micro turbine service includes all normal service and any required repairs (parts and labor) for a period of seven (7) years from project acceptance. This warranty shall be a prepaid service contract provided by an authorized Capstone service provider.

## **Municipal Pool**

### **Pool Co-generation - Scope of Work**

Electricity will be generated to run part or all of the building loads, while the waste heat from the generation process will be recovered and turned into useful heat to heat the swimming pool water. This system reduces or eliminates the demand on the pool heaters. The total system efficiency is more than seventy percent.

Provide and install a complete co-generation system including associated gas piping, pool water supply and return piping. The co-generation system includes a 60kW Capstone micro turbine generator with high pressure fuel kit, gas booster pump, heat exchanger, ducting kit, transfer switch, electric wiring, concrete pad and underground work. The proposed location for this equipment will be coordinated with site staff.

The micro turbine service includes all normal service and any required repairs (parts and labor) for a period of seven (7) years from project acceptance. This warranty shall be a prepaid service contract provided by an authorized Capstone service provider.

## **Public Safety Center**

### **Co-generation - Scope of Work**

Electricity will be generated to run part or all of the building loads, while the waste heat from the generation process will be recovered and turned into useful heat to heat the building heating water loop. This system reduces or eliminates the demand on the gas fired water boiler.

Provide and install a complete 60 kW co-generation system including associated gas piping, hot water supply and return piping. The co-generation system includes one 60kW Capstone type micro turbine generator at the central plant with gas booster pump, heat exchangers, transfer switch, electric wiring and concrete pad. Also includes all related piping to allow the existing boiler to operate in a stand-by mode. The proposed location for this equipment will be coordinated with site staff.

The micro turbine service includes all normal service and any required repairs (parts and labor) for a period of seven (7) years from project acceptance. This warranty shall be a prepaid service contract provided by an authorized Capstone service provider.

## Wastewater Treatment Plant

### **Digester Co-generation - Scope of Work**

This process incorporates the recovery of "waste" gases from the wastewater digesters, turning this gas (which is currently used in boilers or flamed) into fuel to run the turbine generators. The turbine generator exhaust is used to heat the digester tank water. This water maintains the proper temperature in the digester necessary for efficient process.

Provide and install a complete 90kW co-generation system including associated methane gas piping, hot water supply and return piping. The co-generation system includes (3) 30kW Capstone type micro turbine generators with sour gas booster pump, heat exchangers, ducting kits, transfer switch, electric wiring and concrete pad. Due to the addition of Digester #3 and probable gas production growth, the cogeneration system shall be sized and configured for the installation of a fourth micro turbine. The installation also includes all related piping to allow the existing boilers to operate in a stand-by mode. The proposed location for this equipment will be coordinated with site staff.

The micro turbine service includes all normal service and any required repairs (parts and labor) for a period of seven (7) years from project acceptance. This warranty shall be a prepaid service contract provided by an authorized Capstone service provider.



9 Marconi  
Irvine, CA 92618

PROPOSAL #5146.2A - Guarantee  
DATE: Oct. 22, 2003

**CUSTOMER:** City of Paso de Robles

**SERVICES PROVIDED AT:** See Attachment "E" Scope of Work in Installation Agreement for a complete listing of facilities.

**SERVICES TO BE PERFORMED:** Energy Services Agreement – Guarantee  
See Attachment "E" Scope of Work in installation agreement for a complete listing of the work to be performed.

**PRICE:** See Attachment "A" Price, Payment Schedule and Warranty Schedule in Installation agreement.

This Agreement and the Attachments listed below shall constitute the contract (the "Agreement") between the parties only upon signature in the spaces provided below for the City of Paso de Robles (the "City") and Kinetic Systems, Inc. ("Kinetics"). Only an individual duly authorized by Kinetics may change, waive, alter or modify this Agreement. Any change, waiver, alteration, or modification must be in writing and agreed to by the City.

ATTACHMENT A	Performance Guarantee
ATTACHMENT B	Savings Summary
ATTACHMENT C	Utility Baseline Summary
ATTACHMENT D	Occupancy Schedule
ATTACHMENT E	Measurement and Verification (M&V) Plan

**Contractor:**  
KINETIC SYSTEMS, INC.

**Customer:**  
CITY OF PASO DE ROBLES

By: \_\_\_\_\_  
Hal Brey

By: \_\_\_\_\_

Title: \_\_\_\_\_  
Vice President

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Date: \_\_\_\_\_



## **ATTACHMENT A**

### **PERFORMANCE GUARANTEE**

As part of this agreement, Kinetics hereby guarantees the energy and operational savings associated with the energy conservation measures (ECM's) identified in Attachment E of this Agreement. The Performance Guarantee will begin upon completion of the Kinetics installation and continue for a term of not more than seven (7) years.

Kinetics will compile the data and present an energy audit on a semi-annual basis to the City. As a result of the Kinetics' program The City will recognize both energy and operational savings documented in the Savings Summary (Attachment "B" of this Agreement). It is agreed that operational savings are fulfilled upon acceptance of this Agreement.

The Performance Guarantee will be reconciled on an annual basis. During the term of this Agreement, Kinetics guarantees that energy and operational savings will meet or exceed **\$324,027.00**, subject to the following conditions:

1. Energy savings are to be compared to the Utility Rate and Baseline Summary (documented in Attachment "C") and based on the existing rate structure for each individual site at the most recent (2002) PG&E published utility rates.
2. The City facilities will be operated similar to the schedule listed in Attachment "D" Occupancy Schedule, as provided by City staff.
3. During the term of the performance guarantee, the energy management system will monitor the times of HVAC systems operation at the Centennial Park Activity Center and Gymnasium. City staff will be provided local access to control system overrides at applicable site locations. It is understood by the customer that system operation in excess of 8 hours per week during the agreed upon unoccupied or off times will be logged, reported and a mutually agreed upon amount ADDED to the Utility Rate and Baseline Summary (Attachment "C") to reflect the adjusted conditions of operation.

Adherence to the defined occupancy operation schedules is critical to the financial success of this project. If particular rooms or buildings are operated in excess of eight (8) hours during the off schedule with any kind of frequency savings shortfalls may occur which will not be covered by this performance guarantee. Kinetics wants this project to be mutually successful. Toward this goal we will communicate on a continuing basis.

4. Temperatures will be maintained at 76 degrees for cooling and 68 degrees for heating plus or minus 2 degrees during occupied hours.
5. Kinetics will follow the International Performance Measurement and Verification Protocol (IPMVP) to verify the energy savings associated with the ECM's listed in Attachment E of the Installation Agreement. This protocol is recognized by the National Association of Energy Service Companies (NAESCO) as the standard guideline for how savings resulting from energy conservation projects should be measured. The IPMVP defines four broad options for measurement and verification of energy savings. The categories are as follows:



Option A	Largely stipulated parameters, instantaneous measurements may be incorporated.
Option B	Predominately end use measurement techniques, some stipulated parameters are allowable.
Option C	Utility Billing Analysis
Option D	Calibrated Building Simulation Analysis

Each option is applicable to specific situations and oftentimes, more than one option is possible. The table below matches the ECM's with the IPMVP option to be employed. The Measurement and Verification Plan (Attachment "E") provides a detailed description of the proposed M&V protocol for each ECM.

	Lighting	EMS/Controls	VFD, Pump Control, Ltg. Control	Cogeneration
Airport	Option A			
Schwartz Park			Option A	
Centennial Park	Option A	Option B		Option B
City Hall	Option A			Option B
Public Safety Center				Option B
Municipal Pool	Option A			Option B
Senior Center	Option A			
Traffic Intersections	Option A			
Train Depot	Option A			
Veterans Building	Option A			
Wastewater Treatment Plant	Option A			Option B

- Kinetics will monitor the energy audit process and will immediately implement necessary system enhancements if the audit indicates a variance with the annual guaranteed savings amount (shown above). If during the seven (7) years after the Project has been completed and accepted by the City, should guaranteed savings not be realized after Kinetics has performed the IPMVP, Kinetics guarantees that it shall pay to the City, within thirty (30) days of completing the IPMVP, the difference between the guaranteed savings for such year and the savings actually achieved during that year. However, in no case will the sum of any payments made by Kinetics to the City exceed the total project price (see Attachment "A" Price, Payment and Completion Schedule in Installation Agreement).



7. The City agrees to inform Kinetics of any changes to building operating conditions such as; adding equipment, changes to operating schedule, increased occupancy density, adding buildings, or increased square footage. The Utility Rate and Baseline Summary (Attachment "C") will be adjusted by a mutually agreeable amount, on an ongoing basis, to reflect the new conditions.

This guarantee is proprietary property of Kinetics and is provided for the exclusive use of the City. This guarantee will become binding only after acceptance by the City and Kinetics.

## **ATTACHMENT B**

### **SAVINGS SUMMARY**

<b>1. ANNUAL ENERGY SAVINGS</b>	<b>\$302,870</b>
<b>2. ANNUAL OPERATIONAL SAVINGS</b>	<b>\$ 21,157</b>
<p><b>A. LIGHTING OPERATIONAL SAVINGS</b> <span style="float: right;"><b>\$ 6,142</b></span></p> <p>Annual cost, currently paid by the City, to replace lamps, fixtures, ballast and bulbs in facilities scheduled to receive new lighting systems as part of this program. Ongoing disposal costs for fluorescent lamps and ballasts will also be reduced or eliminated at these locations.</p>	
<p><b>B. HVAC / CONTROLS OPERATIONAL SAVINGS</b> <span style="float: right;"><b>\$ 5,000</b></span></p> <p>Estimated annual cost savings due to reduced equipment run time (thus extending the life of the equipment) and reduced repairs associated with that equipment due to the installation of new controls at the following sites: Centennial Park Activity Center and Gym and Barney Schwartz Park. Also included in this category are estimated annual equipment replacement and repair savings due to reduced or eliminated use of the existing boiler systems at: Centennial Park Pool, Municipal Pool, City Hall, Public Safety Center and the Wastewater Treatment Plant. These locations will each receive a new cogeneration system that will serve as the primary heating source rendering the existing boiler plants to backup roles.</p>	
<p><b>C. NATURAL GAS OPERATIONAL SAVINGS</b> <span style="float: right;"><b>\$ 10,015</b></span></p> <p>Annual natural gas cost, currently paid by the City, to heat the anaerobic digesters at the Wastewater Treatment Plant. As part of this program, digester heating requirements will be met by burning "biogas" (free fuel) which is produced during the digester process.</p>	
<b>TOTAL ANNUAL GUARANTEED SAVINGS</b>	<b><u>\$324,027</u></b>

## ATTACHMENT C

### UTILITY RATE AND BASELINE SUMMARY

#### Paso Robles - Baseline Summary

Facility		Total Dollars/ Electric Rate	Total Units	Cost Per Unit
Wastewater Treatment	Electric	\$138,113.70 (E19S)	933,200	\$0.148
	Gas	\$10,015.01		
Muni Pool	Electric	\$29,230.69 (A10)	159,731	\$0.183
	Gas	\$19,344.67		
Veterans Building	Electric	(A1P)		
Centennial Park	Electric	\$71,796.24 (A10)	392,329	\$0.183
	Gas	\$25,223.20		
Airport	Electric	(A1)		
Traffic Signals	Electric	(TC1)		
Train Depot	Electric	(A1)		
Barney Schwartz Park	Electric	\$89,210.06 (A6WP)	641,799	\$0.139
Public Safety Center	Electric	\$109,626.39 (A10)		
City Hall/Library	Gas	\$14,928.27	546,655	\$0.183
	Electric	\$100,037.84 (A10)		
	Gas	\$6,881.83		

This baseline was developed from monthly dollar expenditures and partial year's utility billings, as provided by the City. The Public Safety Center gas and electric expenditures are extrapolated from the 7 months of expenditure information provided. Actual annual usage and unit cost data will be gathered during the construction period and this baseline will be updated with the new information.

## ATTACHMENT D

### OCCUPANCY SCHEDULE

The following tables include daily and hourly occupancy data, as provided by the City, for the various buildings in this project:

#### 2002 Calendar Year

##### Schwartz/ Centennial Park

	<u>Days Occupied</u>	<u>Occupied Hours</u>
Park Grounds	M-F	6:00 a.m. – 11:00 p.m.
Office	M-F	9:00 a.m.-5:30 p.m.
Restroom Bldg	M-F	6:00 a.m.- 11:00 p.m.
Pond Waterfall	M-F	6:00 a.m.- 11:00 p.m.
Concession Stand	M-F	As needed
Park Grounds	Sat, Sun	6:00 a.m. – 11:00 p.m.
Office	Sat, Sun	CLOSED
Restroom Bldg	Sat, Sun	6:00 a.m. – 11:00 p.m.
Pond Waterfall	Sat, Sun	6:00 a.m.- 11:00 p.m.
Concession Stand	Sat, Sun	As needed

##### Centennial Park Activity Center

	<u>Days Occupied</u>	<u>Occupied Hours</u>
Entire Bldg	M-F	8:00 a.m. - 4:40 p.m.
Entire Bldg	Sat, Sun	CLOSED

##### Centennial Park Gym

	<u>Days Occupied</u>	<u>Occupied Hours</u>
Entire Bldg	M-F	7:00 a.m. - 10:00 p.m.
Entire Bldg	Sat, Sun	1:00 p.m. - 6:00 p.m.
Entire Bldg (1/1-3/1)	Sat, Sun	7:30 a.m. – 9:00 p.m.

HVAC Equipment Operating Schedules – HVAC equipment serving the above mentioned areas will be scheduled to turn on one half hour prior to the Occupied Start time, and will be scheduled to turn off one half hour after the Unoccupied Start time.

Holidays - Standard State of California Holiday schedule applies. All facilities are closed on Holidays.

## **ATTACHMENT E**

### **MEASUREMENT & VERIFICATION**

#### **Lighting Only Retrofits (Option A)**

Airport, Centennial Park, City Hall, Municipal Pool, Senior Center, Traffic Intersections, Train Depot, Veterans Building, Wastewater Treatment Plant

Lighting systems hours of operation are mutually agreed upon by Paso Robles and Kinetics. They are documented in the Installation Agreement. Upon acceptance of this Agreement, Kinetics will demonstrate and document pre-retrofit and post-retrofit conditions (amperage and voltage) in the presence of a Paso Robles representative. Kinetics will then prove the energy savings associated with the lighting retrofits by using the pre and post-retrofit readings and the documented lighting hours of operation in the following basic equations:

Fixture Quantity x Watts Saved/Fixture x 1kW/1000W x Hours of Operation x \$/kWh = Energy Charge \$'s Saved

Fixture Quantity x Watts Saved/Fixture x 1kW/1000W x # of Months/Year x \$/kW = Demand Charge \$'s Saved

Refer to Utility Rate and Baseline Summary (Attachment "C") for Utility Rate Structure for above mentioned sites.

After successful completion of the lighting retrofit demonstration the parties agree that all associated energy savings are fulfilled.

### EMS/Controls (Option B)

Centennial Park, Activity Center and Gym

Measurement and verification of the Energy Cost Savings (ECS) associated with the installation of EMS/controls at the Centennial Park Activity Center and Gym will be done by demonstrating a reduction in hours of operation of the air conditioning and heating systems.

The savings associated with the installation of EMS/controls will then be by the following:

$$\text{ECS} = (\text{ML})(\text{HR})(\text{EC})$$

Where:

ML = Measured and/or calculated electrical and gas load of the system.

HR = Annual run-hours reduced from observed operation to projected EMS run-hours.

EC = Average Cost per kWh from the Utility Rate and Baseline Summary (Attachment "C")



## Variable Frequency Drive, Pump Control, Lighting Control (Option – A):

Barney Schwartz Park

The City and Kinetics agree that the energy savings for the above listed energy conservation measures is as follows:

### Variable Frequency Drive installation for the Pond Filter Pump:

Baseline Energy Usage –

$$(15 \text{ HP} \times 0.8 \text{ load factor} \times 0.746 \text{ kw/HP}) / 0.92 \text{ Eff.} = 9.73 \text{ kW}$$

$$9.73 \text{ kW} \times 8,760 \text{ hrs/year} = 85,235 \text{ kWh/year}$$

Energy Savings –

The variable frequency drive will reduce the motor speed based on pond water temperature. Savings will be achieved during the winter months only (170 days). The variable frequency drive will be able to slow the speed of the motor by an average amount of 65%, 12 hours per day. The energy savings calculation is as follows:

$$170 \text{ days/year} \times 12 \text{ hrs/day} \times 9.73 \text{ kW load} \times 0.65 \text{ VFD reduction} = 12,902 \text{ kWh/year}$$

$$12,902 \text{ kWh/year} \times 0.111 \text{ \$/kWh} = \text{\$ 1,432/year}$$

### Pump Control for the Pond Waterfall Pump:

Baseline Energy Usage –

$$(15 \text{ HP} \times 0.8 \text{ load factor} \times 0.746 \text{ kw/HP}) / 0.92 \text{ Eff.} = 9.73 \text{ kW}$$

$$9.73 \text{ kW} \times 8,760 \text{ hrs/year} = 85,235 \text{ kWh/year}$$

Energy Savings –

Pump Control will automatically turn the pump off during unoccupied times. The energy savings calculation is as follows:

$$365 \text{ days/year} \times 8 \text{ hrs/day} \times 9.73 \text{ kW load} = 28,412 \text{ kWh/year}$$

$$28,412 \text{ kWh/year} \times 0.111 \text{ \$/kWh} = \text{\$ 3,154/year}$$

### Lighting Control for the Walkway Lighting:

Baseline Energy Usage –

$$(24.71 \text{ kW lighting load} \times 5,500 \text{ hrs/year} = 135,905 \text{ kWh/Year})$$

Energy Savings –

Walkway lighting is controlled by a non-adjusted time clock. The Lighting Control will be expanded to include photocell control. The 7-day programmable time clock will be interlocked with the new photocell control. The energy savings calculation is as follows:

$$365 \text{ days/year} \times 2 \text{ hrs/day} \times 24.71 \text{ kW load} = 18,038 \text{ kWh/year}$$

$$18,038 \text{ kWh/year} \times 0.111 \text{ \$/kWh} = \text{\$ 2,002/year}$$

## **Cogeneration (Option B)**

Municipal Pool, Centennial Park Pool, City Hall and Public Safety Center

Measurement and verification of the Energy Cost Savings (ECS) associated with the installation of the 60 kW cogeneration system will be done by monitoring the electrical output of the system. The monitored electrical output will be divided by the total cost of cogeneration gas over the same time period to determine the cogeneration unit cost of electricity. The cogeneration gas utility bills, required to calculate cost of gas, will be supplied by the City. The savings will then be determined by subtracting the unit cost of cogeneration electricity from the unit cost of electricity (from Attachment "C" the Utility Rate and Baseline Summary) and multiplying this quantity by the energy output of the cogeneration unit.

The cost savings associated with hot water produced from the cogeneration system which replaces the need for the facilityr boiler to operate will be calculated by multiplying the rated Btu output used by the gain in efficiency from eliminating the combustion efficiency, which is the inverse of the existing boiler efficiency. This quantity is then multiplied by the current cost of gas that would have been paid if the cogeneration system had not been installed.

The savings associated with the electrical generation will then be the following

$$\text{ECS} = [(\text{MO})(\text{EC} - \text{CG})]$$

Where:

MO = Measured output of onsite generation in electricity published information.

EC = Average Cost per kWh from the Utiltiy Rate and Baseline Summary (Attachment "C")

CG = Unit cost of electricity generated, which is the MO from above divided by the total cost of natural gas for the cogeneration system.

The savings associated with the hot water produced will then be the following

$$\text{ECS} = [(\text{HW})(1/\text{BE})(\text{EC})]$$

Where:

HW = Amount of hot water produced in Btu's from rated Btu output

BE = Efficiency of existing boiler, estimated as 80%

EC = Cost to produce Btu's if the cogeneration system was not installed, based upon current tariff from the local utility.

**Digester Cogeneration (Option – B):**  
Wastewater Treatment Plant

Measurement and verification of the Energy Cost Savings (ECS) associated with the installation of the cogeneration system at the wastewater treatment plant will be done by monitoring the electrical output of the system.

The savings associated with the electrical generation will then be the following

$$ECS = (MO)(EC)$$

Where:

MO = Measured output of onsite generation in electricity published information

EC = Average Cost per kWh from the Utility Rate and Baseline Summary (Attachment "C")