

**ENERGY PERFORMANCE/CONSTRUCTION CONTRACT**

**BY AND BETWEEN THE BOARD OF COUNTY COMMISSIONERS  
OF ARAPAHOE COUNTY AND CHEVRON ENERGY SOLUTIONS COMPANY, A DIVISION  
OF CHEVRON U.S.A. INC.**

# **ENERGY PERFORMANCE/CONSTRUCTION CONTRACT**

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## **ENERGY PERFORMANCE/CONSTRUCTION CONTRACT**

This Energy Performance Contract (the "Contract") is made and entered into as of this \_\_\_\_ day of November 2005 by and between the Board of County Commissioners of Arapahoe County, ("County") and Chevron Energy Solutions Company, a Division of Chevron U.S.A., Inc.. ("Contractor"), 12980 Foster Drive, Suite 400, Overland Park, KS 66213, a Pennsylvania corporation doing business in Colorado (the "State").

### **WITNESSETH:**

**WHEREAS**, County is a political subdivision of the State of Colorado, and is authorized and empowered under the laws of the State, particularly Colorado Revised Statutes §29-12.5-101 et. seq. to enter into this Contract for the purpose of the sale and installation of certain energy and water saving equipment, and provision of other services designed to save energy and reduce related costs as per the guarantee described herein for certain property and buildings owned by the County; and

**WHEREAS**, authority exists in the Colorado law and sufficient funds have been budgeted, appropriated and otherwise made available and a sufficient unencumbered balance thereof remains available for encumbering and subsequent payment of this Contract; and

**WHEREAS**, County has been authorized to enter into a lease-purchase agreement for all professional services, construction/improvements, project contingencies, reimbursable expenses and miscellaneous expenses for the purchase and installation of energy and water conservation measures, collectively referred to as the Work(as herein after defined); and

**WHEREAS**, required approval, clearance, and coordination has been accomplished from and with appropriate agencies; and

**WHEREAS**, Contractor has developed or become knowledgeable about certain procedures for controlling energy and water consumption through services provided and equipment installed and maintained at facilities similar in scope and scale of County; and

**WHEREAS**, Contractor was selected after a determination that its proposal was the most advantageous to County pursuant to a Request for Proposal and contract for the Technical Energy Audit Contract(as hereinafter defined); and

**WHEREAS**, Contractor has made an assessment of the utility consumption characteristics of facilities, which was delivered to County as a Technical Energy Audit which County has approved; and

**WHEREAS**, County owns or leases the Premises (as hereinafter defined); and

**WHEREAS**, County desires to retain Contractor to sell to it, install and service certain energy efficiency equipment of the type or class described herein and to provide other services for the purpose of achieving utility cost reductions within Premises; and

**WHEREAS**, Contractor has selected the Equipment (as hereinafter defined) on the basis of competitive quality, compliance with Contractor's specifications, and price;

**NOW, THEREFORE**, in consideration of the mutual promises and covenants contained herein, and intending to be legally bound hereby, County and Contractor hereto covenant and agree that the following Schedules, Exhibits and Appendices are attached hereto (or will be, as provided in this Contract) and are made a part of this Contract by reference.

## **ARTICLE I: DEFINITIONS, SCHEDULES, EXHIBITS AND APPENDICES**

### **Section 1.1. Definitions.**

Change Order: An order directing a change in the scope of work, time for completion and/or Contract Sum and issued in compliance with the provisions of Section 24 of this Contract.

Contract: This Energy Performance Contract and all Schedules and Exhibits attached hereto.

Contractor Monitoring Agreement: The Agreement provided in **Schedules C, D and F**.

Contract Sum: The sum of all materials, labor, auditing, design, engineering, project construction management fees, overhead, profit, contingency, outside services, and bidding and construction contingencies related to the project.

Contract Year: The twelve month period following the Performance Commencement Date and then each subsequent twelve month period until the Contract is terminated.

Energy and Water Cost Savings: The savings as provided in **Schedule C**

Energy and Cost Savings Guarantee: The guarantee that is achieved as a result of the installation and operation of the Equipment and provision of services provided for in this Contract as specified in **Schedule D** and in accordance with the Savings Calculation Formula as set forth in **Schedule F**.

Equipment: The goods enumerated on **Schedules A.1 and A.2** that is now or hereafter from time to time become attached hereto and incorporated herein by reference, together and with any and all additions, modifications, attachments, replacements and parts thereof.

Event of Contract Termination: **As provided in Schedule N.**

Event of Default: Those events described in **Section 17.1 and Section 17.2** hereof.

Interim Period: The period from contract execution until the Performance Commencement Date.

Monitoring Fee: An annual fee according to **Schedule D** for monitoring the Energy and Cost Savings

Notice of Contractor's Settlement: The Notice required by C.R.S. § 38-26-107.



**Performance Commencement Date:** The date described in **Section 4.2.**

**Premises:** The facilities of the County, and is in need of energy and water saving equipment and services designed to reduce consumption and associated costs at said Premises

**Professional Services:** Architecture, engineering, project/construction management related to the Contract.

**Technical Energy Audit:** The Energy Performance Audit performed by the Contractor.

**Work:** Collectively, the Equipment, Professional Services and project construction related to the project.

### **Section 1.2. Schedules.**

Schedule A.1	Energy Performance Equipment to be Installed by Contractor
Schedule A.2	Other Equipment to be Installed by Contractor (Non-Guarantee)
Schedule B	Description of Premises; Pre-Existing Equipment Inventory
Schedule C	Energy and Cost Savings Guarantee
Schedule D	Contractor Monitoring, Maintenance and Service Agreement
Schedule E	Baseline Energy Consumption
Schedule F	Savings Measurement & Calculation Formulae; Methodology to Adjust Baseline; Monitoring and Verification Plan
Schedule G	Construction and Installation Schedule
Schedule H	Systems Start-Up and Commissioning; Operating Parameters of Installed Equipment
Schedule I	Standards of Comfort
Schedule J	Contractor's Maintenance Responsibilities
Schedule K	County's Maintenance Responsibilities
Schedule L	Facility Maintenance Checklist
Schedule M	Contractor's Training Responsibilities
Schedule N	General Conditions
Schedule O.1	Payment Schedule and Schedule of Values for Performance Equipment to be Installed by Contractor
Schedule O.2	Payment Schedule and Schedule of Values for Other Equipment to be Installed by Contractor
Schedule P	Pre-Existing Service Agreements
Schedule Q	Current and Known Capital Projects at Facility
Schedule R	Projected Financial Performance
Schedule S	Certificate of Insurance

### **Schedule 1.3 Exhibits**

Exhibit I	Performance Bond
Exhibit II	Labor and Material Payment Bond

- Exhibit III(i) Form of Notice of Acceptance—Technical Energy Audit and Monitoring and Verification Plan
- Exhibit III(ii) Form of Notice of Substantial Completion
- Exhibit IV Form of Equipment Warranties
- Exhibit V Form of Minority and Women-Owned Business Enterprises
- Exhibit VI Form of Certification that Lifetime of Equipment Exceeds Financing Term

#### **Section 1.4. Appendices**

- Appendix A Lease Agreement and Documents
- Appendix B RFP for Contractor Solicitation
- Appendix C Contractor Proposal

### **Article II: PAYMENTS**

#### **Section 2.01: Purchase and Sale**

County agrees to lease Equipment through a third party lessor, CitiMortgage, Inc, as provided for in a separate lease document, **Appendix A (Lease Agreements and Related Documents)**. Contractor agrees to provide the Equipment described in **Schedules A.1 and A.2**, together with installation, maintenance and other services as provided herein.

The agreed to Contract Sum for the Work is a Guaranteed Maximum Price (GMP) of **\$10,093,933.00** [ten million ninety three thousand nine hundred thirty three dollars and zero cents]. Payment terms are described in **Schedules O.1 and O.2**. If the entire cost of the Work, including the fees set forth in **Schedules O.1 and O.2**, is less than the GMP, the difference between the cost of the Work and the GMP shall inure solely to the benefit of the County and any payments in excess of the Cost of the Work shall be returned to the County, or, at the County's option, may be used to fund additional work.

Contractor will provide the Work and all related services to install and maintain the Equipment identified on **Schedules A.1 and A.2** and the services detailed on **Schedule D**. Contractor shall supervise and direct the Work and shall be solely responsible for all construction means, methods, techniques, sequences, and procedures and for coordinating all portions of the Work under this Contract. Contractor shall be responsible to pay for all labor, materials, equipment, tools, construction equipment and machinery, transportation and other facilities and services necessary for the proper execution and completion of the Work.

#### **Section 2.2. Contractor Compensation – Interim Period.**

County shall pay Contractor the Contract Sum in accordance with **Schedules O.1 and O.2** and **Appendix A**. Payments will be made on a progress basis in accordance with **C.R.S. § 24-91-103** and the applicable provisions of **Schedule N**, for Work completed and authorized by County during the Interim Period. The Progress Payments outlined in **Appendix A** will not be applicable to this Contract. Retainage will be withheld from each payment until the construction installation is completed as set forth in **Section 4.2**.

**Section 2.3. Energy and Cost Savings Guarantee.**

Subsequent to the Performance Commencement Date and throughout the term of this Contract, Contractor hereby guarantees the level of Energy and Cost Savings as detailed in **Schedule C**. Contractor shall provide the guarantee and monitoring as defined in **Schedule D**, for every year of the contract term, or until such time that County issues a notice to terminate the guarantee and monitoring service. County may terminate the Energy and Cost Savings Guarantee and related Monitoring Fee, as set forth in **Section 2.9** and defined in **Schedule R**, after three years of the performance period as legislated by **ARS § 2-2-101(c)**, and this Contract shall terminate and Contractor shall have no further obligations hereunder.

This Energy and Cost Savings Guarantee is achieved as a result of the installation and operation of the Equipment specified in **Schedule A.1** and provision of services provided for in this Contract as specified in **Schedule D** and in accordance with the Savings Calculation Formula as set forth in **Schedule F**. The Annual Energy and Cost Savings Guarantee per **Schedule C** is subject to the satisfactory performance by County of its obligations under this Agreement, including without limitation, adjustment in accordance with an event of Material Change hereunder. In the event this Contract is terminated due to an uncured Event of Default, as defined in **Section 17.1**, by County, the Energy and Cost Savings Guarantee shall be cancelled and Contractor shall have no further obligations hereunder, except to guarantee County the prorated portion of the annual Energy and Cost Savings Guarantee. The prorated portion shall include all Guaranteed Savings incurred prior to the termination date except that such portion should only go up until the Event of Default if the Event is related to the non-payment or other violations impacting the Energy and Cost Savings including but not limited to providing utility bills and access to the Equipment.

Contractor has structured the Energy and Cost Savings Guarantee to be sufficient to exceed any and all annual payments required by the County in connection with the acquisition of Equipment specified in **Schedule A.1** to be installed by Contractor under this Contract, maintenance costs related to said Equipment and the County's lease financing obligations with respect to the Equipment specified in **Schedule A.1**. Actual energy and operations savings achieved by Contractor through the operation of Equipment specified in **Schedule A.1** and performance of services by Contractor, including the annual Energy and Cost Savings Guarantee, shall be sufficient to cover any and all annual fees to be paid by County to Contractor for the provision of services as set forth and in accordance with the provisions of **Schedule D**, all payments to the third party lessor for the Equipment specified in **Schedule A.1** under the terms of the lease documents contained in **Appendix A**, maintenance costs related to said Equipment and all payments to the third party monitor.

**Section 2.4. Allowable Payment Sources.** County has pre-determined that allowable payment sources to be applied to annual payments may include: Energy and water cost savings; material/commodity savings (including avoided cost from replacement lamps, ballasts, etc.), including scheduled replacement of parts; and other cost savings including maintenance contracts.

**Section 2.5. Capital Contribution from County.**  
Not Applicable.

**Section 2.6. Independent Monitoring**

County will hire, with consultation of Contractor and paid for with guaranteed savings, an independent third party monitor to review the Contractor's monitoring and verification reports and advise County of compliance in monitoring and verifying savings. The independent monitor's responsibilities could

also include verifying the prorated share of Guaranteed Savings in the Event of Contract Termination. Compliance checks will relate to the established baseline (**Schedule E**), baseline adjustments, monitoring and verification plan and savings calculations of (**Schedule F**).

**Section 2.7. Annual Review and Reimbursement/Reconciliation.**

Energy-related cost savings shall be measured and/or calculated as specified in **Schedule E** and **Schedule F** and a report provided within ninety (90) days of receipt of all Needed Data (as defined in **Schedule D** hereof) for the previous year for each anniversary of the Performance Commencement Date. Contractor has developed the measurement and verification procedures specified in **Schedule F** which is based on the *International Performance Measurement and Verification Protocol 2002*.

In the event the Energy and Cost Savings achieved during such Contract Year is less than the Guaranteed Energy and Cost Savings (as defined in **Schedule C** hereof), set forth for such year during the years the guarantee is in effect, within thirty (30) days Contractor shall pay the County an amount equal to the deficiency.

If during the Contract Year the Energy and Cost Savings achieved are greater than the Guaranteed Energy and Cost Savings, such excess Energy and Cost Savings shall be retained by the County.

**Section 2.8. Monitoring Information Procedure.**

Energy and Cost Savings shall be calculated monthly in the following manner:

- (i) Each month, by the 10th day after receipt, as long as the Energy and Cost Savings Guarantee is in effect, County shall provide Contractor with copies of all relevant energy bills received for the preceding month;
- (ii) Reporting to County is outlined in **Schedule D**.

**Section 2.9. Monitoring Fee.**

Throughout the Term of this Contract, or until the Contractor Monitoring Agreement is cancelled by County, County shall pay Contractor an annual fee according to **Schedule D** for monitoring the Energy and Cost Savings. Annual guaranteed energy and cost savings achieved shall be sufficient to cover any and all fees to be paid to Contractor pursuant to the provisions of **Schedule D** (as well as lease payments to Lessor for the Equipment specified in **Schedule A.1** and costs of the third party monitor). Notwithstanding the above provisions and also **Section(s) 4.1, 4.2 and 4.3** below,, County shall not be required to begin any Monitoring Fee payments to Contractor under this Contract unless and until all equipment installation is completed by Contractor in accordance with the provisions of **Article VI** and **Article IX, Schedule H** and **Schedule L**, and accepted by County as evidenced by the signed Notice of Substantial Completion as set forth in **Exhibit III (ii)**, and unless and until said equipment is, in the opinion of the County, fully and properly functioning in accordance with **Schedule A.1** and related details and specifications.

**Section 2.10. Late Payment.**

Payment during construction will be in accordance with **Schedule N**. Payment due during the Performance Period shall be due and payable within forty-five (45) days of the invoice date Interest shall accrue on any past due balance owed to either party hereunder at the rate of one percent (1%) per month (or the highest rate not prohibited by law, whichever is lower). This remedy shall be in addition to, not exclusive of, any other remedy available under this Contract or applicable law.

### **Section 3. UTILITY AWARD PAYMENTS**

#### **Section 3.1. Utility Award Payments**

Utility Award Payments are not a part of this contract.

### **ARTICLE IV: TIME FOR COMPLETION; COMMENCEMENT DATE; TERM OF CONTRACT**

#### **Section 4.1. Construction Commencement Date and Time for Completion of Work.**

Work must commence within thirty (30) days of execution of this Contract and shall be completed as set forth in **Schedule G**. The Time for Completion of Work is of the essence of this Contract. By executing this Contract, the parties hereto confirm the Time of Completion of Work is a reasonable period for performing the Work. Except for obligation to make payments of money, Contractor shall not be responsible for any failure to fulfill, or any delay in fulfilling, its obligations hereunder, if such failure or delay is beyond the reasonable ability of such party to control, avoid or mitigate and is due to an act or neglect of County, or by labor disputes, delay in deliveries that are not the fault of Contractor or its subcontractors, unavoidable casualties or due to storm, flood, or other Act of God, or to fire, war, rebellion, scarcity of water, insurrection, riots, strikes or is the result of some order, rule or regulation of any federal, state, municipal, or other governmental agency that could not have been reasonably anticipated or that was not scheduled to take effect at the time the Contract was executed by the Parties. Time for Completion of the Work and the costs related thereto shall be extended and modified by Change Order, for such reasonable time and amount as the parties hereto may determine. Change Orders in excess of contingency funds and/or completion date shall not be allowed unless mutually negotiated by both parties.

#### **Section 4.2. Performance Commencement Date.**

The Performance Commencement Date shall be the first day of the month after the month in which all schedules are in final form and accepted by County and when Contractor shall have delivered a Notice to County that it has installed and commenced operating all of the Equipment specified in **Schedules A.1 and A.2** and in accordance with the provisions of **Article VI** and **Schedule H**, County has inspected and accepted said installation and operation as evidenced by the Notice of Substantial Completion as set forth in **Exhibit III (ii)**. Notwithstanding anything to the contrary in **Article II** and **Article IV** the Performance Commencement Date shall not occur and the County shall not be required to accept the work under this Contract unless and until: all Equipment installation for the subject Premises is completed by Contractor in accordance with the terms and conditions of this Contract. County shall have fifteen (15) days after notification by the Contractor to inspect and accept the Equipment. County reserves the right to reject the Equipment if installation fails to meet reasonable standards of workmanship, does not comply with applicable building codes, or is otherwise not in compliance with this Contract. Acceptance shall occur at the later of the time specified herein for acceptance or at the expiration of the ten (10) days statutory notice of "final settlement" to subcontractors and other person furnishing labor, materials and other supplies in the performance of work. In the even claims are received, acceptance shall not occur until after receipt by County of a signed receipt in full or an order of withdrawal of said claims. At such time as County accepts, County shall issue a Certificate of Final Completion to Contractor [REDACTED]

**Section 4.3. Performance Term of Contract.**

Unless otherwise terminated pursuant to the terms of this Contract, the Performance Term of this Contract shall begin with the Performance Commencement Date and continue for 12 years. This Contract shall be effective and binding upon the parties immediately upon its execution. All energy savings achieved during the Interim Period shall not be applicable to the Guaranteed Savings after the Performance Commencement Date.

**ARTICLE V: ENERGY USAGE RECORDS AND DATA**

**Section 5.1 Energy Usage Records and Data**

County has furnished and shall continue to furnish (or authorize its energy suppliers to furnish) during the Term of this Contract to Contractor or its designee, upon its request, all of its records and complete data concerning energy and water usage and related maintenance for the Premises.

**ARTICLE VI: CONSTRUCTION AND INSTALLATION BY CONTRACTOR**

**Section 6.1. Permits and Approvals.**

County shall use its best efforts to assist Contractor in obtaining all necessary permits and approvals for installation of the Equipment. In no event shall County, however, be responsible for direct payment of any permit or license fee or the delay of any such permit or license fee.

**Section 6.2. Contractor's Duty of Proper Installation.**

All services called for by this Contract which constitute the "practice of architecture" or the "practice of engineering", as those terms are defined in Title 12, Colorado Revised Statutes, as amended (C.R.S.), shall be performed by properly qualified and licensed professionals employed by Contractor and shall be performed in accordance with applicable law. Contractor shall perform all tasks/phases under this Contract, including construction, and shall install the Equipment in such a manner so as not to harm the structural integrity of the buildings or their operating systems and so as to conform to the standards set forth in **Schedule I** and **Schedule G**.

**Section 6.3. Use of Stated Markups.**

In establishing the Contract Sum the Contractor has used the markups for overhead and profit as disclosed in the Contractor Proposal (**Appendix C**), as negotiated in the Contract for Technical Energy Audit and applied to the estimated labor and material costs as shown in **Schedules O.1** and **O.2**. It has also provided a contingency equal to a percentage of the labor, material and direct cost budget. The Contract Sum shall be adjusted based on the actual costs of labor and materials to the Contractor multiplied by the markups agreed to by the Contractor, but in no event shall the Contract Sum be increased. In the event it is possible to reduce the Contract Sum because the actual labor and material costs are less than budgeted, the County can, at its sole option, increase the Work to include additional equipment such that the original Contract Sum is reached. If the County declines to increase the Work, at its sole option, the Contract Sum shall be reduced to an amount consistent with the pricing using the stated markups and the balance shall be applied to the lease financing amount.

**Section 6.4. Open Book Pricing.**

Open book pricing will be required, such that the Contractor will fully disclose all costs. Contractor will maintain cost accounting records on authorized work performed under actual costs for labor and material,

or other basis requiring accounting records. Contractor will afford County access to these records and preserve them for a period of three (3) years after final payment. Costs will be evaluated through price analysis to compare costs with reasonable criteria such as established catalog and market prices or historical prices. The pricing methodology and individual cost markups disclosed during preliminary contract negotiations will be expected to be applied, providing the scope and size of the project remain the same as assumed when markups were disclosed. There will not be any compounding of Contractor's overheads. Only actual costs will be paid and any unused contingencies, either direct or indirect, will be available to perform additional work, or, at the discretion of the County, will result in a reduction of the Contract Sum. All subcontractors will be required to break out contingency as a separate line item on their schedule of values. If the contingency does not get used, it will be refunded to the County or used to perform additional work.

**Section 6.5. Administration.** The Contractor's contact person (Project Manager) shall forward all communications in writing and all documents to the Principal Representative's contact person and the Program Manager's contact person simultaneously as listed below:

For the Principal Representative:  
Anne Cecilione, Project Manager  
Arapahoe County Department of Facilities  
and Fleet Management  
5334 S. Prince St.  
Littleton, CO 80166-0001

For the Contractor Project Manager:  
Bret Thomas, Senior Project Director  
Chevron Energy Solutions Company  
12980 Foster Drive, Suite 400  
Overland Park, KS 66213

## **ARTICLE VII: ENVIRONMENTAL REQUIREMENTS**

### **Section 7.1. Excluded Material and Activities.**

County recognizes that in connection with the installation and/or service or maintenance of Equipment at County's Premises, Contractor may encounter, but is not responsible for, any work relating to (i) asbestos, materials containing asbestos, or the existence, use, detection, removal, containment or treatment thereof, or (ii) pollutants, hazardous wastes, hazardous materials, contaminants other than those described in this Section below (collectively "Hazardous Materials"), or the storage, handling, use, transportation, treatment, or the disposal, discharge, leakage, detection, removal, or containment thereof. The materials and activities listed in the foregoing sentence are referred to as "Excluded Materials and Activities". County agrees that if performance of work involves any Excluded Materials and Activities, County will perform or arrange for the performance of such work and shall bear the sole risk and responsibility therefore. In the event Contractor discovers Hazardous or Excluded Materials, Contractor shall immediately cease work, remove all Contractor personnel or subcontractors from the site, and notify the County. The County shall be responsible to handle such Materials at its expense. Contractor shall undertake no further work on the Premises except as authorized by the County in writing. Notwithstanding anything in this Contract to the contrary, any such event of discovery or remediation by the County shall not constitute a default by the County. In the event of such stoppage of work by Contractor, the Time for Completion of Work will be automatically

extended by the amount of time of the work stoppage and any additional costs incurred by Contractor as a result will be added by Change Order.

Contractor shall be responsible for any hazardous or other materials, including, without limitation, those listed in this **Section 7.1** that it may bring to the Premises.

**Section 7.2. Polychlorinated Biphenyl (PCB) Ballasts; Mercury Lamps.**

Contractor will enter into an agreement with an approved PCB ballast disposal contractor who will provide an informational packet, packing receptacles and instructions, labels and shipping materials, transportation, and recycling or incineration services for PCB ballasts. All capacitors and asphalt potting compound materials removed from County's PCB ballasts will be incinerated in a federally approved facility. After proper disposal, a Certificate of Destruction will be provided by the approved facility to County. Contractor's responsibility shall be for the proper and legal management of any PCB ballasts removed as a result of the installation of the Equipment and shall be limited only until said PCB ballasts are loaded onto an approved PCB ballast disposal contractor's vehicle for transportation.

Contractor will enter into an agreement with an approved lamp disposal contractor who will provide approved containers, materials required to label, transportation, recycling or incineration in accordance with EPA requirements, and a copy of the manifest.

County agrees to sign manifests of ownership for all PCB ballasts and mercury lamps removed from the Premises.

**ARTICLE VIII: ACCEPTANCE TESTING**

**Section 8.1. Modification of Schedules.**

To ensure this Contract properly accounts for as-installed conditions, which conditions may vary from the pre-installation analyses, the Contractor shall re-validate or modify **Schedules A.1 and A.2** and **Schedule H** prior to System Start-Up. The County's approval is required for any such modifications to **Schedules A.1 and A.2**, and such approval shall not be unreasonably withheld.

**Section 8.2. Systems Startup and Equipment Commissioning.**

The Contractor shall conduct a thorough and systematic performance test of each element and total system of the installed Equipment in accordance with the procedures specified in **Schedule H** and prior to acceptance of the project by County as specified in **Exhibit III (ii)**. Testing shall be designed to determine if the Equipment is functioning in accordance with both its published specifications and the Schedules to this Contract, and to determine if modified building systems, subsystems or components are functioning properly within the new integrated environment. The Contractor shall provide notice to the County of the scheduled test(s) and the County and/or its designees shall have the right to be present at any or all such tests conducted by Contractor and/or manufacturers of the Equipment. The Contractor shall be responsible for correcting and/or adjusting all deficiencies in the Equipment operation that may be observed during system commissioning procedures of **Schedule H**. The Contractor shall be responsible for correcting and/or adjusting all deficiencies in Equipment operation that may be observed during system testing procedures. Prior to County acceptance Contractor shall also provide County with reasonably satisfactory documentary evidence that the Equipment installed is the Equipment specified in **Schedules A.1 and A.2**.



## **ARTICLE IX: MAINTENANCE/MONITORING**

### **Section 9.1. Ownership of Certain Proprietary Property Rights.**

County shall not, by virtue of this Contract, acquire any ownership interest in any formulas, patterns, devices, secret inventions or processes, copyrights, patents, other intellectual or proprietary rights, or similar items of property which are or may be used in connection with the Equipment. County shall, however, have a nonexclusive license to utilize all such intellectual or proprietary rights obtained by Contractor related to Equipment in connection with its use of the Equipment under this Contract. The Contractor hereby grants to the County a perpetual, irrevocable, royalty-free license to any and all software or other intellectual property or proprietary rights it obtains from Equipment manufacturers necessary for the County to continue to operate, maintain, and repair the Equipment in a manner that will yield maximal energy consumption reductions. This license shall continue subsequent to any termination or expiration of this Contract other than termination due to breach by County.

### **Section 9.2. Ownership of Documents.**

(a) **Instruments of Service** Drawings, specifications and other documents, including those in electronic form, prepared by the Contractor and Contractor's consultants are Instruments of Service for use solely with respect to this Project. The Contractor and the Contractor's consultants shall be deemed the authors and owners of their respective instruments of service and shall retain all common law, statutory and other reserved rights, including copyrights.

Upon receiving full payment for Instruments of Service, the Contractor hereby grants to the County a perpetual nonexclusive license to reproduce and use, and permit others to reproduce and use for the County, Contractor and Contractor's consultant's Instruments of Service solely for purposes of constructing, using and maintaining the Project or for future alterations, or additions to the Project. The Contractor shall obtain similar nonexclusive licenses from the Contractor's consultants consistent with this Contract. If, and upon the date the Contractor is adjudged in default of this Contract, the foregoing license shall be deemed terminated and replaced by a second, nonexclusive license permitting the County to authorize other similarly credentialed design professionals to reproduce and, where permitted by law, to make changes, corrections or additions to the Instruments of Service solely for purposes of completing, using and maintaining the Project, or for future alterations, or additions to the Project, provided however, that to the extent permitted by law, County waives and releases, and indemnifies and hold harmless, Contractor, its subcontractors, and their directors, employees, subcontractors, and agents from any and all liability, claims, damages, losses and/or costs associated with or resulting from such use.

(b) **As-Built Drawings/Record Drawings** The Contractor shall, upon completion of the Construction Phase, provide redline As-Built Drawings to the County. These redline changes shall describe the built condition of the Project. This information and all of the incorporated changes directed by Bidding Addenda, Change Order/Amendment or Supplementary Instructions shall be incorporated by the Contractor and its consultants into a Record Drawings document provided to the Principal Representative in the form of an electro-media format and a reproducible format as agreed between the parties.

### **Section 9.3. Ownership of Existing Equipment.**

Ownership of the equipment and materials existing at the Premises at the time of execution of this Contract shall remain the property of County even if it is replaced or its operation made unnecessary by work performed by Contractor pursuant to this Contract. If applicable, Contractor shall advise the County in writing of all equipment and materials to be replaced at the Premises and the County shall within fifteen (15) days designate in writing to the Contractor which equipment and materials should not be disposed of off-site by the Contractor. It is understood and agreed to by both Parties that the

County shall be responsible for and designate the location and storage for any equipment and materials that should not be disposed of off-site. Except as may be otherwise provided in this Contract, the Contractor shall be responsible for the disposal of all equipment and materials designated by the County as disposable off-site in accordance with all applicable laws and regulations regarding such disposal. Except as indicated in **Section 7.1** and **Section 7.2**, under no circumstance shall Contractor be obligated to dispose of or take responsibility for any materials identified in **Section 7.1** or **Section 7.2** of this Contract.

**Section 9.4. Ownership of Measurement and Verification Equipment.**

County agrees to own the equipment required to provide the ongoing measurement of energy and water savings (the "Metering Equipment"). If required, County shall provide and maintain a non-dedicated telephone line to facilitate remote monitoring of the Equipment.

**ARTICLE X: STANDARDS OF COMFORT**

**Section 10.1 Standards of Comfort.** Contractor will design and install the Equipment so that it is able to provide the standards of heating, cooling, ventilation, hot water supply, lighting quality and levels described in **Schedule I**. During the term of this Contract, Contractor and County will maintain, according to **Schedule D**, **Schedule J** and **Schedule K**, and operate the Equipment in a manner that will provide the standards of comfort and levels of operation as described in **Schedule I**.

**ARTICLE XI: EQUIPMENT WARRANTIES**

**Section 11.1 Equipment Warranties.**

Contractor warrants that all equipment sold and installed as part of this Contract is new, unless otherwise agreed, will be materially free from defects in materials or workmanship, will be installed properly in a good and workmanlike manner, and will function properly for a period of one (1) year from the date of the Substantial Completion for the particular energy conservation measure if operated and maintained in accordance with the procedures established per building ("Warranty Period"). Substantial Completion shall be defined as the stage in the progress of the Work where the Work is sufficiently complete in accordance with the Contract Documents so that the County can utilize and take beneficial use of the Work for its intended use or purpose. Substantial Completion does not occur until the Equipment or system has been commissioned, accepted, and the "Substantial Completion" form fully executed.

After the warranty period, Contractor shall have no responsibility for performing maintenance, repairs, or making manufacturer warranty claims relating to the Equipment, except as provided in **Schedule D** and **Schedule J**.

Contractor further agrees to assign to County all available manufacturer's warranties relating to the Equipment and to deliver such written warranties and which shall be **provided in the Operation and Maintenance Manuals to be provided near the end of construction**; pursue rights and remedies against the manufacturers under the warranties in the event of Equipment malfunction or improper or defective function, and defects in parts, workmanship and performance. Contractor shall, during the Warranty Period, notify the County whenever defects in Equipment parts or performance occur which give rise to such rights and remedies and those rights and remedies are exercised by Contractor.

During this period, the cost of any risk of damage or damage to the Equipment and its performance, including damage to property and equipment of the County or the Premises, due to Contractor's failure to exercise its warranty rights shall be borne solely by Contractor. Thereafter, County shall be responsible for and shall bear all costs associated with service, repairs and adjustment to the Equipment.

All warranties, to the extent transferable, shall be transferable and extend to the County. The warranties shall specify that only new, not reconditioned, parts may be used and installed when repair is necessitated by malfunction, unless otherwise agreed to by the County.

Notwithstanding the above, nothing in this Section shall be construed to alleviate/relieve the Contractor from complying with its obligations to perform under all terms and conditions of this Contract and as set forth in all attached Schedules.

#### **Section 11.2 Actions by Contractor.**

Incorporated herein by reference **Schedule D, Schedule J, and Schedule N.**

#### **Section 11.3. Malfunctions and Emergencies.**

County shall use its best efforts to notify the Contractor or its designated subcontractor within twenty-four (24) hours after the County's actual knowledge and occurrence of: (i) any malfunction in the operation of the Equipment or any preexisting energy related equipment that might materially impact upon the Energy Savings or Energy Savings Guarantee, (ii) any interruption or alteration to the energy supply to the Premises, or (iii) any alteration or modification in any energy-related equipment or its operation.

Where County exercises due diligence in attempting to assess the existence of a malfunction, interruption, or alteration it shall be deemed not at fault in failing to correctly identify any such conditions as having a material impact upon the savings. County shall notify Contractor within twenty-four (24) hours upon its having actual knowledge of any emergency condition affecting the Equipment. If such malfunction, interruption, or alteration occurs during the Warranty Period, Contractor shall respond to any such notice within twenty-four (24) hours for non-critical equipment, and eight (8) hours for critical equipment, and shall promptly thereafter proceed with corrective measures. Any telephonic notice of such conditions by County shall be followed within three business days by written notice to Contractor from County. If County unreasonably delays in so notifying Contractor of a malfunction or emergency, and the malfunction or emergency is not otherwise corrected or remedied, Contractor may charge County for its loss, due to the delay, associated with the guaranteed savings under this Contract for the particular time period, provided that Contractor is able to show the direct causal connection between the delay and the loss.

The Contractor will provide a written record of all service work performed. This record will indicate the reason for the service, description of the problem and the corrective action performed.

#### **Section 11.4 Actions by County.**

During the term of this Contract, County shall not move, remove, modify, alter, or change in any way the Equipment or any part thereof without the prior written approval of Contractor, which consent shall not be unreasonably withheld, except as set forth in **Schedule K.** Notwithstanding the foregoing, County may take reasonable steps to protect the Equipment if, due to an emergency, it is not possible or reasonable to notify Contractor before taking any such actions. In the event of such an emergency,

County shall take reasonable steps to protect the Equipment from damage or injury. County agrees to maintain the Premises in good repair and to protect and preserve all portions thereof, which may in any way affect the operation or maintenance of the Equipment, all in accordance with the same standard of care the County applies to the Premises generally, that of a reasonably prudent government owner.

## **ARTICLE XII:      MODIFICATION, UPGRADE OR ALTERATION OF EQUIPMENT**

### **Section 12.1. Modification of Equipment.**

During the Term of this Contract, County will not, without the prior written consent of Contractor, affix or install any accessory equipment or device on any of the Equipment if such addition will change or impair the originally intended functions, value or use of the Equipment without Contractor's prior written approval, which shall not be unreasonably withheld.

### **Section 12.2. Upgrade or Alteration of Equipment.**

Contractor shall at all times have the right, subject to County's prior written approval, which approval shall not be unreasonably withheld, to change the Equipment, revise any procedures for the operation of the Equipment or implement other energy saving actions in the Premises, provided that: (i) the Contractor complies with the standards of comfort and services set forth in **Schedule I** herein; (ii) such modifications or additions to, or replacement of the Equipment, and any operational changes, or new procedures are necessary to enable the Contractor to achieve greater energy and cost savings at the Premises and; (iii) any cost incurred relative to such modifications, additions or replacement of the Equipment, or operational changes or new procedures shall be the responsibility of the Contractor.

All modifications, additions or replacements of the Equipment or revisions to operating or other procedures shall be described in a supplemental Schedule(s) to be provided to the County for approval, which shall not be unreasonably withheld, provided that any replacement of the Equipment shall, unless otherwise agreed, be new and have equal or better potential to reduce energy consumption at the Premises than the Equipment being replaced. The Contractor shall update any and all software necessary for the operation of the Equipment in accordance with the provisions of **Section 9.1 of Schedule J**. All replacements of and alterations or additions to the Equipment shall become part the Equipment described in **Schedules A.1 and A.2** and shall be covered by the provisions and terms of **Article VI and Article VIII**.

## **ARTICLE XIII:      LOCATION AND ACCESS**

### **Section 13.1. Contractor Access.**

Contractor acknowledges that there exists sufficient space on the Premises for the installation and operation of the Equipment. County shall take reasonable steps to protect such Equipment from harm, theft and misuse during the term of this Contract. County shall provide access to the Premises for Contractor to perform any function related to this Contract during regular business hours, or such other reasonable hours as may be requested by Contractor and acceptable to the County. Contractor shall be granted immediate access to make emergency repairs or corrections as it may, in its discretion, determine are needed. Contractor's access to the Premises to make emergency repairs or corrections as it may determine are needed shall not be unreasonably restricted by County. Contractor shall immediately notify the County when emergency action is taken and follow up with written notice with three (3) business days specifying the action taken, the reasons therefore, and the impact upon the Premises, if any.

## **ARTICLE XIV: MATERIAL CHANGES**

### **Section 14.1. Material Change Defined.**

A Material Change shall include any change or cumulative changes in or to the Premises, whether structural, operational or otherwise in nature which reasonably could be expected, in the judgment of the County, to increase or decrease annual energy consumption for any single building by five percent (5%) or more in accordance with the provisions and procedures set forth in **Schedule E (and Schedule F** after adjustments for climatic variations and provided a correlation exists between usage and Material Change).

Actions by the County that may result in a Material Change include but are not limited to the following: (i) manner of use of the Premises by the County; or (ii) hours of operation for the Premises or for any equipment or energy using systems operating at the Premises; or (iii) permanent changes in the comfort and service parameters set forth in **Schedule I**; or (iv) occupancy of the Premises; or (v) structure of the Premises; or (vi) types and quantities of equipment used at the Premises or (vii) modification, renovation or construction at the Premises; or (viii) the County's failure to provide maintenance of and repairs to the Equipment in accordance with **Schedule K**; or (ix) casualty or condemnation of the Premises or Equipment, or (x) changes in utility provider or utility rate classification, or (xi) any other conditions other than climate affecting energy or water use at the Premises.

### **Section 14.2. Reported Material Changes; Notice by County**

The County shall use its best efforts to deliver to the Contractor a written notice describing all actual or proposed Material Changes in the Premises or in the operations of the Premises at least 14 days before any actual or proposed Material Change is implemented or as soon as is practicable after an emergency or other unplanned event. Notice to the Contractor of Material Changes which result because of a bona fide emergency or other situation which precludes advance notification shall be deemed sufficient if given by the County within two (2) business days after having actual knowledge that the event constituting the Material Change occurred or was discovered by the County to have occurred.

**Section 14.3 Unreported Material Changes.** In the absence of any Material Changes in the Premises or in their operations the baseline energy consumption set forth in **Schedule E (Baseline Energy Consumption)** should not change from year to year after adjustments for change in climatic conditions. Therefore, if energy and water use for any month is more than five (5%) or more during any month from the projected energy usage for that month, after adjustment for changes in climatic conditions then such deviation shall be deemed to have resulted from a Material Change, except where an increase is due to Equipment failing to provide the anticipated energy savings, Equipment malfunction, malfunction of Premises systems, subsystems, or components attributable to the Equipment, faulty repair or other negligence or breach of contract by Contractor. The Contractor shall report its findings to the County in a timely manner and the Contractor and County shall determine what, if any, adjustments to the baseline will be made in accordance with the provisions set forth in **Schedule F (Savings Measurement and Calculation Formulae; Methodology to Adjust Baseline)** and **Schedule E (Baseline Energy Consumption)**.

### **Section 14.3. Other Adjustments.**

As agreed in Section 16.1 County will alert Contractor of Material Changes as known. Both parties have a vested interest in meeting the guaranteed savings of the Contract. As such, the Contractor will

work with County to investigate, identify and correct any changes that prevent the guaranteed savings from being realized. As a result of such investigation, Contractor and County shall determine what, if any, adjustments to the baseline will be made in accordance with the provisions set forth in **Schedule F** and **Schedule E**.

## **ARTICLE XV: TRAINING AND FOLLOW-UP ACTIVITIES BY CONTRACTOR**

### **Section 15.1. Training.**

The Contractor shall conduct the training program described in **Schedule M**. Appropriate training must be completed prior to Final Acceptance of the Equipment installation. The Contractor shall provide ongoing training whenever needed with respect to updated or altered Equipment, including upgraded software. Such training shall be provided at no charge to the County during the construction and warranty periods.

### **Section 15.2. Application for Energy Star or LEED.**

Not Applicable.

### **Section 15.3 Emissions Reductions Documentation and Reporting.**

Not Applicable.

## **ARTICLE XVI: GENERAL CONTRACTUAL PROVISIONS**

### **Section 16.1 Additional Insurance Requirements- Professional Liability Insurance.**

All insurance provided by Contractor is self insurance. No work will be done by any subcontractor until the appropriate subcontractor's insurance certificate has been provided to the Contractor with a copy to County. Insurance requirements are set forth in Schedule N, General Conditions.

Contractor promises and agrees to provide Errors and Omissions Professional Liability Insurance in the amount of five (5) million per event and in aggregate coverage to be provided through self insurance. The insurance shall remain in effect for the duration of the Interim Period. The Contractor shall be responsible for all claims, damages, losses or expenses, including attorney fees, arising out of or resulting from the performance of professional services contemplated in this Contract, provided that any such claim, damage, loss or expense is caused by any negligent act, error or omission of the Contractor, any consultant or associate thereof, or anyone directly or indirectly employed by the Contractor. The Contractor shall submit a self administered claims program letter to the County.

## **ARTICLE XVII: EVENTS OF DEFAULT**

### **Section 17.1. Events of Default by County.**

Each of the following events or conditions shall constitute an "Event of Default" by County:

- (i) any failure by County to pay Contractor any sum due that is not in dispute, hereunder for a service and maintenance period of more than thirty (30) days after written notification by Contractor that County is delinquent in making payment;

- (ii) any other material failure by County to perform or comply with the terms and conditions of this Contract, including breach of any covenant contained herein, provided that such failure continues for thirty (30) days after notice to County demanding that such material failures to perform be cured or if such cure cannot be effected in such thirty (30), County shall be deemed to have cured default upon the commencement of a cure within such thirty (30) days and diligent subsequent completion thereof;
- (iii) any representation or warranty furnished by County in this Contract that was false or misleading in any material respect when made;
- (iv) the filing of a bankruptcy petition whether by County or by its creditors against County which proceeding shall not have been dismissed within 90 days of its filing, or an Involuntary assignment for the benefit of all creditors of the liquidation of County.

**Section 17.2. Events of Default by Contractor.**

Each of the following events or conditions shall constitute an "Event of Default" by Contractor:

- (i) the standards of comfort and service set forth in **Schedule I** are not provided due to failure of Contractor to properly design, install, maintain, repair or adjust the Equipment except that such failure, if corrected or cured within thirty (30) days after written notice by County to Contractor demanding that such failure be cured or if such cure cannot be effected in such thirty (30) day period, Contractor shall be deemed to have cured default upon the commencement of a cure within such thirty (30) days, shall be deemed cured for purposes of this Contract.
- (ii) any representation or warranty furnished by Contractor in this Contract is false or misleading in any material respect when made;
- (iii) provided that the operation of the facility is not adversely affected and provided that the Standards of Comfort in **Schedule I** are maintained, any failure by Contractor to perform or comply with the terms and conditions of this Contract, including breach of any covenant contained herein except that such failure, if corrected or cured within thirty (30) days after written notice to Contractor demanding that such failure to perform be cured, shall be deemed cured for purposes of this Contract;
- (iv) any lien or encumbrance upon the equipment by any subcontractor, laborer or materialman of Contractor which is not released in thirty days after notice of said filing;
- (v) the filing of a bankruptcy petition whether by Contractor or its creditors against Contractor which proceeding shall not have been dismissed within 90 days of its filing, or an involuntary assignment for the benefit of all creditors or the liquidation of Contractor.

- (vi) failure by the Contractor to pay any amount due that is not in dispute, or perform any material obligation under the terms of this Contract, unless such amount due or failure to perform is excused pursuant to the provisions of this Contract.

## **ARTICLE XVIII: ASSIGNMENT**

**Section 18.1. Assignment by Contractor.** The Contractor acknowledges that the County is induced to enter into this Contract by, among other things, the professional qualifications of the Contractor. The Contractor agrees that except as set forth below, neither this Contract nor any right or obligations hereunder may be assigned in whole or in part to another firm, without the prior written approval of the County.

- (i) The assignment of this Contract, in whole or in part, within the Enterprise of which Contractor is a part does not require the consent of the other party.
- (ii) The Contractor may, without prior written approval of the County, which consent shall not be unreasonably withheld, utilize subcontractors, provided that any subcontractor(s) shall fully comply with the terms of this Contract.

**Section 18.2. Assignment by County.**

County may transfer or assign this Contract and its rights and obligations herein to a successor or purchaser of the Premises or an interest therein with the consent of Contractor, which shall not be unreasonably withheld. The lack of financial qualification of the new owner shall be grounds for withholding such consent.

## **ARTICLE XIX: REPRESENTATIONS AND WARRANTIES**

**Section 19.1. Representations and Warranties.** Each party warrants and represents to the other that:

- (i) it has all requisite power, authority, licenses, permits, and franchises, corporate or otherwise, to execute and deliver this Contract and perform its obligations hereunder;
- (ii) its execution, delivery, and performance of this Contract will not result in a breach or violation of, or constitute a default under any Contract, lease or instrument to which it is a party or by which it or its properties may be bound or affected; or
- (iii) its execution, delivery, and performance of this Contract has been duly authorized by, or are in accordance with, its organic instruments, and this Contract has been duly executed and delivered for its by the signatories so authorized and it constitutes its legal, valid and binding obligation.

## **ARTICLE XX. ADDITIONAL REPRESENTATIONS OF THE PARTIES.**

**Section 20.1. By County.**

County hereby warrants, represents and promises that:

- (i) County is authorized under the Constitution and laws of the State of Colorado to enter into this Contract, each transaction contemplated hereby, and to perform all of its obligations under this Contract.



- (ii) Subject to the provisions contained herein, County has provided or shall provide timely to Contractor, all records relating to energy and water usage and energy-related maintenance of Premises requested by Contractor; and
- (iii) County has not entered into any prior leases, contracts or agreements with other persons or entities regarding the leasing or acquisition of water or energy efficiency equipment or the provision of energy management services for the Premises or with regard to servicing any of the Equipment located in the Premises that would encroach upon the scope of this Contract. County shall provide Contractor with copies of any successor or additional leases of energy efficiency equipment and contracts for management or servicing of preexisting equipment at Premises that may be executed from time to time hereafter within seven days after execution thereof.

**Section 20.2. By Contractor.**

Contractor hereby warrants, represents and promises that:

- (i) before commencing performance of this Contract:
  - (a) Contractor shall have become licensed or otherwise permitted to do business in the State of Colorado
  - (b) Contractor shall have provided proof and documentation of all required insurance and bonds pursuant to this Contract.
- (i) Contractor shall make available, upon reasonable request, documents relating to its performance under this Contract, including contracts and subcontracts it shall enter into;
- (ii) Contractor shall use subcontractors who are qualified, licensed and bonded in this State to perform the work so subcontracted pursuant to the terms hereof;
- (iii) Contractor has all requisite authority to license the use of proprietary property, both tangible and intangible, contemplated by this Contract;
- (iv) The Equipment will meet or exceed the Acceptance Testing Standards set forth in this Contract.
- (v) The Equipment is or will be compatible with all other Premises mechanical and electrical systems, subsystems, or components with which the Equipment interacts, and that, as installed, neither the Equipment nor such other systems, subsystems, or components will materially adversely affect each other as a direct or indirect result of Equipment installation or operation;
- (v) That Contractor is financially solvent, able to pay its debts as they mature and possessed of sufficient working capital to complete the Installation and perform its obligations under this Contract.

**ARTICLE XXI: MISCELLANEOUS DOCUMENTATION PROVISIONS.**

**Section 21.1. Waiver of Liens, Performance Bonds, Labor and Material Payment Bonds.** Such executed bonds will be provided within 14 days of execution of this contract and at that time will be

incorporated herein by reference as **Exhibit I (Performance Bond)** and **Exhibit II (Labor and Material Payment Bond)** per **Schedule N**. It is agreed and clarified that the filing of the Performance and Payment bonds shall provide security to the County to ensure the proper completion of the construction work under this contract and are not being furnished to cover the performance of any energy guaranty or guaranteed savings. The County agrees that the Payment bond will be released upon the completion of the statutory notice period for subcontractors to file a claim against said bond, provided that no such claim is filed within that time period, and all obligations arising there under shall be terminated. NOTE: Ron to provide a copy of the performance bond and we will determine then if and what language needs to be drafted in order to have it released.

#### **Section 21.2. Further Documents**

The parties shall execute and deliver all documents and perform all further acts that may be reasonably necessary to effectuate the provisions of this Contract.

#### **Section 21.3 County's Responsibilities.**

##### **(a) Methods of Operation by County**

The parties acknowledge and agree that said Energy and Cost Savings would not likely be obtained unless certain procedures and methods of operation designed for energy and water conservation shall be implemented, and followed by County on a regular and continuous basis.

##### **(b) County Maintenance Responsibilities**

County agrees that it shall adhere to, follow and implement the energy conservation procedures and methods of operation to be set forth on **Schedule K**, to be attached hereto and made a part hereof after County's approval, such approval not to be unreasonably withheld, conditioned or delayed.

##### **(c) Inspection of Premises**

County agrees that Contractor shall have the right once a month, with prior notice, to inspect Premises to determine if County is complying, and shall have complied with its obligations as set forth in **Section 21.3(b)**. For the purpose of determining County's said compliance, the checklist to be set forth at **Schedule L** as completed and recorded by Contractor during its monthly inspections, shall be used to measure and record County's said compliance. County shall make the Premises available to Contractor for and during each monthly inspection, and shall have the right to witness each inspection and Contractor's recordation on the checklist. County may complete its own checklist at the same time. Contractor agrees to not interfere with the County operations during any monthly inspection.

#### **ARTICLE XXII: CONFLICTS OF INTEREST**

**Section 22.1 Conflicts of Interest.** Conflicts of interest relating to this Contract are strictly prohibited. Except as otherwise expressly provided herein, neither party hereto nor any director, employee or agent of any party hereto shall give to or receive from any director, employee or agent of any other party hereto any gift, entertainment or other favor of significant value, or any commission, fee or rebate in connection with this Contract. Any representative of any party, authorized by that party, may audit the records of the other party related to this Contract, upon reasonable notice and during regular business hours including the expense records of the party's employees involved in this Contract, upon reasonable notice and during regular business hours, for the sole purpose of determining whether there has been compliance with this section.

## **ARTICLE XXIII: CONTRACT DOCUMENTS**

### **Section 23.1. Definition of Contract Documents.**

The Contract Documents shall be defined to be this Energy Performance Contract and all related Schedules, Exhibits and Appendices.

### **Section 23.2. Order of Precedence.**

In the event of conflicts or inconsistencies between this Contract and its Schedules, Exhibits or Appendices, such conflicts or inconsistencies shall be resolved by reference to the documents in the following order of priority: a) Contract body, b) Schedules, c) Exhibits/Appendices, e) Comprehensive Energy Analysis dated October 2005, f) County RFP, g) Contractor Proposal.

In the event of any conflicts between **Schedules C, D and F** and other parts of this Contract regarding Energy and Water Cost Savings calculations or measurement of the guarantee, **Schedules C, D and F** shall govern.

**Section 23.3. Facsimile Signatures.** Parties agree that facsimile signatures shall be accepted as origin

## **Section 24. Change Orders**

24.1. The County, without invalidating, this Agreement and without notice to any surety, may order extra work or make changes by altering, adding to, or deducting from the Work (changes), the Contract Sum and Time for Completion of the Work being adjusted accordingly. All such work shall be executed under the conditions of this Contract except that any Claim for extension of the Time for Completion of the Work caused thereby shall be adjusted by Change Order at the time of ordering such change.

24.2. A Change Order is a written order to the Contractor signed by the Board of County Commissioners or an individual authorized by resolution to sign Change Orders, issued after the execution of this Agreement, authorizing a change in the Work, the method or manner of performance, and adjustment in the Contract Sum or the Time for Completion of the Work. Each adjustment in the Contract Sum resulting from a Change Order shall clearly separate the amount attributable to the Cost of the Work and Contractor's Fee, if any. The Contract Sum and the Time for Completion of the Work may be changed only by Change Order. A Change Order signed by the Contractor conclusively establishes the Contractor's agreement therewith, including the adjustment in the Contract Sum and the Time for Completion of the Work.

24.3. No extra work or change in the Contract Documents shall be made unless by a written Change Order executed by the County either through the Board of County Commissioners or by authorized individual. No Claim for any change to the Contract Sum or Time for Completion of the Work shall be valid unless so executed.

Energy Performance Contract

authorized individual. No Claim for any change to the Contract Sum or Time for Completion of the Work shall be valid unless so executed.

(CONTRACTOR)

(seal)

By:  (signature)

James C. Davis

Attest:

Title: President

Signed this 11/17/05 day of 2005

State of Colorado )  
County of Arapahoe )


Subscribed and sworn to before me this \_\_\_\_ day of \_\_\_\_\_, 2005 by  
\_\_\_\_\_

My commission expires \_\_\_\_\_

SEAL

ARAPAHOE COUNTY

(seal)

By:  11-17-05

Resolution: 060048

Date 2-8-05

Title: Deputy Director

Signed this \_\_\_\_ day of 2005

State of Colorado )  
County of Arapahoe )

Subscribed and sworn to before me this \_\_\_\_ day of \_\_\_\_\_, 2005 by  
\_\_\_\_\_

My commission expires \_\_\_\_\_

SEAL

**SCHEDULE A. 1.**  
**PERFORMANCE EQUIPMENT TO BE INSTALLED BY CONTRACTOR**

The table below indicates which ECM's for which buildings are included.

Building	Energy Conservation Measures																												
	1 - Lighting Energy Efficiency Upgrades	2 - Water Conservation Measures	3a - Water Conservation Measures with Waterless Urinals	3 - Upgrade/Install New EMCS	4 - Install Programmable Thermostats	5a - Replace the Existing Chillers and Cooling Tower - Perf. Contract	5b - Replace the Existing Chillers and Cooling Tower - Work Order	6a - Replace the Existing Natural Gas-Fired Boilers - Performance Contract	6b - Replace the Existing Natural Gas-Fired Boilers - Work Order	7 - Install a New VFD on the Existing Exhaust Fan	8 - Install a VFD on Existing Vane Axial Fan	9 - Replace Air-Cooled Chillers with Water-Cooled Chillers	10 - Install an A/C Unit to Serve Computer Equipment Room	11 - Variable Flow WSFP System	12 - Water Softener	13 - Install Water-side Economizer	14 - Chilled Water Storage	15 - Combined Heat & Power (CHP)	16 - Irrigation Control System Upgrade	17 - Programmable Flush Valve Controls	18 - Install Water Reclaim System	19 - Laundry Conservation	20 - Replace DHW HX with a New DHW Heater	21 - Change Natural Gas Utility Provider	22 - Remove Existing Fire Pumps	23 - Energy Resource Conservation Manager	24 - Replace Cooling Tower	25 - Retro commissioning	26 - Replace Modulates and install VAV boxes, Diffusers, Controls
01 - Administration Building	X		X	X		X		X		X						X			X				X						
12 - Arapahoe Plaza East Building	X		X	X																						X			
13 - Arapahoe Human Services	X		X	X																				X					
14 - Arapahoe Plaza West Building (County Court)	X		X	X																					X				
15 - Federal Warehouse	X		X		X																					X			
16 - CSU Extension Office																													
17 - CSU Warehouse																													
20 - Tri County Health	X				X																						X		
23 - Altam Plaza Building	X		X	X				X																		X			
24 - Centrepont Plaza	X		X																							X			
29 - Peoria Shops	X	X			X																	X				X			
35 - ACJC Courthouse	X		X	X				X			X				X											X		X	
36 - ACJC Detention Center	X	X		X				X							X				X	X		X				X			
37 - ACJC Administrative II	X		X	X				X					X		X											X			
38 - Sheriff/Coroner Facility	X		X																							X		X	

A detailed description of each ECM is detailed in Section 4 of the Comprehensive Energy Analysis by Chevron Energy Solutions dated October, 2005.

**SCHEDULE A. 2.  
OTHER EQUIPMENT TO BE INSTALLED BY CONTRACTOR**

The table below indicates which ECM's for which buildings are included.

Building	Energy Conservation Measures																												
	1 - Lighting Energy Efficiency Upgrades	2 - Water Conservation Measures	2a - Water Conservation Measures with Waterless Urinals	3 - Upgrade/Install New EMCS	4 - Install Programmable Thermostats	5a - Replace the Existing Chillers and Cooling Tower - Perf Contract	5b - Replace the Existing Chillers and Cooling Tower - Work Order	6a - Replace the Existing Natural Gas-Fired Boilers - Performance Contract	6b - Replace the Existing Natural Gas-Fired Boilers - Work Order	7 - Install a New VFD on the Existing Exhaust Fan	8 - Install a VFD on Existing Vane Axial Fan	9 - Replace Air-Cooled Chillers with Water-Cooled Chillers	10 - Install an A/C Unit to Serve Computer Equipment Room	11 - Variable Flow WSHP System	12 - Water Softener	13 - Install Waterside Economizer	14 - Chilled Water Storage	15 - Combined Heat & Power (CHP)	16 - Irrigation Control System Upgrade	17 - Programmable Flush Valve Controls	18 - Install Water Reclaim System	19 - Laundry Conservation	20 - Replace DHW HX with a New DHW Heater	21 - Change Natural Gas Utility Provider	22 - Remove Existing Fire Pumps	23 - Energy Resource Conservation Manager	24 - Replace Cooling Tower	25 - Retro commissioning	26 - Replace Modulators and Install VAV boxes, Diffusers, Controls
01 - Administration Building							X		X																				X
12 - Arapahoe Plaza East Building																													
13 - Arapahoe Human Services																													
14 - Arapahoe Plaza West Building (County Court)																													
15 - Federal Warehouse																													
16 - CSU Extension Office																													
17 - CSU Warehouse																													
20 - Tri County Health																													
23 - Altura Plaza Building									X																				
24 - Centropoint Plaza																													
29 - Peoria Shops																													
35 - ACJC Courthouse									X																				
36 - ACJC Detention Center									X																				
37 - ACJC Administrative II									X																				
38 - Sheriff/Coroner Facility																													

A detailed description of each ECM is detailed in Section 4 of the Comprehensive Energy Analysis by Chevron Energy Solutions dated October, 2005.

**SCHEDULE B.**  
**DESCRIPTION OF PREMISES; PRE-EXISTING EQUIPMENT INVENTORY**

This information is detailed in Section 3 of the Comprehensive Energy Analysis by Chevron Energy Solutions dated October, 2005.

**SCHEDULE C.  
ENERGY AND COST SAVINGS GUARANTEE**

**1. Executive Summary / M&V Overview & Proposed Savings Calculations**

Annual Guaranteed Energy Savings

<u>Year</u>	<u>Dollars</u>
1	\$632,694
2	\$648,511
3	\$664,724
4	\$681,342
5	\$698,376
6	\$613,206
7	\$628,536
8	\$644,250
9	\$660,356
10	\$676,865
11	\$693,787
12	\$711,131

**1.1 Proposed Annual Savings Overview**

Table 1: Proposed Annual Savings Overview



# Energy Performance Contract

ECM	Total Energy Savings (MBTU/Yr)	Electric Energy Savings (kWh/Yr)	Electric Demand Savings (kW/Yr)*	Natural Gas Savings (Therms/Yr)	Water Savings (KGal/Yr)	Irrigation Savings (Kgal/Yr)	Total Energy & Water Cost Savings Yr 1 (\$/Yr)	Other Energy Related O&M Cost Savings (Year 1 (\$/Yr))	Total Cost Savings Yr 1 (\$/Yr)
1	3,196	1,176,356	368	-8,187	0	0	126,125	0	126,125
2	126	0	0	1,261	1,641	0	26,349	0	26,349
2a	0	0	0	0	3,212	0	22,709	0	22,709
3	11,485	854,329	0	85,692	0	0	104,766	0	104,766
4	1,234	26,394	0	11,443	0	0	9,138	0	9,138
5a	273	79,870	54	0	0	0	10,052	0	10,052
5b	0	0	0	0	0	0	0	0	0
6a	3,540	-20,930	-2	36,117	0	0	21,611	0	21,611
6b	0	0	0	0	0	0	0	0	0
7	65	18,915	0	0	0	0	1,110	0	1,110
8	772	226,190	0	0	0	0	13,275	0	13,275
9	0	0	0	0	0	0	0	0	0
10	364	37,602	0	2,356	0	0	3,973	0	3,973
11	0	0	0	0	0	0	0	0	0
12	0	0	0	0	5,718	0	82,754	0	82,754
13	159	46,637	52	0	0	0	6,433	0	6,433
14	0	0	0	0	0	0	0	0	0

# Energy Performance Contract

15	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	433	3,075	0	3,075
17	0	0	0	0	3,615	0	56,616	0	56,616
18	-10	-2,793	-7	0	576	0	6,251	0	6,251
19	128	0	0	1,276	440	0	7,698	0	7,698
20	216	0	0	2,158	0	0	1,370	0	1,370
21	0	0	0	0	0	0	3,619	0	3,619
22	0	0	0	0	0	0	0	0	0
23	1,201	190,460	0	5,508	0	0	14,953	0	14,953
24	22	6,587	4	0	0	0	1,048	0	1,048
25	456	464,882	0	-11,306	0	0	19,770	0	19,770
26	0	0	0	0	0	0	0	0	0
Total Savings	23,227	3,104,500	469	126,317	15,203	433	542,694	0	542,694
1st Year Guaranteed Cost Savings: \$542,694									
MBTU=10 <sup>6</sup> BTU .003413 MBTU/kWh .1 MBTU/therms  * Annual electric demand savings (kW/Yr) is the sum of the monthly demand savings.									

## Energy Performance Contract

### 1.1.1 Site Use and Savings Overview (Optional)

Table 1A: Site Use and Savings Overview (Optional)

01 - ADMINISTRATION BUILDING	Total Energy (MBTU/Yr)	Electric Energy (kWh)/Yr	Electric Demand (kW/Yr)*	Natural Gas (Therms/Yr)	Water (KGal/Yr)	Irrigation (KGal/Yr)
<b>Proposed Project Savings:</b>	3,224	507,055	159	14,936	669	127
<b>Usage for Entire Site**:</b>	13,495	2,794,900	6,798	39,560	5,206	
<b>% Total Site Usage Saved:</b>	23.89%	18.14%	2.34%	37.76%	12.86%	-
<b>Project Square Footage (SF):</b>	1,197,021	1,197,021	1,197,021	1,197,021	1,197,021	1,197,021
<b>Total Site Square Footage (SF):</b>	140,263	140,263	140,263	140,263	140,263	140,263
<b>% Total Site Area Affected:</b>	11.72%	11.72%	11.72%	11.72%	11.72%	11.72%
MBTU=10 <sup>6</sup> BTU .003413 MBTU/kWh .1 MBTU/therms  * Annual electric demand savings (kW/Yr) is the sum of the monthly demand savings. ** Most Recent 12 Months of Utility Data.						

12 - ARAPAHOE PLAZA EAST BUILDING	Total Energy (MBTU/Yr)	Electric Energy (kWh)/Yr	Electric Demand (kW/Yr)*	Natural Gas (Therms/Yr)	Water (KGal/Yr)	Irrigation (KGal/Yr)
<b>Proposed Project Savings:</b>	574	96,740	6	2,439	119	0
<b>Usage for Entire Site**:</b>	1,231	360,545	917		633	
<b>% Total Site Usage Saved:</b>	46.65%	26.83%	0.66%	-	18.78%	-
<b>Project Square Footage (SF):</b>	1,197,021	1,197,021	1,197,021	1,197,021	1,197,021	1,197,021
<b>Total Site Square Footage (SF):</b>	20,957	20,957	20,957	20,957	20,957	20,957
<b>% Total Site Area Affected:</b>	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
MBTU=10 <sup>6</sup> BTU .003413 MBTU/kWh .1 MBTU/therms  * Annual electric demand savings (kW/Yr) is the sum of the monthly demand savings. ** Most Recent 12 Months of Utility Data.						

# Energy Performance Contract

13 - ARAPAHOE HUMAN SERVICES	Total Energy (MBTU/Yr)	Electric Energy (kWh)/Yr	Electric Demand (kW/Yr)*	Natural Gas (Therms/Yr)	Water (KGal/Yr)	Irrigation (KGal/Yr)
Proposed Project Savings:	1,018	176,752	13	4,152	279	0
Usage for Entire Site**:	7,153	830,154	2,085	43,196	653	
% Total Site Usage Saved:	14.24%	21.29%	0.63%	9.61%	42.75%	-
Project Square Footage (SF):	1,197,021	1,197,021	1,197,021	1,197,021	1,197,021	1,197,021
Total Site Square Footage (SF):	54,678	54,678	54,678	54,678	54,678	54,678
% Total Site Area Affected:	4.57%	4.57%	4.57%	4.57%	4.57%	4.57%
MBTU=10 <sup>6</sup> BTU .003413 MBTU/kWh .1 MBTU/therms  * Annual electric demand savings (kW/Yr) is the sum of the monthly demand savings. ** Most Recent 12 Months of Utility Data.						

14 - ARAPAHOE PLAZA WEST BUILDING (COUNTY COURT)	Total Energy (MBTU/Yr)	Electric Energy (kWh)/Yr	Electric Demand (kW/Yr)*	Natural Gas (Therms/Yr)	Water (KGal/Yr)	Irrigation (KGal/Yr)
Proposed Project Savings:	802	87,453	6	5,036	305	0
Usage for Entire Site**:	1,414	414,185	813		867	
% Total Site Usage Saved:	56.74%	21.11%	0.72%	-	35.19%	-
Project Square Footage (SF):	1,197,021	1,197,021	1,197,021	1,197,021	1,197,021	1,197,021
Total Site Square Footage (SF):	20,880	20,880	20,880	20,880	20,880	20,880
% Total Site Area Affected:	1.74%	1.74%	1.74%	1.74%	1.74%	1.74%
MBTU=10 <sup>6</sup> BTU .003413 MBTU/kWh .1 MBTU/therms  * Annual electric demand savings (kW/Yr) is the sum of the monthly demand savings. ** Most Recent 12 Months of Utility Data.						

# Energy Performance Contract

15 - FEDERAL WAREHOUSE	Total Energy (MBTU/Yr)	Electric Energy (kWh)/Yr	Electric Demand (kW/Yr)*	Natural Gas (Therms/Yr)	Water (KGal/Yr)	Irrigation (KGal/Yr)
Proposed Project Savings:	324	41,508	7	1,821	19	0
Usage for Entire Site**:	3,105	573,145	1,547	11,490	460	
% Total Site Usage Saved:	10.43%	7.24%	0.46%	15.85%	4.03%	-
Project Square Footage (SF):	1,197,021	1,197,021	1,197,021	1,197,021	1,197,021	1,197,021
Total Site Square Footage (SF):	75,073	75,073	75,073	75,073	75,073	75,073
% Total Site Area Affected:	6.27%	6.27%	6.27%	6.27%	6.27%	6.27%
MBTU=10 <sup>6</sup> BTU .003413 MBTU/kWh .1 MBTU/therms  * Annual electric demand savings (kW/Yr) is the sum of the monthly demand savings. ** Most Recent 12 Months of Utility Data.						

20 - TRI COUNTY HEALTH	Total Energy (MBTU/Yr)	Electric Energy (kWh)/Yr	Electric Demand (kW/Yr)*	Natural Gas (Therms/Yr)	Water (KGal/Yr)	Irrigation (KGal/Yr)
Proposed Project Savings:	174	18,774	4	1,095	0	0
Usage for Entire Site**:	650	82,380	307	3,690	24	
% Total Site Usage Saved:	26.70%	22.79%	1.37%	29.68%	0.00%	-
Project Square Footage (SF):	1,197,021	1,197,021	1,197,021	1,197,021	1,197,021	1,197,021
Total Site Square Footage (SF):	8,398	8,398	8,398	8,398	8,398	8,398
% Total Site Area Affected:	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%
MBTU=10 <sup>6</sup> BTU .003413 MBTU/kWh .1 MBTU/therms  * Annual electric demand savings (kW/Yr) is the sum of the monthly demand savings. ** Most Recent 12 Months of Utility Data.						

## Energy Performance Contract

<b>23 - ALTURA PLAZA BUILDING</b>	<b>Total Energy (MBTU/Yr)</b>	<b>Electric Energy (kWh)/Yr</b>	<b>Electric Demand (kW/Yr)*</b>	<b>Natural Gas (Therms/Yr)</b>	<b>Water (KGal/Yr)</b>	<b>Irrigation (KGal/Yr)</b>
<b>Proposed Project Savings:</b>	7,222	432,444	62	57,462	515	0
<b>Usage for Entire Site**:</b>	15,786	1,464,538	3,536	107,880	3,632	
<b>% Total Site Usage Saved:</b>	45.75%	29.53%	1.74%	53.26%	14.19%	-
<b>Project Square Footage (SF):</b>	1,197,021	1,197,021	1,197,021	1,197,021	1,197,021	1,197,021
<b>Total Site Square Footage (SF):</b>	74,675	74,675	74,675	74,675	74,675	74,675
<b>% Total Site Area Affected:</b>	6.24%	6.24%	6.24%	6.24%	6.24%	6.24%
MBTU=10 <sup>6</sup> BTU .003413 MBTU/kWh .1 MBTU/therms  * Annual electric demand savings (kW/Yr) is the sum of the monthly demand savings. ** Most Recent 12 Months of Utility Data.						

<b>24 - CENTREPOINT PLAZA</b>	<b>Total Energy (MBTU/Yr)</b>	<b>Electric Energy (kWh)/Yr</b>	<b>Electric Demand (kW/Yr)*</b>	<b>Natural Gas (Therms/Yr)</b>	<b>Water (KGal/Yr)</b>	<b>Irrigation (KGal/Yr)</b>
<b>Proposed Project Savings:</b>	536	288,382	10	-4,478	397	0
<b>Usage for Entire Site**:</b>	9,586	2,743,135	7,196	2,240	4,559	
<b>% Total Site Usage Saved:</b>	5.60%	10.51%	0.14%	-199.90%	8.71%	-
<b>Project Square Footage (SF):</b>	1,197,021	1,197,021	1,197,021	1,197,021	1,197,021	1,197,021
<b>Total Site Square Footage (SF):</b>	105,662	105,662	105,662	105,662	105,662	105,662
<b>% Total Site Area Affected:</b>	8.83%	8.83%	8.83%	8.83%	8.83%	8.83%
MBTU=10 <sup>6</sup> BTU .003413 MBTU/kWh .1 MBTU/therms  * Annual electric demand savings (kW/Yr) is the sum of the monthly demand savings. ** Most Recent 12 Months of Utility Data.						

# Energy Performance Contract

29 - PEORIA SHOPS	Total Energy (MBTU/Yr)	Electric Energy (kWh)/Yr	Electric Demand (kW/Yr)*	Natural Gas (Therms/Yr)	Water (KGal/Yr)	Irrigation (KGal/Yr)
Proposed Project Savings:	938	23,642	-1	8,576	636	0
Usage for Entire Site**:	4,309	320,958	740	32,140	1,851	
% Total Site Usage Saved:	21.77%	7.37%	-0.16%	26.68%	34.34%	-
Project Square Footage (SF):	1,197,021	1,197,021	1,197,021	1,197,021	1,197,021	1,197,021
Total Site Square Footage (SF):	25,008	25,008	25,008	25,008	25,008	25,008
% Total Site Area Affected:	2.09%	2.09%	2.09%	2.09%	2.09%	2.09%

MBTU=10<sup>6</sup> BTU  
.003413 MBTU/kWh  
.1 MBTU/therms

\* Annual electric demand savings (kW/Yr) is the sum of the monthly demand savings.

\*\* Most Recent 12 Months of Utility Data.

35 - ACJC COURTHOUSE	Total Energy (MBTU/Yr)	Electric Energy (kWh)/Yr	Electric Demand (kW/Yr)*	Natural Gas (Therms/Yr)	Water (KGal/Yr)	Irrigation (KGal/Yr)
Proposed Project Savings:	3,153	544,175	74	12,959	3,132	0
Usage for Entire Site**:	16,684	2,755,414	6,240	72,800	6,554	
% Total Site Usage Saved:	18.90%	19.75%	1.18%	17.80%	47.79%	-
Project Square Footage (SF):	1,197,021	1,197,021	1,197,021	1,197,021	1,197,021	1,197,021
Total Site Square Footage (SF):	148,522	148,522	148,522	148,522	148,522	148,522
% Total Site Area Affected:	12.41%	12.41%	12.41%	12.41%	12.41%	12.41%

MBTU=10<sup>6</sup> BTU  
.003413 MBTU/kWh  
.1 MBTU/therms

\* Annual electric demand savings (kW/Yr) is the sum of the monthly demand savings.

\*\* Most Recent 12 Months of Utility Data.

# Energy Performance Contract

36 - ACJC DETENTION CENTER	Total Energy (MBTU/Yr)	Electric Energy (kWh)/Yr	Electric Demand (kW/Yr)*	Natural Gas (Therms/Yr)	Water (KGal/Yr)	Irrigation (KGal/Yr)
Proposed Project Savings:	2,907	47,337	0	27,455	8,731	306
Usage for Entire Site**:	46,510	5,517,976	9,595	276,775	49,491	3,754
% Total Site Usage Saved:	6.25%	0.86%	0.00%	9.92%	17.64%	8.15%
Project Square Footage (SF):	1,197,021	1,197,021	1,197,021	1,197,021	1,197,021	1,197,021
Total Site Square Footage (SF):	291,955	291,955	291,955	291,955	291,955	291,955
% Total Site Area Affected:	24.39%	24.39%	24.39%	24.39%	24.39%	24.39%
MBTU=10 <sup>6</sup> BTU .003413 MBTU/kWh .1 MBTU/therms  * Annual electric demand savings (kW/Yr) is the sum of the monthly demand savings. ** Most Recent 12 Months of Utility Data.						

37 - ACJC ADMINISTRATIVE II	Total Energy (MBTU/Yr)	Electric Energy (kWh)/Yr	Electric Demand (kW/Yr)*	Natural Gas (Therms/Yr)	Water (KGal/Yr)	Irrigation (KGal/Yr)
Proposed Project Savings:	1,366	275,128	62	4,270	221	0
Usage for Entire Site**:	9,009	2,017,650	4,750	21,225	724	
% Total Site Usage Saved:	15.16%	13.64%	1.30%	20.12%	30.45%	-
Project Square Footage (SF):	1,197,021	1,197,021	1,197,021	1,197,021	1,197,021	1,197,021
Total Site Square Footage (SF):	91,110	91,110	91,110	91,110	91,110	91,110
% Total Site Area Affected:	7.61%	7.61%	7.61%	7.61%	7.61%	7.61%
MBTU=10 <sup>6</sup> BTU .003413 MBTU/kWh .1 MBTU/therms  * Annual electric demand savings (kW/Yr) is the sum of the monthly demand savings. ** Most Recent 12 Months of Utility Data.						



# Energy Performance Contract

SERIFF/CORONER FACILITY	Total Energy (MBTU/Yr)	Electric Energy (kWh)/Yr	Electric Demand (kW/Yr)*	Natural Gas (Therms/Yr)	Water (KGal/Yr)	Irrigation (KGal/Yr)
<b>Proposed Project Savings:</b>	319	287,219	13	-6,616	180	0
<b>Usage for Entire Site**:</b>	9,934	2,472,668		14,950	3,428	
<b>% Total Site Usage Saved:</b>	3.21%	11.62%	-	-44.26%	5.25%	-
<b>Project Square Footage (SF):</b>	1,197,021	1,197,021	1,197,021	1,197,021	1,197,021	1,197,021
<b>Total Site Square Footage (SF):</b>	125,055	125,055	125,055	125,055	125,055	125,055
<b>% Total Site Area Affected:</b>	10.45%	10.45%	10.45%	10.45%	10.45%	10.45%
MBTU=10 <sup>6</sup> BTU .003413 MBTU/kWh .1 MBTU/therms  * Annual electric demand savings (kW/Yr) is the sum of the monthly demand savings. ** Most Recent 12 Months of Utility Data.						

## 1.2 M&V Approach Summary

Table 2: M&V Plan Summary for each facility

Building	Electric	Gas	Water	Notes
01 - Administration Building	C	C	A	5
12 - Arapahoe Plaza East	A	N/A	A	
13 - Arapahoe Human Services	C	C	A	
14 - Arapahoe Plaza West	A	N/A	A	
15 - Federal Warehouse	A	Calculated	A	1
20 - Tri County Health	A	Calculated	N/A	1
23 - Altura Plaza Building	C	C	A	
24 - Centrepont Plaza	A	Calculated	A	2
29 - Peoria Shops	A	Calculated	A	1, 3
35 - ACJC Courthouse	C	C	C	
36 - ACJC Detention Center	A	A	C	4, 6
37 - ACJC Administrative II	C	C	A	
38 - Sheriff/Coroner Facility	A	Calculated	A	2

### Notes

- (1) Lighting to be option A, Programmable Thermostat Savings to be calculated.
- (2) Lighting to be option A, Retro Commissioning (ECM 25) to be calculated.
- (3) A flow meter will be installed to measure water recovery measure (ECM 18).
- (4) Ozone laundry ECM to be calculated (ECM 19).
- (5) Water ECM 2 is Option A, ECM 16 is calculated.
- (6) Water ECM 2, 12, & 17 are Option C, ECM 16 is calculated.

\* M&V Options include A, B, C & D. Guidelines include M&V Guidelines: Measurement & Verification for Federal Energy Projects, Version 2.2

([http://www.eere.energy.gov/financing/superespcs\\_mvresources.cfm](http://www.eere.energy.gov/financing/superespcs_mvresources.cfm) : International Performance Measurement & Verification Protocol (IPMVP) Volume I March 2002 ([www.impvp.org](http://www.impvp.org)).

## 2. Whole Project Data / Global Assumptions

### 2.1 Risk & Responsibility

#### 2.1.1 Summarize allocation of responsibility for key items related to M&V

- Refer to contract for details regarding risk allocation.

### 2.2 Energy, Water, and Operations & Maintenance (O&M) Rate Data

#### 2.2.1 Detail baseline energy & water rates

Building:	Electric		Nat. Gas \$/Therm:	Water \$/Kgal:
	\$/kW:	\$/kWh:		
01 – Administration Building	\$14.16	\$0.05869	\$0.63481	\$5.36
12 – Arapahoe Plaza East Building	\$14.16	\$0.05869	\$0.63481	\$5.36
13 – Arapahoe Human Services	\$14.16	\$0.05869	\$0.63481	\$5.36
14 – Arapahoe Plaza West Building (County Court)	\$14.16	\$0.05869	\$0.63481	\$5.36
15 – Federal Warehouse	\$14.16	\$0.05869	\$0.74946	\$5.36
16 – CSU Extension Office	\$14.16	\$0.05869	\$0.74946	\$5.36
17 – CSU Warehouse (Summer)	0.00	\$0.07900	\$0.74946	\$5.36
17 – CSU Warehouse (Winter)	0.00	\$0.07512	\$0.74946	\$5.36
20 – Tri County Health	\$14.16	\$0.05869	\$0.74946	(1)
23 – Altura Plaza Building	\$14.16	\$0.05869	\$0.63481	\$4.99
24 – Centrepont Plaza	\$14.16	\$0.06321	\$0.80714	\$4.99
29 – Peoria Shops	\$14.16	\$0.05869	\$0.63481	\$13.07
35 – ACJC Courthouse	\$14.16	\$0.05869	\$0.63481	\$13.07
36 – ACJC Detention Center (Main Building)	\$14.16	\$0.05869	\$0.63481	\$15.66
36 – ACJC Detention Center (Warehouse)	\$14.16	\$0.05869	\$0.74946	\$13.07
37 – ACJC Administrative II	\$14.16	\$0.05869	\$0.74946	\$13.07
38 – Sheriff/Coroner Facility	\$14.16	\$0.05869	\$0.72763	\$6.53

#### 2.2.2 Provide performance period rate adjustment factors for energy, water, and O&M cost savings, if used.

- Contracted at 2.5% escalated annually

## 2.3 Schedule & Report for Reporting for Verification Activities

### 2.3.1 Define requirements for witnessing of measurements during:

- Baseline - Chevron ES will conduct all M&V activities. Facility personnel will be invited to observe and sign-off of all measurement activities. If County declines offer to observe or sign-off measurements data will not be invalidated.
- Post-installation verification activities - Chevron ES will conduct all M&V activities. Facility personnel will be invited to observe and sign-off of all measurement activities. If County declines offer to observe or sign-off measurements data will not be invalidated.

### 2.3.2 Define schedule of verification reporting activities

Table 3: Schedule of Verification Reporting Activities

Item	Recommended Time of Submission	Owner's review & acceptance period
Final Commissioning Plan	45 days after EMS contractor is under contract	15 days
Post-installation Report	45 days after measurements	15 days
Commissioning Report	45 days after Final Completion of Project	15 days
Annual Report	90 days after years end	15 days

### 2.3.3 Define content and format of reports:

- Post-installation report

Use Post-Installation Report Outline<sup>1</sup>

#### Reports to be Prepared

1. Pre-retrofit measurement report. One report prepared within 30 days of completion of the pre-retrofit measurements. The report will include the names of the measurement team

<sup>1</sup> Electronic copy of Post-Installation Report Outline is available through <http://ateam.lbl.gov/mv>.

and any observers, the results of all measurements, any exceptions or anomalies associated with the measurements.

2. Post-retrofit measurement report. One report prepared within 30 days of completion of the post-retrofit measurements. The report will include the names of the measurement team and any observers, the results of all measurements, any exceptions or anomalies associated with the measurements.
3. As-built documentation provided by Chevron Energy Solutions' construction team will document the description and location of all retrofits. As-built documentation will be provided as detailed in the Agreement.
4. A preliminary monthly savings report will be generated to communicate the energy (water) savings performance of all ECM's. Each report will include:
  - \* Baseline consumption for the month
  - \* Actual consumption for the month
  - \* Dollar savings for the month
  - \* Baseline consumption year to date
  - \* Actual consumption year to date
  - \* Unit savings year to date
  - \* Dollar savings year to date
  - \* Comparison of all ECM savings in aggregate against prorated guaranteed savings
  - \* Quantification of any known adjustments that impact the reported energy (water) savings. Open-book analysis.
5. Commissioning Report: As each energy conservation measure nears completion of construction, it will be commissioned. All commissioning efforts will be conducted by CES and its subcontractors, and will be witnessed by County personnel. The commissioning plan will confirm proper installation of the equipment as well as confirm proper functional performance of the equipment.

A Final Commissioning Plan will be submitted and approved by the County before implementation. While CES will execute and submit one commissioning report at completion of construction, it is highly suggested that the County repeat commissioning of the controls and mechanical systems periodically, preferably once per year.
6. A final annual savings report will be generated to communicate the energy (water) savings performance of all ECM's. Each annual report will include:
  - \* Baseline consumption year to date
  - \* Actual consumption year to date
  - \* Unit savings year to date
  - \* Dollar savings year to date
  - \* Comparison of all ECM savings in aggregate against a prorated guaranteed savings.

- \* Quantification of any known adjustments that impact the report energy (water) savings. Open-book analysis.
- \* Sign-off form asking for County's agreement with the savings calculations including baseline adjustments.
- \* Computation of an energy savings shortfall payment to be issued by Chevron Energy Solutions if savings fall short of the annual guaranteed energy savings.

## **2.4 Operations, Preventive Maintenance, Repair, and Replacement Reporting Requirements**

- 2.4.1 Define Government and ESCO reporting requirements
- o Operating and maintenance requirements for equipment installed in this project will be included in the O&M Manuals to be provided at the end of the project. There are no ongoing reporting requirements.

## **2.5 Construction Period Savings**

- 2.5.1 Provide overview of how construction period savings will be calculated, if applicable.
- o None

## **2.6 Status of Rebates**

- o None

## **2.7 Dispute Resolution**

- 2.7.1 Describe plan for resolving disputes regarding issues such as baseline, baseline adjustment, energy savings calculation, and the use of periodic measurements.
- o Addressed in Section 23 of the Energy Performance Contract.

## **2.8 Buildings with Undecided Future**

- 2.8.1 The future of the Altura Plaza and Peoria Shops is unknown regarding if the County will keep the buildings indefinitely or eliminate them. Therefore, savings for these buildings is included only for the first five years of the performance contract. Should these buildings still be in use by the County at the end of the first five years, Chevron ES shall be entitled to continue to claim the savings from these buildings toward meeting the project guaranteed savings for as long as the buildings are in use.

**SCHEDULE D:  
MONITORING, MAINTENANCE AND SERVICE AGREEMENT**

Annual fees for the monitoring services agreement can be found in schedule R. Monitoring services are inflated 2.5% annually to account for inflation. It is the County's option to extend the Monitoring and Verification fee beyond year 3. If the fee is extended beyond year 3, the fee will continue to escalate at 2.5% per year in the same fashion as shown below. The energy guarantee is terminated upon termination of the Monitoring and Verification fee. Refer to Schedule F for details regarding the Monitoring agreement. Refer to Schedule J for the Contractor's maintenance and service responsibilities.

<b>Year</b>	<b>Monitoring &amp; Verification</b>
<b>1</b>	<b>\$13,500</b>
<b>2</b>	<b>\$13,905</b>
<b>3</b>	<b>\$14,322</b>
<b>4</b>	<b>0</b>
<b>5</b>	<b>0</b>
<b>6</b>	<b>0</b>
<b>7</b>	<b>0</b>
<b>8</b>	<b>0</b>
<b>9</b>	<b>0</b>
<b>10</b>	<b>0</b>
<b>11</b>	<b>0</b>
<b>12</b>	<b>0</b>

**SCHEDULE E:  
BASELINE ENERGY CONSUMPTION**

The baseline information can be found in Schedule F. The baselines for natural gas and electric consumption is calculated based on a regression analysis of utility bills for the period of January 2002 through February, 2005 although some of the data between these dates is not included. The analysis produces a formula for each facility's monthly gas consumption as a function of heating degree-days and electric consumption for cooling degree days. The baseline annual gas consumption is then calculated using 30-year average heating degree-days for City of Denver from the National Oceanographic and Atmospheric Administration. The following data shows the statistics from the regression analysis, the calculation of baseline gas and electrical consumption for each facility:

<u>Building</u>	<u>kWh</u>	<u>NG</u>
Admin I	.6611	.7391
Arapahoe Human Services	.0069	.9142
Altura	.0171	.1274
ACJC Courthouse	.5814	.6403
ACJC Admin II	.6991	.7783

As can be seen from the above data the regression analysis results in less than ideal correlation of weather data to energy usage. Upon execution of this contract the remaining utility data (March 2005 through the commencement of construction and as much of the missing data) will be collected and a new regression analysis will be performed. If an adequate correlation between weather and utility consumption is achieved then the Option C method of measuring and verifying savings will be executed. If an adequate correlation between weather and utility consumption is still not achieved then another method of measuring and verifying savings will be mutually agreed to by both parties.



**SCHEDULE F:  
SAVINGS MEASUREMENT AND CALCULATION FORMULAE; METHODOLOGY TO  
ADJUST BASELINE; MONITORING AND VERIFICATION PLAN**

**3. Measurement and Verification General Approach — Detailed Description of Option C M&V**

**3.1 Standard Energy Management Descriptions & Definitions**

- 3.1.1 M&V Commencement Date:** “M&V Commencement Date” shall be the Performance Commencement Date described in Section 4.2 of the Contract.
- 3.1.2 Construction Period:** The “Construction Period” is the period beginning with the first day of the month that equipment is first installed and continuing until the M&V Commencement Date.
- 3.1.3 Measurement Year:** A “Measurement Year” is each one-year period following the M&V Commencement Date.
- 3.1.4 EC Savings:** The energy conservation savings, or “EC Savings”, having units of dollars (\$), are those savings achieved through the reduction in energy consumption, demand, energy rates, maintenance, or materials through the implementation of the Scope of Work.
- 3.1.5 Energy Savings Term:** The “Energy Savings Term” shall be the number of Measurement Years shown in Schedule R or until the termination of this Contract.
- 3.1.6 Savings Measurement & Verification Plan:** The “Savings Measurement & Verification Plan” is the scope of work defined in this schedule and provides for the quantification of EC Savings for the purpose of meeting the Guaranteed Savings.
- 3.1.7 Projected Energy Savings:** “Projected Energy Savings” are those savings expected from the installation and continued operation of the Scope of Work.
- 3.1.8 Termination of Guaranteed Savings:** If the Contract is terminated, the Guaranteed Savings shall also be terminated. Should such termination occur on a date other than at the beginning of a Measurement Year, Chevron ES shall have no Guaranteed Savings for a partial year.
- 3.1.9 Energy Unit Savings:** The savings in units of energy, power, water, etc., achieved through the reduction in energy consumption, demand, through the implementation of the Scope of Work as defined and calculated in herein.
- 3.1.10 Baselines:** In determining Baselines, Chevron ES identified some of the factors which may affect energy use for the Facilities, including but not limited to: hours and levels of occupancy; adjustments in labor force; building use and operational procedures; temperature, humidification, and ventilation levels; installed lighting and scheduled use; building construction and size; general level of repair and efficiency of heating and air conditioning equipment and other energy-using equipment; and amount of heating and air conditioning and other energy-using equipment. After consideration of those factors and certain other

anomalous use of the Facilities, Chevron ES establishes initial Baselines. It is understood that due to changes in factors affecting energy use, the Baselines may be revised from time to time as detailed in this Schedule. In addition, data collected during the period before construction may indicate a change of the energy use pattern at the facility and require a change to the Baselines. Chevron ES shall notify the Customer, in writing, of all such changes.

- 3.1.11 **Base Energy Rates:** The "Base Energy Rates", having units of dollars per energy unit, are presented herein and shall be used by Chevron ES to calculate the EC Savings.

### 3.2 Guaranteed Savings Terms and Conditions

- 3.2.1 The Customer shall maintain all Scope of Work installed under this Contract in a manner consistent with the manufacturer's or Chevron ES' recommended maintenance schedules and procedures from the time of Substantial Completion. Chevron ES shall, if it deems necessary, inspect the Facilities annually.
- 3.2.2 For the purpose of determining EC Savings, Chevron ES shall prepare reports, take on-site measurements, monitor building automation systems, and/or additional work as required by and detailed in the Savings Measurement & Verification Plan.
- 3.2.3 The Customer acknowledges and consents to Chevron ES' right to monitor EC Savings and energy management performance by conducting on-site measurements, including, but not limited to, reading meters and installing and observing on-site monitoring equipment. The Customer shall cooperate fully with any such measures instituted by Chevron ES pursuant to this Subsection. Chevron ES shall not institute any measures that unreasonably interfere with the business of Customer conducted at the Facilities. At Chevron ES' request, to facilitate Chevron ES' monitoring of the Scope of Work, the Customer, at its expense, shall cause a dedicated telephone line to be installed at each location of the Customer's Facilities designated by Chevron ES for communication between Scope of Work and Chevron ES. Customer shall pay all monthly service charges and fees for such dedicated telephone line, except that Chevron ES shall pay the monthly fees for long distance service from Chevron ES' office to the Customer's Facilities.
- 3.2.4 For the purpose of determining EC Savings, Customer shall cooperate with Chevron ES by providing utility information, changes in factors affecting energy use, and/or additional information as requested by Chevron ES personnel.
- 3.2.5 **Savings Guarantee:** Subject to changes in factors affecting energy use, Chevron ES guarantees that the Customer will realize total EC Savings during the Energy Savings Term of not less than the Guaranteed Savings.
- **Guarantee Payment:** Should the Customer's total EC Savings during any Measurement Year be less than the Guaranteed Savings for that year, Chevron ES guarantees that it shall pay to the Customer, within 30 days of the acceptance of the annual energy savings report, the difference between the Guaranteed Savings for such year and the total EC Savings for that Measurement Year, not to exceed the guarantee amount. If in the judgment of the Customer, Customer would benefit from additional energy services or energy saving retrofits, Customer and Chevron ES may mutually agree upon such

services or retrofits in lieu of Guarantee Payment. For the purposes of this Contract, such services or retrofits actually delivered by Chevron ES will be considered a Guarantee Payment for that Measurement Year.

- Excess Savings: For each Measurement Year in which the EC Savings exceed the Guaranteed Savings, the Excess Savings shall be the difference. Excess savings shall be fully retained by Customer and shall not be used to cover shortfalls in other years.

### 3.2.6 Changes in Factors Affecting Energy Use

- The Customer shall notify Chevron ES of Material Changes as set forth in Article XIV of the Contract. Chevron ES will determine the effect that any such change will have on EC Savings and present to the client a written analysis of the effects of the changes. Material Changes that are long term or permanent and that are not due to Equipment failing to provide anticipated energy savings, Equipment malfunction, malfunction of Premises systems, subsystems, or components attributable to the Equipment, faulty repair or other negligence or breach of Contract by Contractor, will be reflected in a change to the Baseline. Temporary changes that affect energy use will be calculated and added to the corresponding month's EC savings.
- If a change in any of the factors involved in the Baseline occurs and results in a reduction of EC Savings, and such change is not due to Equipment failing to provide anticipated energy savings, Equipment malfunction, malfunction of Premises systems, subsystems, or components attributable to the Equipment, faulty repair or other negligence or breach of Contract by Contractor, then the level of dollar energy savings to be guaranteed by Chevron ES will be decreased by the same amount.
- Customer and Chevron ES may from time to time desire to make changes for the express purpose of increasing EC Savings. It is agreed that these changes will only be made with the written consent of both parties, which will not be unreasonably withheld. The Baseline will not be adjusted to reflect any changes agreed to under this subparagraph. If Chevron ES elects to pay for the cost of any such changes that would not unreasonably interfere with the conduct of Customer's business, and the Customer does not consent to the changes, then the Baseline will be adjusted upward by the amount of savings projected from the changes.
- During the Energy Savings Term when the effect on savings can not be accurately determined due to construction or major changes, Projected Energy Savings for the facility will be used for the period of such changes and until the effect of the changes can be determined by Chevron ES.
- Chevron ES has the right to charge the Customer for work required to assess the effect on savings for any large scale changes, including, but not limited to, building additions, new buildings, and new or changed HVAC equipment, that require more than forty (40) hours per year to be spent in calculating their effect on the energy savings. Such hours will be billed at current Chevron ES engineering rates.
- If the Customer fails to notify Chevron ES of changes in factors affecting energy use as required by the Contract, or fails to supply Chevron ES with requested information that is required for the calculation of saving in a timely manner, EC Savings for the period will be equal to those Projected Energy Savings for the period. Any changes made by Chevron ES to the Baselines or savings calculations, as outlined in this contract, shall be presented to the Customer for approval. The Customer shall have 30 days to approve or question the changes in writing. If Chevron ES does not receive notice in writing

within 30 days, the changes will be considered contractually valid and implemented as proposed. If the Customer notifies Chevron ES within 30 days of their non-approval of the changes, Chevron ES will work with the client to answer any questions or make any necessary corrections.

- The Customer agrees that Chevron ES shall have the right, with or without prior notice, to inspect the facilities to determine if the Customer is complying and shall have complied with its obligations as set forth above. In the event that any inspection discloses that the Customer has failed on the date of the inspection to be in compliance with any items set forth above, then the Guaranteed Energy Savings shall be assumed to have been achieved for and with respect to the portion of the Energy Savings Period during which such failure shall have existed.

### **3.3 Calculation of EC Savings**

3.31 Energy Savings Report: Annually within 90 days after receipt of all needed information for each Measurement Year during the Energy Savings Term, Chevron ES shall submit an annual energy savings report with a precise calculation of the EC Savings to the Customer, unless additional information is needed to accurately calculate the EC Savings, in which case the Customer shall be notified of such a situation within the 90 day period.

3.32 Four different types of EC Savings are identified under this Contract: (a) Energy Use Savings, (b) Fuel Switch Savings, (c) Energy Rate Reduction Savings, and (d) Stipulated Non-Energy Savings. Total EC Savings will be determined by adding together the Energy Use Savings, Fuel Switch Savings, Energy Rate Reduction Savings, Operational Reduction Savings, and any calculation of an adjustment to the savings due to changes in factors affecting energy use for each period.

- Energy Use Savings are those savings achieved through reductions in energy use, energy demand, water, and other commodities. Chevron ES will calculate the Energy Unit Savings as detailed in the Savings Measurement and Verification Plan. The Energy Unit Savings will then be multiplied by the applicable Base Energy Rates set forth herein. The dollar amount determined by such calculation shall be the Energy Use Savings for such period.
- Fuel Switch Savings are those savings achieved by switching to a more economical source of energy on a cost per unit of energy basis. The Fuel Switch Rate (dollars saved per unit of new fuel used) will be calculated by Chevron ES and presented herein and shall not be escalated for purposes of calculating savings. Fuel Switch Savings shall be computed for each period by multiplying the Fuel Switch Rate by the number of units of new fuel consumed for that period.
- Energy Rate Reduction (ERR) Savings are those savings achieved through either improving the rate from local utility company, direct purchase of a commodity, or bulk purchase of commodity. An ERR savings rate (dollars saved per unit of applicable energy) will be calculated by Chevron ES and presented herein. ERR Savings shall be computed for each period by multiplying the ERR savings rate by the number of units of energy consumed for that period. There will be no Energy Rate Reduction Savings calculation or penalty if the current energy rate exceeds the Base Energy Rate. There will be no ERR Savings calculation unless an energy rate reduction has been achieved either directly or indirectly by Chevron ES.

- Stipulated Non-energy Savings are achieved through reduction in non-energy cost due to the implementation of the Scope of Work identified by Chevron ES, to be calculated as set forth herein.

### 3.4 Savings Measurement & Verification Plan

The following details the methodologies and calculations to be used in determining the Energy Unit Savings under this Contract.

3.4.1 M&V Option A: This option allows for the energy savings to be predicted, measured, and agreed upon between the Customer and Chevron ES. One time measurements and stipulated parameters are used to quantify savings that are stipulated for the term of the Contract.

- Chevron ES will supply a one-time report to the Customer detailing the measurements and calculation of savings. If the calculated savings fall short of those expected, Chevron ES will have the opportunity to remedy the short fall and re-measure and calculate the results. Such work will be done at Chevron ES' expense and shall not be unreasonably denied by the Customer, as long as such work does not interfere with the Customer's use of the Facilities. These calculated savings will be defined as Energy Unit Savings and will be agreed to occur each year of the Contract.

3.4.2 M&V Option C: Option C verification techniques calculate savings by comparing the post-retrofit overall energy use in a building or facility with pre-retrofit energy Baselines. This methodology captures all of the savings under a particular meter, and requires ongoing monitoring of the facilities.

- The monthly Energy Unit Savings are calculated by subtracting the monthly post-retrofit consumption from the corresponding monthly Baseline consumption, and presented in ongoing reports. During the Construction Period, Option C Energy Unit Savings will be calculated each month.
- **Energy Savings Term**  
Except for where Projected Savings are to be utilized as detailed in this contract, for each Facility's Baseline, Energy Unit Savings will be calculated by subtracting the post implementation current month's usage from the Baseline usage for that month. The specific equations for calculating the unit savings are as follows:

Baseline Usage - Current Usage = Energy Unit Savings

Current Usage = Total units (i.e. kWh, kW, ccf, therms, gals, etc.) from the current post-implementation utility bills or other calibrated measuring device, for all meters of that type that measure the usage used to derive the Baseline.

Baseline Usage: The pre-Construction Period usage, as detailed below, revised from time-to-time as detailed in this Contract.

- **Baselines and Projected Savings:**

01 - Administration								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan	211,594	29,716	537	54	5,080	1,579		
Feb	194,140	29,716	521	54	4,650	1,579		
Mar	229,168	29,716	566	54	3,950	1,579		
Apr	227,016	54,793	578	72	3,550	911		
May	246,029	54,793	568	72	2,140	911		
Jun	256,849	54,793	589	72	1,740	911		
Jul	284,832	54,793	601	72	1,010	911		
Aug	271,611	54,793	601	72	1,390	911		
Sep	241,245	54,793	564	72	2,220	911		
Oct	230,168	29,716	576	54	4,110	1,579		
Nov	220,561	29,716	561	54	4,850	1,579		
Dec	211,947	29,716	542	54	4,870	1,575		
Totals	2,825,160	507,055	6,804	758	39,560	14,936		

13 - Arapahoe Plaza Human Services								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan	56,825	14,729	153	13.1	6,316	2,254	66,669	0
Feb	53,311	14,729	153	13.1	5,567	2,254	67,107	0
Mar	57,360	14,729	154	13.1	5,364	1,153	69,682	0
Apr	55,422	14,729	154	13.1	3,074	1,705	64,598	0
May	57,204	14,729	154	13.1	2,324	50	57,155	0
Jun	69,488	14,729	142	13.1	1,054	50	50,238	0
Jul	102,970	14,729	230	13.1	605	50	51,973	0
Aug	83,302	14,729	200	13.1	873	50	46,829	0
Sep	80,601	14,729	200	13.1	1,523	50	54,752	0
Oct	83,325	14,729	200	13.1	4,029	1,153	62,046	0
Nov	73,482	14,729	192	13.1	6,131	1,153	73,987	0
Dec	56,864	14,729	153	13.1	6,336	1,705	82,590	0
Totals	830,154	176,752	2,085	157.2	43,196	11,629	747,626	0

<b>23 - Altura Plaza</b>								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan	121,594	36,037	272	61.5	18,160	11,449		
Feb	103,244	36,037	272	61.5	11,670	11,449		
Mar	112,618	36,037	228	61.5	5,160	5,740		
Apr	112,883	36,037	276	61.5	5,010	8,594		
May	120,411	36,037	288	61.5	4,150	31		
Jun	122,653	36,037	324	61.5	3,700	31		
Jul	139,482	36,037	344	61.5	4,530	31		
Aug	138,135	36,037	312	61.5	6,300	31		
Sep	126,767	36,037	308	61.5	7,530	31		
Oct	120,855	36,037	320	61.5	14,900	5,740		
Nov	119,468	36,037	320	61.5	18,330	5,740		
Dec	126,428	36,037	272	61.5	13,010	8,594		
Totals	1,464,538	432,445	3,536	738	112,450	57,462		

*In the proforma (schedule R) of this contract these savings are eliminated after year 5 as a contingency plan if the County no longer owns this facility. If the County however does continue to own this facility throughout the contract term these savings will continue to be counted toward the generated performance contract savings.*

<b>35 - ACJC Courthouse</b>								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan	202,551	45,348	514	74.0	9,680	2,505	425,622	156,618
Feb	172,659	45,348	513	74.0	8,870	2,505	514,533	156,618
Mar	234,751	45,348	532	74.0	7,540	1,284	565,324	313,236
Apr	234,674	45,348	491	74.0	6,710	1,894	563,143	156,618
May	248,888	45,348	504	74.0	4,560	62	383,824	313,236
Jun	247,557	45,348	540	74.0	4,020	62	486,176	313,236
Jul	293,663	45,348	569	74.0	2,730	62	667,161	469,854
Aug	276,365	45,348	544	74.0	3,710	62	773,075	469,854
Sep	228,143	45,348	539	74.0	3,870	62	758,773	313,236
Oct	214,985	45,348	479	74.0	6,020	1,284	689,563	156,618
Nov	201,979	45,348	526	74.0	6,770	1,284	617,494	156,618
Dec	199,199	45,348	489	74.0	8,320	1,894	783,212	156,618
Totals	2,755,414	544,175	6,240	888	72,800	12,959	7,227,900	3,132,357

36 - ACJC Detention Center								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan							2,756,486	727,613
Feb							4,021,000	727,613
Mar							4,314,714	727,613
Apr							4,984,286	727,613
May							3,368,529	727,613
Jun							4,151,471	727,613
Jul							4,564,677	727,613
Aug							4,210,161	727,613
Sep							5,095,161	727,613
Oct							4,572,727	727,613
Nov							3,977,273	727,613
Dec							3,475,000	727,613
Totals							49,491,485	8,731,353

37 - ACJC Administration II								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan	153,391	22,927	375	62.0	3,292	809		
Feb	131,596	22,927	374	62.0	2,623	809		
Mar	148,392	22,927	367	62.0	2,661	421		
Apr	165,731	22,927	371	62.0	1,611	615		
May	180,679	22,927	366	62.0	1,342	32		
Jun	190,243	22,927	424	62.0	773	32		
Jul	208,851	22,927	427	62.0	650	32		
Aug	205,531	22,927	419	62.0	841	32		
Sep	186,209	22,927	435	62.0	897	32		
Oct	169,193	22,927	405	62.0	977	421		
Nov	151,009	22,927	403	62.0	2,320	421		
Dec	153,405	22,927	391	62.0	3,238	615		
Totals	2,044,230	275,128	4,757	744	21,225	4,270		



3.4.3 Calculated Savings: When the cost, complexity, or uncertainty of savings measurements are high as compared to the projected savings, the Customer and Chevron ES may agree to stipulate the projected Energy Unit Savings as being achieved, without any measurements being taken.

- For the Stipulated Option, the Energy Unit Savings presented in a subsequent section will be agreed to occur each year of the Contract.

### 3.5 Base Energy Rates

EC Savings shall be calculated using the Base Energy Rates or actual energy rates for that meter, whichever results in greater EC Savings. Actual energy rates will be calculated at the end of each Contract year using utility billing information for that Contract Year and using the same methodology as was employed to determine the Base Energy Rate in the Comprehensive Energy Analysis Report.

The Base Energy Rates listed here are to be increased each year on a cumulative basis by two and one half percent (2.5%) beginning on the first anniversary of the M&V Commencement Date and continuing on the first day of each Contract Year thereafter. The energy rates can be found in Section 2.2.1.

### 3.6 Stipulated Non-Energy \$ Savings

The following dollar savings have been calculated by the Customer from the installation of the EC measures and have been agreed to by the Customer and will not be measured. The sum of these savings each measurement year will be added to the EC savings for that Measurement Year for all facilities.

Measurement Year	Maintenance Reallocation
1	\$90,000
2	\$92,250
3	\$94,556
4	\$96,920
5	\$99,343
6	\$101,827
7	\$104,372
8	\$106,982
9	\$109,656
10	\$112,398
11	\$115,208
12	\$118,088

## **4. ECM 1 – Lighting Improvements**

### **4.1 Overview of ECM and M&V plan for ECM**

This M&V plan applies to the following buildings: Arapahoe Plaza East, Arapahoe Plaza West, Federal Warehouse, Tri County Health, Centrepont Plaza, Peoria Shops, ACJC Detention Center, Sheriff/Coroner Facility. Lighting retrofits are being implemented in other buildings, but those buildings have Option C electrical and natural gas M&V which will capture the lighting savings and heating penalty.

- 4.1.1 The Arapahoe County Facilities utilize fluorescent fixtures containing a combination of standard and energy saving T12 lamps with standard magnetic core and coil ballasts and a limited number of electronic T12 ballasts. This ECM considers replacing the existing T12 lamps and ballasts with T8 lamps and electronic ballasts and retrofitting some existing four-lamp and two-lamp U-tube fluorescent fixtures with specular reflectors, electronic ballasts, and T8 straight lamps. Incandescent lamps which have significant operating hours will be retrofitted with screw-in or hard-wired compact fluorescent retrofit kits with lamps and ballasts into the existing luminaire. In some instances new fixtures will replace existing fixtures. Some of the existing mercury vapor (MV) fixtures will be retrofitted with metal halide (MH) pulse-start lamp and ballast retrofit kits. All existing incandescent exit sign fixtures to be replaced with new Light Emitting Diode (LED) exit sign fixtures

Option A Method will be used to measure and verify the electricity savings from this retrofit. This method requires utilizing Xcel Energy standard tables to establish the baseline electricity consumption of the existing lighting systems and the post-retrofit electrical consumption of the new lighting systems. Operating hours for each usage type classification will be measured.

- 4.1.2 FEMP Method LE-A-02

- 4.1.3 The intent of this measurement plan is to verify baseline and post retrofit power and operating hours.

### **4.2 Energy Baseline Development**

- 4.2.1 Variables Affecting Baseline Energy Use

- The only variables affecting baseline energy use will be measured or stipulated. Power consumption of fixtures before and after will be stipulated per XCEL Energy's standard table for the Custom Efficiency Program. Hours of runtime will be measured on a sampling basis using run time data loggers.

- 4.2.2 Define key system performance factors characterizing the baseline conditions

- A sampling of light level measurements will be taken to confirm pre lighting levels and post compliance with IES standards.

4.2.3 N/A

4.2.4 Baseline Data Collected

- Baseline Period: Lighting fixtures will be grouped according to run-time type and measured on a sampling basis.
- Metering Plan: Industry standard data run time loggers will be used to measure run time hours for a two week period. The hours measured will be averaged by usage group per week and then multiplied by 26 to determine annual hours per usage group.
  - Up to ten usage groups will be defined and 11 different measurements will be taken for each usage group. This will give statistically valid sampling. Usage groups will include: corridors, office bays, individual offices, restrooms, storage areas, conference rooms, lounges, mechanical rooms, stairwells, lobbies, and large meeting rooms. The actual quantity and location of measurements in each facility will be randomly selected by CES and County personnel.

4.2.5 Data Analysis Performed

- Calculations and Adjustments
  - Baseline Period: Annual kW baselines will be developed by applying the XCEL lighting tables to the total fixture population. Annual kWh baselines will be developed by multiplying the power calculations by the annual operating hours.
  - Post-installation Period: Annual post-retrofit kW consumption will be developed by applying the XCEL lighting tables to the total post-retrofit fixture population. Annual kWh consumption will be developed by multiplying the post-retrofit power calculations by the annual operating hours.

### 4.3 Energy Savings Calculations

- 4.3.1 The energy savings calculation has two main components: reduced electrical usage and increased natural gas consumption through the heating penalty.
- The lighting retrofits will remain installed for the duration of the guarantee term. Retrofits are homogeneous throughout the project's included facilities.
  - Post-retrofit kWh consumption will be subtracted from the baseline kWh consumption to determine the energy unit savings. Post-retrofit kW consumption per room will be subtracted from the baseline kW. This product will be multiplied by a diversity factor as shown in the Comprehensive Energy Analysis to determine the on-peak demand savings.

Annual Cost Savings: Annual energy cost savings will be determined by multiplying the energy unit and demand savings by the contractual base energy and demand rates as detailed in the Agreement. To be conservative, no credit will be taken for the air conditioning credit. CES reserves the right to add this credit to the savings calculations, as approved by Arapahoe County, should CES fall short of guaranteed energy savings. For all buildings

with natural gas heat, the kWh saved per year shall be multiplied by 0.01004 to arrive at the heating penalty in therms of natural gas. This value was derived per the equation below. This heating penalty will not be applied to the Arapahoe Plaza East and West Buildings, as the heating penalty will be captured in the Option C measurements for the Arapahoe Human Services Building.

$3413 \text{ btu/kW} / .85 \text{ heat system efficiency} \times (1 \text{ therm}/100,000 \text{ btu}) \times .25 \text{ (assumes 1/4 of annual btus get replaced by heating system)} = .01004 \text{ Therms/kWh}$

- 4.3.2 Annual Cost Savings: Annual electrical cost savings will be determined by multiplying each the demand and energy unit by the contractual base demand and energy rates as detailed in the Agreement. The following is an example for the Arapahoe Plaza East Facility:

Total Annual Savings (kWh): 16,471

Total Monthly Savings (kW): 6.07

Total Annual Savings (therms):  $16,471 \times .01004 = (165)$

Rate (Section 2.2.1): \$14.16/kW    \$0.05869/kWh    \$0.63481/therm

Total Savings:

$(16,471 \times .05869) + (12 \times 6.07 \times 14.16) + ((165) \times 0.63481) = \$1,893.35$

#### 4.4 Operational & Maintenance Cost Savings

No O&M savings were predicted for this retrofit

#### 4.5 Total Annual Measured Savings for ECM

12 - Arapahoe Plaza East								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan	33,024	1,373	78	6.1				
Feb	28,866	1,373	79	6.1				
Mar	33,384	1,373	80	6.1				
Apr	28,336	1,373	80	6.1				
May	28,416	1,373	71	6.1				
Jun	28,020	1,373	76	6.1				
Jul	29,354	1,373	74	6.1				
Aug	31,700	1,373	75	6.1				
Sep	29,611	1,373	76	6.1				
Oct	30,668	1,373	77	6.1				
Nov	27,862	1,373	74	6.1				
Dec	31,304	1,373	77	6.1				
Totals	360,545	16,471	917	72.8				

14 - Arapahoe Plaza County Court								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan	34,674	1,065	70	5.9				
Feb	32,763	1,065	72	5.9				
Mar	36,092	1,065	71	5.9				
Apr	32,596	1,065	72	5.9				
May	32,167	1,065	68	5.9				
Jun	32,748	1,065	68	5.9				
Jul	34,057	1,065	67	5.9				
Aug	34,661	1,065	67	5.9				
Sep	32,809	1,065	67	5.9				
Oct	33,233	1,065	69	5.9				
Nov	32,757	1,065	63	5.9				
Dec	34,647	1,065	67	5.9				
Totals	403,204	12,783	821	70.7				

15 - Federal Warehouse								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan	37,689	1,319	112	7.0	2,680	-32		
Feb	35,256	1,319	106	7.0	2,510	-32		
Mar	38,450	1,319	105	7.0	1,690	-16		
Apr	39,504	1,319	135	7.0	730	-24		
May	43,549	1,319	141	7.0	230	0		
Jun	50,500	1,319	152	7.0	40	0		
Jul	64,726	1,319	172	7.0	10	0		
Aug	57,394	1,319	158	7.0	0	0		
Sep	44,586	1,319	144	7.0	80	0		
Oct	43,687	1,319	119	7.0	560	-16		
Nov	36,400	1,319	95	7.0	2,150	-16		
Dec	35,914	1,319	98	7.0	2,890	-24		
Totals	527,655	15,823	1,537	84.48	13,570	-159		

20 - Tri County Health								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan	5,744	882	21	4.2	820	-21		
Feb	5,234	882	20	4.2	620	-21		
Mar	5,733	882	20	4.2	460	-11		
Apr	6,359	882	24	4.2	220	-16		
May	7,874	882	33	4.2	130	0		
Jun	8,991	882	35	4.2	60	0		
Jul	10,123	882	31	4.2	60	0		
Aug	9,758	882	33	4.2	60	0		
Sep	8,033	882	32	4.2	80	0		
Oct	6,697	882	23	4.2	250	-11		
Nov	5,860	882	21	4.2	520	-11		
Dec	5,840	882	20	4.2	760	-16		
Totals	86,246	10,584	313	50.52	4,040	-106		

### 24 - Centrepointe

Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan	260,048	2,932	643	10.2	340	-71		
Feb	401,078	2,932	610	10.2	260	-71		
Mar	261,719	2,932	579	10.2	230	-35		
Apr	215,531	2,932	578	10.2	150	-53		
May	211,119	2,932	537	10.2	160	0		
Jun	203,988	2,932	644	10.2	120	0		
Jul	223,833	2,932	599	10.2	130	0		
Aug	219,062	2,932	627	10.2	160	0		
Sep	203,212	2,932	552	10.2	220	0		
Oct	224,160	2,932	537	10.2	380	-35		
Nov	230,257	2,932	590	10.2	160	-35		
Dec	256,230	2,932	654	10.2	170	-53		
Totals	2,910,237	35,183	7,150	122.16	2,480	-353		

### 29 - Peoria Shops

Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan	31,395	1,353	71	5.4	538	-33		
Feb	30,020	1,353	73	5.4	527	-33		
Mar	29,589	1,353	68	5.4	395	-16		
Apr	25,210	1,353	64	5.4	204	-25		
May	25,120	1,353	60	5.4	109	0		
Jun	25,790	1,353	56	5.4	20	0		
Jul	26,147	1,353	59	5.4	10	0		
Aug	25,917	1,353	62	5.4	5	0		
Sep	23,967	1,353	61	5.4	60	0		
Oct	26,448	1,353	65	5.4	206	-16		
Nov	29,101	1,353	64	5.4	458	-16		
Dec	30,367	1,353	66	5.4	634	-25		
Totals	329,071	16,237	769	64.20	3,166	-164		

36 - ACJC Detention Center								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan	453,980	23,158	728	55.1	31,370	-558		
Feb	411,708	23,158	731	55.1	27,300	-558		
Mar	464,851	23,158	747	55.1	28,060	-279		
Apr	449,165	23,158	779	55.1	24,710	-419		
May	468,214	23,158	833	55.1	19,640	0		
Jun	466,091	23,158	888	55.1	17,680	0		
Jul	503,173	23,158	906	55.1	13,590	0		
Aug	513,825	23,158	857	55.1	13,270	0		
Sep	468,494	23,158	874	55.1	16,670	0		
Oct	462,990	23,158	769	55.1	24,690	-279		
Nov	433,440	23,158	757	55.1	29,110	-279		
Dec	422,045	23,158	726	55.1	32,890	-419		
Totals	5,517,976	277,890	9,595	661.56	278,980	-2,790		

38 - Sheriff/Coroner Facility								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan	233,435	3,279	0	12.9	2,160	-79		
Feb	215,005	3,279	0	12.9	2,260	-79		
Mar	215,985	3,279	0	12.9	1,430	-40		
Apr	199,959	3,279	0	12.9	1,370	-59		
May	202,483	3,279	0	12.9	770	0		
Jun	194,728	3,279	0	12.9	630	0		
Jul	204,941	3,279	0	12.9	760	0		
Aug	203,837	3,279	0	12.9	420	0		
Sep	191,454	3,279	0	12.9	460	0		
Oct	190,813	3,279	0	12.9	780	-40		
Nov	185,731	3,279	0	12.9	1,720	-40		
Dec	238,052	3,279	0	12.9	2,630	-59		
Totals	2,476,423	39,353	0	154.56	15,390	-395		



#### **4.6 Post-Installation Verification Activities**

Chevron ES will supply a one-time report to the County detailing the measurements and calculation of savings. If the calculated savings fall short of those expected, Chevron ES will have the opportunity to remedy the short fall and re-measure and calculate the results. Such work will be done at Chevron ES' expense and shall not be unreasonably denied by the County, as long as such work does not interfere with the County's use of the Facilities. These calculated savings will be defined as Energy Unit Savings and will be agreed to occur each year of the Contract.

##### **4.6.1 Variables Affecting Post-installation Energy Use**

- **All variables are being addressed during the baseline development stage.**

##### **4.6.2 Define key system performance factors characterizing the post-installation conditions**

- **A sampling of light level measurements will be taken to confirm compliance with IES recommendations.**

##### **4.6.3 Acceptable lighting levels will be verified and included in the post installation report.**

##### **4.6.4 N/A**

##### **4.6.5 Post-Installation Data To Be Collected**

Lighting loggers will be placed in fixtures to confirm the accuracy of the assumed run hours shown in the CEA. The measured hours for each usage group will be averaged to obtain the hours used for savings calculations.

- As-built documentation provided by CES' construction team will document the description and location of all retrofits. As-built documentation will be provided as detailed in the Agreement.
- Post-retrofit report will be completed within 60 days of the post-retrofit measurements. This report will detail the measurements taken and the annual energy unit savings calculated from all of the measurements.

##### **4.6.6 Described in Section 3.3**

#### **4.7 Periodic / Interval Verification Activities**

- **N/A**

## **5. ECM 2 and 2a – Water Consumption Improvements**

### **5.1 Overview of ECM and M&V plan for ECM**

This M&V plan applies to the following buildings at Arapahoe County: Administration Building, Arapahoe Plaza East, Arapahoe Human Services, Arapahoe West Building, Federal Warehouse, Altura Plaza, Centrepont Plaza, Peoria Shops, ACJC Administrative Building, and Sheriff/Coroner Facility. No water measures are being implemented at Tri County Health. At the ACJC Courthouse and Detention Center, water savings are being measured via Option C which will capture water savings from these retrofits.

- 5.1.1 This ECM concerns replacing selected toilets, urinals and faucets at certain sites that have a high domestic water use and where water cost savings justifies replacement. Replacement of china and flush valve (or tank) is indicated in order to ensure proper operation.

Option A Method will be used to measure and verify the water savings from this retrofit. This method requires measuring the baseline usage per flush of the existing toilets and urinals and the post-retrofit usage per flush of the new toilets and urinals. This method also requires measuring the baseline flow rates of the existing faucets as well as the post-retrofit flow rates. Flushes per year for each toilet will be stipulated initially, and for the duration of the guarantee period, as well as annual usage hours for faucets.

An Option A approach is warranted for this retrofit because usage per flush and flow rates are easily measured using Option A techniques, savings from this ECM are very sustainable, and the cost of this measurement is in line with the projected savings.

- 5.1.2 Option A will be used to measure savings.
- 5.1.3 The intent of this measurement plan is to quantify the water and sewer cost savings associated with retrofitting or replacing existing end use fixtures with new low flow end use fixtures.

### **5.2 Energy Baseline Development**

This method requires measuring the baseline consumption of the existing system. In this case, baseline water consumption will be determined by measuring a sampling of the toilet, urinal and faucet water usage before being retrofitted.

- 5.2.1 Variables Affecting Baseline Energy Use
- The impact of weather, operating hours, and set points will not affect the accuracy of savings measurement since actual water consumption will be measured at the source.
- 5.2.2 Define key system performance factors characterizing the baseline conditions

- Post retrofit measurements and commissioning efforts will confirm the accuracy of performance.

5.2.3 N/A

5.2.4 Baseline Data Collected

- Baseline Period: Toilets, urinals and faucets will be grouped according to pre-retrofit type and measured on a sampling basis. Gallons per flush and flow rates will be measured using County-approved equipment.
  - Sample size for each pre-retrofit and post-retrofit group will be 10% or a smaller amount if statistically valid per IMPV protocol. Every effort will be made to take at least this number of measurements. Sometimes it is not possible to isolate a fixture type and thus fewer measurements will be taken. Sometimes, no measurements are possible and the gallons per flush will be taken to be equal to the expected gallons per flush presented in this report.
  - The location of each measurement will be determined in agreement with County and CES personnel.

5.2.5 Data Analysis Performed

- Calculations and Adjustments
  - Baseline Period: Annual water usage baselines will be developed by applying the results of pre-retrofit measurements to the total fixture population. Annual water baselines will be developed by inserting the pre-measured gallons per flush and flow rates into the appropriate water usage calibrated model as defined by usage group.
  - Pre-retrofit measurement report. One report prepared within 45 days of completion of the pre-retrofit measurements. The report will include the names of the measurement team and any observers, the results of all measurements, any exceptions or anomalies associated with the measurements.

### 5.3 Energy Savings Calculations

- 5.3.1 The energy savings calculation has two main components: reduce water and sewer usage. There is also a minor component: thermal savings from reduced hot water usage. Thermal savings occur only at the Administration I building and the ACJC Detention Center.
- 5.3.2 An instantaneous measurement of pre-retrofit usage per flush and flow rate is representative of the system's usage at all times. The retrofits will remain installed for the duration of the guarantee term. Retrofits are homogeneous throughout the project's included facilities. The calculated annual usage per year is described in Section 4 of the Comprehensive Energy Analysis as follows:

**General:**

Domestic Water usage for each building was modeled using population figures, both staff and visitors, occupancy schedules, fixture usage rates as determined in the survey and average estimates of fixture usage. The model is then compared to the metered usage and reasonable adjustments to the model are made to reflect the metered usage. In general, the fixture rates were adjusted to bring the model rates safely below the metered rates. After matching the water model to the building use, various water conservation scenarios were applied to the model to analyze potential savings.

The water usage is determined by:

$$(\text{Number of People}) \times (\text{Fixture Rate}) \times (\text{Uses per Day}) \times (\text{Days Occupied per Year})$$

Visitor populations were also included. Visitation period was assumed to be for .5 hours for the Admin 1 A/D Works buildings and 2 hours for the Court Houses, the detention center and Altura Plaza, and then the population was normalized to an 8 hr day and added to the given population figure using the following formula:

$$(\text{Number of Hours Visitation}) \div (8 \text{ hours}) \times (\text{Visitors/Day}) = \text{Normalized Visitor Population}$$

**Fixture use rates:**

There were some adjustments made to the fixture rates to bring the modeled usage in line with the metered data. Some of the adjustments were downward (lower GPF). Some were adjusted upward; this is justified as long as all water is accounted for. Maladjusted flush valves and leaking tank valves can account for significant losses. Also, where there was a mix of fixtures, a weighted average was applied to the model, which also lowered the modeled fixture rate.

The following table illustrates the uses per day per person used in the models.

Uses per day	Inmates		Staff		Visitors		Units
	Male	Female	Male	Female	Male	Female	
Toilet	5	5	1	4	1	4	Flushes
Urinal	0	0	3	0	3	0	Flushes
Lav Faucet	1	1	0.5	0.5	0.5	0.5	Minutes
Shower (M F)		10	0	0	0	0	Minutes

\*Based on: "A Water Conservation Guide for Commercial Institutional and Industrial Users", Water Use and Conservation Bureau, New Mexico Office of the State Engineer.

Schedules are considered only to the extent that the days that the buildings are open and the building are populated.

**Schedules:**

The number of days used for the savings calculations are to only include the days that the buildings are open and the building is populated. The number of days used for the savings calculations was calculated in the following manner:

All Buildings Except Detention Center:

Work Days (52 wks/yr x 5 days/wk) – Holidays (13 days) – Vacation Days (21 days) = 226 Days

Detention Center:

365 days/year.

	Office (staff and visitors)	Detention Center
Work days	250	365
Holidays	-10	0
Vacation	-14	0
Total	226	365

Population assumptions are listed below:

	Population (1)	Visitors / day (2)	Quantity of toilets
Administration #1	358	1000*	44
Arapahoe Plaza (A/D works)	60	100	11
Arapahoe Plaza (Human Services)	90	500	19
Arapahoe Plaza (County Court)	30	500	19
CSU Extension Office	16	0 (3)	4
CSU Ware House	0		1
Federal Blvd Warehouse	15	15	10
Tri County Health	NA	NA	8
Administration #2	250	100	32
ACJC District Court	109	1500	79
P.J. Sullivan Detention Center	195	163	71
P.J. Sullivan Detention Center (Comby)	1215	0	413
County Shops:	35	0	6
Altura Plaza	145	1600	55
Total			772

- (1) Population figures are as given by the Maintenance Staff.
- (2) Visitor figures as per Arapahoe County Staff.
- (3) There are no public bathroom facilities.

5.3.3 Annual Cost Savings: Annual water cost savings will be determined by multiplying the water unit by the contractual base water and sewer rates as detailed in the Agreement. The following is an example for the Administration I Facility:

Total Annual Savings (kgals): 669.410  
 Rate (Section 2.2.1): \$5.36  
 Total Savings:  $669.41 \times 5.36 = \$3,588.04$

5.3.4 Annual natural gas cost savings at the Detention Center: Since Option C will be used to determine water savings in this facility the calculated water savings for the lavatory

measure shall be used to determine water savings. Annual gas cost savings will be determined by multiplying the gas unit savings by the contractual gas rate as detailed in the agreement. The natural gas unit savings shall be determined by using the following equation:

S = Total Calculated Savings (Detention equals 243,643 gallons)

HWF = Hot water Fraction

DHWS = Domestic Hot Water Supply Temperature in degrees F

ST = Domestic water cold water delivery Temperature in degrees F

T = Tap temperature in degrees F

HWU = Hot water Usage

$$\text{HWF} = (T - \text{ST}) / (\text{DHWS} - \text{ST}) = (105 - 54) / (130 - 54) = 67\%$$

$$\text{HWU} = S \times \text{HWF} \text{ or } 296,839 \times 67\% = 198,882 \text{ gallons}$$

$$\text{Convert gallons to Therms} = \text{HWU} \times 8.33 \times (\text{DHWS} - \text{ST}) / 100,000 = 1,261$$

#### **5.4 Operational & Maintenance Cost Savings**

- No O&M savings were predicted for this retrofit

#### **5.5 Total Annual Measured Savings For ECM**

01 - Administration								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan							129,964	55,784
Feb							115,628	55,784
Mar							266,561	55,784
Apr							352,443	55,784
May							699,329	55,784
Jun							789,762	55,784
Jul							878,157	55,784
Aug							954,706	55,784
Sep							655,211	55,784
Oct							524,794	55,784
Nov							214,553	55,784
Dec							120,761	55,784
Totals							5,701,869	669,410

12 - Arapahoe Plaza East								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan							33,275	9,909
Feb							33,915	9,909
Mar							49,501	9,909
Apr							56,000	9,909
May							63,073	9,909
Jun							63,810	9,909
Jul							76,159	9,909
Aug							83,542	9,909
Sep							57,797	9,909
Oct							47,814	9,909
Nov							39,065	9,909
Dec							29,149	9,909
Totals							633,100	118,904

13 - Arapahoe Plaza Human Services								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan							66,669	23,262
Feb							67,107	23,262
Mar							69,682	23,262
Apr							64,598	23,262
May							57,155	23,262
Jun							50,238	23,262
Jul							51,973	23,262
Aug							46,829	23,262
Sep							54,752	23,262
Oct							62,046	23,262
Nov							73,987	23,262
Dec							82,590	23,262
Totals							747,626	279,145

14 - Arapahoe Plaza County Court								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan							88,900	25,422
Feb							101,914	25,422
Mar							94,652	25,422
Apr							79,483	25,422
May							96,804	25,422
Jun							94,524	25,422
Jul							67,931	25,422
Aug							69,619	25,422
Sep							66,839	25,422
Oct							68,736	25,422
Nov							75,455	25,422
Dec							77,038	25,422
Totals							981,895	305,067



15 - Federal Warehouse								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan							3,993	1,545
Feb							3,375	1,545
Mar							27,075	1,545
Apr							42,253	1,545
May							90,865	1,545
Jun							101,429	1,545
Jul							105,545	1,545
Aug							104,617	1,545
Sep							67,602	1,545
Oct							50,570	1,545
Nov							14,536	1,545
Dec							3,702	1,545
Totals							615,562	18,540

23 - Altura Plaza								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan							231,312	42,948
Feb							188,690	42,948
Mar							157,555	42,948
Apr							247,231	42,948
May							322,300	42,948
Jun							347,233	42,948
Jul							387,367	42,948
Aug							459,150	42,948
Sep							414,267	42,948
Oct							361,683	42,948
Nov							318,155	42,948
Dec							196,791	42,948
Totals							3,631,734	515,380

24 - Centrepoinite								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan							116,409	33,075
Feb							121,020	33,075
Mar							127,429	33,075
Apr							217,067	33,075
May							450,652	33,075
Jun							608,281	33,075
Jul							767,500	33,075
Aug							847,328	33,075
Sep							677,306	33,075
Oct							354,273	33,075
Nov							156,870	33,075
Dec							114,772	33,075
Totals							4,558,907	396,900

29 - Peoria Shops								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan							99,923	4,971
Feb							147,319	4,971
Mar							187,883	4,971
Apr							181,875	4,971
May							128,820	4,971
Jun							123,600	4,971
Jul							137,541	4,971
Aug							206,059	4,971
Sep							135,714	4,971
Oct							200,571	4,971
Nov							133,714	4,971
Dec							168,000	4,971
Totals							1,851,019	59,656

<b>37 - ACJC Administration II</b>								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan							50,667	18,378
Feb							62,424	18,378
Mar							67,807	18,378
Apr							74,499	18,378
May							52,803	18,378
Jun							64,498	18,378
Jul							56,908	18,378
Aug							62,375	18,378
Sep							58,965	18,378
Oct							60,856	18,378
Nov							61,749	18,378
Dec							52,392	18,378
Totals							725,943	220,533

<b>38 - Sheriff/Coroner Facility</b>								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan							93,314	15,000
Feb							121,580	15,000
Mar							97,456	15,000
Apr							131,250	15,000
May							500,091	15,000
Jun							557,777	15,000
Jul							631,966	15,000
Aug							590,513	15,000
Sep							470,063	15,000
Oct							279,428	15,000
Nov							116,476	15,000
Dec							89,700	15,000
Totals							3,679,614	180,000

## 5.6 Post-Installation Verification Activities

Chevron ES will supply a one-time report to the County detailing the measurements and calculation of savings. If the calculated savings fall short of those expected, Chevron ES will have the opportunity to remedy the short fall and re-measure and calculate the results. Such work will be done at Chevron ES' expense and shall not be unreasonably denied by the County, as long as such work does not interfere with the County's use of the Facilities. These calculated savings will be defined as Energy Unit Savings and will be agreed to occur each year of the Contract.

### 5.6.1 Variables Affecting Post-installation Energy Use

- The impact of weather, operating hours, and set points will not affect the accuracy of savings measurement since actual water consumption will be measured at the source.

### 5.6.2 Define key system performance factors characterizing the post-installation conditions

- Post retrofit measurements and commissioning efforts will confirm the accuracy of performance.

### 5.6.3 See 4.6.2

### 5.6.4 N/A

### 5.6.5 Post-Installation Data To Be Collected

- Schedule: Pre-retrofit measurements will be performed before retrofits are completed. Post measurements will be completed after the retrofits are completed.
- Post-installation Period:
  - Post-retrofit fixtures will be grouped according to post-retrofit type and measured on a sampling basis. Gallons per flush and flow rates will be measured using the approved apparatus described above.
  - Sample size will consist of 10% of population or a statistically valid quantity per the latest version of the IPMVP, whichever is less.
  - Annual post-retrofit water consumption will be developed by applying the results of post-retrofit measurements to the total post-retrofit fixture population. Annual water consumption will be developed by inserting the post-retrofit gallons per flush values into the appropriate water usage calibrated models. Copies of these models can be found in the Comprehensive Energy Analysis.
  - Post-retrofit water consumption will be subtracted from the baseline water consumption to determine the water unit savings.
  - As-built documentation provided by Chevron's construction team will document the description and location of all retrofits. As-built documentation will be provided as detailed in the Agreement.
  - Post-retrofit report will be completed within 60 days of the post-retrofit measurements. This report will detail the measurements taken and the savings calculated from all of the measurements.

### 5.6.6 Described above.

## **5.7 Periodic / Interval Verification Activities**

- N/A

## **6. ECM 3 – Upgrade/Expand DDC Controls**

### **6.1 Overview of ECM and M&V plan for ECM**

This M&V plan applies to the Arapahoe Plaza East Building and the Arapahoe Plaza West Building. The ACJC Detention Center has no savings associated with this ECM and thus is not included. The two buildings covered by this plan receive heating and cooling from the Arapahoe Human Services Building, thus the only savings measure by this plan is the fan energy consumption. No demand savings are claimed for this ECM, just kwh savings.

- 6.1.1 This ECM investigates installing an Energy Management Control System (EMCS) to control the heating, ventilation, and air conditioning (HVAC) equipment at the two buildings specified above.

Option A Method will be used to measure and verify the fan electricity savings from this retrofit. This method requires stipulating the baseline operating schedules of the existing mechanical systems. The post-retrofit operating schedules will be measured to verify savings. The existing average fan energy consumption will be measured as well as the post-retrofit fan energy consumption. The performance of the system will be verified by viewing trend logs of the mechanical systems.

- 6.1.2 The intent of this measurement plan is to quantify the electrical savings associated with upgrading or expanding direct digital controls.

### **6.2 Energy Baseline Development**

Baselines will be developed by measuring motor kW at various load points and from the existing hours of operation which are stipulated in the Standards of Control.

#### **6.2.1 Variables Affecting Baseline Energy Use**

- Many variables such as weather, operating hours, and set point changes impact equipment consumption.
- The variable with the biggest impact is weather. To account for this variable, heating degree days will be logged during the baseline period and also during the energy savings verification period. The heating degree days will be used as a baseline adjustment to facilitate an accurate verification of savings.
- The reliability of the EMS to store data needed for calculations is at times not reliable. For time periods in which data is not available from the EMS, the savings shall be derived from the performance of the system to date during similar weather conditions. If there is insufficient system performance data, the savings shall be stipulated.
- The impact of operating hours will be measured via measuring post-retrofit actual run times.
- The method in which the systems are operated is an important variable. The facilities staff is responsible for operating and maintaining the systems. If the systems are not

operated or maintained properly, energy consumption will increase. Therefore, if it is determined that any part of the systems are not being operated properly during the savings verification period, the savings being derived from the part of the system that is not being operated properly shall be stipulated for the time period of improper operation.

6.2.2 Define key system performance factors characterizing the baseline conditions

- Post retrofit measurements and commissioning efforts will confirm the accuracy of performance.

6.2.3 N/A

6.2.4 Baseline Data Collected

- Reduction in Motor Run Times:
  - Baseline Period: Motor power draw will be measured using an RMS wattmeter at various load points. The motor load will be logged for a one-month period to correlate motor load to outside air temperature. Motor run times shall be as shown in the Standards of Comfort as shown in the CEA. Motor load during the post-retrofit period will be measured over a 3 month period to correlate motor load to outside air temperature. The motor load correlation to outside air temperature will be used to derive an annual average consumption.
  - Metering Plan: The indicated wattmeter will be used to measure motor kW on an instantaneous basis at various loads.

6.2.5 Data Analysis Performed

- Reduction in Motor Run Times:
  - Calculations and Adjustments
    - Actual motor run times will be logged over a 3 month period. The measured run times will be compared to the baseline period run times to determine savings.

### 6.3 Energy Savings Calculations

- 6.3.1 The energy savings calculation has one component: reduce electricity usage, not demand. The following is an example energy savings calculation for the Arapahoe Plaza East Facility as used in the energy audit:

Total Annual Savings (kWh): 76,871  
Rate (Section 2.2.1): \$.05869  
Total Savings:  $76,871 \times .05869 = \$4,511.56$

6.3.2 The controls retrofits will remain installed for the duration of the guarantee term. Retrofits are homogeneous throughout the project's included facilities.

6.3.3 Annual Cost Savings:

- Reduction in Motor Run Times:

The kWh savings shall be calculated by:

$$\text{KWh savings} = (\text{ABKW} \times \text{BSH}) - (\text{APKW} \times \text{PRH}), \text{ where}$$

ABKW = Average baseline period KW, as measured during the baseline period.

BSH = Baseline annual hours of operation, as stipulated in the Standards of Control

APKW = Average post-retrofit KW, as measured during the post-retrofit period.

PRH = Post retrofit annual hours as measured by the EMS.

## 6.4 Operational & Maintenance Cost Savings

- No O&M savings were predicted for this retrofit

## 6.5 Total Annual Measured Savings for ECM

12 - Arapahoe Plaza East								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan	33,024	6,406	78	0				
Feb	28,866	6,406	79	0				
Mar	33,384	6,406	80	0				
Apr	28,336	6,406	80	0				
May	28,416	6,406	71	0				
Jun	28,020	6,406	76	0				
Jul	29,354	6,406	74	0				
Aug	31,700	6,406	75	0				
Sep	29,611	6,406	76	0				
Oct	30,668	6,406	77	0				
Nov	27,862	6,406	74	0				
Dec	31,304	6,406	77	0				
Totals	360,545	76,871	917	0.0				



<b>14 - Arapahoe Plaza County Court</b>								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan	34,674	5,940	70	0.0				
Feb	32,763	5,940	72	0.0				
Mar	36,092	5,940	71	0.0				
Apr	32,596	5,940	72	0.0				
May	32,167	5,940	68	0.0				
Jun	32,748	5,940	68	0.0				
Jul	34,057	5,940	67	0.0				
Aug	34,661	5,940	67	0.0				
Sep	32,809	5,940	67	0.0				
Oct	33,233	5,940	69	0.0				
Nov	32,757	5,940	63	0.0				
Dec	34,647	5,940	67	0.0				
Totals	403,204	71,285	821	0.0				

## 6.6 Post-Installation Verification Activities

Chevron ES will supply a one-time report to the County detailing the measurements and calculation of savings. If the calculated savings fall short of those expected, Chevron ES will have the opportunity to remedy the short fall and re-measure and calculate the results. Such work will be done at Chevron ES' expense and shall not be unreasonably denied by the County, as long as such work does not interfere with the County's use of the Facilities. These calculated savings will be defined as Energy Unit Savings and will be agreed to occur each year of the Contract.

### 6.6.1 Variables Affecting Post-installation Energy Use

- Same as described above for the pre-installation period.

### 6.6.2 Define key system performance factors characterizing the post-installation conditions

- Post retrofit measurements and commissioning efforts will confirm the accuracy of performance.

### 6.6.3 N/A

### 6.6.4 N/A

### 6.6.5 Post-Installation Data To Be Collected

This is described above.

- 6.6.6 Data analysis to be performed and minimum acceptance requirements.  
This is described above.

**6.7 Periodic / Interval Verification Activities**

- N/A

## 7. ECM 6 – Replace the Existing Boilers

### Overview of ECM and M&V plan for ECM

The ACJC Detention Center currently utilizes very untreated water. This water is fed into the boiler system and leads to scaled-up and inefficient boilers. This ECM involves replacing the existing boilers with new boilers.

The existing boilers have been proven to operate at a very low efficiency, with stack temperatures over 500 degrees F. Given the 24 hour operation of this facility, the savings associated with this ECM will be achieved purely by improved boiler efficiency. The guaranteed savings are 8.1% of the baseline.

Based on the situation of the building, all parties agree that the savings calculations are conservative. The calculations are located in Volume 2 of the Comprehensive Energy Analysis. The M&V plan shall consist of confirming that the new boilers operate at the modeled combustion efficiency of at least 80%. Upon confirmation that the new plant is operating at least this efficiency, the savings will be considered as having been met.

If the system does not prove to be operating at 80% combustion efficiency, the guarantee will be considered to not have been met.

36 - ACJC Detention Center								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan					31,370	4,457		
Feb					27,300	2,815		
Mar					28,060	1,877		
Apr					24,710	938		
May					19,640	469		
Jun					17,680	235		
Jul					13,590	469		
Aug					13,270	469		
Sep					16,670	1,173		
Oct					24,690	2,346		
Nov					29,110	3,519		
Dec					32,890	4,692		
Totals	5,517,976	0	9,595	0	278,980	23,459	49,491,485	0

Total Annual Savings (therms): 23,459

Rate (Section 2.2.1): \$0.63481

Total Savings:  $23,459 \times .63481 = \$14,892$

## **8. ECM 18 – Install Water Reclaim System**

### **8.1 Overview of ECM and M&V plan for ECM**

This ECM involves recycling some of the water used for vehicle washing at the Peoria Shops.

- 8.1.1 This ECM involves installing an underground water storage tank after the filters installed on the drain of the truck washing station. The salvaged water will be used for heavy washing. City water will continue to be used for final washing.

Option A Method will be used to measure and verify the water and sewer savings from this retrofit. The nominal amount of increased electricity usage shall be calculated as shown in the Comprehensive Energy Analysis.

- 8.1.2 The intent of this measurement plan is to quantify the water and sewer savings associated with recycling some of the existing water used for washing vehicles.

### **8.2 Energy Baseline Development**

The energy savings calculations shown in the CEA are accepted as the baseline.

8.2.1 Variables Affecting Baseline Energy Use

- The main variable effecting water use is the quantity of vehicles washed per month and the length of each wash.

8.2.2 Define key system performance factors characterizing the baseline conditions

- Post retrofit measurements and commissioning efforts will confirm the accuracy of performance.

8.2.3 N/A

8.2.4 Baseline Data Collected

- Baseline Period: The water model, as shown in the Comprehensive Energy Analysis, is accepted as the baseline condition.
- Metering Plan: A standard water meter will be installed on the new tank to measure the actual amount of water being recycled. It will be read manually.

8.2.5 Data Analysis Performed

- Calculations and Adjustments

- No calculations will be performed. Metered recycled water will be compared to the projected value monthly.

### 8.3 Energy Savings Calculations

#### 8.3.1 Annual Cost Savings:

Each month, the projected volume of recycled water will be subtracted from the metered actual recycled water volume. The following is an example for this ECM:

Total Annual Savings (kgals): 576  
 Rate (Section 2.2.1): \$13.07  
 Total Savings:  $576 \times 13.07 = \$7,528.32$

There will be a slight increase in electrical usage due to a small sump pump. These savings will be stipulated (\$1,277).

### 8.4 Operational & Maintenance Cost Savings

- No O&M savings were predicted for this retrofit

### 8.5 Total Annual Measured Savings for ECM

29 - Peoria Shops								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan							99,923	48,000
Feb							147,319	48,000
Mar							187,883	48,000
Apr							181,875	48,000
May							128,820	48,000
Jun							123,600	48,000
Jul							137,541	48,000
Aug							206,059	48,000
Sep							135,714	48,000
Oct							200,571	48,000
Nov							133,714	48,000
Dec							168,000	48,000
Totals							1,851,019	576,000

## 8.6 Post-Installation Verification Activities

Chevron ES will supply a one-time report to the County detailing the measurements and calculation of savings. If the calculated savings fall short of those expected, Chevron ES will have the opportunity to remedy the short fall and re-measure and calculate the results. Such work will be done at Chevron ES' expense and shall not be unreasonably denied by the County, as long as such work does not interfere with the County's use of the Facilities. These calculated savings will be defined as Energy Unit Savings and will be agreed to occur each year of the Contract.

### 8.6.1 Variables Affecting Post-installation Energy Use

- **Same as described above for the pre-installation period.**

### 8.6.2 Define key system performance factors characterizing the post-installation conditions

- **Post retrofit measurements and commissioning efforts will confirm the accuracy of performance.**

### 8.6.3 N/A

### 8.6.4 N/A

### 8.6.5 Post-Installation Data To Be Collected

This is described above.

### 8.6.6 Data analysis to be performed and minimum acceptance requirements.

This is described above.

## 8.7 Periodic / Interval Verification Activities

- N/A

## **9. Calculated Energy Conservation Measures**

### **9.1 Overview of ECM and M&V plan for ECM**

- 9.1.1 This plan investigates using calculations for energy savings guarantees. Descriptions of calculations and their validity used in lieu of field measurements or baseline comparisons are outlined below. Actual savings calculations can be found in Volume II of the Energy Audit.

Calculated savings are used where the cost/benefit ratio of savings guaranteed to the difficulty or time consumption to prove savings is high. Typically the savings from these ECMs are small and is obvious to all parties that savings will be achieved. All parties agree the savings calculations are conservative. Given the amount of cost it would take to confirm the small amount of savings, all parties agree to accept the savings calculation shown in the CEA upon confirmation that each measure has been properly installed.

### **9.2 Energy Baseline Development**

N/A

### **9.3 Energy Savings Calculations**

- 9.3.1 The energy savings calculation has the following components: reduce electricity, natural gas, and water usage.

9.3.2 N/A

9.3.3 Annual Cost Savings:

Operational & Maintenance Cost Savings

- No O&M savings were predicted for these retrofits

### **9.4 Total Annual Measured Savings for ECM**

- 3.4.1 The following sections outline each individual facility per ECM.

**Administration I**

**ECM 16 – Irrigation Control System Upgrade**

Irrigation savings are calculated using spreadsheet analysis. Calculations can be found in Volume II of the Energy Audit.

<b>01 - Administration</b>								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan							129,964	0
Feb							115,628	0
Mar							266,561	6,346
Apr							352,443	12,691
May							699,329	19,037
Jun							789,762	25,382
Jul							878,157	38,073
Aug							954,706	12,691
Sep							655,211	12,691
Oct							524,794	0
Nov							214,553	0
Dec							120,761	0
<b>Totals</b>							<b>5,701,869</b>	<b>126,911</b>

The following is an example for this ECM:

Total Annual Savings (kgals): 126.9

Rate (Section 2.2.1): \$5.36

Total Savings:  $126.9 \times 5.36 = \$680.18$



**Arapahoe Plaza East**

**ECM 23 – ERCM**

ERCM savings is calculated on a square foot basis encompassing all buildings within the scope. Savings calculations can be found in Volume II of the Energy Audit.

<b>12 - Arapahoe Plaza East</b>								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan	33,024	283						
Feb	28,866	283						
Mar	33,384	283						
Apr	28,336	283						
May	28,416	283						
Jun	28,020	283						
Jul	29,354	283						
Aug	31,700	283						
Sep	29,611	283						
Oct	30,668	283						
Nov	27,862	283						
Dec	31,304	283						
Totals	360,545	3,398						

The following is an example for this ECM:

Total Annual Savings (kWh): 3,398  
 Rate (Section 2.2.1): \$0.05869/kWh  
 Total Savings:  $(8,865 \times .05869) = \$199.43$

Gas Savings will be measured through the gas meter in the Human Services Facility (Option C).

**Arapahoe Human Services**

**ECM 21 – Change Natural Gas Provider**

These savings are purely monetary with no energy unit savings therefore the baseline for this ECM shall remain unchanged.

13 - Arapahoe Plaza Human Services								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan					6,316	0		
Feb					5,567	0		
Mar					5,364	0		
Apr					3,074	0		
May					2,324	0		
Jun					1,054	0		
Jul					605	0		
Aug					873	0		
Sep					1,523	0		
Oct					4,029	0		
Nov					6,131	0		
Dec					6,336			
Totals					43,196	0		

The savings for this ECM result from using a cheaper gas rate. The current natural gas utility provider, Xcel Energy, at Building 13-Arapahoe Human Services charges \$0.74946/therm. The new natural gas utility provider, Seminole Energy Services, shall charge \$0.63481/therm.

The dollar savings for this ECM were calculated by taking the difference in the two utility rates (\$0.11465/therm) and multiplying it the target natural gas usage of the facility. The target natural gas usage was calculated with the following equation:

$$\text{Target Natural Gas Usage} = \text{Baseline Natural Gas Usage} - \text{Total Natural Gas Saved}$$

where,

$$\text{Total Natural Gas Saved} = \text{Total Natural Gas Saved at Building 12-Arapahoe Plaza Building} + \text{Total Natural Gas Saved at Building 13-Arapahoe Human Services} + \text{Total Natural Gas Saved at Building 14-Arapahoe Plaza West Building}$$

The following is an example for this ECM:

Baseline (therms):	43,196
Savings Total (therms):	11,552
Target Baseline (therms):	31,644
Rate difference:	\$0.11465/therm

Total Savings:  $31,644 \times \$0.11465 = \$3,627.99$

Note: The natural gas-fired boilers at Building 13-Arapahoe Human Services provide heating to Buildings 12 and 14, that is why these two buildings are included in the calculation above.

**14 - Arapahoe Plaza West**  
ECM 23 – ERCM

ERCM savings is calculated on a square foot basis encompassing all buildings within the scope. Savings calculations can be found in Volume II of the Energy Audit.

<b>14 - Arapahoe Plaza County Court</b>								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan	34,674	282						
Feb	32,763	282						
Mar	36,092	282						
Apr	32,596	282						
May	32,167	282						
Jun	32,748	282						
Jul	34,057	282						
Aug	34,661	282						
Sep	32,809	282						
Oct	33,233	282						
Nov	32,757	282						
Dec	34,647	282						
Totals	403,204	3,385						

The following is an example for this ECM:

Total Annual Savings (kWh): 3,385  
 Rate (Section 2.2.1): \$0.05869/kWh  
 Total Savings:  $(3,385 \times .05869) = \$198.67$

Gas Savings will be measured through the gas meter in the Human Services Facility (Option C).

### 15 – Federal Warehouse

ECM 4 – Programmable Thermostat

ECM 23 – ERCM

Programmable thermostat savings are calculated using a spreadsheet analysis. ERCM savings is calculated on a square foot basis encompassing all buildings within the scope. Savings calculations can be found in Volume II of the Energy Audit.

15 - Federal Warehouse								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan	37,689	2,140			2,680	356		
Feb	35,256	2,140			2,510	356		
Mar	38,450	2,140			1,690	193		
Apr	39,504	2,140			730	274		
May	43,549	2,140			230	28		
Jun	50,500	2,140			40	28		
Jul	64,726	2,140			10	28		
Aug	57,394	2,140			0	28		
Sep	44,586	2,140			80	28		
Oct	43,687	2,140			560	193		
Nov	36,400	2,140			2,150	193		
Dec	35,914	2,140			2,890	275		
Totals	527,655	25,685			13,570	1,980		

The following is an example for ECM 4:

Total Annual Savings (kWh): 13,513

Total Annual Savings (therms): 1,662

Rate (Section 2.2.1): \$0.05869/kWh \$0.74946/therm

Total Savings:  $(13,513 \times .05869) + (1,162 \times 0.74946) = \$2,038.68$

The following is an example for ECM 23:

Total Annual Savings (kWh): 12,172

Total Annual Savings (therms): 318

Rate (Section 2.2.1): \$0.05869/kWh \$0.74946/therm

Total Savings:  $(12,172 \times .05869) + (318 \times 0.74946) = \$952.38$

**20 – Tri County Health**

ECM 4 – Programmable Thermostat

ECM 23 – ERCM

Programmable thermostat savings are calculated using a spreadsheet analysis. ERCM savings is calculated on a square foot basis encompassing all buildings within the scope. Savings calculations can be found in Volume II of the Energy Audit.

20 - Tri County Health								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan	5,744	682			820	236		
Feb	5,234	682			620	236		
Mar	5,733	682			460	120		
Apr	6,359	682			220	178		
May	7,874	682			130	3		
Jun	8,991	682			60	3		
Jul	10,123	682			60	3		
Aug	9,758	682			60	3		
Sep	8,033	682			80	3		
Oct	6,697	682			250	120		
Nov	5,860	682			520	120		
Dec	5,840	682			760	178		
Totals	86,246	8,190			4,040	1,202		

The following is an example for ECM 4:

Total Annual Savings (kWh): 6,828

Total Annual Savings (therms): 1,166

Rate (Section 2.2.1): \$0.05869/kWh \$0.74946/therm

Total Savings:  $(6,828 \times .05869) + (1,166 \times 0.74946) = \$1,274.61$

The following is an example for ECM 23:

Total Annual Savings (kWh): 1,362

Total Annual Savings (therms): 36

Rate (Section 2.2.1): \$0.05869/kWh \$0.74946/therm

Total Savings:  $(1,362 \times .05869) + (36 \times 0.74946) = \$106.92$

## 24 – CentrepoinTE

ECM 23 – ERCM

ECM 25 – Retro Commissioning

ERCM savings is calculated on a square foot basis encompassing all buildings within the scope. Retro commissioning savings is calculated using Trane Trace modeling software. Savings calculations and Trace assumptions can be found in Volume II of the Energy Audit.

24 - CentrepoinTE								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan	260,048	21,100			340	-873		
Feb	401,078	21,100			260	-873		
Mar	261,719	21,100			230	-419		
Apr	215,531	21,100			150	-646		
May	211,119	21,100			160	35		
Jun	203,988	21,100			120	35		
Jul	223,833	21,100			130	35		
Aug	219,062	21,100			160	35		
Sep	203,212	21,100			220	35		
Oct	224,160	21,100			380	-419		
Nov	230,257	21,100			160	-419		
Dec	256,230	21,100			170	-646		
Totals	2,910,237	253,199			2,480	-4,125		

The following is an example for ECM 23:

Total Annual Savings (kWh): 15,907

Total Annual Savings (therms): 415

Rate (Section 2.2.1): \$0.06321/kWh \$0.80714/therm

Total Savings:  $(15,907 \times 0.06321) + (415 \times 0.80714) = \$1,340.45$

The following is an example for ECM 25:

Total Annual Savings (kWh): 237,292

Total Annual Savings (therms): (4,540)

Rate (Section 2.2.1): \$0.06321/kWh \$0.80714/therm

Total Savings:  $(237,292 \times 0.06321) + ((4,540) \times 0.80714) = \$11,334.81$

## 29 – Peoria Shops

ECM 4 – Programmable Thermostat

ECM 23 – ERCM

Programmable thermostat savings are calculated using a spreadsheet analysis. ERCM savings is calculated on a square foot basis encompassing all buildings within the scope. Savings calculations can be found in Volume II of the Energy Audit.

29 - Peoria Shops								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan	31,395	842			5,380	1,733		
Feb	30,020	842			5,270	1,733		
Mar	29,589	842			3,950	872		
Apr	25,210	842			2,040	1,303		
May	25,120	842			1,090	10		
Jun	25,790	842			200	10		
Jul	26,147	842			100	10		
Aug	25,917	842			50	10		
Sep	23,967	842			600	10		
Oct	26,448	842			2,060	872		
Nov	29,101	842			4,580	872		
Dec	30,367	842			6,340	1,303		
Totals	329,071	10,108			31,660	8,740		

The following is an example for ECM 4:

Total Annual Savings (kWh): 6,053

Total Annual Savings (therms): 8,615

Rate (Section 2.2.1): \$0.05869/kWh \$0.63481/therm

Total Savings:  $(6,053 \times 0.05869) + (8,615 \times 0.63481) = \$5,824.14$

The following is an example for ECM 23:

Total Annual Savings (kWh): 4,055

Total Annual Savings (therms): 125

Rate (Section 2.2.1): \$0.05869/kWh \$0.63481/therm

Total Savings:  $(4,055 \times 0.05869) + (125 \times 0.63481) = \$317.34$



**36 – Detention Center**

ECM 16 – Irrigation Control System Upgrade

ECM 19 – Laundry Conservation

ECM 23 – ERCM

Irrigation and laundry conservation savings are calculated using a spreadsheet analysis. ERCM savings is calculated on a square foot basis encompassing all buildings within the scope. Savings calculations can be found in Volume II of the Energy Audit.

<b>36 - ACJC Detention Center</b>								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Irrigation Usage Baseline gallons	Irrigation Usage Projected Savings gallons
Jan	453,980	3,945			31,370	228	838	0
Feb	411,708	3,945			27,300	228	3,667	0
Mar	464,851	3,945			28,060	228	42,333	15,294
Apr	449,165	3,945			24,710	228	150,000	30,587
May	468,214	3,945			19,640	228	390,471	45,881
Jun	466,091	3,945			17,680	228	723,529	61,174
Jul	503,173	3,945			13,590	228	746,699	91,761
Aug	513,825	3,945			13,270	228	703,986	30,587
Sep	468,494	3,945			16,670	228	611,283	30,587
Oct	462,990	3,945			24,690	228	320,795	0
Nov	433,440	3,945			29,110	228	8,621	0
Dec	422,045	3,945			32,890	228	8,498	0
<b>Totals</b>	<b>5,517,976</b>	<b>47,337</b>			<b>278,980</b>	<b>2,735</b>	<b>3,710,720</b>	<b>305,870</b>

The following is an example for ECM 16:

Total Annual Savings (kgals): 306

Rate (Section 2.2.1): \$7.83

Total Savings:  $306 \times 7.83 = \$2,395.98$

The following is an example for ECM 19:

Total Annual Savings (therms): 1,276

Rate (Section 2.2.1): \$0.63481/therm

Total Savings:  $(1,276 \times 0.63481) = \$810.02$

The following is an example for ECM 23:

Total Annual Savings (kWh): 47,337

Total Annual Savings (therms): 1,459

Rate (Section 2.2.1): \$0.05869/kWh \$0.63481/therm

Total Savings:  $(47,337 \times .05869) + (1,459 \times 0.63481) = \$3,704.40$

**38 – Sheriff / Coroner Facility**

ECM 23 – ERCM

ECM 25 – Retro Commissioning

ERCM savings is calculated on a square foot basis encompassing all buildings within the scope. Retro commissioning savings is calculated using Trane Trace modeling software. Savings calculations and Trace assumptions can be found in Volume II of the Energy Audit.

<b>38 - Sheriff/Coroner Facility</b>								
Month	Electric Usage Baseline kWh	Electric Usage Projected Savings kWh	Electric Demand Baseline kW	Electric Demand Projected Savings kW	Natural Gas Usage Baseline therms	Natural Gas Usage Projected Savings therms	Water Usage Baseline gallons	Water Usage Projected Savings gallons
Jan	233,435	20,656			2,160	-1,308		
Feb	215,005	20,656			2,260	-1,308		
Mar	215,985	20,656			1,430	-631		
Apr	199,959	20,656			1,370	-969		
May	202,483	20,656			770	45		
Jun	194,728	20,656			630	45		
Jul	204,941	20,656			760	45		
Aug	203,837	20,656			420	45		
Sep	191,454	20,656			460	45		
Oct	190,813	20,656			780	-631		
Nov	185,731	20,656			1,720	-631		
Dec	238,052	20,656			2,630	-969		
<b>Totals</b>	<b>2,476,423</b>	<b>247,866</b>			<b>15,390</b>	<b>-6,221</b>		

The following is an example for ECM 23:

Total Annual Savings (kWh): 20,276

Total Annual Savings (therms): 545

Rate (Section 2.2.1): \$0.05869/kWh \$0.72763/therm

Total Savings:  $(20,276 \times 0.05869) + (545 \times 0.72763) = \$1,586.56$

The following is an example for ECM 25:

Total Annual Savings (kWh): 227,590

Total Annual Savings (therms): (6,766)

Rate (Section 2.2.1): \$0.05869/kWh \$0.72763/therm

Total Savings:  $(227,590 \times 0.05869) + ((6,766) \times 0.72763) = \$8,434.11$

## **9.5 Post-Installation Verification Activities**

Chevron ES will supply a one-time report to the County detailing the calculation of savings. These calculated savings will be defined as Energy Unit Savings and will be agreed to occur each year of the Contract.

### **9.5.1 Variables Affecting Post-installation Energy Use**

- Same as described above for the pre-installation period.

### **9.5.2 Define key system performance factors characterizing the post-installation conditions**

- Post retrofit measurements and commissioning efforts will confirm the accuracy of performance.

### **9.5.3 N/A**

### **9.5.4 N/A**

### **9.5.5 Post-Installation Data to Be Collected**

This is described above.

### **9.5.6 Data analysis to be performed and minimum acceptance requirements.**

This is described above.

## **9.6 Periodic / Interval Verification Activities**

- N/A

**SCHEDULE G:  
CONSTRUCTION AND INSTALLATION SCHEDULE**

Substantial Completion will be achieved on all work within 360 days of execution of this contract. The Performance Commencement Date will occur within 420 days of execution of this contract.

The specific detailed construction schedule will be developed during the engineering phase of this contract to better enable Owner-required limitations to be incorporated. Owner and Contractor will mutually agree to the construction schedule.

**SCHEDULE H:  
SYSTEMS START-UP AND COMMISSIONING; OPERATING PARAMETERS OF  
INSTALLED EQUIPMENT**

All major equipment will be started up by a factory-authorized representative. All controls will be thoroughly commissioned either on a point-by-point basis or on a sampling basis as agreed to by the Customer. Customer personnel are invited to attend all start-up and commissioning activities. Full commissioning reports will be provided. The operating parameters of the installed equipment will be provided in the Operation and Maintenance Manuals. Commissioning of the installed systems is intended to verify that the systems are functioning according to design.

The following is a list of steps that will be taken to commission the controls and mechanical systems.

- Design and specify the systems so that complete system commissioning can be performed.
- Produce commissioning forms for each system to be commissioned.
  - The sequence of operations will be put into a form that will allow the commissioning agent to check off each component of a system.
- Perform system commissioning with the owner, engineer, controls contractor and commissioning agent present. The following are examples of system commissioning.
  - Verify that the outside air dampers close when commanded, open to allow minimum air and modulate to maintain the mixed air setpoint.
  - Verify that the heating coil valve modulates to maintain the design setpoint.
  - Verify that the Cooling coil valve modulates to maintain the design setpoint.
  - Verify unoccupied operations.
  - Verify outside air lockouts are in place.
  - Verify appropriate interlocks are in place.
  - Verify variable frequency drive unloading performance.
  - Verify boiler and chiller efficiency.
- Complete documentation (Commissioning Report) to go along with the O&M.
- Completing the process with system training.

### SCHEDULE I: STANDARDS OF COMFORT

Equipment Operating Schedules - Arapahoe County Buildings																		Notes
Building	Schedule	Equipment	Start	Stop	Days	EXISTING				Start	Stop	Days	PROPOSED					
						Heating		Cooling					Heating		Cooling			
						Occupied	Unoccupied	Occupied	Unoccupied				Occupied	Unoccupied	Occupied	Unoccupied		
01 - Administration Building	A	DHWP-1 & HX Pump	0:00	23:59	MTWRF	N/A	N/A	N/A	N/A	6:00	18:30	MTWRF	N/A	N/A	N/A	N/A		
			0:00	23:59	SS	N/A	N/A	N/A	N/A	OFF	OFF	SS	N/A	N/A	N/A	N/A		
01 - Administration Building	B	AH-1	5:00	23:00	MTWRF	70-72	OFF	72-74	OFF	6:00	18:30	MTWRF	72	55	74	OFF	1	
			8:00	18:00	SS	70-72	OFF	72-74	OFF	OFF	OFF	SS	OFF	55	OFF	OFF		
01 - Administration Building	C	AH-2	5:00	23:00	MTWRF	70-72	OFF	72-74	OFF	6:00	18:30	MTWRF	72	55	74	OFF	1	
			8:00	18:00	SS	70-72	OFF	72-74	OFF	OFF	OFF	SS	OFF	55	OFF	OFF		
01 - Administration Building	D	AH-3	5:00	23:00	MTWRF	70-72	OFF	72-74	OFF	6:00	18:30	MTWRF	72	55	74	OFF	1	
			8:00	18:00	SS	70-72	OFF	72-74	OFF	OFF	OFF	SS	OFF	55	OFF	OFF		
01 - Administration Building	E	AH-4	5:00	23:00	MTWRF	70-72	OFF	72-74	OFF	6:00	18:30	MTWRF	72	55	74	OFF	1	
			8:00	18:00	SS	70-72	OFF	72-74	OFF	OFF	OFF	SS	OFF	55	OFF	OFF		
12 - Arapahoe Plaza East Building	A	AHU-E1	6:00	22:00	MTWRF	70-72	OFF	72-74	OFF	7:00	18:00	MTWRF	72	55	74	OFF		
			8:00	18:30	SS	70-72	OFF	72-74	OFF	OFF	OFF	SS	OFF	55	OFF	OFF		
12 - Arapahoe Plaza East Building	B	AHU-E2	6:00	22:00	MTWRF	70-72	OFF	72-74	OFF	7:00	18:00	MTWRF	72	55	74	OFF		
			8:00	18:30	SS	70-72	OFF	72-74	OFF	OFF	OFF	SS	OFF	55	OFF	OFF		
13 - Arapahoe Human Services	A	AHU-SE1	Existing Schedule Was Not Available to Chevron Energy Solutions								7:00	18:00	MTWRF	72	55	74	OFF	2
										OFF	OFF	SS	OFF	55	OFF	OFF		
13 - Arapahoe Human Services	B	AHU-SE2	Existing Schedule Was Not Available to Chevron Energy Solutions								7:00	18:00	MTWRF	72	55	74	OFF	2
										OFF	OFF	SS	OFF	55	OFF	OFF		
13 - Arapahoe Human Services	C	AHU-SW1	Existing Schedule Was Not Available to Chevron Energy Solutions								7:00	18:00	MTWRF	72	55	74	OFF	2
										OFF	OFF	SS	OFF	55	OFF	OFF		
13 - Arapahoe Human Services	D	AHU-SW2	Existing Schedule Was Not Available to Chevron Energy Solutions								7:00	18:00	MTWRF	72	55	74	OFF	2
										OFF	OFF	SS	OFF	55	OFF	OFF		
14 - Arapahoe Plaza West Building	A	AHU-W1	0:00	23:59	MTWRF	70-72	OFF	72-74	OFF	7:00	18:00	MTWRF	72	55	74	OFF		
			4:00	18:00	SS	70-72	OFF	72-74	OFF	OFF	OFF	SS	OFF	55	OFF	OFF		
14 - Arapahoe Plaza West Building	B	AHU-W2	0:00	23:59	MTWRF	70-72	OFF	72-74	OFF	7:00	18:00	MTWRF	72	55	74	OFF		
			4:00	18:00	SS	70-72	OFF	72-74	OFF	OFF	OFF	SS	OFF	55	OFF	OFF		
15 - Federal Warehouse	A	RTU-1 & RTU-4	N/A	N/A	MTWRF	66	55-68	72-78	72-90	6:00	17:00	MTWRF	68	55	74	OFF	3	
			N/A	N/A	SS	66	55-68	72-78	72-90	OFF	OFF	SS	OFF	55	OFF	OFF		
15 - Federal Warehouse	B	RTU-2 & RTU-3	6:00	18:00	MTWRF	66	55-59	68-73	90	6:00	17:00	MTWRF	66	55	74	OFF		
			6:00	18:00	SS	66	55-59	68-73	90	OFF	OFF	SS	OFF	55	OFF	OFF		
15 - Federal Warehouse	C	RTU-5, RTU-6, RTU-8, RTU-9	6:00	18:00	MTWRF	63-66	55-60	71-78	73-90	6:00	17:00	MTWRF	65	55	74	OFF		
			6:00	18:00	SS	63-66	55-60	71-78	73-90	OFF	OFF	SS	OFF	55	OFF	OFF		
15 - Federal Warehouse	D	RTU-7	6:00	17:00	MTWRF	70	60	74	90	6:00	17:00	MTWRF	70	55	74	OFF		
			6:00	17:00	SS	70	60	74	90	OFF	OFF	SS	OFF	55	OFF	OFF		
15 - Federal Warehouse	D	RTU-10	0:00	23:59	MTWRF	70-72	70-72	72-74	72-74	6:00	17:00	MTWRF	70	55	74	OFF		
			0:00	23:59	SS	70-72	70-72	72-74	72-74	OFF	OFF	SS	OFF	55	OFF	OFF		

**ENERGY PERFORMANCE/CONSTRUCTION CONTRACT**

**BY AND BETWEEN THE BOARD OF COUNTY COMMISSIONERS  
OF ARAPAHOE COUNTY AND CHEVRON ENERGY SOLUTIONS COMPANY, A DIVISION  
OF CHEVRON U.S.A. INC.**



# **ENERGY PERFORMANCE/CONSTRUCTION CONTRACT**

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Section 22.1. Conflicts of Interest.

## **ARTICLE XXIII: CONTRACT DOCUMENTS**

Section 23.1. Plan Details.

Section 23.2. General Conditions.

Section 23.3. Order of Precedence.

Section 23.4. Facsimile Signatures

## **SCHEDULES**

Schedule A.1	Energy Performance Equipment to be Installed by Contractor
Schedule A.2	Other Equipment to be Installed by Contractor (Non-Guarantee)
Schedule B	Description of Premises; Pre-Existing Equipment Inventory
Schedule C	Energy and Cost Savings Guarantee
Schedule D	Contractor Monitoring, Maintenance and Service Contract
Schedule E	Baseline Energy Consumption
Schedule F	Savings Measurement & Calculation Formulae; Methodology to Adjust Baseline; Monitoring and Verification Plan
Schedule G	Construction and Installation Schedule
Schedule H	Systems Start-Up and Commissioning; Operating Parameters of Installed Equipment
Schedule I	Standards of Comfort
Schedule J	Contractor's Maintenance Responsibilities
Schedule K	County's Maintenance Responsibilities
Schedule L	Facility Maintenance Checklist
Schedule M	Contractor's Training Responsibilities
Schedule N	General Conditions
Schedule O.1	Payment Schedule and Schedule of Values for Performance Equipment to be Installed by Contractor
Schedule O.2	Payment Schedule and Schedule of Values for Other Equipment to be Installed by Contractor
Schedule P	Pre-Existing Service Agreements
Schedule Q	Current and Known Capital Projects at Facility
Schedule R	Projected Financial Performance
Schedule S	Certificate of Insurance

## **EXHIBITS**

Exhibit I	Performance Bond
Exhibit II	Labor and Material Payment Bond
Exhibit III (i)	Notice of Acceptance—Technical Energy Audit and Monitoring and Verification Plan
Exhibit III (ii)	Notice of Substantial Completion
Exhibit IV	Equipment Warranties
Exhibit V	Minority and Women-Owned Business Enterprises
Exhibit VI	Certification that Lifetime of Equipment Exceeds Financing Term
Exhibit VII	Change Order Form

## **APPENDICES**

Appendix A	Lease Agreement and Documents
Appendix B	RFP for Contractor Solicitation
Appendix C	Contractor Proposal
Appendix D	Miscellaneous Equipment
Appendix E	Lighting Inventory
Appendix F	EMS Point Lists