Annual Measurement & Verification Report Outline

[Note: All content in this outline is required (if applicable), except items noted as optional.]

**Contract # / Delivery Order # / Task #:** (include as appropriate)

**Performance Period Dates Covered:** \_\_\_\_\_\_\_\_\_\_\_ to\_\_\_\_\_\_\_\_\_\_\_\_\_

**Contract year #:** \_\_\_\_\_\_\_\_\_\_\_

# Executive Summary

## Project Background

### Provide an overview of project background, including:

#### Date of contract execution and primary parties to the contract

#### Dates of relevant contract modifications

#### Performance period dates covered

#### Project acceptance date

## Brief Project and CSM Descriptions

#### Provide an overview what was done and how savings are generated.

#### Note any changes in project scope between the Final Proposal (including any relevant modifications) and as-built conditions as recorded in post-installation report.

## Summary of Proposed and Verified Energy and Cost Savings

#### Compare verified savings for Performance Year # to Guaranteed Cost Savings for Year #.

#### State whether guarantee is fulfilled for year. If not, provide detailed explanation.

#### Define performance period.

#### Summarize information in Table 1, Table 2, and Table 3.

**Table 1. Proposed Annual Savings Overview**

[Include all fuels/commodities for project, e.g., electric energy, electric demand, natural gas, fuel oil, propane, water, etc.]

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Cost-saving Measure | Total energy savings (MBtu/ year) | Electric energy savings (kWh/ year) | Electric demand savings (kW/ year)\* | Natural gas savings (MBtu/year)\*\* | Water savings (gallons/year) | Other energy savings (MBtu/ year)\*\* | Total energy and water cost savings, Year 1 ($/year) | Energy-related O&M cost savings, Year 1 ($/year) | Total cost savings, Year 1 ($/year) |
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|  |  |  |  |  |  |  |  |  |  |
| Total Savings |  |  |  |  |  |  |  |  |  |
| First Year Guaranteed Cost Savings: $ |

Notes:

MBtu=106 Btu.

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

\*\*If energy is reported in units other than MBtu, provide a conversion factor to MBtu (e.g., 0.003413 MBtu/kWh).

**Table 2. Verified Savings for Performance Year [ # ]**

[Include all fuels/commodities for project, e.g., electric energy, electric demand, natural gas, fuel oil, propane, water, etc.]

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Cost-saving Measure | Total energy savings (MBtu/ year) | Electric energy savings (kWh/ year) | Electric demand savings (kW/ year)\* | Natural gas savings (MBtu/ year)\*\* | Water savings (gallons/ year) | Other energy savings (MBtu/ year)\*\* | Total energy and water cost savings, Year [#] ($/year) | Energy-related O&M cost savings, Year [#] ($/year) | Total cost savings, Year [#] ($/year) |
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|  |  |  |  |  |  |  |  |  |  |
| Total Savings |  |  |  |  |  |  |  |  |  |
| First Year Guaranteed Cost Savings: $ |

Notes:

MBtu=106 Btu.

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

\*\*If energy is reported in units other than MBtu, provide a conversion factor to MBtu (e.g., 0.003413 MBtu/kWh).

[Table 3 summarizes the variance to guaranteed savings as verified per the M&V plan and Risk and Responsibility Matrix as well as an estimated net variance to the guarantee when including impacts to cost savings due to Entity actions that are outside the ESP’s responsibility. Entity impacts to savings may include, but are not limited to, changes in operating hours, heating/cooling set points or physical changes or removal of equipment.]

**Table 3. Summary of Cost Savings Impact Due to Performance and O&M Issues**

|  |  |  |  |
| --- | --- | --- | --- |
| 1. **Per M&V Plan and RRPM Matrix**
 | **Energy (MBtu)** | **($)** | **Responsibility** |
| * 1. Proposed Cost Savings (from Table 1)
 |  |  | ESP |
| * 1. Verified Cost Savings (from Table 2)
 |  |  | ESP |
| * 1. Guaranteed Cost Savings (from Table 2)
 |  |  | ESP |
| * 1. Variance to Guarantee (b. – c.)
 |  |  | ESP |
| 1. **Estimated Entity Impact to Savings**
 | **Energy (MBtu)** | **($)** | **Responsibility** |
| * 1. Entity Impact on CSMs (Estimated change to energy/cost savings, express losses as negative, increases as positive)
 |  |  | Entity |
| * 1. Net Energy/Cost Savings to Entity (b. + e.)
 |  |  |  |
| * 1. Net Variance (f. – c.)
 | N/A |  |  |

## Savings Adjustments

#### Provide summary of any energy and/or cost savings adjustments required.

## Performance and O&M Issues

#### Note impact of operating deficiencies or enhancements on savings.

#### Note impact of maintenance deficiencies on generation of savings.

#### Detail any deficiencies that need to be addressed by ESP or Entity in Table 4.

**Table 4. Detail of Cost Savings Impact due to Performance and O&M Issues**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| CSM | Impact to Energy Savings (MBTU) | Impact to Cost Savings ($) | CSM Location | Cause of Savings Impact | Responsibility(ESP/Entity) |
|  |  |  |  |  |  |
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## Energy, Water, and O&M Data

#### Provide monthly utility data for the Baseline period and the performance year.

#### Detail energy and water rates used to calculate cost savings for this period.

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

#### Report actual energy and water rates at site for same period (optional).

## Verified Savings to Date

#### Summarize information in Table 5.

**Table 5. Verified Savings for Performance Period to Date**

[Include all fuels/commodities for project, e.g., electric energy, electric demand, natural gas, fuel oil, propane, water, etc.]

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Year # | Total energy savings (MBtu/yr) | Electric energy savings (kWh/yr) | Electric demand savings (kW/yr)\* | Natural gas savings (MBtu/yr)\*\* | Water savings (gallons/yr) | Other energy savings (MBtu/yr)\*\* | Total energy and water cost savings, ($/yr) | Energy-related O&M cost savings, ($/yr) | Total cost savings, ($/yr) | Guaranteed cost-savings for year |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| Total Savings |  |  |  |  |  |  |  |  |  |  |

Notes:

MBtu=106 Btu.

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

\*\*If energy is reported in units other than MBtu, provide a conversion factor to MBtu (e.g., 0.003413 MBtu/kWh).

# Details for CSM [name / #]

Develop section for each CSM.

## Overview of CSM, M&V Plan, and Savings Calculation for CSM

* Summarize the scope of work, location, and how cost savings are generated.
* Describe source of all savings including energy, water, O&M, and other (if applicable).
* Discuss any changes in scope/results recorded in post-installation M&V report.
* State M&V guideline and option used (A, B, C or D).
* Provide an overview of M&V activities for CSM.
* Explain the intent of M&V plan, including what is being verified.
* Provide an overview of savings calculation methods for CSM.
* Provide a general description of analysis methods used for savings calculations.

## M&V Activities Conducted This Period

Detail measurements, monitoring, and inspections conducted this reporting period in accordance with M&V plan.

* Measurement equipment used
* Equipment calibration documentation
* Dates/times of data collection or inspections, names of personnel, and documentation of Entity witnessing
* Details to confirm adherence to sampling plan
* Include all measured values for this period. Include periods of monitoring, durations and frequency of measurements. (Use appendix and electronic format as necessary). Include description of data format (headings, units, etc.).
* Describe how performance criteria have been met.
* Detail performance deficiencies that need to be addressed by ESP or Entity.
* Note impact of performance deficiencies or enhancements on generation of savings.

## Verified Savings Calculations and Methodology

* Provide detailed description of analysis methodology used.
* Describe any data manipulation or analysis that was conducted prior to applying savings calculations.
* Detail all assumptions and sources of data, including all stipulated values used in calculations.
* Include equations and technical details of all calculations made. (Use appendix and electronic format as necessary.) Include description of data format (headings, units, etc.).
* Details of any baseline or savings adjustments made.
* Detail energy and water rates used to calculate cost savings.
* Provide performance period energy & water rate adjustment factors, if used.
* Report actual energy and water rates at site for same period (optional).
* Detail verified savings for this CSM for performance year
	+ Include Table 6.

Table 6. Verified Annual Savings for CSM for Performance Year #

CSM: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

[Include all fuels/commodities for project, e.g., electric energy, electric demand, natural gas, fuel oil, propane, water, etc.]

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Total energy use (MBtu/ year) | Electric energy use (kWh/ year) | Electric energy cost, Year # ($/year) | Electric demand (kW/ year)\* | Electric demand cost, Year # ($/year) | Natural gas (MBtu/ year)\*\* | Natural gas cost, Year # ($/year) | Water use (gallons/year) | Water cost, Year # ($/year) | Other energy use (MBtu/ year) | Other energy cost, Year # ($/year) | Energy-related O&M costs, Year # ($/year) | Total costs, Year # ($/year) |
| Baseline  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Year #  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Savings |  |  |  |  |  |  |  |  |  |  |  |  |  |

Notes:

MBtu = 106 Btu.

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

\*\*If energy is reported in units other than MBtu, provide a conversion factor to MBtu (e.g., 0.003413 MBtu/kWh).

## Details of O&M and Other Savings (if applicable)

* Describe source of savings, if applicable.
* Describe verification activities.
* Provide performance period O&M savings adjustment factors, if applicable.
* Describe source of other savings, if applicable.
* Describe verification activities.
* Provide performance period adjustment factors, if applicable.

## O&M and Other Activities

* Operating requirements:
* State organization(s) responsible for equipment operations. If appropriate, detail how responsibilities are shared.
* Summarize key operating procedures and any related verification activities.
* Detail any deficiencies that need to be addressed by ESP or Entity.
* Note impact of operating deficiencies or enhancements on generation of savings.
* Preventive maintenance requirements:
* State organization(s) responsible for performing maintenance. If appropriate, detail how responsibilities are shared.
* Verification of scheduled maintenance items completed by ESP or Entity.
* Detail any deficiencies that need to be addressed by ESP or Entity.
* Note impact of maintenance deficiencies on generation of savings.
* Repair and replacement requirements:
* State organization(s) responsible for repair and replacement. If appropriate, detail how responsibilities are shared.
* Summary of activities conducted this period by ESP or Entity.
* Detail any deficiencies that need to be addressed by ESP or Entity.
* Note impact of equipment deficiencies on generation of savings.