Final Report

Volume One - Executive Summary

Basewide Energy Study

Fort Indiantown Gap

DEPARTMENT OF THE ARMY
CONSTRUCTION ENGINEERING RESEARCH LABORATORIES
P.O. BOX 4005
CHAMPAIGN, ILLINOIS 61820

REPLY TO ATTENTION OF: TR-I Library

17 Sep 1997

Based on NOW, these Energy Studies are Unclassified/unlimited. Distribution A. Approved for public release.

Marie Wakefield,
Librarian Engineering

Final Report

Volume One - Executive Summary

BASEWIDE ENERGY STUDY

FORT INDIANTOWN GAP

Prepared for

DEPARTMENT OF THE ARMY
Fort Indiantown Gap
Annville, Pennsylvania

Prepared by

XENERGY INC.
60 Mall Road
Burlington, Massachusetts

June, 1989

TABLE OF CONTENTS

SECTION 1
EXECUTIVE SUMMARY

1.1 Purpose

The purpose of this Executive Summary is to summarize the results of the EEAP.

The Army Energy Plan, established in early 1978, sets both short and long term energy goals for the Army consistent with the Presidential Executive Order 12003 issued in mid-1977. It directs the Major Army commands to develop detailed implementation plans and funding documents. The National Energy Conservation Policy Act (NECPA) of 1978, directs that all facilities owned and operated by a Federal Agency must have all energy conservation retrofits performed by 1 January 1990.

The Department of the Army, through the Corps of Engineers Baltimore, has contracted with XENERGY Inc. to provide the Energy Engineering Analysis Program (EEAP) at Fort Indiantown Gap under contract number DACA31-85-0117. The results of the study are indicated in detail in the main report. Backup calculations have been provided under separate volumes to the Corps of Engineers.

1.2 Scope of Work (SOW)

The measurements of work to be provided as stated in the contract are as follows.

1.2.1 Increment A

Increment A projects involve modifying, improving or retrofitting existing buildings, including family housing, to make the buildings more energy efficient. Items to be investigated include architectural and structural features, HVAC systems, plumbing systems, interior or exterior building lighting.

Specifically, a matrix was created listing the 120 buildings to be included in the field survey along with the Energy Conservation Opportunities (ECO) to be examined. Not all buildings of the post were examined in this SOW, but instead, a majority of the energy consuming ones. Also, as specified in the ECO matrix, not every ECO was examined for each building since many were not applicable or appropriate. Despite this, many suitable energy conservation projects were formed at this post.

Computer modeling was used to incorporate field survey data, weather data, occupancy schedules, building construction data, energy distribution systems, and equipment data into a model of the typical buildings and to calculate total base energy use. The computer was used to develop load profiles, calculate energy savings, and evaluate possible energy conservation opportunities. The computer model was capable of analyzing the energy requirements of buildings, performance of heating, cooling, and ventilating equipment, energy distribution systems, and energy conversion equipment. The computer model was verified against historical energy use. The computer program analyzed the installation on an hour-by-hour basis. The computer model used was DOE-2 which has become the industry standard. It is comparable to the BLAST program used by the Army.

1.2.2 Increment B

Increment B projects involve utilities and energy distribution systems, EMCS for building and distribution systems, and existing energy plants. Specifically, the AE shall determine the feasibility of an EMCS for building electrical, mechanical and utility distribution systems. The intent of this study is to determine the basic conceptual architecture of the EMCS to the extent that primary economic calculations can be made to determine feasibility per ECIP criteria. The documentation shall be of sufficient accuracy to insure that future project design calculations that will be done after completion of this study will not deviate more than 20 percent from the results of this study.

The results of this increment indicate that a centralized EMCS is not recommended at Fort Indiantown Gap at this time since the SIR criteria is less than 1.0. Some 34 of the 120 buildings did qualify initially to be grouped into a system of automated controls, but taken as a whole, when the costs of centralizing and non-energy related costs were considered, failed to meet the SIR criteria. As technology and energy price changes in the future, a centralized EMS might be cost-effective.

1.2.3 Increment F

Increment F projects provide recommendations for modifications and changes in system operation which are within the Director of Engineering and Housing funding authority and management control. These projects are also referred to as low cost/no cost projects in this Scope of Work. The intent of this increment is to provide energy saving recommendations in the form of specific, practical instructions for the use by Director of Engineering and Housing personnel. The results of the study were that a number of ECOs were available for local action by the post. These include reduce lighting hours, downsize nozzles, remove vents, domestic hot water no cost/low cost, reconfigure DHW tank.

1.2.4 Increment G

Increment G projects are those feasible energy saving projects developed in Increments A and B which do not qualify under the ECIP criteria. Economic analysis shall be based on ECIP procedures.

The result of the study were that a few of the ECOs did not meet the ECIP criteria, namely reduce window area, drop ceiling with insulation convert to coal, T8 lamps and ballast and O&M.

1.2.5 Project Documentation

Finally, the SOW delineated that project documentation should be created for the following funding types: ECIP, PECIP and QRIP. After review with all parties concerned, five separate project documentations have been created. In addition, other ECOs were grouped for local action only. Finally, ECOs are listed as not cost-effective as no projects were developed for these ECOs. These groupings are summarized in Table 1-1.

Table 1-1

ECO Grouping Summary

Project Type	ECOs
QRIP #1	Relamp/Refixture Lighting
PECIP #1	Heating Systems Controls New Burner Guns
PECIP #2	Destratification Fans
PECIP #3	Pipe and Duct Insulation
ECIP #1	Wall Insulation Roof Insulation Floor Insulation Caulk and Weatherstripping Storm Windows Replace Doors Storm Doors Dock Seals Outside Air Reset Controls
Local Action Only (Increment F)	Reduce Lighting Hours Downsize Nozzles Remove Vents DHW No Cost/Low Cost Reconfigure DHW Tank
Not Cost-Effective (Increment G)	Reduce Window Area Drop Ceiling and Insulation Convert to Coal O&M T8 Lamps & Ballasts

SECTION 2
EXISTING ENERGY CONSUMPTION

2.1 Introduction and Summary

FIG uses four (4) different fuels to satisfy the energy input requirements of the facility. Fuels utilized are electricity, fuel oil (No. 2 and No. 6), propane and coal. During FY85, FIGs total consumption was 188,061 MBTUs. At the current total building inventory of 4,736,731 gross square feet, the facility consumption rate for FY85 was 39,703 BTUs/GSF/YR. When normalized for heating degree days recorded for the site in FY85, the consumption rate translates to 8.77 BTUs/GSF/HDD. A breakdown of units of fuels used at FIG which comprise the total consumption for FY81 through FY85 is shown in Table 2-1. An illustration of the percent of the total consumption each fuel type represents, for FY85 only, is shown in Figure 2-1

An analysis of FIG's energy use has been conducted and is presented and summarized in Figures 2-1 through 2-3. A brief discussion of each figure is provided on page 2-3.

Figures 2-1 through Figure 2-3 have been plotted from the data shown in Table 2-1. The energy and building inventory area data shown in Table 2-1 is that which was provided by the Army for FIG.

Energy consumption data for FIG for the years FY 1975 through FY 1980 was unavailable.

2.2 Historical Energy Use

Table 2-1 summarizes the facility-wide energy data for fiscal years 1981 through 1985. Also listed are heating degree days base 65°F and the building inventory area data for the years addressed.

Table 2-1

Facility-Wide Energy Data for FY81 - FY85

Description	FY 1981	FY 1982	FY 1983	FY 1984	FY 1985
Electricity Usage (MBTU)	29,740	34,305	29,875	19,727	29,492
Fuel Oil Usage (MBTU)	111,120	120,968	112,549	99,818	99,395
Propane Usage (MBTU)	6,048	6,621	6,715	7,244	7,909
Coal Usage (MBTU)	17,101	38,944	38,201	46,302	51,285
TOTAL USE (MBTU)	164,309	202,837	187,340	181,091	188,081
Heating Degree Days	5,780	4,610	4,929	5,982	4,525
Square Footage (Ksf)	4,736 7	4,736 7	4,736 7	4,736 7	4,736 7
TOTAL USE (MBTU/Ksf)	34 69	42.82	39 55	38 23	39 70
TOTAL USE (KBTU/sf/HDD)	0 00600	0 00929	0 00802	0 00639	0.00877

Conversions:

Electricity	3 413 MBTU/mWh
Coal	25 4 MBTU/ton
Propane	0.095 MBTU/gallon
Fuel Oil (#2)	138,700 BTUs/gallon
Fuel Oil (#6)	149,700 BTUs/gallon

2.3 Energy End Use - FY 1985

Figure 2-1 illustrates the percent of the total consumption each fuel type represents. Electricity is used for lighting, fans, pumps, miscellaneous equipment and some cooling. Fuel oil is used for heating and domestic water heating, with most used for heating. Coal is used strictly for heating. Propane is used for domestic water heating and cooking. Space heating and domestic water heating consume 80.0% of the total energy use at FIC.

2.4 Energy Fuel Use Breakdown - FY81 through FY85

The graph in Figure 2-2 shows energy fuel use trends over the years studied. Propane and electricity use have remained fairly constant. Fuel oil consumption indicates a slow trend downward, as coal consumption rises. This illustrates the ongoing conversion of fuel oil-fired equipment to coal-fired equipment which apparently has been occurring over the five year period studied. Nonetheless, fuel use did increase between FY 1984 and FY 1985.

2.5 Total Energy Use Trends

The graph in Figure 2-3 presents the total energy use at FIC for 1981 through 1985 in MBTUs (left scale). For the five year period studied, the data indicates that energy use shows both increasing and decreasing trends year to year. Even when normalized by heating degree days as shown by the KBTU/sf/HDD (right scale) the energy intensity does not show a clear increasing or decreasing trend.

Figure 2-1

Energy End-Use Breakdown (FY 1985)

Fort Indiantown Gap, Annville, PA

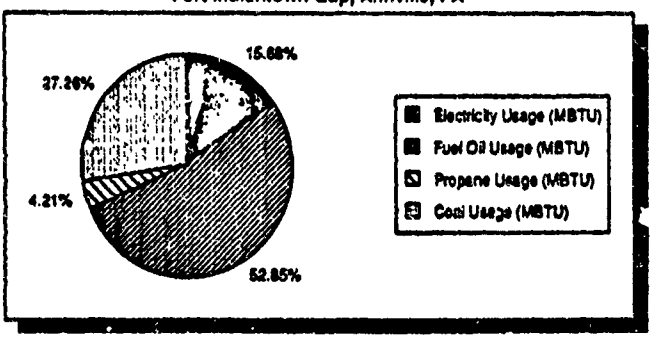


Figure 2-2

Energy Fuel Use Breakdown

Fort Indiantown Gap, Annville, PA

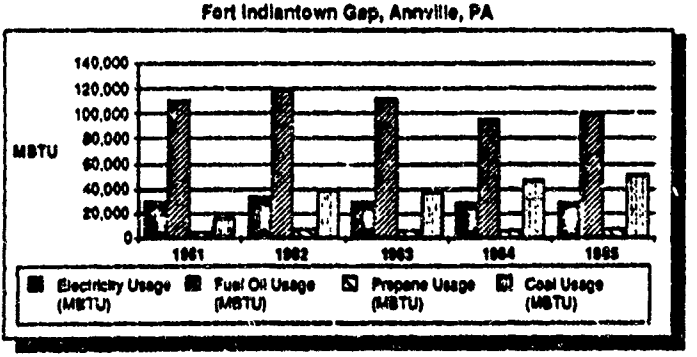
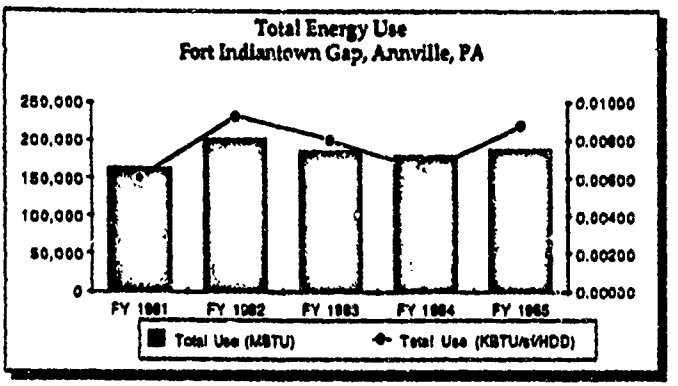


Figure 2-3
Total Energy Use
Fort Indiantown Gap, Annville, PA



2.6 Individual Building Energy Use

Table 2-2 presents individual building performance data for all 120 buildings plus the area 14 corridors audited for the study. The total KBTUs shown for each year for each building does include electricity consumed as estimated by the DOE-2 simulations. The KBTU/sf utilization shown for each building for FY85 includes what fuels are used in the building for space heating and domestic water heating and electricity. Data for the table was provided by actual fuel bills for each building and the estimated electrical use derived from the DOE-2 simulations.

The total FY1985 fossil fuel was 87,215 MBTU (55% of the post total) and the total electricity use was 3,944,920 kWh (46% of the past total). Also shown in Table 2-2 are the peak heating and cooling loads for each building, as well as the energy utilization index (KBTU/sf). The energy utilization index includes the fossil fuel and electrical use shown.

Table 2-2
Surveyed Building List Sorted by Building

Building Number	Building Description	Building Area (sf)	Annual Electricity Use (Kwh)	FY 1985 Fossil Fuel Use (MBTU)	Peak Heating Load (KBTU/hr)	Peak Cooling Load (KBTU/hr)	FY 1985 Energy Utilization (KBTU/sf)
00-001	Offices	14,884	109,154	2,421	525 43	615 88	187 76
00-004	BOQ	7,296	40,806	78	262 83	224 14	29 09
00-006	Club	12,686	81,970	127	428 81	272 90	33 99
00-022	Chapel	3,145	15,118	1,186	119 11	111.02	383 97
01-004	Recreation	2,592	8,241	300	98.86	91 00	122.64
03-108	Office	8,737	17,665	879	383.22	906.74	107 51
03-114	Classroom	2,333	32,973	473	96.04	125.13	259 01
04-117	Gym	21,927	157,372	1,872	1,141.69	760 32	106 79
04-118	Bowling Alley	11,234	22,714	1,323	428.45	394 40	156.67
04-162	STP	809	1,636	144	30.85	28 40	384 90
05-001	Office	2,160	15,950	813	76.28	60.80	399 93
05-002	Barracks	4,500	6,937	79	181.23	101.14	21.30
05-040	Office	1,070	1,176	66	43 10	24.05	65.43
05-047	Mess Hall	2,096	2,299	25	84 42	47 11	35.67
05-115	Office	84,710	142,195	39	1,173.27	1,023.00	13.11
05-117	Fire Station	5,469	40,218	810	192.33	152.81	179.21
07-001	Office	2,170	8,890	231	73 35	63 96	120 43
07-002	BOQ	7,353	54,073	1,219	259 59	207 45	190 88
07-004	Office	1,075	4,404	275	36.34	31.66	368 61
07-005	Office	3,232	13,414	390	78 49	62 57	199 83
07-006	Office	1,075	4,404	186	36.34	31 68	187.01
07-021	Motor Rpr	2,988	12,241	589	101 00	86 0"	231 10
07-034	Office	2,170	8,890	397	73.35	63.96	190.83
08-003	BOQ	7,354	30,127	651	248 58	216.75	102.51
08-004	BOQ	7,354	35,351	191	292 E.	259 65	42.36
08-011	Office	3,528	14,453	595	119 25	103 98	182 63
08-012	Office	2,187	10,513	243	82.83	77.20	127 52
08-013	Office	1,647	12,112	209	57.92	46 02	132 08
08-015	Office	1,647	10,333	241	85 76	53 61	167 74
08-020	Laundry	2,187	12,721	193	113 87	73.84	109 66
08-024	Office	783	5,758	136	27 94	21.88	224.33
08-027	Barracks	4,800	25,168	471	149 77	138.25	123.76
08-028	Barracks	4,800	28,233	550	234 31	151 93	143.64
08-032	Office	1,075	6,743	183	36.97	36.29	191 65
08-033	Barracks	4,500	25,168	582	149 77	138 25	148.42
08-034	Mess Hall	2,243	12,545	897	74 65	68.91	285.25
08-035	Barracks	4,500	25,168	540	149 77	138.25	139 09
08-036	Barracks	4,500	25,168	613	149 77	138.25	153 76
04-042	Office	1,075	4,404	315	36.34	31.66	307 01
08-046	Supply	2,456	4,966	238	94.08	86.58	130 58
08-048	Barracks	4,500	25,168	614	149 77	138.25	155 53
08 050	Barracks	4,500	25,168	395	149 77	138 25	106 87
08-051	Barracks	4,500	25,168	469	149 77	138.25	119 47
08-052	Barracks	4,500	25,168	668	149 77	138 25	171 38
08-054	Office	3,528	14,453	877	119.25	103 98	262 56
08-056	Lab	4,114	16,854	1,209	139 06	121.25	327 30
08-059	Motor Rpr	2,988	10,747	314	155 58	100 88	126.30
08-063	Switchboard	2,146	15,726	295	73.12	90 68	162.27
08-065	Club	13,962	76,729	2,572	604 53	863 66	177.54
08-067	BOQ	7,410	30,356	566	230 47	218 40	90 10
08-079	Library	4,318	19 509	266	132 72	133 16	72 42
10-030	Mess Hall	7,360	49,376	130	89 51	116 63	134 97
10-031	Barracks	4,720	98.732	438	179 05	233 26	144.20
10-032	Barracks	4,720	98.732	317	179 05	233.26	136 57

Table 2-2 (Continued)

Building Number	Building Description	Building Area (sf)	Annual Electricity Use (Kwh)	FY 1985 Fossil Fuel Use (MBTU)	Peak Heating Load (KBTU/hr)	Peak Cooling Load (KBTU/hr)	FY 1985 Energy Utilization (KBTU/sf)
10-033	Office	1,164	4,687	161	38.67	33.72	154.72
10-034	Supply	1,296	7,268	168	43.13	39.81	146.72
10-066	Warehouse	8,376	22,024	348	181.72	158.45	39.56
• 11-006	Clothing Sales	11,113	49,724	1,806	578.63	373.21	186.98
11-007	Office	19,106	78,263	1,533	645.76	862.05	95.27
• 11-009	Office	10,372	42,491	995	390.60	308.70	109.91
11-012	Supplies	11,107	45,502	5,269	375.44	327.36	488.37
11-013	Storage	9,054	37,091	776	306.04	266.85	99.69
11-017	Shops	3,410	13,970	243	113.27	100.51	85.24
11-018	Shops	3,410	13,970	348	113.27	100.51	114.04
11-019	Office	5,595	22,921	668	189.12	164.91	131.39
11-029	Office	5,469	22,403	607	184.86	161.19	130.46
11-030	Shops	4,849	19,863	238	163.91	142.92	63.27
11-031	Storage	2,826	10,782	102	99.38	78.96	61.19
• 11-036	Latrine	207	1,522	23	7.28	5.75	136.21
• 11-070	Heavy Equip	10,591	43,388	1,016	358.00	312.16	109.91
11-071	Warehouse	10,591	43,388	3,853	358.00	312.16	377.78
11-088	Cold Storage	40,000	294,153	283	1,406.70	1,117.66	32.17
11-091	Warehouse	119,200	488,321	3,906	4,029.22	3,513.26	63.33
11-095	Office	171	701	0	5.78	5.04	13.99
12-033	Mess Hall	1,649	1,809	168	66.42	37.06	103.80
12-038	Mess Hall	2,294	2,517	62	92.40	51.56	30.77
• 13-176	Comm Ctr	2,574	12,373	332	97.49	90.86	145.39
14-099	Office	5,277	25,367	963	199.86	186.28	198.90
14-100	Office	3,070	4,207	340	117.08	107.78	189.31
14-101	BOQ	3,391	18,963	619	112.86	104.18	201.63
14-102	Crew Rm	1,075	4,404	196	36.34	33.68	196.31
14-103	BOQ	4,245	23,707	773	141.32	130.44	201.41
14-104	BOQ	3,975	24,940	725	208.97	134.21	203.80
14-105	BOQ	4,246	26,440	775	221.08	143.36	208.94
14-106	BOQ	3,391	21,275	619	176.56	114.49	208.96
14-107	BOQ	4,246	28,411	775	140.81	149.89	198.93
14-108	BOQ	3,391	21,273	619	176.56	114.49	208.96
14-109	BOQ	3,391	21,275	619	176.56	114.49	208.96
14-110	Office	3,700	17,766	675	140.14	130.61	198.64
14-111	BOQ	3,391	18,963	619	112.86	104.18	201.63
14-112	Office	3,848	11,028	702	167.91	126.55	198.21
14-116	Health Clinic	3,722	13,268	679	123.81	107.70	196.41
14-118	Health Clinic	2,767	11,318	568	93.33	81.58	196.49
14-120	Health Clinic	1,465	1,885	264	38.20	32.68	186.64
14-200	Office	4,077	16,704	748	138.49	120.75	196.53
14-202	Office	3,960	13,731	706	129.80	113.16	196.53
14-204	Office	3,860	18,731	701	129.80	113.18	196.33
14-206	Office	3,637	14,900	664	122.94	107.20	196.53
14-208	Office	3,637	14,900	664	122.94	107.20	195.35
14-210	Office	3,637	14,900	664	122.94	107.20	196.55
14-212	Storage	3,637	76,093	664	137.95	179.76	253.97
14-214	Office	3,840	18,731	701	129.80	113.18	196.53
14-300	Office	6,445	26,408	1,176	217.86	189.96	196.45
14-301	Storage	9,662	39,382	1,765	326.60	284.77	196.63
14-304	Computer	4,212	23,357	768	140.19	129.40	201.42
14-306	Office	3,637	14,900	666	122.94	107.20	196.95
14-308	Office	3,637	14,960	660	123.94	107.20	196.83
14-310	Storage	3,848	18,497	702	145.76	133.84	198.86

Table 2-2 (Concluded)

Building Number	Building Description	Building Area (sf)	Annual Electricity Use (Kwh)	FY 1985 Fossil Fuel Use (MBTU)	Peak Heating Load (KBTU/hr)	Peak Cooling Load (KBTU/hr)	FY 1985 Energy Utilization (KBTU/sf)
14-401	Custodial	782	14,341	143	29.66	38.65	254.27
14-415	Office	3,650	14,95*	666	123.38	107.98	196.45
14-417	Storage	3,633	14,883	660	122.80	107.08	196.46
14-419	Storage	3,650	14,953	666	123.38	107.58	196.45
14-501	Boiler Plant	3,872	28,474	706	136.17	108.19	207.43
14-COR	Area 14 Corridor	30,000	122,900	4413	1,014.06	384.21	167.82
* 16-[illegible]17	Office	3,006	12,313	288	101.61	88.60	109.79
* 16-1[illegible]9	TMP	18,043	132,700	2,011	634.60	504.20	136.54
* 16-153	Office	2,532	18,373	343	85.59	74.63	108.95
* 19-018	Office	2,085	18,023	309	70.97	73.60	143.42
* 19-020	Hangar	5,646	41,481	632	199.38	158.37	136.60
25-020	Office	741	3,036	87	28.08	21.84	131.39
TOTALS		760,665	3,944,550	87,322	27,523	23,319	132.37

Note 1. Electricity use is not separately metered, values in table are derived from the DOE-2 simulations.
Note 2: Peak Heating and Peak Cooling Loads derived from the DOE-2 simulations.
Note 3 FY 1985 Energy Utilization includes both fossil fuel and electrical use
Note 4. Starred (*) buildings had no record of FY1985 actual fuel use, table values derived from DOE-2 simu
Note 5 Building 14-419 is presently vacant, fuel and electrical use based assumes full occupancy.
Note 6 Building 11-95 has electric heat only due to its small size.
Note 7 Area 14 buildings fossil fuel use pro-rated by square footage assuming 25% central plant distribution

SECTION 3

ENERGY CONSERVATION OPPORTUNITY (ECO)SUMMARY

As a result of XENERGY's on-site evaluations and subsequent analysis, thirty Energy Conservation Opportunities (ECOs) have been evaluated. These include recommendations which address energy efficiency of the building envelope (walls, roof, windows), ventilation systems, HVAC system controls, steam systems, domestic hot water (DHW) systems, and lighting systems.

Table 3-1 is the ECO Master Matrix Summary. This table shows the status of each of the recommendations for each of the buildings. Some of the codes in this table may require some additional clarification. Measures which are considered acceptable have a Savings to Investment Ratio (SIR) which is greater than 1 and are indicated as REC. If the SIR is less than 1, indicating that the measure is not recommended, we are SIR < 1. Finally, if the particular recommendation is not applicable to some building, we have indicated this by N/A.

All of the recommendations are further categorized as ECIP, QRIP or PECIP ECOs. Table 3-2 presents a list of the ECOs and indicates which category they represent. Local indicates that the measure is to be implemented by facility staff. A brief description of the categories follows.

3.1 ECIP

Recommendations which are classified as ECIP have payback periods which exceed 4 years and therefore are not available for funding by QRIP or PECIP. Primarily, these include building envelope recommendations such as roof, floor and wall insulation, caulking and weatherstripping, storm windows and doors, replacement doors, dock seals and outdoor air reset. The total energy savings of the ECIP recommendations is 18,082.9 MBtu including synergistic effects.

3.2 QRIP and PECIP

QRIP recommendations have paybacks which are less than 2 years. Included in this category are relamping and refixturing of incandescent and fluorescent lighting systems. Overall energy savings in the QRIP category are 808.37 MBtu.

Table 3-1

ECO Master Matrix Summary

Building Number	Wall Insulation Status	Roof Attic Insulation Status	Roof Cavity Insulation Status	Roof with Drop Ceiling Insulation Status	Floor Insulation Status	Window Caulk & Wstrip Status	Door Caulk & Wstrip Status	Storm Window Status	Reduce Window Area Status	Storm Door Status	Replace Door Status	Loading Dock Seals Status	Add Vestibule Status	Reduce Lighting Hours Status	T8/Electronic Fluorescent Lighting Status
[illegible]	REC	N/A	SIR<1	SIR<1	REC	REC	REC	REC	N/A	N/A	SIR<1	N/A	N/A	N/A	REC
[illegible]	N/A	REC	REC	SIR<1	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	SIR<1	REC	SIR<1	SIR<1	SIR<1	REC	REC	REC	N/A	N/A	SIR<1	N/A	SIR<1	N/A	REC
[illegible]	REC	N/A	N/A	N/A	N/A	SIR<1	REC	REC	N/A	N/A	REC	N/A	N/A	N/A	REC
[illegible]	REC	N/A	SIR<1	N/A	N/A	REC	REC	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A
[illegible]	SIR<1	N/A	SIR<1	N/A	SIR<1	REC	REC	REC	N/A	REC	REC	N/A	N/A	N/A	N/A
[illegible]	SIR<1	SIR<1	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	REC
[illegible]	N/A	N/A	N/A	N/A	N/A	SIR<1	SIR<1	SIR<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	N/A	N/A	N/A	N/A	N/A	REC	N/A	REC	N/A	N/A	REC	N/A	SIR<1	REC	REC
[illegible]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	REC	N/A	SIR<1	N/A	N/A
[illegible]	N/A	N/A	N/A	N/A	N/A	REC	REC	REC	SIR<1	REC	REC	N/A	N/A	N/A	REC
[illegible]	SIR<1	N/A	SIR<1	N/A	SIR<1	REC	REC	REC	SIR<1	SIR<1	N/A	N/A	N/A	N/A	REC
[illegible]	SIR<1	SIR<1	SIR<1	N/A	SIR<1	SIR<1	SIR<1	SIR<1	N/A	SIR<1	SIR<1	N/A	SIR<1	N/A	N/A
[illegible]	SIR<1	N/A	SIR<1	N/A	SIR<1	SIR<1	N/A	SIR<1	N/A	N/A	SIR<1	N/A	SIR<1	N/A	N/A
[illegible]	SIR<1	N/A	SIR<1	N/A	SIR<1	SIR<1	N/A	SIR<1	N/A	N/A	SIR<1	N/A	SIR<1	N/A	N/A
[illegible]	SIR<1	N/A	SIR<1	N/A	SIR<1	SIR<1	N/A	SIR<1	N/A	N/A	SIR<1	N/A	N/A	N/A	N/A
[illegible]	REC	N/A	N/A	N/A	N/A	REC	REC	REC	N/A	REC	REC	N/A	SIR<1	N/A	N/A
[illegible]	REC	N/A	REC	N/A	REC	REC	REC	N/A	N/A	N/A	REC	N/A	SIR<1	REC	REC
[illegible]	REC	REC	REC	SIR<1	REC	REC	N/A	REC	N/A	N/A	REC	N/A	SIR<1	N/A	N/A
[illegible]	N/A	N/A	N/A	N/A	SIR<1	SIR<1	N/A	N/A	N/A	N/A	SIR<1	N/A	SIR<1	N/A	N/A
[illegible]	SIR<1	REC	SIR<1	SIR<1	SIR<1	REC	N/A	N/A	N/A	N/A	SIR<1	N/A	SIR<1	N/A	REC
[illegible]	REC	REC	N/A	SIR<1	REC	REC	N/A	N/A	N/A	N/A	REC	N/A	SIR<1	N/A	N/A
[illegible]	REC	REC	REC	SIR<1	REC	REC	N/A	N/A	N/A	N/A	REC	N/A	SIR<1	N/A	N/A
[illegible]	SIR<1	REC	N/A	N/A	N/A	REC	N/A	REC	N/A	N/A	SIR<1	N/A	SIR<1	N/A	N/A
[illegible]	REC	REC	REC	REC	REC	REC	N/A	REC	N/A	N/A	REC	N/A	SIR<1	N/A	N/A
[illegible]	REC	REC	REC	SIR<1	REC	REC	N/A	N/A	N/A	N/A	REC	N/A	SIR<1	N/A	N/A
[illegible]	REC	REC	REC	REC	N/A	REC	N/A	N/A	N/A	N/A	REC	N/A	SIR<1	N/A	N/A
[illegible]	SIR<1	REC	N/A	SIR<1	SIR<1	N/A	REC	REC	SIR<1	REC	N/A	N/A	N/A	REC	REC
[illegible]	REC	N/A	REC	N/A	REC	REC	N/A	REC	N/A	N/A	REC	N/A	SIR<1	N/A	N/A
[illegible]	REC	N/A	REC	N/A	REC	REC	N/A	REC	SIR<1	N/A	REC	N/A	SIR<1	N/A	N/A
[illegible]	SIR<1	N/A	REC	N/A	REC	REC	N/A	REC	SIR<1	N/A	REC	N/A	SIR<1	N/A	REC
[illegible]	REC	N/A	REC	SIR<1	N/A	REC	N/A	REC	SIR<1	N/A	REC	N/A	SIR<1	N/A	N/A
[illegible]	REC	N/A	REC	REC	REC	REC	N/A	N/A	N/A	N/A	REC	N/A	SIR<1	N/A	REC
[illegible]	REC	N/A	REC	N/A	REC	REC	N/A	N/A	N/A	N/A	REC	N/A	N/A	N/A	REC
[illegible]	REC	N/A	REC	N/A	REC	REC	N/A	REC	SIR<1	N/A	REC	N/A	N/A	N/A	REC
[illegible]	N/A	N/A	REC	SIR<1	REC	REC	N/A	N/A	N/A	N/A	REC	N/A	SIR<1	N/A	REC
[illegible]	N/A	N/A	REC	SIR<1	REC	REC	N/A	REC	REC	N/A	REC	N/A	SIR<1	N/A	N/A
[illegible]	SIR<1	N/A	SIR<1	SIR<1	SIR<1	SIR<1	SIR<1	N/A	N/A	SIR<1	SIR<1	N/A	SIR<1	REC	REC
[illegible]	REC	N/A	REC	N/A	REC	REC	N/A	REC	REC	N/A	REC	N/A	SIR<1	N/A	REC
[illegible]	REC	N/A	REC	N/A	REC	REC	N/A	REC	REC	N/A	REC	N/A	SIR<1	N/A	REC
[illegible]	N/A	N/A	SIR<1	N/A	REC	REC	N/A	REC	SIR<1	N/A	REC	N/A	SIR<1	N/A	N/A

Table 3-1 (Continued)

Building Number	Wall Insulation Status	Roof Attic Insulation Status	Roof Cavity Insulation Status	Roof w/Drop Ceiling Insulation Status	Floor Insulation Status	Window Caulk & Wthstp Status	Door Caulk & Wthstp Status	Storm Window Status	Reduce Window Area Status	Storm Door Status	Replace Door Status	Loading Dock Seals Status	Add Vestibule Status	Reduce Lighting Hours Status	T12 Efficient Fluorescent Lighting Status
[illegible]	REC	REC	REC	N/A	N/A	REC	N/A	N/A	N/A	N/A	REC	N/A	SIR<1	N/A	REC
[illegible]	N/A	N/A	REC	SIR<1	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	N/A	N/A	REC	N/A	REC	N/A	REC	N/A	N/A	REC	REC	N/A	SIR<1	N/A	REC
[illegible]	N/A	N/A	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	REC	N/A	SIR<1	N/A	REC
[illegible]	N/A	N/A	REC	SIR<1	REC	N/A	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A
[illegible]	REC	N/A	REC	SIR<1	N/A	REC	N/A	N/A	N/A	N/A	REC	N/A	N/A	N/A	REC
[illegible]	REC	N/A	REC	SIR<1	REC	REC	N/A	REC	SIR<1	N/A	REC	N/A	SIR<1	N/A	REC
[illegible]	REC	N/A	REC	SIR<1	N/A	REC	N/A	REC	SIR<1	N/A	REC	N/A	SIR<1	N/A	N/A
[illegible]	REC	REC	REC	SIR<1	REC	REC	REC	REC	SIR<1	N/A	REC	N/A	SIR<1	N/A	REC
[illegible]	REC	N/A	N/A	REC	REC	N/A	N/A	N/A	N/A	N/A	REC	N/A	N/A	N/A	REC
[illegible]	N/A	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A
[illegible]	N/A	N/A	N/A	N/A	N/A	REC	REC	REC	SIR<1	SIR<1	N/A	N/A	N/A	REC	REC
[illegible]	SIR<1	SIR<1	SIR<1	N/A	SIR<1	SIR<1	N/A	SIR<1	SIR<1	N/A	SIR<1	SIR<1	N/A	N/A	REC
[illegible]	SIR<1	REC	SIR<1	N/A	SIR<1	SIR<1	N/A	SIR<1	SIR<1	N/A	SIR<1	N/A	N/A	N/A	REC
[illegible]	SIR<1	REC	SIR<1	N/A	SIR<1	SIR<1	N/A	SIR<1	SIR<1	N/A	SIR<1	N/A	N/A	N/A	N/A
[illegible]	REC	REC	REC	SIR<1	REC	REC	N/A	REC	SIR<1	N/A	REC	N/A	N/A	N/A	N/A
[illegible]	REC	REC	REC	SIR<1	N/A	REC	N/A	REC	REC	N/A	REC	N/A	N/A	N/A	REC
[illegible]	REC	REC	N/A	N/A	N/A	REC	N/A	REC	SIR<1	N/A	REC	N/A	N/A	N/A	REC
[illegible]	REC	REC	N/A	SIR<1	REC	REC	N/A	REC	SIR<1	N/A	REC	SIR<1	SIR<1	N/A	REC
[illegible]	REC	N/A	N/A	N/A	N/A	REC	REC	REC	SIR<1	REC	N/A	REC	N/A	N/A	REC
[illegible]	SIR<1	SIR<1	N/A	SIR<1	SIR<1	REC	N/A	REC	SIR<1	N/A	REC	REC	SIR<1	N/A	REC
[illegible]	REC	REC	N/A	REC	REC	REC	N/A	REC	SIR<1	N/A	REC	REC	SIR<1	N/A	REC
[illegible]	N/A	REC	N/A	SIR<1	REC	REC	REC	REC	SIR<1	N/A	REC	REC	N/A	N/A	N/A
[illegible]	REC	N/A	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A	REC	N/A	N/A	N/A	REC
[illegible]	REC	N/A	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A	REC	N/A	N/A	N/A	REC
[illegible]	REC	REC	N/A	SIR<1	REC	REC	N/A	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A
[illegible]	REC	REC	N/A	SIR<1	REC	REC	N/A	REC	SIR<1	N/A	REC	N/A	SIR<1	N/A	N/A
[illegible]	REC	N/A	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A	REC	N/A	N/A	N/A	REC
[illegible]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	REC	N/A	REC	N/A	N/A	REC	N/A	REC	SIR<1	N/A	REC	N/A	N/A	N/A	N/A
[illegible]	N/A	N/A	N/A	N/A	N/A	REC	N/A	REC	SIR<1	N/A	N/A	SIR<1	N/A	N/A	REC
[illegible]	N/A	N/A	N/A	N/A	SIR<1	REC	REC	REC	SIR<1	N/A	N/A	N/A	N/A	N/A	REC
[illegible]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	N/A	N/A	N/A	SIR<1	N/A	N/A	REC	N/A	N/A	N/A	N/A	SIR<1	N/A	N/A	N/A
[illegible]	N/A	REC	N/A	SIR<1	REC	REC	N/A	REC	SIR<1	N/A	SIR<1	N/A	N/A	N/A	REC
[illegible]	N/A	REC	N/A	SIR<1	N/A	REC	REC	REC	SIR<1	REC	N/A	N/A	N/A	N/A	N/A
[illegible]	N/A	SIR<1	N/A	SIR<1	N/A	SIR<1	SIR<1	SIR<1	SIR<1	SIR<1	N/A	N/A	N/A	N/A	N/A
[illegible]	N/A	N/A	N/A	N/A	N/A	REC	N/A	REC	SIR<1	REC	N/A	N/A	N/A	N/A	N/A
[illegible]	REC	REC	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A	REC	N/A	SIR<1	N/A	N/A
[illegible]	REC	REC	N/A	SIR<1	REC	REC	N/A	REC	SIR<1	N/A	REC	N/A	SIR<1	N/A	N/A
[illegible]	REC	REC	N/A	SIR<1	REC	REC	N/A	REC	REC	N/A	SIR<1	N/A	SIR<1	N/A	N/A

Table 3-1 (Continued)

Building Number	Wall Insulation Status	Roof Attic Insulation Status	Roof Cavity Insulation Status	Roof w/R30 Drop-Ceiling Insulation Status	Floor Insulation Status	Window Caulk & Weatherstrip Status	Door Caulk & Weatherstrip Status	Storm Window Status	Exterior Window Area Status	Storm Door Status	Replace Door Status	Loading Dock Seals Status	Add Vestibule Status	Exterior Lighting Fixtures Status	T12 Electronic Fluorescent Lighting Status
15-102	N/A	N/A	REC	SIR<1	N/A	REC	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A
15-103	REC	REC	N/A	SIR<1	REC	REC	N/A	REC	REC	N/A	SIR<1	N/A	SIR<1	N/A	N/A
15-104	REC	N/A	REC	SIR<1	REC	REC	N/A	REC	SIR<1	N/A	REC	N/A	SIR<1	REC	N/A
15-105	REC	REC	N/A	SIR<1	REC	REC	N/A	REC	SIR<1	N/A	REC	N/A	SIR<1	N/A	N/A
15-106	REC	N/A	REC	REC	REC	REC	N/A	REC	SIR<1	N/A	REC	N/A	SIR<1	N/A	N/A
15-107	REC	N/A	REC	REC	REC	REC	N/A	REC	SIR<1	N/A	REC	N/A	SIR<1	REC	N/A
15-108	REC	N/A	REC	SIR<1	REC	REC	N/A	REC	SIR<1	N/A	REC	N/A	N/A	N/A	N/A
15-109	REC	N/A	REC	SIR<1	REC	REC	N/A	REC	SIR<1	N/A	REC	N/A	N/A	N/A	N/A
15-110	N/A	N/A	N/A	N/A	N/A	REC	REC	N/A	N/A	REC	REC	N/A	N/A	REC	N/A
15-111	REC	REC	N/A	SIR<1	REC	REC	N/A	REC	SIR<1	N/A	SIR<1	N/A	N/A	N/A	N/A
15-112	REC	N/A	SIR >1	SIR<1	REC	REC	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A
15-113	REC	REC	N/A	SIR<1	REC	REC	REC	N/A	N/A	REC	N/A	N/A	N/A	N/A	REC
15-114	REC	N/A	REC	SIR<1	REC	REC	REC	REC	N/A	REC	N/A	N/A	N/A	N/A	REC
15-115	REC	N/A	REC	SIR<1	REC	REC	REC	REC	SIR<1	N/A	N/A	N/A	N/A	N/A	N/A
15-116	REC	N/A	REC	SIR<1	REC	REC	REC	REC	SIR<1	N/A	N/A	N/A	N/A	N/A	N/A
15-117	SIR<1	SIR<1	N/A	SIR<1	SIR<1	SIR<1	SIR<1	SIR<1	SIR<1	SIR<1	N/A	N/A	N/A	N/A	REC
15-118	REC	N/A	REC	SIR<1	REC	REC	N/A	REC	SIR<1	REC	REC	N/A	N/A	N/A	N/A
15-119	REC	N/A	REC	SIR<1	REC	REC	N/A	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A
15-120	REC	N/A	REC	N/A	REC	REC	N/A	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A
15-121	REC	N/A	REC	N/A	REC	REC	N/A	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A
15-122	REC	N/A	SIR<1	N/A	REC	REC	N/A	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A
15-123	REC	N/A	REC	N/A	REC	REC	N/A	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A
15-124	SIR<1	SIR<1	N/A	SIR<1	SIR<1	SIR<1	SIR<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
15-125	REC	N/A	SIR<1	N/A	REC	REC	N/A	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A
15-126	REC	N/A	REC	SIR<1	REC	REC	N/A	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A
15-127	REC	N/A	REC	SIR<1	REC	REC	N/A	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A
15-128	REC	N/A	REC	SIR<1	REC	REC	REC	REC	N/A	N/A	REC	N/A	N/A	N/A	N/A
15-129	REC	N/A	REC	SIR<1	REC	REC	REC	REC	N/A	N/A	REC	N/A	N/A	N/A	N/A
15-130	REC	N/A	REC	SIR<1	REC	REC	REC	REC	N/A	N/A	REC	N/A	N/A	N/A	N/A
15-131	REC	N/A	REC	SIR<1	REC	REC	REC	REC	SIR<1	N/A	REC	N/A	N/A	N/A	N/A
15-132	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
15-133	REC	N/A	REC	SIR<1	REC	REC	REC	REC	SIR<1	N/A	REC	N/A	N/A	N/A	N/A
15-134	REC	N/A	REC	SIR<1	REC	REC	REC	REC	SIR<1	N/A	REC	N/A	N/A	N/A	N/A
15-135	REC	N/A	REC	SIR<1	REC	REC	REC	REC	SIR<1	N/A	REC	N/A	N/A	N/A	N/A
15-136	REC	N/A	REC	SIR<1	REC	REC	REC	REC	SIR<1	N/A	REC	N/A	N/A	N/A	N/A
15-137	REC	N/A	REC	SIR<1	REC	REC	REC	REC	SIR<1	N/A	REC	N/A	N/A	N/A	N/A
15-138	REC	N/A	REC	SIR<1	REC	REC	REC	REC	SIR<1	N/A	REC	N/A	N/A	N/A	N/A
15-139	REC	N/A	REC	SIR<1	REC	REC	REC	REC	SIR<1	N/A	REC	N/A	N/A	N/A	N/A
15-140	REC	N/A	REC	SIR<1	REC	REC	REC	REC	SIR<1	N/A	REC	N/A	N/A	N/A	N/A
15-141	REC	N/A	REC	SIR<1	REC	REC	REC	REC	SIR<1	N/A	REC	N/A	N/A	N/A	N/A
15-142	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
15-143	REC	N/A	REC	SIR<1	REC	REC	REC	REC	SIR<1	N/A	REC	N/A	N/A	N/A	N/A
15-144	REC	N/A	REC	SIR<1	REC	REC	REC	REC	SIR<1	N/A	REC	N/A	N/A	N/A	N/A
15-145	REC	N/A	REC	SIR<1	REC	REC	REC	REC	SIR<1	N/A	REC	N/A	N/A	N/A	N/A
15-146	REC	N/A	REC	SIR<1	REC	REC	REC	REC	SIR<1	N/A	REC	N/A	N/A	N/A	N/A
15-147	REC	N/A	REC	SIR<1	REC	REC	REC	REC	SIR<1	N/A	REC	N/A	N/A	N/A	N/A
15-148	REC	N/A	REC	SIR<1	REC	REC	REC	REC	SIR<1	N/A	REC	N/A	N/A	N/A	N/A
15-149	REC	N/A	REC	SIR<1	REC	REC	REC	REC	SIR<1	N/A	REC	N/A	N/A	N/A	N/A
15-150	REC	N/A	REC	SIR<1	REC	REC	REC	REC	SIR<1	N/A	REC	N/A	N/A	N/A	N/A
15-151	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
15-CCR	REC	N/A	N/A	SIR<1	REC	REC	REC	REC	SIR<1	N/A	REC	N/A	N/A	N/A	N/A
15-147	REC	REC	REC	N/A	N/A	REC	N/A	REC	SIR<1	N/A	REC	N/A	SIR<1	N/A	REC
15-149	N/A	N/A	N/A	SIR<1	N/A	SIR<1	N/A	SIR<1	SIR<1	SIR<1	SIR<1	N/A	SIR<1	N/A	REC
15-153	N/A	N/A	N/A	N/A	N/A	REC	REC	REC	SIR<1	REC	REC	N/A	SIR<1	N/A	N/A
15-CHE	REC	REC	N/A	REC	REC	REC	REC	N/A	N/A	REC	N/A	N/A	N/A	N/A	REC
15-CHI	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	SIR<1	N/A	N/A	N/A	N/A	REC
15-CHI	N/A	N/A	N/A	N/A	N/A	N/A	N/A	REC	SIR<1	N/A	REC	N/A	N/A	N/A	REC

Table 3-1 (Continued)

Building Number	Delamp of Fluorescent Lighting Status	Delamp Lighting Status	T8/Electronic Fluorescent Lighting Status	Operation & Maintenance Status	Improve Temperature Controls Status	Reset Controls Status	[illegible] Status	[illegible] Status	Convert to Coal Status	Fix Steam Traps Status	[illegible] Fans Status	[illegible] Status	Insulate Pipe & [illegible] Status	[illegible] DHW Tank Status	Low Cost/ No Cost DHW Status
[illegible]	N/A	N/A	REC	REC	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	SIR<1
[illegible]	REC	N/A	REC	SIR<1	REC	N/A	N/A	SIR<1	N/A	N/A	N/A	N/A	REC	N/A	REC
[illegible]	REC	N/A	REC	SIR<1	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	SIR<1	N/A	N/A
[illegible]	REC	REC	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	SIR<1	N/A	N/A
[illegible]	REC	N/A	N/A	SIR<1	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	REC
[illegible]	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	SIR<1	N/A	N/A
[illegible]	N/A	N/A	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	N/A	N/A	REC	REC	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	REC	N/A	REC	REC	REC	N/A	REC	REC	N/A	N/A	REC	N/A	N/A	N/A	SIR<1
[illegible]	N/A	N/A	REC	REC	REC	N/A	REC	N/A	N/A	N/A	N/A	REC	N/A	N/A	REC
[illegible]	REC	N/A	REC	REC	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	SIR<1
[illegible]	REC	N/A	REC	REC	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	SIR<1
[illegible]	REC	N/A	N/A	SIR<1	N/A	N/A	REC	N/A	N/A	N/A	N/A	SIR<1	N/A	N/A	N/A
[illegible]	REC	N/A	N/A	SIR<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	REC	N/A	N/A	SIR<1	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	REC	N/A	REC	SIR<1	REC	N/A	REC	SIR<1	SIR<1	N/A	N/A	N/A	SIR<1	N/A	REC
[illegible]	N/A	N/A	REC	REC	N/A	N/A	REC	REC	SIR<1	N/A	N/A	N/A	N/A	N/A	REC
[illegible]	N/A	N/A	REC	REC	REC	N/A	N/A	REC	N/A	N/A	N/A	N/A	REC	N/A	N/A
[illegible]	REC	N/A	N/A	REC	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A	REC	N/A	SIR<1
[illegible]	REC	N/A	REC	REC	REC	N/A	REC	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	REC	N/A	REC	REC	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	REC	N/A	REC	REC	REC	N/A	N/A	REC	N/A	N/A	N/A	N/A	REC	SIR<1	N/A
[illegible]	REC	N/A	REC	N/A	REC	N/A	REC	N/A	N/A	N/A	SIR<1	N/A	N/A	N/A	N/A
[illegible]	REC	N/A	N/A	REC	REC	N/A	N/A	REC	N/A	N/A	N/A	N/A	REC	N/A	N/A
[illegible]	REC	N/A	N/A	REC	REC	N/A	N/A	REC	N/A	N/A	N/A	N/A	REC	N/A	SIR<1
[illegible]	REC	N/A	N/A	REC	REC	N/A	N/A	REC	N/A	N/A	N/A	N/A	REC	N/A	SIR<1
[illegible]	REC	N/A	REC	REC	REC	N/A	N/A	REC	N/A	N/A	SIR<1	N/A	REC	N/A	SIR<1
[illegible]	REC	N/A	REC	REC	REC	N/A	REC	N/A	SIR<1	N/A	N/A	N/A	REC	N/A	N/A
[illegible]	REC	N/A	REC	REC	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	REC	N/A	N/A
[illegible]	N/A	N/A	REC	REC	N/A	N/A	REC	N/A	SIR<1	N/A	N/A	N/A	REC	N/A	N/A
[illegible]	REC	N/A	N/A	REC	REC	N/A	REC	N/A	SIR<1	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	REC	N/A	REC	REC	REC	N/A	REC	N/A	SIR<1	N/A	N/A	N/A	REC	N/A	REC
[illegible]	REC	N/A	REC	REC	REC	N/A	REC	N/A	SIR<1	N/A	N/A	N/A	REC	N/A	REC
[illegible]	REC	N/A	REC	REC	REC	N/A	REC	N/A	SIR<1	N/A	N/A	N/A	REC	N/A	REC
[illegible]	REC	N/A	REC	REC	REC	N/A	REC	N/A	SIR<1	N/A	N/A	N/A	REC	N/A	N/A
[illegible]	N/A	N/A	N/A	REC	REC	N/A	REC	N/A	SIR<1	N/A	N/A	N/A	N/A	N/A	SIR<1
[illegible]	REC	N/A	REC	REC	REC	SIR<1	N/A	N/A	N/A	N/A	N/A	N/A	SIR<1	N/A	REC
[illegible]	REC	N/A	REC	REC	REC	N/A	REC	N/A	SIR<1	N/A	N/A	N/A	REC	N/A	REC
[illegible]	REC	N/A	REC	REC	REC	REC	REC	N/A	SIR<1	N/A	N/A	N/A	REC	N/A	REC
[illegible]	REC	N/A	N/A	N/A	SIR<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	REC	N/A	REC

Table 3-1 (Continued)

Building Number	Delamp of Fluorescent Lighting Status	Delamp Lighting Status	% Ballast Fluorescent Lighting Status	Operation & Maintenance Status	Improve Temperature Controls Status	[illegible] Controls Status	[illegible] Nozzles Status	[illegible] Status	Convert to Coal Status	Fix Steam Traps Status	[illegible] Fans Status	Exhaust Fans/Vents Status	Insulate Pipe & Duct Status	Reconfigure DHW Tank Status	Low Cost/No Cost DHW Status
[illegible]	REC	N/A	REC	REC	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	REC	N/A	N/A
[illegible]	REC	N/A	N/A	REC	REC	N/A	REC	N/A	SIR<1	N/A	N/A	N/A	REC	N/A	REC
[illegible]	REC	N/A	REC	REC	REC	N/A	REC	N/A	SIR<1	N/A	N/A	N/A	REC	N/A	REC
[illegible]	REC	REC	REC	REC	REC	N/A	REC	N/A	SIR<1	N/A	N/A	N/A	REC	N/A	REC
[illegible]	REC	N/A	N/A	REC	REC	N/A	REC	N/A	SIR<1	N/A	N/A	N/A	REC	N/A	REC
[illegible]	REC	N/A	REC	REC	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A	REC	N/A	REC
[illegible]	REC	N/A	REC	REC	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	SIR<1	SIR<1
[illegible]	REC	N/A	N/A	REC	REC	N/A	N/A	REC	SIR<1	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	REC	REC	REC	REC	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	REC	N/A	REC	REC	REC	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	SIR<1
[illegible]	REC	N/A	REC	REC	REC	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	REC
[illegible]	N/A	N/A	REC	REC	SIR<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	REC	N/A	N/A
[illegible]	N/A	N/A	REC	REC	N/A	N/A	REC	REC	N/A	N/A	N/A	N/A	N/A	N/A	REC
[illegible]	REC	N/A	REC	REC	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	SIR<1
[illegible]	REC	N/A	N/A	REC	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A	REC	REC
[illegible]	REC	N/A	REC	REC	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	REC	N/A	N/A
[illegible]	N/A	N/A	REC	REC	REC	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	REC	N/A	REC	REC	REC	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	REC	N/A	REC	REC	REC	REC	N/A	N/A	SIR<1	N/A	REC	REC	SIR<1	N/A	N/A
[illegible]	REC	N/A	REC	REC	REC	N/A	N/A	REC	SIR<1	N/A	REC	N/A	N/A	N/A	N/A
[illegible]	REC	N/A	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	REC	REC	SIR<1	N/A	N/A
[illegible]	REC	N/A	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	SIR<1	REC	SIR<1	N/A	N/A
[illegible]	REC	N/A	REC	REC	REC	N/A	N/A	REC	N/A	N/A	N/A	N/A	REC	REC	N/A
[illegible]	REC	N/A	REC	REC	N/A	N/A	N/A	N/A	SIR<1	N/A	N/A	N/A	REC	REC	N/A
[illegible]	REC	N/A	REC	REC	REC	N/A	REC	N/A	SIR<1	N/A	N/A	N/A	REC	N/A	N/A
[illegible]	REC	N/A	REC	REC	REC	REC	N/A	REC	SIR<1	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	REC	N/A	REC	REC	N/A	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	REC	N/A	REC	REC	REC	N/A	REC	REC	N/A	N/A	N/A	N/A	REC	N/A	N/A
[illegible]	REC	N/A	N/A	SIR<1	N/A	N/A	REC	SIR<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	REC	N/A	N/A	SIR<1	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	REC
[illegible]	REC	N/A	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	N/A	N/A	REC	REC	REC	REC	N/A	REC	N/A	N/A	N/A	N/A	SIR<1	N/A	SIR<1
[illegible]	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	REC	REC	N/A	REC	REC	N/A	N/A	REC	N/A	N/A	N/A	N/A	SIR<1	N/A	N/A
[illegible]	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	REC	N/A	N/A	N/A	REC	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	REC	N/A	N/A	SIR<1	REC	N/A	N/A	SIR<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	N/A	N/A	REC	REC	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	N/A	N/A	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	REC
[illegible]	N/A	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	REC	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	REC

Table 3-1 (Concluded)

Building Number	[illegible] Fluorescent Lighting Status	Delamp Lighting Status	T8 [illegible] Fluorescent Lighting Status	Operation & Maintenance Status	Improve Temperature Controls Status	[illegible] Controls Status	Domestic [illegible] Status	New Burner Status	Convert to Coal Status	Fix Steam Traps Status	[illegible] Fans Status	[illegible] Vents Status	Insulate Pipe & Duct Status	Reconfigure DHW Tank Status	Low Cost No Cost DHW Status
[illegible]	REC	N/A	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	REC	N/A	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	REC
[illegible]	REC	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	SIR<1	REC
[illegible]	REC	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	SIR<1	REC
[illegible]	REC	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	SIR<1	REC
[illegible]	REC	N/A	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	REC
[illegible]	REC	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	SIR<1	REC
[illegible]	REC	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	SIR<1	REC
[illegible]	REC	[illegible]	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	REC
[illegible]	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	SIR<1	N/A	N/A
[illegible]	REC	N/A	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	SIR<1	SIR<1
[illegible]	N/A	N/A	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	N/A	N/A	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	N/A	N/A	REC	N/A	SIR<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	N/A	N/A	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	REC
[illegible]	N/A	N/A	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	REC
[illegible]	N/A	N/A	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	REC
[illegible]	REC	N/A	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	REC
[illegible]	REC	N/A	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	REC
[illegible]	N/A	N/A	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	REC
[illegible]	REC	N/A	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	N/A	N/A	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	REC
[illegible]	REC	N/A	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	REC
[illegible]	REC	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	REC	N/A	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	REC	N/A	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	REC
[illegible]	REC	N/A	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	REC
[illegible]	REC	N/A	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	REC
[illegible]	REC	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	N/A	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	REC	N/A	REC	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]-COR	N/A	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	SIR<1	N/A	N/A
[illegible]	N/A	N/A	REC	REC	N/A	N/A	REC	REC	N/A	N/A	N/A	N/A	N/A	N/A	REC
[illegible]	REC	N/A	REC	REC	N/A	REC	REC	N/A	N/A	N/A	REC	N/A	N/A	N/A	N/A
[illegible]	N/A	REC	N/A	REC	REC	N/A	REC	REC	SIR<1	N/A	N/A	N/A	N/A	N/A	REC
[illegible]	REC	N/A	REC	REC	REC	N/A	N/A	REC	SIR<1	N/A	N/A	N/A	N/A	N/A	SIR<1
[illegible]	REC	N/A	REC	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
[illegible]	N/A	N/A	REC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 3-2

ECO Summary Table

#	ECO	Electricity (kWh)	Fuel Oil #2 (gal)	Fuel Oil #6 (gal)	Coal (tons)	Savings (MBTU)	Percent of Total	Savings ($)	Cost ($)	SIOH ($)	Payback (yrs)	SIR	Comments
1	Delamp Selected Lighting Fixtures	98,127	0	0	0.0	334.9	0.38%	$8,698	$1,000	$57	0.1	93.4	Local
2	Downsize Nozzles	0	4,140	0	4.1	778.5	0.89%	$3,657	$1,400	$88	0.4	47.8	Local
3	Recover Vents	0	2,671	0	15.7	769.9	0.88%	$3,048	$7,000	$385	2.3	9.0	Local
4	Reduce Lighting Hours	31,971	0	0	4.8	147.2	0.13%	$1,053	$2,950	$162	2.8	4.0	Local
5	DHW No Cost/Low Cost	17,872	685	0	0.0	144.7	0.17%	$1,676	$6,344	$349	3.8	5.5	Local
6	Reconfigure DHW Tank	3,769	0	0	0.0	23.1	0.03%	$230	$1,170	$64	4.9	2.3	Local
7	Refixture Incandescent w/ Fluorescent	188,237	0	0	0.0	642.5	0.74%	$16,112	$26,108	$1,436	1.6	6.9	QRIP #1
8	Relamp Fluorescent Lighting	48,444	0	0	0.0	165.9	0.19%	$3,560	$11,760	$647	3.3	3.4	QRIP #1
9	New Burner Guns	0	24,507	0	25.0	4,083.6	4.59%	$20,083	$36,316	$2,000	1.8	7.4	PECIP #1
10	Improve Heating System Controls	0	54,790	28,573	27.0	13,963.3	16.01%	$67,481	$163,533	$8,994	2.4	5.4	PECIP #1
11	Destratification Fans	-7,852	2,855	0	9.0	369.2	0.42%	$1,645	$6,171	$339	3.0	4.1	PECIP #2
12	Pipe & Duct Insulation	0	53,401	0	38.0	8,136.2	9.33%	$42,257	$127,363	$6,994	3.0	6.8	PECIP #3
13	Caulk & Weatherstripping	3,754	14,834	17,477	37.8	5,579.6	6.40%	$25,716	$230,622	$12,684	9.0	2.2	ECIP #1
14	Storm Doors	0	1,114	293	0.8	217.7	0.25%	$2,883	$11,104	$611	3.9	5.2	ECIP #1
15	Dock Seals	0	987	0	2.4	182.2	0.21%	$851	$9,438	$529	11.3	1.7	ECIP #1
16	Replace Doors	0	3,863	8,200	2.5	2,013.8	2.31%	$9,790	$77,895	$4,284	8.0	2.5	ECIP #1
17	Storm Windows	236	7,200	6,428	26.4	2,595.5	2.98%	$11,832	$188,315	$10,357	15.9	1.2	ECIP #1
18	Wall Insulation	0	7,838	12,156	9.4	3,131.5	3.59%	$15,066	$221,507	$12,187	14.7	1.3	ECIP #1
19	Floor Insulation	117	8,392	10,118	3.1	2,755.6	3.16%	$13,619	$228,992	$12,595	16.8	1.2	ECIP #1
20	OA Reset Controls	0	363	0	3.6	136.5	0.16%	$533	$9,666	$532	18.1	1.0	ECIP #1
21	Roof Insulation	88	3,539	4,204	2.5	1,470.5	1.69%	$7,342	$146,296	$8,046	19.9	1.1	ECIP #1
	TOTALS	384,971	194,227	87,549	255.3	47,521.9	54.51%	$257,831	$1,515,450	$83,348	5.9		

Notes

1. Construction costs are for fiscal year 1989 and do not include SIOH, design, or contingencies.
2. Savings for ECIP project include allowances for synergistic effects.
3. Roof Insulation ECO combines two roof ECOs (attic and pitched roofs).
4. Caulk & Weatherstripping ECO combines two ECOs (doors & windows).
5. Total savings for ECIP Project is: 18,583 MBTU

PECIP recommendations are those with paybacks under 4 years. These are further reduced into PECIP #1, PECIP #2, and PECIP #3. PECIP #1 includes heating system control improvements and installation of new burner guns. The energy savings are 13,961.3 MBtu. PECIP #2 includes destratification fans and represents an energy savings of 369.2 MBtu. PECIP #3 includes installation of pipe and duct insulation and results in energy savings of 8,136.2 MBtu.

3.3 Other Measures

Certain measures are referred to as local indicating that facility staff will handle implementation. The recommendations listed as local include reduced lighting hours, delamping of light fixtures, downsizing nozzles, reconfiguration of DHW systems, no cost/low cost DHW measures, remove vents and installation of T8 lamps and ballasts.

Deleted ECOs are those measures do not qualify (SIR < 1) for any buildings. Conversion to coal and reduced window area fell into this category.

3.4 Energy Management Control System Evaluation

An Energy Management Control System (EMCS) was evaluated at Fort Indiantown Gap and a conceptual design developed.

Each building and its energy-consuming systems was analyzed to determine the applicability of various energy conservation measures as well as EMCS. All of the pertinent data were obtained from field investigation and documentation.

The savings were analyzed for the functions of temperature reset, load shedding, HVAC improvements and reduction of lighting hours using conventional controls such as timers. As per the SOW alternative local control methods of implementing were also evaluated against the EMCS. The EMCS analysis and conceptual design was done in accordance with TM-5-815-2/NAVFAC DM-4.9/AFM 88-36.

Costs were computed using the guidelines from HNDSP 83-049-ED-MI increased by 7.4 percent to reflect price increases since January 1, 1986 the date upon which the guidelines were based. The local HVAC improvement costs, such as radiator valves, were added to the individual building costs.

Savings and EMCS field costs were computed for each building. As per the Army documented analysis method all buildings with an SIR of less than one were excluded from the final EMCS package. To the EMCS building field costs were added the central equipment, DTM and general costs.

The resultant EMCS considered provided monitoring and/or control functions in 34 buildings. A total of 276 points would be required for implementation. According to NAVFAC DM-4.9/ AFM 88-36 a micro EMCS would not be appropriate since more than 125 points are required. Since the cost difference between a small system (50 - 600 points) and a medium system (200 - 2,500) is about 12% and yet provides for significant expansion, the medium system was analyzed. Finally, the SOW required an EMCS system having the capacity to provide expanded control throughout the Base in the future.

Table 3-3 presents a summary of costs for the larger, medium, and small EMCS systems in addition to the energy and cost savings. Because the facilities were generally quite small and had such a small number of points per building, the savings were not large enough to justify the costs of an EMCS. The SIR for the medium EMCS system was .87. Even when evaluating a small EMCS the SIR still was less than 1 at .86.

3.5 Conclusions, Recommendations & Energy Savings Plan

3.5.1 Conclusions

The following conclusions were reached as a result of the Energy Engineering Analyses Program (EEAP) Basewide Energy Study at FIG:

1. Currently, there is significant energy waste at the post in both fossil fuels and electricity. This is due to the age and construction of the buildings.
2. No major energy conservation project or efforts have been instituted at the post. In fact, that is one reason why this EEAP has been completed.
3. Of the buildings surveyed, there is significant energy conservation opportunities (ECOs) for all major end-use categories and fuels. If all ECOs are implemented, it is estimated that 54.5% of the energy will be saved. This includes allowances for synergistic effects.
4. These ECOs have been grouped into five major projects plus local action for implementation by the Army.

Table 3-3
Final Cost Summary

Energy Management and Control System
HNDSP 83-049-EDME APRIL 1987

	Points:	276	
	Large	Medium	Small
COSTS:			
General Costs	$72,017	$72,017	$71,691
System Equipment:	$146,295	$101,902	$50,117
Software	$68,319	$60,533	$41,856
Field Equipment	$350,581	$350,581	$350,581
Data Trans Media	$49,233	$49,233	$49,233
Maintenance(60%)	$45,305	$41,862	$37,169
Taxes and Insurance	$51,483	$47,570	$42,261
Overhead	$102,967	$95,140	$84,522
Profit	$68,644	$63,427	$56,348
Bond	$6,864	$6,343	$5,635
TOTAL COSTS:	$961,709	$888,605	$789,431

SAVINGS:		mmbtus	
Electricity	16,331 kwh	56	
Coal	43 tons	1,095	
Oil	47,068 gallons	6,528	
Oil	17,234 gallons	2,590	
TOTAL		10,259	$51,271

SIR	0.70	0.76	0.86	

3.5.2 Recommendations & Energy Savings Plan

It is recommended that all the ECOs which met the cost-effectiveness criteria (ECIP criteria) be funded and implemented. Twenty-one different ECOs were shown to be cost-effective and are summarized in Table 3-2 below. The table lists for each ECO the specific fuel savings, the savings in MBTU, savings as a percent of the total energy use of the building surveyed, savings in current dollars, estimated construction cost, SIOH, simple payback, and the savings-to-investment ratio (SIR). Also listed is the recommended grouping of the ECOs

It is recommended that five projects (plus local action) be implemented as follows:

Project	ECOs
QRIP #1	Refixture Incandescent w/ Fluorescent Relamp Fluorescent Lighting
FECIP #1	Install New Burner Guns Improve Heating System Controls
FECIP #2	Install Destratification Fans
FECIP #3	Install Pipe & Duct Insulation
ECIP #1	Caulk & Weatherstripping Storm Doors Dock Seals Replace Doors Add Storm Windows Install Wall Insulation Install Floor Insulation Outside Air Reset Controls Install Roof Insulation
Local Action	Delamp Selected Lighting Fixtures Downsize Burner Nozzles Remove Vents Reduce Lighting Hours DHW No Cost/Low Cost Reconfigure DHW Tank

It is further recommended that the local action ECOs be implemented during FY1990. It is recommended that the QRIP and FECIP projects be implemented as soon as possible either during FY1991 or FY1992. Because of the size of the ECIP project, it is recommended that implementation be funded during FY1996.