

**JACKSON**

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**COOPERATIVE**

**CORPORATION**

**2010-2013 CONSTRUCTION WORK PLAN**

**KENTUCKY 03 JACKSON**

2010 - 2013  
CONSTRUCTION WORK PLAN  
JACKSON ENERGY  
COOPERATIVE CORPORATION  
KENTUCKY 03 JACKSON  
115 Jackson Energy Lane  
McKEE, KY 40447

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PREPARED BY:

Jackson Energy Cooperative  
Engineering Department

November 2009

Name Benjamin G. Jones  
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I hereby certify that this 2010-2013  
Construction Work Plan meets RUS standards  
and guidelines and that I am a duly registered  
Professional Engineer under the laws  
of the State of Kentucky. Registration  
Number 26427.

By: 

SEAL

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### Engineer's Certification

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**Section One**  
**Executive Summary**

## **PURPOSE OF THE REPORT**

This report documents the winter of 2008-2009 engineering analysis and summarizes the proposed construction for Jackson Energy Cooperative Corporation's (JEC's) electric distribution system for the four-year planning period of 2010 through 2013.

The report also provides engineering support, in the form of descriptions, costs and justification of required new and alteration of facilities, for a loan application to RUS to finance the proposed construction program.

## **RESULTS OF THE PROPOSED CONSTRUCTION**

Upon completion of the construction of facilities proposed herein, the system will provide adequate and dependable service to 54,030 consumers consisting of 50,158 residential consumers using an average of 1,286 kWh per consumer per month; 3,865 small commercial consumers, and 7 large consumers which are provided for on an individual basis.

## **GENERAL BASIS OF THE STUDY**

The 2013 projected number of consumers and total peak system load of 333 MW were taken directly from the cooperative's 2008 Power Requirements Study (PRS) prepared jointly by East Kentucky Power Cooperative (EKPC) and JEC as approved by the RUS. The projected load increases were spread uniformly except for projected high growth areas that were projected individually.

New distribution, transmission, and power supply construction requirements were considered simultaneously as a "one system" approach for the orderly and economical development of the total system. All of the proposed construction and recommendations herein, relative to power supply and delivery, were discussed with the cooperative's power supplier, EKPC.

A complete list of the lines and equipment with their estimated cost (all based on recent historical data) required to serve additional members and service upgrades is listed on the Summary page.

An analysis, using as a basis RUS guidelines and the design criteria herein, for thermal loading, voltages, physical conditions and reliability was performed on all of the substations and distribution lines and major equipment of the existing system. Milsoft Distribution Analysis Software (WindMil) was used to analyze the distribution circuits during the Winter of 2012-2013 peak loading conditions.

For each inadequacy that was determined, alternate solutions were investigated and economically evaluated, so that the most cost effective construction, if required, could be proposed.

## SERVICE AREA AND POWER SUPPLY

Jackson Energy Cooperative headquartered in McKee, Kentucky, provides service to seven counties in Southeastern Kentucky. The area is typically rolling hills to mountainous and predominately rural living except for the London area which is suburban and urban in nature. Interstate 75 runs north and south through the western portion of the system. This has allowed that area to experience high growth in residential and commercial classifications.

Most of the service area is rural in nature with some industry, tourism, farming, and commercial establishments. The population of our service area is increasing at a modest rate. Much of our commercial growth is around the London area. Manufacturing and the development of industrial parks is occurring system wide.

The following data is from JEC's 07/31/2009 Form 7:

Number of Consumers:	51,335
KWh Purchased:	992,622,394
KWh Sold:	932,887,373
Maximum kW Demand:	298,523
Total Utility Plant:	\$191,831,594
Consumers per Mile:	9.07

Each of our 29 substations is constructed for 69/12.47 kV operation. Total distribution line mileage is 5,621. Installed conductor sizes range from 8A CW to 795ACSR.

JEC receives its power from East Kentucky Power Cooperative (EKPC). They provide transmission lines and distribution substations for our supply. EKPC owns, maintains and is responsible for the operation of the substations.

EKPC provides all of our power and energy requirements, by virtue of a standard "all requirements" power contract. EKPC is an RUS financed G & T in Winchester KY.

## SUMMARY OF PROPOSED 4-YEAR CONSTRUCTION AND COSTS

CODE	DESCRIPTION	Number	Miles	ESTIMATED COSTS TOTAL
100	NEW SERVICES	3,425	152	\$11,296,000
200	NEW DIST TIE LINES			
300	DIST LINE CONVERSIONS	7	13.8	\$1,332,500
601	TRANSFORMERS AND METERS			
	UG Transformers	187		\$546,920
	OH Transformers	2,675		\$3,139,180
	Meters	3,425		\$1,028,000
	Meter Disconnect Collars	3,000		\$465,000
602	SERVICE UPGRADES	450		\$990,000
603	SECTIONALIZING			\$2,500,000
604	REGULATORS	0		\$0
605	CAPACITORS/CONTROLS			\$0
606	POLE REPLACEMENTS	1,000		\$2,236,800
607	MISC REPLACEMENTS	168		\$184,800
608	CONDUCTOR REPLACEMENT		102.4	\$7,860,000
615	COMMUNICATIONS EQUIPMENT			\$1,500,000
701	SECURITY LIGHTS	2,200		\$1,156,700

TOTAL CONSTRUCTION WORK PLAN

**\$34,235,900**

## **Section Two**

### **Basis of the Study and Proposed Construction**



# JACKSON ENERGY COOPERATIVE CORPORATION

## DESIGN CRITERIA

Each of the following design criteria items were reviewed by the RUS General Field Representative on September 21, 2009.

Construction proposed in the work plan is required to meet the following minimum standards of adequacy for voltages, thermal loading, safety and reliability on the system.

1. The voltage on primary distribution lines are not to be less than 118 Volts, (120 Volt base, 126 Volts at source), after re-regulation.

NOTE: It is recommended that proposed construction items required for voltage improvements, whose forecasted need is based solely on calculated voltages from computer circuit analysis printouts, not be authorized for construction until such calculated voltages are measured in the field and then compared to calculated values to corroborate that actual voltages are below the minimum design level.

2. The following ratings for equipment loading are recommended for thermal protection. The percentage is of the base plate rating, 55 deg. Rise with a 90% power factor.

Transformers (OA)	140% winter, 99% summer (ANSI C57)
Regulators	120% at 7.5% rise
Reclosers	70%
Line Fuses	70%
Current Limiting Fuses	70%

3. Primary conductors are not to be loaded over 80% of their thermal rating for existing and projected loading. Major tie lines will be limited to 80% of their thermal ratings.
4. Loading on single-phase lines beyond 40 amps will be subject to further analysis.
5. Pole and/or cross arms are to be replaced if found to be physically deteriorated by visual inspection and/or tests.
6. Capacitor banks will be installed on distribution lines as required to maintain no less than 90% lagging power factor at peak loading conditions. Capacitor switching will be utilized as required to maintain off peak power factor between 90% lagging and 90% leading.
7. All new distribution lines are to be designed and built according to RUS standard construction specifications and guidelines.
8. Replacement of copper conductors due to age and deterioration. Replace ACSR conductor when deterioration of the steel core is detected.

9. Inspect direct buried primary cable 20 years old or older. Replacement of direct buried primary cable as warranted.

## Distribution Line and Equipment Costs

2010-2013 Estimated Cost	DISTRIBUTION LINES
	<u>1-PHASE TO 1-PHASE (OH) LINE CONVERSIONS</u>
\$75,000	1 - Phase; OH, #1/0 ACSR per mile
	<u>1-PHASE TO 2-PHASE (OH) LINE CONVERSIONS</u>
\$85,000	2 - Phase; OH, #1/0 ACSR per mile
	<u>1-PHASE TO 3-PHASE (OH) LINE CONVERSIONS</u>
\$105,000	3 - Phase; OH, #1/0 ACSR per mile
\$115,000	3 - Phase; OH, 336 MCM ACSR per mile
	<u>3-PHASE TO 3-PHASE (OH) LINE CONVERSIONS</u>
\$100,000	With #1/0 ACSR per mile
\$110,000	With #336 ACSR per mile
	<u>1-PHASE TO 1-PHASE (UG) LINE REPLACEMENT</u>
\$100,000	With #1/0 URD per mile

NOTE: Above projects include engineering and tree trimming costs.

Estimated Labor	LINE REGULATORS
\$6,800	Single Phase, 76.2 KVA
\$20,000	Three Phase, 76.2 KVA
\$22,000	Three Phase, 114.3 KVA
\$23,000	Three Phase, 167 KVA
\$28,000	Three Phase, 250 KVA
\$30,000	Three Phase, 333 KVA
	<b>CAPACITORS</b>
\$3,200	1 - 300 kVAR Fixed Capacitor Bank
\$4,200	1 - 300 kVAR Switched Capacitor Bank
\$3,200	1 - 450 kVAR Fixed Capacitor Bank
\$4,200	1 - 450 kVAR Switched Capacitor Bank

## Distribution Line and Equipment Costs

### Estimated

#### Labor

\$1,700

\$1,700

\$1,800

\$1,800

\$2,100

\$2,200

\$5,000

#### OIL CIRCUIT RECLOSERS

Versa Tech Recloser

35 Amp. Tyle L Recloser

50 Amp. Tyle L Recloser

70 Amp. Tyle L Recloser

100 Amp. Tyle L Recloser

140 Amp. Tyle L Recloser

560 Amp. Type VWE

Status of the previous Work Plan

Item			Existing	Proposed		
Number	Status	Description	Conductor	Conductor	Miles	Cost
301-29*	Completed	Conway Feeders	1 Ph 6A & 8A Cu	3 Ph 336 MCM	4.0	\$450,000
373-30*	Completed	Big Creek Feeders	3 Ph 6A & 8A Cu	3 Ph 336 MCM	2.5	\$250,000
303-14	Completed	London Laurel County Air Park	2 Ph 1/0 ACSR	3 Ph 1/0 ACSR	0.5	\$31,000
304-21	Completed	Junction of Sinking Creek and High Moore Road	1 Ph 6A & 8A Cu	1 Ph 1/0 ACSR	1.0	\$55,000
305-23	Completed	Relieve loading on Campground Feeder #4 - Convert line along Route 488	1 Ph 6A & 8A Cu	3 Ph 336 MCM	2.5	\$250,000
306-8	Completed	Relieve loading on Campground Feeder #4. Double circuit along Campground	3 Ph 336 MCM	2 - 3 Ph 336 MCM	0.4	\$80,000
307-10	Completed	Salt Peter Cave Road – Poplar Gap	1 Ph 6A & 8A Cu	1 Ph 1/0 ACSR	2.7	\$148,500
308-27	Completed	Mullins Hollow Road	1 Ph 6A & 8A Cu	1 Ph 1/0 ACSR	0.5	\$25,000
311-7	Completed	Dug Hill Road to Riddell Road	1 Ph 6A & 8A Cu	1 Ph 1/0 ACSR	1.4	\$77,000
312-5	Completed	Owsley County Health Care	3 Ph 6A & 8A Cu	3 Ph 1/0 ACSR	0.3	\$21,000
314-7	Completed	Thomas Road down Low Gap Road	1 Ph 6A & 8A Cu	1 Ph 1/0 ACSR	2.5	\$137,500
320-14	Completed	Cross Keys UG	1/0 UG Direct Buried	1 Ph 1/0 UG	0.8	\$67,200
321-14	Completed	Crown Point UG	1/0 UG Direct Buried	1 Ph 1/0 UG	0.9	\$75,600
323-14	Completed	Route 192, Pleasant View and Cold Hill Road	3 Ph 3/0 ACSR	3 Ph 336 MCM	3.0	\$300,000
326-22	Deleted	Laurel Canyon Subdivision	0	3 Ph 336 MCM	0.5	\$60,000
327-19	Completed	Upper Raccoon Creek Road to Radio Tower	3 Ph 6A & 8A Cu	3 Ph 1/0 ACSR	1.2	\$108,000
328-1	Completed	Moore Road, Russell Jackson tap	1 Ph 6A & 8A Cu	1 Ph 1/0 ACSR	0.6	\$33,000
331-4	Completed	Robinson Fork, past Swindling Gap, to the county line	1 Ph 6A & 8A Cu	1 Ph 1/0 ACSR	2.0	\$125,000
335-6	Completed	Hopewell Church to Hwy 11	1 Ph 6A & 8A Cu	3 Ph 336 MCM	1.3	\$130,000
339-6	Completed	Hwy 498 from Fairground Ridge Road to Hopewell Church	3 Ph 6A & 8A Cu	3 Ph 336 MCM	1.1	\$110,000
344-15	Completed	Paris-Karr Road	3 Ph #2 ACSR	3 Ph 336 MCM	1.5	\$150,000
347-6	Completed	Hwy 11 to Hilltop Full Gospel Church	3 Ph 6A & 8A Cu	3 Ph 1/0 ACSR	2.7	\$243,000
350-6	Completed	Hwy 11 down Proffett Road near Shoemaker Ridge	3 Ph 6A & 8A Cu	1 Ph 1/0 ACSR	0.2	\$11,000
351-20	Completed	Hwy 80 up House Branch	3 Ph 6A & 8A Cu	3 Ph 336 MCM	3.1	\$310,000
353-23	Completed	Hwy 80 and Curry Branch	3 Ph 6A & 8A Cu	3 Ph 336 MCM	3.3	\$330,000
354-21	Completed	Hwy 1956 near Burnett Road	3 Ph #4 ACSR	3 Ph 1/0 ACSR	1.4	\$126,000
355-21	Completed	Hwy 1956 start at end of existing 4ACSR	3 Ph 6A & 8A Cu	3 Ph 1/0 ACSR	2.0	\$180,000
356-3	Completed	Reynolds Road start near end of Farris-Jones Road	3 Ph 6A&8A Cu & 1 Ph #4 ACSR	1 Ph 1/0 ACSR	1.7	\$93,500
357-12	Completed	Barnes Mountain to Leighton	2 Ph 6A & 8A Cu	2 Ph 1/0 ACSR	2.1	\$168,000
358-12	Completed	Redbud Road off Barnes Mtn. Road	3 Ph 6A & 8A Cu	1 Ph 1/0 ACSR	0.6	\$33,000
367-7	Completed	Wagersville up Hwy 1209	3 Ph 6A & 8A Cu	1 Ph 1/0 ACSR	1.1	\$60,500
369-15	Completed	Hwy 552 near I-75 to Wildcat Road off Taylor Bridge Road	3 Ph 6A & 8A Cu	3 Ph 1/0 ACSR	1.1	\$99,000

\* Carry over item

Status of the previous Work Plan

Item Number	Status	Description	Existing Conductor	Proposed Conductor	Miles	Cost
370-3	Carry Over	Hwy 1394 Hazel Green School to Farris-Jones Road	3 Ph 6A & 8A Cu	3 Ph 1/0 ACSR	1.9	\$171,000
371-6	Completed	Hwy 11 - Tap to the Lee County Hwy Dept.	3 Ph 6A & 8A Cu	3 Ph 1/0 ACSR	1.0	\$90,000
372-3	Deleted	Fort Sequoyah Clefth Rock UG	1/0 UG Direct Buried	1 Ph 1/0 UG	1.5	\$126,000
374-3	Completed	Hazel Patch to Exit 909	1 Ph 6A & 8A Cu	2 Ph 1/0 ACSR	0.6	\$23,300
375-6	Completed	Abner Flat Road	1 Ph 6A & 8A Cu	1 Ph 1/0 ACSR	1.0	\$55,000
376-22	Completed	Re-conductor a portion of Pine Grove Feeder #1	3 Ph 3/0 ACSR	3 Ph 336 MCM	1.4	\$140,000
377-14	Completed	Re-conductor a portion of West London Feeder #3	3 Ph 3/0 ACSR	3 Ph 336 MCM	0.8	\$80,000
378-11	Completed	Sally Little Road down Beech Crk	3 Ph 6A & 8A Cu	3 Ph 1/0 ACSR	2.1	\$189,000
379-12	Completed	Hwy 213 on Tanglewood Drive to Pitts Road	3 Ph 6A & 8A Cu	3 Ph 1/0 ACSR	2.3	\$207,000
380-12	Completed	Pitts Road and McIntosh Hollow	1 Ph 6A & 8A Cu	1 Ph 1/0 ACSR	0.7	\$38,500
381-12	Completed	Fitchburg to Hwy 213 near Gum Springs Church	3 Ph 6A & 8A Cu	3 Ph 1/0 ACSR	1.0	\$90,000
382-20	Completed	Hacker School	3 Ph 6A & 8A Cu	3 Ph 1/0 ACSR	0.5	\$45,000
383-8	Completed	Echo Valley Road	1 Ph 6A & 8A Cu	3 Ph 1/0 ACSR	1.6	\$160,000
384-29	Completed	Jacks Creek Road	3 Ph 6A & 8A Cu	1 Ph 1/0 ACSR	3.4	\$187,000
385-1	Completed	Line located behind Gray Hawk Post Office	3 Ph 6A & 8A Cu	3 Ph 1/0 ACSR	0.3	\$27,000
386-9	Completed	Line that feeds the McKee Sewer Plant	3 Ph 6A & 8A Cu	3 Ph 1/0 ACSR	0.2	\$18,000
387-16	Completed	Hwy 28 near Booneville Elem. School and down the river	3 Ph 6A & 8A Cu	3 Ph 1/0 ACSR	0.4	\$36,000
388-16	Completed	Line that serves Booneville Shopwise	3 Ph 6A & 8A Cu	3 Ph 1/0 ACSR	0.3	\$27,000
389-16	Completed	Line located across the road from Spencer's Dairy Bar	3 Ph 6A & 8A Cu	3 Ph 1/0 ACSR	0.1	\$9,000
390-6	Completed	Line that serves Hour Of Harvest on Hwy 11	3 Ph 6A & 8A Cu	3 Ph 1/0 ACSR	0.2	\$18,000
391-8	Completed	East HWY 80 to HWY 229 - Work Plan Amendment	3 Ph 1/0 ACSR	3 Ph 336 MCM	3	\$300,000
				<b>Totals</b>	<b>74.7</b>	<b>\$6,374,600</b>

## **ANALYSIS OF THE 2007 OPERATIONS AND MAINTENANCE SURVEY**

In November of 2007, the Operations and Engineering Department of Jackson Energy Cooperative completed the 2007 Operations and Maintenance Survey (Form 300).

In general, the distribution facilities, operations and maintenance, and engineering programs are adequate and improvements are made every year. A few recommendations were noted:

1. Some telephone poles remain close to the electric poles following pole change-outs. A program is underway to remove the old telephone poles.
2. Assuring accurate reporting and code compliance with cable TV attachments is an ongoing problem.
3. Several problem trees were observed in residential areas.
4. A more aggressive right-of-way clearing program has been implemented. This program should be continued.

## SECTIONALIZING STUDY

Jackson Energy will perform sectionalizing studies on an on going basis. The Milsoft Windmil software analyzes the equipment loading capabilities with each run. The program indicates areas where loading problems may occur. The Milsoft LightTable software can be used to verify protective device coordination or indicate work that needs to be done. This work will be incorporated in the four-year work plan. As the system is modified, the protection scheme will be reviewed and corrected as required.

The GIS system and the NISC Billing Computer have a full record of the coordination devices. Our line personnel use spreadsheets to track the number of operations on each recloser. As each recloser requires service, it will be repaired and placed back in service. Maintenance will be established based on the number of load break operations and no device will continue in service more than ten years.



**Jackson Energy Cooperative  
Substation Transformer Ratings**

<b>Substation</b>	<b>Present Rating</b>		<b>Cooling Stage</b>
	<b>Summer (KW)</b>	<b>Winter (KW)</b>	
Annville	13,620	18,140	OA/FA-65C
Beattyville	13,620	18,140	OA/FA-65C
Big Creek	11,070	15,720	OA-65C
Booneville	11,070	15,720	OA-65C
Brodhead	13,620	18,140	OA/FA-65C
Bush	11,070	15,720	OA-65C
Campground	19,460	25,920	OA/FA-65C
Conway	13,620	18,140	OA/FA-65C
East Bernstadt	19,460	25,920	OA/FA-65C
Eberle	11,070	15,720	OA-65C
Fall Rock	11,070	15,720	OA-65C
Goose Rock	13,620	18,140	OA/FA-65C
Green Hall	15,560	20,730	OA/FA-65C
Greenbriar	13,620	18,140	OA/FA-65C
Hargett	11,070	15,720	OA-65C
Keavy #1	13,620	18,140	OA/FA-65C
Keavy #2	13,620	18,140	OA/FA-65C
Laurel Industrial #1	13,620	18,140	OA/FA-65C
Laurel Industrial #2	13,620	18,140	OA/FA-65C
Maplesville	11,070	15,720	OA-65C
Maretburg	11,070	15,720	OA-65C
McKee	11,070	15,720	OA-65C
Millers Creek	5,590	7,450	OA/FA-65C
Oneida	11,070	15,720	OA-65C
Pine Grove #1	13,620	18,140	OA/FA-65C
Pine Grove #2	13,620	18,140	OA/FA-65C
Rice	13,620	18,140	OA/FA-65C
Sand Gap	11,070	15,720	OA-65C
South Fork	5,530	7,860	OA-65C
Three Links	11,070	15,720	OA-65C
Tyner	8,820	14,940	OA-65C
West London #1	13,620	18,140	OA/FA-65C
West London #2	13,620	18,140	OA/FA-65C

**Jackson Energy Cooperative  
Substation Winter Loading**

<b>Substation</b>	<b>Max Winter Capacity (KW)</b>	<b>January 2009 (KW)</b>	<b>% Max Loading</b>	<b>Projected 2012-13 (KW)</b>	<b>% Max Loading</b>
Annville	18,140	8,001	44.1%	9,600	52.9%
Beattyville	18,140	11,392	62.8%	15,200	83.8%
Big Creek	15,720	3,774	24.0%	5,000	31.8%
Booneville	15,720	8,234	52.4%	11,700	74.4%
Brodhead	18,140	11,902	65.6%	13,100	72.2%
Bush	15,720	8,781	55.9%	10,100	64.2%
Campground	25,920	16,992	65.6%	21,700	83.7%
Conway	18,140	7,672	42.3%	9,400	51.8%
East Bernstadt	25,920	17,519	67.6%	20,900	80.6%
Eberle	15,720	8,513	54.2%	10,100	64.2%
Fall Rock	15,720	9,766	62.1%	11,600	73.8%
Goose Rock	18,140	9,997	55.1%	11,600	63.9%
Green Hall	20,730	4,141	20.0%	5,000	24.1%
Greenbriar	18,140	9,812	54.1%	10,800	59.5%
Hargett	15,720	5,949	37.8%	7,300	46.4%
Keavy #1	18,140	5,276	29.1%	7,200	39.7%
Keavy #2	18,140	10,218	56.3%	12,600	69.5%
Laurel Industrial #1	18,140	9,115	50.2%	10,500	57.9%
Laurel Industrial #2	18,140	5,250	28.9%	6,500	35.8%
Maplesville	15,720	9,144	58.2%	11,100	70.6%
Maretburg	15,720	9,150	58.2%	11,200	71.2%
McKee	15,720	10,015	63.7%	11,700	74.4%
Millers Creek	7,450	4,924	66.1%	5,700	76.5%
Oneida	15,720	3,047	19.4%	3,500	22.3%
Pine Grove #1	18,140	8,723	48.1%	10,800	59.5%
Pine Grove #2	18,140	7,848	43.3%	9,900	54.6%
Rice	18,140	12,086	66.6%	13,200	72.8%
Sand Gap	15,720	5,548	35.3%	6,700	42.6%
South Fork	7,860	3,512	44.7%	4,200	53.4%
Three Links	15,720	6,121	38.9%	6,300	40.1%
Tyner	14,940	8,064	54.0%	9,300	62.2%
West London #1	18,140	8,989	49.6%	10,800	59.5%
West London #2	18,140	7,261	40.0%	9,000	49.6%

**Jackson Energy Cooperative  
Substation Summer Loading**

<b>Substation</b>	<b>Max Summer Capacity (KW)</b>	<b>August 2009 (KW)</b>	<b>% Max Loading</b>	<b>Projected 2013 (KW)</b>	<b>% Max Loading</b>
Annville	13,620	4,933	36.2%	6,000	44.1%
Beattyville	13,620	8,561	62.9%	10,800	79.3%
Big Creek	11,070	2,373	21.4%	4,000	36.1%
Booneville	11,070	4,733	42.8%	6,500	58.7%
Brodhead	13,620	7,469	54.8%	7,400	54.3%
Bush	11,070	4,997	45.1%	6,200	56.0%
Campground	19,460	10,688	54.9%	14,000	71.9%
Conway	13,620	4,271	31.4%	7,000	51.4%
East Bernstadt	19,460	9,245	47.5%	11,800	60.6%
Eberle	11,070	4,445	40.2%	5,600	50.6%
Fall Rock	11,070	6,578	59.4%	8,500	76.8%
Goose Rock	13,620	5,989	44.0%	7,600	55.8%
Green Hall	15,560	2,338	15.0%	3,200	20.6%
Greenbriar	13,620	7,978	58.6%	10,100	74.2%
Hargett	11,070	3,852	34.8%	5,100	46.1%
Keavy #1	13,620	3,489	25.6%	4,500	33.0%
Keavy #2	13,620	6,348	46.6%	8,000	58.7%
Laurel Industrial #1	13,620	8,231	60.4%	10,100	74.2%
Laurel Industrial #2	13,620	4,487	32.9%	5,900	43.3%
Maplesville	11,070	4,968	44.9%	6,400	57.8%
Maretburg	11,070	6,386	57.7%	7,500	67.8%
McKee	11,070	5,608	50.7%	7,200	65.0%
Millers Creek	5,590	3,626	64.9%	4,200	75.1%
Oneida	11,070	2,992	27.0%	3,500	31.6%
Pine Grove #1	13,620	4,770	35.0%	5,700	41.9%
Pine Grove #2	13,620	4,359	32.0%	5,700	41.9%
Rice	13,620	8,047	59.1%	10,400	76.4%
Sand Gap	11,070	2,870	25.9%	3,800	34.3%
South Fork	5,530	2,069	37.4%	2,700	48.8%
Three Links	11,070	3,079	27.8%	5,200	47.0%
Tyner	8,820	4,284	48.6%	5,500	62.4%
West London #1	13,620	6,529	47.9%	8,700	63.9%
West London #2	13,620	4,267	31.3%	5,300	38.9%

**JACKSON ENERGY COOPERATIVE**  
**SERVICE INTERRUPTIONS**  
**AVERAGE ANNUAL MINUTES/CONSUMER**  
**BY CAUSE**

<u><b>Year</b></u>	<u><b>Power Supply</b></u>	<u><b>Storm</b></u>	<u><b>Pre-Arranged</b></u>	<u><b>Other</b></u>	<u><b>Total</b></u>
<b>2004</b>	<b>17.40</b>	<b>145.80</b>	<b>3.60</b>	<b>516.0</b>	<b>682.80</b>
<b>2005</b>	<b>36.0</b>	<b>0.60</b>	<b>4.20</b>	<b>85.80</b>	<b>126.60</b>
<b>2006</b>	<b>21.0</b>	<b>0.60</b>	<b>6.0</b>	<b>148.2</b>	<b>175.80</b>
<b>2007</b>	<b>51.60</b>	<b>0.0</b>	<b>7.20</b>	<b>126.00</b>	<b>184.80</b>
<b>2008</b>	<b>36.00</b>	<b>7.80</b>	<b>5.40</b>	<b>223.20</b>	<b>272.40</b>
<u><b>5 Year Average</b></u>	<b>32.40</b>	<b>30.96</b>	<b>5.28</b>	<b>219.84</b>	<b>288.48</b>

## Historical Annual Energy, Load and Consumer Data

Year	Energy Purchased (mWh)	Energy Sold (mWh)	% Inc.	Energy Loss (mWh)	% Loss	Coincident Peak (mW)	% Inc.	% Annual Load Factor	# of Consumers Year End	% Inc.
1998	805,689	765,394		40,295	5.0%	174.5		50.1%	45,640	
1999	848,625	789,601	3.2%	59,024	7.0%	211.2	21.0%	42.7%	46,656	2.2%
2000	902,415	852,468	8.0%	49,947	5.5%	226.7	7.3%	42.9%	47,713	2.3%
2001	906,229	853,337	0.1%	52,892	5.8%	240.9	6.3%	40.4%	48,575	1.8%
2002	943,920	879,677	3.1%	64,243	6.8%	220.7	-8.4%	45.5%	49,185	1.3%
2003	939,743	880,976	0.1%	58,767	6.3%	243.9	10.5%	41.2%	49,758	1.2%
2004	949,906	895,089	1.6%	54,817	5.8%	257.1	5.4%	39.7%	50,133	0.8%
2005	992,738	938,792	4.9%	53,946	5.4%	258.7	0.6%	41.4%	50,661	1.1%
2006	954,602	901,031	-4.0%	53,571	5.6%	258.1	-0.2%	39.9%	51,019	0.7%
2007	999,556	946,899	5.1%	52,657	5.3%	266.4	3.2%	40.6%	51,460	0.9%
2008	1,006,833	965,491	2.0%	41,342	4.1%	276.1	3.6%	39.9%	51,699	0.5%

Notes: All data is from the Form 7.

## PROJECTED ANNUAL ENERGY, LOAD AND CONSUMER DATA

Year	Energy Sold	% Inc.	Energy Loss	% Inc.	Billing Demand	% Inc.	Number of Consumers	% Inc.
2009	960,501	7.3%	53,824	-1.8%	316	22.9%	51,969	3.7%
2010	980,526	2.1%	54,944	2.1%	320	1.3%	52,410	0.8%
2011	995,901	1.6%	52,783	-3.9%	324	1.3%	52,901	0.9%
2012	1,012,250	1.6%	53,649	1.6%	329	1.5%	53,459	1.1%
2013	1026776	1.4%	54,419	1.4%	333	1.2%	54,030	1.1%

Note: All of the projections above are from the 2008 Load Forecast.

## ANALYSIS OF THE LONG RANGE WORK PLAN

The 4 year Construction Work Plan is being prepared in conjunction with the 20 year Long Range Plan.

## Consumers on the System

<b>Substation</b>	<b>Feeder</b>	<b>Consumers</b>
Annville	1	33
Annville	2	901
Annville	3	385
Annville	4	27
Annville	5	45
Big Creek	1	167
Big Creek	2	189
Big Creek	3	517
Beattyville	1	453
Beattyville	2	881
Beattyville	3	769
Beattyville	4	606
Booneville	1	561
Booneville	2	593
Booneville	3	466
Brodhead	1	810
Brodhead	2	575
Brodhead	3	694
Brodhead	4	475
Bush	1	758
Bush	2	479
Bush	3	320
Conway	1	662
Conway	2	231
Conway	3	412
Camp Ground	1	270
Camp Ground	2	1,007
Camp Ground	3	370
Camp Ground	4	1,270

## Consumers on the System

Substation	Feeder	Consumers
Eberle	1	371
Eberle	2	488
Eberle	3	645
East Bernstadt	1	935
East Bernstadt	2	30
East Bernstadt	3	811
East Bernstadt	4	985
Fall Rock	1	416
Fall Rock	2	448
Fall Rock	3	1,344
Greenbriar	1	2
Greenbriar	2	1,161
Greenbriar	3	327
Greenbriar	4	38
Greenhall	3	510
Greenhall	4	247
Greenhall	5	280
Goose Rock	1	1,076
Goose Rock	2	245
Goose Rock	3	551
Goose Rock	4	359
Goose Rock	5	5
Hargett	1	242
Hargett	2	418
Hargett	3	362
Hargett	4	319
Keavy	1	289
Keavy	2	770
Keavy	3	602
Keavy	4	882
Keavy	5	297



## Consumers on the System

Substation	Feeder	Consumers
Laurel Industrial	1	11
Laurel Industrial	2	14
Laurel Industrial	3	698
Laurel Industrial	4	582
Laurel Industrial	5	114
Maplesville	1	545
Maplesville	2	805
Maplesville	3	271
Mareburg	1	629
Mareburg	2	1
Mareburg	3	555
McKee	1	476
McKee	2	735
McKee	3	122
McKee	4	229
McKee	5	171
Millers Creek	1	540
Millers Creek	2	419
Millers Creek	3	447
Oneida	1	304
Oneida	2	60
Oneida	3	260
Oneida	4	270
Oneida	5	105
Pine Grove	1	277
Pine Grove	2	1,014
Pine Grove	3	305
Pine Grove	4	685
Rice Station	1	650
Rice Station	2	1,285
Rice Station	3	784

## Consumers on the System

<b>Substation</b>	<b>Feeder</b>	<b>Consumers</b>
South Fork	1	136
South Fork	2	287
South Fork	3	283
South Fork	4	352
South Fork	5	95
Sand Gap	1	89
Sand Gap	2	647
Sand Gap	3	520
Three Links	1	506
Three Links	2	341
Three Links	3	308
Tyner	1	559
Tyner	2	247
Tyner	3	605
Tyner	4	73
West London	1	542
West London	2	499
West London	3	630
West London	4	585
West London	5	287
<b>Total</b>		<b>51,335</b>

## Voltage Measurements

<u>Substation</u>	<u>Feeder</u>	<u>Measured Voltage</u>	<u>WindMil Line Section #</u>	<u>WindMil Model Voltage</u>
Annville	2	123.7	PL.70867	120.3
Annville	3	124.1	PL.71924	119.2
Beattyville	1	122.4	PL.16881	118
Beattyville	2	123.6	PL.19145	122.1
Beattyville	3	122.6	PL.17999	114
Beattyville	4	124.1	PL.18470	122.3
Big Creek	1	125.2	PL.11306	124.5
Big Creek	2	124.1	PL.943	123
Big Creek	3	124.2	PL.1179	124
Booneville	1	122.3	PL.14365	117.2
Booneville	2	124.2	PL.15440	121.5
Booneville	3	124.7	PL.15865	122.4
Brodhead	1	124.5	PL.48311	121.6
Brodhead	2	124.8	PL.48227	119.6
Brodhead	3	124.7	PL.63712	122.2
Brodhead	4	124.6	PL.50141	119.6
Bush	1	124.4	PL.33584	113.4
Bush	2	124.2	PL.33135	122.6
Bush	3	125.3	PL.55089	120.3
Camp Ground	1	126.9	PL.55523	121
Camp Ground	2	123.8	PL.63731	118.7
Camp Ground	3	126.4	PL.54745	124.2
Camp Ground	4	123.8	PL.64352	119.5
Conway	1	124.2	PL.47546	121.3
Conway	2	124.2	PL.37265	122.7
Conway	3	123.7	PL.38159	117.9
East Bernstadt	1	125.6	PL.57759	118
East Bernstadt	3	124.8	PL.59920	122.7
East Bernstadt	4	124.6	PL.35617	119.8
Eberle	1	124.8	PL.41669	118.5
Eberle	2	124.1	PL.58815	121.8
Eberle	3	125.1	PL.59247	117.1
Fall Rock	1	121.9	PL.7783	121.2
Fall Rock	2	124.8	PL.10219	123.2
Fall Rock	3	124	PL.8462	122.8

## Voltage Measurements

<u>Substation</u>	<u>Feeder</u>	<u>Measured Voltage</u>	<u>WindMil Line Section #</u>	<u>WindMil Model Voltage</u>
Goose Rock	1	123.5	PL.1969	122.6
Goose Rock	2	124.5	PL.1371	124.6
Goose Rock	3	123.3	PL.3303	118.6
Goose Rock	4	125.6	PL.3934	122.6
Greenbriar	2	123	PL.6465	119.2
Greenbriar	3	123.4	PL.6903	121.2
Greenhall	3	124	PL.31866	117.5
Greenhall	4	123.3	PL.30064	118.8
Greenhall	5	123.4	PL.31423	119.5
Hargett	1	123.2	PL.21599	122.3
Hargett	2	126.1	PL.22105	118.8
Hargett	3	125.1	PL.22727	121.5
Hargett	4	124.4	PL.24606	121.3
Keavy	1	126.5	PL.55923	122.3
Keavy	2	126.5	PL.41713	120.9
Keavy	3	124.7	PL.56953	118.7
Keavy	4	121.8	PL.42410	120.5
Keavy	5	125.4	PL.62221	120.2
Laurel Industrial	3	127.1	PL.35257	118.3
Laurel Industrial	4	126	PL.64297	122.1
Laurel Industrial	5	126.2	PL.35124	123
Maplesville	1	122.9	PL.44021	115.6
Maplesville	2	123.6	PL.43835	121.4
Maplesville	3	125.1	PL.44638	121.6
Maretburg	1	122.3	PL.49719	120.9
Maretburg	3	123.7	PL.50056	121.7
McKee	1	124	PL.66802	120.5
McKee	2	125.1	PL.68062	123.9
McKee	3	124.9	PL.67064	123.5
McKee	4	125.2	PL.67263	123.9
Millers Creek	1	122.9	PL.23790	122.1
Millers Creek	2	124.8	PL.24238	120.6
Millers Creek	3	122.6	PL.21258	120.8

## Voltage Measurements

<u>Substation</u>	<u>Feeder</u>	<u>Measured Voltage</u>	<u>WindMil Line Section #</u>	<u>WindMil Model Voltage</u>
Oneida	1	125.7	PL.12121	124
Oneida	2	126.2	PL.10303	124.7
Oneida	3	125.6	PL.10521	122.1
Oneida	4	124.5	PL.11123	124.5
Oneida	5	126.2	PL.11464	124.6
Pine Grove	1	125.6	PL.61017	119.2
Pine Grove	2	123.8	PL.56013	123.3
Pine Grove	3	124.1	PL.55759	118.6
Pine Grove	4	126.5	PL.55619	117.7
Rice Station	1	123.2	PL.25297	121.7
Rice Station	2	121.5	PL.27435	120.1
Rice Station	3	125	PL.28707	114.2
Sand Gap	1	125	PL.26181	124.4
Sand Gap	2	125.1	PL.30302	118.3
Sand Gap	3	125.2	PL.29195	123.8
South Fork	1	124.9	PL.12866	121.8
South Fork	2	124.6	PL.13503	120.4
South Fork	3	123.4	PL.13298	121.5
South Fork	4	121.5	PL.12362	124.5
Three Links	1	123.2	PL.38173	116.4
Three Links	2	124.2	PL.63136	120.5
Three Links	3	125.2	PL.48954	116.7
Tyner	1	126.4	PL.68847	121
Tyner	2	126.6	PL.69452	122.9
Tyner	3	124.3	PL.69982	122.8
West London	1	124.6	PL.34927	121.8
West London	2	124.4	PL.36962	122.9
West London	3	125.1	PL.61003	121.9
West London	4	124.8	PL.52925	123.6
West London	5	126.1	PL.63294	124.7

## **Differences between calculated and measured voltages**

The model used to calculate voltages is a computer simulation. The computer simulation uses certain assumptions when calculating voltage drops.

One of these assumptions is that all conductors of a certain type have exactly the same characteristics, such as impedance. For example, one line section with 6A Copper conductor has the same impedance as any other line section with 6A Copper conductor, in the computer model. There is no differentiation, in the computer model, due to age or deterioration. One line section may have been installed within the last two years and another line section may have been in place for over 40 years. In the computer model these two line sections would be assigned exactly the same impedance values and yield identical voltage drops. If all other parameters are the same, the actual voltage measured at the end of these two line sections will be different.

A second assumption concerns the load on the circuit at the time the actual voltage measurements were made. The loads used in the computer model were obtained from East Kentucky Power Cooperative, which remotely reads the substations in the Jackson Energy Cooperative service area to obtain a peak value. Due to the size of the Jackson Energy Cooperative's service area, the actual voltage readings required more than one day to obtain.

At the time the actual voltage measurements were made the load on the system may not have been the same value as was used in the computer model. This was true in early 2009 due to the ice and wind storms. In addition to outage restoration in our own service area, our personnel also assisted with outage restoration in Western Kentucky. This created a time gap between the time when the system peak occurred and the time when the voltages were measured.

Depending on the time of day and weather conditions when the actual voltage measurements were made the load on the system may have been different than the load used in the computer model.

Jackson Energy Cooperative strives to maintain a balanced load flow on its system. But the system balance changes with the seasons of the year and can also vary with the time of day. At the precise moment when the actual voltage measurements were made the status of the system balance was not known.

## **Section Three**

### **Required Construction Items**

**JACKSON ENERGY COOPERATIVE**  
CONSTRUCTION REQUIRED

CODE 100 NEW SERVICES	2007	2008	Through July 2009	TOTALS 2007-2009	'07-'09 YEAR AVERAGE (2)	2010	2011	2012	2013	Totals 2010-2013
Number of New Services										
Underground	223	198	84	505	188	150	175	200	225	750
Overhead	897	718	332	1,947	728	575	625	700	775	2,675
Total	1,120	916	416	2,452	916	725	800	900	1,000	3,425
Linear Feet of New Line										
Underground	50,536	45,668	19,925	116,129	43,454	34,500	40,250	46,000	51,750	172,500
Ave. Length	227	231	237	230	231	230	230	230	230	230
Overhead	237,411	164,049	62,537	463,997	169,555	135,125	146,875	164,500	182,125	628,625
Ave. Length	265	228	188	238	233	235	235	235	235	235
Total Length in Feet	287,947	209,717	82,462	580,126	213,009			210,500	233,875	801,125
				Length in Miles =	40.34				Length in Miles =	152
Cost of New Line										
Underground	\$743,721	\$678,087	\$370,142	\$1,791,950	\$685,446	\$600,000	\$728,000	\$865,200	\$1,012,500	\$3,205,700
Ave. Cost	\$3,335	\$3,425		\$3,548	\$3,646	\$4,000	\$4,160	\$4,326	\$4,500	
Overhead	\$2,778,458	\$2,078,170	\$941,300	\$5,797,928	\$2,156,762	\$1,630,125	\$1,842,500	\$2,146,200	\$2,471,475	\$8,090,300
Ave. Cost	\$3,098	\$2,894	\$2,835	\$2,978	\$2,963	\$2,835	\$2,948	\$3,066	\$3,189	
Total Cost New Line (1)	\$3,522,179	\$2,756,257	\$1,311,442	\$7,589,878	\$2,842,207			\$3,011,400	\$3,483,975	\$11,296,000

NOTES: (1) Net cost less nonrefundable contribution in aide of construction.

(2) Average derived by projecting the remainder of 2009



<b>CODE 601 TRANSFORMERS</b>	<b>2007</b>	<b>2008</b>	<b>Through July 2009</b>	<b>TOTALS 2007-2009</b>	<b>'07-'09 YEAR AVERAGE (1)</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>Totals 2010-2013</b>
# of New Transformers										
Padmounted	127	56	16	199	70	37	44	50	56	187
Overhead	1038	763	275	2076	757	575	625	700	775	2,675
Ave. Cost per										
Padmounted	\$2,602.78	\$3,574.21	\$1,652.63	\$2,666.88	\$3,790.78	\$2,737.00	\$2,846.00	\$2,960.00	\$3,079.00	
Overhead	\$907.71	\$994.45	\$1,132.20	\$819.35	\$1,123.49	\$1,100.00	\$1,144.00	\$1,190.00	\$1,237.00	
Cost of Transformers										
Padmounted	\$330,553.66	\$200,155.51	\$26,442.00	\$530,709.17	\$265,354.59	\$101,269.00	\$125,224.00	\$148,000.00	\$172,424.00	\$546,917.00
Overhead	\$942,198.72	\$758,763.88	\$311,355.00	\$1,700,962.60	\$850,481.30	\$632,500.00	\$715,000.00	\$833,000.00	\$958,675.00	\$3,139,175.00
Total Cost of Transformers	\$1,272,752.38	\$958,919.39	\$337,797.00	\$2,231,671.77	\$1,115,835.89	\$733,769.00	\$840,224.00	\$981,000.00	\$1,131,099.00	\$3,686,092.00

<b>CODE 601 METERS</b>	<b>2007</b>	<b>2008</b>	<b>Through July 2009</b>	<b>TOTALS 2007-2009</b>	<b>'07-'09 YEAR AVERAGE (1)</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>Totals 2010-2013</b>
Number of New Meters	1236	1032	108	2,376	818	725	800	900	1,000	3,425
Ave. Installed Cost	\$433.34	\$200.55	\$487.37	\$334.69	\$339.37	\$373.10	\$315.63	\$280.56	\$252.50	
Cost of Meters	\$535,611.44	\$206,968.91	\$52,636.00	\$795,216.35	\$277,605	\$270,500	\$252,500	\$252,500	\$252,500	\$1,028,000
Number of new Meter Disc Collars				875		750	750	750	750	3,000
Ave. Installed Cost						\$155	\$155	\$155	\$155	
Cost of Disc Collars						\$116,250	\$116,250	\$116,250	\$116,250	\$465,000

<b>CODE 602 SERVICE UPGRADES</b>	<b>2007</b>	<b>2008</b>	<b>Through July 2009</b>	<b>TOTALS 2007-2009</b>	<b>'07-'09 YEAR AVERAGE (1)</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>Totals 2010-2013</b>
Number of Inc. Capacity	49	34	26	109	43	105	110	115	120	450
Ave. Installed Cost	\$1,068.44	\$967.70	\$975.42	\$1,014.83	\$1,009.09	\$2,200.00	\$2,200.00	\$2,200.00	\$2,200.00	
Cost of Inc. Capacity	\$52,353.58	\$32,901.63	\$25,361.00	\$110,616.21	\$42,910	\$231,000	\$242,000	\$253,000	\$264,000	\$990,000

(1) Average derived by projecting the remainder of 2009

CODE 603 SECTIONALIZING	2007	2008	Through July 2009	TOTALS 2007-2009	'07-'09 YEAR AVERAGE (1)	2010	2011	2012	2013	Totals 2010-2013
Versa-Tech Recloser	0	15	55	70	23	50	50	50	50	200
Ave. Cost per Unit	\$0	\$3,750	\$4,130	\$3,750	\$2,627	\$4,200	\$5,880	\$8,232	\$11,525	
Cost of 70 Amp L		\$56,250	\$227,150	\$262,500	141,700	\$210,000	\$294,000	\$411,600	\$576,250	\$1,491,850
Electronic 3 Ph Recloser	0	0		0		11	11	10	10	42
Ave. Cost per Unit	\$0	\$0		\$0		\$17,000	\$17,680	\$18,387	\$19,123	
Cost of 100 Amp L						\$187,000	\$194,480	\$183,870	\$191,230	\$756,580
GOAB Switches	5	2	1	7	3	5	5	5	5	20
Ave. Cost per Unit	\$2,600.00	\$2,700.00	\$2,800.00	\$0.00	\$2,700	\$3,000	\$4,200	\$5,880	\$8,232	
Cost of GOAB Switches	\$13,000.00	\$5,400.00	\$2,800.00	\$18,400.00	\$7,067	\$15,000	\$21,000	\$29,400	\$41,160	\$106,560
Fused Cutouts	641	18	152	659	270	125	110	100	95	430
Ave. Cost per Unit	\$197	\$225	\$250	\$0.00	\$224	\$318	\$331	\$344	\$358	
Cost of Fused Cuouts	\$126,277.00	\$4,050.00	\$38,000.00	\$130,327.00	\$56,109	\$39,750	\$36,410	\$34,400	\$34,010	\$144,570
Sectionalizing Total	\$139,277.00	\$65,700.00	\$267,950.00	\$411,227.00	\$157,642	\$451,750	\$545,890	\$659,270	\$842,650	\$2,499,560

(1) Average derived by projecting the remainder of 2009

<b>CODE 604</b>			<b>Through July</b>	<b>TOTALS</b>	<b>'07-'09 YEAR</b>					<b>Totals</b>
<b>LINE REGULATORS</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2007-2009</b>	<b>AVERAGE (1)</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2010-2013</b>
Single Phase Unit, 76.2	\$0	\$0		\$0	0			\$0	\$0	\$0
Single Phase Unit, 114.3	\$0	\$0		\$0	0			\$0	\$0	\$0
Single Phase Unit, 167	\$0	\$0		\$0	0			\$0	\$0	\$0
Single Phase Unit, 250	\$0	\$0		\$0				\$0	\$0	\$0
Single Phase Unit, 333								\$0	\$0	\$0
<b>Total</b>	<b>\$0.00</b>	<b>\$0.00</b>		<b>\$0.00</b>	<b>\$0</b>			<b>\$0.00</b>	<b>\$0.00</b>	<b>\$0.00</b>

<b>CODE 605</b>			<b>Through July</b>	<b>TOTALS</b>	<b>'07-'09 YEAR</b>					<b>Totals</b>
<b>CAPACITORS/ CONTROLS</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2007-2009</b>	<b>AVERAGE (1)</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2010-2013</b>
Number of Capacitors/Controls	0	0		0	0			0	0	0
Ave. Installed Cost	\$0.00	\$0.00		\$0.00	\$0.00			\$0.00	\$0.00	
<b>Total</b>	<b>\$0.00</b>	<b>\$0.00</b>		<b>\$0.00</b>	<b>\$0</b>			<b>\$0</b>	<b>\$0</b>	<b>\$0</b>

<b>CODE 606</b>			<b>Through July</b>	<b>TOTALS</b>	<b>'07-'09 YEAR</b>					<b>Totals</b>
<b>POLE REPLACEMENTS</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2007-2009</b>	<b>AVERAGE (1)</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2010-2013</b>
Number of Poles	118	256	212	586	246	250	250	250	250	1,000
Ave. Installed Cost	\$2,349.75	\$2,162.20	\$2,107.49	\$2,180.17	\$2,164	\$2,107	\$2,191	\$2,279.00	\$2,370.00	
<b>Total</b>	<b>\$277,270.10</b>	<b>\$553,523.46</b>	<b>\$446,787.00</b>	<b>\$1,277,580.56</b>	<b>\$532,238</b>	<b>\$526,750</b>	<b>\$547,750</b>	<b>\$569,750</b>	<b>\$592,500</b>	<b>\$2,236,750</b>

<b>CODE 607</b>			<b>Through July</b>	<b>TOTALS</b>	<b>'07-'09 YEAR</b>					<b>Totals</b>
<b>Misc Replacements</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2007-2009</b>	<b>AVERAGE (1)</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2010-2013</b>
# of Replacements			30			42	42	42	42	168
Ave. Installed Cost			\$1,030.00			\$1,100.00	\$1,100.00	\$1,100.00	\$1,100.00	
<b>Total</b>			<b>\$30,900</b>			<b>\$46,200</b>	<b>\$46,200</b>	<b>\$46,200</b>	<b>\$46,200</b>	<b>\$184,800</b>

(1) Average derived by projecting the remainder of 2009

<b>CODE 701</b>			<b>Through July</b>	<b>TOTALS</b>	<b>'07-'09 YEAR</b>					<b>Totals</b>
<b>SECURITY LIGHTS</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2007-2009</b>	<b>AVERAGE (1)</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2010-2013</b>
Number of Lights	534	598	301	1433	549	550	550	550	550	2,200
Ave. Installed Cost	\$450.76	\$460.09	\$495.20	\$463.99	\$468.34	\$495.00	\$515.00	\$536.00	\$557.00	
Total	\$240,703.27	\$275,133.99	\$149,055.00	\$664,892.26	\$257,120	\$272,250	\$283,250	\$294,800	\$306,350	\$1,156,650

(1) Average derived by projecting the remainder of 2009

### Code 300 Project Summary

Item		Existing	Proposed	1 Phase	2 Phase	3 Phase	
Number	Description	Conductor	Conductor	Miles	Miles	Miles	Cost
370-3 *	Hwy 1394 Hazel Green School to Farris-Jones Road	3 Ph 6A & 8A Cu	1/0 ACSR			1.9	\$190,000
301-20	Greenbriar F2 to Greenbriar F4 Load Transfer	1 Ph 6A Cu & 1 Ph #4 ACSR	336 MCM			1.0	\$115,000
302-11	Chop Bottom and Williams Hollow two phase	1 Ph 6A Cu	1/0 ACSR		0.3		\$25,500
303-22	Riverbend UG Replacement	1 Ph 1/0 UG Direct Buried	1 Ph 1/0 UG	2.0			\$200,000
304-16	Lymans Creek to Tallega	1 Ph 6A Cu	1/0 ACSR			2.8	\$294,000
305-16	Wilson Fork to Bear Run Road	3 Ph #2 ACSR	1/0 ACSR			1.0	\$100,000
306-26	Arvel along Farmer's Ridge	1 Ph 6A Cu	1/0 ACSR		4.8		\$408,000
			Totals	2.0	5.1	6.7	\$1,332,500
			Total Miles	13.8			

\* Carry Over Item

## Code 300 Projects

**Project:** Greenbriar Feeder #2 to Greenbriar Feeder #4 Load Transfer

**Project Code:** 301-20

**Distance:** 1.0 Mile

**Cost:** \$115,000

### DESCRIPTION OF THE PROPOSED WORK

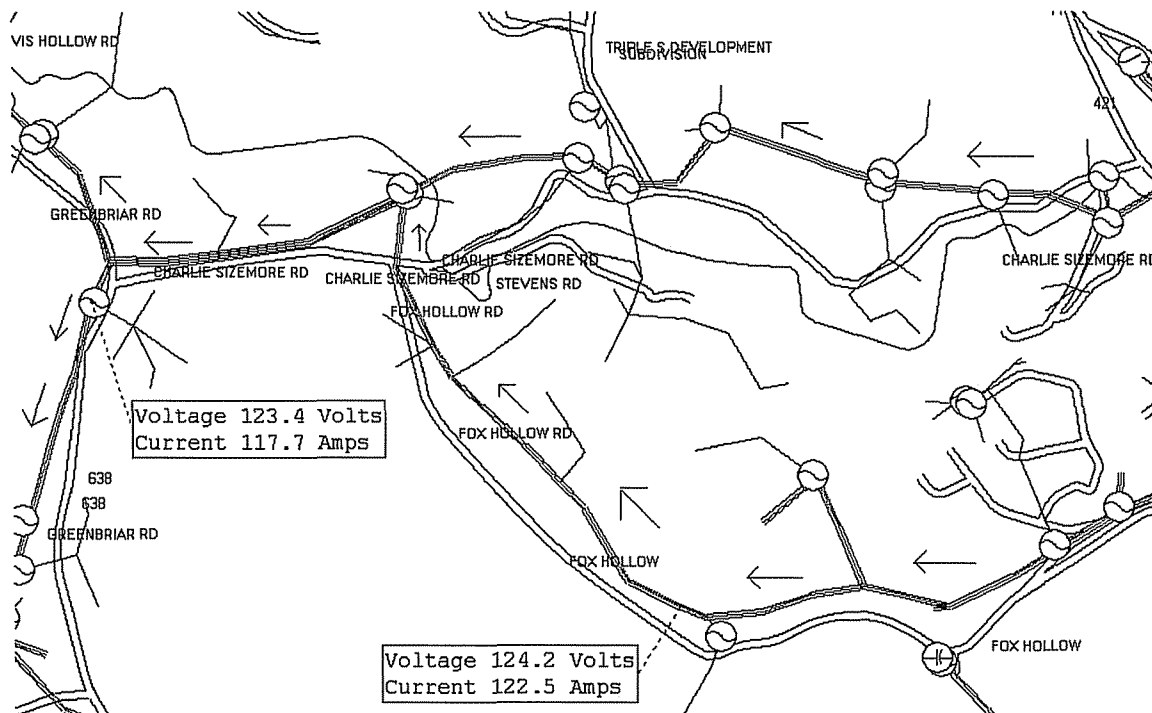
Convert 1.0 mile of single phase line composed of sections of #4 ACSR, #2 ACSR and 6A Cu to three phase 336 MCM ACSR.

### REASON FOR THE PROPOSED CONSTRUCTION

Load balancing between feeders - Greenbriar Feeder #4 has very little load on it, while Greenbriar Feeder #2 has a load in excess of 200 amps on cold mornings.

### RESULTS OF THE PROPOSED CONSTRUCTION

The amount of line, and current load, will be more evenly distributed between Greenbriar Feeder #2 and Greenbriar Feeder #4. This will improve reliability to the consumers in the area.



## Code 300 Projects

**Project:** Chop Bottom and Williams Hollow two phase

**Project Code:** 302-11

**Distance:** 0.3 Mile

**Cost:** \$25,500

### DESCRIPTION OF THE PROPOSED WORK

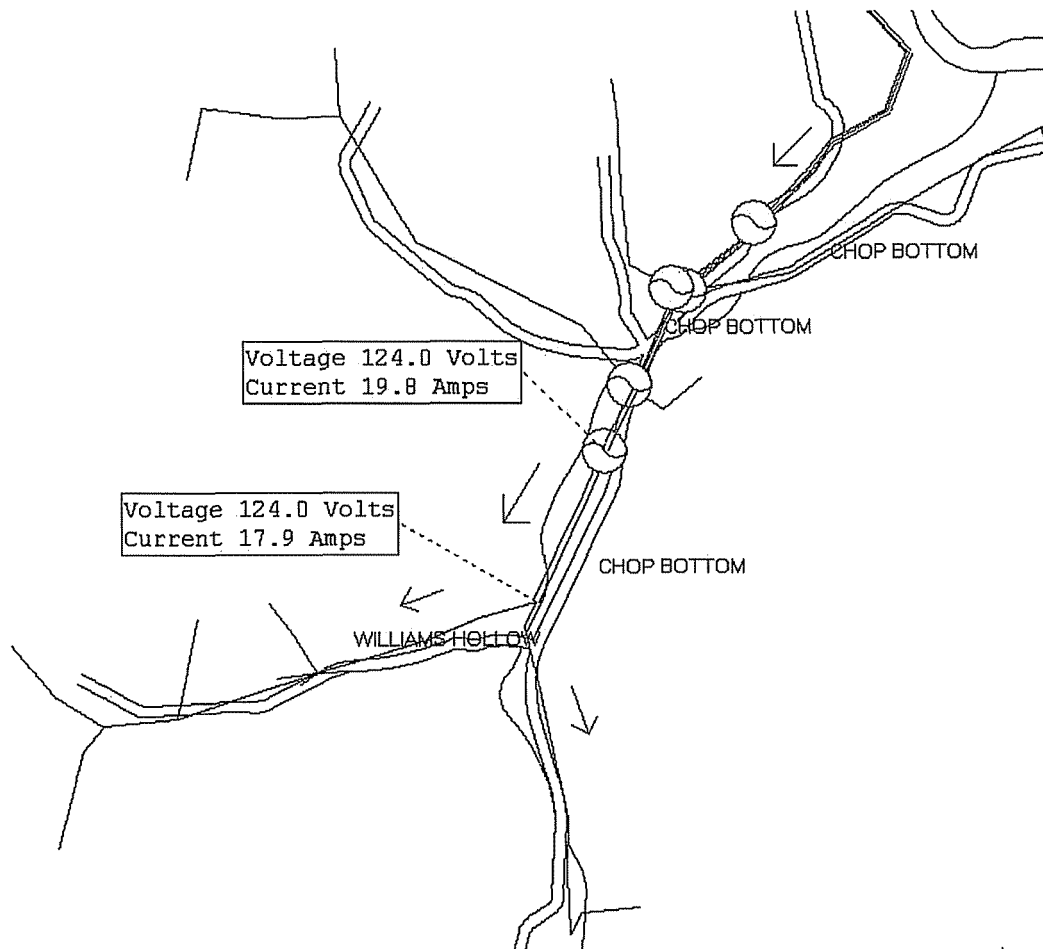
Replace 0.3 mile of single phase 6A Cu with two phase 1/0 ACSR.

### REASON FOR THE PROPOSED CONSTRUCTION

Design Criteria 4 and 8. Field personnel report having problems restoring service due to the condition of the 6A Cu conductor. During cold weather the loading on the existing single phase lengthens outage restoration time.

### RESULTS OF THE PROPOSED CONSTRUCTION

Improved reliability for consumers in this area.



## Code 300 Projects

**Project: Riverbend UG Replacement**

**Project Code: 303-22**

**Distance: 2.0 Miles**

**Cost: \$200,000**

### **DESCRIPTION OF THE PROPOSED WORK**

Replace 2.0 miles of single phase direct burial UG with single phase underground cable in conduit.

### **REASON FOR THE PROPOSED CONSTRUCTION**

Design Criteria # 9.

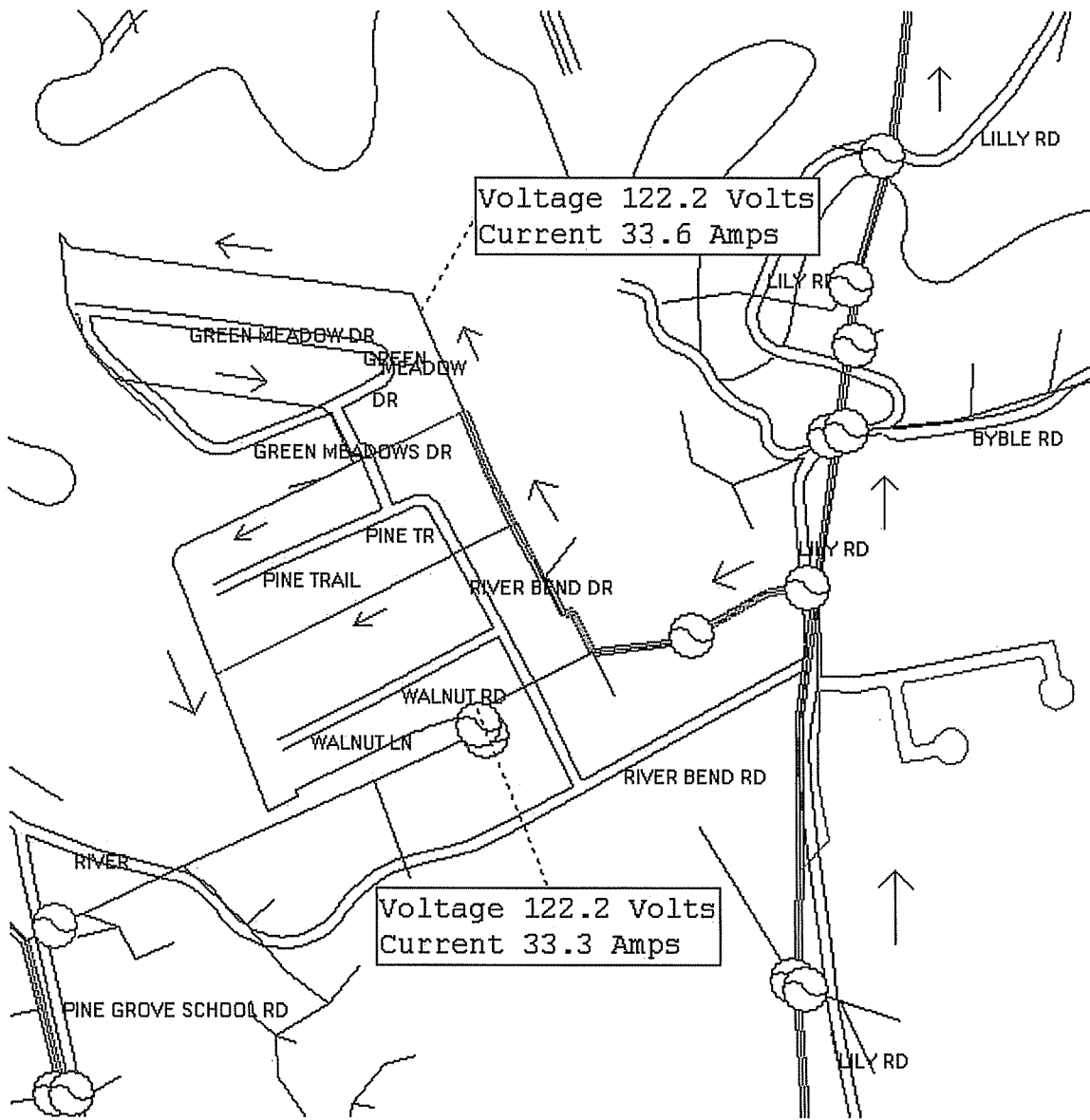
### **RESULTS OF THE PROPOSED CONSTRUCTION**

Improved reliability for consumers in this area.

(The map for this project is included on the following page.)



Code 300 Projects



Item 303-22 Riverbend UG Replacement

## Code 300 Projects

**Project:** Lymans Creek to Tallega

**Project Code:** 304-16

**Distance:** 2.8 Mile

**Cost:** \$294,000

### **DESCRIPTION OF THE PROPOSED WORK**

Convert 2.8 miles of existing single phase 6A Cu line to three phase 1/0 ACSR line

### **REASON FOR THE PROPOSED CONSTRUCTION**

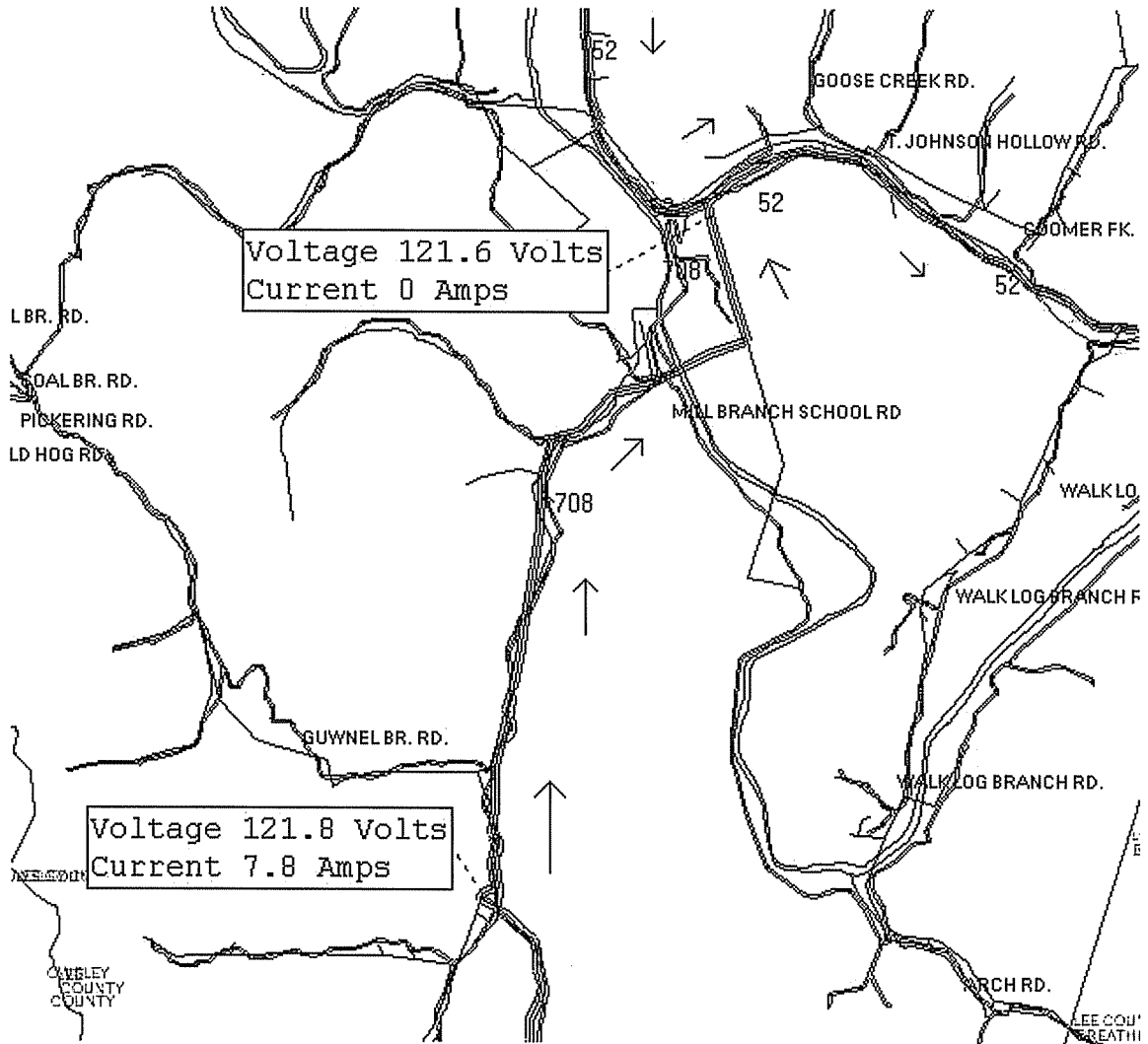
Provide a three phase back feed capability for Beattyville Feeder No.2 as this is now a radial feed.

### **RESULTS OF THE PROPOSED CONSTRUCTION**

Lessen outage times by providing access to additional sources. Lessen the number of outages due to maintenance by providing access to additional sources.

(The map for this project is included on the following page.)

Code 300 Projects



Project Code 304-16 Lymans Creek to Tallega

## Code 300 Projects

**Project:** Wilson Fork to Bear Run Road

**Project Code:** 305-16

**Distance:** 1.0 Mile

**Cost:** \$100,000

### DESCRIPTION OF THE PROPOSED WORK

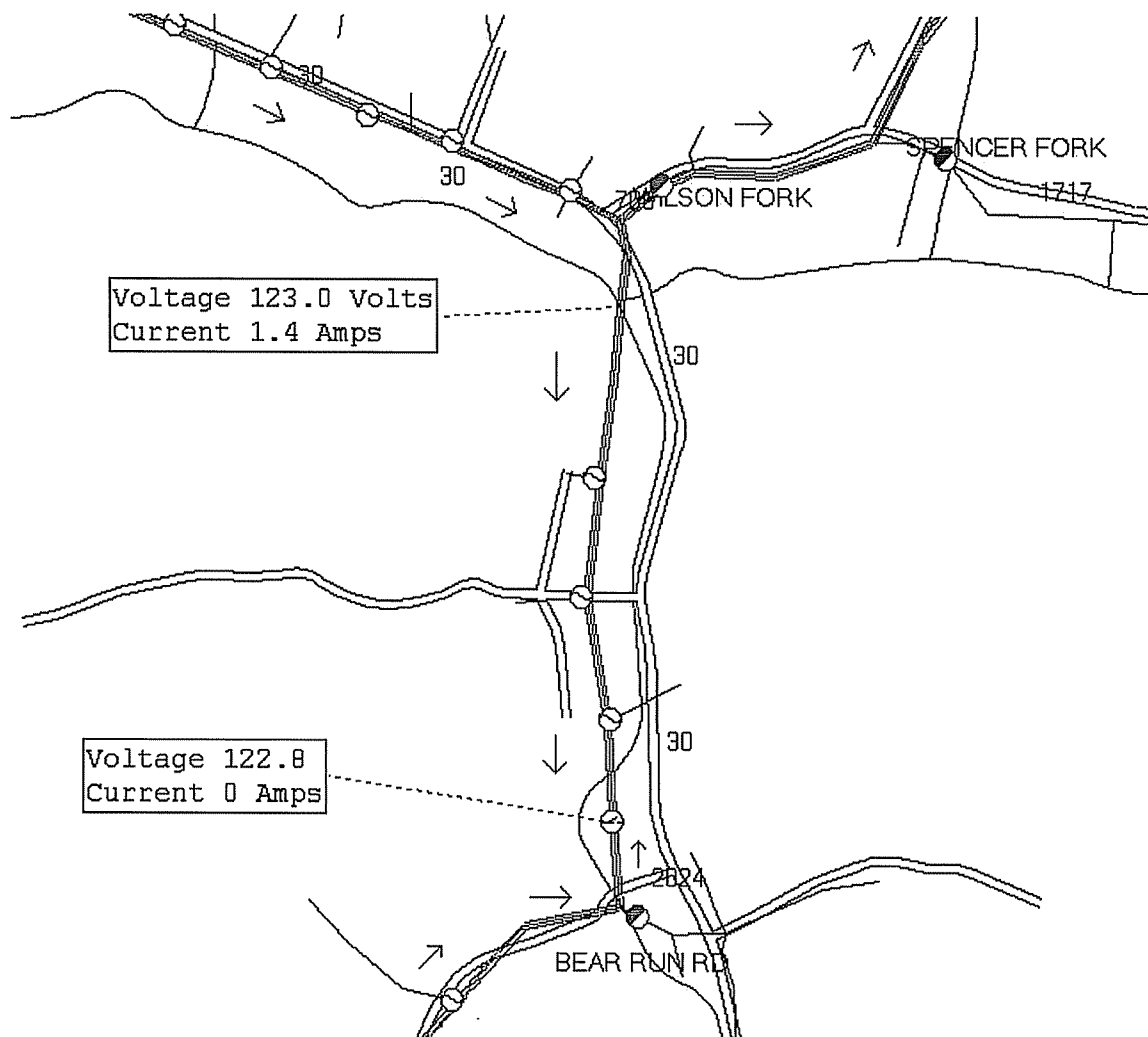
Replace approximately 1.0 mile of three phase #2 ACSR with three phase 1/0 ACSR.

### REASON FOR THE PROPOSED CONSTRUCTION

When back feeding, this section is the weak link. This limits the number of consumers that can be fed from another substation during an outage.

### RESULTS OF THE PROPOSED CONSTRUCTION

Improve reliability to consumers in the area by strengthening the back feed capability.



## Code 300 Projects

**Project:** Arvel along Farmer's Ridge

**Project Code:** 306-26

**Distance:** 4.8 Miles

**Cost:** \$408,000

### **DESCRIPTION OF THE PROPOSED WORK**

Replace 4.8 miles of single phase 6A and 8A Cu conductor with two phase 1/0 ASCR and single phase 1/0 ACSR.

### **REASON FOR THE PROPOSED CONSTRUCTION**

Design Criteria 4 and 8.

### **RESULTS OF THE PROPOSED CONSTRUCTION**

Improved voltage levels and reliability to consumers in the area.

(The map for this project is included on the following page.)



## Code 300 Projects

**Project: HWY 1394 - Hazel Green School to Farris-Jones Road**

**Project Code: 370-3**

**Distance: 1.9 miles**

**Cost: \$190,000**

### DESCRIPTION OF THE PROPOSED WORK

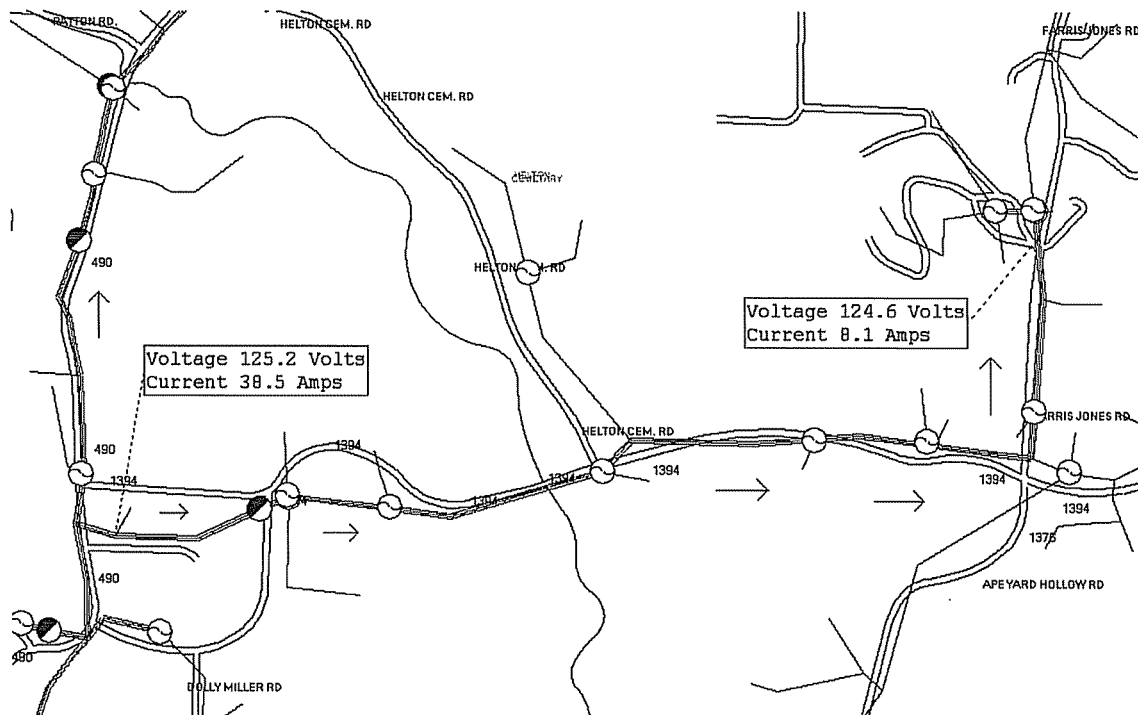
Replace 1.9 miles of three phase 6A & 8A Copper conductor with three phase 1/0 ACSR conductor.

### REASON FOR THE PROPOSED CONSTRUCTION

Design Criteria: 8

### RESULTS OF THE PROPOSED CONSTRUCTION

Improved reliability and voltage levels.



## Conductor Replacement - Code 608

The following is a summary of the conductors that will be replaced during this construction work plan:

6A Copper    100.9 miles

#4 ACSR        1.5 miles

Total         102.4 miles

The cost for these conductor replacements is \$7,860,000.



## **Code 615 - Communications Equipment**

Jackson Energy Cooperative utilizes a radio system licensed in the Private Land Mobile Radio service. The channel width of the existing radio system is 25 KHz.

The Federal Communications Commission is requiring that Private Land Mobile Radio licensees, operating below 512 MHz, migrate to a channel width of 12.5 KHz. The deadline for the change is January 1, 2013.

In order to meet the requirements of the Federal Communications Commission Jackson Energy Cooperative will purchase a new radio system. The new radio system will meet the 12.5 KHz channel width requirement.

The radio system selected by Jackson Energy is the Kenwood NEXEDGE system. This will be a digital, trunked radio system operating in the 450 MHz band.

An itemized list of the equipment is included on the following pages.

## Code 615 - Communications Equipment

<u>Item</u>	<u>Qty</u>
NXR8000SK1 NXR-8000 High Performance Exciter Unit	25
KXK3M Very Narrow Band Option	7
KSGCB60004 NXR Series Programming Cable	6
KSGA315S 150 W Continuous Duty Amplifier with Power Supply	24
KSGMRCK7 Seven foot Aluminum equipment rack	20
KSGP91800 Repeater Trunking Feature	22
KSGPGKEYSM System Manager Software & Secure USB Key	1
KSGPG91810 Site Networking Option	5
KSGNS10008 8-Port Managed Switch with mounting tray	6
KSGRT10004 4-Port Managed VPN with mounting tray	6
KSG4 4-channel combiner, multicoupler, preselector	6
KSGLOT Misc. shop supplies, jumper cables & inter cable wiring	6
KSGPW1525 Uninterruptible Power Supply	24
KSGLDF6-50 1-1/4" foam heliax, 600'	6
KSGDB616 5.25 db antenna	12
KSGLDF4.5-50 5/8" foam heliax, 400'	6
FSJ4-50 1/2" superflex, 50'	6
KSGKEN Special WT fab antenna mount	6
KSGLOT Misc. connectors, hangers, grounding, etc.	14
KSG-60F1579 Power Strip	8
KSGTLH-5x-TTX-N 5.8 GHz microwave radio	15
KSGLH-1-T1-RM T-1 indoor rack	14
KSGLH-Key-TDM TDM mode upgrade	15
KSGTBD Industrial CAT-6 cable, 250'	14
KSGRFS37300059 5.8 GHz 4' antenna	14
KSGLOT Special WT fab antenna mount	14
KSG9050319 Three position bundled 4020RD 10 Channel Console	1
KSG9019351/9314 4018 Console, Power Supply, Microphone	1
KSG9509439/9102 Telephone/Radio Headset interface	4
KSG9509820 Dual Channel Card	4
KSG9509695 Console Interface Card	1
KSG9019630 iRIM interface module w/Rack Mount	6
KSG9500889 System Programming Software	1
KSG9050229 Patch Card	1
KSGLOT Cables, connectors, punch-down blocks, slot covers	1
KSG9500454 Wireless Headset System	4
NX-800K Control Station Radio	16
KSGPS Power Supply	1

## Code 615 - Communications Equipment

<u>Item</u>	<u>Qty</u>
Antenna Package-Yagi antenna, transmission line, lightening protect	1
NX-800HK Mobile Radios	92
NX-300K Handheld Portable Radios	42
AVL/GPS NX-800K Control Station	6
AVL/GPS Receiver Board	90
KSGMN10700 NXR800 Service Manual	1
KSGMP10035 KMC35 Service Microphone	1
KSGPGKEY01 USB Key Grade 1	1
KSGPGKEY01 USB Key Grade 2	1
KSGPA23413 150W Continuous Duty Amplifier	1
KSG20400 40A Power Supply	1
Digital Voice Recorder	1
20 KW Generator	1
Equipment Cost	\$1,322,537
Labor Cost	\$ 177,000
Total Cost	\$1,499,537