BISON 3 WINDPOWER - SIEMENS FEEDERS
PRIMARY CONDUCTOR & COMMUNICATIONS B.O.M.

CABLE LABEL	FROM	TO	TRENCH	QTY.	UNIT	DESCRIPTION	MANUFACTURER
						FEEDER #813	
813B 77-813A 88	SW 813 BRAVO-77	SW 813 ALPHA-88	2,024	6,072	FT	750 kcmil str AL, 35kV, 16#12 CU CONC NEUTRAL, JKT	OKONITE
813A 77-SUB	SW 813 ALPHA-77	FDR BKR 813	24,628	73,884	FT	1000 kcmil str AL, 35kV, 16#12 CU CONC NEUTRAL, JKT	OKONITE
813C 77-813B 88	SW 813 CHARLIE-77	SW 813 BRAVO-88	2,554	7,662	FT	350 kcmil str AL, 35kV, 16#12 CU CONC NEUTRAL, JKT	OKONITE
813D 77-813C 88	SW 813 DELTA-77	SW 813 CHARLIE-88	4,292	12,876	FT	4/0 AWG str AL, 35kV, 12#14 CU CONC NEUTRAL, JKT	OKONITE
813E 77-813B 33	SW 812 ECHO-77	SW 813 BRAVO-33	1002	3,006	FT	4/0 AWG str AL, 35kV, 12#14 CU CONC NEUTRAL, JKT	OKONITE
T302-813D 88	TURBINE 302	SW 813 DELTA-88	20	60	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T301-813D 33	TURBINE 301	SW 813 DELTA-33	1,948	5,844	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T304-813C 44	TURBINE 304	SW 813 CHARLIE-44	1,862	5,586	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T303-813C 33	TURBINE 303	SW 813 CHARLIE-33	486	1,458	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T305-813E 88	TURBINE 305	SW 813 ECHO-88	1,162	3,486	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T306-813E 33	TURBINE 306	SW 813 ECHO-33	76	228	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T307-813A 33	TURBINE 307	SW 813 ALPHA-33	116	348	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
813A T7-813TR	SW 813 ALPHA-T7	813TR	18	54	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
	Feeder Fiber Total		40,188	40,188	FT	9/125 SINGLE MODE, 24 STRAND FIBER, LOOSE TUBE, UV RESISTANT PE JKT, FOR DIRECT BURIAL, IN 2" HDPE INNERDUCT	COMMSCOPE
	Feeder Conductor Total			120,564	FT		
						FEEDER #814	
814B 77-814A 88	SW 814 BRAVO-77	SW 814 ALPHA-88	3,860	11,580	FT	750 kcmil str AL, 35kV, 16#12 CU CONC NEUTRAL, JKT	OKONITE
814A 77-SUB	SW 814 ALPHA-77	FDR BKR 814	23,455	70,365	FT	1000 kcmil str AL, 35kV, 16#12 CU CONC NEUTRAL, JKT	OKONITE
814D 77-814C 88	SW 814 DELTA-77	SW 814 CHARLIE-88	1,662	4,986	FT	350 kcmil str AL, 35kV, 16#12 CU CONC NEUTRAL, JKT	OKONITE
814C 77-814B 88	SW 814 CHARLIE-77	SW 814 BRAVO-88	1,820	5,460	FT	750 kcmil str AL, 35kV, 16#12 CU CONC NEUTRAL, JKT	OKONITE
814F 77-814E 88	SW 814 FOXTROT-77	SW 814 ECHO-88	2,518	7,554	FT	4/0 AWG str AL, 35kV, 12#14 CU CONC NEUTRAL, JKT	OKONITE
814E 77-814D 88	SW 814 ECHO-77	SW 814 DELTA-88	1,734	5,202	FT	350 kcmil str AL, 35kV, 16#12 CU CONC NEUTRAL, JKT	OKONITE
T308-814F 88	TURBINE 308	SW 814 FOXTROT-88	1,744	5,232	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T309-814F 33	TURBINE 309	SW 814 FOXTROT-33	20	60	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T310-814E 33	TURBINE 310	SW 814 ECHO-33	18	54	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T311-814D 33	TURBINE 311	SW 814 DELTA-33	18	54	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T312-814C 33	TURBINE 312	SW 814 CHARLIE-33	98	294	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T313-814B 33	TURBINE 313	SW 814 BRAVO-33	32	96	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T314-814A 33	TURBINE 314	SW 814 ALPHA-33	180	540	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
814A T7-814TR	SW 814 ALPHA-T7	814TR	20	60	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
	Feeder Fiber Total		37,179	37,197	FT	9/125 SINGLE MODE, 24 STRAND FIBER, LOOSE TUBE, UV RESISTANT PE JKT, FOR DIRECT BURIAL, IN 2" HDPE INNERDUCT	COMMSCOPE
	Feeder Conductor Total			111,591	FT		
						FEEDER #815	
815B 77-815A 88	SW 815 BRAVO-77	SW 815 ALPHA-88	2,730	8,190	FT	750 kcmil str AL, 35kV, 16#12 CU CONC NEUTRAL, JKT	OKONITE
815A 77-SUB	SW 815 ALPHA-77	FDR BKR 815	27,044	81,132	FT	1000 kcmil str AL, 35kV, 16#12 CU CONC NEUTRAL, JKT	OKONITE
815D 77-815C 88	SW 815 DELTA-77	SW 815 CHARLIE-88	1,878	5,634	FT	4/0 AWG str AL, 35kV, 12#14 CU CONC NEUTRAL, JKT	OKONITE
815C 77-815B 88	SW 815 CHARLIE-77	SW 815 BRAVO-88	8,056	24,168	FT	350 kcmil str AL, 35kV, 16#12 CU CONC NEUTRAL, JKT	OKONITE
815B 33-815E 77	SW 815 BRAVO-33	SW 815 ECHO-77	1,306	3,918	FT	4/0 AWG str AL, 35kV, 12#14 CU CONC NEUTRAL, JKT	OKONITE
T321-815D 88	TURBINE 321	SW 815 DELTA-88	1,652	4,956	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T320-815D 33	TURBINE 320	SW 815 DELTA-33	18	54	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T319-815C 33	TURBINE 319	SW 815 CHARLIE-33	46	138	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T316-815B 44	TURBINE 316	SW 815 BRAVO-44	16	48	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T317-815E 88	TURBINE 317	SW 815 ECHO-88	18	54	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T318-815E 33	TURBINE 318	SW 815 ECHO-33	2,744	8,232	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T315-815A 33	TURBINE 315	SW 815 ALPHA-33	20	60	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
815A T7-815TR	SW 815 ALPHA-T7	815TR	14	42	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
	Feeder Fiber Total		45,542	45,542	FT	9/125 SINGLE MODE, 24 STRAND FIBER, LOOSE TUBE, UV RESISTANT PE JKT, FOR DIRECT BURIAL, IN 2" HDPE INNERDUCT	COMMSCOPE
	Feeder Conductor Total			136,626	FT		

BISON 3 WINDPOWER - SIEMENS FEEDERS
PRIMARY CONDUCTOR & COMMUNICATIONS B.O.M. (CON'T)

CABLE LABEL	FROM	TO	TRENCH	QTY.	UNIT	DESCRIPTION	MANUFACTURER
						FEEDER #816	
816B 77-816A 88	SW 816 BRAVO-77	SW 816 ALPHA-88	2,726	8,178	FT	750 kcmil str AL, 35kV, 16#12 CU CONC NEUTRAL, JKT	OKONITE
816A 77-SUB	SW 816 ALPHA-77	FDR BKR 816	30,698	92,094	FT	1000 kcmil str AL, 35kV, 16#12 CU CONC NEUTRAL, JKT	OKONITE
816C 77-816B 88	SW 816 CHARLIE-77	SW 816 BRAVO-88	880	2,640	FT	750 kcmil str AL, 35kV, 16#12 CU CONC NEUTRAL, JKT	OKONITE
816E 77-816D 88	SW 816 ECHO-77	SW 816 DELTA-88	1,842	5,526	FT	4/0 AWG str AL, 35kV, 12#14 CU CONC NEUTRAL, JKT	OKONITE
816D 77-816C 88	SW 816 DELTA-77	SW 816 CHARLIE-88	2,614	7,842	FT	350 kcmil str AL, 35kV, 16#12 CU CONC NEUTRAL, JKT	OKONITE
T323-816E 33	TURBINE 323	SW 816 ECHO-33	20	60	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T322-816E 88	TURBINE 322	SW 816 ECHO-88	1,208	3,624	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T324-816D 33	TURBINE 324	SW 816 DELTA-33	1,538	4,614	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T325-816C 33	TURBINE 325	SW 816 CHARLIE-33	3,212	9,636	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T326-816C 44	TURBINE 326	SW 816 CHARLIE-44	660	1,980	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T327-816B 33	TURBINE 327	SW 816 BRAVO-33	64	192	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T328-816A 33	TURBINE 328	SW 816 ALPHA-33	1,108	3,324	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
816A T7-816TR	SW 816 ALPHA-T7	816TR	28	84	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
	Feeder Fiber Total		46,598	46,598	24 FO	9/125 SINGLE MODE, 24 STRAND FIBER, LOOSE TUBE, UV RESISTANT PE JKT, FOR DIRECT BURIAL, IN 2" HDPE INNERDUCT	COMMSCOPE
	Feeder Conductor Total			139,794	FT		
						FEEDER #817	
817B 77-817A 88	SW 817 BRAVO-77	SW 817 ALPHA-88	1,868	5,604	FT	750 kcmil str AL, 35kV, 16#12 CU CONC NEUTRAL, JKT	OKONITE
817A 77-SUB	SW 817 ALPHA-77	FDR BKR 817	25,174	75,522	FT	1000 kcmil str AL, 35kV, 16#12 CU CONC NEUTRAL, JKT	OKONITE
817C 77-817B 88	SW 817 CHARLIE-77	SW 817 BRAVO-88	3,986	11,958	FT	350 kcmil str AL, 35kV, 16#12 CU CONC NEUTRAL, JKT	OKONITE
817D 77-817B 44	SW 817 DELTA-77	SW 817 BRAVO-44	3,906	11,718	FT	4/0 AWG str AL, 35kV, 12#14 CU CONC NEUTRAL, JKT	OKONITE
T335-817C 88	TURBINE 335	SW 817 CHARLIE-88	1,838	5,514	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T334-817C 33	TURBINE 334	SW 817 CHARLIE-33	18	54	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T333-817C 44	TURBINE 333	SW 817 CHARLIE-44	1,904	5,712	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T331-817B 33	TURBINE 331	SW 817 BRAVO-33	18	54	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T330-817D 88	TURBINE 330	SW 817 DELTA-88	20	60	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T329-817D 33	TURBINE 329	SW 817 DELTA-33	2,554	7,662	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
T332-817A 33	TURBINE 332	SW 817 ALPHA-33	18	54	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
817A T7-817TR	SW 817 ALPHA-T7	817TR	20	60	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	OKONITE
	MET TOWER	SW 817 DELTA-88	5,838	5,838	FT	9/125 SINGLE MODE, 24 STRAND FIBER, LOOSE TUBE, UV RESISTANT PE JKT, FOR DIRECT BURIAL, IN 2" HDPE INNERDUCT	COMMSCOPE
	Feeder Fiber Total		47,162	47,162	FT	9/125 SINGLE MODE, 24 STRAND FIBER, LOOSE TUBE, UV RESISTANT PE JKT, FOR DIRECT BURIAL, IN 2" HDPE INNERDUCT	
	Feeder Conductor Total			123,972	FT		
						TOTALS	
			130,999	392,997	FT	1000 kcmil str AL, 35kV, 16#12 CU CONC NEUTRAL, JKT	AS-BUILT
			15,908	47,742	FT	750 kcmil str AL, 35kV, 16#12 CU CONC NEUTRAL, JKT	
			20,606	61,818	FT	350 kcmil str AL, 35kV, 16#12 CU CONC NEUTRAL, JKT	
			16,744	50,232	FT	4/0 AWG str AL, 35kV, 12#14 CU CONC NEUTRAL, JKT	
			26,574	79,722	FT	1/0 AWG str AL, 35kV, 10#14 CU CONC NEUTRAL, JKT	
			216,669	216,669	FT	9/125 SINGLE MODE, 24 STRAND FIBER, LOOSE TUBE, UV RESISTANT PE JKT, FOR DIRECT BURIAL, IN 2" HDPE INNERDUCT CAT# D-024-LN-8W-F-12-NS	AS-BUILT

THIS BILL OF MATERIAL DOES NOT INCLUDE CONDUCTORS FOR LV POWER AND GROUNDING FROM PAD MOUNT TO TURBINE OR FOUNDATION GROUNDING
*TRENCH LENGTH IS MEASURED FROM START OF PIPE TO END OF PIPE

PIKE ENERGY SOLUTIONS
PIKE ENERGY SOLUTIONS, LLC.
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Charlotte, NC 28262
ND License No. 954PE

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
A	RJG	RJG	CSF	8/16/11	85% DELIVERABLE
B	BNK	CSF	CSF	9/20/11	90% DELIVERABLE
0	BNK	CSF	JLM	10/4/11	ISSUED FOR CONSTRUCTION
1	BNK	CSF	JLM	10/7/11	REVISED QUANTITIES PER COMMENTS
2	NJG	NJG	NJG	2/21/13	CONSTRUCTION REVISIONS

REGISTERED PROFESSIONAL ENGINEER KENNETH J. BENOIT 6506 DATE 2-21-13 STATE OF NORTH DAKOTA

CLIENT	8/16/11	9/20/11		10/4/11	10/7/11		
BID							
CONSTRUCTION							
PERMITTING							
RELEASED TO/FOR	A	B	C	0	1	2	3
	DATE RELEASED						

BARR
Corporate Headquarters: Minneapolis, Minnesota Ph: 1-800-632-2277
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Scale	N.T.S
Date	8/16/11
Drawn	RJG
Checked	CEG
Designed	RJG
Approved	JLM

minnesota power AN ALLETE COMPANY — Bison
A WIND ENERGY INITIATIVE OF MINNESOTA POWER IN NORTH DAKOTA

BISON 3 WIND PROJECT
MORTON & OLIVER COUNTIES, NORTH DAKOTA

COLLECTOR SYSTEM
BILL OF MATERIAL - PRIMARY CONDUCTOR AND COMMUNICATIONS

BARR PROJECT No. 34/33-1006
CLIENT PROJECT No.
DWG. No. E-BM-31
REV. No. 2

Images in Drawing