KPSC Case No. 2011-00401 Sierra Club's Initial Data Requests Dated January 13, 2012 Item No. 3, Volume C Page 1 of 204

KENTUCKY POWER COMPANY

INTEGRATED RESOURCE PLANNING REPORT TO THE KENTUCKY PUBLIC SERVICE COMMISSION

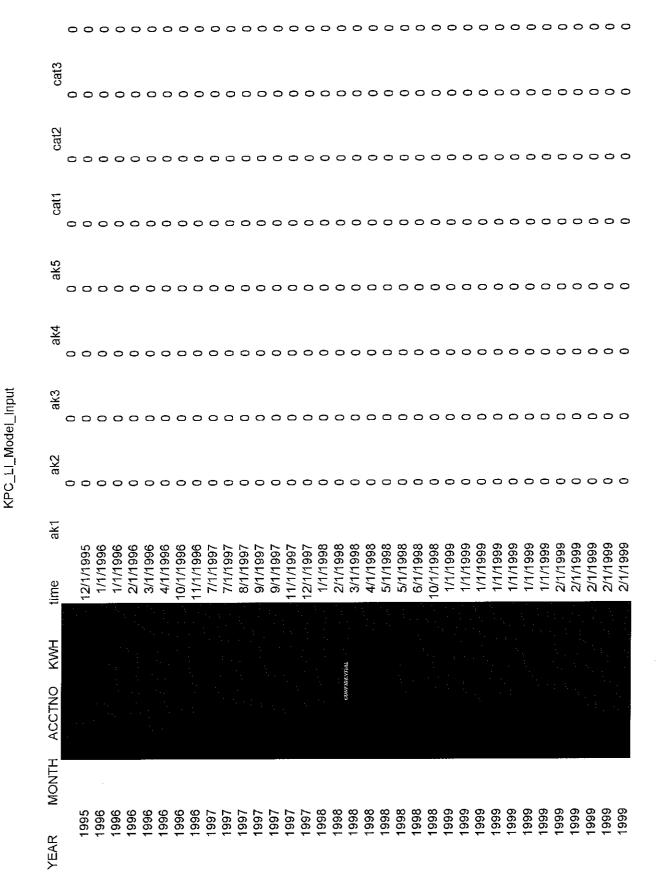
CHAPTER 2, CONFIDENTIAL APPENDIX (REDACTED)

VOLUME C

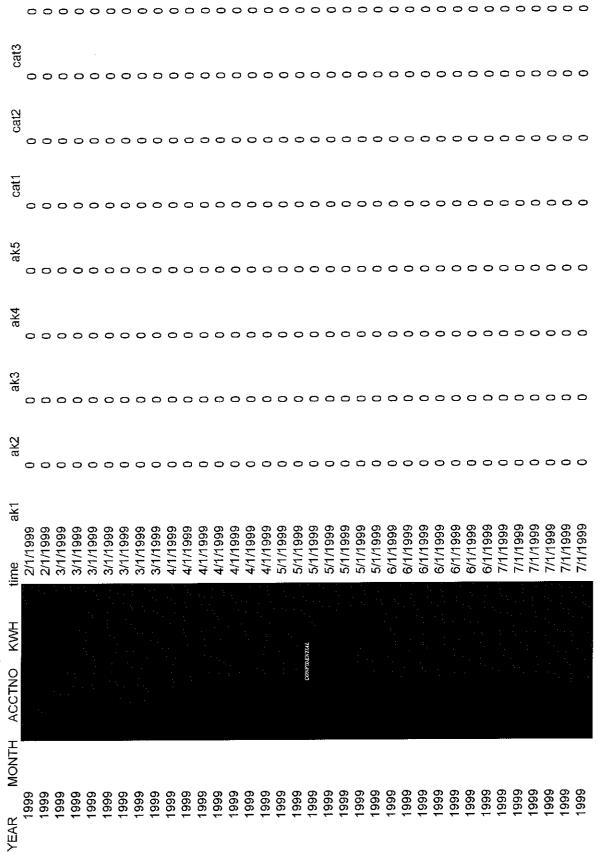
Case No. 2009-_____ August 17, 2009

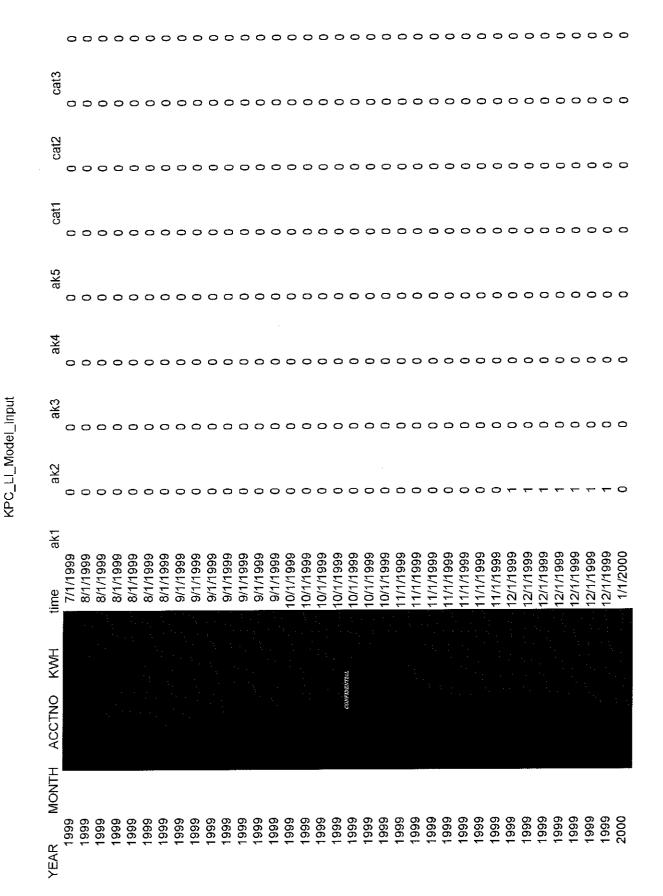
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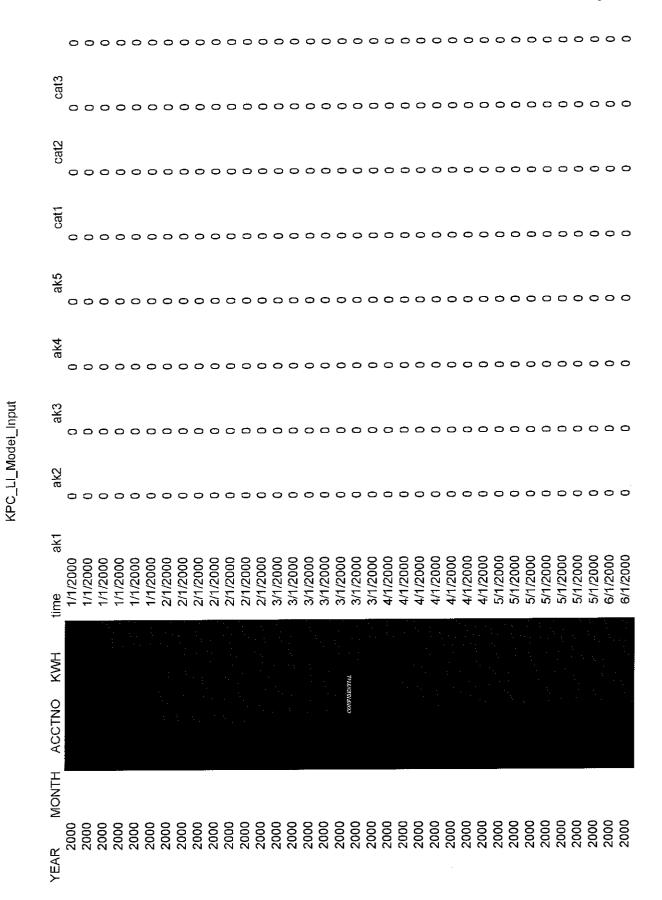
CONFIDENTIAL SHORT-TERM LARGE INDUSTRIAL

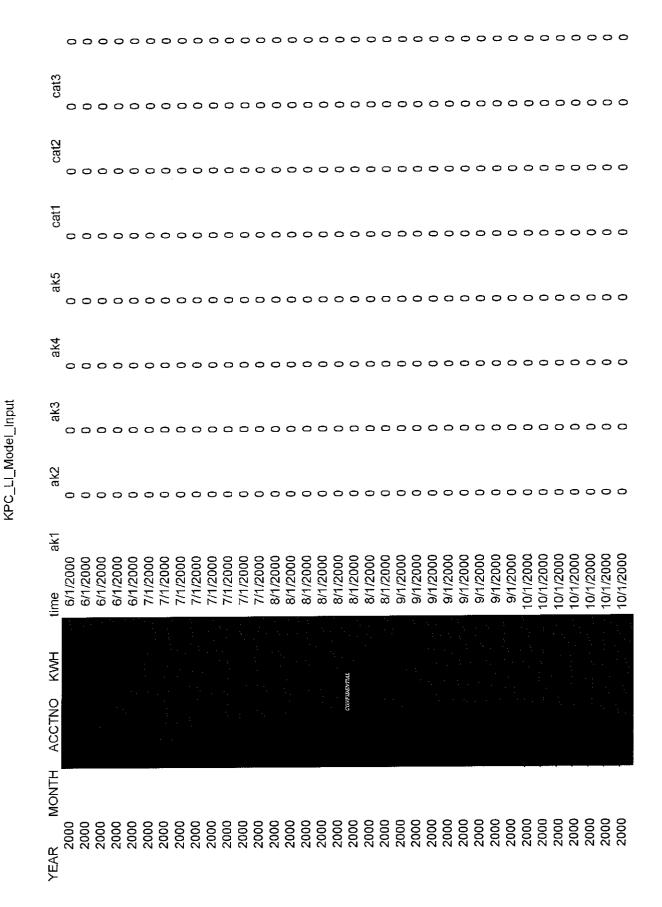


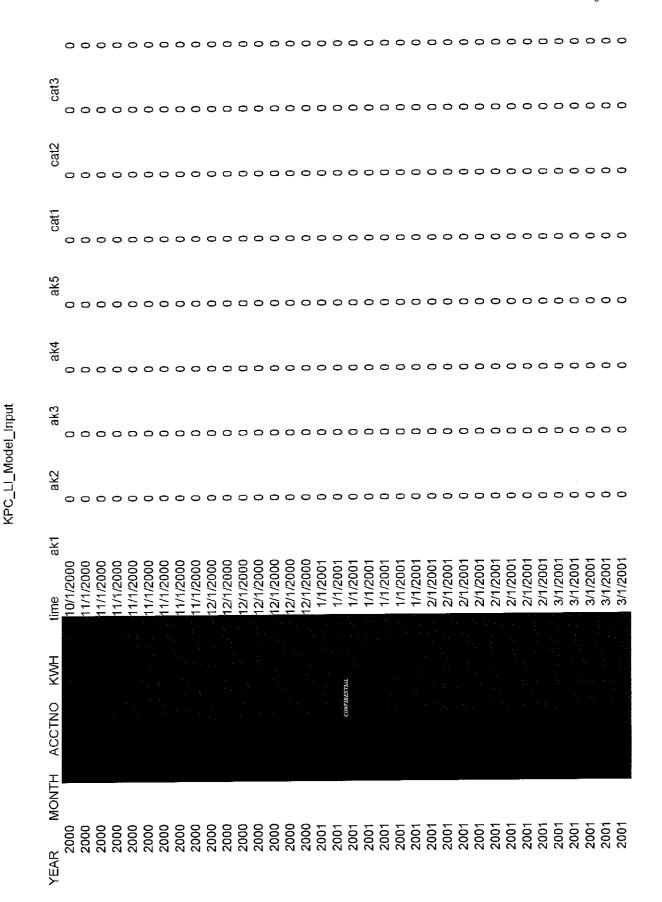
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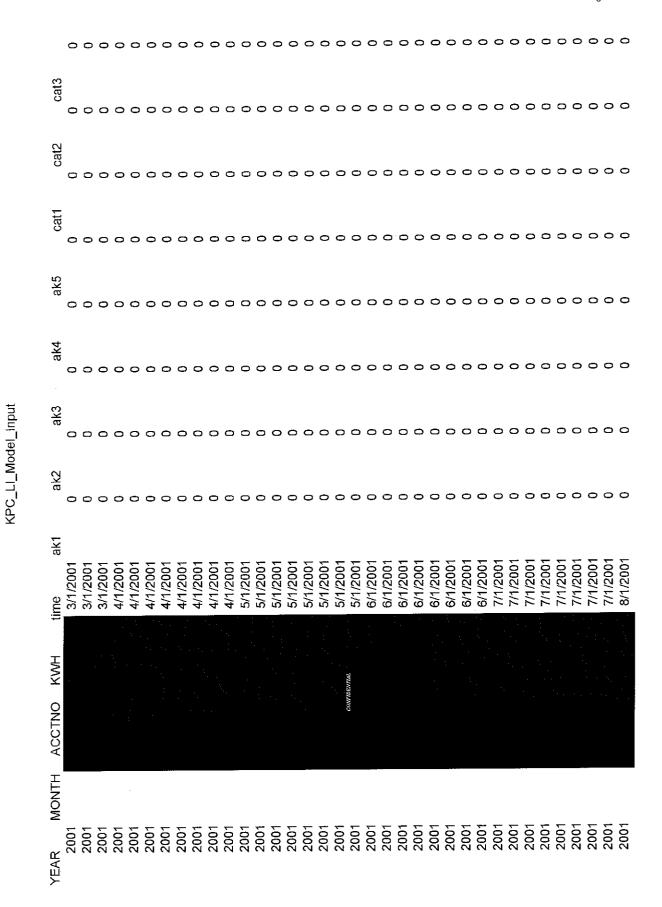


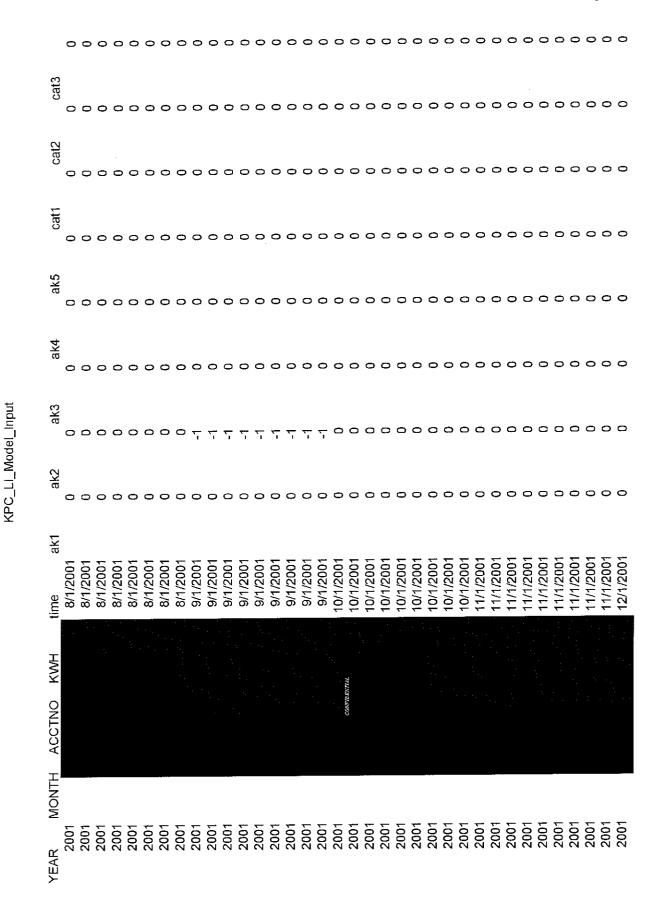


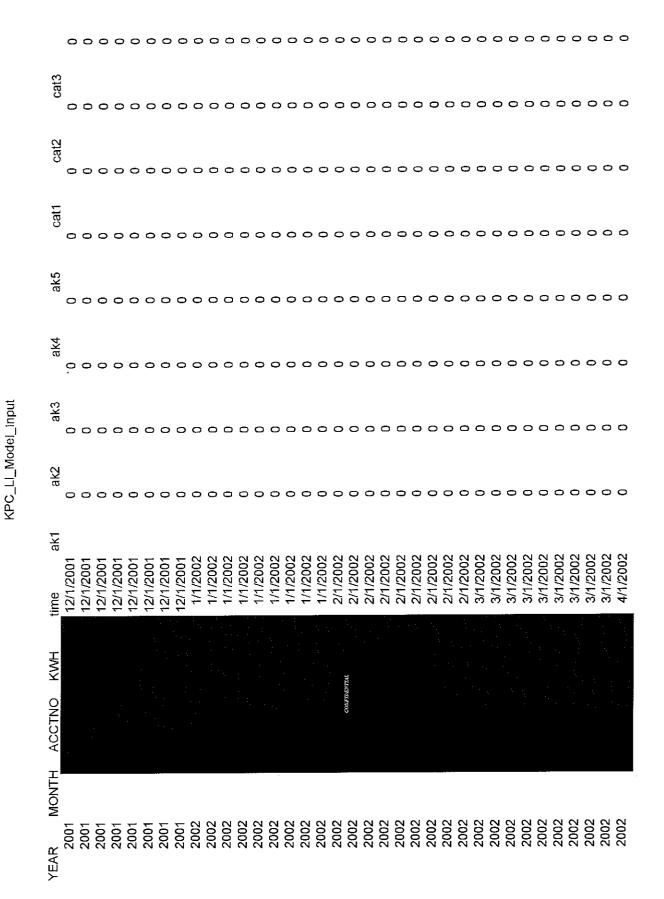


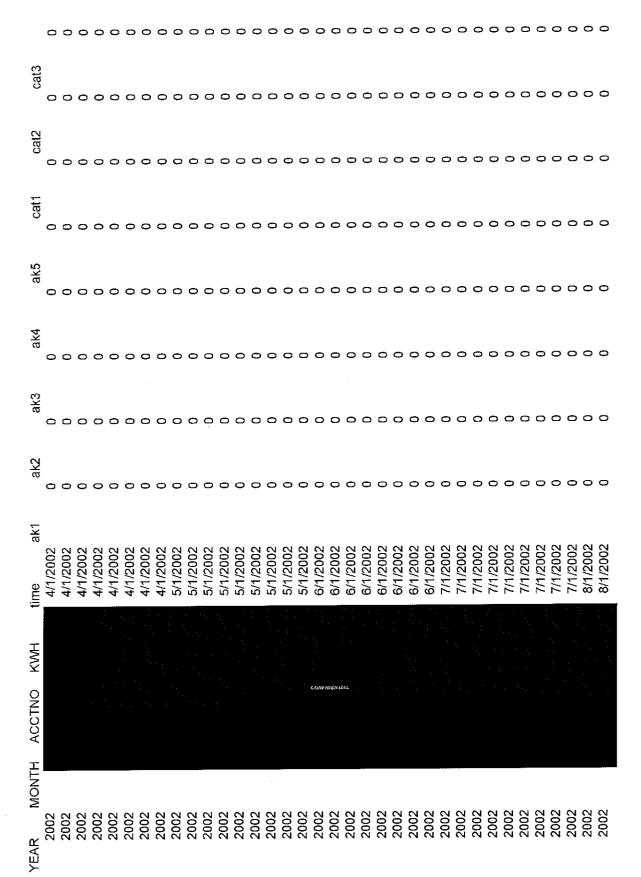


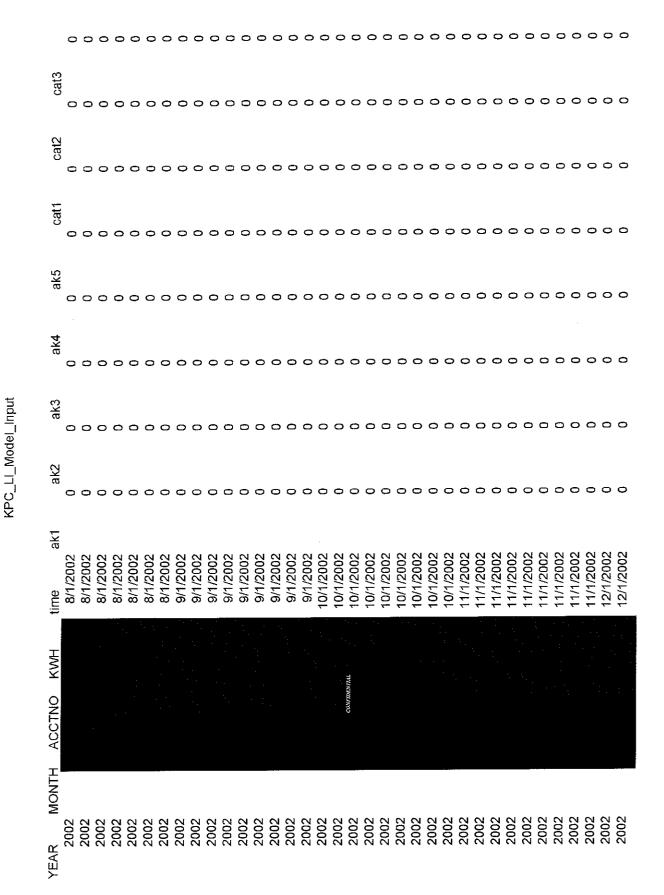


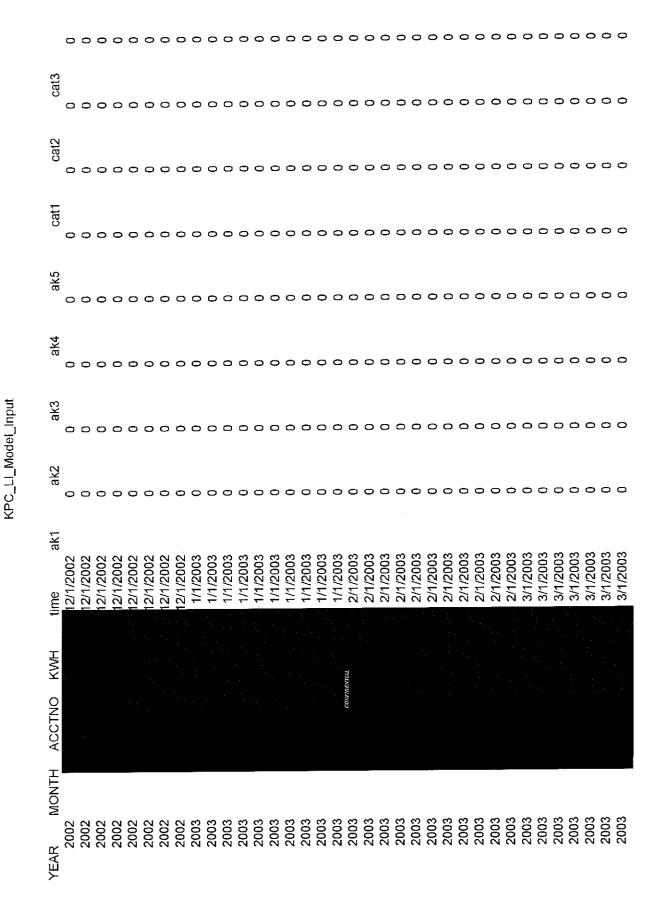


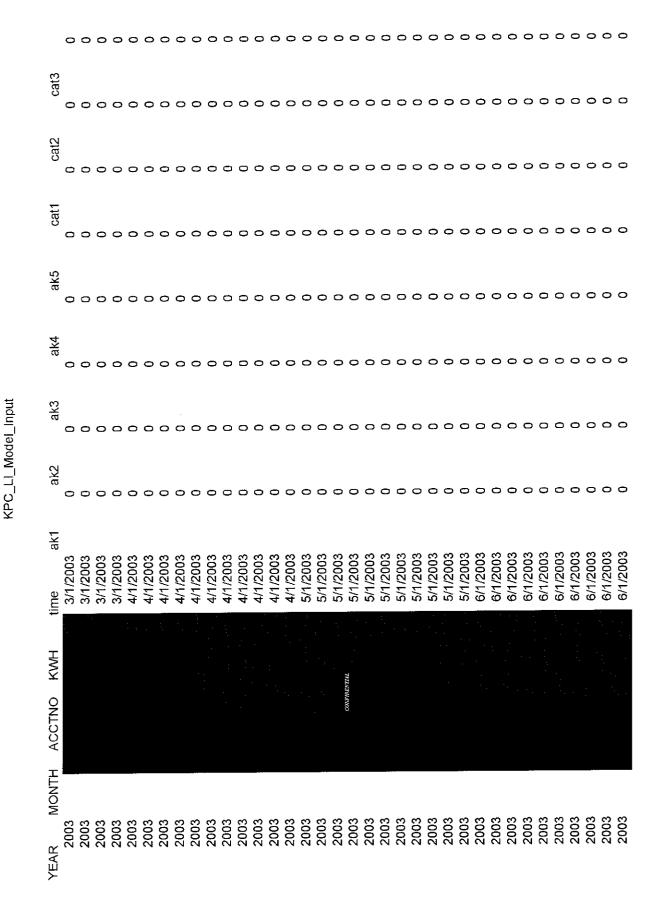


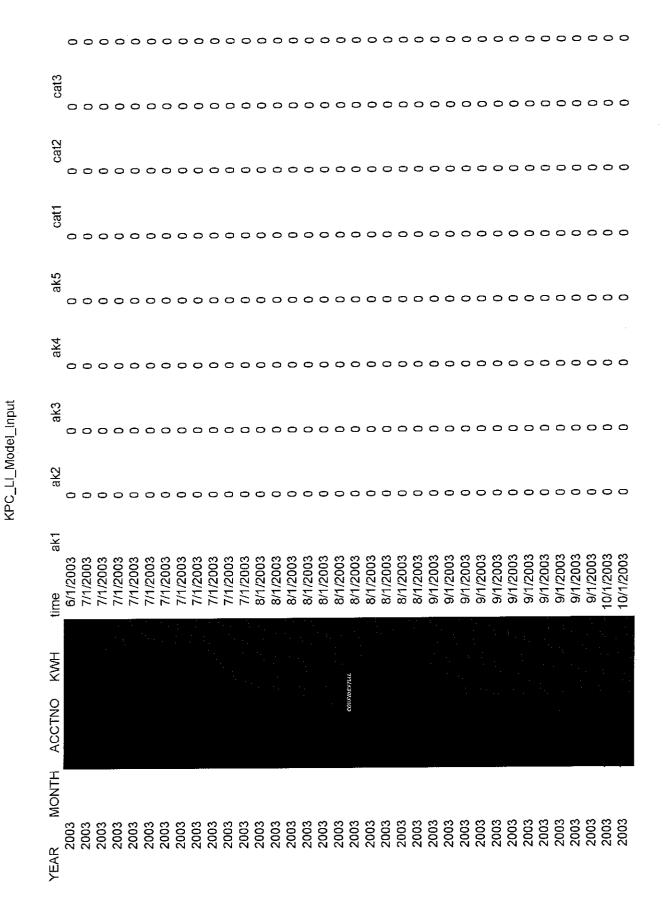


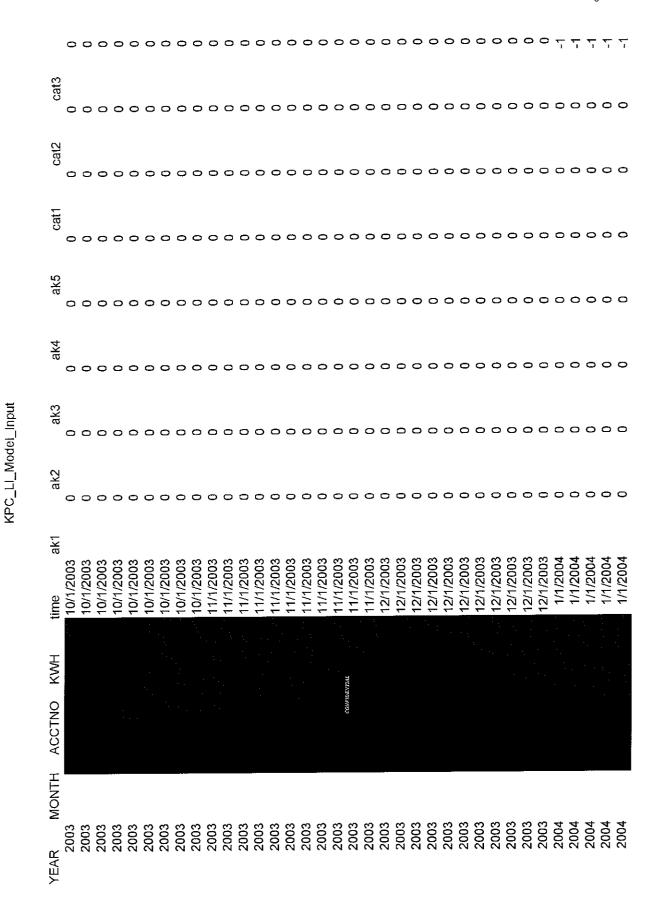


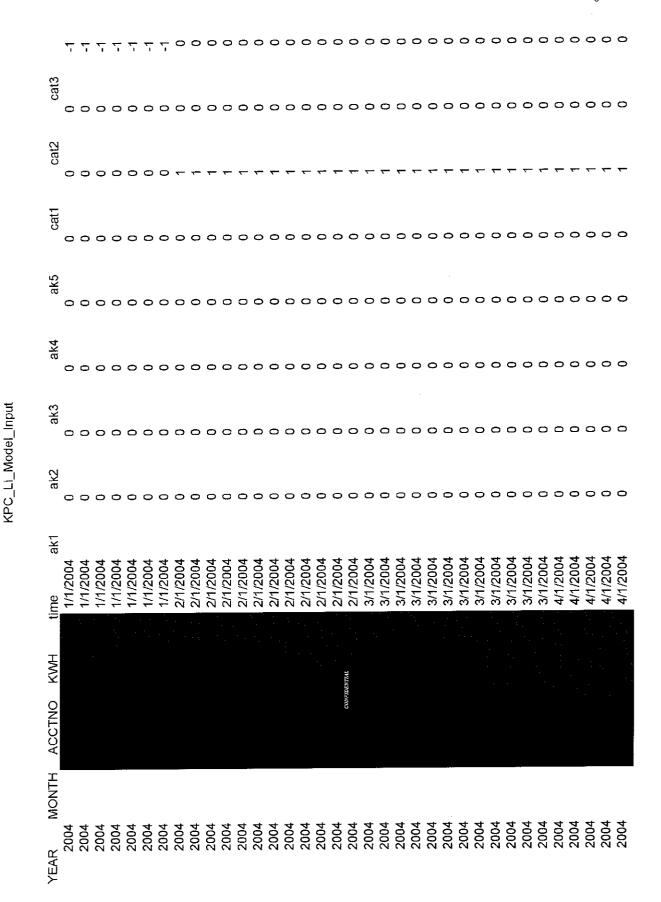


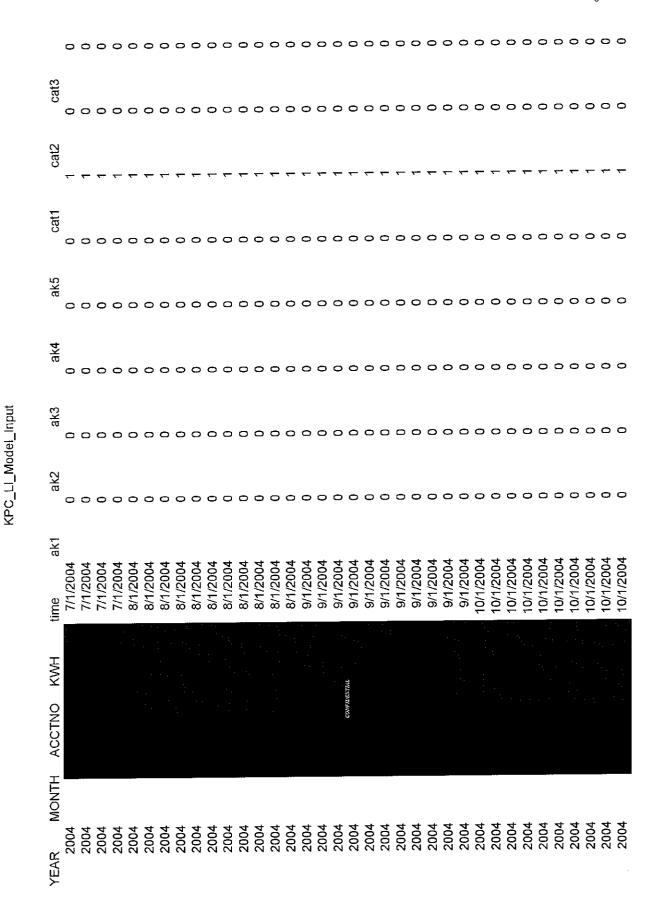


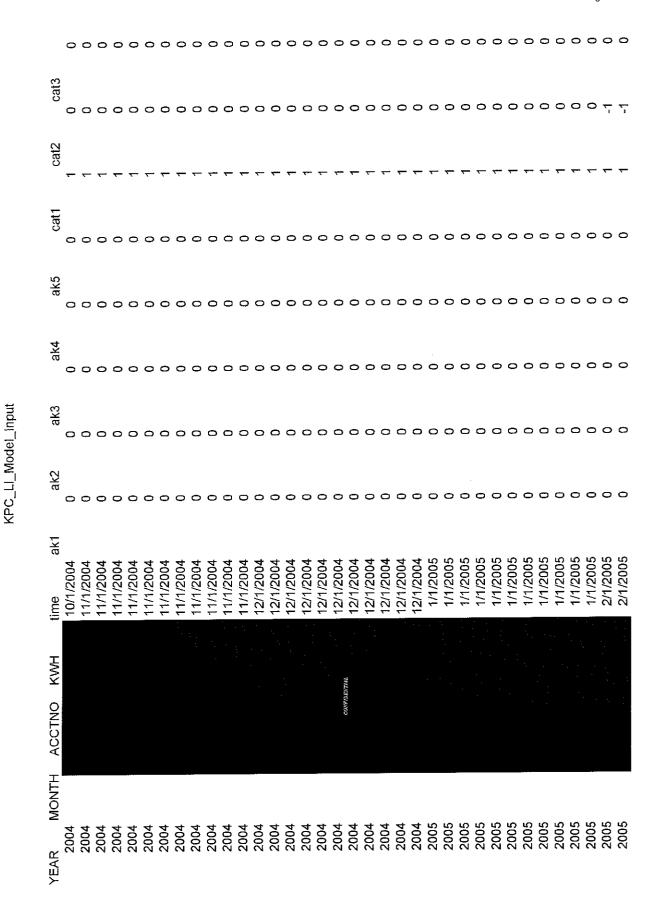


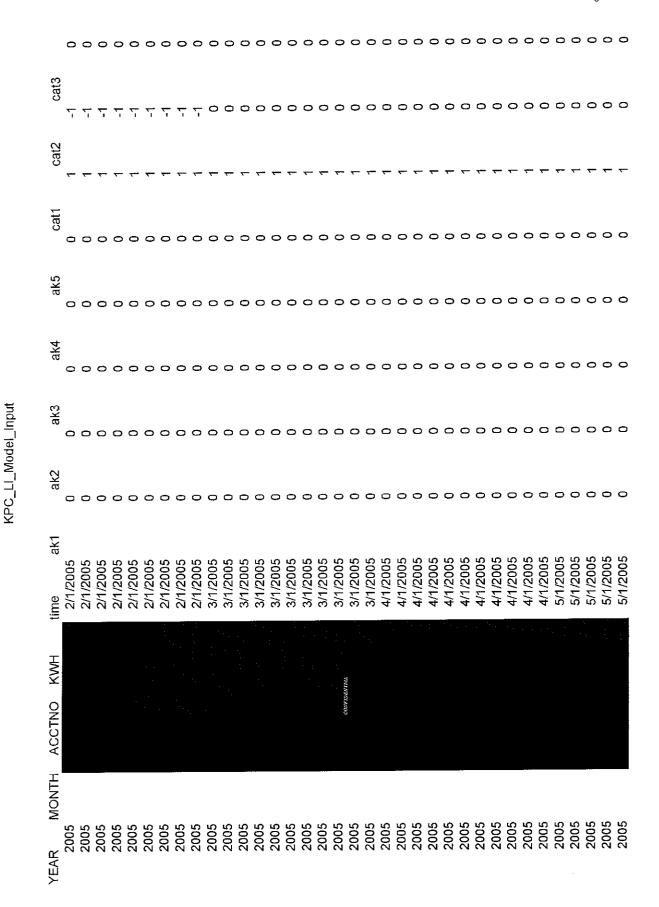


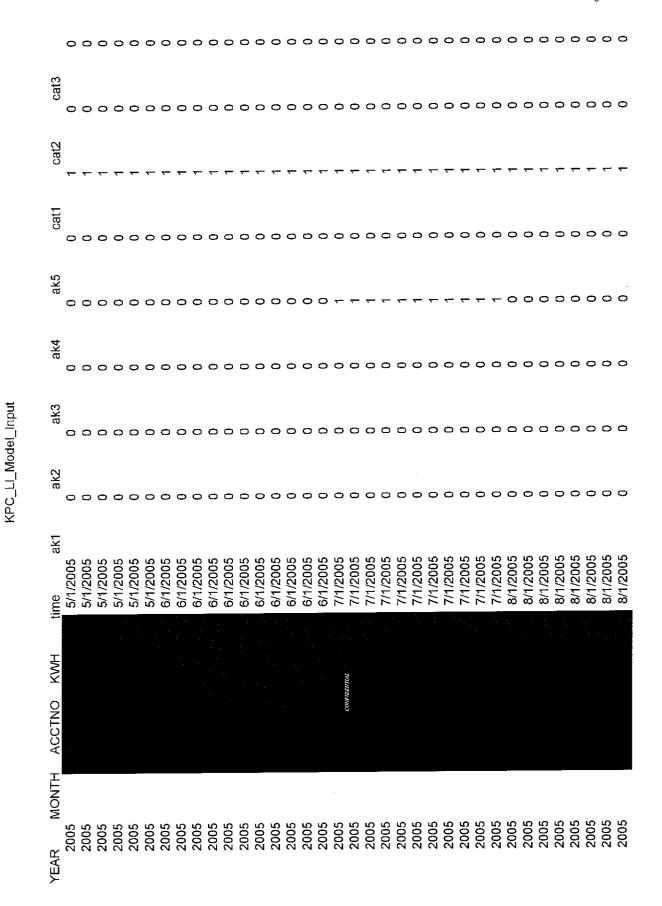


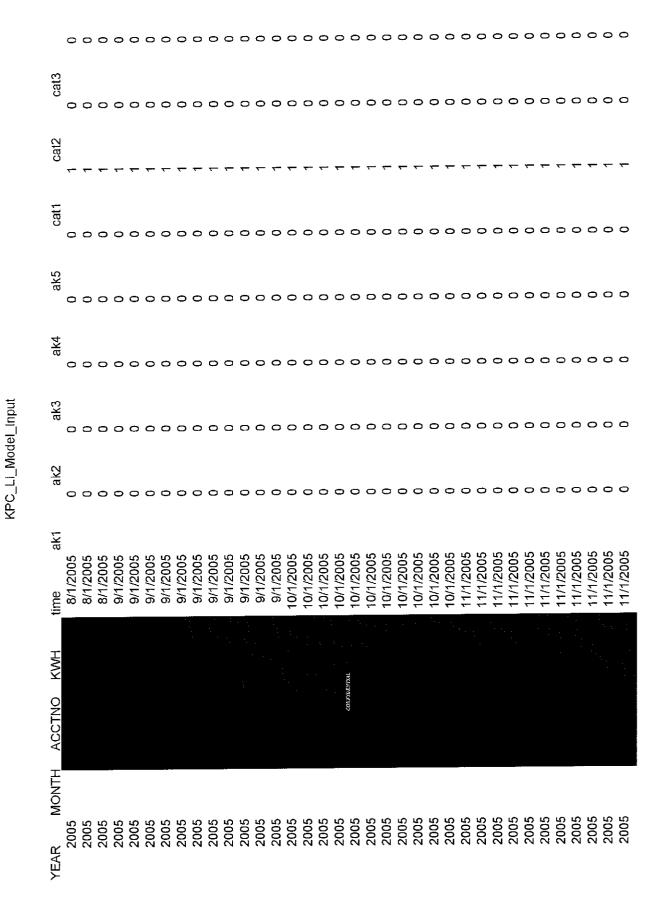


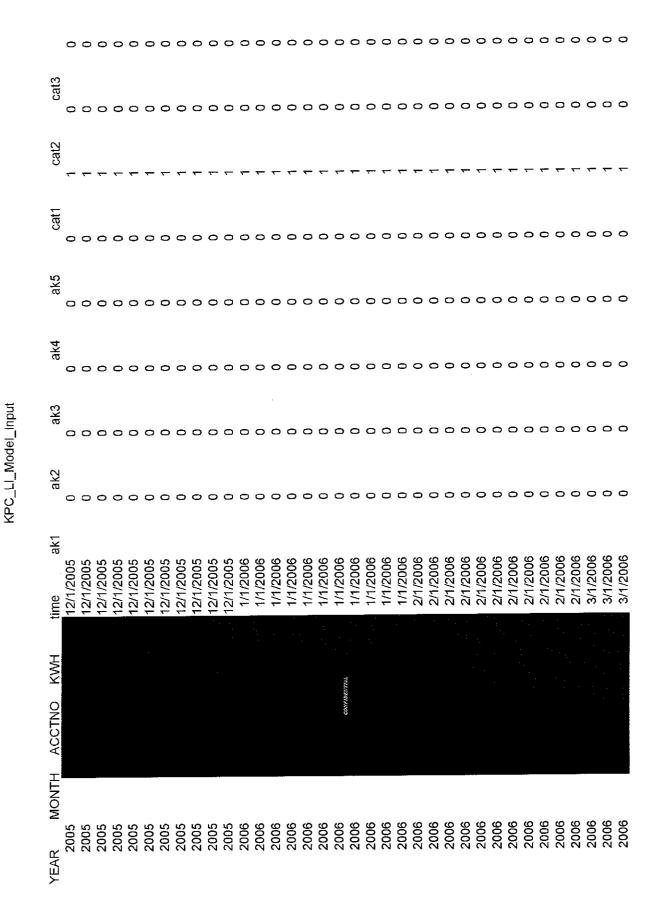


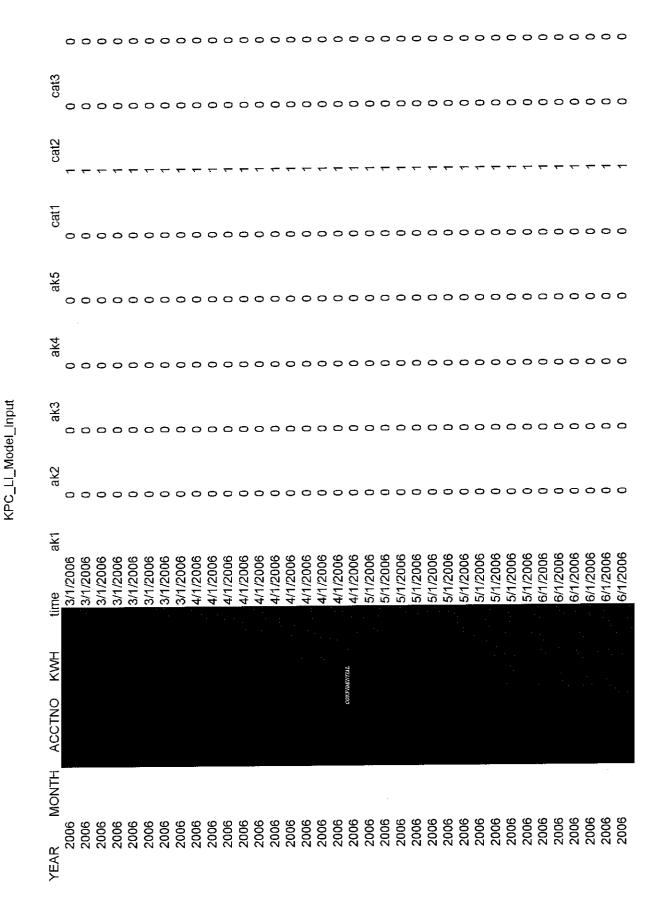


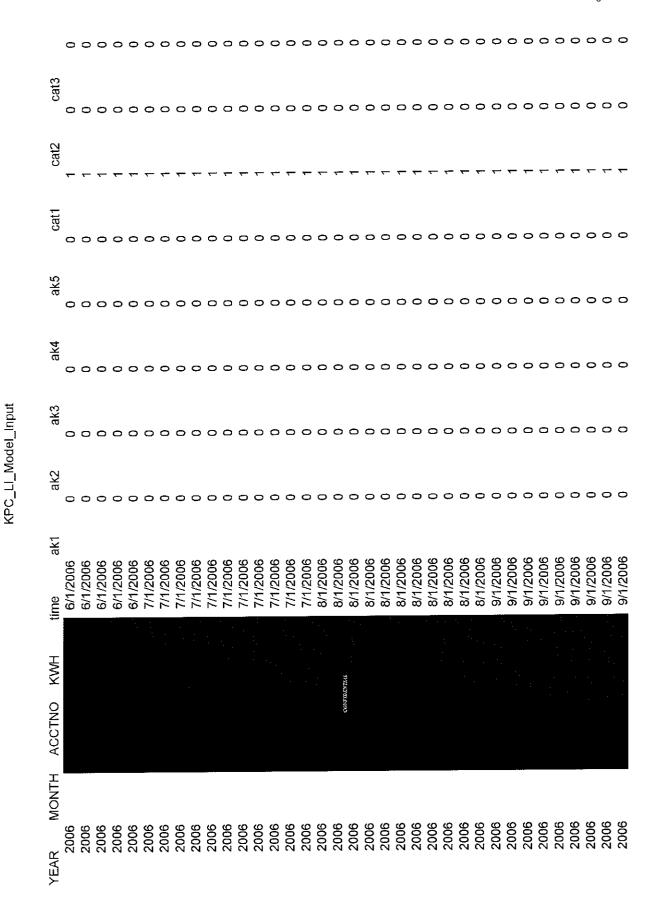


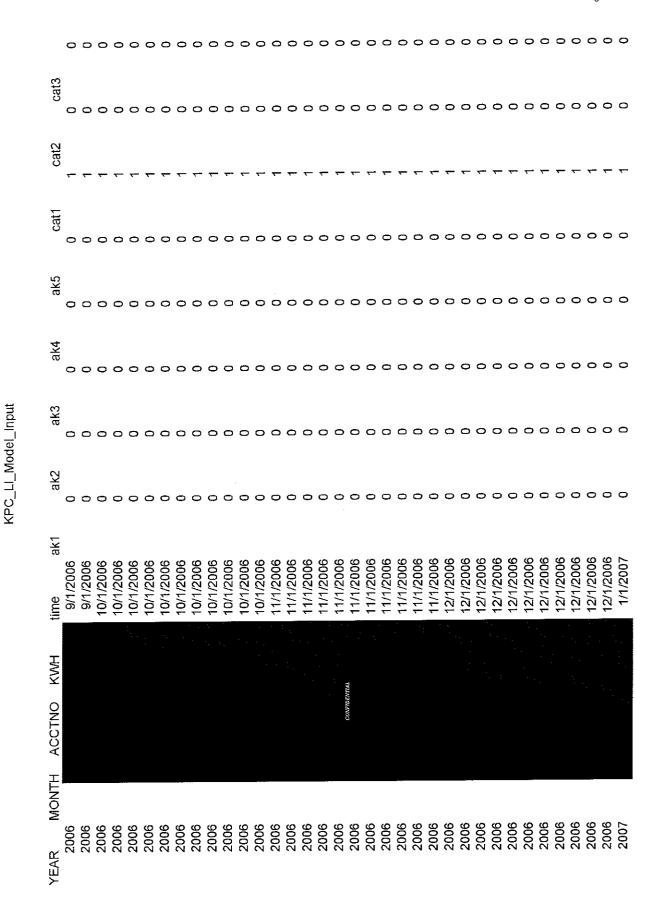


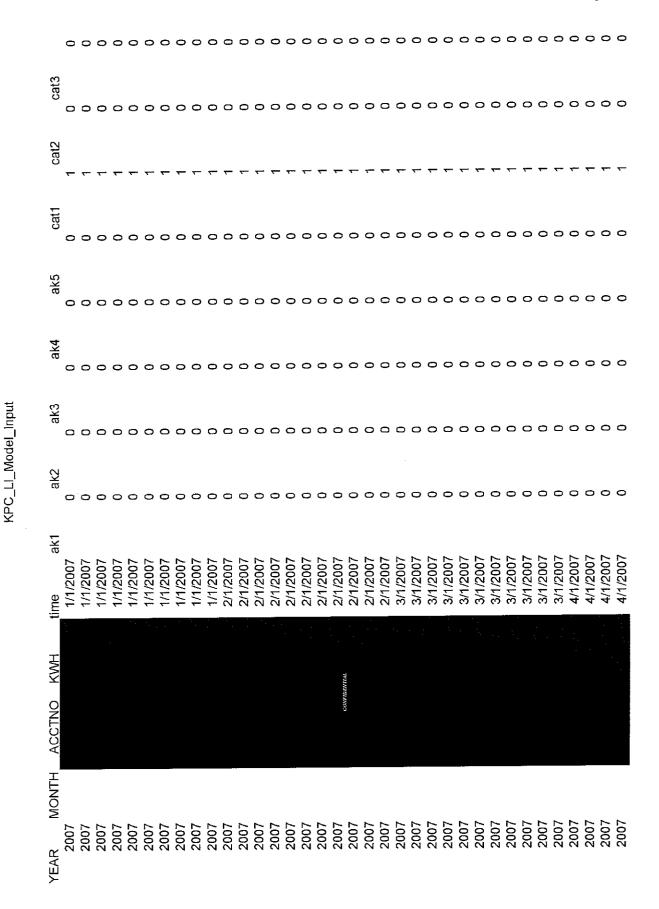


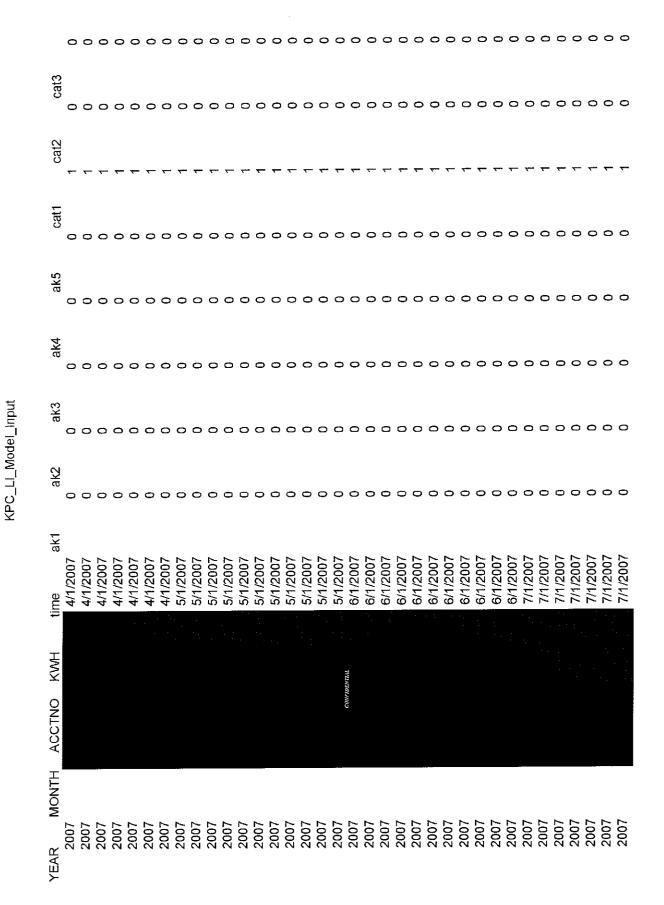


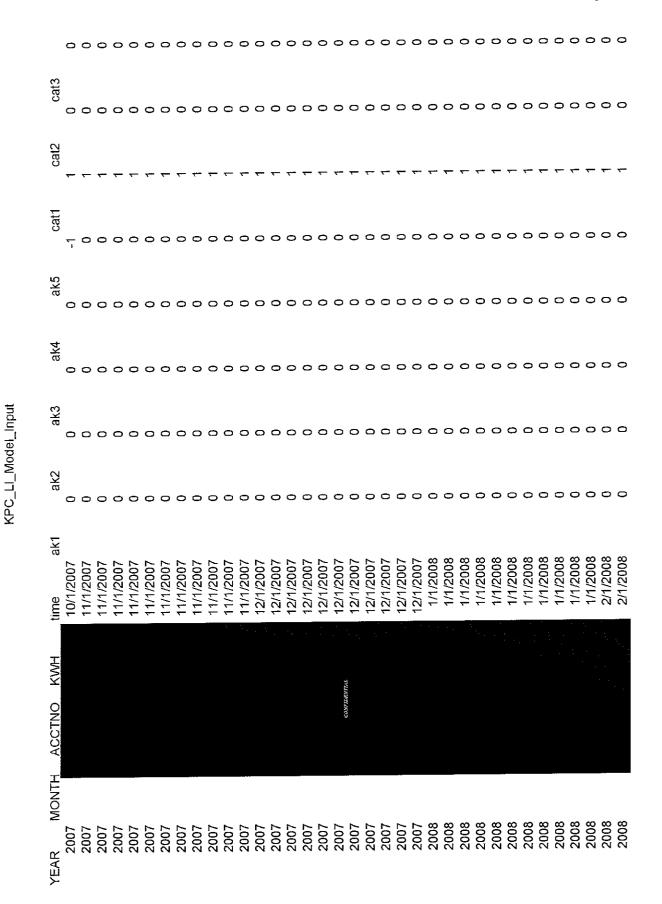


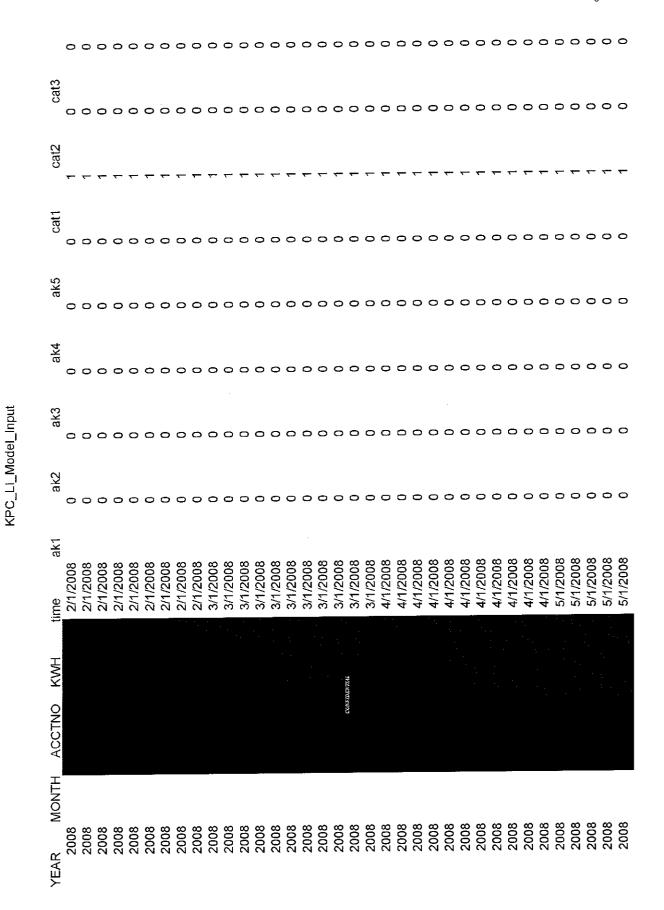




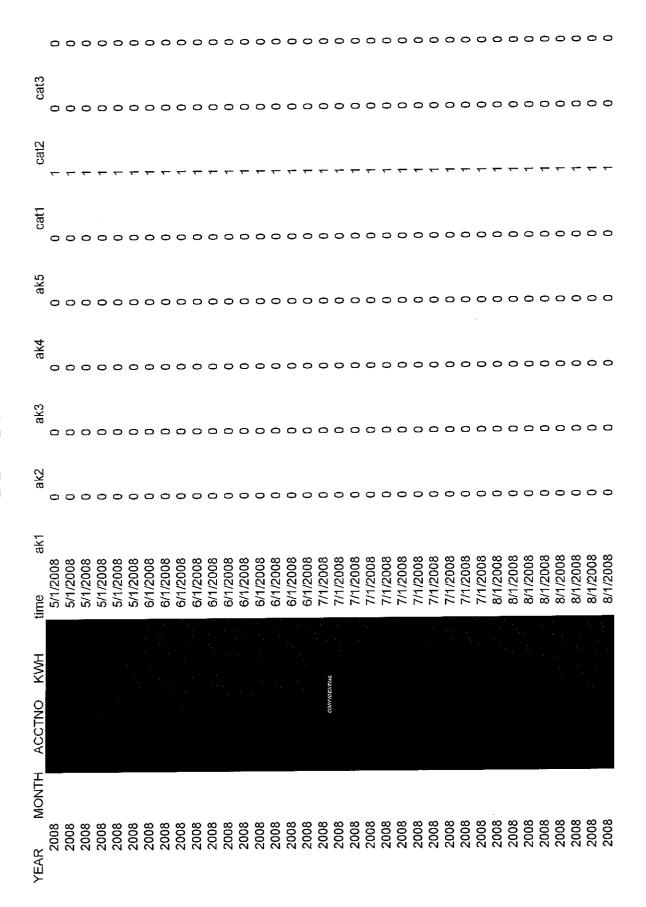


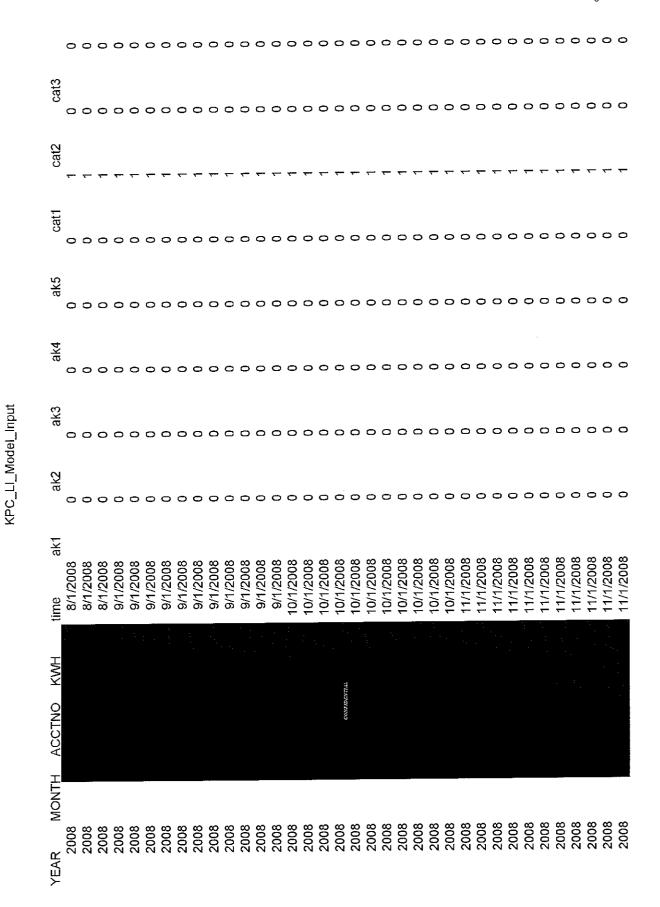


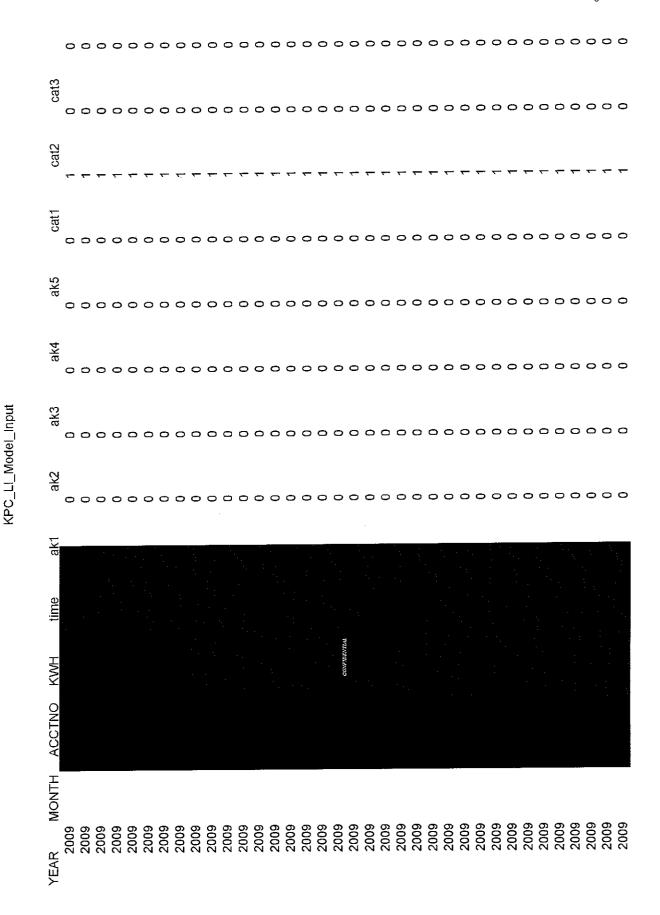


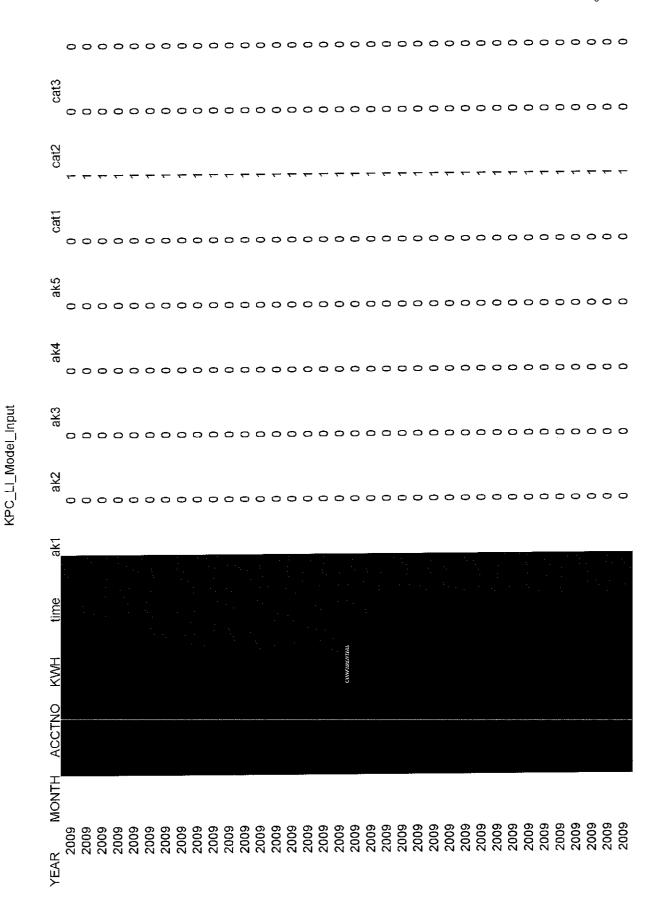


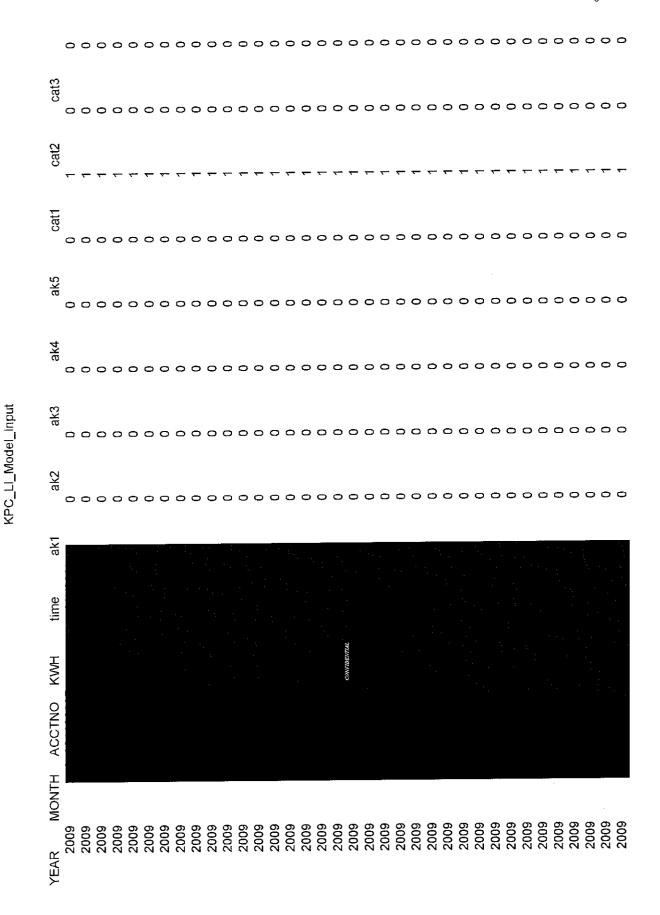


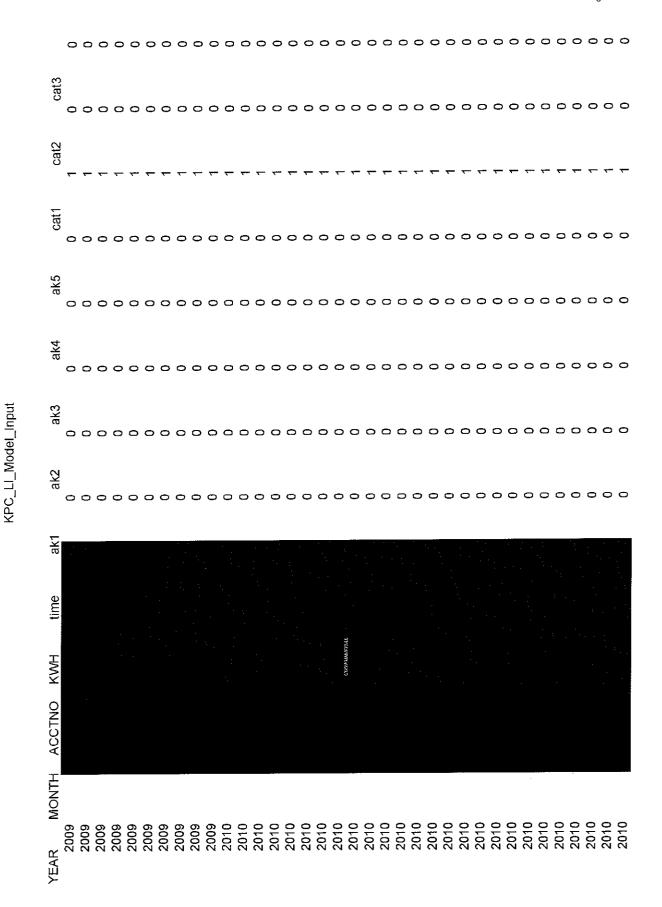


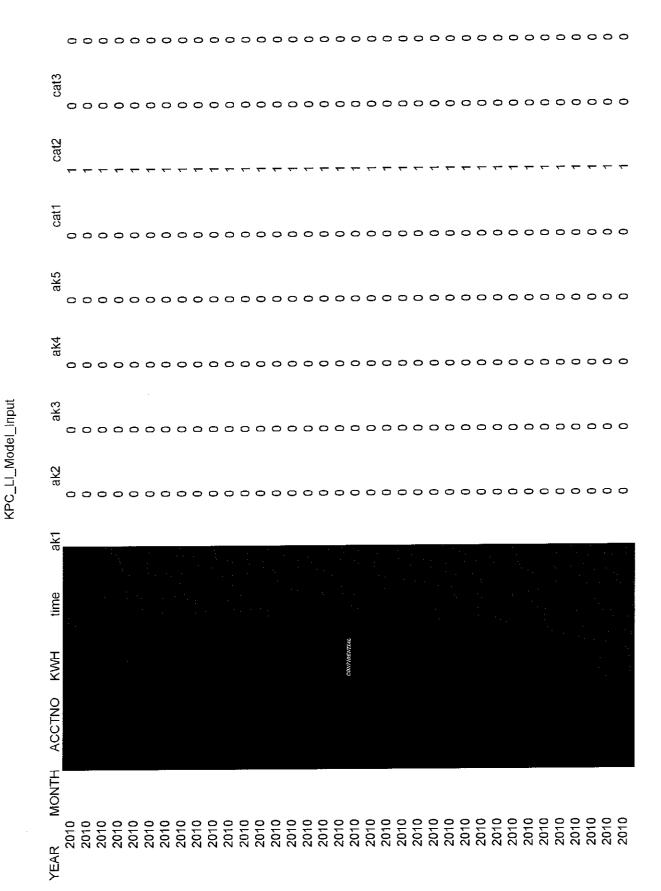


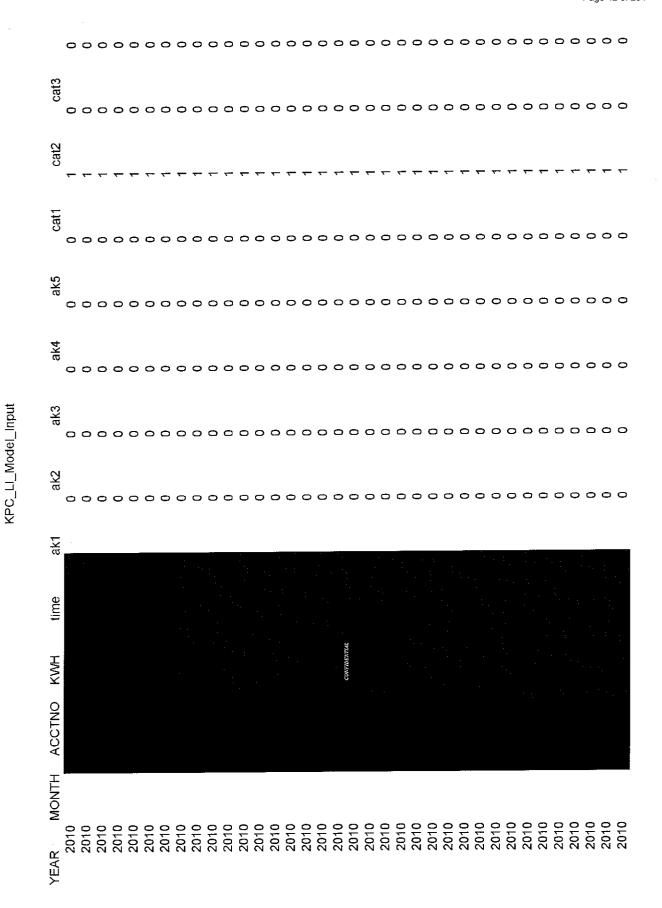


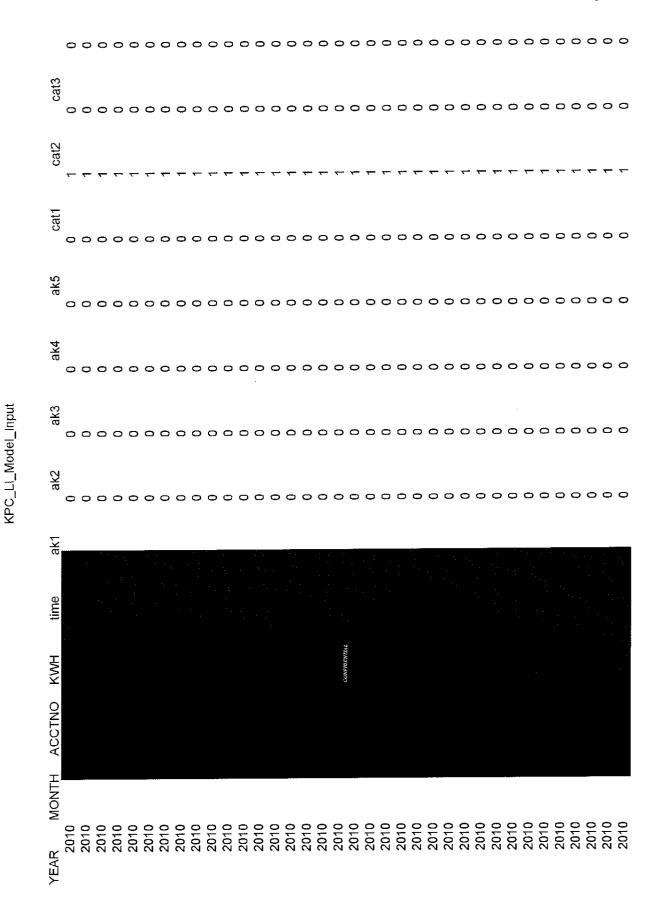


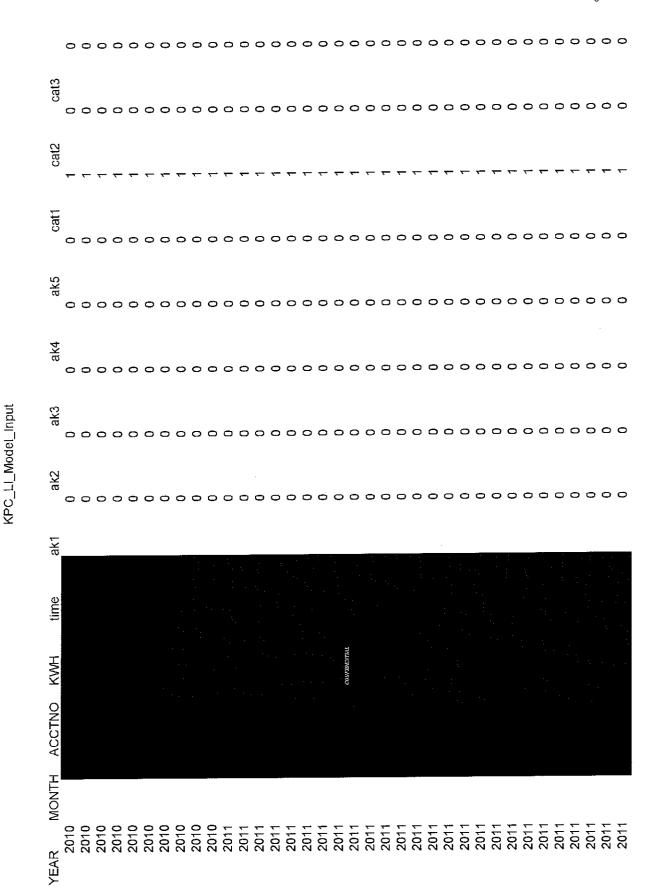


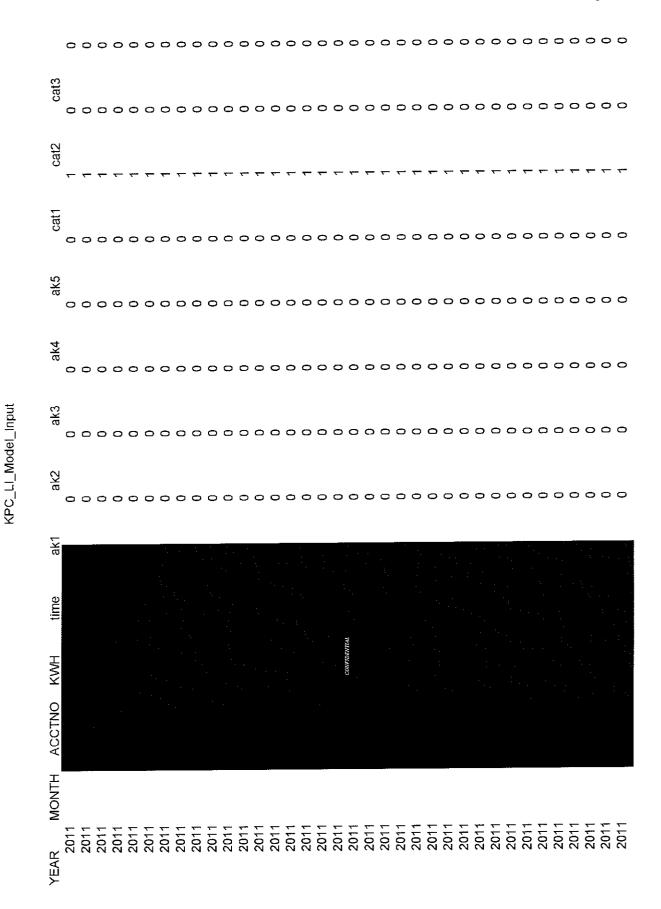


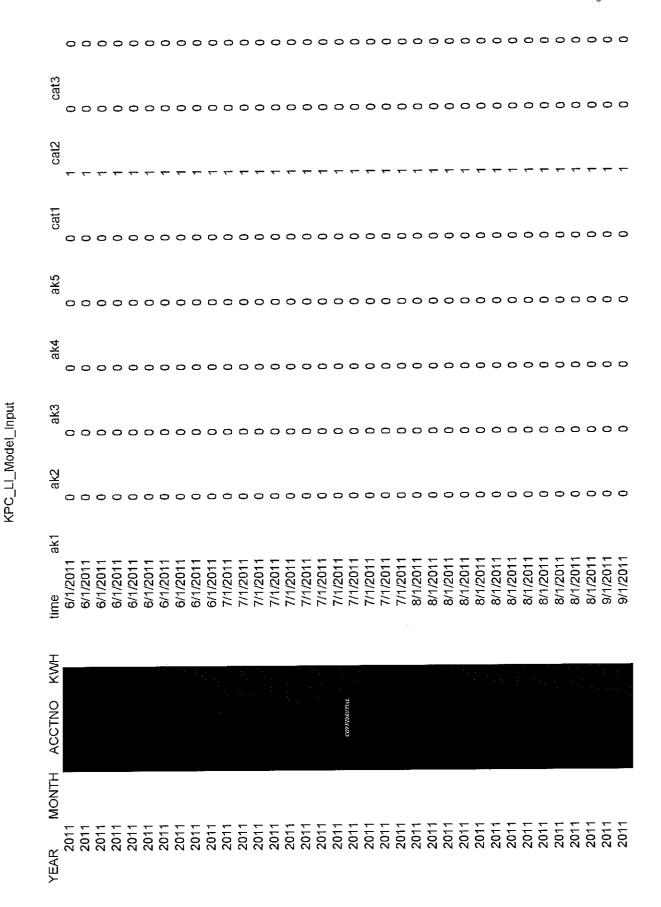


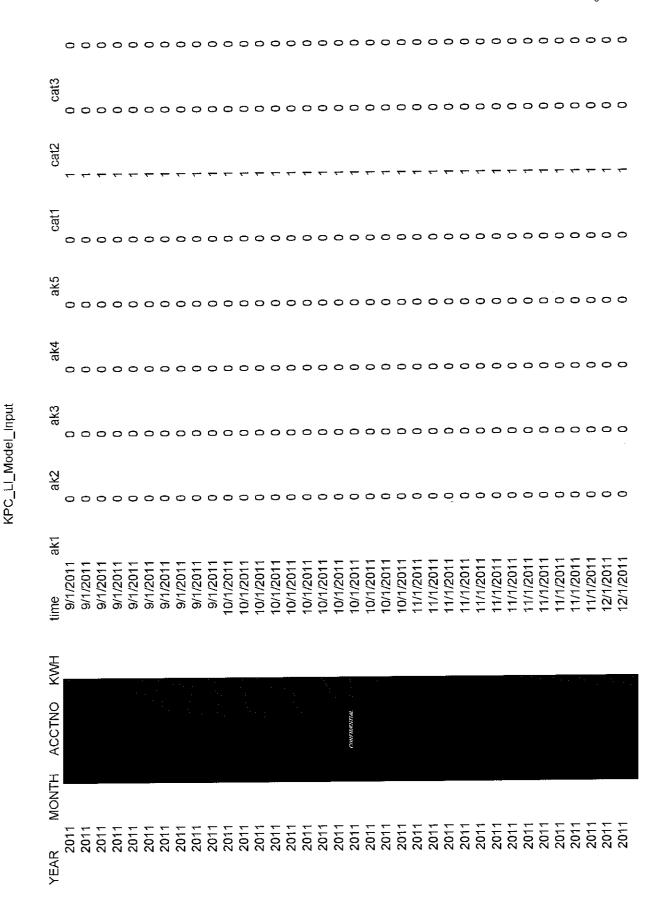




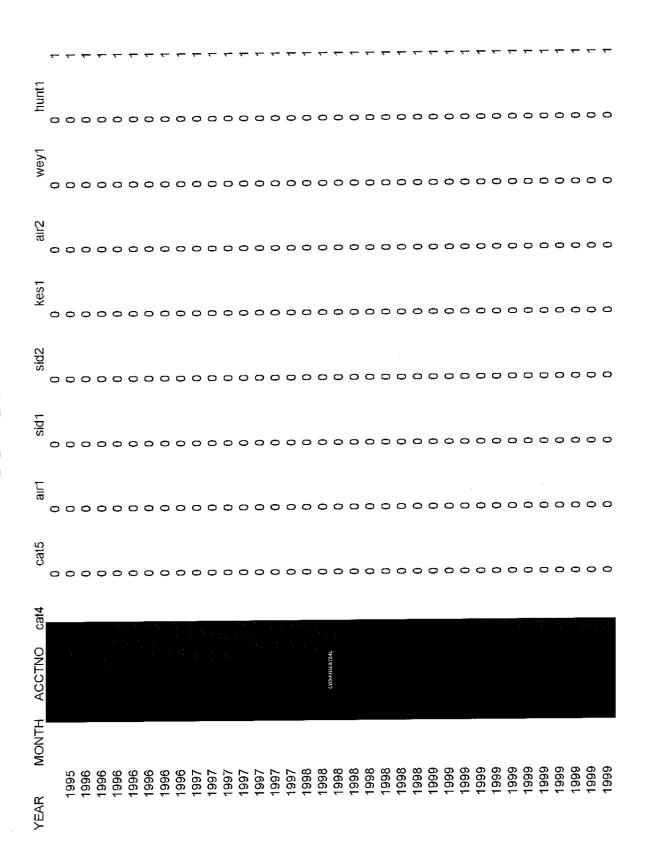


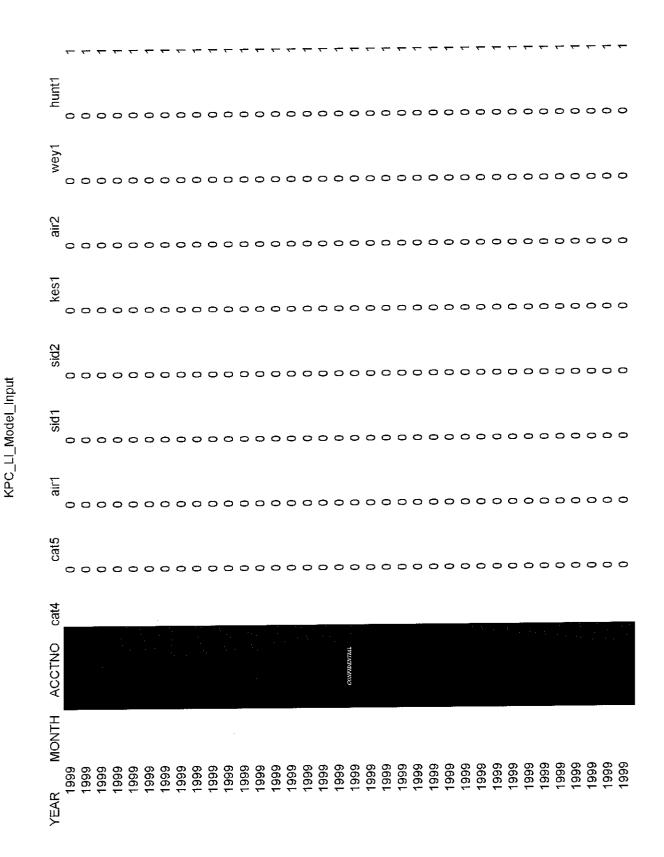


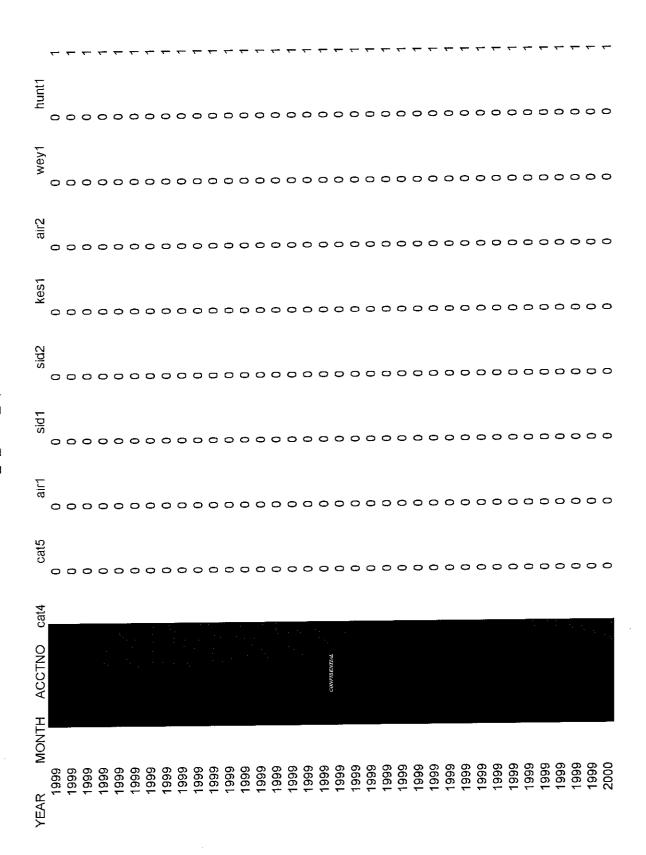


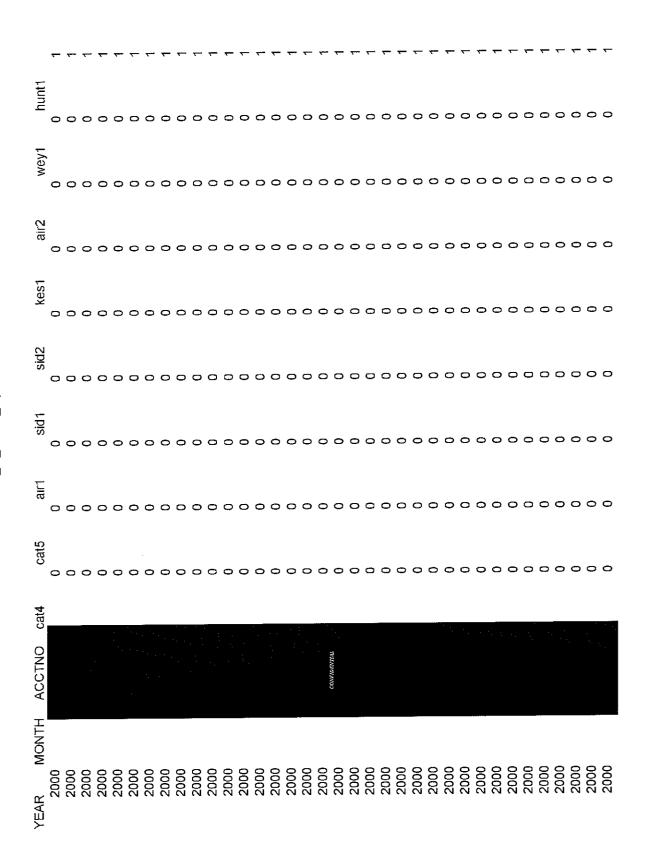


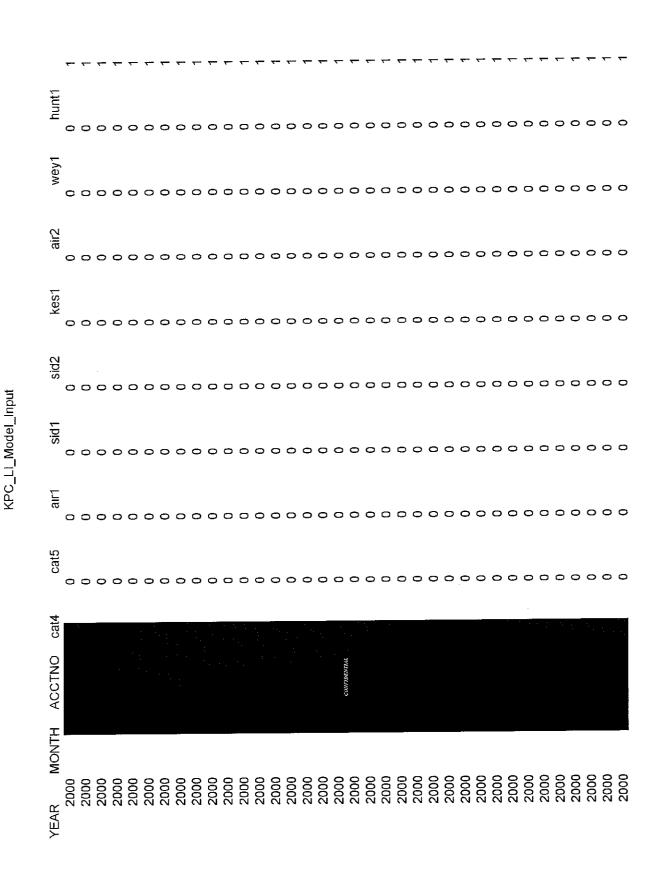
KPC_LI_Model_Input

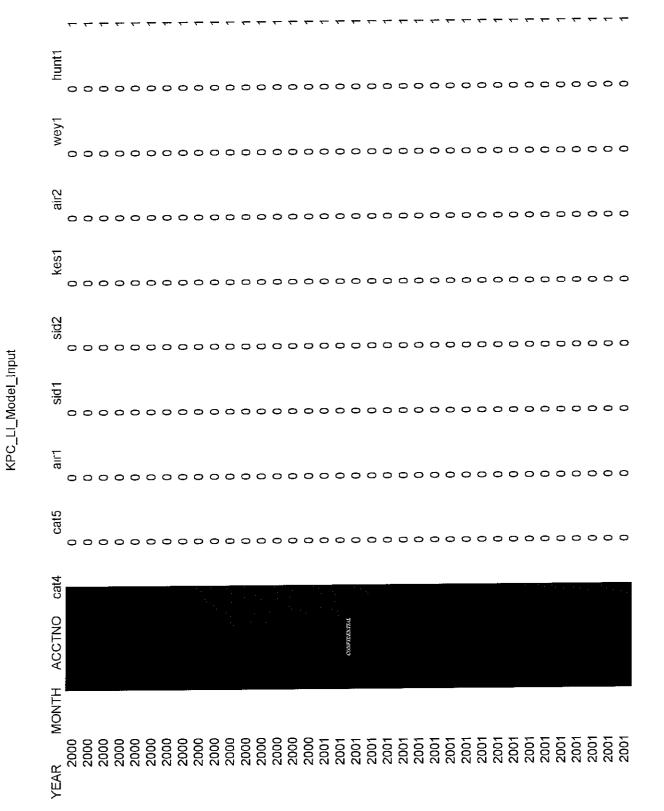


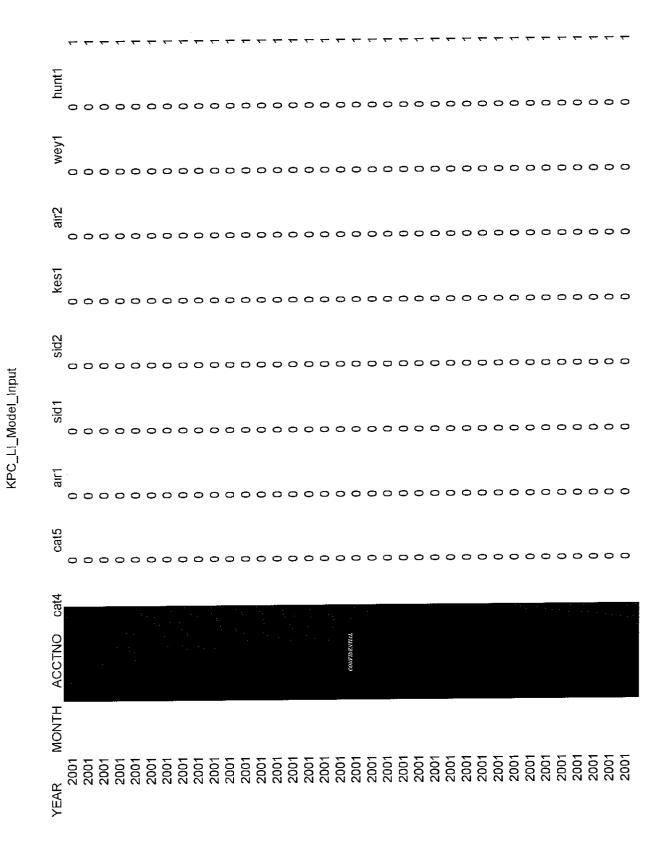


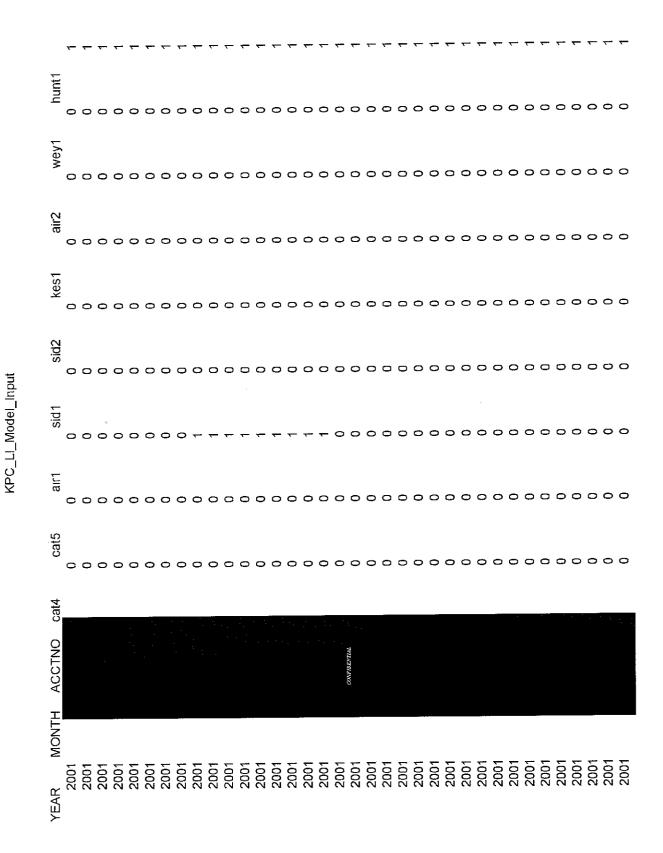


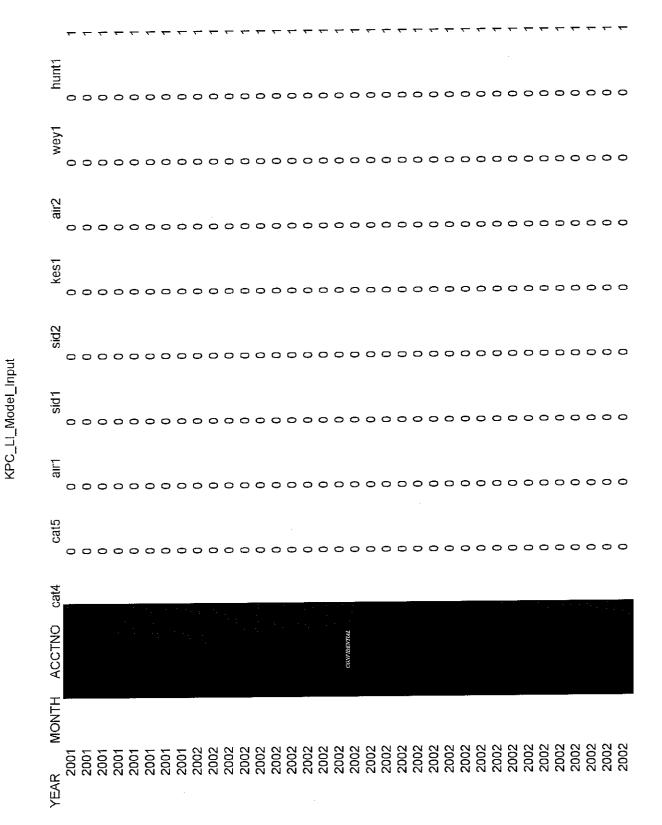




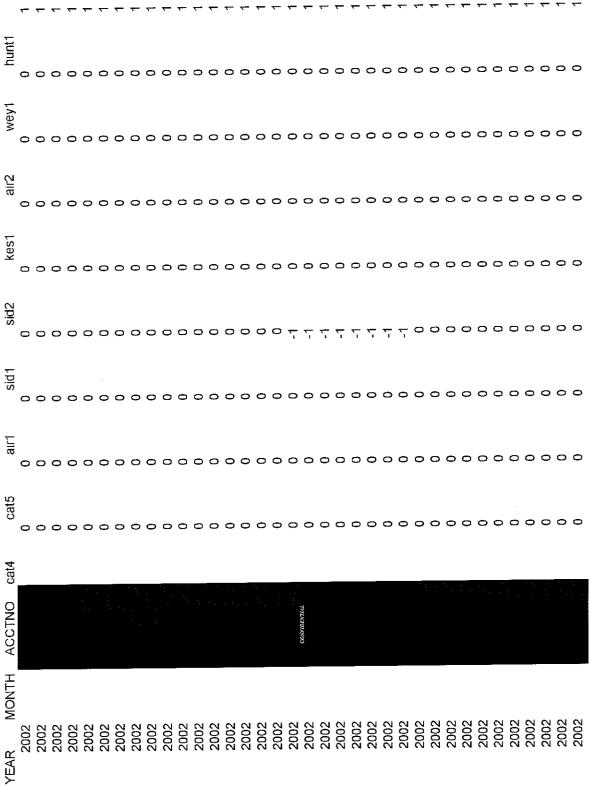


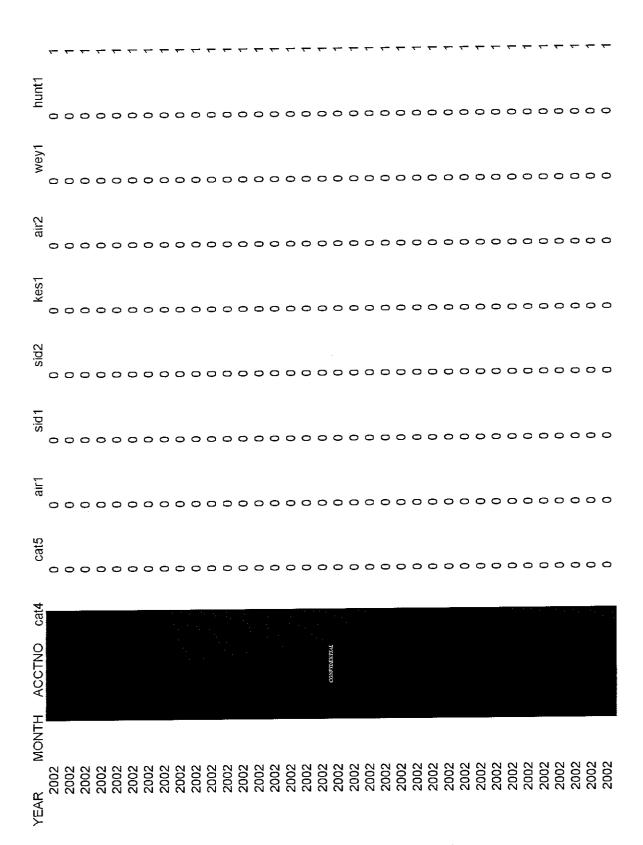


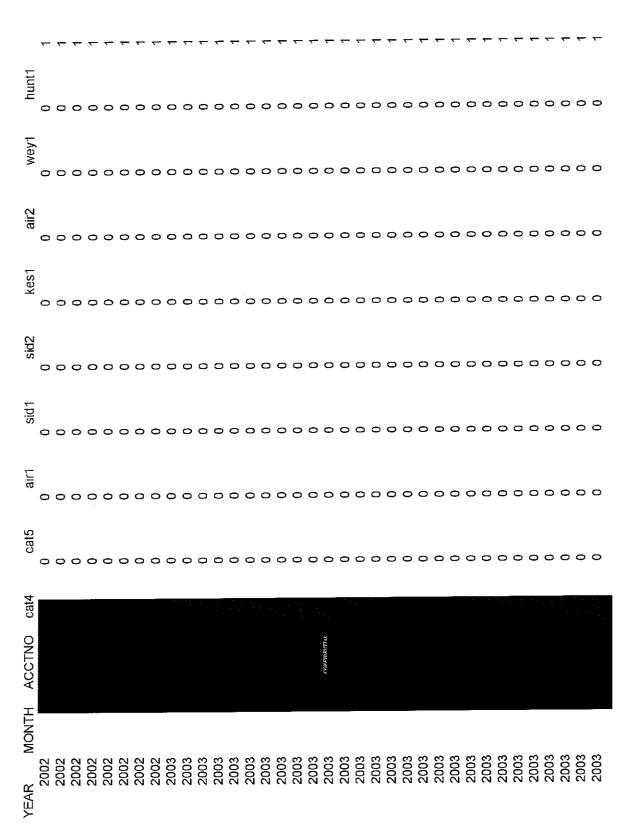




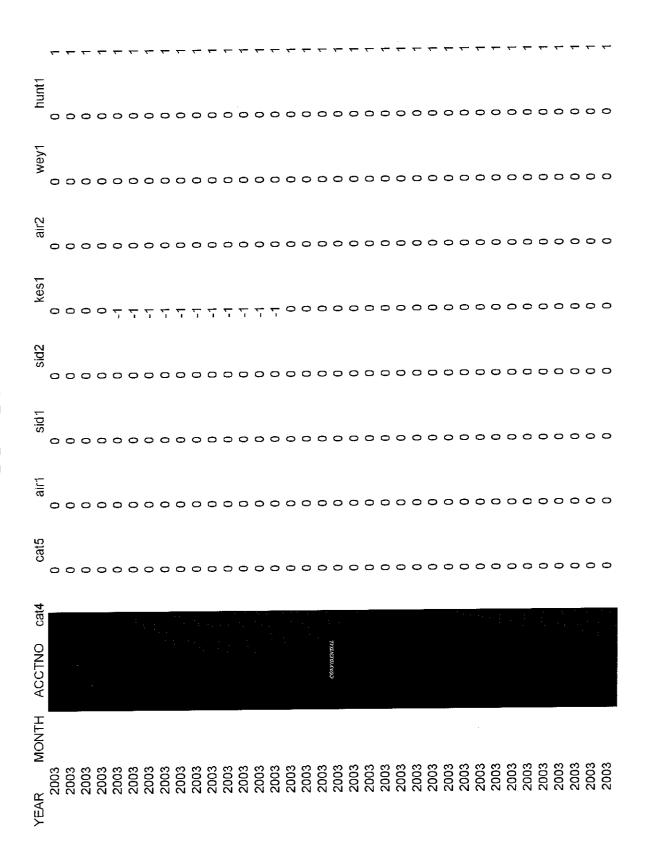
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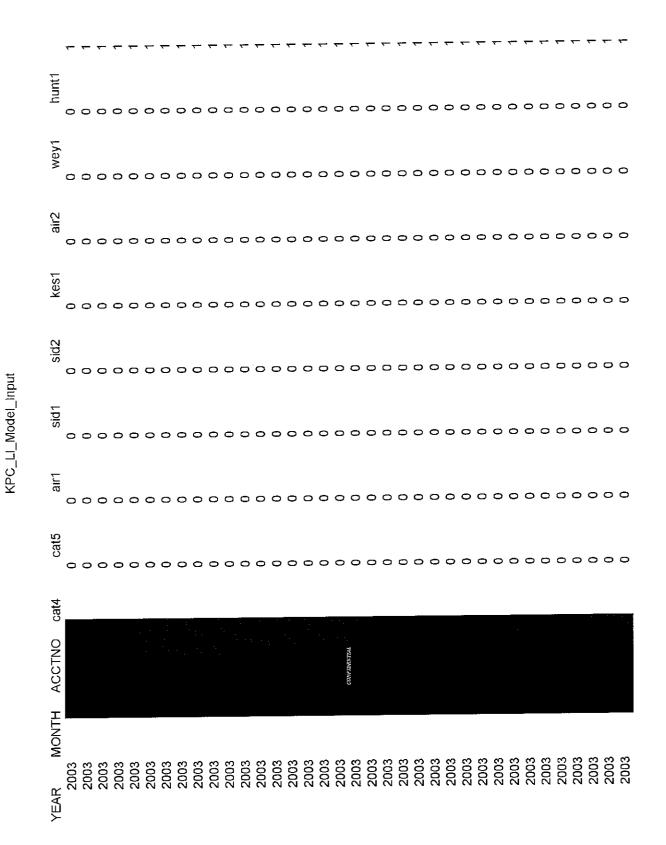


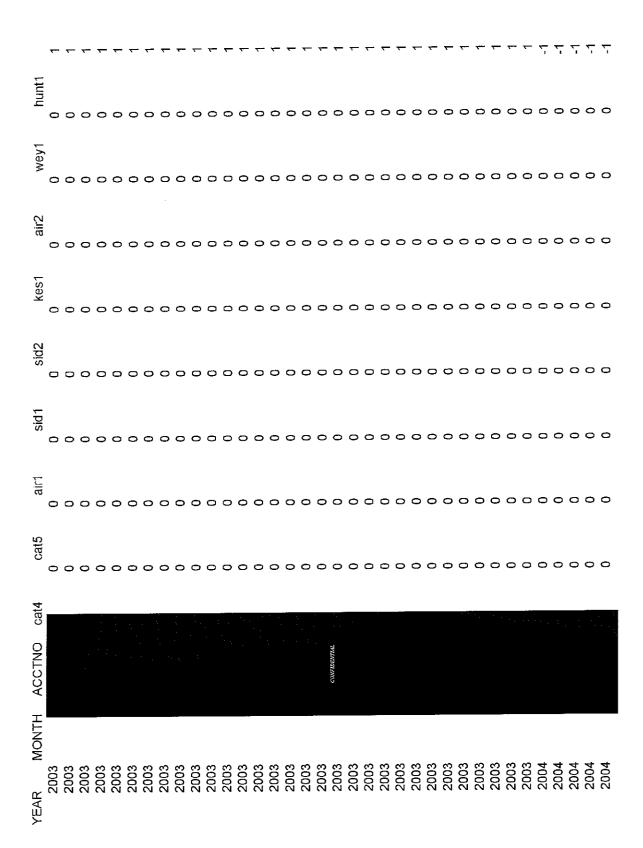


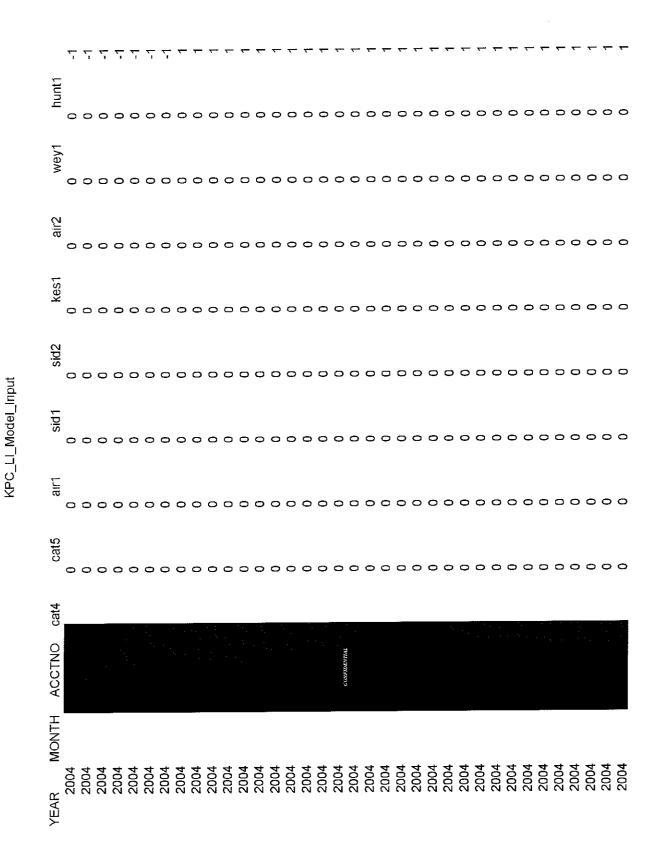


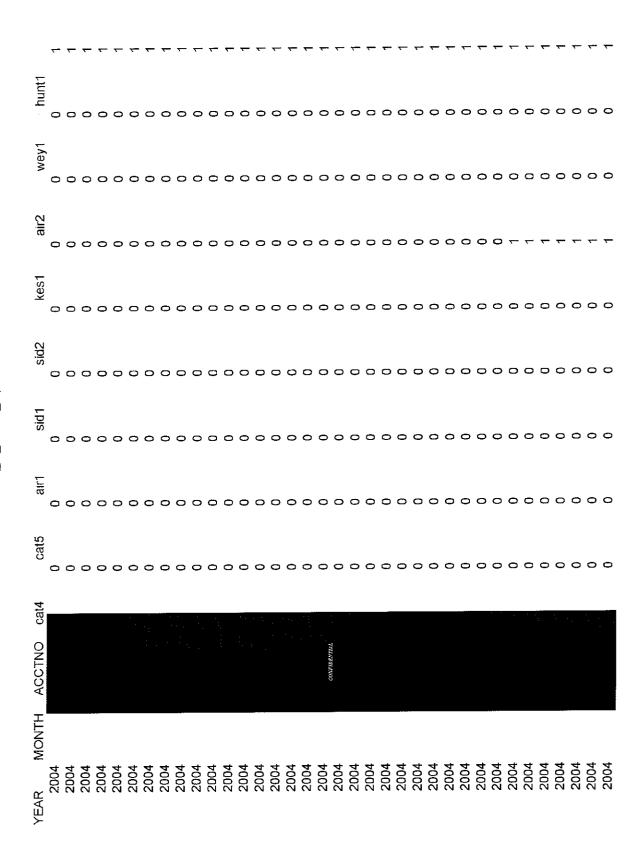




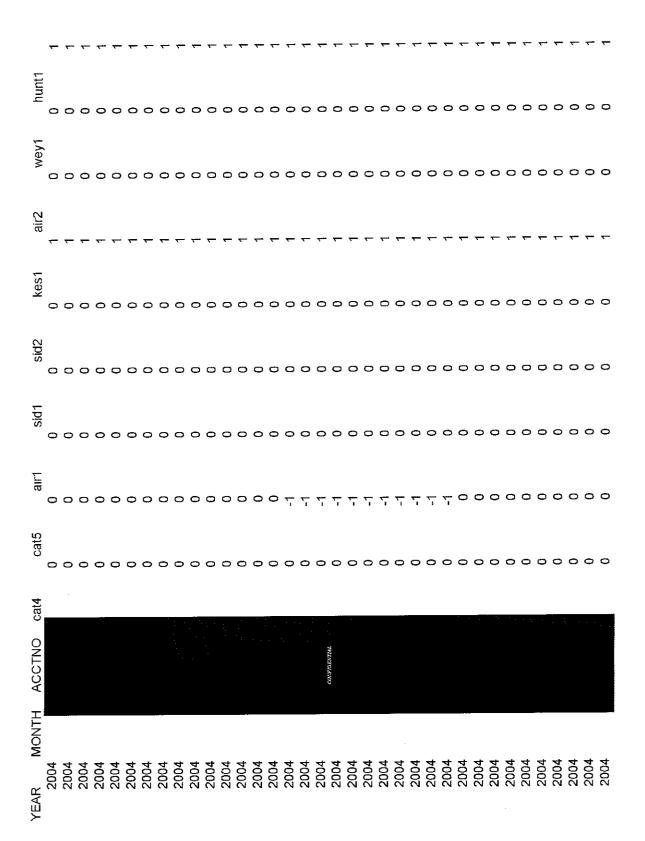


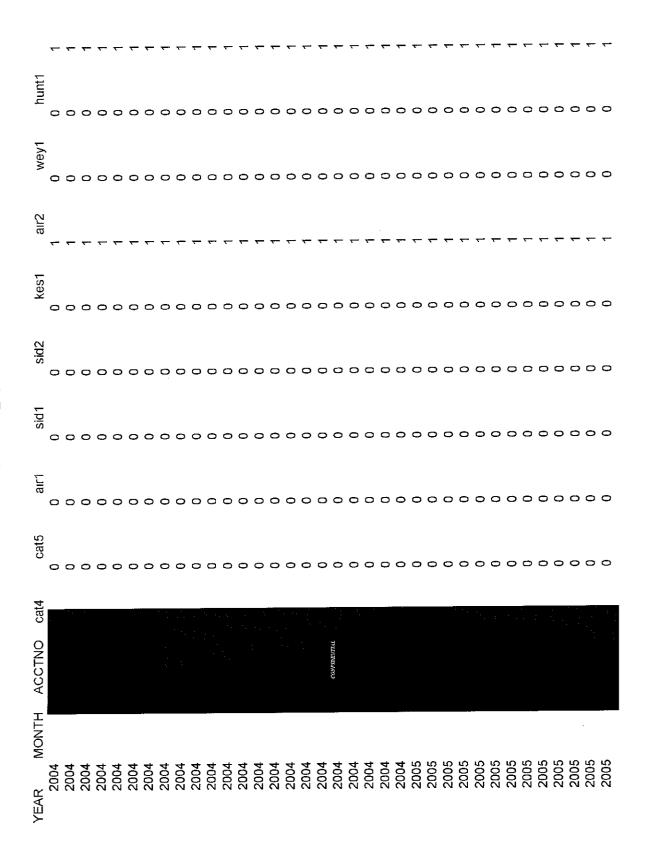


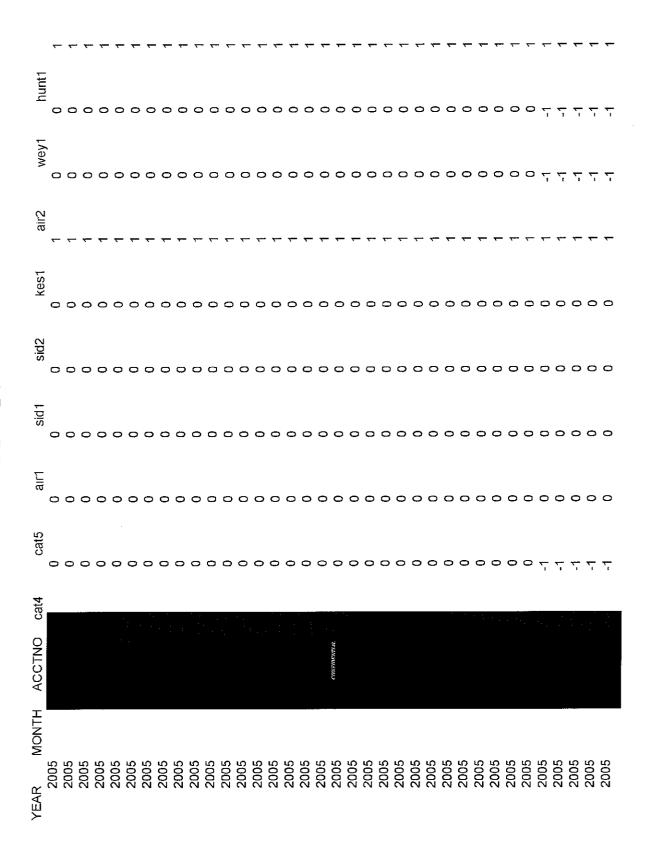


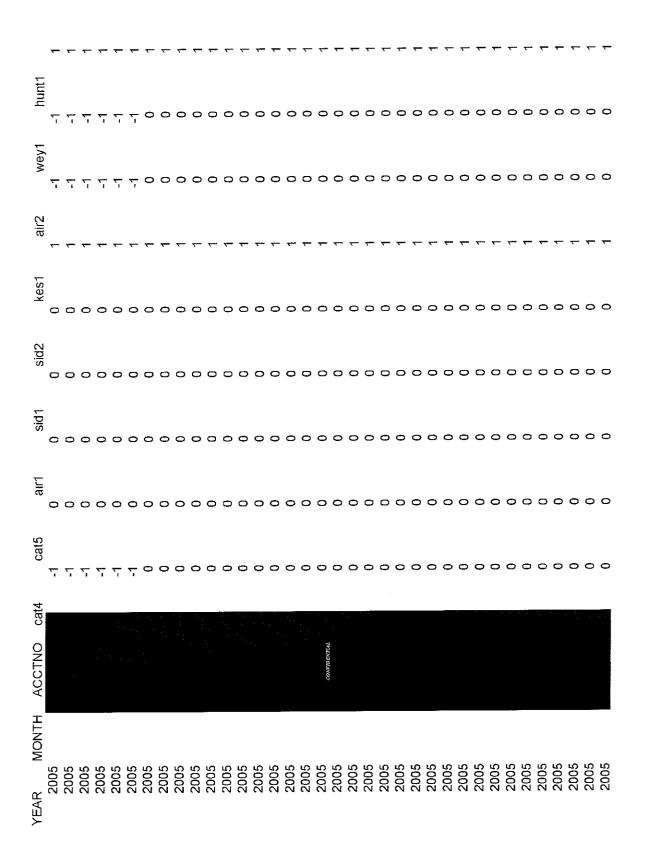


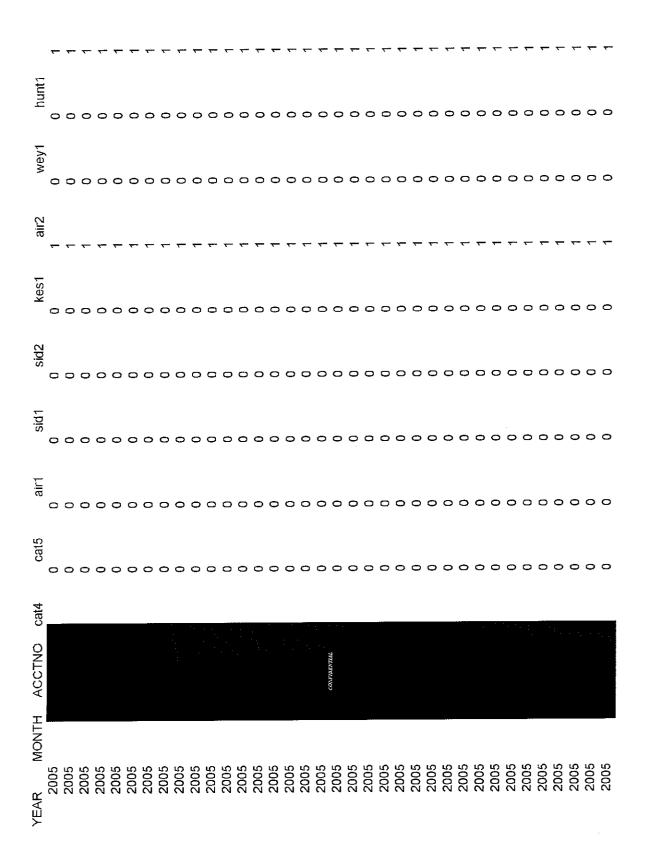


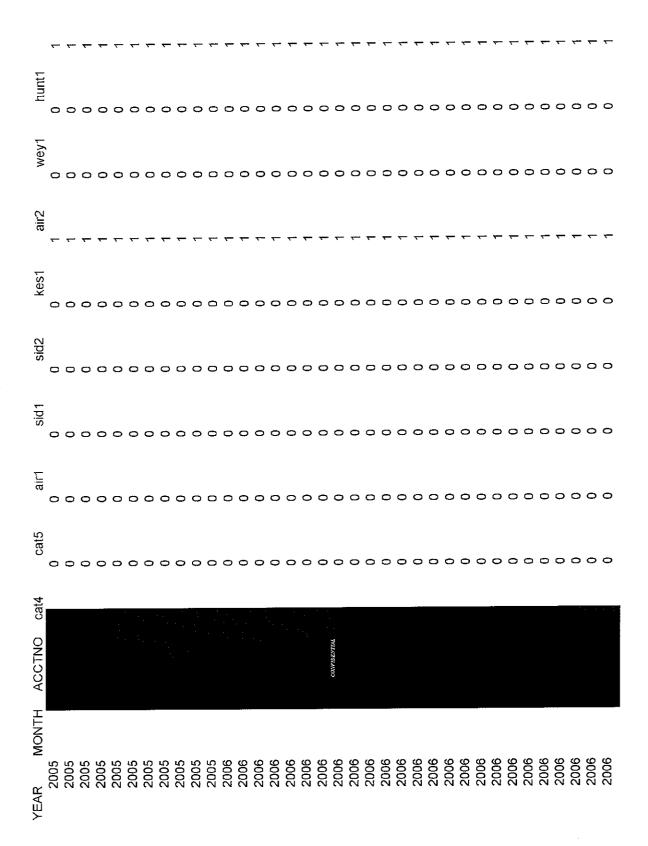


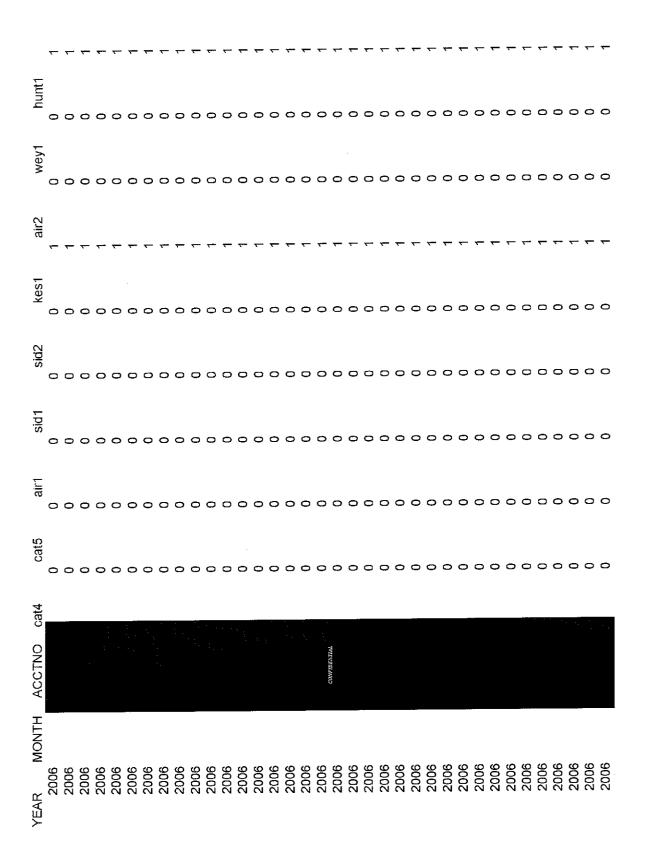


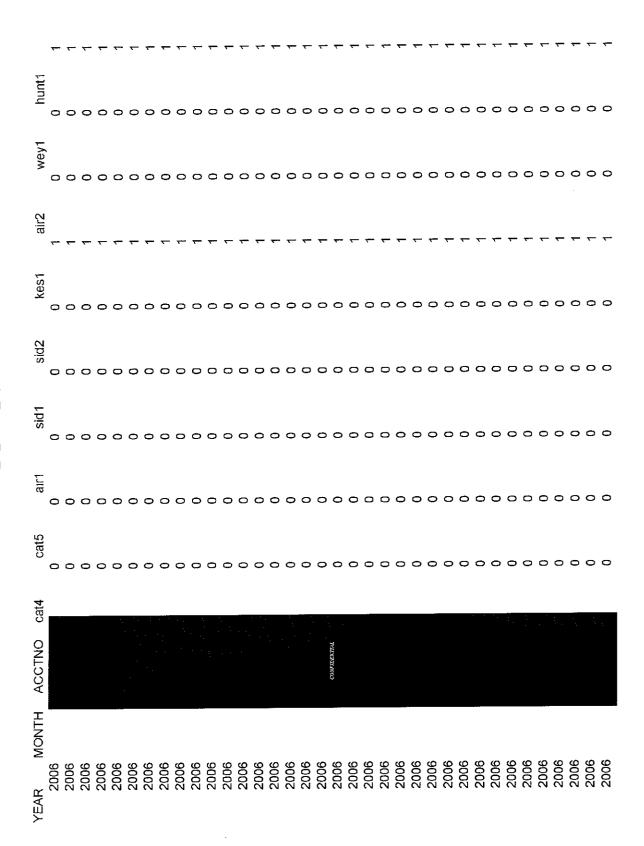


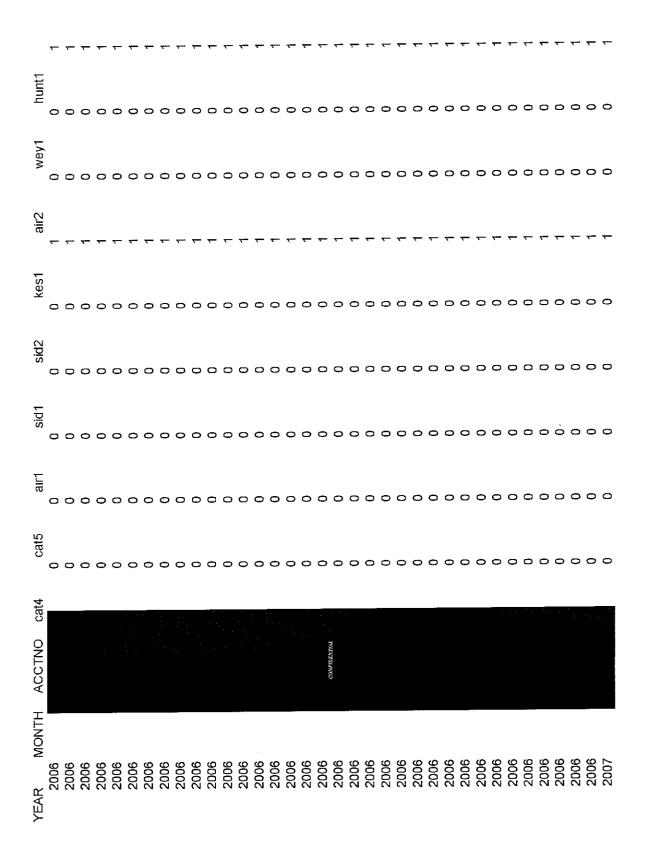


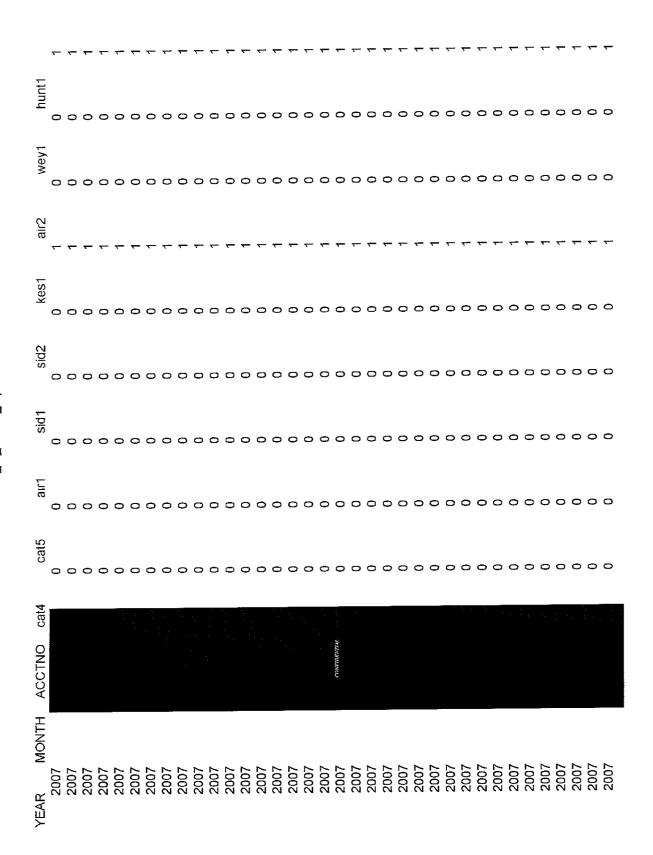


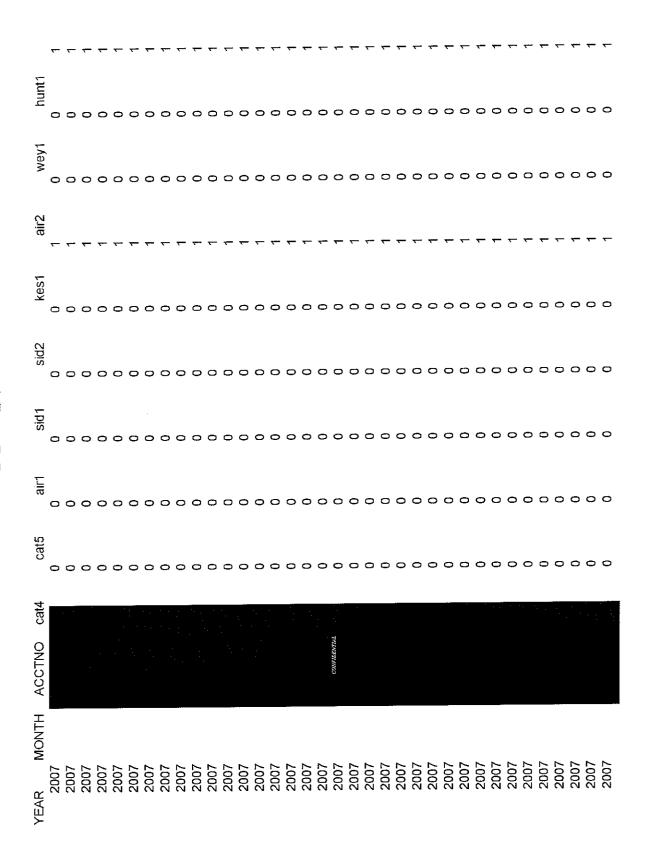


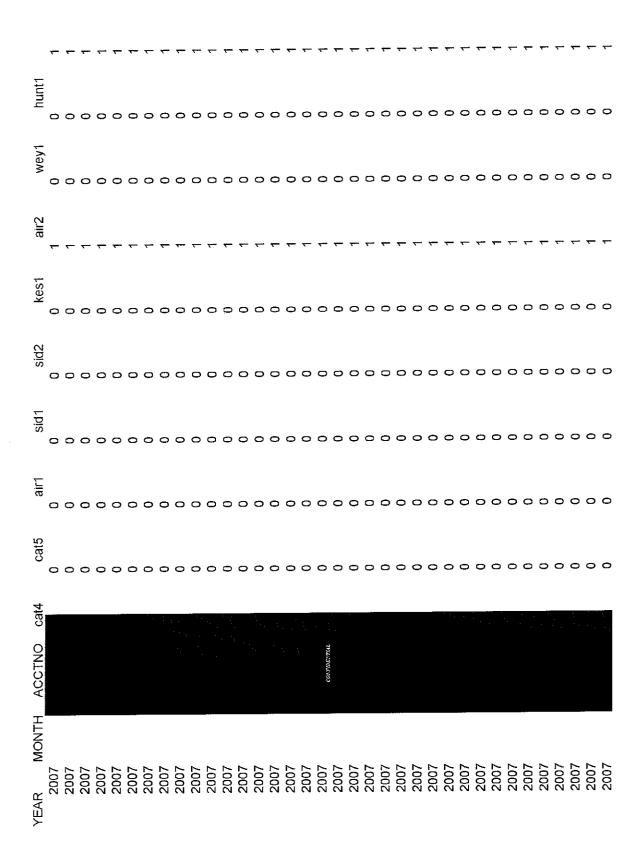


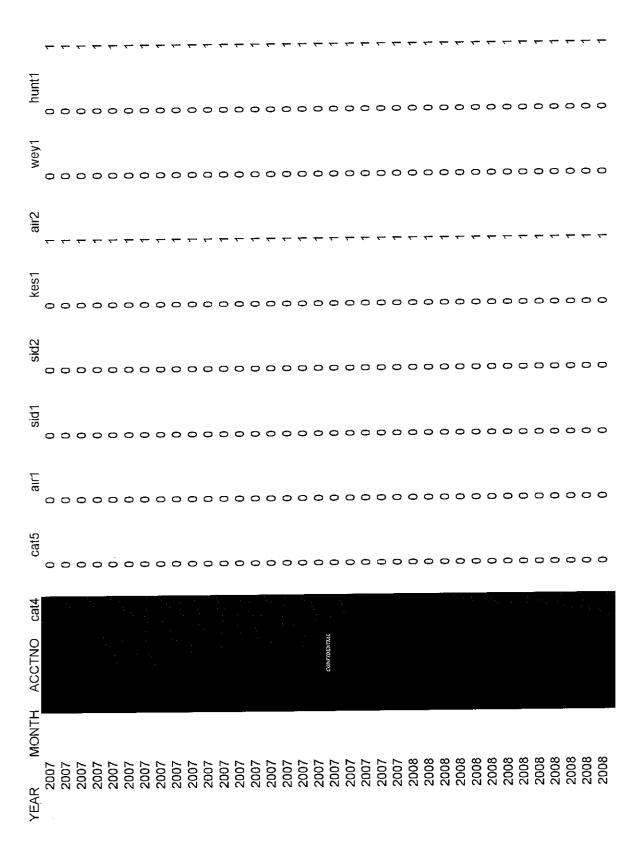


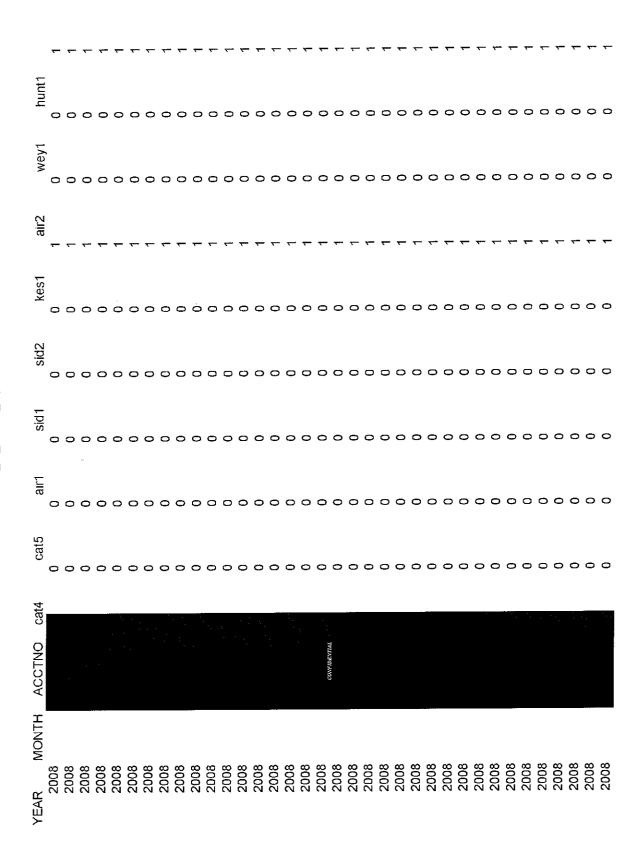




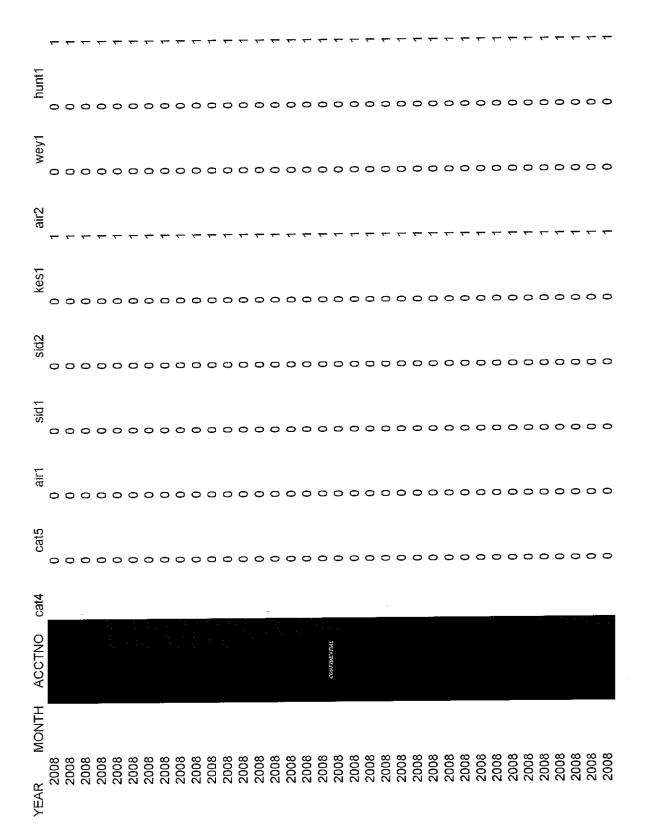




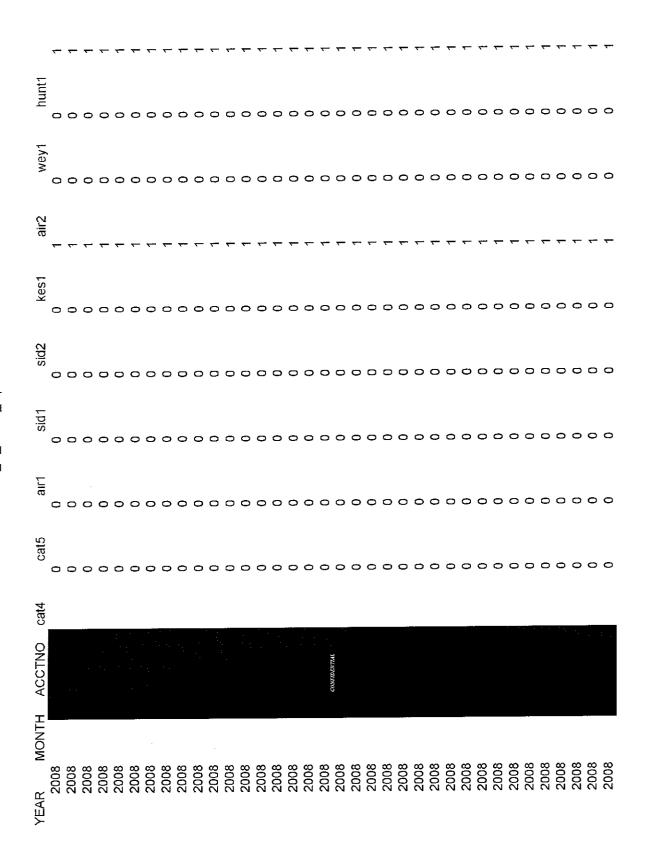


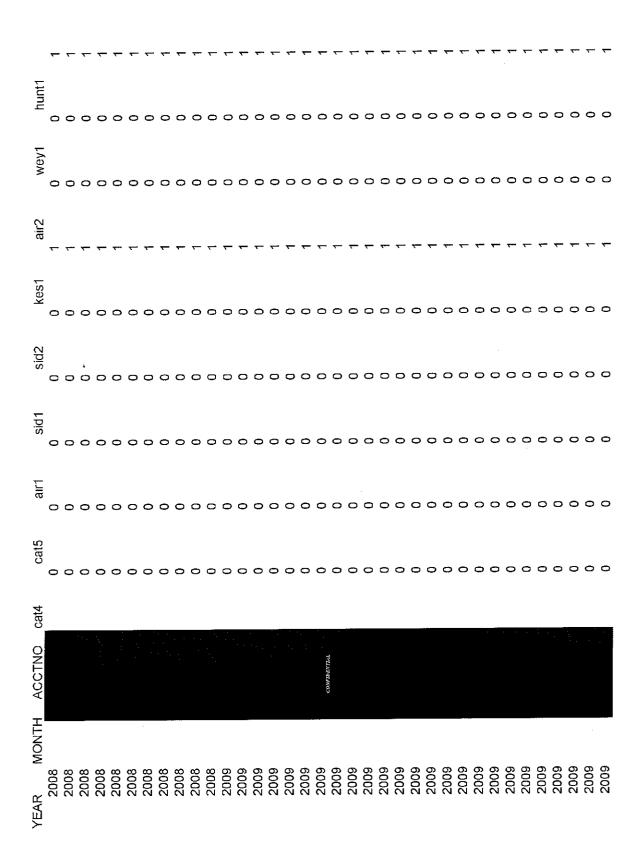


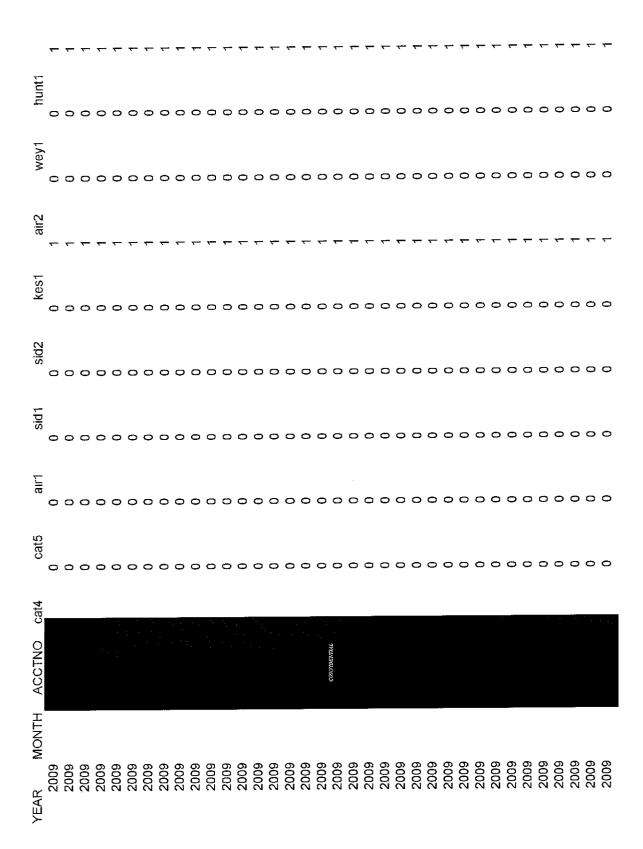


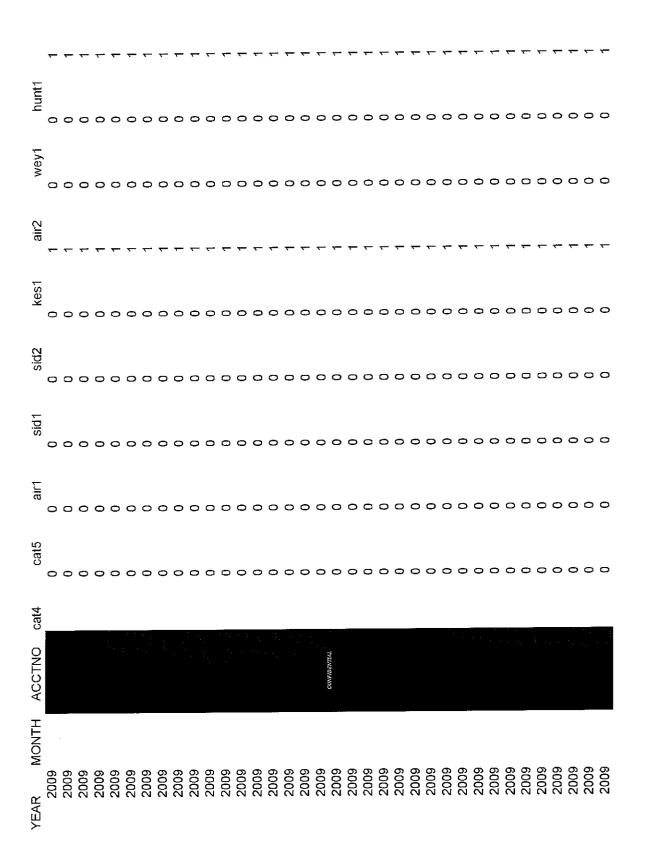


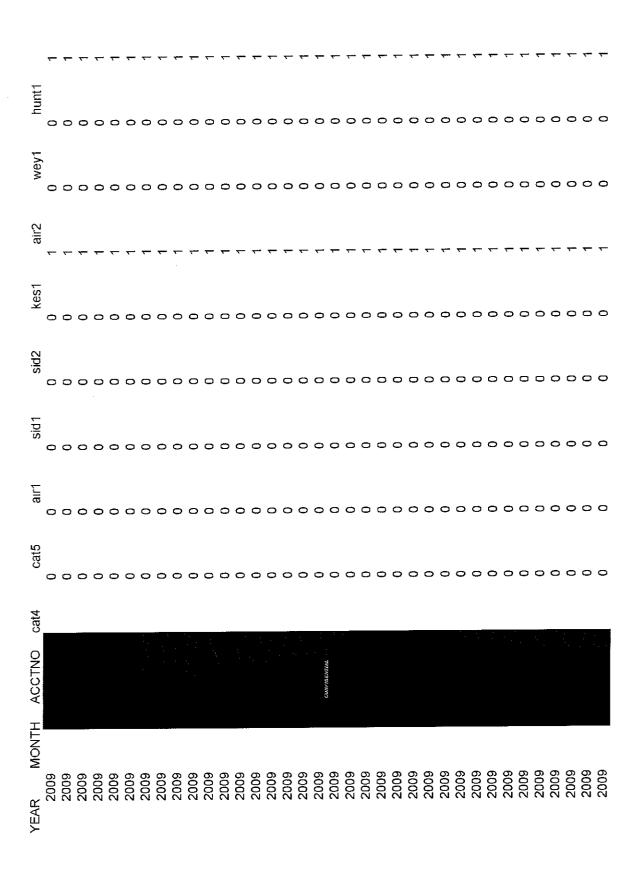


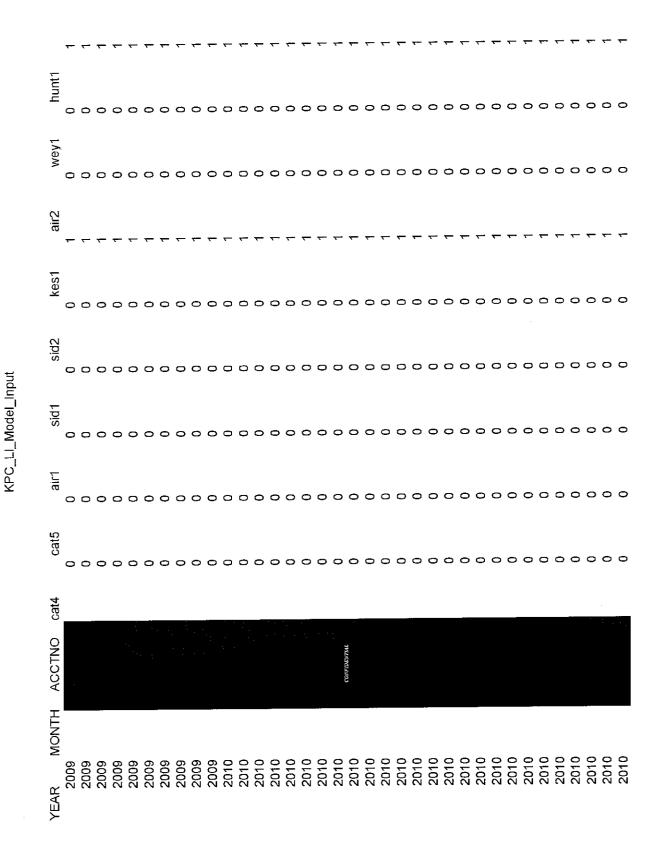


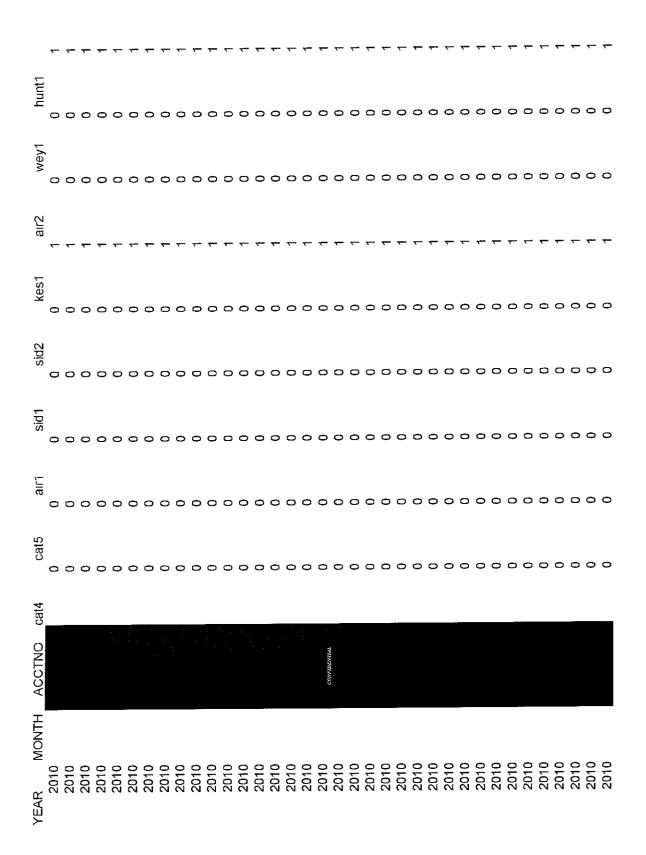


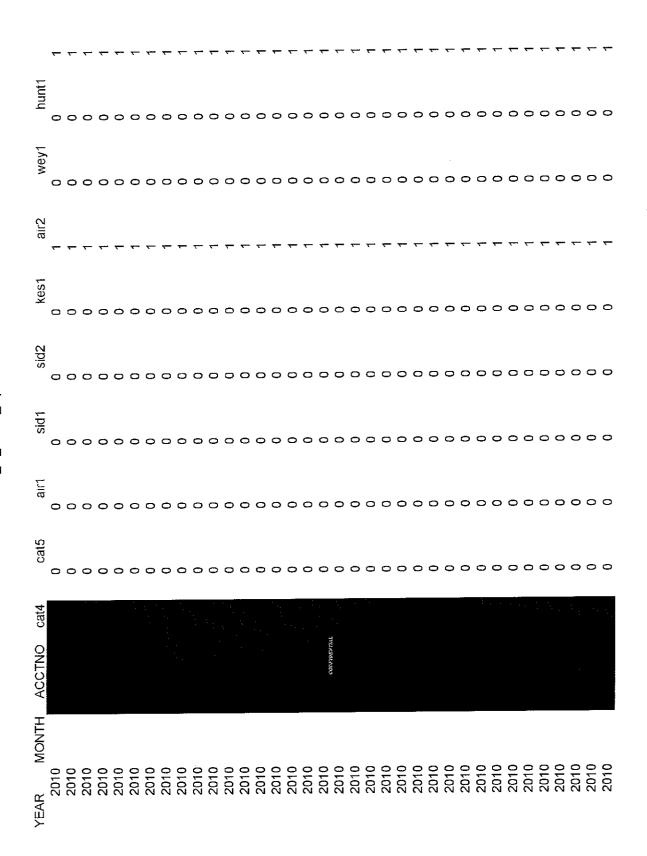


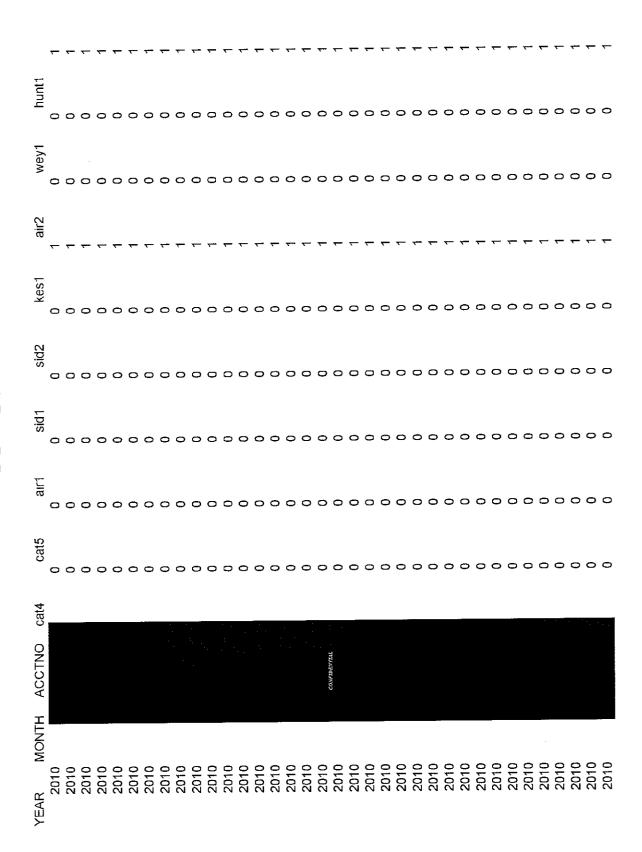


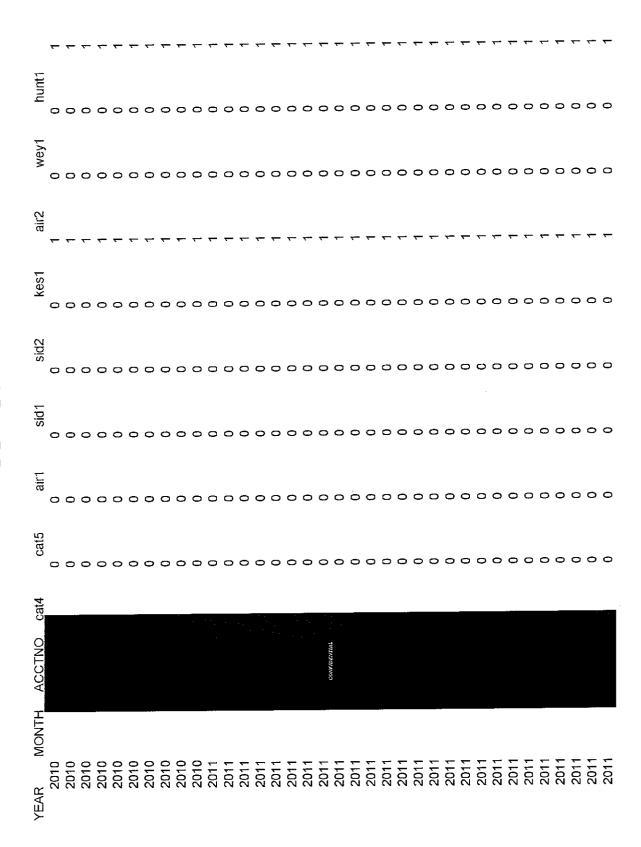


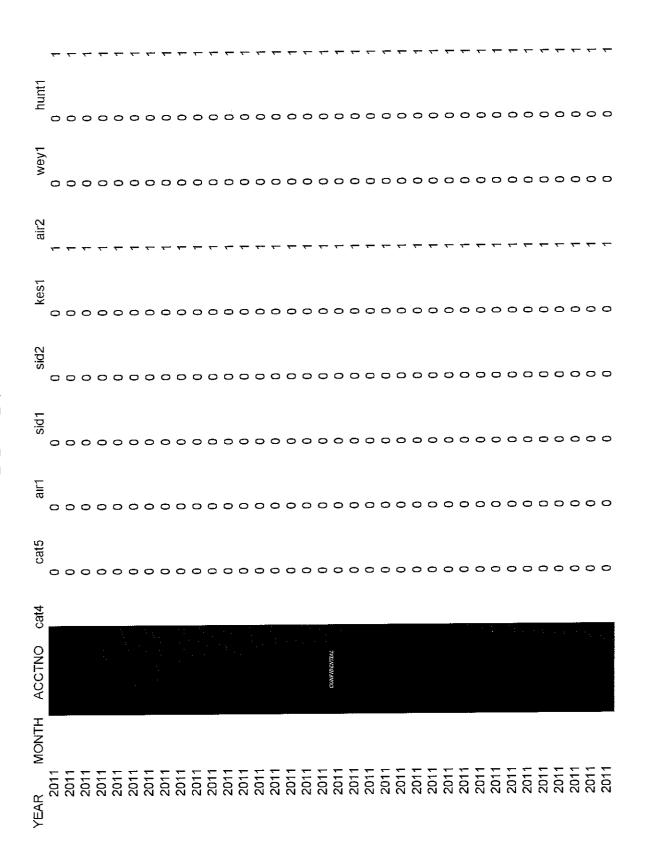


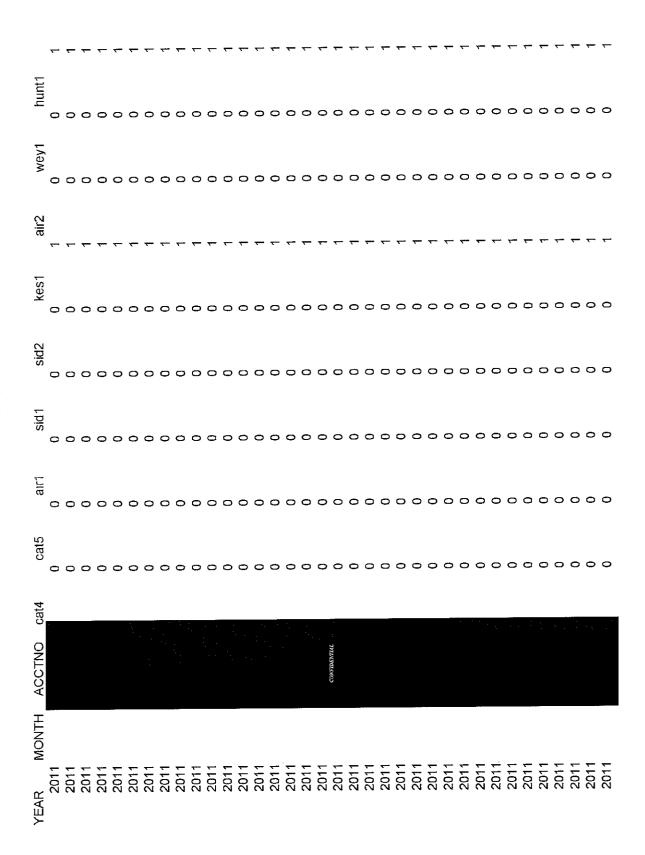


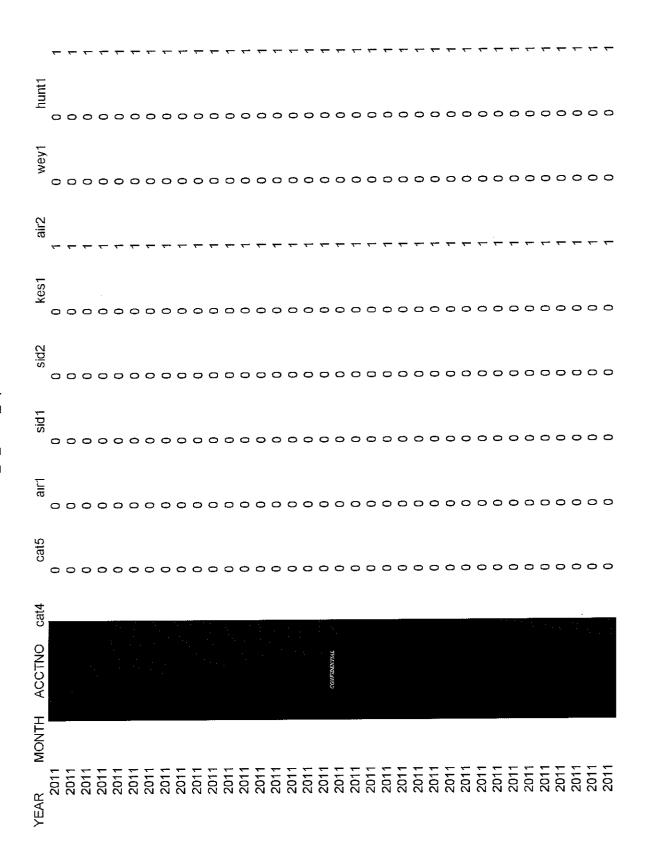












KPC_LI_Model_Input

Kentucky Power Company

The ARIMA Procedure

Conditional Least Squares Estimation

Parameter	Estimate	Standard Error	t Value	Approx Pr > t	Lag	Variable	Shift
MU	-218330.5	177051.5	-1 23	0 2203	0	KWH	0
AR1.1	0 24425	0 13130	1 86	0 0656	3	KWH	0
AR2.1	-0.25445	0.12880	-1 98	0 0508	12	KWH	0
NUM1	4540391 2	1393008 8	3 26	0 0015	0	aki	0
NUM2	4541651 5	1350699 1	3.35	0 0011	0	ak2	0
NUM3	2348432.4	1330420 1	1 77	0 0804	0	ak3	0
NUM4	-4680935.3	1332037 8	-3 51	0 0007	0	ak4	0
NUM5	4661021 6	1374418 6	3 39	0 0010	0	ak5	0

Constant Estimate	-206988	
Variance Estimate	3.039E12	
Std Error Estimate	1743177	
AIC	3576	279
SBC	3598	098
Number of Residuals	113	

 $[\]star$ AIC and SBC do not include \log determinant

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The ARIMA Procedure

			Correl	ations of	Parameter E	stimates			
Variable	S	KWH	KWH	KWH	ak1	ak2	ak3	ak4	ak5
Paramete		MU	AR1,1	AR2,1	NUM1	NUM2	NUM3	NUM4	NUM5
				2 050	-0.034	-0 001	-0 003	0 006	0 006
KWH	MU	1 000	-0 138			-0 061	0 019	-0 035	-0 049
KWH	AR1,1	-0 138	1 000 -0 038			0.161	0 009	-0 014	0 027
KWH	AR2,1	-0 059				0.030	0 005	-0 011	0 012
ak1	NUM1	-0 034 -0 001	0 284 -0 061	0 161		1 000	0 000	-0 000	0 007
ak2	NUM2	-	0 019			0 000	1 000	-0 001	-0 001
ak3	NUM3	-0 003 0 006	-0 035			-0 000	-0 001	1 000	0 039
ak4	NUM4	0 006	-0 049			0 007	-0 001	0 039	1 000
ak5	NUM5	U UUD	-0 049	0 027	*0.012	<i>D</i> 007	-0 00.	5 665	
			Autoc	orrelation	Check of R	esiduals			
To	Chi-		Pr >						
Lag	Square	DF	ChiSq			-Autocorre	lations		
6	0 59	4	0 9637	0 014	0 011	0 009	0 002	-0 055	-0 037
12	2 22	10	0 9944	-0 067	0 052	0 001	-0 0 15	0 071	-0 023
18	7 27	16	0 9677	-O 004	0 069	0 075	~0 125	0 009	0 107
24	10 97	22	0 9752	0 048	-0 057	-0 000	-0.024	0 104	-0 094
					D1 4 -4 D-	- 4 - 4 - 1 - 1 -			
			Autoc	orrelation	Plot of Re	SIGUALS			
	Covariance	Corro	lation	.1087	6 5 4 3 2 1	01234	56789	1 St	d Error
Lag	COVAL TAILCE	COLLE	Tation	1301	004021	•	• • • • •		
0	3 03867E12	1	00000	1		*****	******	* *	0
1	4 17969E10		01376	ì		İ		0	094072
2	3 24567E10		01068	i		i		0	094090
3	2.77546E10		00913	i		i		0	094101
4	6121266317		00201	i		İ		0	094108
5	-1 7032E11		05605	i		*		0	094109
-									



Autocorrelation Plot of Residuals

Lag	Covariance	Correlation	-1 9 8	76543210	1 2 3 4 5 6 7 8 9 1	Std Error
6	-1 1378E11	- 03744	1	*		0 094404
7	-2.0277E11	- 06673	i	*	. 1	0 094535
8	1,58124E11	0 05204	i	*	1	0 094951
9	1988162012	0 00065	i	į	İ	0 095203
10	-4.5882E10	- 01510	ì	i	1	0 095203
11	2.15553E11	0 07094	-	· *	. 1	0 095224
12	-7 1334E10	- 02348	1	i	i	0 095691
13	-1.2235E10	- 00403	1	i	i	0 095742
	2,08958E11	0 06877	1	*	i	0 095743
14		0 07526	1	· · · · · · · · · · · · · · · · · · ·	* i	0 096179
15	2 2868E11		1	**[i	0 096699
16	-3.7951E11	- 12489	1		· · · · · · · · · · · · · · · · · · ·	0 098116
17	2 78202E10	0 00916	!	; [*:	. !	0 098124
18	3 26535E11	0 10746	!	ı	^ !	0 099160
19	1.45315E11	0 04782		[*	!	
20	-1.7387E11	05722		*	!	0 099364
21	-176411324	- 00006		1	!	0 099655
22	-7.3753E10	- 02427			1	0 099655
23	3.15871E11	0 10395		[**	*	0 099707
24	-2 8441E11	- 09350	[**	1	0 100662

[&]quot; " marks two standard errors

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The ARIMA Procedure

Inverse Autocorrelations

Lag	Correlation	- 1	9	8	7	5	5	4	3	2	1	t	O	1	2	3	4	5	6	7	8	9	1	
1	-0 03841	1										*	i											1
2	-0 05905	ļ										*	l											1
3	-0 00661	1											ı											
4	0 03820	1											*											1
5	0 04766	1											*											
6	0 01988	1											i											
7	0 04559	-1											*											
8	-0 04854	1										*	ı											
9	-0 00080	1.											l											
19	0 02650	1											*											l
11	-0 07060	1										*	l											
12	0 03696	1											*											
13	-0 01415	1											l											
14	-0 06977	1										*	ı											
15	-0 05746	1										*	1											
16	0 10948	1											*	*										
17	0 00295	1											ı											
18	-0 11951	1									*	*	l											l
19	-0 03697	ı										*	l											
20	0 04958	1											*											1
21	0 00134	1											l											
22	0 03053	1											*											1
23	-0 09649	1									*	*												1
24	0 06475	1											*											1



Partial Autocorrelations

Lag	Correlation	-1	9	8	7	6	5	4	3	2	1	0	1	2	3	4	5	6	7	8	9	1	
1	0 01376	1																					1
2	0 01049	ĺ										l											1
3	0 00885											f											
4	0 00166																						
5	-0 05631										,	*											
6	-0 03617										1	*											l
7	-0 06495										,	*											ļ
В	0 05576											-1	×										1
9	0 00167																						ı
10	-0 01788																						l
11	0 06724											-	*										l
12	-0 03460										•	*											
13	-0.00303																						1
14	0 06912											l	*										l
15	0.08004	ŀ										- 1	* *										l
16	-0 12800	ŀ									**	*											1
17	0 01019											ŀ											ļ
18	0.12336											ŀ	* *										1
19	0 04146											ı	*										l
20	-0 05241	-									,	* [ļ
21	0 00394											ı											1
22	-0 03365										,	*											1
23	0 10061	1										ı	* *										1
24	- 0 0 6991	1									7	*											1

Model for variable KWH

Estimated Intercept Period(s) of Differencing -218331 12

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Kentucky Power Company

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The ARIMA Procedure

Autoregressive Factors

Factor 1: 1 · 0 24425 B**(3) Factor 2: 1 + 0 25445 B**(12)

Input Number 1

Input Variable akt
Period(s) of Differencing 12
Overall Regression Factor 4540391

Input Number 2

Input Variable ak2
Period(s) of Differencing 12
Overall Regression Factor 4541651

Input Number 3

Input Variable ak8
Period(s) of Differencing 12
Overall Regression Factor 2348432

Input Number 4

Input Variable ak4
Period(s) of Differencing 12
Overall Regression Factor -4580935



Input Number 5

Input Variable	akb
Period(s) of Differencing	12
Overall Regression Factor	4661022

WARNING: There are gaps in the interval for observation 3 according to ID variable TIME WARNING: There are gaps in the interval for observation 4 according to ID variable TIME WARNING: There are gaps in the interval for observation 6 according to ID variable TIME

Obs	Forecast	Std Error	95% Confidence Limits
0bs 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142	For ecast	Std Error 1743177 1743177 1743177 1794424 1794424 1797435 1797435 1797435 1797614 1797614 1221845 2221845 2221845 2224622 2244622 2244622	95% Confidence Limits confidence Limits
144		2245973	

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The ARIMA Procedure





Conditional Least Squares Estimation

Parameter	Estimate	Standard Error	t Value	Approx Pr > [t]	Lag
MU	-4246.8	29491.1	-0 14	0 8858	0
AR1.1	-0 50342	0 08457	-5 95	< 0001	1
AR2,1	-0 58024	0 08485	-6 84	< 0001	12

Correlations of Parameter Estimates

Parameter	MU	AR1,1	AR2,1
MU	1 000	0 008	0 008
AR1,1	0 008	1 000	0 029
AR2,1	0 008	0 029	1.000

^{*} AIC and SBC do not include log determinant



Autocorrelation Check of Residuals

To Lag	Chi- Square	DF	Pr > ChiSq			Autocorr	elations		****
5	6 84	4	0 1445	-0 117	-0 158	0.114	-0 087	-0 033	0 001
12	13 14	10	0 2159	-0 087	-0 075	0 004	0 042	0 063	-0 180
18	23 62	16	0 0982	0 066	0 154	-0.096	0 079	0 145	-0 127
24	37 97	22	0.0185	-0 023	0 113	-0 071	-0 049	0 104	-0 265
			Autoc	orrelation	Plot of R	esidua l s			

Lag	Covariance	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7	8 9 1 Std Error
0	4.97427E11	1 00000	********	*****
1	-5 8095E10	- 11679	**	0 095783
2	-7.8822E10	- 15846	***	0 097080
3	5 65885E10	0 11376	**	0 099425
4	-4.322E10	08689	**	0.100612
5	-1.6439E10	03305	_i *I	0 101298
6	717168497	0 00144	i i	0 101397
7	-4 3396E10	- 08724	**	0 101397
8	-3.7189E10	- 07476	*	0 102083
9	1840281309	0 00370	i	0 102585
10	2.08368E10	0 04189	į×	0 102586
11	3 1124E10	0 06257	· [*	0 102743
12	-8.9386E10	- 17970	****	0 103092
13	3 27111E10	0 06576	j*	0 105926
14	7 64B69E10	0 15377	***	0 106300
15	-4.7854E10	- 09620	**	0 108322
16	3 94809E10	0 07937	**	0 109103
17	7,20017E10	0 14475	***	0 109631
18	-6 3313E10	- 12728	***	0 111371
19	-1.1229E10	- 02257	i	0 112697
20	5 62427E10	0 11307	**	0 112739



Autocorrelation Plot of Residuals

Lag	Covariance	Correlation	-1 S	8 7 6 5 4 3 2 1 0 1 2 3 4 5	6 7 8 9 1 Std Error
21	-3.5235E10	- 07083	1	*	0 113774
22	-2.443E10	- 04911	i	*	0 114178
23	5.19664E10	0 10447	i	, **	0 114372
24	-1.3176E11	- 26488	İ	****	0 115244

[&]quot; " marks two standard errors

Inverse Autocorrelations

Lag	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 1	
1	0 07028	. *	i
2	0 15453	***	l
3	0 02115		ŀ
4	0 09993	**	ŀ
5	0 02601] [*	1
6	0 14079	***	ļ
7	0 04674	*	t
8	0 04156	*	[
9	-0 02605	*	
10	-0 02752	. *	1
11	-0 08425	** .	l
12	0 18324	***	l
13	-0 08255	**	
14	-0 09085	**	1
15	-0 03151	*	1
15	-0 04309	*!	1
17	-0 07298	*	
18	0 06286	[*	
19	0 00237		
20	-0 00437		



Inverse Autocorrelations

Lag	Correlation	-1 9	876	5 4	3 2	1 0	1	2	3 4	5	6	7	8	9	1
21	-0 03487	ı				*									I
22	0 06292	1				- 1	×								Ì
23	-0 04603	i				*									- 1
24	0 22747	1				- 1	***	**							- 1

Partial Autocorrelations

Lag	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2	3 4 5 6 7 8 9 1
1	-0 11679	**	1
2	-0 17448	***	1
3	0 07492	*	1
4	-0 09468	**	1
5	-0 02527	*	Į.
6	-0 04574	*	Į.
7	-0 09145	**	
8	0 11444	**1	1
9	-0 05628	*	
10	0 01161	1	Į
11	0 06145	. [*	Ļ
12	-0 18998	****	ŀ
13	0 02106	1	Ĺ
14	0 09166	1	Į
15	0 03324	*	[
16	0 06494] "	1
17	0 14531	***	į.
18	-0 03396	*	Į.
19	0 02937	*	Į.
20	0 07310	ļ*	Į.
21	0 01192	ļ .	
22	-0 00850		



Partial Autocorrelations

Lag	Correlation	-1987654	32101234567	891
23	0 11847	1	. **	ł
24	0 28159	i '	*****	

Model for variable KWH

Estimated Mean -4246 79
Period(s) of Differencing 1,12

Autoregressive Factors

Factor 1: 1 + 0 50342 B**(1) Factor 2: 1 + 0 58024 B**(12)

WARNING: There are gaps in the interval for observation 2 according to ID variable TIME WARNING: There are gaps in the interval for observation 3 according to ID variable TIME WARNING: Observation 129 is out of order according to the ID variable TIME

Gbs	Forecast	Std Error	95% Confidence Limits
123		705285	
124		787457	
125	CONFIDENTIAL	948631	CONFIDENTIAL
126	COMPREHIME	1045281	CONFIDENTIAL
127		1152019	
128		1241014	•

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The ARIMA Procedure

Obs	Forecast	Std Error	95% Confidence Limits
129		1328085	
130		1407862	:
131		1484272	
132		1556495	
133		1625726	
134		1692023	
135		1857022	
136	i	1956557	
137		2075053	
138		2175490	
139		2277035	
140		2371549	
141	CONFIDENTIAL	2463738	CONFIDENTIAL
142		2551967	
143		2537554	
144		2720299	
145		2800674	
146		2878770	
147		3118700	
148		3254684	
149		3424867	
150		3567342	
151		3713722	
152		3849962	
153		3983766	

Kentucky Power Company

The ARIMA Procedure

Conditional Least Squares Estimation

Parameter	Estimate	Standard Error	t Value	Approx Pr > t	Lag	Variable	Shift
MU	231911.4	627870.8	0 37	0 7126	0	KWH	0
MA1,1	0 68555	0.07895	8 68	< 0001	12	KWH	0
AR1.1	0.37393	0.09295	4 02	0 0001	1	KWH	0
NUM1	15490709	3494377 4	4 43	< 0001	0	cat1	0
NUN2	6344584.6	6229211 8	1 02	0 3108	0	cat3	0
NUMS	19690384	5988463 7	3 29	0 0014	0	cat5	0

Correlations of Parameter Estimates

Variable Parameter			KWH MU	KWH MAi,1	KWH ARi,1	cati NUM1	cat3 NUM2	cat5 NUM3
KWH	MU	1	000	0 077	-0 074	-0 742	0 222	-0 066
KWH	MA1,1	0	077	1 000	-0 083	-0 006	-0 017	-0 039
KWH	AR1,1	- O	074	-0 083	1 000	0 056	-0 052	-0 019
cat1	NUM1	O	742	-0 006	0 056	1 000	~0 290	0 094
cat3	NUM2	0	222	-0 017	-0 052	-0 290	1 000	-0 025
cat5	NUM3	- 0	066	~ 0 039	-0 019	0 094	~0 025	1 000

^{*} AIC and SBC do not include log determinant



Autocorrelation Check of Residuals

Lag Square DF ChiSq	То	Chi- Square		>		Autocorrela	tions	
12 3 55 10 0 9653 -0 006 -0 008 0 023 0 055 -0 034 -0 054 18 7 78 16 0 9553 0 042 0 020 0 055 0 050 0 075 -0 136 24 12 07 22 0 9559 0 063 0 062 -0 135 -0 032 -0 065 -0 018 Autocorrelation Plot of Residuals Autocorrelation Plot of Scion Plot of Scion Plot of Residuals Autocorrelation Plot of	Lag	Square	Dr Cit.	.04				
12 3 55 10 0 9653 -0 006 -0 008 0 023 0 055 -0 034 -0 054 18 7 78 16 0 9553 0 042 0 020 0 055 0 050 0 075 -0 138 24 12 07 22 0 9559 0 063 0 062 -0 136 -0 032 -0 065 -0 018 Autocorrelation Plot of Residuals Autocorrelation Plot of Residuals	6	2.60	4 0.63	61 0 035	-0 070	-0 D17 -0	113 -0	028 -0 054
Autocorrelation Plot of Residuals Autocorrelation Plot of Residuals Lag Covariance Correlation -1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 1 Std Error 0 4 75996E13 1 00000					-0 008	0 023	0 055 -0	034 -0 054
Autocorrelation Plot of Residuals Lag Covariance Correlation -1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 1 Std Error 0 4 75995E13 1 00000						0 055	0.050	075 -0 138
Autocorrelation Plot of Residuals Lag Covariance Correlation -1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 1 Std Error 0 4 75996E13 1 00000							0 032 -0	065 -0 018
Lag Covariance Correlation -1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 1 Std Error 0 4 75996E13 1 00000 ************************************	24	12 07	22 0 3.		• •			
Lag Covariance Correlation -1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 1 Std Error 0 4 75996E13 1 00000 ************************************				utocorrelatio	on Plot of Res	f duals		
0 4 75996E13 1 00000 ************************** 0 1 1.68204E12 0 03534 * 0 096225 2 -3.3175E12 - 06970 * 0 096345 3 -8.223E11 - 01728 0 096811 4 -5 3772E12 - 11297 ** 0 09639 5 -1 3456E12 - 02827 * 0 098052 6 -2 5627E12 - 05384 * 0 098452 7 -2 6566E11 - 00558 0 098401 8 -3.7758E11 - 00793 0 098403 9 1 11728E12 0 02347 0 098403 9 1 11728E12 0 02347 0 098403 10 2.61823E12 0 05501 * 0 098401 11 -1 6087E12 - 03380 * 0 098452 13 1 97711E12 0 04154 * 0 099852 13 1 9771E12 0 04154 * 0 099289 15 2 61989E12 0 05504 * 0 099327 16			•	1010001102012	OIL 1 100 OI 1100			
1 1.68204E12 0 03534 * 0 096225 2 -3,3175E12 - 06970 * 0 096345 3 -8.223E11 - 01728 0 096811 4 -5 3772E12 - 11297 ** 0 096813 5 -1 3456E12 - 02827 * 0 0988252 6 -2 5627E12 - 05384 * 0 098127 7 -2 6556E11 - 00558 0 098127 7 -2 6556E11 - 00558 0 098401 8 -3.7758E11 - 00793 0 098401 9 1 11728E12 0 02347 0 098403 9 1 11728E12 0 02347 0 098409 10 2.61823E12 0 05501 * 0 098401 11 -1 6087E12 - 03380 * 0 098461 12 -2.5844E12 - 05429 * 0 09852 13 1 97711E12 0 04154 * 0 099285 14 9 54772E11 0 02006 0 099289 15 2 61989E12 0 05504 * 0 099289 15 2 61989E12 0 05504 * 0 099327 16 2 36421E12 0 04967 * 0 099609 17 3.57494E12 0 07510 ** 0 099838 18 -6.5683E12 - 13799 *** 0 100359 19 3 00621E12 0 06316 * 0 102101	Lag	Covariance	Correlati	on -198	7654321	012345	67891	Std Error
1 1.68204E12 0 03534 * 0 096245 2 -3.3175E12 - 06970 * 0 096345 3 -8.223E11 - 01728 0 096811 4 -5 3772E12 - 11297 ** 0 096839 5 -1 3456E12 - 02827 0 098052 6 -2 5627E12 - 05384 0 098127 7 -2 6566E11 - 00558 0 098403 8 -3.7758E11 - 00793 0 098403 9 1 11728E12 0 02947 0 098409 10 2.61823E12 0 05501 0 098403 11 -1 6087E12 - 03380 0 098451 12 -2.5844E12 - 05429 0 098652 13 1 97711E12 0 04154 0 099128 14 9 54772E11 0 02006 0 099289 15 2 61989E12 0 05504 0 099289 15 2 61989E12 0 05504 0 099287 16 2 36421E12 0 04967 0 099838 18 -6.5683E12 - 13799 *** 0 099865 </td <td>0</td> <td>4 75996E13</td> <td>1 000</td> <td>10 I</td> <td></td> <td>******</td> <td>******</td> <td>0</td>	0	4 75996E13	1 000	10 I		******	******	0
2 -3,3175E12 - 06970 * 0 096345 3 -8.223E11 - 01728 0 096811 4 -5 3772E12 - 11297 ** 0 096839 5 -1 3456E12 - 02827 * 0 098652 6 -2 5627E12 - 05384 * 0 098127 7 -2 6556E11 - 00558 0 098401 8 -3.7758E11 - 00793 0 098401 9 1 11728E12 0 02347 0 098403 9 1 11728E12 0 05501 * 0 098401 10 2.61823E12 0 05501 * 0 098461 11 -1 6087E12 - 03380 * 0 098451 12 -2.5844E12 - 05429 * 0 09852 13 1 97711E12 0 04154 * 0 099285 14 9 54772E11 0 02006 0 099289 15 2 61989E12 0 05504 * 0 099289 16 2 36421E12 0 04967 * 0 099609 17 3.57494E12 0 07510 ** 0 099688 18 -6.5683E12 0 16316 ** 0 100359 19 3 00621E12 0 06316 *** 0 100359	_			•		*	j	0 096225
3 -8.223E11 - 01728 0 096811 4 -5 3772E12 - 11297 ** 0 096831 4 -5 3772E12 - 11297 ** 0 096839 5 -1 3456E12 - 02627 * 0 098052 6 -2 5627E12 - 05384 * 0 098127 7 -2 6566E11 - 00558 0 098401 8 -3.7758E11 - 00793 0 098401 9 1 11728E12 0 02347 0 098409 10 2.61823E12 0 05501 * 0 098401 11 -1 6007E12 - 03380 * 0 098411 12 -2.5844E12 - 05429 * 0 098652 13 1 97711E12 0 04154 * 0 099652 13 1 97717E12 0 04154 * 0 099289 15 2 61989E12 0 05504 * 0 099289 15 2 61989E12 0 05504 * 0 099609 17 3.57494E12 0 07510 ** 0 099638 18 -6.5683E12 0 10316			- 069	70 i	*	İ	i	0 096345
4 -5 3772E12 - 11297 ** 0 096839 5 -1 3456E12 - 02827 * 0 098052 6 -2 5627E12 - 05384 * 0 098127 7 -2 6566E11 - 00558 0 098401 8 -3.7758E11 - 00793 0 098403 9 1 11728E12 0 02347 0 098403 10 2.61823E12 0 05501 0 098401 11 -1 6087E12 - 03380 0 098745 12 -2.5844E12 - 06429 0 098652 13 1 97711E12 0 04154 0 099289 15 2 61989E12 0 05504 0 099289 15 2 61989E12 0 05504 0 099327 16 2 36421E12 0 04967 0 099838 18 -6,5683E12 - 13799 0 100359 19 3 00621E12 0 06316 0			- 017	28 i		İ	- 1	0 096811
5 -1 3456E12 -02827 * 0 098052 6 -2 5627E12 -05384 * 0 098127 7 -2 6556E11 -00558 0 098403 8 -3.7758E11 -00793 0 098409 9 1 11728E12 0 02947 0 098409 10 2.61823E12 0 05501 * 0 098461 11 -1 6087E12 0 03800 * 0 098745 12 -2.5844E12 -05429 0 098452 13 1 9771E12 0 04154 0 099128 14 9 54772E11 0 20066 0 099289 15 2 61989E12 0 05504 0 099327 16 2 36421E12 0 04967 0 09	-	and the second second	- 112	97 j	**	İ	1	0 096839
6 -2 5627E12 - 05384 * 0 098127 7 -2 6566E11 - 00558 0 098401 8 -3.7758E11 - 00793 0 098403 9 1 11728E12 0 02347 0 098409 10 2.61823E12 0 05501 * 0 098401 11 -1 6087E12 - 03380 * 0 098745 12 -2.5844E12 - 05429 * 0 098652 13 1 97711E12 0 04154 * 0 099128 14 9 54772E11 0 02006 0 099289 15 2 61989E12 0 05504 * 0 099289 15 2 6421E12 0 04967 * 0 099609 17 3.57494E12 0 07510 ** 0 099838 18 -6.5683E12 - 13799 *** 0 102105			- 028	27 İ	*	ĺ	1	0 098052
7 -2 6566E11 - 00558 0 098401 8 -3.7758E11 - 00793 0 098403 9 1 11728E12 0 02347 0 098409 10 2.61823E12 0 05501 * 0 098461 11 -1 6087E12 - 03380 * 0 098745 12 -2.5844E12 - 05429 * 0 09852 13 1 97711E12 0 04154 * 0 099745 14 9 54772E11 0 02006 0 099289 15 2 61989E12 0 05504 * 0 099289 15 2 61989E12 0 05504 * 0 099327 16 2 36421E12 0 04967 * 0 099609 17 3.57494E12 0 07510 ** 0 099838 18 -6.5683E12 13799 *** 0 100359 19 3 00621E12 0 06316 * 0 102101		-2 5627E12	- 053	34 İ	*	İ	1	0 098127
9 1 11728E12	7	-2 6566E11	- 005	58		ĺ	!	0 098401
9 1 11728E12	8	-3.7758E11	- 007	33 İ		İ		0 098403
10			0 023	17 İ		İ	1	0 098409
12		2.61823E12	0 055)1 İ		*	1	0 098461
13 1 97711E12 0 04154 * 0 099128 14 9 54772E11 0 02006 0 099289 15 2 61989E12 0 05504 * 0 099287 16 2 36421E12 0 04967 * 0 099609 17 3 .57494E12 0 07510 ** 0 099838 18 -6.5683E12 - 13799 *** 0 100359 19 3 00621E12 0 06316 * 0 102101	11	-1 6087E12	- 033	i oi	*	İ	1	0 098745
14 9 54772E11 0 02006 0 099289 15 2 61989E12 0 05504 * 0 099327 16 2 36421E12 0 04967 * 0 099609 17 3.57494E12 0 07510 ** 0 099838 18 -6.5683E12 - 13799 *** 0 100359 19 3 00621E12 0 06316 * 0 102101	12	-2.5844E12	- 054	29 j	*	1	1	0 098852
15 2 61989E12 0 05504 * 0 099327 16 2 3642E12 0 04967 * 0 099609 17 3.57494E12 0 07510 ** 0 099838 18 -6.5683E12 - 13799 *** 0 100359 19 3 00621E12 0 06316 * 0 102101	13	1 97711E12	0 041	i4 İ		*	1	0 099128
16 2 36421E12	14	9 54772E11	0 020	16		1	1	
17 3.57494E12 0.07510 *** 0.099838 18 -6.5683E12 - 13799 *** 0.100359 19 3.00621E12 0.06316 * 0.102101	15	2 61989E12	0 055	14		*		0 099327
18 -6.5683E12 - 13799 *** 0 100359 19 3 00621E12 0 06316 * 0 102101	16	2 36421E12	0.0496	57		 *	1	
19 3 00621E12 0 06316 * 0 102101	17	3.57494E12	0 075	10 [**	1	
19 3 00021212 0 00010	18	-6.5683E12	- 137	99	***	1	I	
20 2 96361E12	19	3 00521E12	0 063	6		*	I	
	20	2 96361E12	0 062	26		*	1	0 102462



Autocorrelation Plot of Residuals

Lag	Covariance	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 1	Std Error
21	-6 4027E12	- 13451	***	0 102812
22	-1 5069E12	~ 03166	* .	0 104429
23	-9 0805E12	- 06472	- j * - T	0 104518
24	.8 5354F11	- 01793	i 1 1	0 104888

" ' marks two standard errors

Inverse Autocorrelations

Lag	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 1	
1	-0 05122	*1	l
2	0 09234	**	
3	0 02516	 *	
4	0 11257	**	l
5	0 00031	1	į
6	0 07316	*	ı
7	-0 00485	1	l
8	-0 00332	į I	ĺ
9	-0 03116	*	
10	-0 02663	*	L
11	-0 00536	į l	ı
12	0 05179	1 "	1
13	-0 07985	**	ı
14	0 00077	i I	l
15	-0 06588	*	1
16	-0 01643	1	1
17	~0 07537	**	1
18	0 14003	***	
19	-0 06361	*	1
20	-0 04127	*	ı

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The ARIMA Procedure

Inverse Autocorrelations

Lag	Correlation	-1 9	8	7	6	5 4	4 3	2	1	0	1	2	3	4	5	6	7	8	9	1	
21	0 09805	ı								1	* *									1	
22	0 02861	i								Ţ,	*										
23	0 05572	1								1	*										
24	0 02430	1																			

Partial Autocorrelations

Lag	Correlation	- 1	9	8	7	6	5	4	3	5	1	0	1	2	3	4	5	6	7	8	9	1	
1	0 03534	1										1	*										
2	-0 07103											*											
3	-0 01220	1																					
4	-0 11757	1									*	*											
5	0 02245	+																					
6	-0 07081	1										*											1
7	-0 00877	1										-											
8	-0 03243	-1										*											
9	0 01636	1																					1
10	0 03590	1											*										
11	-0 03960	1										*											
12	-O 05407	1										*											1
13	0 04405	1											*										
14	0 01734	1																					1
15	0 05705	1										-	*										ļ
16	0 04331	1											17										1
17	0 09071	ı										-	**										1
18	-0 13839	- 1									* *	- 1											1
19	0 10982	1										1	* *										1
20	0 05063	-										ı	×										1
21	~0 09951	-									*	*											1
22	-0 03278	-										*											-

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The ARIMA Procedure

Partial Autocorrelations

Model for variable KWH

Estimated Intercept 231911.4 Period(s) of Differencing 12

Autoregressive Factors

Factor 1: 1 - 0 37393 B**(1)

Moving Average Factors

Factor 1: 1 - 0 68555 B**(12)

Input Number 1

Input Variable cat1
Period(s) of Differencing 12
Overall Regression Factor 15490709

Input Number 2

Input Variable cat3
Period(s) of Differencing 12
Overall Regression Factor 6344585



Input Number 3

Input Variable
Period(s) of Differencing
Overall Regression Factor

cat5 12 19690384

WARNING: There are gaps in the interval for observation 4 according to ID variable TIME
WARNING: There are gaps in the interval for observation 11 according to ID variable TIME
WARNING: There are gaps in the interval for observation 26 according to ID variable TIME

Obs	Forecast	Std Error	95% Confidence Limits
121		6899246	
122		7365809	
123		7428711	
124		7437464	
125		7438687	
126		7438858	
127		7438882	
128		7438885	
129		7438885	
130	CONFIDENTIAL	7438885	CONFIDENTIAL
131		7438885	
132		7438885	
133		7748805	
134		7791156	
135		7797060	
136		7797885	
137		7798000	
138		7798016	
139		7798019	

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0bs	Forecast	Std Error	95% Confidence Limits
140		7798019	
141		7798019	
142		7798019	
143		7798019	
144		7798019	
145		8094190	CONFIDENTIAL
146	CONFIDENTIAL	8134742	
147		8140395	
148		8141185	
149		8141297	
150		8141312	
151		8141315	

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The ARIMA Procedure

Conditional Least Squares Estimation

Parameter	Estimate	Standard Error	t Value	Approx Pr > t	Lag	Variable	Shift
MU	-5436.2	52838.9	-0 10	0 9183	o	KWH	0
AR1,1	-0.81518	0.09684	-8 42	< 0001	12	KWH	0
NUM1	-3711790 4	533124 0	- 6 96	< 0001	0	air1	0
		Constant E	stimate	-9867.65			

Variance Estimate	9.067E11
Std Error Estimate	9.067E11
Std Error Estimate	952215.9
AIC	3252.651
SBC	3260.67
Number of Residuals	107

Correlations of Parameter Estimates

Variable Parameter			MU MU	KWH AR1,1	air1 NUM1
KWH	MU	1	000	-0 005	-0 001
KWH	AR1,1	-0	005	1 000	0 246
air1	NUM1	- 0	001	0 246	1 000

Number of Residuals 107
* AIC and SBC do not include log determinant

0 112574

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The ARIMA Procedure

Autocorrelation Check of Residuals

То	Chi-		Pr >												
Lag	Square	DF	ChiSq	• •				Au1	tocorr	elat:	ions -				
6	12 58	5	0 0276	O	273	0.	001	- 0	168	-0	010	-0	097	0	033
12	16 84	11	0 1127	0	069	-0.	019	- 0	018	-0	015	0	077	-0	153
18	20 63	17	0 2435	0	046	0	045	0	048	0	094	-0	074	-0	094
24	26 10	23	0 2962	0	014	0.	055	- 0	032	-0	005	0	054	-0	179
			Auto				t of R								
												0.1		Std E	
Lag	Covariance	Corr	elation	-1 :	987	0 5 4	132	1 0	1 2 3	450	, , ,	9 1		Ocu L	, 0,
О	9.06715E11		1 00000	1				* 1	*****	****	****	****			O
1	-2.4756E11		- 27303				***	**				1		0 096	
2	-553710262		- 00061	1				ļ						0 10	3630
3	-1 5214E11		- 16779	Ĺ			*	**				- 1		0 10	3530
-															0450

19

1.29937E10

4 9779E10

0 01433

0 05490



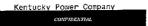
Autocorrelation Plot of Residuals

Lag	Covariance	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8	9 1	Std Error
21	-2.8633£10	- 03158	* .	1	0 112824
22	-4.7637E9	- 00525		- 1	0 112907
23	4.85853E10	0 05358	 * .	- 1	0.112909
24	-1 6236E11	~ 17906	****	ı	0 113146

" " marks two standard errors

Inverse Autocorrelations

Lag	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 1	
1	0 54039	*******	İ
2	0 42784	*******	i
3	0 46053	*****	l
4	0 36318	******	!
5	0 33223	*****	l
6	0 26093	****	i
7	0 16898	***	1
8	0 14599	***	l
9	0.16556	***	l
10	0 07518	**	l
11	0 03467	<u> </u>	l
12	0 13152	***	l
13	0 02153		ı
14	-0 00517	1	l
15	0 00133		l
16	-0 0 1915		ĺ
17	0 06064	*	1
18	0 09541	**	1
19	0 04189	77	1
20	0 03648	*	1



Inverse Autocorrelations

Lag	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7	891
21	0 09652	**	i
22	0 06008	[*	- 1
23	0 04763	[*	ı
24	0 10614	**	-

Partial Autocorrelations

Lag	Correlation	- 1	9	8	7	6	5	4	3	2	! 1	C) .	1 :	2	3	4	5	6	7	8	9	1	
1	-0 27303	Ι								* *	**	*												j
2	-0 08121	1									*	*												ĺ
3	~0 20682	1								*	* *	*												
4	-0 13488	1									**	*												
5	-0 19070	1								×	* *	*												
6	-0 12442										*	*												
7	-0 01998	1																						1
8	-0 07761										*	*												
9	-0 08648	1									*	*												ł
10	-0 07397	1										*												
11	o 03269	1										-	*											l
12	-0 16172	1									**	*												ŀ
13	-0.09128										*	*												ı
14	-0 00209																							ı
15	0.00552											-												1
15	0 13552											-	*1	**										ı
17	0 00233											-												l
18	-0.09315										*	*												1
19	0 03379											1	*											1
20	0 08363												*:	*										ł
21	0 00986])												
22	-0 03840	1										*												

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Partial Autocorrelations

Lag	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9	9 1
23	0 06765	. [*	
24	-0 18740	****	

Model for variable KWH

Estimated Intercept -5435 19
Period(s) of Differencing 1,12

Autoregressive Factors

Factor 1: 1 + 0 81518 B**(12)

Input Number 1

Input Variable air1
Period(s) of Differencing 1,12
Overall Regression Factor -3711790

Obs	Forecast	Std Error	95% Confidence Limits
121 122 123 124 125 126	GONFIDENTIAL	952216 1346637 1649286 1904432 2129219 2332443	CONTIDENTIAL

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0bs	Forecast	Std Error	95% Confidence Limits
127		2519326	
128		2693273	
129		2856648	
130		3011171	
131		3158143	
132		3298573	
133		3486178	
134		3564190	
135		3833946	
136		3996498	
137		4152691	
138		4303220	
139	CONFIDENTIAL	4448657	CONFIDENTIAL
140		4589488	,
141		4726125	
142		4858921	
143		4988182	
144		5114178	
145		5468695	
146		5801589	
147		6116392	
148		6415767	
149		6701781	
150		6976079	
151		7239993	



Conditional Least Squares Estimation

Parameter	Estimate	Standard Error	t Value	Approx Pr > [t]	Lag
MU	-174202.5	170496.3	-1 02	0 3092	0
AR1,1	0 44559	0 08870	5 02	< 0001	1
AR2,1	-0 54706	0 08798	-6 22	< 0001	12
	Constant	t Estimate	-149415		
		e Estimate	2.237E12		
	Std Erro	or Estimate	1495586		
	AIC		3443 091		
	SBC		3451 193		

SBC 3451 193
Number of Residuals 110
* AIC and SBC do not include log determinant

Correlations of Parameter Estimates

Parameter		MU	AF	71 1	AF	12 1
MU	1	000	-0	019	0	013
AR1,1	-0	019	1	000	- 0	214
AB2.1	0	013	-0	214	1	000

0 106853

0 106868



The ARIMA Procedure

Autocorrelation Check of Residuals

To	Chi-		Pr >						
Lag	Square	DF	ChiSq			Autocorr	elations		
8	- 4								
6	4 55	4	0 3367	-0.025	0 002	0 078	0 015	0 113	0 138
12	13 90	10	0 1778	0 071	-0 043	0 062	0 118	0 185	-0 128
18	15 67	16	0 4752	0 100	-0 025	-0 002	0 044	-0 027	-0 024
24	24 35	22	0 3293	0 013	0 088	-0 072	0 096	-0 109	-0 165
			Auto	correlation	Plot of F	Residuals			
Lag	Covariance	Corre	e l ation	-1987	6 5 4 3 2	1 0 1 2 3	4 5 6 7 8 9	9 1	Std Error
ŭ									
0	2.23678E12		00000	1		******	*********	***	0
1	-5,6333E10		- 02518	l		*			0 095346
2	4561639200	(00204	ŧ		1			0 095407
3	1.73877E11	(07774	E		**		i	0 095407
4	3.38518E10		01513	[1		ı	0 095981
5	2.5327E11	(11323	1		**		ı	0 096003
5	3 08346E11	(13785	l		***		ı	0.097209
7	1.59055E11	(07111	I		1*		1	0 098971
8	-9.5433E10		- 04267	i		*		- 1	0 099434
9	1 37917E11		06166	i		*			0 099600
10	2 63616E11		11786	i		** .		- 1	0.099947
11	4 15766E11	(18588	i		****			0 101202
12	-2.854E11		12759	i	. 1	***		1	0 104260
13	2 23319E11		09984	i		**		1	0 105670
14	5.532E10		02473	i		Ì		1	0 106524
15	-3.79604E9		- 00170	i		İ		1	0 106576
16	9.83983E10		0.04399	i		j*		1	D 106576
17	-6.1326E10		- 02742	i		*		i	0 106741
18	-5.317E10		- 02377	i		i		j	0 106805
, 0	0.017670			1		i		i	0.106853

0.01308 0.08835

2 92614E10

1 97612E11



Autocorrelation Plot of Residuals

Lag	Covariance	Correlation	~1 9	8 7 6 5 4 3 2 1 0 1 2 3 4 5	67891	Std Error
21	-1.6077E11	- 07188	1	*1	1	0 107530
22	2.14693E11	0 09598	İ	**		0 107966
23	-2 4289E11	- 10859	1	**		0 108738
24	-3 6957E11	- 16522	1	***		0 109720

" marks two standard errors

Inverse Autocorrelations

Lag	Correl	ation	- 1	9	8	7	6	5	4	3	2	1	0	1	2	3	4	5	6	7	8	9	1
1	0	02512	1										1	ŧ									ŀ
2	O	00299	1										ļ										ŀ
3	-0	04241	1									,	* [Į.
4	0	03879	ĺ										1	۲									1
5	-0	09834	1									* 1	*										t
6	~ O	13042	1								,	* * 1	*[ŀ
7	- O	05210										,	*										-
В	0	07467											1	t									
9	- O	88800	1										ŀ										
10	- O	13284									:	***	* [-
11	-0	15528										**:	۲,										
12	O	16588	+										1	* * *	*								Ì
13	-0	11171										*	k										ŀ
14	-0	00924																					ļ
15	0	01488	1										ŀ										
16	0	06888											1	t									į
17	0	02336	1										ĺ										1
1 B	O	05457										,	۱,										ĺ
19	O	05021										,	*										[
20	- 0	04298										,	*										f

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The ARIMA Procedure

Inverse Autocorrelations

Lag	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 6	9 1
21	0 03786	. [*	- 1
22	-0 07177	. *	
23	0 06856	[" ·	
24	0 17738	****	

Partial Autocorrelations

Lag	Correlation	198765432101234	567891
1	-0 02518	*	1
2	0 00141	l i	
3	0 07787	**	1
4	0 01918	1	1
5	0 11451	×*	ŀ
6	0 14082	***	ı
7	0 08206	**	
8	0 05369	*	1
9	0 03544	1.	l
10	0 09743	** ·	ı
11	0 18002	****	1
12	-0 16037	***	1
13	0 07094	*	ļ
14	- 0 05 367	*	
15	0 01174		l
16	-0 05619	*	ļ
17	-0 05400	*	1
18	-0 02785	*	1
19	0 02725	1*	Į.
20	0 05112	*	
21	0 07908	**	
22	0 09858	**	



Partial Autocorrelations

Lag	Correlation	-1	9	8	7	6	5	4	3	2	1	0	1	2	3	4	5	6	7	8	9	1	
23	-0 07324	1								,		*											
24	-0 21448	- 1								*	* *	*											

Model for variable KWH

Estimated Mean -174202 Period(s) of Differencing 12

Autoregressive Factors

Factor 1: 1 - 0 44559 B**(1) Factor 2: 1 + 0 54706 B**(12)

WARNING: There are gaps in the interval for observation 3 according to ID variable TIME

0bs	Forecast	Std Error	95% Confidence Limits
123 124 125 126 127 128 129 130 131	CONFIDENTIAL	1495586 1637344 1664054 1669306 1670347 1670554 1670603 1670604 1670605	CONFIDENTIAL

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0bs	Forecast	Std Error	95% Confidence Limits
133 134 135 136 137 138 139 140 141 142 143	For ecast CONFIDENTIAL	Std Error 1670505 1670505 1802753 1827855 1832798 1833778 1833973 1834011 1834019 1834021 1834021 1834021	95% Confidence Limits CONFIDENTIAL
145 146 147		1834021 1834021 2151594	

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The ARIMA Procedure

Conditional Least Squares Estimation

		Standard		Approx			
Parameter	Estimate	Error	t Value	Pr > t	Lag	Variable	Shift
MU	-6948.4	9593.1	-0.72	0 4704	0	кин	0
MA1,1	0 62803	0 07457	8.42	< 0001	1	KWH	0
MA2 1	0.57442	0.08143	7 05	< 0001	12	KWH	0
NUM1	2198118 4	449871 8	4 89	< 0001	0	sid1	0

Constant Estimate -6948.44
Variance Estimate 3.135E11
Std Error Estimate 559939.3
AIC 3345 159
SBC 3356 104
Number of Residuals 114

Correlations of Parameter Estimates

Variable Parameter			KWIH Mu	KWH MA1,1	KWH MA2 1	sid1 NUM1
KWH	MU	1	000	-0 026	-0 049	0 001
KWH	MA1,1	- O	026	1 000	-0 059	0 001
KWH	MA2,1	- O	049	-0 059	1 000	-0 087
eid1	NUM	0	001	0 001	-D 087	1 000

^{*} AIC and SBC do not include log determinant

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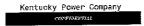
The ARIMA Procedure

Autocorrelation Check of Residuals

To Lag	Chi- Square	DF	Pr > ChiSq			Autocorr	elations		
6	2 48	4	0.6487	0 043	-0 064	0 028	-0 079	0 041	0 076
12	15 16	10	0.1264	-0 177	0 100	-0 089	-0.030	0 223	0 024
18	18 59	16	0.2906	-0 124	0 006	~0 096	0.031	0 009	-0 013
24	22 78	22	0.4142	0 004	0 088	-0 083	-0 006	-0 111	0 047

Autocorrelation Plot of Residuals

Lag	Covariance	Correlation	-1 9 8 7 6	543210	1234567891	Std Error
0	3 13532E11	1 00000	1		*****	1 0
1	1.35275E10	0 04315	i	ĺ	*	0 093659
2	-2.0148E10	~ 06426	i	*		0 093833
3	8707961783	0 02777	i		N.	0 094218
4	-2 4892E10	- 07939	i	**		0.094290
5	1.2939E10	0 04127	i	i	*	0.094874
6	2.39712E10	0 07646	i	. j	**	0 095032
7	-5.5499E10	~ 17701	İ	****		0.095570
8	3.12369E10	0 09963	İ	ı	**	0 098404
9	-2 7783E10	- 08861	Í	**		0.099285
10	-9.30979E9	- 02969	i	*		0.099976
11	6 99801E10	0 22320	i	ĺ	****	0.100053
12	7468604536	0 02382	ĺ	ĺ		0 104330
13	-3.8932E10	- 12417	Í	**		0.104377
14	1802401299	0 00575	İ	I		0.105665
15	-3.0229E10	- 09641	i	**		0.105668
16	9765246572	0 03115		I	*	0 106437
17	2683723914	0 00856	İ	1		0 106517
18	-4.04342E9	- 01290		I		0 106523
19	1326826144	0 00423		I		0 106536
20	2 77204E10	0 08841		I	**	0.106538



Autocorrelation Plot of Residuals

Lag	Covariance	Correlation	-1 9	87654321012345	57891	\$td Error
21	-2 6019E10	- 08299	1	**	1	0 107179
22	-1 91321E9	- 00610	j	ŀ	1	0 107742
23	-3.4772E10	- 11090		**	l	0 107745
24	-1 4595E10	- 04655		* [0 108741

" ' marks two standard errors

Inverse Autocorrelations

Lag	Correlation	1	9	8	7	6	5	4	3	2	1	0	1	2	3	4	5	6	7	8	9	1	
1	-0 13110	1								,	**	*										-1	
2	0 05895	i										1	*										
3	-0 03516	Ĺ										*											
4	-0.00272	Ĺ										1											
5	-0.02575	Ĺ										*											
6	-0 04562	- 1										*											
7	0 17452	- 1										1	: *	*									
8	-0 10225	- 1									*	*											
9	0 12566	-1										1	* *	*								l	
10	0 02800	- 1											*									ł	
11	-0 22070	1								*	* *	*										ı	
12	-0 01004	1																				1	
13	0 04925	1											*									ı	
14	0 05643	1											*									1	
15	0 02807	1											*									- 1	
16	0 01793	1																				- 1	
17	0 03069	1										- 1	*									ļ	
18	-0 08116	- [*	*										- 1	
19	0 06391	- 1										- 1	×									ı	
20	-0 10411	1									*	*										į	

Kentucky Power Company

The ARIMA Procedure

Inverse Autocorrelations

Lag	Correlati o n	-1 9 8 7 6 5 4 3 2 1 0 1 2	3 4 5 6 7 8 9 1
21	0 06556	. *	
22	0.03894	*	
23	0 10757	**	
24	-0 00191	1	

Partial Autocorrelations

Lag	Correlation	-1	9 :	3	7	б	5	4	3	2		1	0	1	2	3	4	5	6	7	8	9	1	
1	0 04315	ı											ļ	*										l
2	-0 06625	1										ý	1											ŀ
3	0 03380	1											1	*										ĺ
4	-0 08719	1										* *	١,											ì
5	0 05440	1											1	*										ĺ
6	0 05990	1								,			1	*										ı
7	0 17568	1								Ħ	*	* *	١,											ı
8	0 12570	1												* *	*									ı
9	-0 13361	1									*	* *	۱ ا											ı
10	0 02630	1											1	*										ı
11	0 18337	1												* *	* *									ı
12	0 01466	1																						ı
13	0 10265	1										* *	۱ ا											ļ
14	-0 02514	1										,	١,											1
15	-0 03361	1										,	۱ ا											ı
16	-0 01433	1																						ı
17	-0 02377	1																						1
18	0 06466]												*										!
19	-0 03743											7	-											ļ
20	0 11070												- 1	* *										I
21	-0 07518											* *	۱,											l
22	-0 07289											,	۱,											l

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The ARIMA Procedure

Partial Autocorrelations

Lag	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8	391
23	-0 12800	***	
24	0 00228		

Model for variable KWH

Estimated Intercept -6948 44
Period(s) of Differencing 1,12

Moving Average Factors

Factor 1: 1 - 0 62803 B**(1) Factor 2: 1 - 0 57442 B**(12)

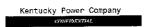
Input Number 1

Input Variable sid1
Period(s) of Differencing 1,12
Overall Regression Factor 2198118

WARNING: There are gaps in the interval for observation 3 according to ID variable TIME

WARNING: There are gaps in the interval for observation 6 according to ID variable TIME

WARNING: There are gaps in the interval for observation 8 according to ID variable TIME



The ARIMA Procedure

Obs	Forecast	Std Error	95% Confidence Limits
128		559939	
129		597421	
130		632686	
131		666087	
132		697891	
133		728307	
134		757503	
135		785615	•
136		812755	•
137		839018	
138		864483	
139		889219	
140	CONFIDENTIAL	995060	CONFIDENTIAL
141		1038414	
142		1080030	
143		1120100	
144		1158786	
145		1196222	
146		1232520	
147		1267780	
148		1302086	
149		1335510	
150		1368118	
151		1399967	
152		1498789	

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The ARIMA Procedure

Conditional Least Squares Estimation

Parameter	Estimate	Standard Error t V	alue	Approx Pr > t	Lag	Variable	Shift
MU NUM1	-154344 3 2551500 0		1 48 4 44	0 1436 < 0001	0	KWH wey1	0
	* ΔΙ	Constant Estima Variance Estima Std Error Estim AIC SBC Number of Resid	te ate uals	-154344 6.614E11 813281.8 1835 355 1839 576 61 log determinar	ŧŧ		

Correlations of Parameter Estimates

Variable Parameter			KWH MU	wey 1 NUM1
KWH	MU	1	000	0 000
wov1	NII BJ 1	Ω	000	1 000



Autocorrelation Check of Residuals

To Lag	Chi- Square	DF	Pr > ChiSq			Autocorr	elations		
6	68 11	6	< 0001	0 657	0 504	0 476	0.273	0 196	0 135
12	104 20	12	< 0001	-0 003	-0 106	-0 259	-0.251	-0 327	-0 471
18	127 45	18	< 0001	-0 308	~0 258	-0 283	-0 125	-0 095	-0 125
24	130 09	24	< 0001	0 014	0 068	0 113	0.093	0 026	0 020

Autocorrelation Plot of Residuals

Lag	Covariance	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 6	3 9 1 Std Error
o	6 61427E11	1 00000	********	*****
1	4 34586E11	0 65704	*******	0 128037
5	3 33071E11	0 50356	*****	0 174779
3	3 14657E11	0 47572	*****	0 197134
4	1.80344E11	0 27266	****	0 215132
5	1 29956E11	0 19549	****	0 220724
6	8.96091E10	0 13548	***	0 223574
7	-1 92112E9	- 00290		0 224915
8	-6 9849E10	- 10560	**	0 224916
9	-1.7138E11	- 25911	****	0 225727
10	-1.658E11	- 25067	****	0 230552
11	-2 1607E11	- 32667	. *****	0 234977
12	-3 1139E11	- 47079	******	0 242308
13	-2 0374E11	- 30803	*****	0 256866
14	1 7095E11	- 25846	****	0 252851
15	-1 8692E11	- 28260	*****	0 266985
16	-8 2882E10	- 12531	***	0 271845
17	-6 2854E10	- 09503	**	0 272790
18	-8.2505E1D	- 12474	**	0 273332
19	8986506013	0 01359	1	0 274264
20	4 49304E10	0 06793	*	0 274275



Autocorrelation Plot of Residuals

Lag	Covariance	Correlation	-1987	6 5 4 3 2 1 0 1 2 3 4 5 6	7891	Std Error
21	7 47716E10	0 11305	I	и*	. 1	0 274550
22	6 17818E10	0 09341	j	**	I	0 275312
23	1 70665E10	0 02580	İ	*	1	0 275831
24	1 30621E10	0 01975	i	1	1	0 275871

" ' marks two standard errors

Inverse Autocorrelations

Lag	Correlation	- 1	9	8	7	5	5	4	3	2	1	0	1	2	3	4	5	6	7	8	9	1	
1	-0 39194	ı						*	**	* *	* *	*										ŀ	
2	0 00833	1										-										- 1	
3	-0.08070	1									*	*										- 1	
4	0 05203	1										1	•									1	
5	-0 00545																					- 1	
6	-0 07915	Ī									*	*											
7	0 04317											1	•										
8	-0 09617										*	*											
9	0 16411											1	**:	*									
10	-0 19174	1								*	**	*										- 1	
11	0 00728	1										1										1	
12	0 27749	1										1	* * :	* * :	* *							- 1	
13	-0 12050	1									*	*										- 1	
14	0 02178	1										į											
15	0 01059	1										1										l	
16	0 02841	1										1	t										
17	-0 10733	j									*	*										- 1	
18	0.12873	1										1	*	*								- 1	
19	-O 05744	1										*										f	
20	0 00593											1											



Inverse Autocorrelations

Lag	Correlation	-1 9	8 7	6	5	4 :	3 2	1	0	1	2	3	4	5	6	7	8	9	1
21	-0 03284	1							*										1
55	-0 07714	1						*	*										E
23	0 05674	-1							- 13	*									[
24	0 06163								-13	ŕ									-

Partial Autocorrelations

Lag	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 1	
1	0 65704	*********	!
2	0 12645	×**	1
3	0 18529	***	1
4	-0 22427	***	
5	0.02969	*	1
6	-0 05980	*	
7	-0 10290	**	
8	-0 14305	. ***	1
9	-0 24571	****	1
10	0 12454	**	1
11	-0 18424	***	1
12	-0 20402	****	
13	0 24211	****	
14	0 05223	26	1
15	-0 00920	1	1
16	0 04902	28	1
17	-0 00770		ļ
18	-0 11806	**	1
19	0 11222	**	1
20	-0 04199	*	1
21	-0 02769	*	1
22	-0 09754	**	1



Partial Autocorrelations

Lag	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6	7891
23	-0 22154	****	i
24	-0 10665	**	1

Model for variable KWH

Estimated	Intercept	-154344
Period(s)	of Differencing	12

Input Number 1

Input Variable	wey1
Period(s) of Differencing	12
Overall Regression Factor	2551500

0bs	Forecast	Std Error	95% Confidence Limits
74		813282	
75		813282	
76		813282	
77		813282	
78		813282	
79	CONFIDENTIAL	813282	CONFIDENTIAL
80		813282	
81		B13282	
82		813282	
83		813282	
84		813282	

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The ARIMA Procedure

0bs	Forecast	Std Error	95% Confidence Limits
85		813282	
86		1150154	
87		1150154	
88		1150154	
89		1150154	
90		1150154	
91	CONFIDENTIAL	1150154	CONFIDENTIAL
92	CONFIDENTIAL	1150154	CONFIDENTIAL
93		1150154	
94		1150154	
95	*	1150154	
96	:	1150154	
97		1150154	
98		1408645	

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The ARIMA Procedure

Conditional Least Squares Estimation

Parameter:	Estimate	Standard Error	t Value	Approx Pr > t	Lag	Variable	Shift
MU	286171.7	192274.7	1 49	0 1409	0	KWH	O
AR1.1	0.56579	0.09822	5 76	< 0001	1	KWH	0
NUM1	1064543 6	456779 9	2 33	0 0225	0	sid2	0

 Constant Estimate
 124258.5

 Variance Estimate
 5.505E11

 Std Error Estimate
 742034.7

 AIC
 2303 098

 SBC
 2310 129

 Number of Residuals
 77

* AIC and SBC do not include log determinant

Correlations of Parameter Estimates

Variable Parameter			KWH MU	KWH AR1 ₁ 1	sid2 NUM1
KWH	MU	1	000	0 171	-0 003
KWH	AR1,1	0	171	1 000	-0 018
-: 40	AH ILAH	0	003	an ora	1 000



Autocorrelation Check of Residuals

To Lag	Chi- Square	OF	Pr > ChiSq			Autocorre	elations		
6	7.94	5	0 1595	-0 035	-0 079	0 175	0 193	-0 136	-0 041
12	18 36	11	0 0736	0 159	~0 066	0 025	0 142	0 174	-0 184
18	20 98	17	0 2272	0 075	0 101	-0 008	0 015	0 097	0 035
24	23 87	23	0 4111	0 007	0 120	0 003	-0 108	0 009	0 055

Autocorrelation Plot of Residuals

Lag	Covar Lance	Correlation	-1 9 8 7	6 5 4 3 2 1	01234567891	St	d Error
0	5.50616E11	1 00000			******	1	0
1	-1,9493E10	- 03540	i	*		0	113961
2	-4.352E10	- 07904	i	**		0	114103
3	9 5394E10	0 17507	ì		N***	0	114812
4	1 0629E11	0 19304	i		****	0	118228
5	-7 4898E10	- 13603	i	***		0	122253
6	-2.2765E10	- 04134	i	*		0	124203
7	8.76972E10	0 15927	i		***	0	124382
8	-3.6567E10	- 06641	i	*		0	127003
9	1 40012E10	0.02543	i		*	0	127453
10	7 80896E10	0 14182	Ì		***	0	127519
11	9.56435E10	0 17370	j		***	0	129551
12	-1.0118E11	- 18376	ì	***		0	132541
13	4.11587E10	0 07475	ì		*	0	135809
14	5.5457E10	0.10072	i		**	0	136343
15	4.17442E9	00758	ì]	0	137306
16	8092218382	0 01470	i			0	13731 1
17	5.35334E10	0 09722	i		**	0	137331
18	1.91986E10	0.03487	ĺ		*	0	138222
19	4051714994	0 00736	1		· 1	0	138337
20	6 61164E10	0 12008	1		**	0	138342



Autocorrelation Plot of Residuals

Lag	Covariance	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5	6 7 8 9 1 Std Erro	r
21	1675412450	0 00304	1	0 13965	39
22	-5.921E10	- 10753	**	0 13969	10
23	4756205827	0 00864	T I	0 14076	
24	1 20324E10	0 02185	1	0 14075	7

[&]quot; ' marks two standard errors

Inverse Autocorrelations

Lag	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 1	í
1	0 06076	1*	I
2	-0 00483]	ı
3	-0 21589	****	1
4	-0 17584	****	1
5	0 05540	W.	1
6	0 15228	***	1
7	0 05084	и	İ
8	0 03579	*	l
9	-0 13810	***	j
10	-0 08782	**	1
11	-0 17004	***	1
12	0 16171	***	1
13	-0 00240		1
14	0 00816	1	1
15	-0 05213	*1	ı
16	-0 04896	*	1
17	-0 03601	*	1
18	-0 01899		1
19	-0 04362	*	1
20	-0 03210	*	1



Inverse Autocorrelations

Lag	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 1	
21	0 00515	1	l
22	0 08654	**	l
23	-0 00613	1	1
24	0 05364	1 1*	

Partial Autocorrelations

Lag	Correlation	-1987654321012345	67891
1	-0 03540	*	I
2	-0 08039	**	
3	0 17051	***	l
4	0 20503	****	
5	-0 10090	**	
ô	-0 06157	*	
7	0 08131	1 4 4	
8	-0 06381	1 *1	t
9	0 10171	tr#	t
10	0 11995	**	l
11	0 17032	***	I
12	-0 15509	***	I
13	0 00717	ļ .	I
14	-0 01534		I
15	0 04579	j *	1
16	0 11569	**	1
17	0 05939	*	
19	-0 01583		
19	0 02840	*	1
20	0 02552	*	- 1
21	-0 02242	1	1
22	-0 10364	**	

Kentucky Power Company

The ARIMA Procedure

Partial Autocorrelations

Model for variable KWH

Estimated Intercept 286171.7
Period(s) of Differencing 12

Autoregressive Factors

Factor 1: 1 - 0 56579 B**(1)

Input Number 1

Input Variable sid2
Period(s) of Differencing 12
Overall Regression Factor 1064544

WARNING: Observation 96 is out of order according to the ID variable TIME



Obs	Forecast	Std Error	95% Confidence Limits
90		742035	
91		852571	
92		885044	
93		895190	
94		898414	
95		899443	
96		899773	
97		899878	
98		B99912	
99		899923	
100		899926	
101		899927	
102	CONFIDENTIAL	1166906	CONFIDENTIAL
103		1240287	
104		1262877	,
105		1270024	
106		1272303	
107		1273032	
108		1273265	
109		1273340	
110		1273363	
111		1273371	
112		1273374	1
113	N.	1273374	The second second
114		1474205	1. 14.4.

The ARIMA Procedure

Conditional Least Squares Estimation

Parameter	Estimate	Standard Error	t Value	Approx Pr > t	Lag
MU	49375.8	165688.7	0 30	0 7662	O
AR1,1	-0 34574	0 08530	-4 05	< 0001	1

Number of Residuals 123
* AIC and SBC do not include log determinant

Correlations of Parameter Estimates

Parameter	MU	AR1,1
MU	1 000	-0 002
AR1.1	-0 002	1 000

The ARIMA Procedure

Autocorrelation Check of Residuals

To Lag	Chi- Square	DF	Pr > ChiSq	*******		Autocorr	elations		
õ	7 40	5	0 1925	-0.057	-0 201	-0 103	-0 009	-0 058	0 023
12	8 50	11	0 6682	-0 005	0 007	-0 055	-0 001	0 013	0 069
18	10 29	17	0 8909	-0 007	-0 040	0 029	-0 024	-0 084	0 048
24	10 73	23	0 9858	0 022	0 012	0 007	-0 008	0 033	-0 032

Autocorrelation Plot of Residuals

Lag	Covariance	Correlation	-1 9	876543210	01234567891	Std Error
0	6.09269E12	1 00000	ı		******	0
1	3 4433E11	- 05652	i	, *		0 090167
2	-1 2234E12	- 20079	i	***		0 090454
3	-6 2661E11	- 10285	i	**	j l	0 094008
4	-5 2571E10	- 00863	į		į l	0 094919
5	-3.5551E11	- 05835	i	*	i 1	0 094925
6	1.37807E11	0 02262	i		j	0 095216
7	2.9821E10	- 00489	i		i I	0 095260
8	4.06265E10	0 00667	i		i I	0 095262
9	-3 3209E11	05451	i	*	i I	0 095266
10	-6.69687E9	- 00110	i		i I	0 095519
11	7 80325E10	0 01281	i		į l	0 095519
12	4.21864E11	0 06924	i		*	0 095533
13	-4.5268E10	- 00743	i		i I	0 095940
14	-2.442E11	- 04008	i	*	i I	0 095945
15	1.77677E11	0 02916	i		*	0 096081
16	-1 4739E11	- 02419	i		i I	0 096153
17	5.1166E11	- 08398	i	**	i 1	0 096202
18	2.90728E11	0 04772	i		*	0 096796
19	1 3635E11	0 02238	i		i i	0 096988
20	7 1623E10	0 01176	i		į į	0 097029



Autocorrelation Plot of Residuals

Lag	Covariance	Correlation	-198	37654321012345	6 7 8 9 1	Std Error
21	4 21072E10	0 00691	1	1	ı	0 097041
22	-4.768E10	00783	i	1	1	0 097045
23	1.99904E11	0 03281	İ	17	1	0 097050
24	-1 9575E11	- 03213	1	*	1	0 097140

[&]quot; ' marks two standard errors

Inverse Autocorrelations

Lag	Correl	ation	- 1	9	8	7	6	5	4	3	2	1	0	1	2	3	4	5	6	7	8	9	1	
1	0	23481	ı										ŀ	**	***	•							ſ	
2	0	32800	- 1										1	* * :	* * *	**	k						t	
3	0	25376	- 1										13	* * :	* * *								Į	
4	0	16941	İ										1:	* * :	۲.								ı	
5	0	19542	- 1										1	**	×								- 1	
6	0	10773	- 1										1	* *									1	
7	0	12523	- 1										1	**	•								- 1	
8	0	08993	- 1										1:	* *									- 1	
9	0	10362	- 1										- 13	* *									- 1	
10	0	05118	- 1										- 13	×									ı	
11	0	05272	ı										1	*									١	
12	0	00734	- 1										-										- 1	
13	0	03145	- 1										1:	r									١	
14	0	06037	- 1										1	•									١	
15	0	01258	- 1										-										- 1	
16	0	03660	- 1										1	*									١	
17	0	07115	- 1										-13	*									ı	
18	-0	02396	- 1										-										- 1	
19	0	01299	- 1																				ı	
20	- O	01077	J										-										- 1	

The ARIMA Procedure

Inverse Autocorrelations

Lag	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7	891
21	-0 01543	1	1
22	0 01347	1	
23	-0 03024	*	
24	0 02513	[*	

Partial Autocorrelations

19) CTGT /McGool CTGCTO											
Lag	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9	1								
1	-0 05652	. *[- 1								
2	-0 20464	***									
3	-0 13411	***									
4	-0 07352	*									
5	-0 12356	**									
6	-0 03048	*									
7	-0 06017	*									
8	-0 02745	*									
9	-0 08451	**	- 1								
10	-0 03866	*	1								
11	-0 02988	*	1								
12	0 03912	*									
13	-0 00999										
14	-0 03244	*	- 1								
15	0 03464		1								
16	-0 03543	*	ŀ								
17	-0 08366	**	1								
18	0.01734										
19	-0 02052										
20	0 00684										
21	0 01123										
22	-0 01080										

The ARIMA Procedure

Partial Autocorrelations

Model for variable KWH

Estimated Mean 49375 78 Period(s) of Differencing 1

Autoregressive Factors

Factor 1: 1 + 0 34574 B**(1)

WARNING: There are gaps in the interval for observation 5 according to ID variable TIME

WARNING: Observation 131 is out of order according to the ID variable TIME

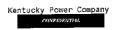
Obs	Forecast	Std Error	95% Confidence Limits
125		2468338	
126		2949691	·
127		3514076	
128		3951898	
129	CONFIDENTIAL	4360624	CONFIDENTIAL
130		4729459	
131		5073064	
132	:	5394333	
133		5697677	

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The ARIMA Procedure

Obs	Forecast	Std Error	95% Confidence Limits	
134		5985614		
135		6260340		
136		6523501		
137		6776451		
138		7020293		
139		7255945		
140		7484180		
141		7705659	·	
142	CONFIDENTIAL	7920947	CONFIDENTIAL	
143		8130536		
144		8334857		
145		8534287	the second second	
146		8729163		
147	1 1	8919782		
148		9105411		
149		9289292		



Conditional Least Squares Estimation

Parameter	Estimate	Standard Error t Value	Approx Pr > t	Lag	Variab l e	Shift
MU	994077 6	234779 8 4 23	< 0001	o	KWH	0
NUM1	8124589 0	269211 1 30 18	< 0001	0	kes1	0
		Constant Estimate	994077.6			
		Variance Estimate	9.371E11			
		Std Error Estimate	968021.8			
		AIC	2160 648			
		SBC	2165 173			
		Number of Residuals	71			
	* A1C	and SBC do not includ	le log determinan	t		
		Correlations of Parame	eter ESTIMATES			

Variable			KWH	kes1
Parameter	•		MU	NUM1
KWH	MU	1	000	-0 872
kes1	NUMI	- 0	872	1 000



Autocorrelation Check of Residuals

To Lag	Chi- Square	DF	Pr > ChiSq			Autocorr	elations	w	
6	8 24	6	0 2207	0 188	0 126	0 182	0 106	-0 067	0 092
12	11 48	12	0 4880	~0 107	0 084	0 042	-0 004	-0 097	0 094
18	12 21	18	0 8360	-0 036	0 034	-0 043	0 043	0 041	0 004
24	14 82	24	0 9258	0 057	-0 0 36	-0 044	-0 044	-0 108	-0 066

Autocorrelation Plot of Residuals

Lag	Covariance	Correlation	-19876	5 4 3 2 1 0 1 2 3	4567891	Std Error
0	9 37066E11	1 00000	1	*****	******	0
1	1 76275E11	0 18811	i	***		0 118678
2	1 18466E11	0 12642	ĺ	***	1	0 122806
3	1 70823E11	0 18230	i	****	1	0 124626
4	9.93145E10	0 10598	i	**	1	0 128325
5	-6.2657E10	- 06687	i	10"		0 129553
6	8.59507E10	0 09172	i	**		0 130038
7	-1.0036E11	- 10711	i	**	j	0 130946
8	7 83252E10	0 08359	1	**	j	0 132175
9	3.89757E10	0 04159	i	*	Ĭ	0 132917
	-3.45439E9	- 00369		i	i	0 133100
10		09657	l I	**	i	0 133102
11	-9.0493E10		J I	 **	į.	0 134085
12	8.85336E10	0 09448		*1	,	0 135019
13	3 3304E10	~ 03554		*1	ì	0 135151
14	-3 1639E10	- 03376		*1		0 135270
15	-4.0388E10	~ 04310	ļ	* *	l l	0 135453
16	4 04691E10	0 04319			Į,	0 135657
17	3.86494E10	0 04125		*		
18	4129426402	0 00441	l		ļ	0 135833
19	5.38302E10	0 05745	1	*	ļ	0 135835
20	-3 4058E10	03635		*		0 136177

The ARIMA Procedure

Autocorrelation Plot of Residuals

Lag	Covariance	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5	6 7 8 9 1 Std Error
21	-4 1259E10	- 04403	38	0 136314
22	-4 1362E10	- 04414	*	0 136514
23	-1 0118E11	- 10798	**	0 136715
24	-6 1837E10	- 06599	<u> </u>	0 137910

[&]quot; " marks two standard errors

Inverse Autocorrelations

Lag	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 1	
1	-0 28378	*****	
2	0 08288	**	
3	-0 19525	****	
4	-0 03357	*	
5	0 11940	x*	
6	-0 11792	**	
7	0 19749	0***	
8	-0 19183	***	l
9	0 08477	**	
10	-0 09447	**	
11	0 18064	***	
12	-0 17010	***	
13	0 07354	*	
14	-0 01285		ļ.
15	0 03234	*	ĺ
16	0 05045	*	1
17	-0 12440	**	
18	0 09949	**	
19	-0 15522	. ***	
20	0 08699	**	

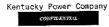


Inverse Autocorrelations

Lag	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7	891
21	-0 00511	1	1
22	0 02971	*	I
23	0 04488	*	
24	-0 01365	1	ŀ

Partial Autocorrelations

Lag	Correlation	- 1	9	8	7	6	5	4	3	2	1	0	1	2	3	4	5	6	7	8	9	1
1	0 18811	1										F	* * *	* *								- [
2	0 09437	1										1	* *									
3	0 14958	1										1	* * :	*								
4	0 04350	1										F	*									
5	-0 12969	1									* *	*										
6	0 08943											- [* *									
7	-0 15445	1									* *	* [
8	0 15523											ľ	* *	×								- 1
9	0 00977											ļ										
10	-0 01521	1										ı										- 1
11	-0 10406	1									*	*										
12	0 07550	1										1	* *									- 1
13	-0 00698	1										1										
14	-0 03968	Ţ										*										
15	-0 01632	1										-										
15	0 03313	i										- 1	*									-
17	0 08617	1										-11	* *									-
18	-0 06684	j										*										I
19	0 11352	ŀ										- 1	* *									ļ
20	-0 13935	t									* * *	*										- 1
21	-0 01514	1										-										1
22	-0.06237	1										*]



Partial Autocorrelations

Eag Correlation -1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 1
23 -0 05037 | *| | | |

Model for variable KWH

Estimated Intercept 994077 6

Input Number 1

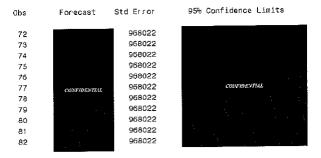
Input Variable

kes1

Overall Regression Factor

8124589

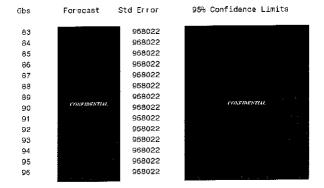
WARNING: Observation 78 is out of order according to the ID variable TIME



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The ARIMA Procedure



The ARIMA Procedure

Conditional Least Squares Estimation

Parameter -	Estimate	Standard Error	t Value	Approx Pr > t	Lag	Variable	Shift
MU	182210.6	79526.3	2 29	0.0267	0	KWH	0
MA1,1	-0.10605	0.14983	-0 71	0 4827	1	KWH	0
NUM1	-2115188 1	248148 6	-8 52	< 0001	0	hunti	0
		Constant E	stimate	182210.6			
		Variance E	stimate	2,439E11			
		Std Error	Estimate	493845.9			
		AIC		1397 578			
		SBC		1403 292			
		Number of	Residuals	48			
	* A1	C and SBC do	not include	log determinar	ıt		

Correlations of Parameter Estimates

Variable			KWH	KWH	hunt1
Parameter			MU	MA1 ₁ 1	NUM1
KWH	MU	1	000	-0 019	-0 145
KWH	MA1,1	0	019	1 000	0 003
hunt1	NUMBER	-0	145	0 003	1 000

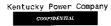


Autocorrelation Check of Residuals

To Lag	Chi- Square	DF	Pr > ChiSq	Autocorrelations	
6	14 52	5	0 0126	0 041 0 402 0 127 0 222 0 178 0 11	0
12	18 28	11	0 0753	0 055 -0 014 0 128 -0 064 0 137 -0 12	28
18	21 84	17	0 1911	-0 123	3
24	37 64	23	0 0278	-0 106 -0 066 -0 115 -0 149 -0 118 -0 3t	5

Autocorrelation Plot of Residuals

Lag	Covariance	Correlation	-1 9 8 7 6 5 4 3 2 1	01234567891	Std Error
0	2 43884811	1 00000	1	*********	0
1	1 00338E10	0 04114	Ì	[* ,	0 144338
2	9 79605E10	0 40167	Ì	******	0 144582
3	3 10465E10	0 12730	Ì	***	0 165212
4	5 41943E10	0 22221	Ì	****	0 168230
5	4 34164E10	0 17802		*****	0 174238
6	2 68132E10	0 10994	Ì	**	0 177987
7	1,33275E10	0 05465	ŀ	"	0 179396
8	-3.50942E9	- 01439	1		0 179743
9	3.11265E10	0 12763		***	0 179767
10	-1,5691E10	- 06434	*		0 181645
11	3 33962E10	0 13693		***	0 182119
12	-3.122E10	- 12801	***	1	0 184251
13	-2.9982E10	- 12293	**	1	0 186095
14	6569815926	0 02694		*	0 187779
15	-3.3886E10	- 13895	***		0 187860
16	2.39716E10	0 09829	1	**	0 189989
17	-1.5789E10	- 06474	*	1	0 191045
18	3160425154	0 01296			0 191502
19	-2 5966E10	- 10547	**		0 191520
20	-1 6162E1D	- 06627	*		0 192749



Autocorrelation Plot of Residuals

Lag	Covariance	Correlation	-1 9 8 7 6	5 4 3 2 1 0 1 2 3 4	567891	Std Error
21	-2 7989E10	- 11476		**	1	0 193223
22	3.6341E10	- 14901	i	***	1	0 194638
23	-2.889E10	- 11846	į	**	1	0 197000
24	-7 6B21E10	- 31499	1	*****	1	0 198479

marks two standard errors

Inverse Autocorrelations

Lag	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 1	
1	0 17865	***	l
2	-0 21896	****	
3	-0 20903	***	
4	-0 2 6075	****	
5	-0 10257	**	L
6	0 07954	**	
7	0 21250	****	
8	0.05911	*	
9	-0 10157	**	
10	-0 14925	***	
11	-0 15233	***	
12	0 18670	***	
13	0 22665	****	l
14	0 08225	**	
15	0 04533	*	
16	-0 13514	***	
17	-0 16426	***	
18	-0 11151	**	
19	0 02107	 	
20	0 08339	**	

The ARIMA Procedure

Inverse Autocorrelations

Lag	Correlation	- 1	9	8	7	б	5	4	3	2	1	0	1	2	3	4	5	6	7	8	9	1
21	0 05184	1										1	×									
22	0 01649											-1										1
23	0 00589	1										-										
24	0 08023	1										١	* *									- 1

Partial Autocorrelations

Lag	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9	1
1	0 04114	* .	i
2	0 40065	******	l
3	0 12041	**	1
4	0 07328	*	ı
5	0 10497	×*	ı
6	-0 00949		ı
7	-0 09238	**	- 1
8	-0 12010	**	ı
9	0 10658	**	1
10	-0 04938	*	1
11	0 08397	**	1
12	-0 08810	**	
13	-0 24850	****	
14	0 09133	**	
15	-0 02722	*	
16	0 13600	31 * #	
17	0 10481	**	
18	-0 01424		
19	-0 13271	***]
20	-0 21716	****	1
21	-0 09829	**	1
22	-0 10697	**	ı

The ARIMA Procedure

Partial Autocorrelations

Model for variable KWH

Estimated Intercept 182210.6 Period(s) of Differencing 12

Moving Average Factors

Factor 1: 1 + 0 10605 B**(1)

Input Number 1

Input Variable hunti
Period(s) of Differencing
Overall Regression Factor -2115188

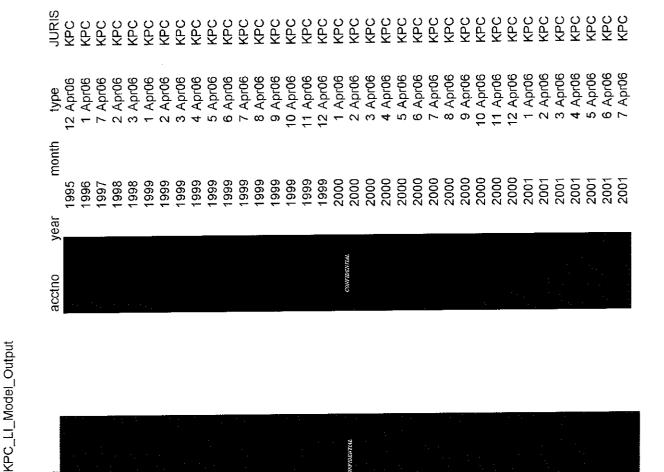
Obs	Forecast	Std Error	95% Confidence Limits
61		493846	
62		496615	
63		496615	<u> </u>
64	CONFIDENTIAL	496615	CONFIDERTIAL
65		496615	
66		496615	

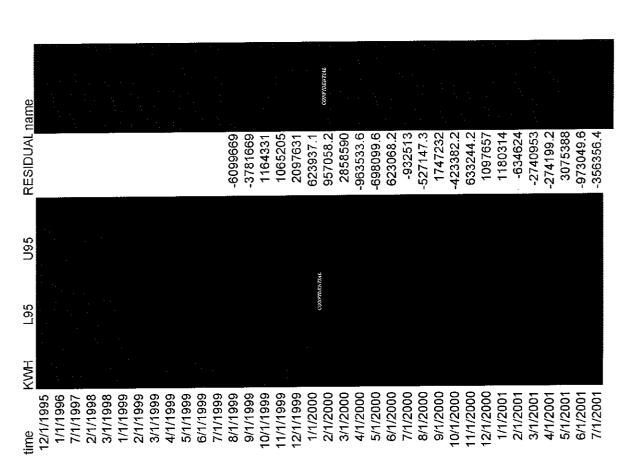
KPSC Case No. 2011-00401 Sierra Club's Initial Data Requests Dated January 13, 2012 Item No. 3, Volume C Page 163 of 204

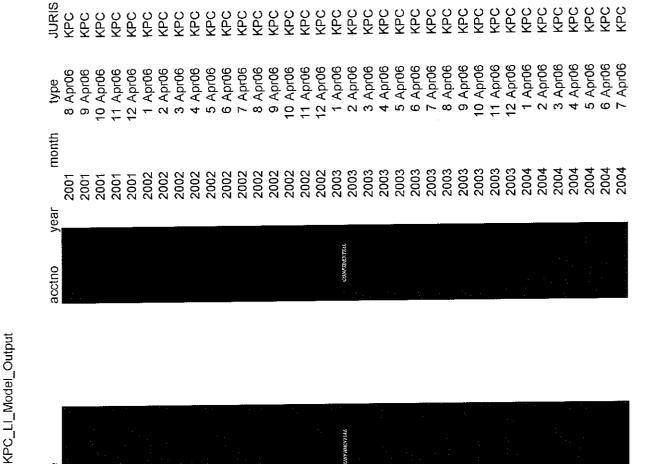


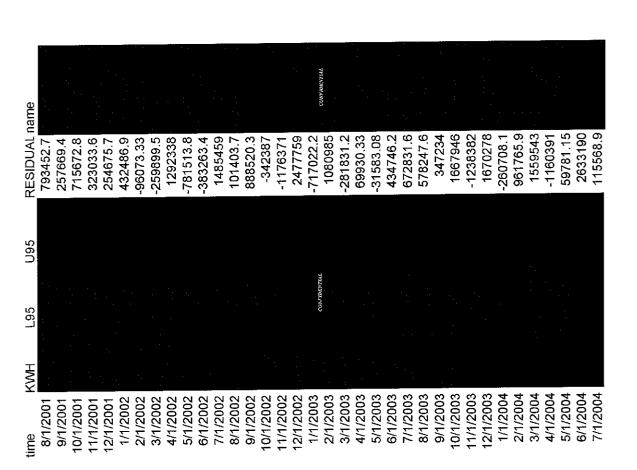
The ARIMA Procedure

0bs	Forecast	Std Error	95% Confidence Limits
67		496615	
68		496615	
69		496615	
70		496615	
71		496615	
72		496615	
73		700364	
74		702320	
75		702320	
76	CONFIDENTIAL	702320	CONFIDENTIAL
77		702320	4.1
78		702320	
79		702320	1.5
80		702320	
81		702320	10 mg
82		702320	*,
83		702320	
84		702320	and the second second
85		858567	

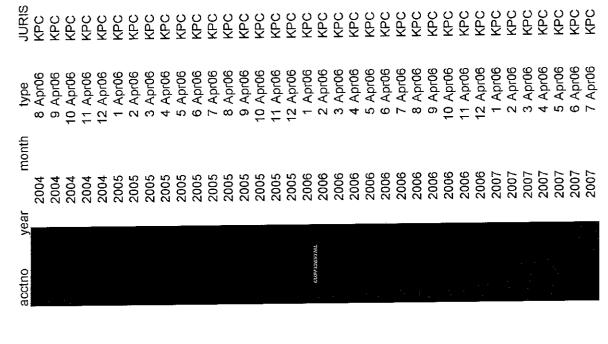


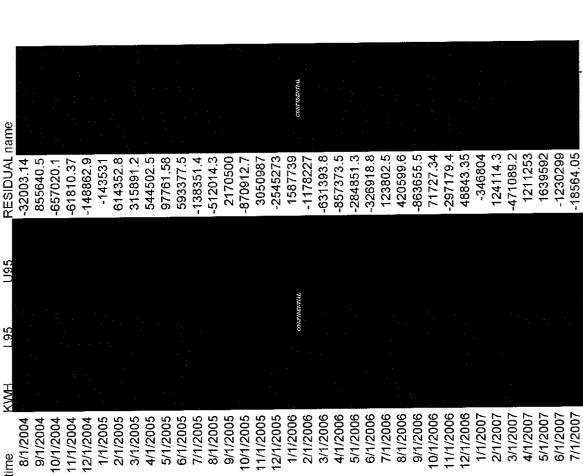




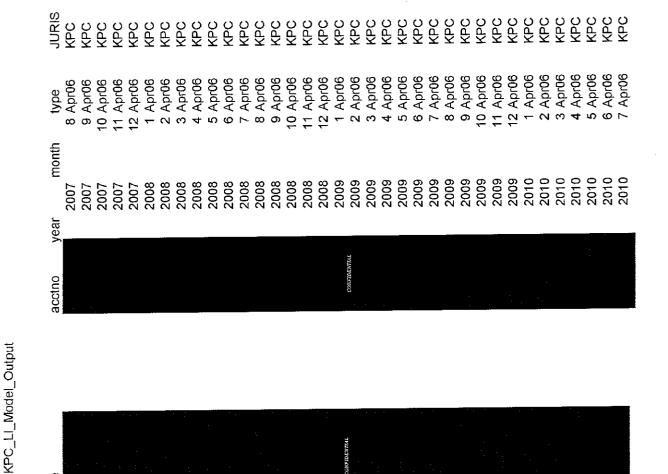


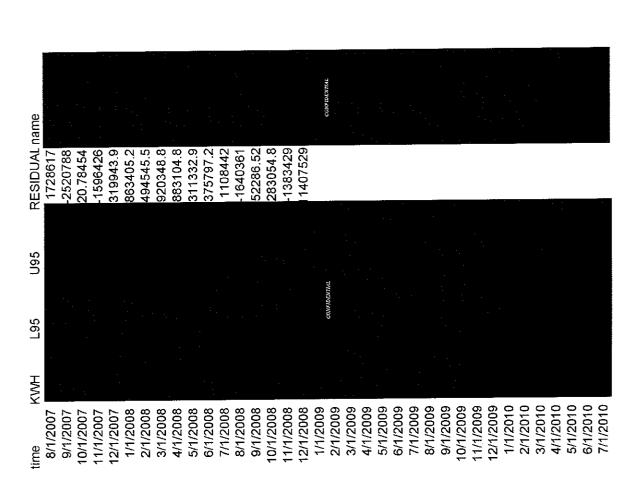
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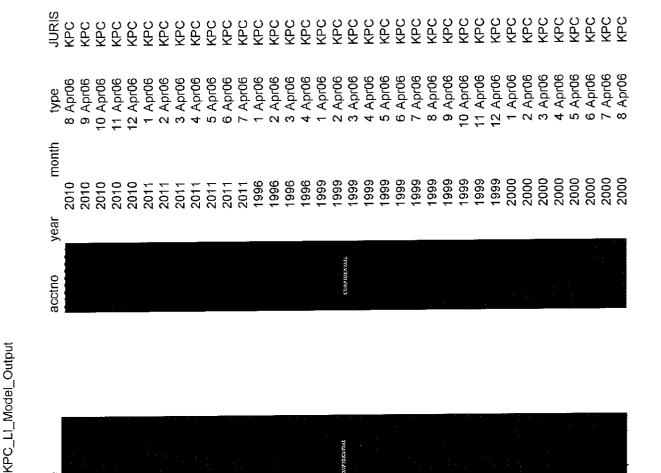


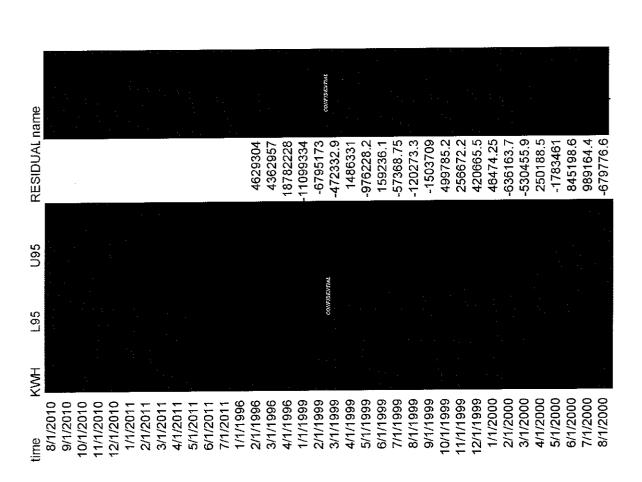


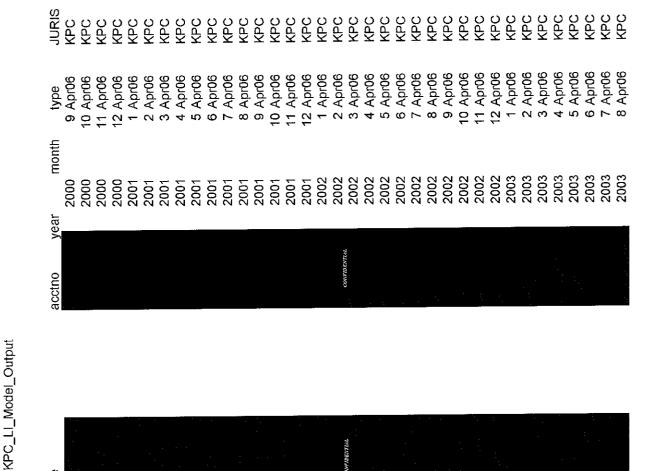
KPC_LI_Model_Output

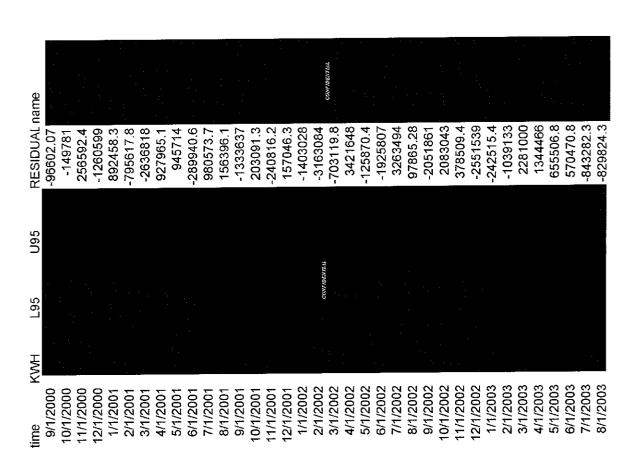


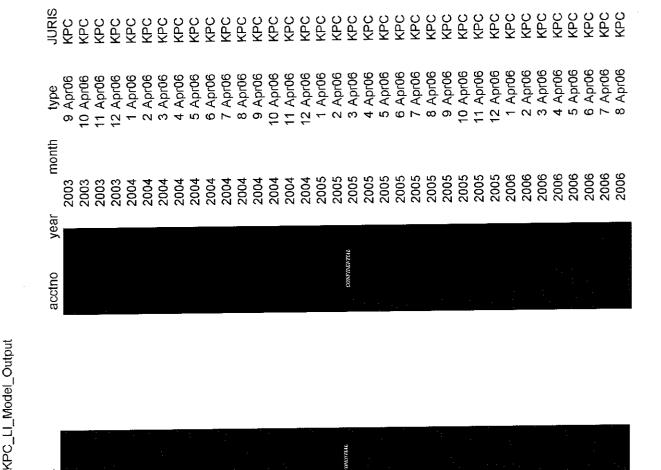


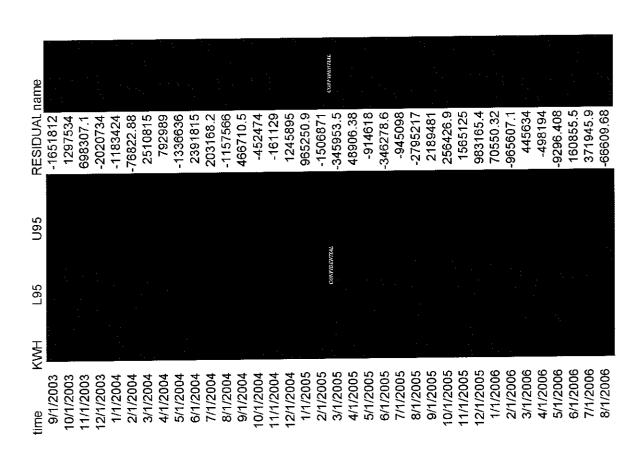


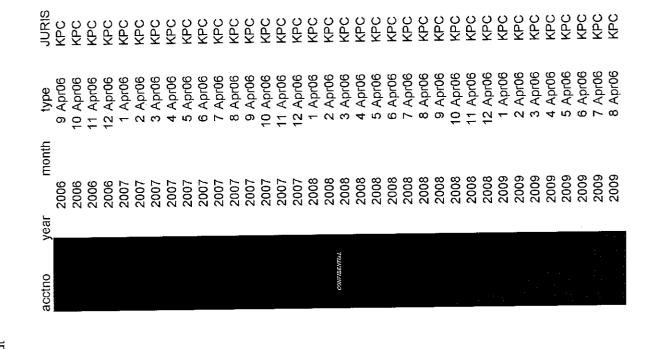


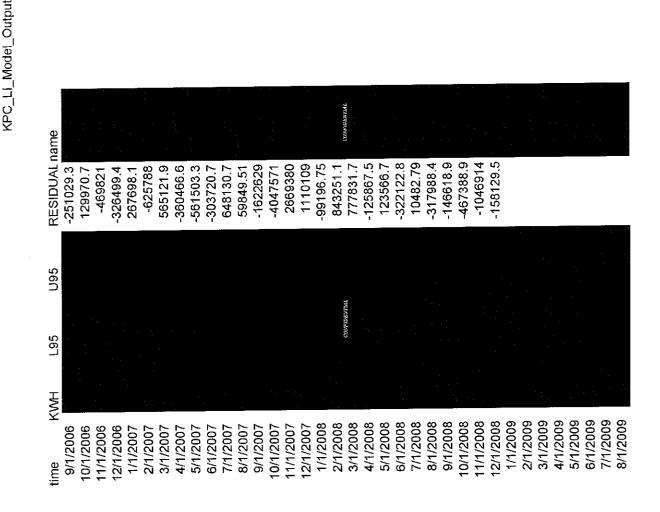


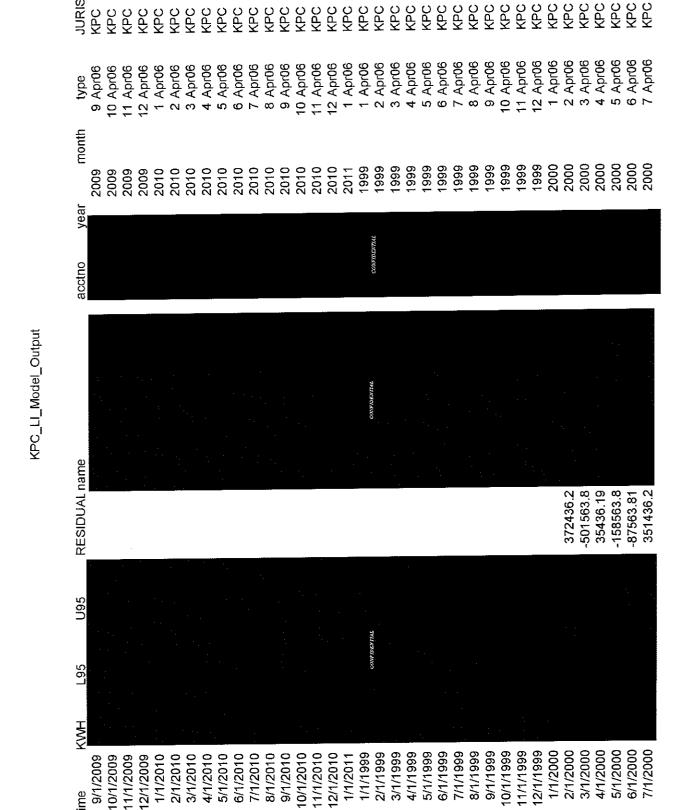


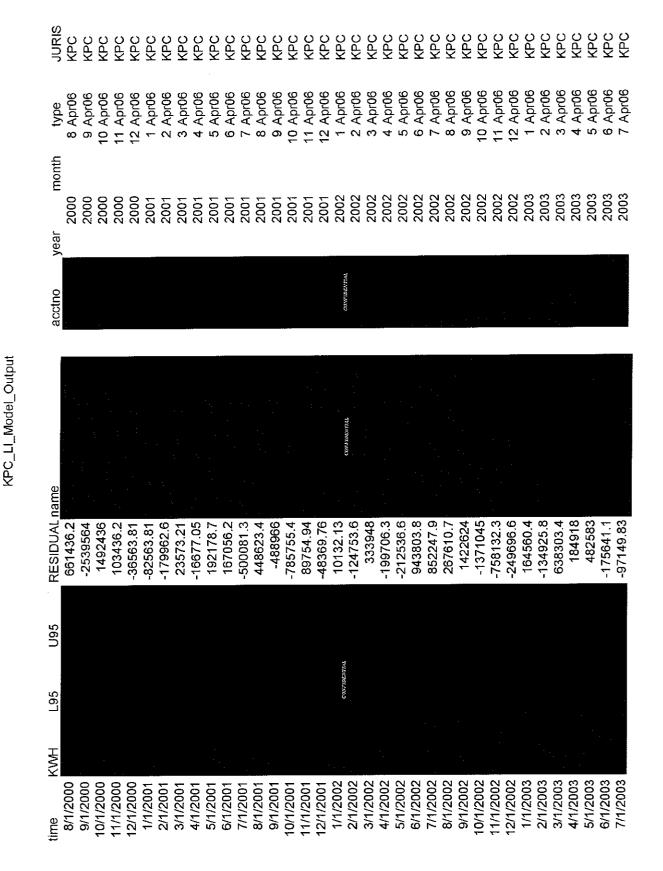


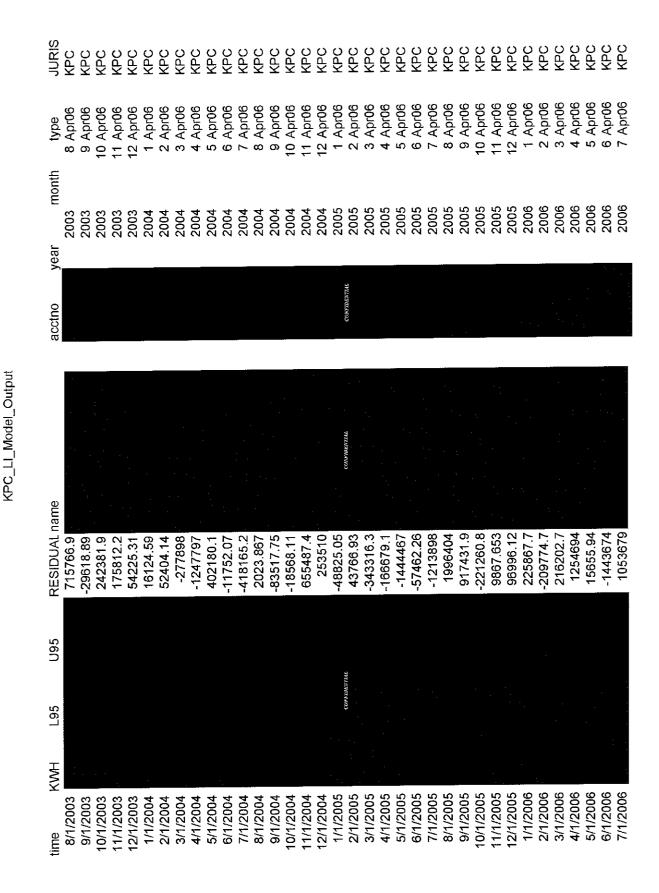


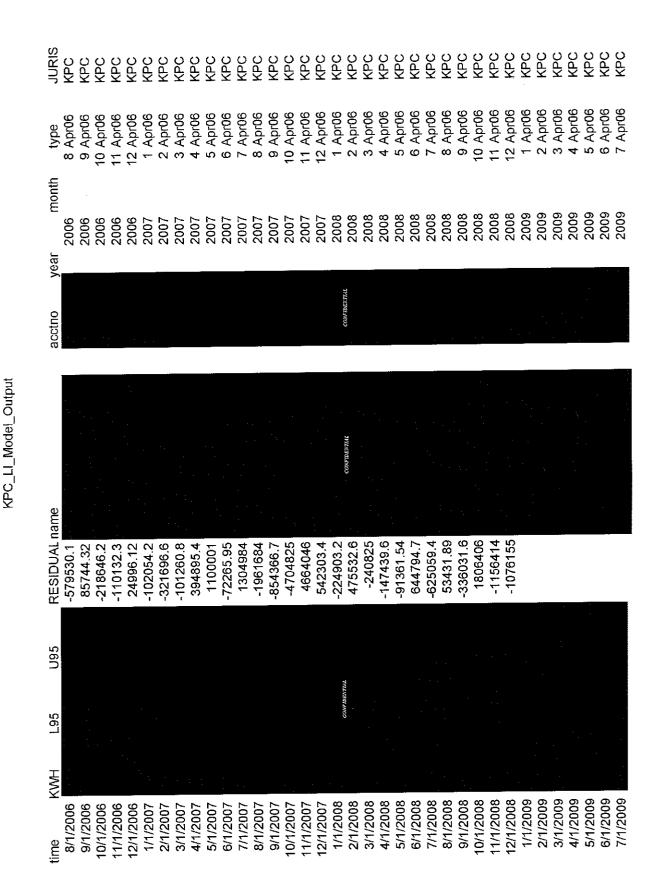


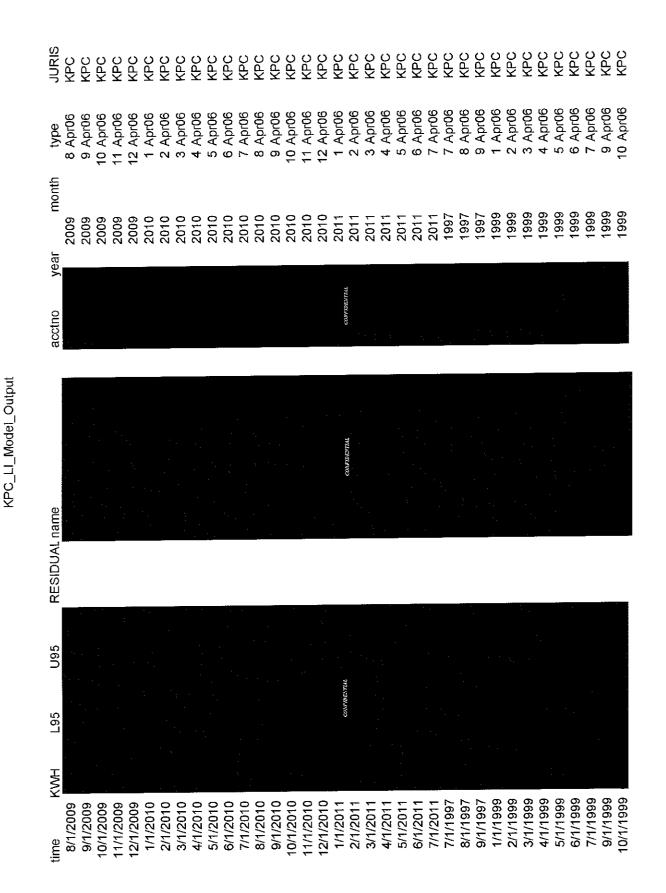


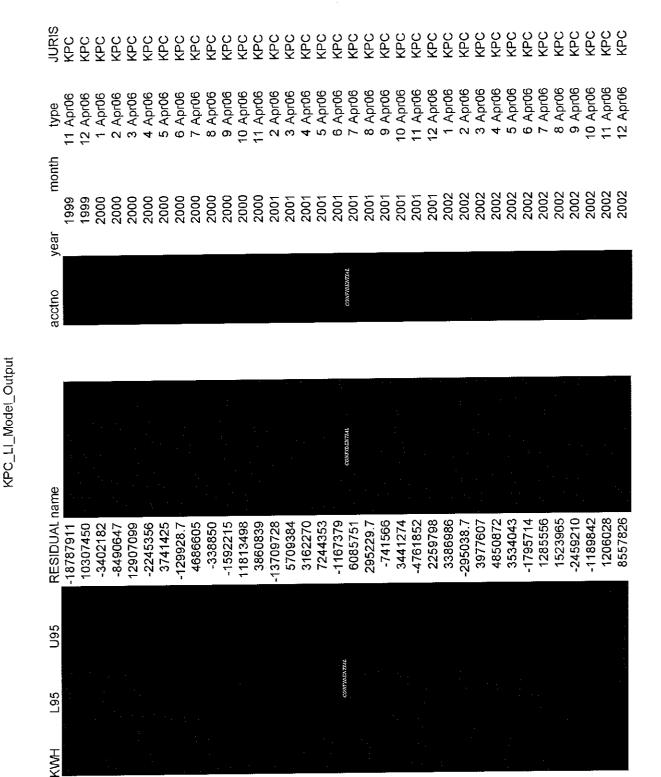












7/1/2000

8/1/2000 9/1/2000 10/1/2000 11/1/2000 2/1/2001 4/1/2001 6/1/2001

11/1/1999

2/1/2000 3/1/2000 4/1/2000 5/1/2000 6/1/2000 8/1/2001

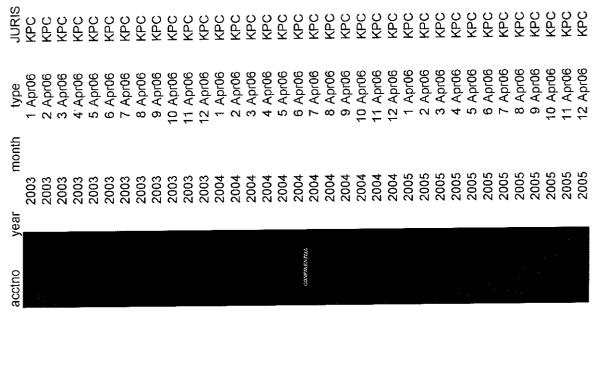
9/1/2001 10/1/2001 11/1/2001 12/1/2001

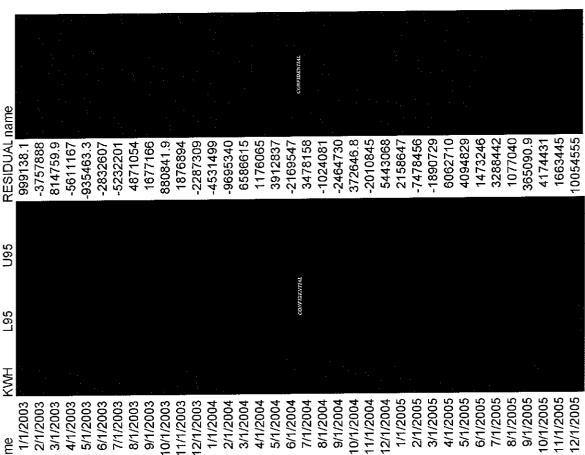
7/1/2001

2/1/2002

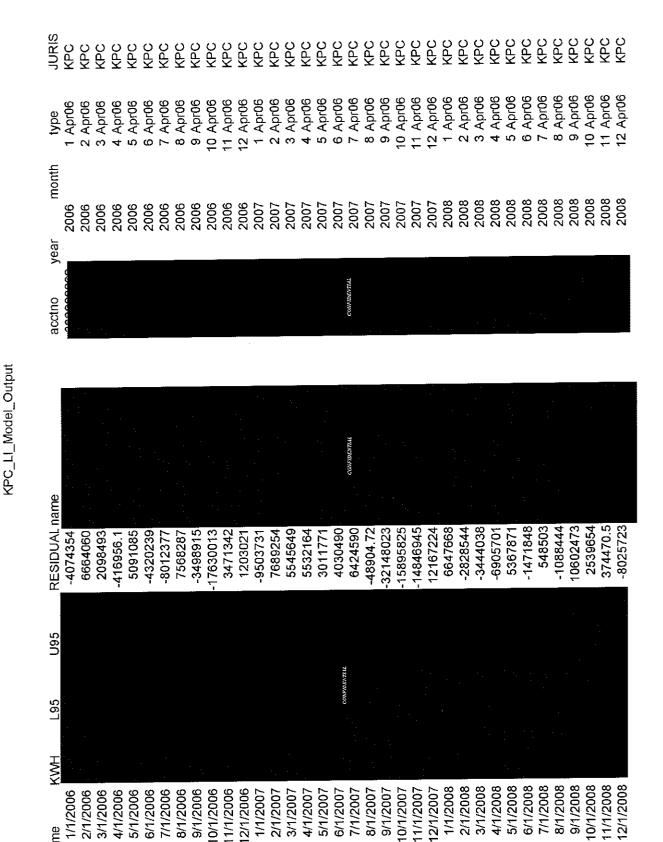
1/1/2002

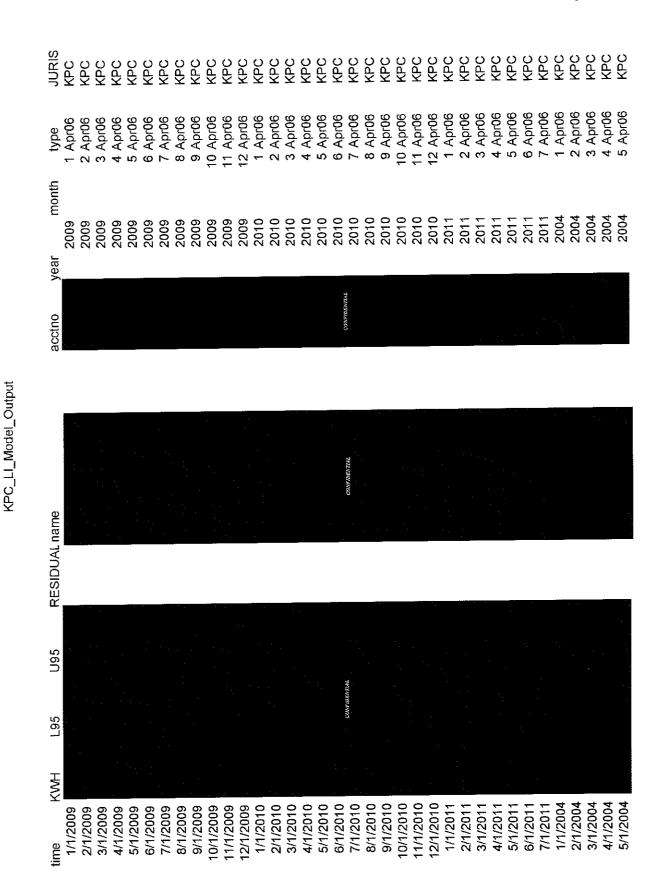
3/1/2002 4/1/2002 5/1/2002 6/1/2002 7/1/2002 8/1/2002 9/1/2002 10/1/2002

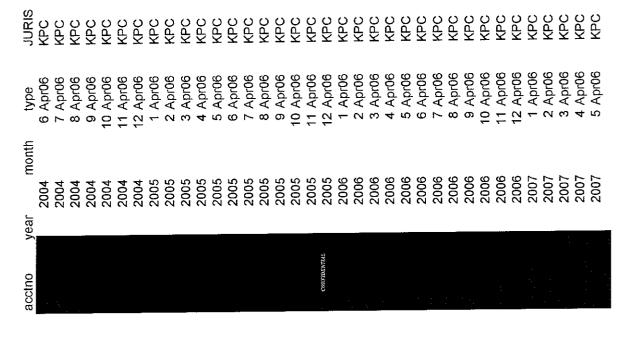


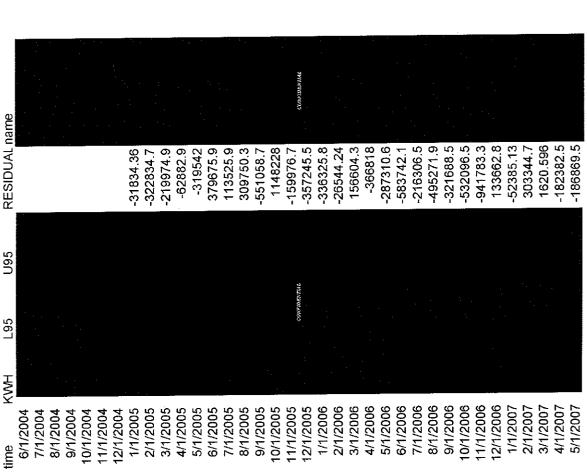


KPC_LI_Model_Output

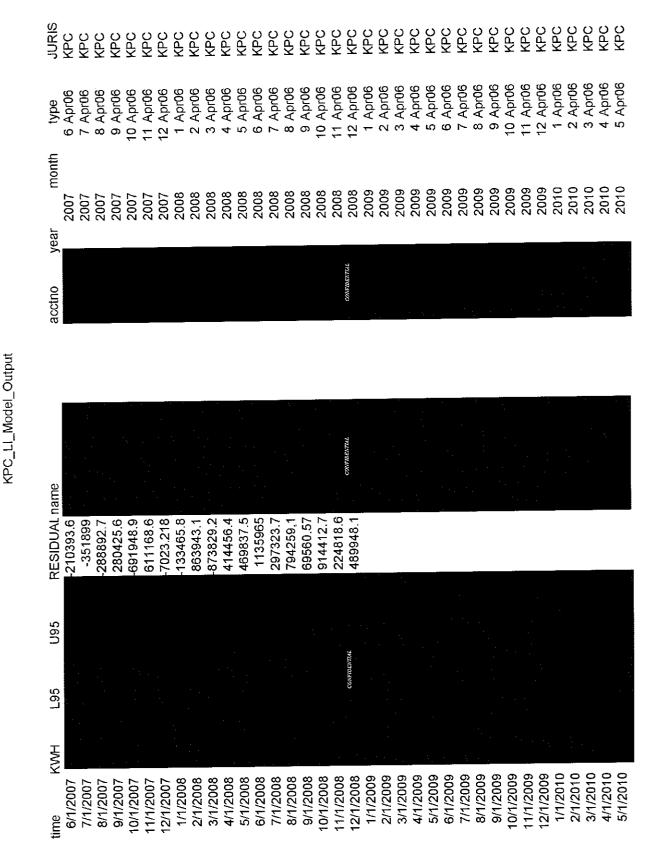




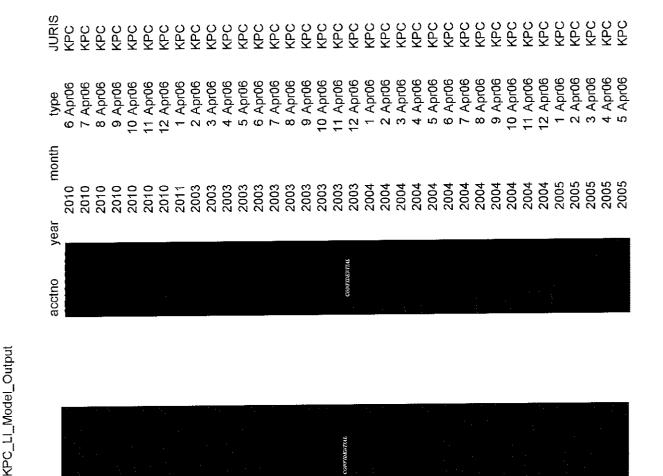


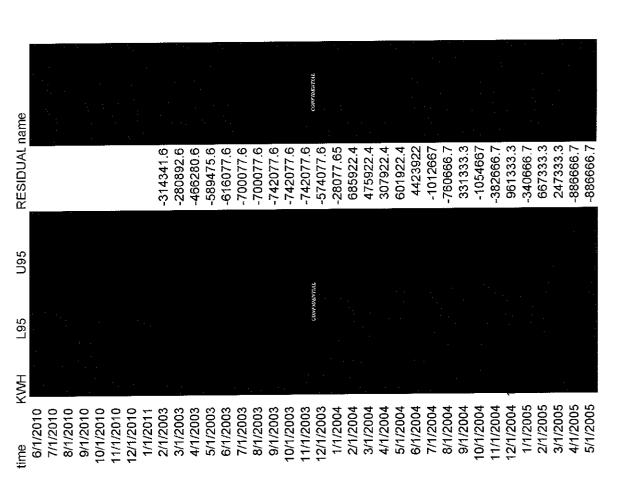


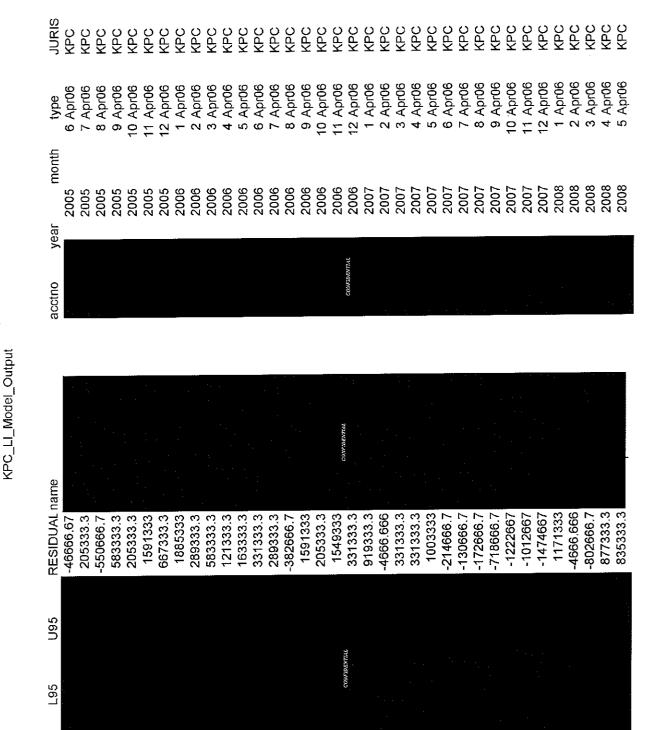
KPC_LI_Model_Output



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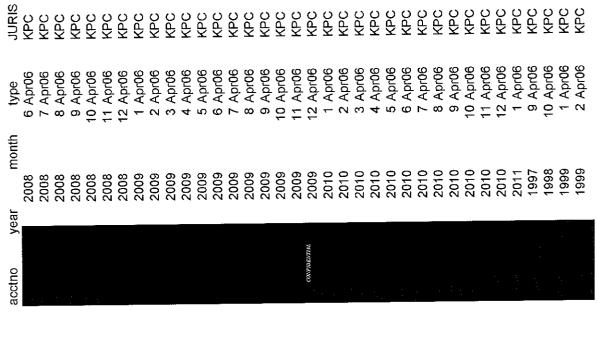


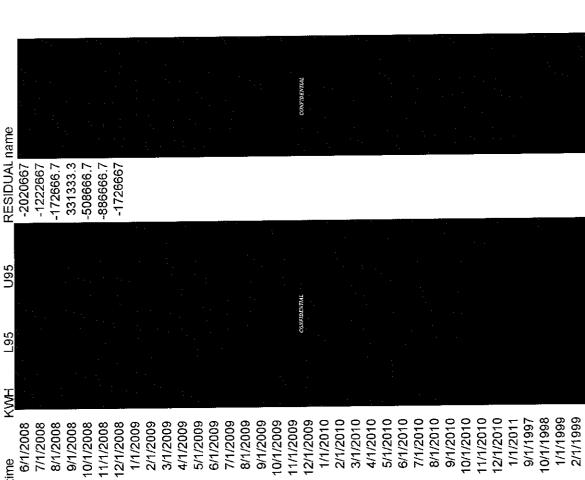
6/1/2005 7/1/2005 8/1/2005

9/1/2005 10/1/2005 11/1/2005 12/1/2005

1/1/2006 2/1/2006 3/1/2006

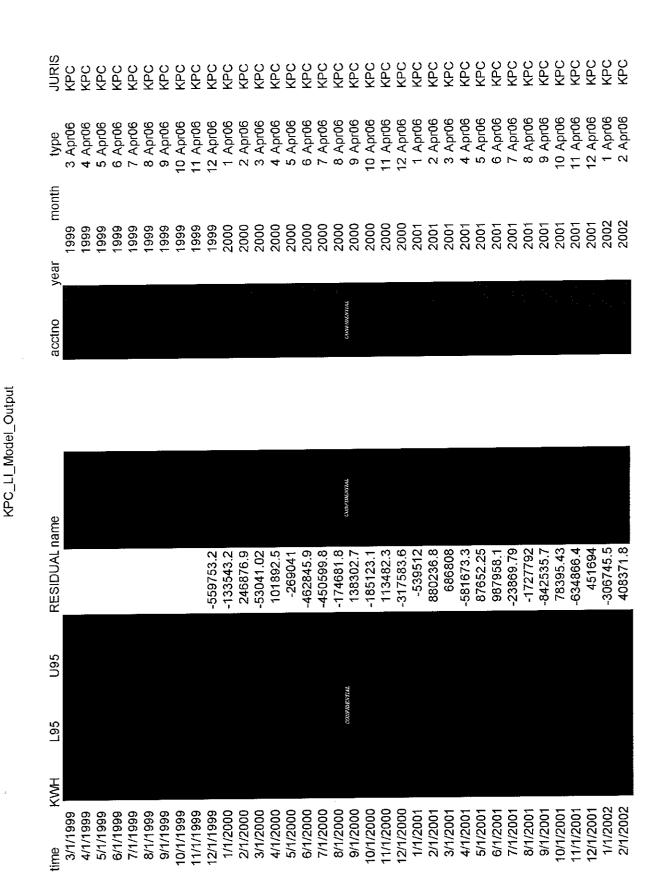
4/1/2006 5/1/2006 6/1/2006 7/1/2006 8/1/2006 9/1/2006 10/1/2006 11/1/2006 12/1/2006 1/1/2007 2/1/2007 3/1/2007 4/1/2007 5/1/2007 6/1/2007 7/1/2007 8/1/2007 9/1/2007 0/1/2007 1/1/2007 12/1/2007 1/1/2008 2/1/2008 3/1/2008 4/1/2008

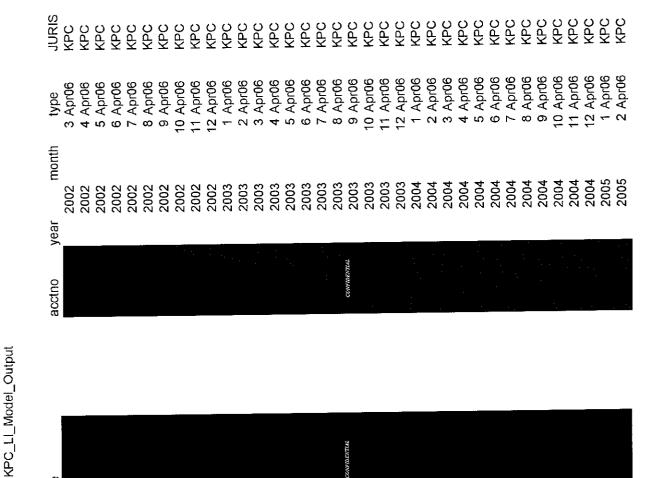


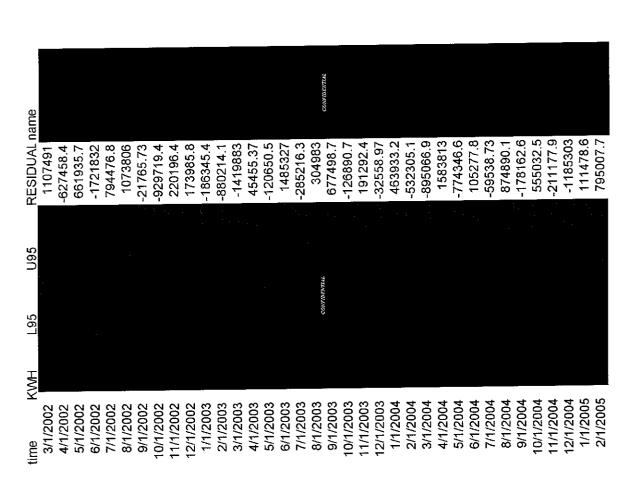


KPC_LI_Model_Output

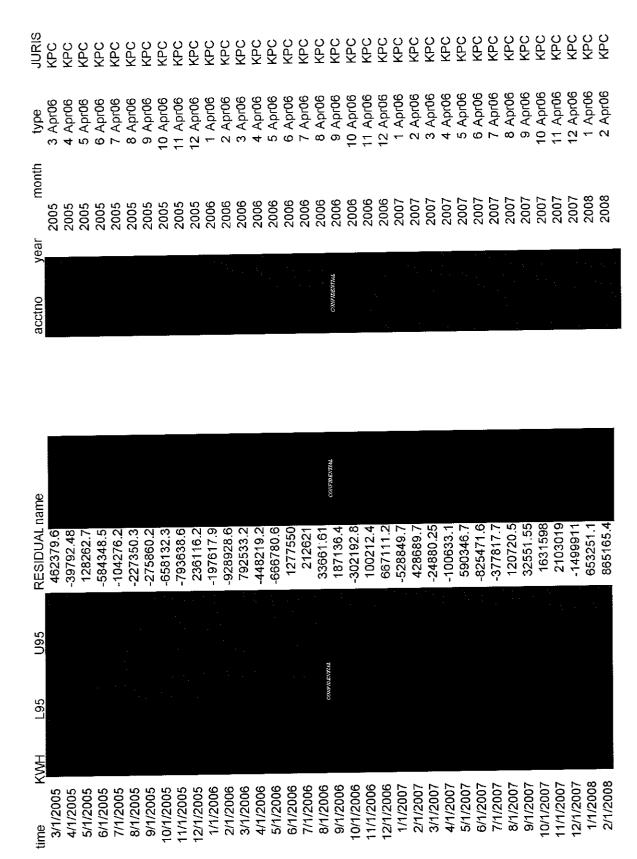
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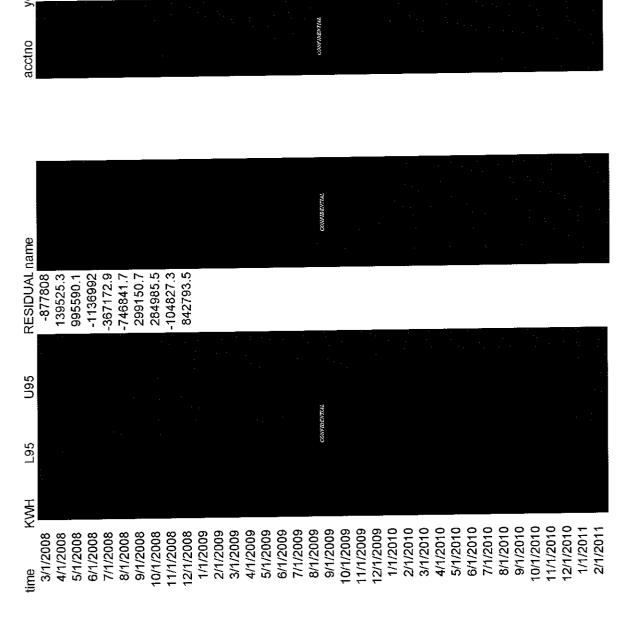












10 Apr06 11 Apr06 12 Apr06 1 Apr06

2009 2009 2009 2009 2009 2010 2010

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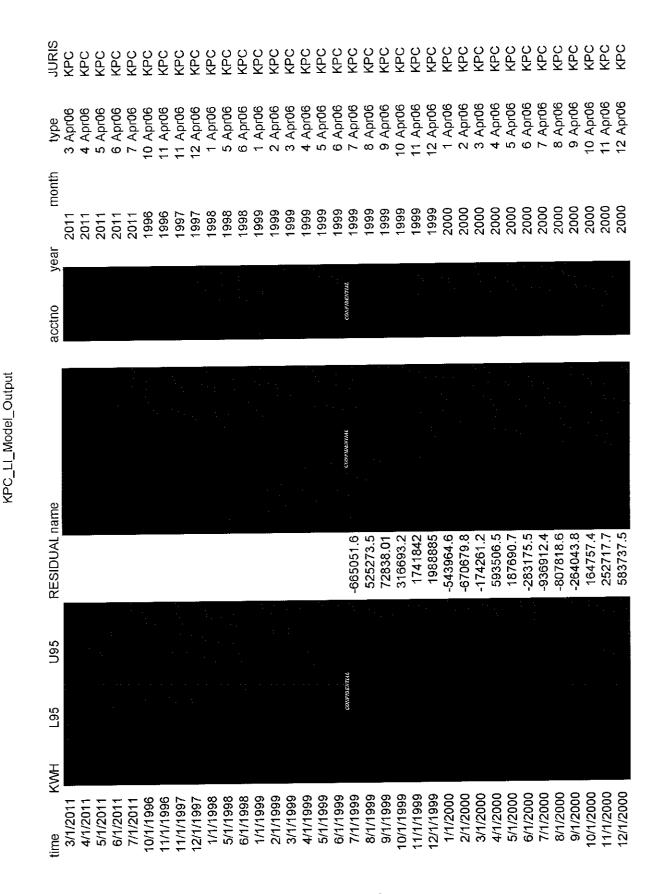
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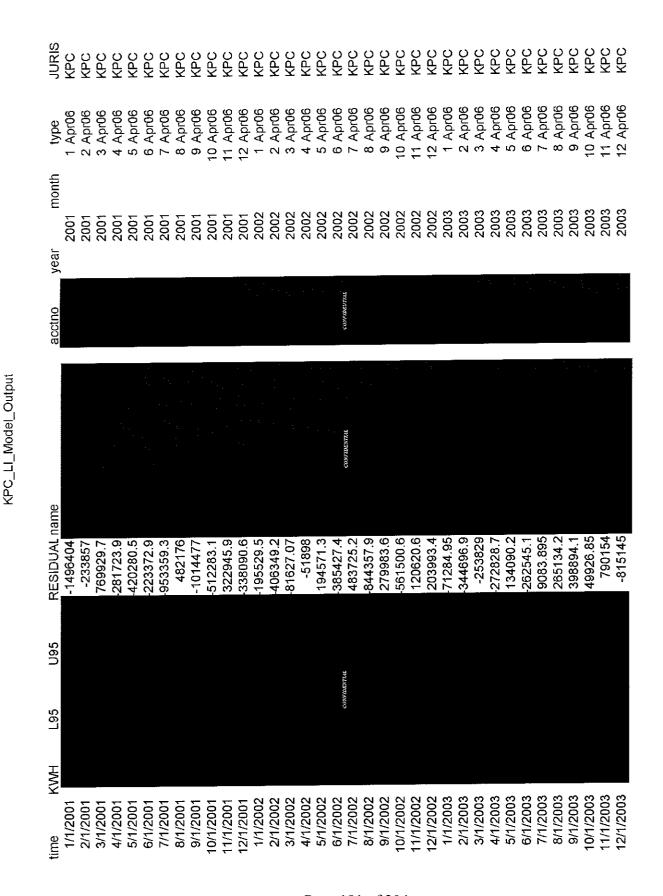
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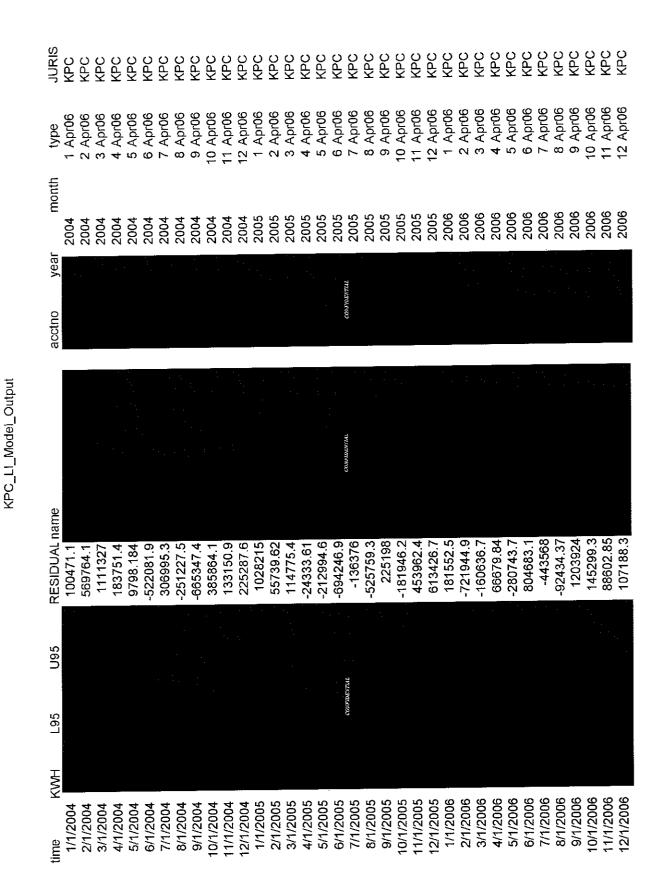
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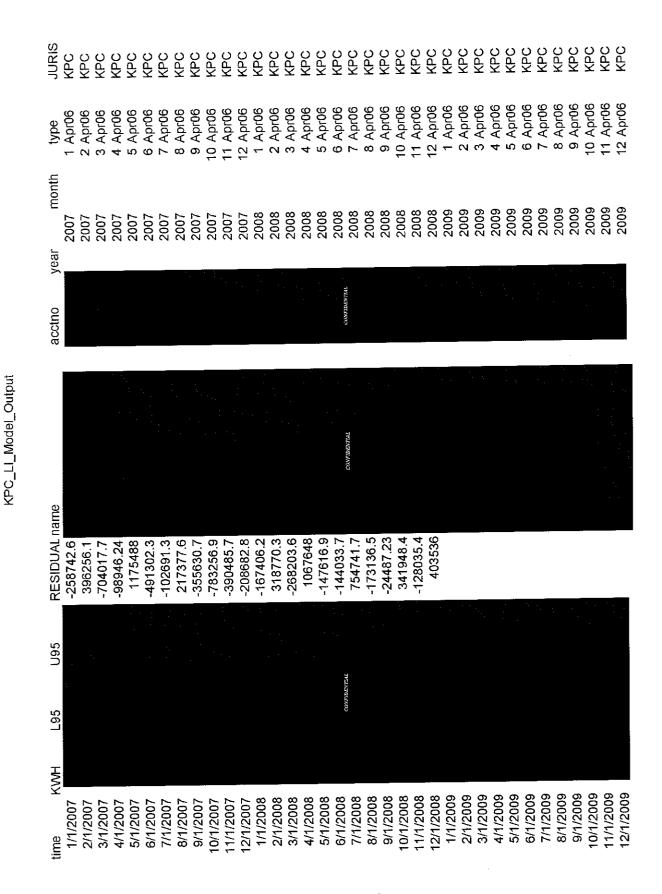
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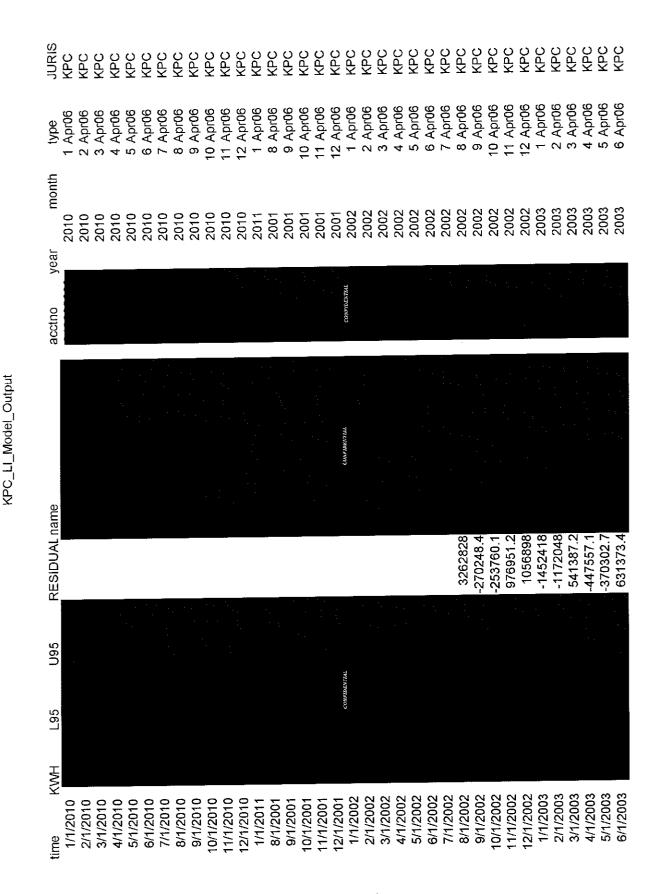
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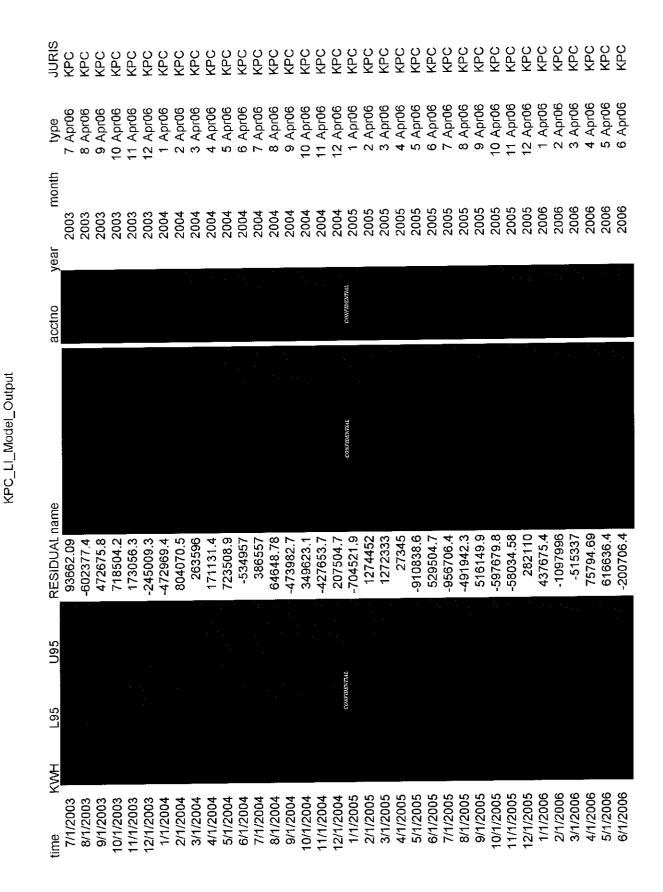




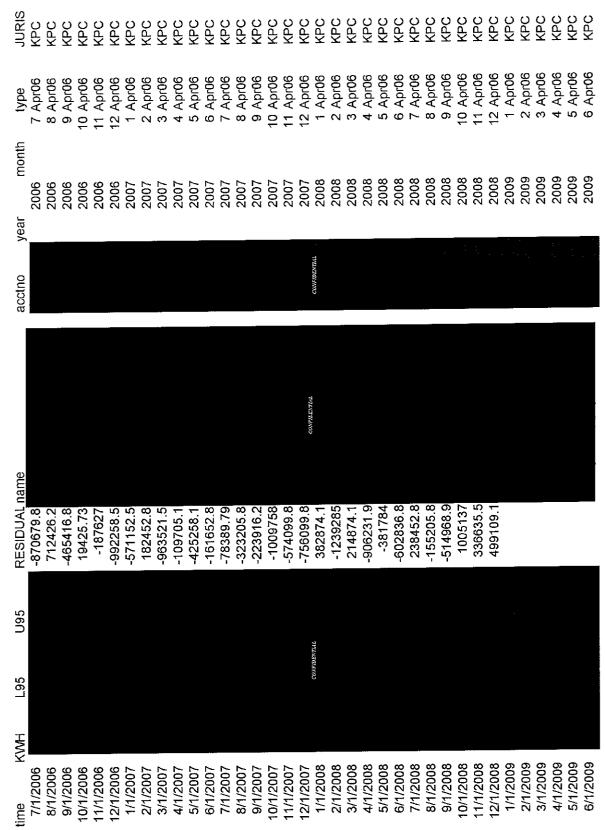




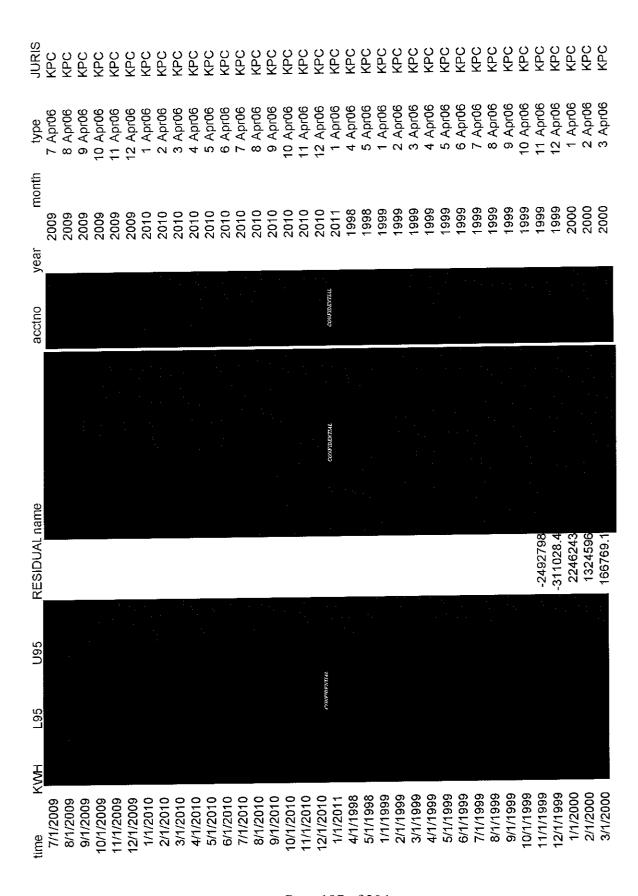




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KPC_LI_Model_Output



KPC_L1_Model_Output

