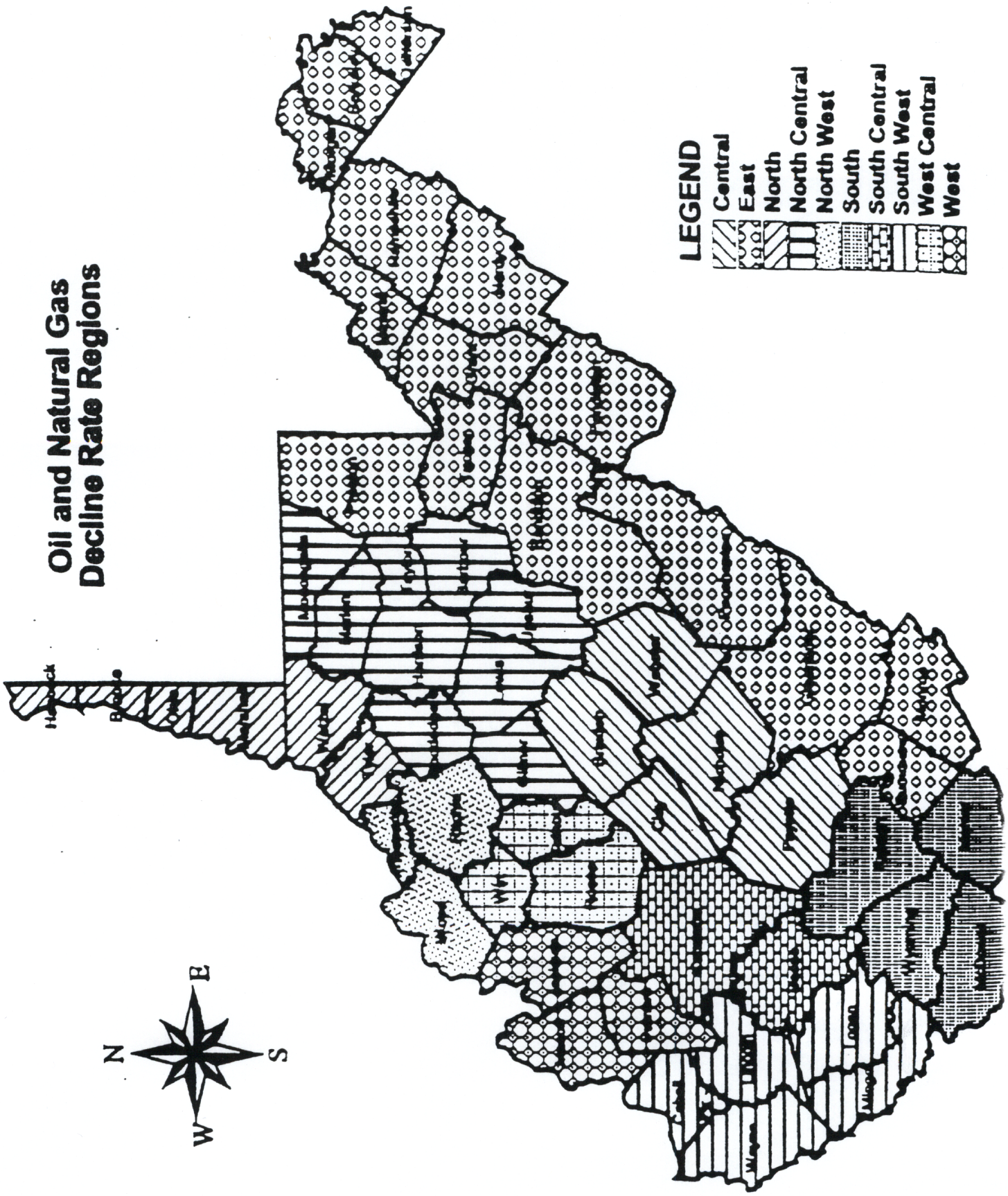

Oil and Natural Gas
Decline Rate Regions
LEGEND
Central
East
North
North Central
North West
South
South Central
South West
West Central
West
N
E
S
W

WEST VIRGINIA GEOLOGICAL AND ECONOMIC SURVEY

State of West Virginia
Gaston Caperton
Governor

Department of Commerce, Labor,
& Environmental Resources
Leonard A. Harvey, Secretary

Geological and Economic Survey
Larry D. Woodfork, Director
Carl J. Smith, Deputy Director

Central Region:

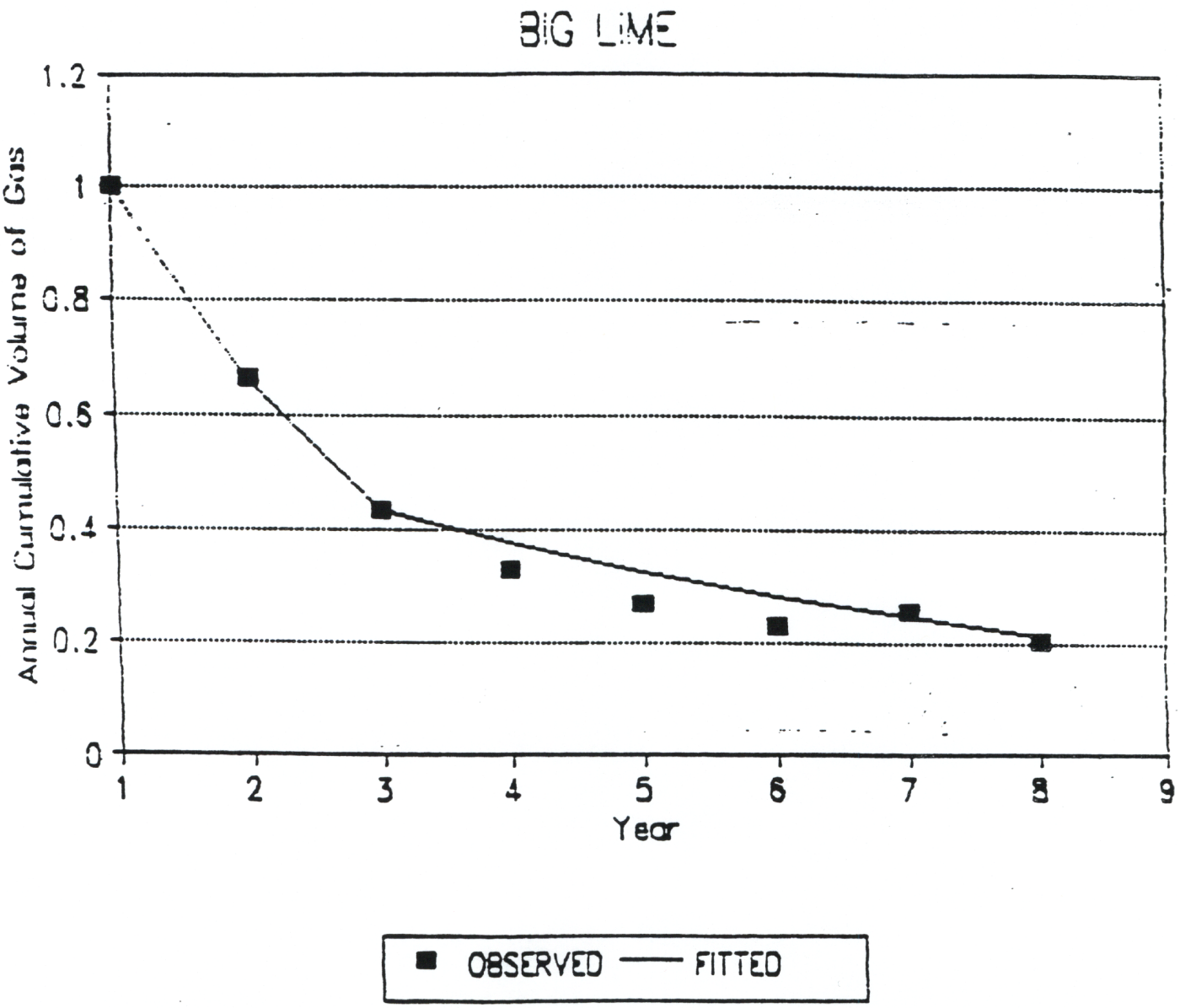
Formation = Big Lime

Model

Decline from 1st to 2nd year = .34 (# observations used = 78)
Decline from 2nd to 3rd year = .34 (# observations used = 63)
Decline after 3rd year = .13 (# observations used ranged from 37 to 53)

Normalized Decline

Year	Observed	Model
1	1.00	1.00
2	.66	.66
3	.43	.43
4	.33	.38
5	.27	.33
6	.23	.28
7	.26	.24
8	.20	.21


BIG LIME
Annual Cumulative Volume of Gas
1.2
1
0.8
0.6
0.4
0.2
0
1
2
3
4
5
6
7
8
9
Year
OBSERVED
FITTED

Decline Rates for Natural Gas and Oil Formations

Code			Central	Central	Central	
			Year 1	Year 2	Year 3	Braxton
12	Alexander, Benson		0.31	0.20	0.10	Clay
14	Benson		0.48	0.08	0.08	Fayette
16	Benson, Balltown		0.45	0.16	0.12	Nicholas
17	Gordon +		0.30	0.07	0.07	Webster
18	Big Injun		0.34	0.13	0.13	
19	Big Injun, Big Lime		0.36	0.13	0.13	
22	Big Lime		0.34	0.34	0.13	
26	Ravencliff		0.40	0.40	0.25	
93	4th Sand		0.42	0.32	0.08	
94	50 Foot		0.34	0.26	0.07	
95	Injun/Weir		0.51	0.26	0.09	
96	Maxton		0.70	0.27	0.08	
9	Exception (median)		0.38	0.23	0.10	
10	Non-Filer		0.30	0.07	0.07	

Decline Rates for Natural Gas and Oil Formations

Code			East	East	East	
			Year 1	Year 2	Year 3	Berkeley
1	Oriskany		0.30	0.30	0.19	Grant
14	Benson		0.31	0.17	0.12	Greenbrier
20	Benson +		0.44	0.20	0.08	Hampshire
21	Benson, Fifth		0.29	0.28	0.09	Hardy
32	Brallier +		0.48	0.20	0.05	Jefferson
33	Elk, Benson		0.39	0.21	0.08	Mineral
34	Elk, Benson, Riley		0.53	0.19	0.05	Monroe
35	Elk, Benson, Riley +		0.36	0.19	0.11	Morgan
36	Elk, Benson, Balltown		0.34	0.18	0.11	Pendelton
37	Elk, Alexander, Benson		0.50	0.07	0.07	Pocahontas
38	Elk, Alexander, Benson +		0.40	0.16	0.16	Preston
39	Hunterville		0.31	0.31	0.14	Randolph
40	Fox, Haverty		0.36	0.21	0.15	Summers
93	4th Sand		0.42	0.32	0.08	Tucker
94	50 Foot		0.34	0.26	0.07	
95	Injun/Weir		0.51	0.26	0.09	
96	Maxton		0.70	0.27	0.08	
9	Exception (median)		0.39	0.21	0.09	
10	Non-Filer		0.29	0.07	0.05	

Decline Rates for Natural Gas and Oil Formations

Code			North	North	North	
			Year 1	Year 2	Year 3	Brooke
11	Gordon		0.47	0.31	0.09	Hancock
13	Alexander, Benson, Riley		0.26	0.16	0.15	Marshall
15	Benson, Riley		0.18	0.16	0.06	Ohio
93	4th Sand		0.42	0.32	0.08	Tyler
94	50 Foot		0.34	0.26	0.07	Wetzel
95	Injun/Weir		0.51	0.26	0.09	
96	Maxton		0.70	0.27	0.08	
9	Exception (median)		0.42	0.26	0.08	
10	Non-Filer		0.18	0.16	0.06	

[redacted]

Code		North Central Year 1	North Central Year 2	North Central Year 3	
					Barbour
11	Gordon	0.41	0.14	0.12	Doddridge
12	Alexander, Benson	0.37	0.19	0.11	Gilmer
13	Alexander, Benson, Riley	0.40	0.28	0.05	Harrison
14	Benson	0.31	0.17	0.12	Lewis
15	Benson, Riley	0.34	0.17	0.14	Marion
18	Big Injun	0.36	0.16	0.13	Monongalia
21	Benson, Fifth	0.31	0.20	0.14	Taylor
28	Weir	0.34	0.34	0.07	Upshur
29	Weir +	0.28	0.28	0.23	
33	Elk, Benson	0.34	0.16	0.11	
34	Elk, Benson, Riley	0.42	0.27	0.08	
37	Elk, Alexander, Benson	0.49	0.23	0.08	
38	Elk, Alexander, Benson +	0.38	0.20	0.12	
40	Fox, Haverty	0.46	0.16	0.08	
50	Rhinestreet	0.28	0.03	0.03	
57	Alexander, Benson, Balltown	0.39	0.26	0.08	
58	Alexander	0.35	0.20	0.10	
59	Alexander +	0.39	0.22	0.10	
60	Alexander, Benson, Riley+	0.39	0.35	0.12	
61	Balltown	0.35	0.20	0.10	
62	Balltown, Speechley	0.28	0.22	0.10	
63	Balltown, Speechley +	0.30	0.13	0.10	
64	Benson, Balltown, Speechley	0.28	0.22	0.09	
65	Benson, Bradford	0.37	0.20	0.10	
66	Benson, Balltown	0.29	0.23	0.11	
67	Benson, Riley +	0.38	0.14	0.10	
68	Benson, Speechley	0.30	0.22	0.14	
69	Brallier, Elk	0.42	0.20	0.13	
70	Brallier	0.40	0.22	0.15	
71	Deeper/Onondago or Oriskany/Heiderberg	0.24	0.24	0.03	
72	Elk, Alexander	0.42	0.22	0.09	
73	Elk, Benson +	0.38	0.20	0.12	
74	Elk	0.43	0.12	0.10	
75	Elk, Riley	0.60	0.35	0.17	
76	Fox +	0.46	0.18	0.09	
77	Haverty, Elk, Benson (no Alexander)	0.35	0.16	0.16	
78	Haverty	0.45	0.15	0.15	
79	Riley	0.44	0.22	0.10	
80	Speechley	0.30	0.18	0.09	
81	Alexander, Benson, Speechley	0.39	0.24	0.10	
82	Haverty, Elk, Alexander	0.47	0.14	0.14	
85	Fifth Oil	0.45	0.25	0.22	
87	Bayard All	0.30	0.20	0.05	
88	Fifth	0.29	0.18	0.12	
89	Fifth +	0.25	0.15	0.13	
90	Gordon/Injun All	0.41	0.23	0.23	
91	Squaw	0.37	0.31	0.06	
92	Injun +	0.34	0.22	0.22	
93	4th Sand	0.42	0.32	0.08	
94	50 Foot	0.34	0.26	0.07	
95	Injun/Weir	0.51	0.26	0.09	
96	Maxton	0.70	0.27	0.08	
9	Exception (median)	0.38	0.21	0.10	
10	Non-Filer	0.24	0.03	0.03	

Decline Rates for Natural Gas and Oil Formations

Code			North West	North West	North West	
			[illegible]	[illegible]	[illegible]	Pleasants
2	Huron, Rhinestreet		0.41	0.26	0.07	Ritchie
4	Huron		0.42	0.24	0.14	Wood
5	Huron, Shale, Above Huron		0.39	0.25	0.14	
8	Berea		0.31	0.15	0.15	
11	Gordon		0.38	0.10	0.10	
12	Alexander, Benson (No Riley)		0.34	0.23	0.10	
13	Alexander, Benson, Riley		0.32	0.20	0.10	
14	Benson		0.19	0.19	0.10	
44	Rhinestreet, Huron, Shallow Shale		0.43	0.28	0.11	
47	Alexander, Riley, (no Benson)		0.41	0.05	0.05	
48	Rhinestreet, Alexander, Benson, Riley		0.31	0.24	0.10	
49	Weir, Squaw, Big Injun		0.27	0.17	0.07	
50	Rhinestreet		0.40	0.27	0.27	
51	Rhinestreet +		0.36	0.21	0.10	
52	All Upper Devonian (undiv)		0.48	0.33	0.19	
53	Huron, Chemung		0.35	0.11	0.09	
54	Huron, Hampshire, Pocono		0.12	0.12	0.11	
55	Upper Devonian (above Huron)		0.46	0.33	0.23	
56	Chemung Sands=Riley,Bradford,Ballown,Speechley&Warren(no Benson or Alexander)		0.28	0.18	0.10	
83	Huron Oil		0.74	0.44	0.40	
93	4th Sand		0.42	0.32	0.08	
94	50 Foot		0.34	0.26	0.07	
95	Injun/Weir		0.51	0.26	0.09	
96	Maxton		0.70	0.27	0.08	
9	Exception (median)		0.39	0.24	0.10	
10	Non-Filer		0.12	0.05	0.05	

Decline Rates for Natural Gas and Oil Formations

Code			South	South	South	
			[illegible]	[illegible]	[illegible]	McDowell
8	Berea		0.34	0.15	0.15	Mercer
22	Big Lime		0.31	0.19	0.07	Raleigh
23	Big Lime, Maxton		0.31	0.19	0.07	Wyoming
24	Big Lime, Ravencliff		0.29	0.29	0.17	
25	Berea +		0.37	0.12	0.08	
26	Ravencliff		0.40	0.08	0.07	
28	Weir		0.44	0.20	0.10	
29	Weir +		0.28	0.21	0.08	
30	Weir, Big Lime		0.37	0.19	0.13	
42	Maxton, Ravencliff		0.40	0.08	0.07	
93	4th Sand		0.42	0.32	0.08	
94	50 Foot		0.34	0.26	0.07	
95	Injun/Weir		0.51	0.26	0.09	
96	Maxton		0.27	0.13	0.09	
97	Methane		0.23	0.08	0.05	
9	Exception (median)		0.34	0.19	0.08	
10	Non-Filer		0.23	0.08	0.05	
98	Methane (Spec)*		0.60	0.60	0.60	

* Involves a special drilling procedure for coalbed methane removal

Decline Rates for Natural Gas and Oil Formations

Code			South Central	South Central	South Central	
			Year 1	Year 2	Year 3	Boone
3	Devonian Shale		0.23	0.08	0.05	Kanawha
4	Huron		0.31	0.15	0.04	
8	Berea		0.23	0.14	0.09	
18	Big Injun		0.29	0.25	0.12	
27	Huron, Shales above Huron		0.21	0.08	0.05	
28	Weir		0.30	0.21	0.14	
29	Weir +		0.31	0.25	0.09	
31	Devonian Shales +		0.27	0.07	0.05	
86	Big Injun-Oil		0.19	0.18	0.10	
93	4th Sand		0.42	0.32	0.08	
94	50 Foot		0.34	0.26	0.07	
95	Injun/Weir		0.51	0.26	0.09	
96	Maxton		0.70	0.27	0.08	
9	Exception (median)		0.30	0.21	0.08	
10	Non-Filer		0.19	0.07	0.04	

Decline Rates for Natural Gas and Oil Formations

Code			South West Year 1	South West Year 2	South West Year 3	Cabell
3	Devonian Shale		0.31	0.15	0.04	Lincoln
8	Berea		0.36	0.11	0.11	Logan
18	Big Injun		0.38	0.22	0.04	Mingo
22	Big Lime		0.19	0.19	0.19	Wayne
43	Berea, Big Lime		0.18	0.18	0.18	
93	4th Sand		0.42	0.32	0.08	
94	50 Foot		0.34	0.26	0.07	
95	Injun/Weir		0.51	0.26	0.09	
96	Maxton		0.70	0.27	0.08	
9	Exception (median)		0.36	0.22	0.08	
10	Non-Filer		0.18	0.11	0.04	

Decline Rates for Natural Gas and Oil Formations

Code		West Central	West Central	West Central	
					Calhoun
2	Huron, Rhinestreet	0.49	0.11	0.06	Roane
4	Huron	0.33	0.22	0.14	Wirt
27	Huron, Shales above Huron	0.42	0.23	0.12	
44	Rhinestreet, Huron, Shallow Shale	0.51	0.14	0.11	
45	Devonian Shale, Pocono	0.25	0.17	0.12	
46	Pocono	0.29	0.25	0.12	
84	Big Injun - Oil	0.41	0.41	0.11	
93	4th Sand	0.42	0.32	0.08	
94	50 Foot	0.34	0.26	0.07	
95	Injun/Weir	0.51	0.26	0.09	
96	Maxton	0.70	0.27	0.08	
9	Exception (median)	0.42	0.25	0.11	
10	Non-Filer	0.25	0.11	0.06	

Decline Rates for Natural Gas and Oil Formations

Code		West	West	West	
		Year 1	Year 2	Year 3	Jackson
1	Oriskany	0.40	0.40	0.29	Mason
2	Huron, Rhinestreet	0.13	0.12	0.03	Putnam
3	Devonian Shale	0.31	0.15	0.04	
4	Huron	0.29	0.14	0.05	
5	Huron, Shale, Above Huron	0.38	0.15	0.06	
6	Huron, Berea	0.29	0.08	0.08	
7	Berea, Devonian Shales	0.08	0.08	0.08	
8	Berea	0.36	0.16	0.16	
93	4th Sand	0.42	0.32	0.08	
94	50 Foot	0.34	0.26	0.07	
95	Injun/Weir	0.51	0.26	0.09	
96	Maxton	0.70	0.27	0.08	
9	Exception (median)	0.35	0.16	0.08	
10	Non-Filer	0.08	0.08	0.03	