INFORMATION SERIES 71

Colorado Coal Directory, 2005

Includes Map of Coal Production and Distribution with Statistics on Electric Generation and Fuel Consumption

By Christopher J. Carroll

Mine map cartography and book production by Cheryl Brchan

Bill Owens, Governor,
State of Colorado

COLORADO
DEPARTMENT OF
NATURAL
RESOURCES

Russell George, Executive Director,
Department of Natural Resources

COLORADO GEOLOGICAL SURVEY

Vincent Matthews,
State Geologist and Division Director,
Colorado Geological Survey

Denver, Colorado
2005

FOREWORD

This directory of coal mines and electric generation in Colorado provides the most recent information available on active, recently active, and potentially active coal mines. The booklet also contains information on each mine's location, operating company, mine type, geology, coal quality, coal production, and distribution. Because much of the coal produced in Colorado is consumed by steam-electric power plants, data on electric generation and fuel consumption by coal-fired power plants are included in this directory. The 1:1,000,000-scale map that accompanies this directory depicts the distribution paths of coal throughout Colorado and contains information about coal production for 2004.

This is an update and revision to Colorado Geological Survey Information Series 55 published in 2000. Compilation of the data is based on information provided directly from managers at the mines and power plants as of January 2005. The data was checked for accuracy using information provided by the Colorado Division of Minerals and Geology, the U.S. Department of Energy's Energy Information Administration, the U.S. Department of the Interior Office of Surface Mining, the Colorado State Land Board, and the *2004 Keystone Coal Industry Manual*.

Funding for this project came from the Colorado Department of Natural Resources Severance Tax Operational Fund. Severance taxes are derived from the production of gas, oil, coal, and minerals. The objective of this publication is to provide geological information to resource developers, government planners, and interested citizens.

James A. Cappa,
Chief, Mineral and Mineral Fuels Section

Vince Matthews
State Geologist and Division Director

CONTENTS

Foreword iii
Introduction 1
Active or Recently Active Colorado Coal Mines
Bowie Mine No. 2 3
Bowie Mine No. 3 7
Colowyo Mine 11
Deserado Mine 15
Elk Creek Mine 19
Empire Mine 23
Foidel Creek (Twentymile) Mine 27
King Coal Mine 31
Lorencito Canyon Mine 35
McClane Canyon Mine 39
New Horizon Mine 43
Seneca II-W 47
Trapper Mine 51
West Elk Mine 55
Yoast Mine 58
Electricity Generation 63
References 68

TABLES

1. Active mines and production figures for 2004 1
2. Summary of electricity generated by fuel type in Colorado for 2004. 63
3. Electric generation and fuel consumption at major coal-fired power plants in Colorado. 64
4. Electric generation and fuel consumption at major gas-fired power plants in Coloradofor 2004. 65
5. Electric generation at hydroelectric power plants in Colorado 66

PLATE

1. Coal production, distribution, and Electric Generation Map of Colorado, 2005 ..... In rear pocket

INTRODUCTION

The Colorado coal industry is a thriving and active market today. All economic sectors are doing well as production, employment, prices, and demand for Colorado coal are high. Coal mines in Colorado have set annual production records for eight of the last nine years, and Colorado ranks sixth nationally among coal producing states. In 2004, 40 million tons of coal were produced from eight underground and five surface operations (Table 1). Of this total, approximately 30 million tons were from underground mines and 10 million tons from surface mines. In the five years since the last *Coal Directory* was published Colorado coal production has increased by 33 percent. In 1999, the 30-million-ton per year level was first achieved, and by 2004 the 40-million-ton per year level was reached.

Table 1. Active mines and production figures for 2004.

Mine Name	County	Coal Region	Field	Geologic Unit	Tons of Coal Produced
Bowie No.2	Delta	Uinta	Somerset	Mesaverde D seam	4,108,077
Bowie No.3	Delta	Uinta	Somerset	Mesaverde B seam	587,990
Colowyo	Moffat	Uinta	Danforth Hills	Williams Fork	6,379,546
Deserado	Rio Blanco	Uinta	Lower White River	Williams Fork	2,550,883
Elk Creek	Delta	Uinta	Somerset	Mesaverde D seam	6,549,024
Foidel Creek	Routt	Green River	Yampa	Williams Fork	8,557,745
King Coal	La Plata	San Juan River	Durango	Menefee	460,611
McClane Canyon	Garfield	Uinta	Bookcliffs	Mt. Garfield	289,495
New Horizon	Montrose	San Juan River	Nucla-Naturita	Dakota	413,332
Seneca II-W	Routt	Green River	Yampa	Williams Fork	673,124
Trapper	Moffat	Green River	Yampa	Williams Fork	1,837,102
West Elk	Gunnison	Uinta	Somerset	Mesaverde	6,591,183
Yoast	Routt	Green River	Yampa	Williams Fork	815,925
Total					**39,813,937 tons**

Coal is produced in eight counties statewide: Delta, Gunnison, La Plata, Garfield, Moffat, Montrose, Rio Blanco, and Routt. Gunnison County had the largest production from coal mines in 2004, producing over 13.14 million tons of coal from the Elk Creek and West Elk mines. Most of the coal is produced in the Uinta Coal Region, which extends from Moffat to Gunnison counties. The four largest producing mines, Foidel Creek (Twentymile), Elk Creek, West Elk, and Colowyo, together account for over 70 percent of the state's coal production. The largest coal producer is Peabody Energy/ Twentymile Coal Co's Foidel Creek underground mine in Routt County with 8.56 million tons produced in 2004, a new annual coal production record for a single mine.

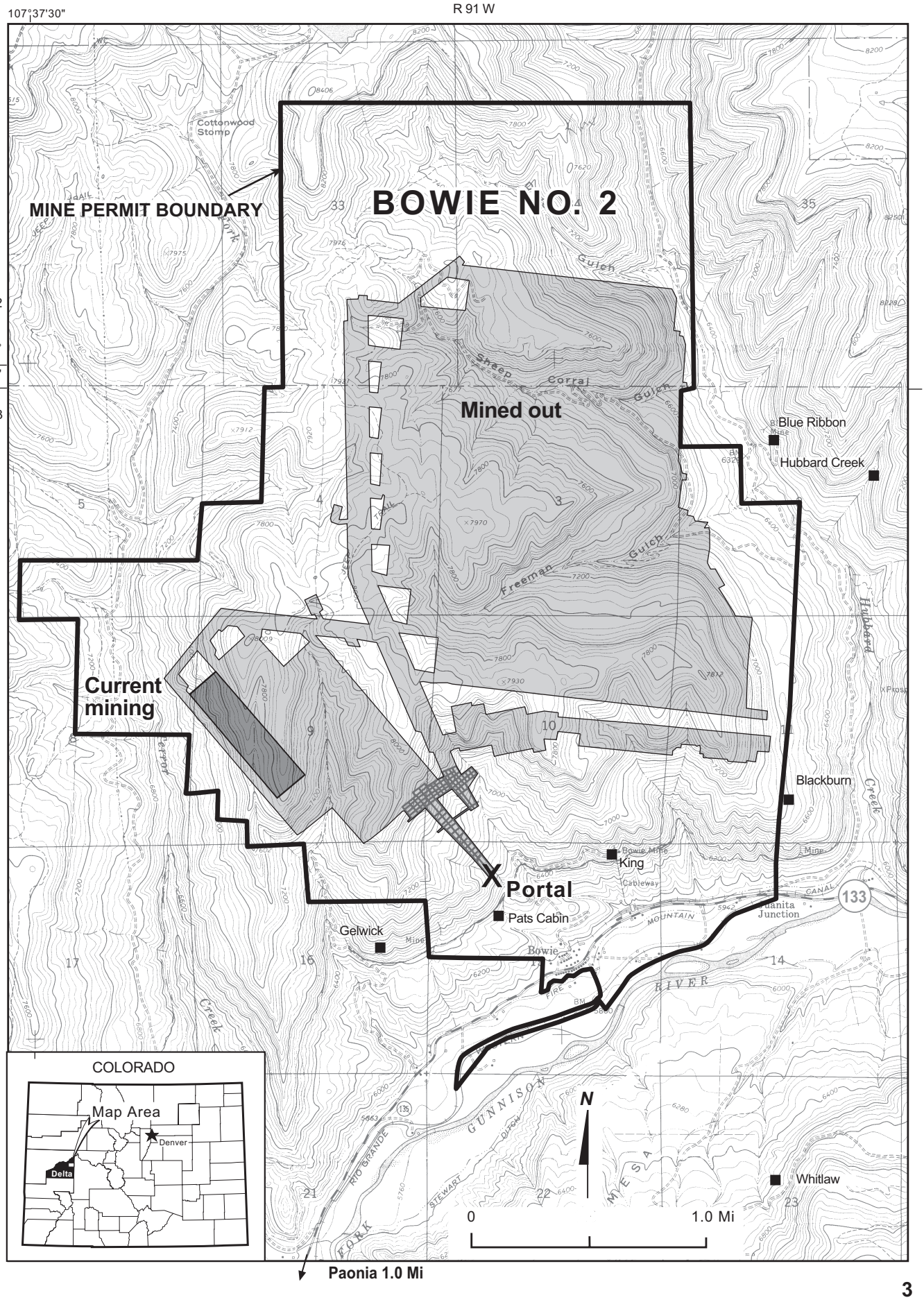
Cumulatively, over 1.24 billion tons of coal have been mined in Colorado between 1864 and 2004.

Colorado coal is primarily found in Cretaceous age bituminous and subbituminous coal-bearing formations. Currently coal is mined from the Mesaverde Group (including the Williams Fork, Mt. Garfield, and Menefee Formations), and the Dakota Group. Ten of the thirteen active mines are located in the Uinta or Green River coal regions and produce from the Mesaverde Group. Throughout the state coal beds mined by surface methods ranged from 1.6- to 20.4-ft thick. Underground-mined coal beds range from 5- to over 20-ft thick (although the actual maximum thickness recovered is 12 ft). The current maximum underground mining depth is 2,300 ft in one part of the West Elk Mine. The two most productive coal beds are the Mesaverde Somerset D coal bed (Somerset coal field in Delta and Gunnison counties) and the Williams Fork Wadge coal bed (Yampa coal field in Routt County). In 2004, the Somerset B bed was mined for over 11 million tons, averaging 135 in. thick. Over 10 million tons of coal were mined from the Wadge seam in 2004, which averages 103 in. thick.

Coal rank is a measure of the degree of physical alteration or maturation of the organic matter composing the coal (EIA, 1997). The quality of the coal is based on rank, which in Colorado ranges from lignite (lowest rank) in the Denver Coal Region to anthracite (highest rank) in small parts of the Uinta Coal Region. The average Colorado coal burned at power plants has a heat value of 11,131 Btu/lb (ranging from 9,850 to 13,100 Btu/lb, as-received), is low in sulfur and trace elements such as mercury, and has a moderately low ash content. Only two of the mines have preparation plants for coal washing as most Colorado coal is used directly for feedstock at power plants. Colorado coal is often mixed with higher-sulfur coals produced in other states to reduce power plant emissions. Nearly 19 million tons of Colorado and Wyoming coal were consumed at steam electric power plants in Colorado in 2004 (Tables 2 ,3). In 2004, 31.6 million tons of bituminous coal were produced from eleven mines, while the two subbituminous coal mines produced 8.2 million tons.

Peabody Energy's Foidel Creek Mine in Routt County is the third largest underground coal mine in the nation. Colorado's productive capacity for coal production based on transportation, sales prices, and need has been about 40 million tons. In 2003, the capacity utilization, as defined by EIA as the ratio of annual production to annual productive capacity was 87 percent for underground mines, and 92 percent for surface mines. Coal production increased in 2004 by 16 percent over the previous year, indicating that the productive capacity of 40 million tons has been reached in 2004. Underground mines averaged 9.14 short tons produced per employee per hour in 2003, the second highest productivity for states nationally. Surface miners averaged 7.25 short tons.

BOWIE NO. 2 MINE



BOWIE NO. 2 MINE

CDMG Permit: C-1996-083

LOCATION INFORMATION

Previous Mine Names:

Permit Location: Sec. 2-4, 9-11, 14-16, T. 13 S., R. 91 W.

Topographic Quadrangle(s):
Bowie

Coal Region: Uinta

Field: Somerset

County Delta

COMPANY INFORMATION

Parent Company:
Colorado Energy Investments, LLC

1500 North Big Run Road, Ashland, KY 41102

(606) 928-0460
Contact: Larry Addington

Local Mine Operator:
Bowie Resources, LLC

P.O. Box 1488, Paonia, CO 81428

Contact: Colin Stewart, General Manager
Phone: (970) 929-5240
Fax: (970) 527-2234

Web Site:

GENERAL INFORMATION

Mine Type: Underground
Mine Status: Producing
Mining Method: Continuous miners, longwall
Start-Up Date: October 1997
No. of Acres in Permit: 1,496

No. of Employees: 250
Union Affiliation: Non-Union
Surface: Federal/Private
Mineral: Federal/Private

GEOLOGIC INFORMATION

Geologic Age: Upper Cretaceous

Geologic Unit: Mesaverde Group, Bowie Shale Mbr

Coal Zone(s) or Bed(s):
D Seam

Coal Bed Thickness(es):
7-12 ft

Contact for Geologic Information at Mine:
Greg Hunt

Strike of Bedding: NW

Dip of Bedding: 2-5°NNE

Cleat Orientation and Spacing:
N 71 E, 75 SE

Thickness of Overburden:
450-1800 ft

Thickness of Interburden:

BOWIE NO. 2 MINE

COAL QUALITY

	SAMPLE 1 As Shipped, Washed	SAMPLE 2 As shipped, washed	SAMPLE 3 As shipped, washed
Seam:	D	D	D
Rank:	na	na	na
Moisture (%):	10.13	8.81	11.23
Ash (%):	5.96	7.37	5.97
Fixed Carbon (%):	50.24	49.86	49.38
Volatile Matter (%):	33.67	33.96	33.42
Sulfur (%):	0-1	0-1	0.38
Heating Value (Btu/lb):	12,055	12,053	11,893
Free Swelling Index:	na	na	na
Hardgrove Grindability:	51	50	56
Ash-Softening Temperature (F°):	2,730	2725	2,760
Methane Characteristics:	na	na	na
Reflectance Data:	na	na	na

COAL PRODUCTION

2003 Production (tons): 4,926,457

2004 Production (tons): 4,108,077

Cumulative Production through 2004 (tons): 28,210,666

Projected Production for 2005 (tons): 1,300,000

Production per Shift (tons): 10,000-20,000

Shifts per Day: 4 (10 hours), 3 (13 hours) per we

Reserves (tons): < 2 Million tons

Preparation Plant: Heavy media, cyclone, 700 tp

Tipple: Converse

Haulage: Conveyors

Equipment: Longwall, continuous miners, shuttle cars, roof bolters

SALES DATA

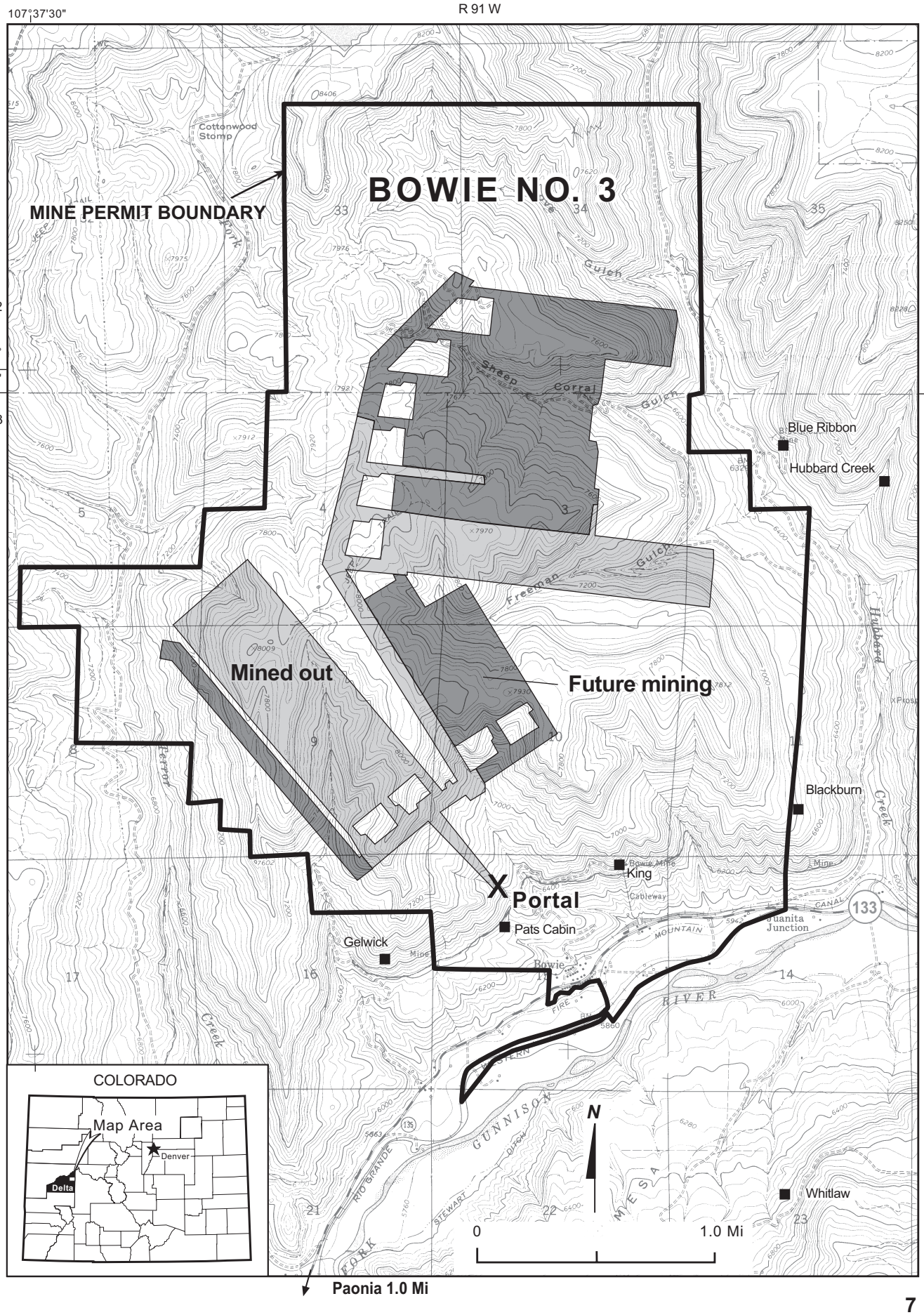
	SALES	USE	DESTINATION
In-State:	0		
Out-of-State:	100%	Steam, Industrial	5% cement plants, 95% TVA steam
Foreign:	0		

Mode of Transportation: Conveyor, Rail

ADDITIONAL INFORMATION AND COMMENTS

*Shifts: 3 during week, 2 on weekends; 4/10-hr shifts, 3/13-hr shifts per week. Bowie Mine #2 is the 38th largest coal mine in the US, and the 13th largest underground coal mine.
Ownership in 2005 is 55% Colorado Energy Investments, LLC, 45% Sentient.
Geologic Reference Map: Dunrud, R.C., 1989, Geologic map and coal stratigraphic framework of the Paonia area, Delta and Gunnison Counties, Colorado: U.S. Geological Survey Map C-115, scale 1:50,000

BOWIE NO. 3 MINE



BOWIE NO. 3 MINE

CDMG Permit: C-1996-083

LOCATION INFORMATION

Previous Mine Names:

Permit Location: Sec. 2-4, 9-11, 14-16, T. 13 S., R. 91 W.

Topographic Quadrangle(s):
Bowie

Coal Region: Uinta

Field: Somerset

County Delta

COMPANY INFORMATION

Parent Company:
Colorado Energy Investments, LLC

1500 North Big Run Road, Ashland, KY 41102

(606) 928-0460
Contact: Larry Addington

Local Mine Operator:
Bowie Resources, LLC

P.O. Box 1488, Paonia, CO 81428

Contact: Colin Stewart, General Manager
Phone: (970) 929-5240
Fax: (970) 527-2234

Web Site:

GENERAL INFORMATION

Mine Type: Underground
Mine Status: Producing
Mining Method: Continuous miners, longwall
Start-Up Date: February 2004
No. of Acres in Permit:

No. of Employees: (see Bowie #2)
Union Affiliation: Non-Union
Surface: Federal/Private
Mineral: Federal/Private

GEOLOGIC INFORMATION

Geologic Age: Upper Cretaceous
Geologic Unit: Mesaverde Group, Bowie Shale Mbr

Coal Zone(s) or Bed(s):
B Seam, Upper and Lower Splits

Coal Bed Thickness(es):
12-20 ft

Contact for Geologic Information at Mine:
Greg Hunt

Strike of Bedding: NW
Dip of Bedding: 2-5°NNE
Cleat Orientation and Spacing:

Thickness of Overburden:
450-2,000 ft

Thickness of Interburden:

BOWIE NO. 3 MINE

COAL QUALITY

	SAMPLE 1 Run-of-Mine	SAMPLE 2 Run-of-mine	SAMPLE 3 not mined yet
Seam:	B Upper	B upper	B lower
Rank:	na	na	na
Moisture (%):	8.22		
Ash (%):	9.43		
Fixed Carbon (%):	na		
Volatile Matter (%):	na		
Sulfur (%):	0-1	0-1	
Heating Value (Btu/lb):	na		
Free Swelling Index:	na		
Hardgrove Grindability:	na		
Ash-Softening Temperature (F°):	na		
Methane Characteristics:	na		
Reflectance Data:	na		

COAL PRODUCTION

2003 Production (tons):

2004 Production (tons): 587,990

Cumulative Production through 2004 (tons): 587,990

Projected Production for 2005 (tons): 4,000,000

Production per Shift (tons): 5,000 tons/shift continuo

Shifts per Day: 4 (10 hours), 3 (13 hours) per we

Reserves (tons): 42 million tons

Preparation Plant: Heavy media, cyclone, 700 tp

Tipple:

Haulage: Conveyors

Equipment: DBT America DDR 1300 longwall shearer

SALES DATA

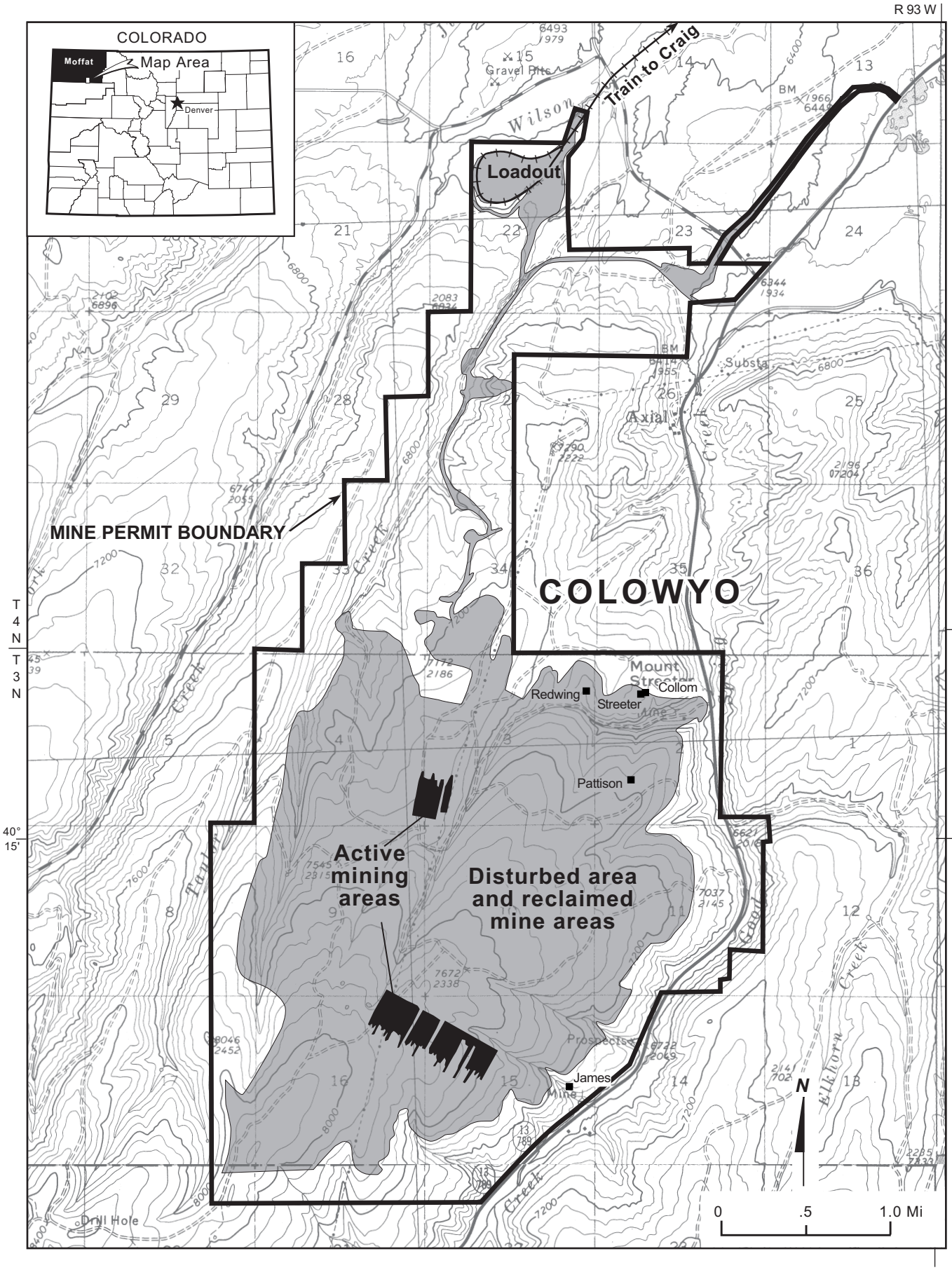
	SALES	USE	DESTINATION
In-State:	0		
Out-of-State:	100	Steam, Industrial	5% cement plants, 95% steam coal to TVA
Foreign:	0		

Mode of Transportation: Conveyor, rail

ADDITIONAL INFORMATION AND COMMENTS

Ownership in 2005 is 55% Colorado Energy Investments, LLC, 45% Sentient.
Geologic Reference Map: Dunrud, R.C., 1989, Geologic map and coal stratigraphic framework of the Paonia area, Delta and Gunnison Counties, Colorado: U.S. Geological Survey Map C-115, scale 1:50,000

COLOWYO MINE



COLOWYO MINE

CDMG Permit: C-1981-019

LOCATION INFORMATION

Previous Mine Names:

Permit Location: Sec. 15, 22, 23, 26-28, 33, 34, T. 4 N., R. 93 W; Sec 2-4, 8-11, 14-17, 20-22, T. 3 N., R. 93 W.

Topographic Quadrangle(s):
Ninemile Gap, Axial

Coal Region: Uinta

Field: Danforth Hills

County Moffat

COMPANY INFORMATION

Parent Company:
Kennecott Energy Co.

505 S. Gillette Ave., Gillette, WY 82716

(307) 687-6000
Contact: Bret Clayton, President and CEO

Local Mine Operator:
Colowyo Coal Company, L.P.

5731 State Highway 13, Meeker, CO 81641

Contact: Kelly Sanders, General Mgr.
Phone: (970) 824-1500
Fax: (970) 824-1504

Web Site: *http://www.kenergy.com*

GENERAL INFORMATION

Mine Type: Surface
Mine Status: Producing
Mining Method: Dragline, truck and shovel
Start-Up Date: 1976
No. of Acres in Permit: 7,402

No. of Employees: 318
Union Affiliation: Non-Union
Surface: Federal/State/Private
Mineral: Federal/State/Private

GEOLOGIC INFORMATION

Geologic Age: Upper Cretaceous

Geologic Unit: Williams Fork Fm, Fairfield Coal Group

Coal Zone(s) or Bed(s):
8 seams: Y, X, A, B, C, D, E, F

Coal Bed Thickness(es):
52.2 ft total; Y=4 ft, X=10.7 ft, A=2 ft, B=6.8 ft, C=6.4 ft, D=10.1 ft, E=6.8 ft, F=5.4 ft

Contact for Geologic Information at Mine:
Juan Garcia

Strike of Bedding: N60°W

Dip of Bedding: 0-20° NE

Cleat Orientation and Spacing:
132°

Thickness of Overburden:
400 ft total overburden and interburden

Thickness of Interburden:

COLOWYO MINE

COAL QUALITY

	SAMPLE 1	SAMPLE 2	SAMPLE 3
	Composite Sample pre-2000	2003 Shipment Composite	
Seam:	East Pit seams	F-B seams	
Rank:	Sub B	Sub B	
Moisture (%):	16.93	16.34	
Ash (%):	5.75	5.98	
Fixed Carbon (%):	44.76	44.65	
Volatile Matter (%):	32.79	33.03	
Sulfur (%):	0-1	0-1	
Heating Value (Btu/lb):	10,453	10466	
Free Swelling Index:			
Hardgrove Grindability:	49	49	
Ash-Softening Temperature (F°):	2,303	2338	
Methane Characteristics:			
Reflectance Data:			

COAL PRODUCTION

2003 Production (tons): 4,998,615

2004 Production (tons): 6,379,546

Cumulative Production through 2004 (tons): 112,840,674

Projected Production for 2005 (tons): 5,500,000

Production per Shift (tons): 10,000

Shifts per Day: 2 (12 hours)

Reserves (tons): 140,000,000

Preparation Plant: No plant, just Crusher and scr

Tipple: Yes

Haulage: Haulage trucks out of pit to crusher and

Equipment: 495 BEShovel, Marion 8050 dragline w/60 yd bucket, overburden drills,

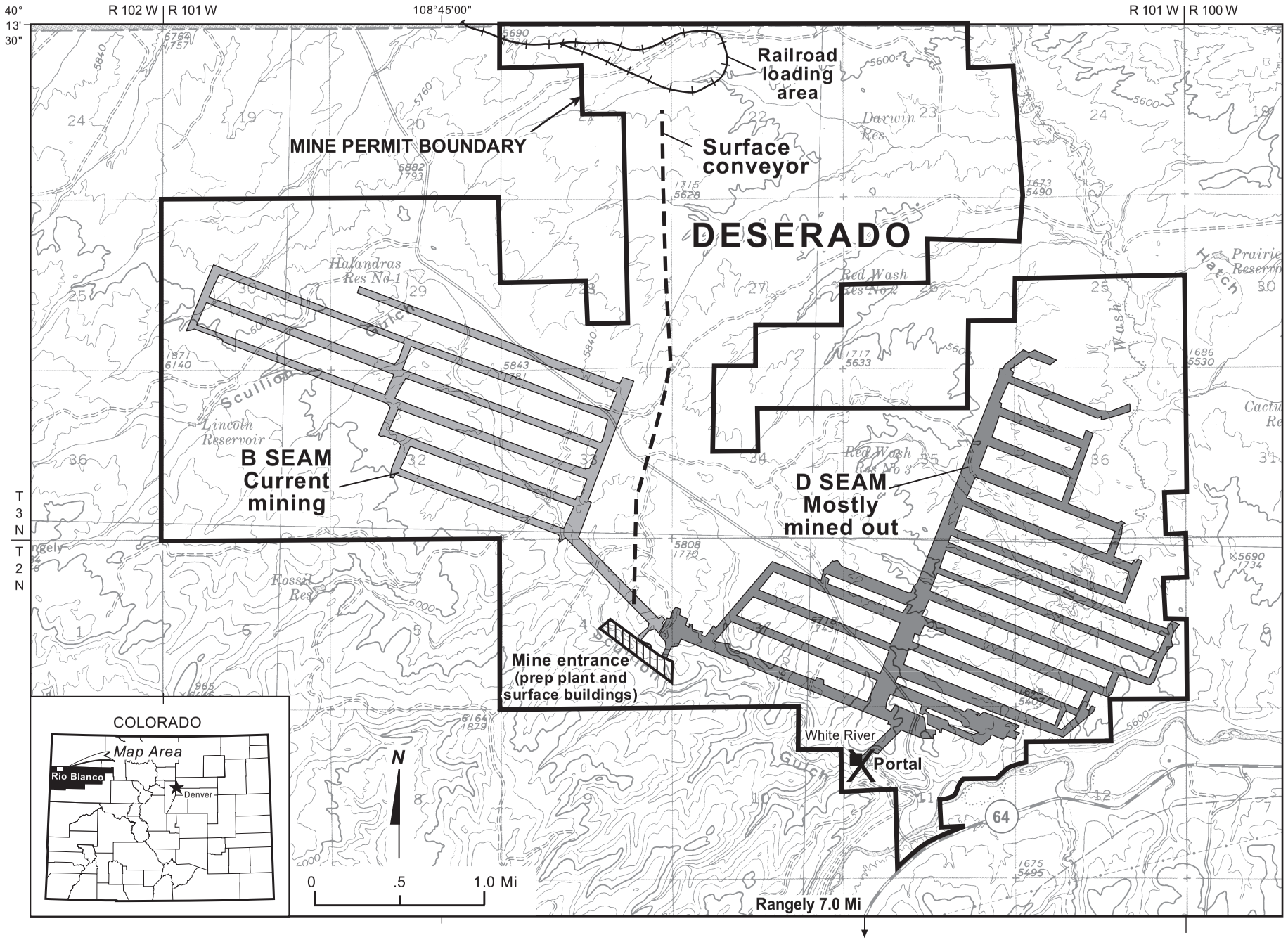
SALES DATA

	SALES	USE	DESTINATION
In-State:	57%	Steam, industrial	Xcel Energy Valmont Plant, Cherokee Plant, Hayden Plant; Tri-State Craig Station
Out-of-State:	43%	Steam, industrial	NB, TX, IA, AZ
Foreign:	0		

Mode of Transportation: Rail (Union Pacific)

ADDITIONAL INFORMATION AND COMMENTS

Colowyo now using a highwall miner with Joy continuous miner (ICG ADDCAR) mining system. Colowyo is the 37th largest coal mine in the US, and the 25th largest surface mine. Geologic Map Reference: Hardy, J.K., and Zook, J.M., 1997, Geologic map and cross sections of the Axial quadrangle, Moffat County, Colorado: Colorado Geological Survey Open-File Report 97-5, scale 1:24,000.



DESERADO MINE

DESERADO MINE

CDMG Permit: C-1981-018

LOCATION INFORMATION

Previous Mine Names:

Permit Location: Sec. 1-4, 10-12, T. 2 N., R. 101 W.; Sec. 21-23, 25-36, T. 3 N., R. 101 W.

Topographic Quadrangle(s):
Rangely NE, Cactus Reservoir

Coal Region: Uinta

Field: Lower White River

County Rio Blanco

COMPANY INFORMATION

Parent Company:
Deseret Generation and Transmission Coop.

10714 S. Jordan Gateway 300, S. Jordan, UT 84095

(801) 619-6510
Contact: Edward Thatcher

Local Mine Operator:
Blue Mountain Energy, Inc.

3607 County Road 65, Rangely, CO 81648

Contact: Alan Hillard, Mine Manager
Phone: (970) 675-4312
Fax: (970) 675-4399

Web Site: *http://www.deseretgt.com/grid/powerpoints/deserado.shtml*

GENERAL INFORMATION

Mine Type: Underground
Mine Status: Producing
Mining Method: Longwall
Start-Up Date: 1982
No. of Acres in Permit: 9,497

No. of Employees: 150
Union Affiliation: UMWA No. 1984
Surface: Federal/Private
Mineral: Federal

GEOLOGIC INFORMATION

Geologic Age: Upper Cretaceous
Geologic Unit: Lower Williams Fork Formation

Coal Zone(s) or Bed(s):
B and D

Coal Bed Thickness(es):
B: 7-16 ft., D: 6-8 ft.

Contact for Geologic Information at Mine:
Jeff Dubbert

Strike of Bedding: N46°W
Dip of Bedding: 7.5° NE

Cleat Orientation and Spacing:
N80E-N87E face, 1-4 in spacing

Thickness of Overburden:
400-900 ft.

Thickness of Interburden:
10-40 ft B-D

DESERADO MINE

COAL QUALITY

	SAMPLE 1	SAMPLE 2 Average D-Seam Quality 2003	SAMPLE 3 Average B-Seam Quality 2003
Seam:	A/B/C	D	B
Rank:	Sub A	Sub A	
Moisture (%):	12.0	10	14-16
Ash (%):	16.1	10	10-12
Fixed Carbon (%):			
Volatile Matter (%):			
Sulfur (%):	0-1	0-1	0.4-0.6
Heating Value (Btu/lb):	9,400	10500	9800
Free Swelling Index:			
Hardgrove Grindability:			
Ash-Softening Temperature (F°):	2,550		
Methane Characteristics:	Low		
Reflectance Data:			

COAL PRODUCTION

2003 Production (tons): 1,942,772

2004 Production (tons): 2,552,762

Cumulative Production through 2004 (tons): 28,311,150

Projected Production for 2005 (tons): 2,100,000

Production per Shift (tons): 8,500 tons

Shifts per Day: 2 8-hrs, 1 10-hrs daily

Reserves (tons): 24 years

Preparation Plant: 750 tons/hour

Tipple:

Haulage: 2,500 tons/hour. 3. mile conveyor to trai

Equipment: Joy 4LS-5 DDR 1030 longwall shearer

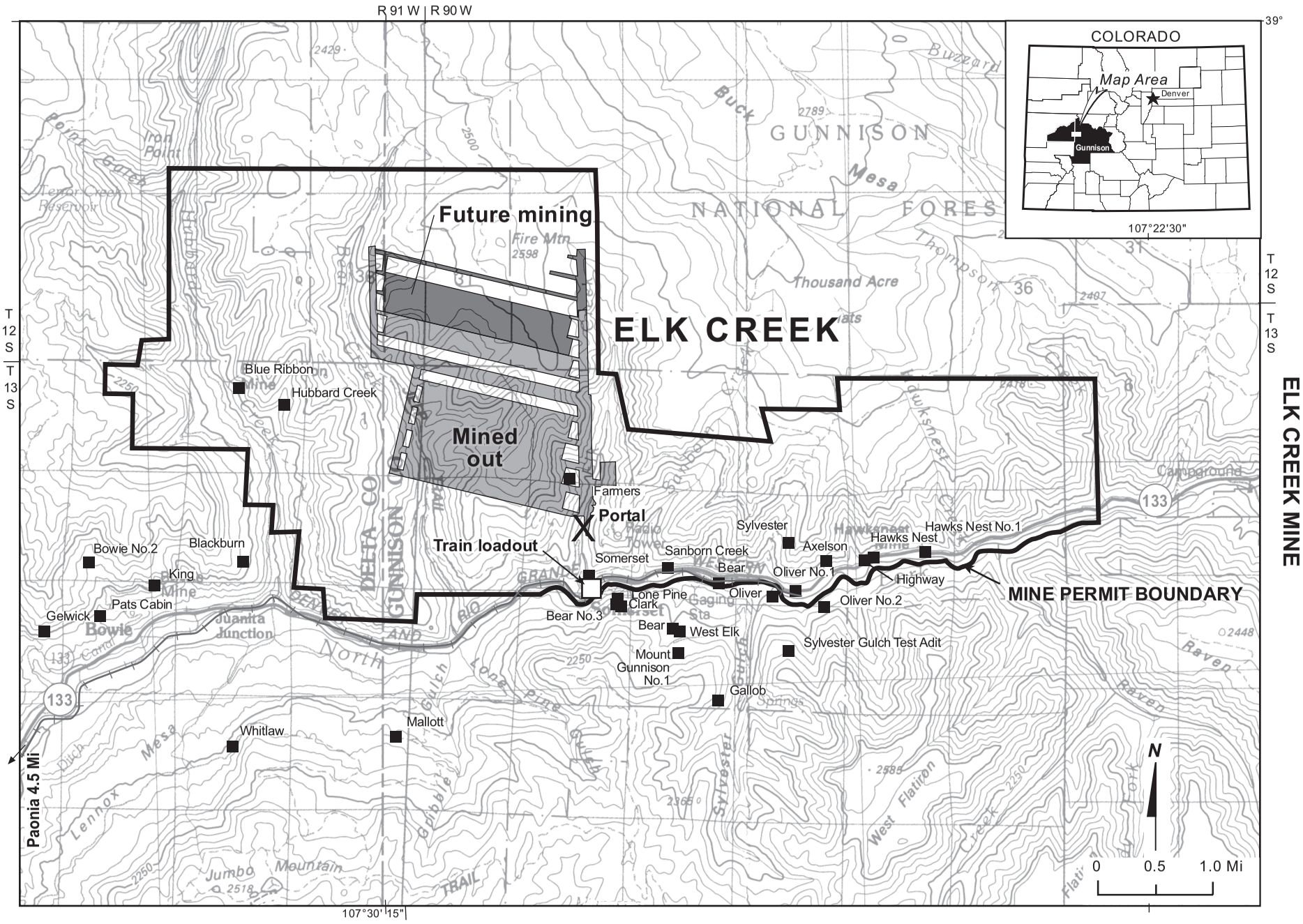
SALES DATA

	SALES	USE	DESTINATION
In-State:	0	none	none
Out-of-State:	100%	Steam	Utah (Bonanza Power Plant)
Foreign:			

Mode of Transportation: Electric unit train

ADDITIONAL INFORMATION AND COMMENTS

Captive fuel supply for the Bonanza Power Plant in Utah. Coal is delivered by an electric railroad to the power plant. The B seam is currently being mined. Cumulative production through 2003 estimated from DMG reports. Geologic Map Reference: Barnum, B.E. and Garrigues, R.S., 1980, Geologic map and coal sections of the Cactus Reservoir quadrangle, Rio Blanco and Moffat Counties, Colorado: U.S. Geological Survey Map MF-1179, scale 1:24,000



ELK CREEK MINE

ELK CREEK

CDMG Permit: C-1981-022

LOCATION INFORMATION

Previous Mine Names:

Permit Location: Sec. 6, 7, T. 13 S., R. 89 W.; Sec. 31, T. 12 S., R. 90 W.; Sec. 34-36, T. 12 S., R. 91 W.; Sec. 1-12, T. 13 S., R. 90 W.; Sec. 1-3, 11-13, T. 13 S., R. 91 W.

Topographic Quadrangle(s):
Somerset, Bowie

Coal Region: Uinta

Field: Somerset

County Gunnison

COMPANY INFORMATION

Parent Company:
Oxbow Carbon and Minerals Holdings, Inc.

1601 Forum Place, West Palm Beach, FL 33401.

Contact: Jim Cooper

Local Mine Operator:
Oxbow Mining, LLC

P.O. Box 535, Somerset, CO 81434

Contact: Bob Koch
Phone: (970) 929-5122
Fax: (970) 929-5177

Web Site: *http://tinyurl.com/5wep2*

GENERAL INFORMATION

Mine Type: Underground
Mine Status: Active
Mining Method: Longwall, continuous miners
Start-Up Date: Jan. 2003
No. of Acres in Permit: 9,047

No. of Employees: 304
Union Affiliation: Non-union
Surface: Federal/Private
Mineral: Federal/Private

GEOLOGIC INFORMATION

Geologic Age: Upper Cretaceous

Geologic Unit: Mesaverde Group, Bowie Shale Mbr

Coal Zone(s) or Bed(s):
D2 seam

Coal Bed Thickness(es):
D=6-19 ft. D2 seam minable is 14 ft.

Contact for Geologic Information at Mine:
Ken Ball

Strike of Bedding: N55W

Dip of Bedding: 2-5 NE

Cleat Orientation and Spacing:
N70E, dip 90, 4-6 inches

Thickness of Overburden:
200-2500 ft

Thickness of Interburden:
B-D is 230-300 ft (avg), B-C is 35-90 ft, C-D2 is 170 ft. E seam 160 ft above D2 seam.

ELK CREEK

COAL QUALITY	SAMPLE 1 Sanborn Creek Mine	SAMPLE 2 Core Sample 2004	SAMPLE 3
Seam:	B	D	
Rank:	Bituminous	Bituminous	
Moisture (%):	6.25	5.37	
Ash (%):	8.59	6.03	
Fixed Carbon (%):	47.25	50.65	
Volatile Matter (%):	38	38	
Sulfur (%):	0-1	0-1	
Heating Value (Btu/lb):	12,375	12,829	
Free Swelling Index:	2.5	3.0	
Hardgrove Grindability:	48	51	
Ash-Softening Temperature (F°):	2,470	2,580	
Methane Characteristics:			
Reflectance Data:	0.74		

COAL PRODUCTION

2003 Production (tons): 4,595,582

2004 Production (tons): 6,549,034

Cumulative Production through 2004 (tons): 11,144,616

Projected Production for 2005 (tons): 6,400,000

Production per Shift (tons): 11,200

Shifts per Day: 3 (2-8 hrs, 1-8 hr maint)

Reserves (tons): 47.6 million (9 yrs)

Preparation Plant: none

Tipple: Terror Creek

Haulage: rail

Equipment: Joy 7LS-3A DDR 1700 longwall shearer

SALES DATA

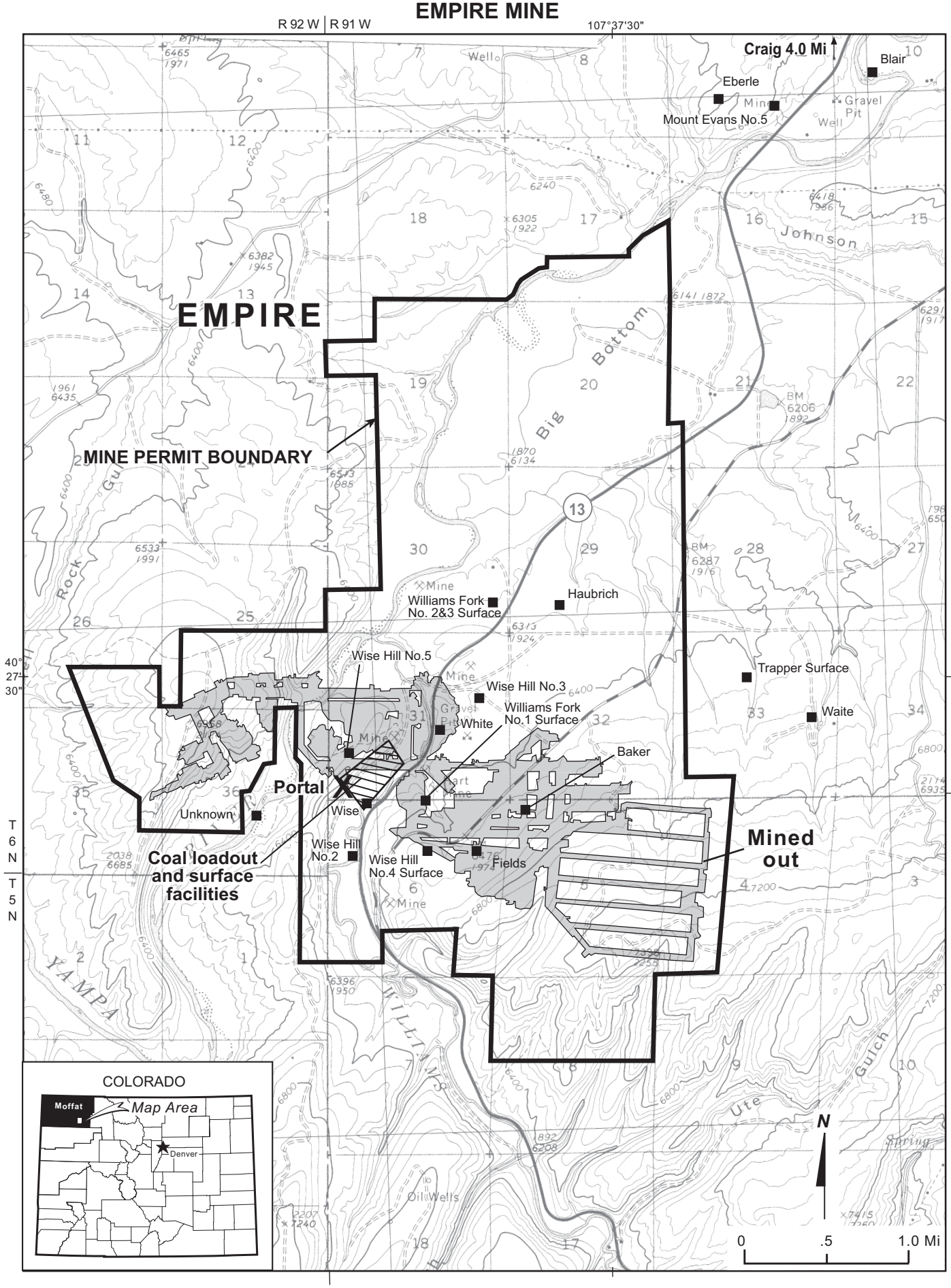
	SALES	USE	DESTINATION
In-State:	6.3%	Steam	Tri-Gen (Coors Brewery); Xcel Energy (Valmont plant)
Out-of-State:	93.7%	Steam	TX, TN, KY, MA, GA
Foreign:	0	0	0

Mode of Transportation: Rail (Union Pacific), Truck (Terror Creek Loadout)

ADDITIONAL INFORMATION AND COMMENTS

Elk Creek is the 48th largest coal mine in the US, and the 18th largest underground coal mine nationally. Some coal even transported via Atlantic seaboard vessel in 2004.

EMPIRE MINE


R 92 W
R 91 W
107°37'30"
Craig 4.0 Mi
Blair
Eberle
Mount Evans No.5
Gravel Pit
Well
Johnson
EMPIRE
MINE PERMIT BOUNDARY
Big Bottom
Rock Gulch
13
Williams Fork No. 2&3 Surface
Haubrich
Trapper Surface
Waite
Wise Hill No.5
Wise Hill No.3
Williams Fork No.1 Surface
White
Baker
Portal
Wise
Unknown
Wise Hill No.2
Wise Hill No.4 Surface
Fields
Coal loadout and surface facilities
Mined out
40° 27' 30"
T 6 N
T 5 N
YAMPA
WILLIAMS
Ute Gulch
Spring
Oil Wells
COLORADO
Moffat
Map Area
Denver
N
0
.5
1.0 Mi

EMPIRE MINE

CDMG Permit: C-1981-044

LOCATION INFORMATION

Previous Mine Names:
Empire Mine, Eagle 5&9 Mines

Coal Region: Green River

Field: Yampa

Permit Location: Sec. 19, 20, 21, 28-33, T. 6 N., R. 91 W.; Sec. 4-6, 8, T. 5 N., R. 91 W.; Sec. 25, 26, 35, 36, T. 6 N., R. 92 W.

Topographic Quadrangle(s):
Round Bottom, Castor Gulch

County Moffat

COMPANY INFORMATION

Parent Company:
Peabody Energy Company

701 Market St., # 765, St. Louis, MO 63101

(314) 342-3766

Contact: Charles A. Burggraf, Group Executive, Colorado

Local Mine Operator:
Twentymile Coal Co.

P.O. Box 68, Craig, CO 81626

Contact:

Phone: (970) 879-3800

Fax:

Web Site: _____

GENERAL INFORMATION

Mine Type: Underground

Mine Status: Idle

Mining Method: Longwall, continuous miners

Start-Up Date: Early 1970s

No. of Acres in Permit: 6,387

No. of Employees: 3

Union Affiliation: UMWA

Surface: Federal/State/Private

Mineral: Federal/State/Private

GEOLOGIC INFORMATION

Geologic Age: Upper Cretaceous

Geologic Unit: Williams Fork Formation

Coal Zone(s) or Bed(s):
F & E

Coal Bed Thickness(es):
10.5 ft

Contact for Geologic Information at Mine:
Rocky Thompson

Strike of Bedding: NW

Dip of Bedding: 12-15°

Cleat Orientation and Spacing:
320-314° face cleat fairly well developed in NWSE 31, T. 6 N., T. 91 W.

Thickness of Overburden:
0-900 ft

Thickness of Interburden:

EMPIRE MINE

COAL QUALITY	SAMPLE 1	SAMPLE 2	SAMPLE 3
Seam:	F & E		
Rank:	Bituminous		
Moisture (%):	8.93-12.84		
Ash (%):	4.99-10.36		
Fixed Carbon (%):	41.75-52.85		
Volatile Matter (%):	35.43-38.83		
Sulfur (%):	0-1	0-1	
Heating Value (Btu/lb):	10,377-11,567		
Free Swelling Index:			
Hardgrove Grindability:			
Ash-Softening Temperature (F°):			
Methane Characteristics:			
Reflectance Data:			

COAL PRODUCTION

2003 Production (tons):

2004 Production (tons):

Cumulative Production through 2004 (tons): 19,719,949

Projected Production for 2005 (tons):

Production per Shift (tons):

Shifts per Day:

Reserves (tons): 25 years

Preparation Plant:

Tipple: Yes

Haulage:

Equipment: Anderson Mavor, Kloeckner Becroit face conveyor

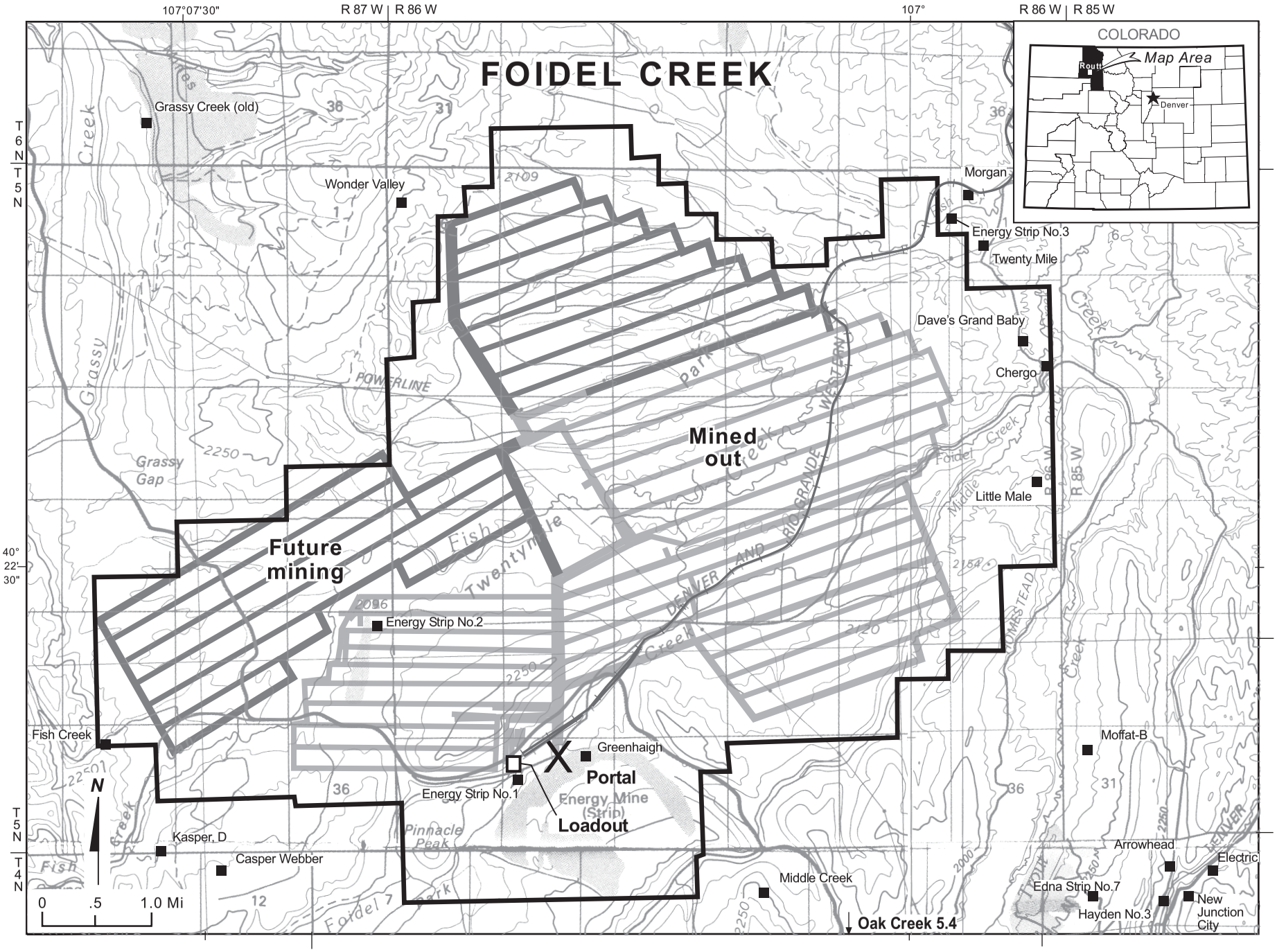
SALES DATA

	SALES	USE	DESTINATION
In-State:			
Out-of-State:			
Foreign:			

Mode of Transportation:

ADDITIONAL INFORMATION AND COMMENTS

No production or sales since 1995; mine was idle from 1995-2005.


FOIDEL CREEK
107°07'30"
R 87 W | R 86 W
107°
R 86 W | R 85 W
COLORADO
Map Area
Routt
Denver
T 6 N
T 5 N
T 5 N
T 4 N
40° 22' 30"
Grassy Creek (old)
Wonder Valley
Morgan
Energy Strip No.3
Twenty Mile
Dave's Grand Baby
Chergo
Little Male
Mined out
Future mining
Energy Strip No.2
Fish Creek
Greenhaigh
Portal
Energy Mine (Strip)
Loadout
Energy Strip No.1
Kasper, D
Casper Webber
Middle Creek
Oak Creek 5.4
Moffat-B
Arrowhead
Electric
Edna Strip No.7
Hayden No.3
New Junction City
Grassy Gap
Pinnacle Peak
POWERLINE
Grassy Creek
Fish Creek
Twentymile Park
Fordel Creek
Middle Fordel Creek
Foidel Creek
Fordel Park
DENVER AND RIO GRANDE WESTERN
DENVER
HOMESTEAD
N
0 .5 1.0 Mi
FOIDEL CREEK MINE

FOIDEL CREEK MINE

CDMG Permit: C-1982-056

LOCATION INFORMATION

Previous Mine Names:
Main, Twentymile

Permit Location: Sec. 1-33, T. 5 N., R. 86 W.; Sec. 32, 33, T. 6 N., R. 86 W., Sec. 23-27, 34-36, T. 5 N., R. 87 W.; Sec. 7-9, T. 4 N., R. 86 W.

Topographic Quadrangle(s):
Rattlesnake Butte, Milner, Oak Cr, Cow Cr, Dunkley

Coal Region: Green River

Field: Yampa

County Routt

COMPANY INFORMATION

Parent Company:
Peabody Energy Co.

701 Market St., # 765, St. Louis, MO 63101

(314) 342-3766

Contact: Charles A. Burggraf, Group Executive, Colorado

Local Mine Operator:
BTU Worldwide Inc, Twentymile Coal Company

29515 Routt Cty Rd. 27, Oak Creek, CO 80467

Contact: Mike Ludlow
Phone: (970) 879-3800
Fax: (970) 879-8050

Web Site: *http://www.peabodyenergy.com/*

GENERAL INFORMATION

Mine Type: Underground
Mine Status: Producing
Mining Method: Longwall, continuous miners
Start-Up Date: April 1983
No. of Acres in Permit: 22,000

No. of Employees: 360
Union Affiliation: Non-Union
Surface: Federal/State/Private
Mineral: Federal/State/Private

GEOLOGIC INFORMATION

Geologic Age: Upper Cretaceous

Geologic Unit: Williams Fork Formation, Middle Coal Group

Coal Zone(s) or Bed(s):
Wadge

Coal Bed Thickness(es):
8.5-9.5 ft

Contact for Geologic Information at Mine:
Rocky Thompson

Strike of Bedding: N25°E-N50°W

Dip of Bedding: 2-6°

Cleat Orientation and Spacing:
N40°W

Thickness of Overburden:
900-1600 ft, avg. 1200 ft

Thickness of Interburden:

FOIDEL CREEK MINE

COAL QUALITY	SAMPLE 1 As shipped	SAMPLE 2	SAMPLE 3
Seam:	Wadge		
Rank:	Bituminous C		
Moisture (%):	10.0		
Ash (%):	9.5		
Fixed Carbon (%):	44.5		
Volatile Matter (%):	35.5		
Sulfur (%):	0-1	0-1	
Heating Value (Btu/lb):	11,300		
Free Swelling Index:			
Hardgrove Grindability:			
Ash-Softening Temperature (F°):	2,515		
Methane Characteristics:			
Reflectance Data:			

COAL PRODUCTION

2003 Production (tons): 8,127,386

2004 Production (tons): 8,557,745

Cumulative Production through 2004 (tons): 95,447,277

Projected Production for 2005 (tons): 9,200,000

Production per Shift (tons): 22,500

Shifts per Day: 2 (10 hours)

Reserves (tons): 10 years

Preparation Plant: wash plant, 5% of products

Tipple: 2,000 tons/hr

Haulage: MTA face conveyor system

Equipment: MTA shields, Anderson EL 3000 shearer, DBT America DDR 1920

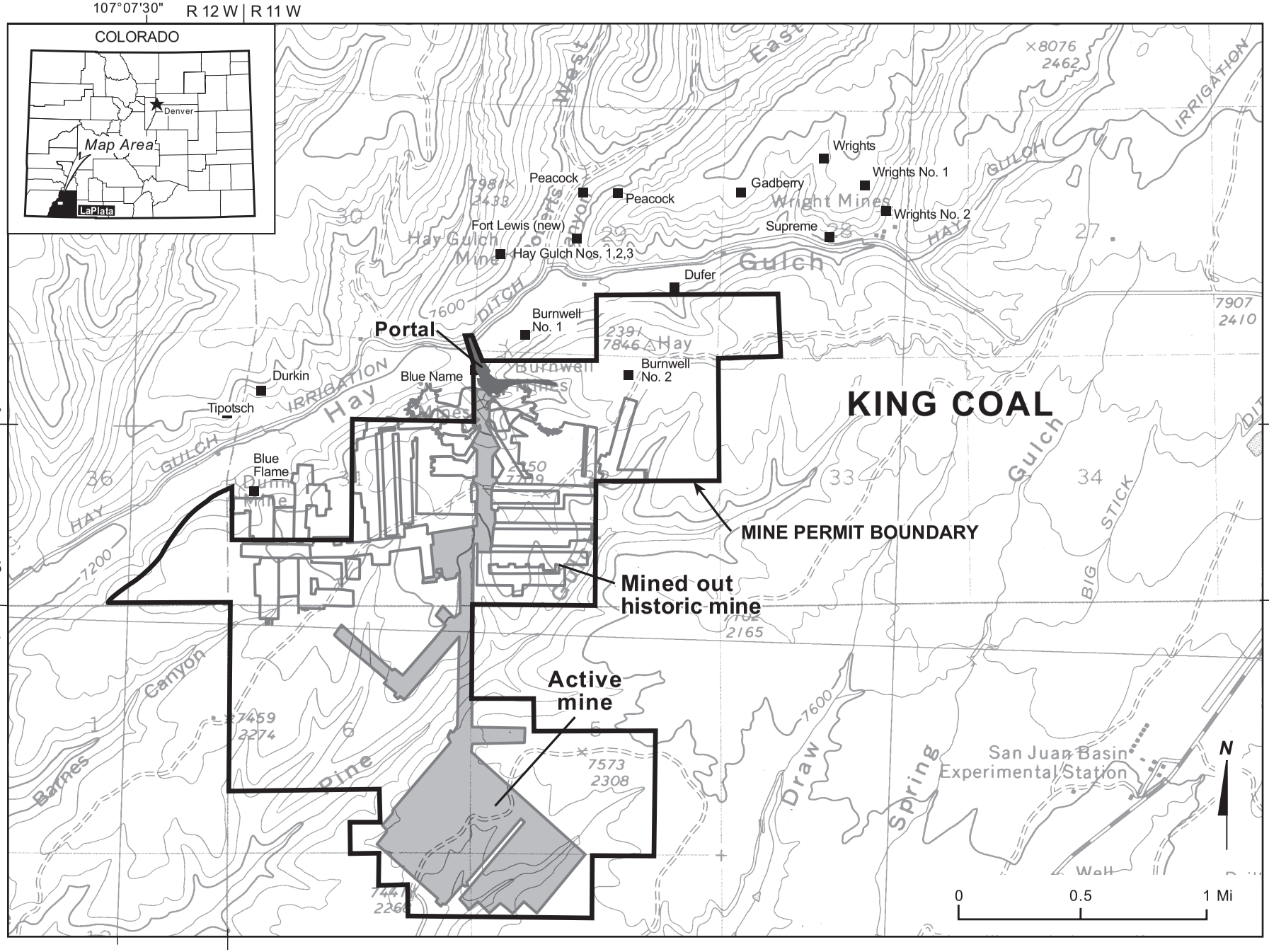
SALES DATA

	SALES	USE	DESTINATION
In-State:	35%	Steam	Colorado Springs, Denver
Out-of-State:	50%	Steam, industrial	AZ, TX, MS, MI, WI, MO, IA, WY, AL
Foreign:	15%	Steam	Mexico

Mode of Transportation: Rail (Union Pacific)

ADDITIONAL INFORMATION AND COMMENTS

Foidel Creek Mine is the 18th largest coal mine in the U.S., and the third largest underground coal mine. Geologic Map References: Dames & Moore, 1979, Coal resource and development of the Milner quad: USGS OFR 79-815; Dames & Moore, 1979, Coal resource and development maps of the Rattlesnake Butte quad: USGS OFR 1396; Carroll, C.J., and Morgan, M.L., 2000, Demonstrated reserve base for coal in Colorado; Yampa coal field: CGS OFR 00-12; Carroll, C.J., Papp, A.R., and Kinnes, D.W., 2003, Available coal resources of the Williams Fork Formation, Yampa Coal Field, CGS Resources Series 41..


107°07'30"
R 12 W | R 11 W
COLORADO
Denver
Map Area
LaPlata
KING COAL
KING COAL MINE
Portal
MINE PERMIT BOUNDARY
Mined out historic mine
Active mine
Durkin
Tipotsch
Blue Name
Blue Flame
Burnwell No. 1
Burnwell No. 2
Dufer
Fort Lewis (new)
Hay Gulch Nos. 1,2,3
Peacock
Peacock
Gadberry
Wrights
Wrights No. 1
Wrights No. 2
Supreme
Wright Mines
Hay Gulch Mine
Burnwell Mines
Plum Mine
San Juan Basin Experimental Station
37° 15'
T 35 N
T 34 N
0
0.5
1 Mi
N

KING COAL MINE

CDMG Permit: C-1981-035

LOCATION INFORMATION

Previous Mine Names:
National King Coal, LLC

Permit Location: Sec. 28, 29, 31, 32, T. 35 N., R. 11 W.; Sec. 5, 6, T. 34 N., R. 11 W.; Sec. 36, T. 35 N., R. 12 W.

Topographic Quadrangle(s):
Kline, Hesperus

Coal Region: San Juan River

Field: Durango

County La Plata

COMPANY INFORMATION

Parent Company:
Alpha Natural Resources

P.O.BOX 2345, Abindgon, VA 24212

(800) 856-0715
Contact: Trent Peterson

Local Mine Operator:
National King Coal, LLC

4424 County Rd. 120, Hesperus, CO 81326

Contact: Tom Bird
Phone: (970) 385-4528
Fax: (970) 385-4638

Web Site: *http://alphanr.com/Home.aspx*

GENERAL INFORMATION

Mine Type: Underground
Mine Status: Producing
Mining Method: Continuous miner
Start-Up Date: 1936
No. of Acres in Permit: 1,433

No. of Employees: 57
Union Affiliation: Non-Union
Surface: State/Private
Mineral: Federal/State/Private

GEOLOGIC INFORMATION

Geologic Age: Cretaceous
Geologic Unit: Upper Menefee

Coal Zone(s) or Bed(s):
Upper

Coal Bed Thickness(es):
52-72 in.

Contact for Geologic Information at Mine:
Tom Bird

Strike of Bedding:
Dip of Bedding: 3° S-SW

Cleat Orientation and Spacing:
N51°W, dip 90° face, Sec. 32, T. 35 N., R. 11 W.

Thickness of Overburden:
0-325 ft

Thickness of Interburden:

KING COAL MINE

COAL QUALITY	SAMPLE 1	SAMPLE 2	SAMPLE 3
Seam:	Menefee A		
Rank:			
Moisture (%):	5		
Ash (%):	8		
Fixed Carbon (%):	57		
Volatile Matter (%):	36		
Sulfur (%):	0-1	0-1	
Heating Value (Btu/lb):	12,800		
Free Swelling Index:	4.2		
Hardgrove Grindability:	44		
Ash-Softening Temperature (F°):	2,700		
Methane Characteristics:			
Reflectance Data:			

COAL PRODUCTION

2003 Production (tons): 392,966

2004 Production (tons): 460,609

Cumulative Production through 2004 (tons): 4,694,611

Projected Production for 2005 (tons): 400,000

Production per Shift (tons): 1,000 tons

Shifts per Day: 2 (10 hours), 4 days/week

Reserves (tons): 3-4 years, 25 years in East Alkal

Preparation Plant:

Tipple: Screen and crusher

Haulage: Shuttle car to belt

Equipment: Continuous miner sections

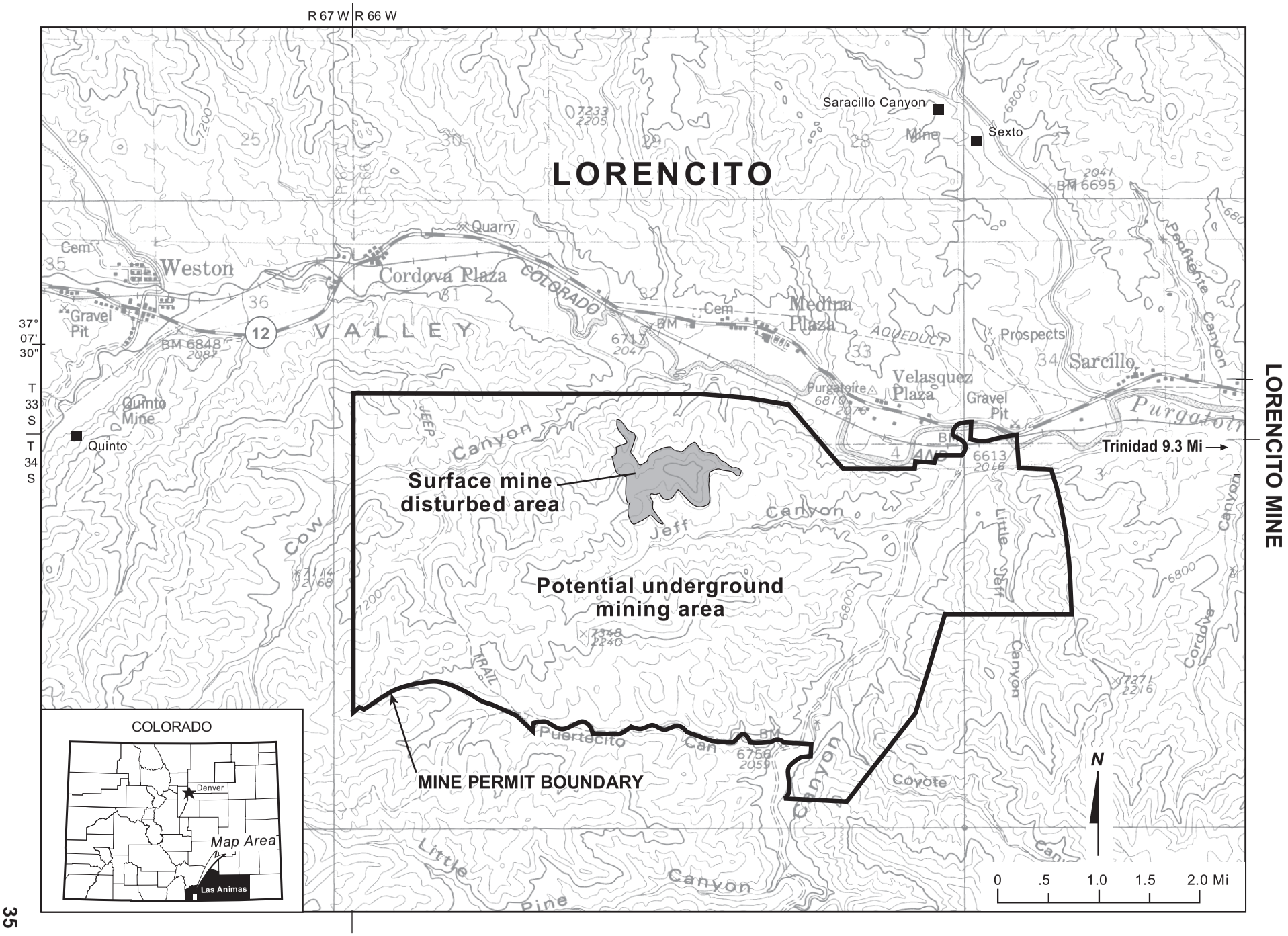
SALES DATA

	SALES	USE	DESTINATION
In-State:	10%	Domestic, industrial DRGG train)	Durango (stoker, lump, nut sales)
Out-of-State:	60%	Industrial	AZ, NM, TX
Foreign:	30%	Industrial	Mexico

Mode of Transportation: Truck

ADDITIONAL INFORMATION AND COMMENTS

Cement plant coal is trucked to Gallup, NM, railhead. Geologic Map Reference: Zapp, A.D., 1949, Geology and coal resources of the Durango area, La Plata and Montezuma Counties, Colorado: U.S. Geological Survey Oil Investigations Map 109, scale 1:236,720; Kirkham, R.M., Gonzales, D.A., Poitras, C., Remly, K., and Allen, D., 2000, Geologic Map of the Hesperus Quadrangle, La Plata and Montezuma Counties, Colorado: Colorado Geological Survey Open-File Report 00-04, scale 1:24,000.


LORENCITO
R 67 W
R 66 W
37° 07' 30"
T 33 S
T 34 S
Weston
Cordova Plaza
Medina Plaza
Velasquez Plaza
Saracillo Canyon
Sexto
Prospects
Sarcillo
Gravel Pit
Quinto Mine
Quinto
Quarry
Cem
BM 6848
BM 6695
BM 6613
BM 6756
COLORADO
VALLEY
AQUEDUCT
Purgatoire
Canyon
Jeff Canyon
Cow Canyon
Little Jeff Canyon
Puertecito Can
Coyote Canyon
Little Pine Canyon
JEEP TRAIL
Trinidad 9.3 Mi
LORENCITO MINE
Surface mine disturbed area
Potential underground mining area
MINE PERMIT BOUNDARY
COLORADO
Denver
Map Area
Las Animas
N
0 .5 1.0 1.5 2.0 Mi

LORENCITO CANYON MINE

CDMG Permit: C-1996-084

LOCATION INFORMATION

Previous Mine Names:
Jeff Canyon Surface Mine

Permit Location: Sec. 6, 5, 4, T. 34 S., R.66 W.; Sec. 32, T. 33 S., R. 66 W.

Topographic Quadrangle(s):
Little Pine Canyon

Coal Region: Raton Mesa

Field: Trinidad

County Las Animas

COMPANY INFORMATION

Parent Company:
AP Maxwell Development Co., LLC
AP Maxwell Co.
4422 Bryan Station Rd, Lexington, Ky 40516

(606) 928-3433
Contact: Bruce Addington 859 2947333

Local Mine Operator:
AP Maxwell Development Co., LLC

Peak Project Mgment, 34115 CR 20.8, Trinidad, Co 81082

Contact: Ron Thompson
Phone: (719) 846-4975
Fax:

Web Site: *http://www.alperry.com/coal/lorencito.html*

GENERAL INFORMATION

Mine Type: Combination
Mine Status: Active, in Reclamation
Mining Method: Contour, mountaintop removal
Start-Up Date: October 2001
No. of Acres in Permit: 18,000

No. of Employees:
Union Affiliation: Non-Union
Surface: Private
Mineral: Private

GEOLOGIC INFORMATION

Geologic Age: Paleocene and Upper Cretaceou
Geologic Unit: Raton Formation

Coal Zone(s) or Bed(s):
Ciruela seam (Na, M, N, P,R)

Coal Bed Thickness(es):
1-3 ft

Contact for Geologic Information at Mine:
Ron Thompson

Strike of Bedding:
Dip of Bedding: 1° NE
Cleat Orientation and Spacing:
N30W 80 SW, 1" spacing

Thickness of Overburden:
Ciruela: 0-350 ft; Weston: 200 ft; Primero: 250 ft

Thickness of Interburden:
20-40 ft

LORENCITO CANYON MINE

COAL QUALITY	SAMPLE 1	SAMPLE 2	SAMPLE 3
Seam:			
Rank:			
Moisture (%):	7.0		
Ash (%):	10.0		
Fixed Carbon (%):	57.0		
Volatile Matter (%):	31.0		
Sulfur (%):	0-1	0-1	
Heating Value (Btu/lb):	12,500-13,000		
Free Swelling Index:	7.5-9		
Hardgrove Grindability:	65		
Ash-Softening Temperature (F°):	2,000-2,300		
Methane Characteristics:			
Reflectance Data:			

COAL PRODUCTION

2003 Production (tons): 0

2004 Production (tons):

Cumulative Production through 2004 (tons): 167,922

Projected Production for 2005 (tons):

Production per Shift (tons): 1,000

Shifts per Day: 2 (10 hrs x 5 days/wk)

Reserves (tons): 17 million surface minable

Preparation Plant: New Elk, but not used for clea

Tipple:

Haulage: 6 x 6 articulated truck

Equipment:

SALES DATA

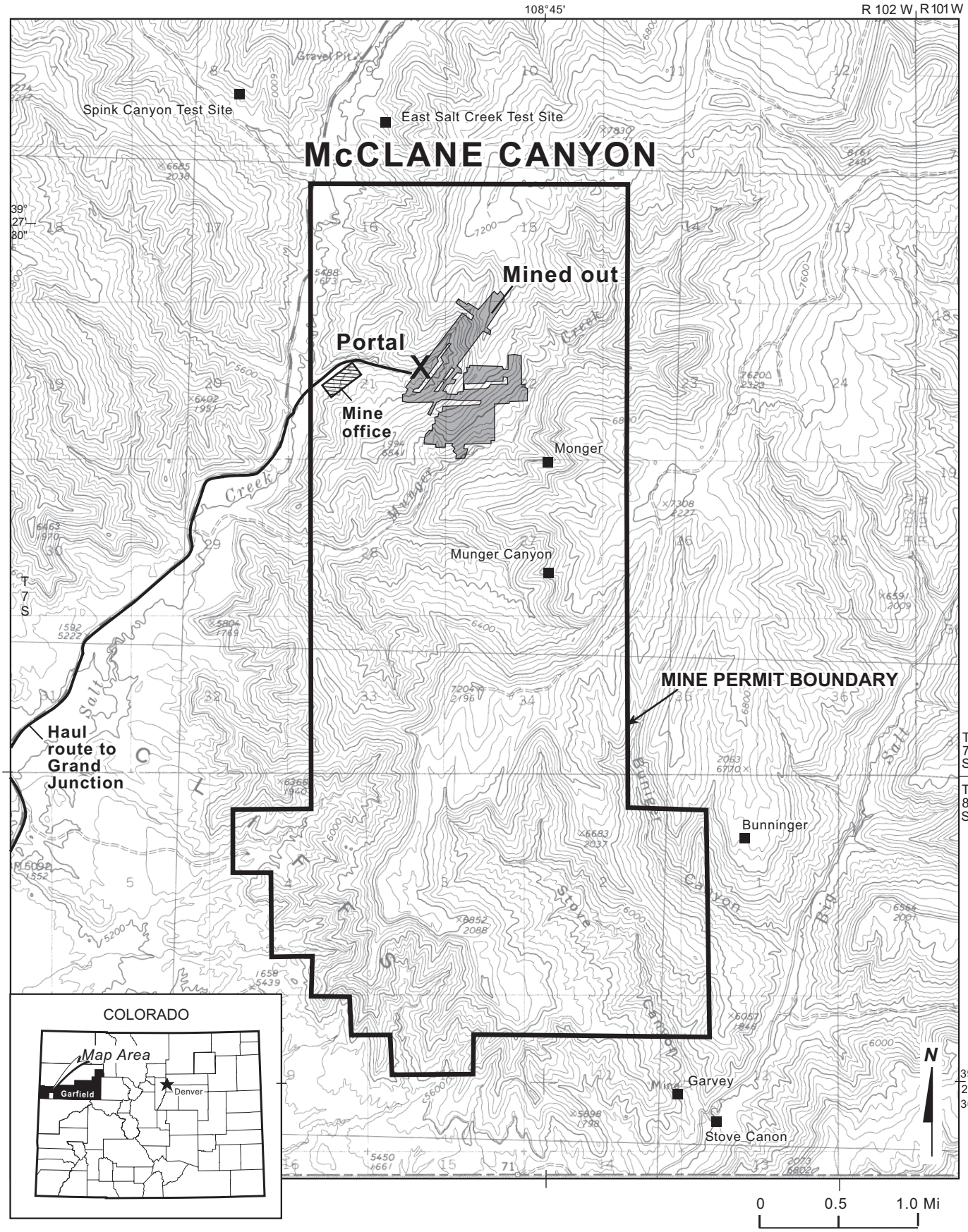
	SALES	USE	DESTINATION
In-State:		0	TVA
Out-of-State:	100%	Steam	TN
Foreign:			

Mode of Transportation: Rail, shuttle cars

ADDITIONAL INFORMATION AND COMMENTS

Geologic Map Reference: Johnson, R.B., 1969, Geologic map of the Trinidad quadrangle, south-central Colorado: U.S. Geological Survey Miscellaneous Investigations Map I-558, scale 1:250,000.

McCLANE CANYON MINE



McCLANE CANYON MINE

CDMG Permit: C-1980-004

LOCATION INFORMATION

Previous Mine Names:
Sheridan Ent., Salt Creek Mining, Lodestar Energy

Permit Location: Sec. 15, 16, 21, 22, T. 7 S., R. 102 W.

Topographic Quadrangle(s):
Howard Canyon, Garvey Canyon

Coal Region: Uinta

Field: Book Cliffs

County Garfield

COMPANY INFORMATION

Parent Company:
Central Appalachian Mining (CAM)

116 Main St, Rogers Bldg., Pikeville, KY 41501

(606) 432-3900
Contact:

Local Mine Operator:
Central Appalachian Mining (CAM)

3148 State Highway 139, Loma, CO 81524.

Contact: Walter Witlidge
Phone: (970) 858-3960
Fax:

Web Site: _____

GENERAL INFORMATION

Mine Type: Underground
Mine Status: Producing
Mining Method: Continuous miners
Start-Up Date: 1977
No. of Acres in Permit: 2,560

No. of Employees: 11
Union Affiliation: Non-Union
Surface: Federal
Mineral: Federal

GEOLOGIC INFORMATION

Geologic Age: Upper Cretaceous

Geologic Unit: Mt. Garfield Formation, Mesaverde Group

Coal Zone(s) or Bed(s):
Upper Cameo, Lower Cameo

Coal Bed Thickness(es):
Upper Cameo: 5-9 ft; Lower Cameo: 8-10 ft

Contact for Geologic Information at Mine:

Strike of Bedding: N50°W

Dip of Bedding: 2-3°NE

Cleat Orientation and Spacing:

Thickness of Overburden:
500 ft to more than 1,500 ft

Thickness of Interburden:
0-70 ft

McCLANE CANYON MINE

COAL QUALITY	SAMPLE 1 Average of 6 samples	SAMPLE 2 Average of 9 samples	SAMPLE 3
Seam:	Upper Cameo	Lower Cameo	
Rank:			
Moisture (%):	11.1	9.82	
Ash (%):	13.5	16.42	
Fixed Carbon (%):	40.43	32.57	
Volatile Matter (%):	31.49	24.52	
Sulfur (%):	0-1	0-1	
Heating Value (Btu/lb):	10,475	10,259	
Free Swelling Index:	1	1	
Hardgrove Grindability:	50	50	
Ash-Softening Temperature (F°):	2,700	2,700	
Methane Characteristics:			
Reflectance Data:			

COAL PRODUCTION

2003 Production (tons): 274,354

2004 Production (tons): 289,495

Cumulative Production through 2004 (tons): 2,286,252

Projected Production for 2005 (tons): 271,000

Production per Shift (tons): 1,280

Shifts per Day: 1

Reserves (tons): 10 years +

Preparation Plant:

Tipple:

Haulage: Shuttle cars

Equipment: Continuous miners

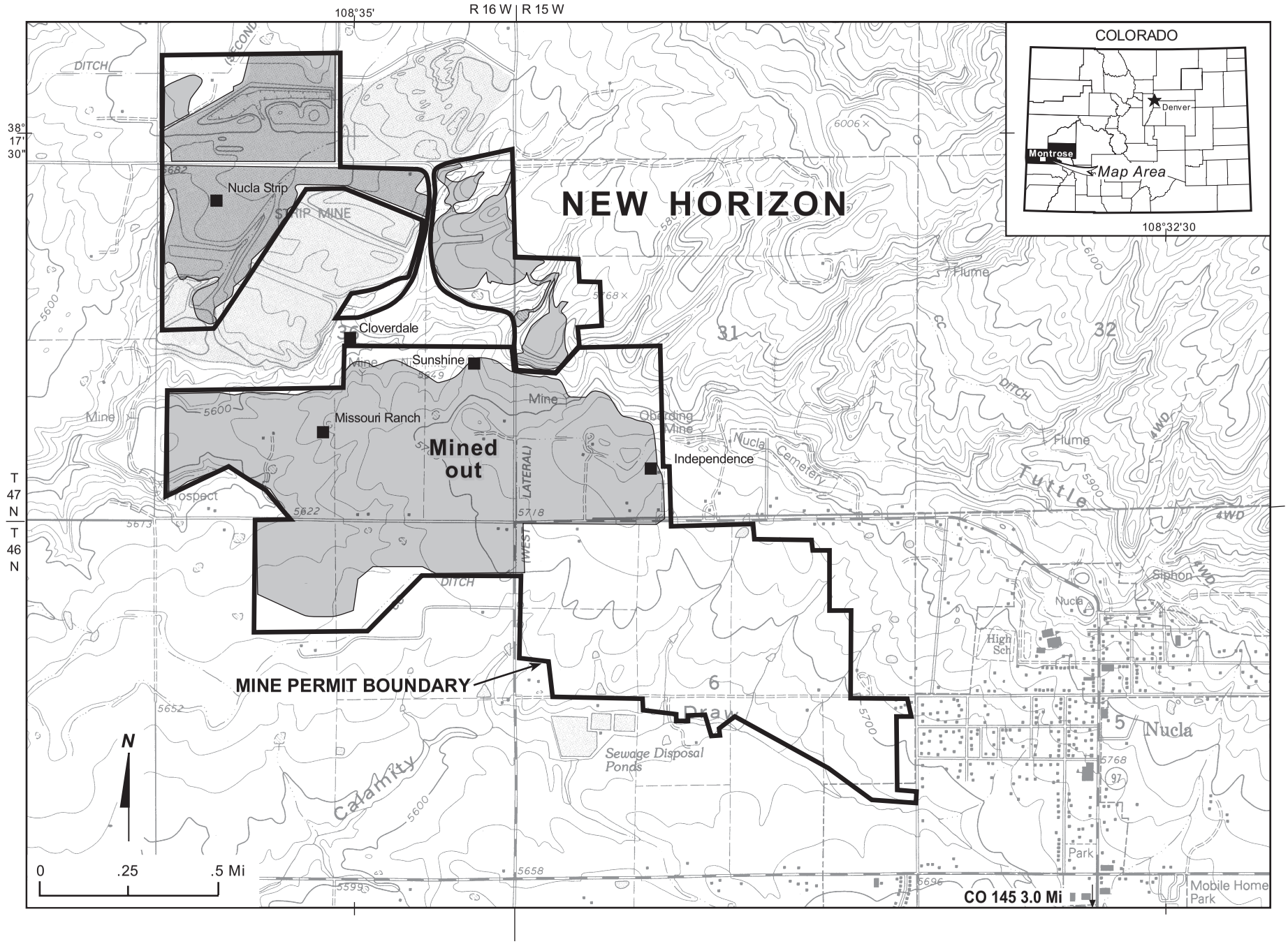
SALES DATA

	SALES	USE	DESTINATION
In-State:	100%	Steam	Cameo Power Plant
Out-of-State:	0		
Foreign:			

Mode of Transportation: Truck

ADDITIONAL INFORMATION AND COMMENTS

**Mine originally in operation by Sheridan Enterprises, Inc., 1977-1982. Idle 1983–1987. Operated by Salt Creek Mining 1988-1991. Idle 1992-1996. Operated by Lodestar Energy 1997, and then 2000-2003. Sold to CAM in February 2003.



NEW HORIZON MINE

NEW HORIZON MINE

CDMG Permit: C-1981-008

LOCATION INFORMATION

Previous Mine Names:
Nucla and Nucla East (2)

Permit Location: Mining: Sec. 1, T. 46 N., R. 16 W.; Sec. 36, T. 47 N., R. 16 W. Reclaiming: Sec. 6, T. 46 N., R. 15 W.; Sec. 31, T. 47 N., R. 15 W (NH2); Sec. 25, T47N R16W (NH1).

Topographic Quadrangle(s):
Nucla

Coal Region: San Juan River

Field: Nucla-Naturita

County Montrose

COMPANY INFORMATION

Parent Company:
Western Fuels Colorado, LLC

P.O. Box 3424, Denver, CO 80233

(303) 254-3070
Contact: Duane Richards

Local Mine Operator:
Western Fuels Colorado

P.O. Box 628, Nucla, CO 81424

Contact: Lance Wade, Mine Mgr
Phone: (970) 864-2165
Fax: (970) 864-2168

Web Site: *http://www.westernfuels.org/*

GENERAL INFORMATION

Mine Type: Surface
Mine Status: Producing
Mining Method: Shovel, dozer
Start-Up Date: 1993
No. of Acres in Permit: 923

No. of Employees: 28
Union Affiliation: UMWA Local 1281
Surface: Private
Mineral: Private

GEOLOGIC INFORMATION

Geologic Age: Lower Cretaceous
Geologic Unit: Dakota Sandstone

Coal Zone(s) or Bed(s):
1, 2

Coal Bed Thickness(es):
1: 0.80-1.5 ft; 2: 5.0-7.5 ft

Contact for Geologic Information at Mine:
Tony Adkins

Strike of Bedding: N25°W-N45°W
Dip of Bedding: 1-2°SW

Cleat Orientation and Spacing:
63° face, 308° butt, 0.8-3 ft spacing

Thickness of Overburden:
15-100 ft

Thickness of Interburden:
6-10 ft

NEW HORIZON MINE

COAL QUALITY

	SAMPLE 1 (1999)	SAMPLE 2	SAMPLE 3
Seam:	Dakota lower seam	Dakota lower seam	Dakota lower seam
Rank:			
Moisture (%):	6.7	5.6	6.0
Ash (%):	15.1	13.59	16.53
Fixed Carbon (%):	47.0		
Volatile Matter (%):	30.7		
Sulfur (%):	0-1	0-1	0.44
Heating Value (Btu/lb):	11,680	11879	10604
Free Swelling Index:			
Hardgrove Grindability:			
Ash-Softening Temperature (F°):	2,750		
Methane Characteristics:			
Reflectance Data:			

COAL PRODUCTION

2003 Production (tons): 215,364

2004 Production (tons): 413,332

Cumulative Production through 2004 (tons): 4,176,510

Projected Production for 2005 (tons): 372,000

Production per Shift (tons): 800

Shifts per Day: 2 coal production; 2 overburden s

Reserves (tons): 8-10 years

Preparation Plant:

Tipple:

Haulage:

Equipment: Shovels, dozers, trucks, overburden drill, front-end loader

SALES DATA

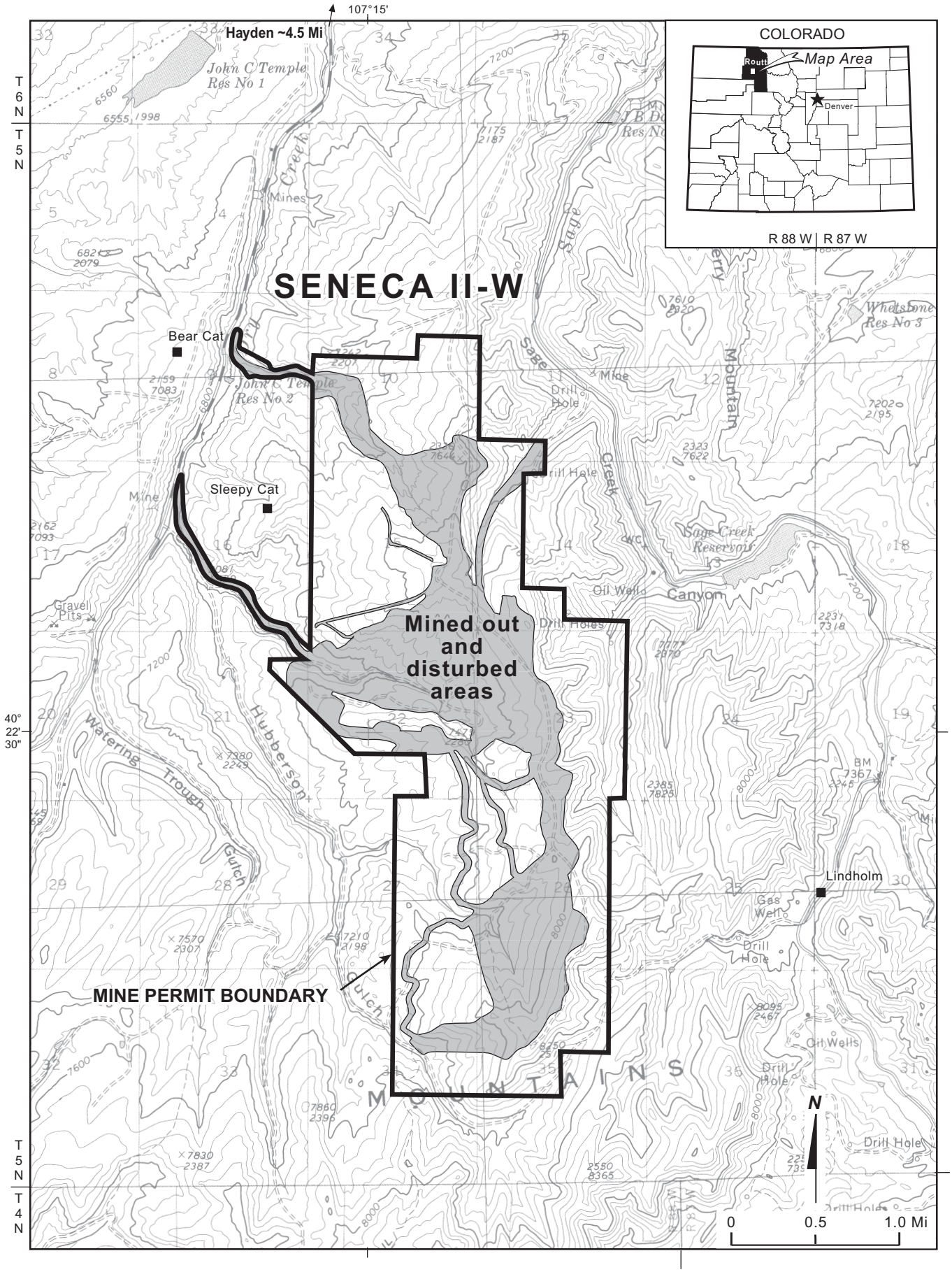
	SALES	USE	DESTINATION
In-State:	100%	Steam	Nucla Power Plant (fluidized bed combustion unit)
Out-of-State:			
Foreign:			

Mode of Transportation: Truck

ADDITIONAL INFORMATION AND COMMENTS

Geologic Reference Map: Williams, P.L., 1964, Geology, structure and uranium deposits of the Moab quadrangle, Colorado and Utah: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-360, scale 1:250,000.

SENECA II-W MINE



SENECA II W MINE

CDMG Permit: C-1982-057

LOCATION INFORMATION

Previous Mine Names:

Permit Location: Sec. 9-11, 14-16, 21-23, 26, 27, 34, 35, T. 5 N., R. 88 W.

Topographic Quadrangle(s):
Dunckley, Hayden, Hayden Gulch, Mt. Harris

Coal Region: Green River

Field: Yampa

County Routt

COMPANY INFORMATION

Parent Company:
Peabody Energy

701 Market St., # 765, St. Louis, MO 63101

(314) 342-3400

Contact: Charles A. Burggraf, Group Executive, Colorado

Local Mine Operator:
Seneca Coal Company

P.O. Box 670, Hayden, CO 81639-0670

Contact: Greg Kitchen
Phone: (970) 276-3707
Fax: (970) 276-3014

Web Site: *http://www.peabodyenergy.com/index-ie.html*

GENERAL INFORMATION

Mine Type: Surface

Mine Status: Producing

Mining Method: Dragline

Start-Up Date: 1990

No. of Acres in Permit: 4,093

No. of Employees: 93**

Union Affiliation: UMWA

Surface: Federal/State/Private

Mineral: Federal/State/Private

GEOLOGIC INFORMATION

Geologic Age: Upper Cretaceous

Geologic Unit: Middle Coal Group, Williams Fork Formation

Coal Zone(s) or Bed(s):
Wadge, Wolf Creek, Sage Creek

Coal Bed Thickness(es):
Wadge: 8.9-12.2 ft (avg. 11.7 ft); Wolf Creek: avg. 20.4 ft; Sage Creek: 3.4-5.4 ft (avg. 4.6 ft)

Contact for Geologic Information at Mine:

Strike of Bedding:

Dip of Bedding: 27°

Cleat Orientation and Spacing:

Thickness of Overburden:
Range 0-100 ft. Wadge: avg. 60.8 ft; Wolf Creek: avg. 95.7 ft; Sage Creek: avg. 42.0 ft

Thickness of Interburden:

SENECA II W MINE

COAL QUALITY	SAMPLE 1	SAMPLE 2	SAMPLE 3
Seam:	Wadge	Wolf Creek	Sage Creek
Rank:			
Moisture (%):	13.63	13.33	13.94
Ash (%):	7.84	11.11	6.46
Fixed Carbon (%):			
Volatile Matter (%):			
Sulfur (%):	0-1	0-1	0.68
Heating Value (Btu/lb):	12,322	11,908	12,325
Free Swelling Index:			
Hardgrove Grindability:			
Ash-Softening Temperature (F°):			
Methane Characteristics:			
Reflectance Data:			

COAL PRODUCTION

2003 Production (tons): 728,740

2004 Production (tons): 673,124

Cumulative Production through 2004 (tons): 11,596,538

Projected Production for 2005 (tons): 785,000

Production per Shift (tons): 3,000-3,500

Shifts per Day: 3 (8 hours)

Reserves (tons): 1 Year

Preparation Plant:

Tipple:

Haulage: 72 ton tandem trailers

Equipment: Draglines, overburden drills, coal drills, loaders, haul trucks

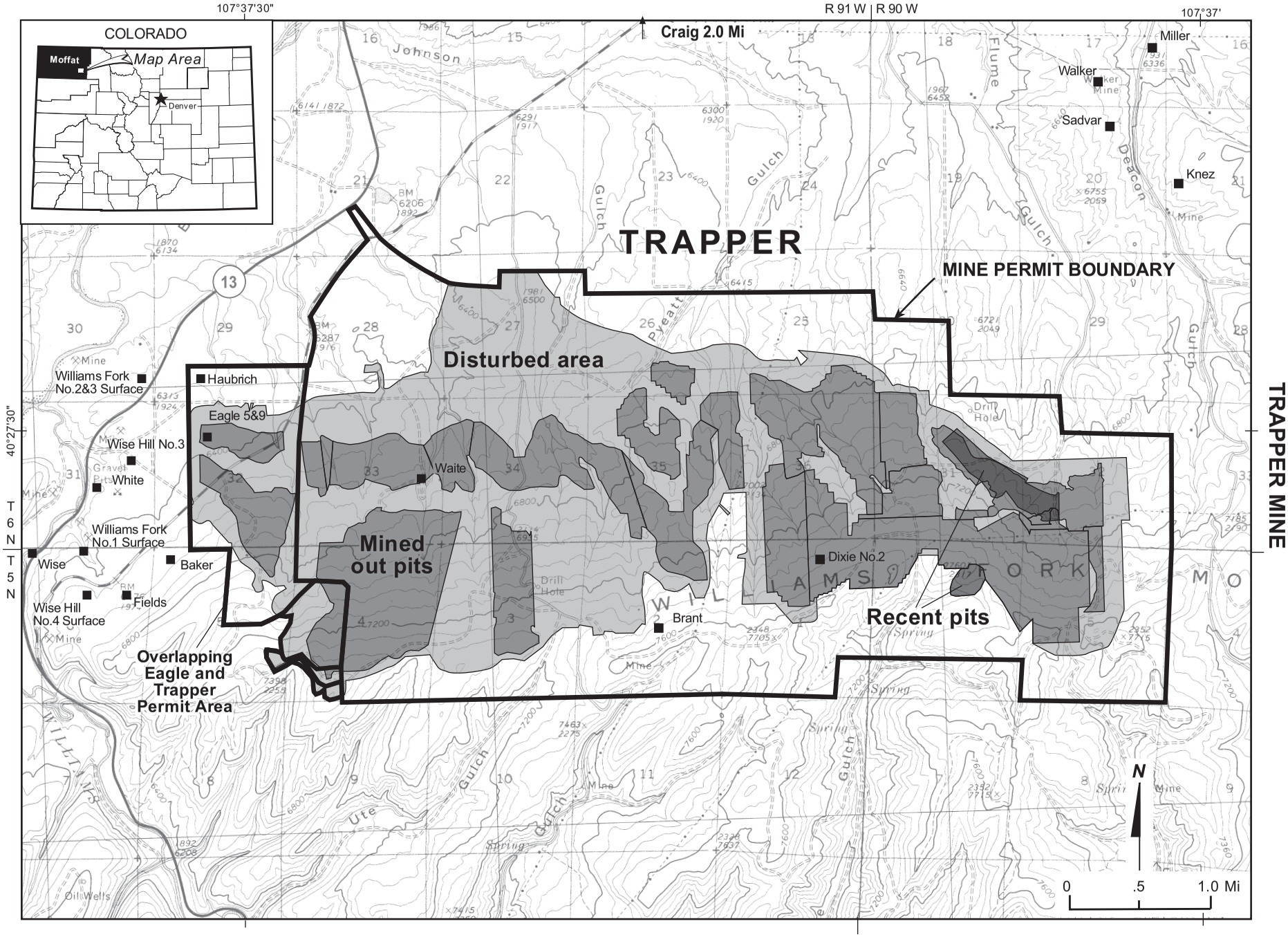
SALES DATA

	SALES	USE	DESTINATION
In-State:	100%	Steam	Hayden Power Plant
Out-of-State:	0		
Foreign:			

Mode of Transportation: Haulage truck

ADDITIONAL INFORMATION AND COMMENTS

Mine to close at the end of 2005. Geologic Map References: Dames & Moore, 1979, Coal resource and development of the Milner quad: USGS OFR 79-815; Dames & Moore, 1979, Coal resource and development maps of the Rattlesnake Butte quad: USGS OFR 1396; Carroll, C.J., and Morgan, M.L., 2000, Demonstrated reserve base for coal in Colorado; Yampa coal field: CGS OFR 00-12; Carroll, C.J., Papp, A.R., and Kinnes, D.W., 2003, Available coal resources of the Williams Fork Formation, Yampa Coal Field, CGS Resources Series 41.


COLORADO
Moffat
Map Area
Denver
107°37'30"
R 91 W
R 90 W
107°37'
Craig 2.0 Mi
TRAPPER
MINE PERMIT BOUNDARY
Disturbed area
Mined out pits
Recent pits
Overlapping Eagle and Trapper Permit Area
Haubrich
Eagle 5&9
Waite
Dixie No.2
Brant
Williams Fork No.2&3 Surface
Wise Hill No.3
White
Williams Fork No.1 Surface
Wise
Baker
Fields
Wise Hill No.4 Surface
Miller
Walker
Sadvar
Knez
Johnson Gulch
Flume Gulch
Deacon Gulch
Pyeatt Gulch
Ute Gulch
WILLIAMS FORK
40°27'30"
T 6 N
T 5 N
TRAPPER MINE
N
0
.5
1.0 Mi

TRAPPER MINE

CDMG Permit: C- 1981-010

LOCATION INFORMATION

Previous Mine Names:

Permit Location: Sec. 5, 6, T. 5 N., R. 90 W. Sec. 1-5, T. 5 N., R. 91 W.; Sec. 30-32, T. 6 N., R. 90 W.; Sec. 25-29, 32-36, T. 6 N., R. 91 W.

Topographic Quadrangle(s):
Castor Gulch, Round Bottom

Coal Region: Green River

Field: Yampa

County Moffat

COMPANY INFORMATION

Parent Company:
Tri-State Generation and Transmission

P.O Box 1307, Craig, CO 81626

(303) 824-4401
Contact: Raymond Dubois

Local Mine Operator:
Trapper Mining, Inc.

P.O. Box 187, Craig, CO 81626

Contact: Steve Hinkemeyer
Phone: (970) 824-4401
Fax: (970) 826-6136

Web Site: _____

GENERAL INFORMATION

Mine Type: Surface
Mine Status: Producing
Mining Method: Dragline, strikeline mining
Start-Up Date: 1977
No. of Acres in Permit: 10,382

No. of Employees: 150
Union Affiliation: Operating Engineers
Surface: State (45%)/Private (55%)
Mineral: Federal (75%)/State (22%)/Private (3%)

GEOLOGIC INFORMATION

Geologic Age: Upper Cretaceous

Geologic Unit: Upper Coal Group, Williams Fork Formation

Coal Zone(s) or Bed(s):
H, I, K, L, M, Q

Coal Bed Thickness(es):
H=6 ft, I=5 ft, K=4 ft, L=4 ft, M=6 ft, Q=10 ft

Contact for Geologic Information at Mine:
Tonya Perkins

Strike of Bedding: SE

Dip of Bedding: 16°

Cleat Orientation and Spacing:
327° face, 40° butt; primary 0.5-2 inch spacing

Thickness of Overburden:
20-140 ft

Thickness of Interburden:
4-50 ft

TRAPPER MINE

COAL QUALITY

	SAMPLE 1 Run of mine 1999	SAMPLE 2	SAMPLE 3 Short prox 12/10/04
Seam:	Run of mine - average		
Rank:	Sub B		
Moisture (%):	16	17.5	17
Ash (%):	8	7.5	7
Fixed Carbon (%):	48	44.4	
Volatile Matter (%):	33	30.2	
Sulfur (%):	0-1	0-1	.44
Heating Value (Btu/lb):	9,800	9,900	9850
Free Swelling Index:			
Hardgrove Grindability:			
Ash-Softening Temperature (F°):	2,120	2,242	
Methane Characteristics:			
Reflectance Data:			

COAL PRODUCTION

2003 Production (tons): 1,845,061

2004 Production (tons): 1,837,102

Cumulative Production through 2004 (tons): 54,561,827

Projected Production for 2005 (tons): 2,100,000

Production per Shift (tons): 9,700

Shifts per Day: 1 (10-12 hours)

Reserves (tons): Surface - 20,000,000 tons; Und

Preparation Plant: None

Tipple:

Haulage: 6 haul trucks from pit to power plant

Equipment: 3 draglines, 3 drills, 9 bulldozers, front-end loaders, 2 hydraulic

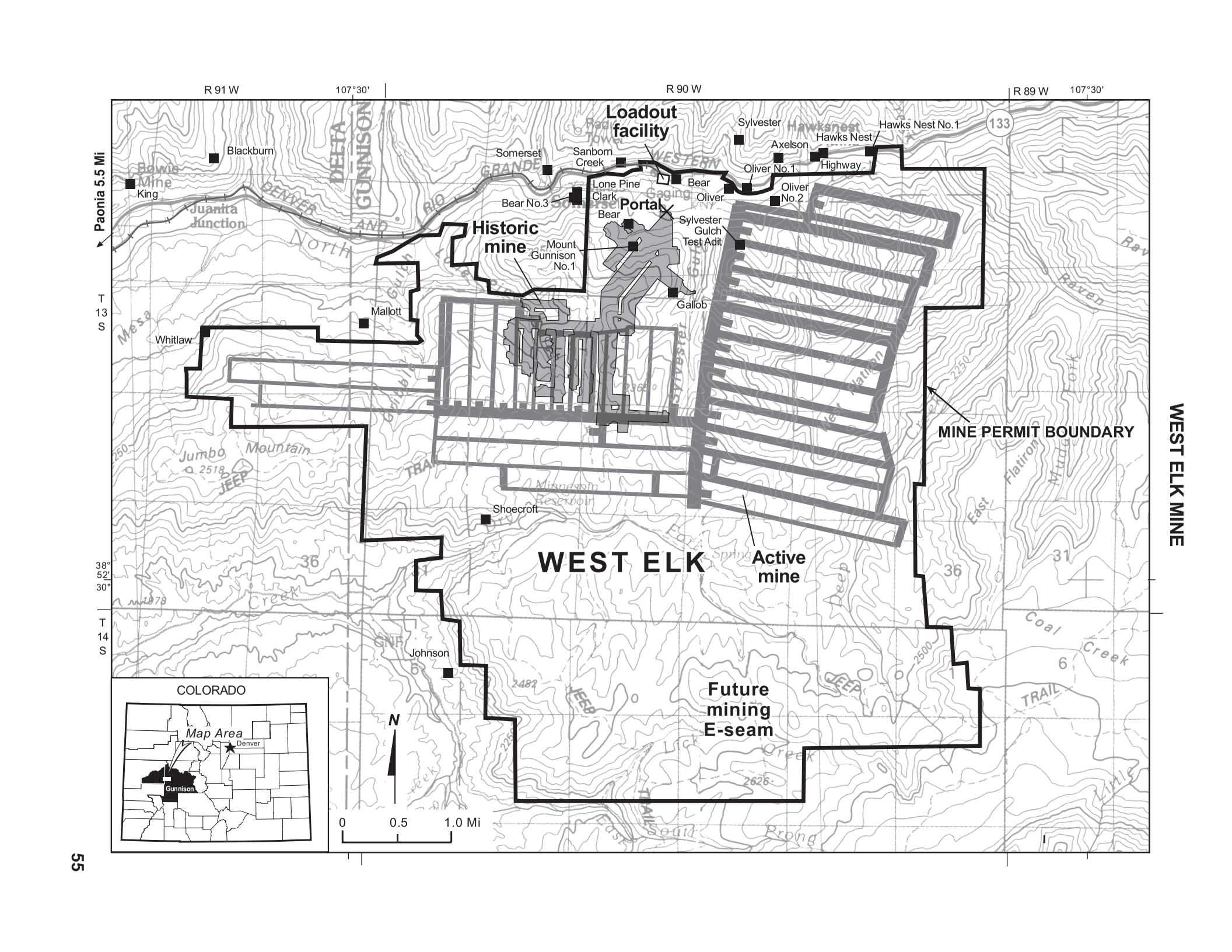
SALES DATA

	SALES	USE	DESTINATION
In-State:	100%	Steam	Colorado Tri-State G&T Craig Station
Out-of-State:	0		
Foreign:			

Mode of Transportation: Truck

ADDITIONAL INFORMATION AND COMMENTS

Salt River Project Agricultural Improvement and Power District (32%), Tri-State (22%), Pacificcorp (21%), Platte River Power Authority (20%) main ownership. Geologic Map Reference: Tweto, Ogden, 1976, Geologic map of the Craig 1° x 2° quadrangle, northwestern Colorado: U.S. Geological Survey Miscellaneous Investigations Series I-972, scale 1:250,000.


R 91 W
107°30'
R 90 W
R 89 W
107°30'
Paonia 5.5 Mi
T 13 S
T 14 S
38° 52' 30"
Loadout facility
Historic mine
Portal
Active mine
Future mining E-seam
MINE PERMIT BOUNDARY
WEST ELK
WEST ELK MINE
Blackburn
Bowie Mine
King
Juanita Junction
Somerset
Sanborn Creek
Lone Pine
Clark
Bear No.3
Bear
Oliver
Sylvester
Hawksnest
Hawks Nest No.1
Hawks Nest
Axelson
Highway
Oliver No.1
Oliver No.2
Sylvester Gulch Test Adit
Mount Gunnison No.1
Gallob
Mallott
Whitlaw
Shoecroft
Johnson
Jumbo Mountain
Minnesota Reservoir
Coal Creek
Deep Creek
Lick Creek
East Prong
Little
Raven
Flatiron
Mudd
East
Mesa
North
Gulch
Spring
Trail
Jeep
133
2518
2482
2626
2500
2250
2365
0
0.5
1.0 Mi
N
COLORADO
Map Area
Denver
Gunnison

WEST ELK MINE

CDMG Permit: C-1980-007

LOCATION INFORMATION

Previous Mine Names:
Mt. Gunnison

Permit Location: Sec. 9, 10, 15, 16, 18-30, 34-36, T. 13 S., R. 90 W.; Sec. 23-26, T. 13 S. R. 91 W.

Topographic Quadrangle(s):
Somerset, Minnesota Pass, Bowie

Coal Region: Uinta

Field: Somerset

County Gunnison

COMPANY INFORMATION

Parent Company:
Arch Coal Inc.

City Place One, Suite 300, St. Louis, MO 63141

(800) 238-7398
Contact: Deck Sloan

Local Mine Operator:
Mountain Coal Company, Inc.

P.O. Box 591, Somerset, CO 81434

Contact: Gene DeClaudio, Phil Schmidt
Phone: (970) 929-5015
Fax: (970) 929-5595

Web Site: *http://www.archcoal.com/aboutus/westelk.asp*

GENERAL INFORMATION

Mine Type: Underground
Mine Status: Producing
Mining Method: Continuous miners, longwall
Start-Up Date: March 1980
No. of Acres in Permit: 14,590

No. of Employees: 325
Union Affiliation: Non-Union
Surface: Federal/Private
Mineral: Federal/Private

GEOLOGIC INFORMATION

Geologic Age: Upper Cretaceous

Geologic Unit: Mesaverde Group, Bowie Shale Mbr

Coal Zone(s) or Bed(s):
B seam (1994-present), E seam (2004-2020), F seam (mined 1982-1991)

Coal Bed Thickness(es):
B: 12 ft, E: 12 ft.

Contact for Geologic Information at Mine:
Wendell Koontz

Strike of Bedding: N35W

Dip of Bedding: 3-5° NE

Cleat Orientation and Spacing:
Main Cleat: N65°E - N70°E, Primary fracture N 58-70°E

Thickness of Overburden:
B: 0-2300 ft, avg. 1200 ft; E: 0-1700 ft, avg. 800 ft; F: 0-1500 ft, avg. 700 ft

Thickness of Interburden:
B-E: 170-300 ft; E-F: 60-190 ft; avg. 120-130 ft

WEST ELK MINE

COAL QUALITY

	SAMPLE 1	SAMPLE 2 2004 data	SAMPLE 3 USGS Composite Sample 2003
Seam:	E	B	B
Rank:	Bituminous	Bituminous	Bituminous
Moisture (%):	11.0	8.1	3.5
Ash (%):	6.5	9.0	7.16
Fixed Carbon (%):		46.5	
Volatile Matter (%):		35.0	
Sulfur (%):	0-1	0-1	
Heating Value (Btu/lb):	11,600	12,000	
Free Swelling Index:			
Hardgrove Grindability:		41-49	
Ash-Softening Temperature (F°):		2,500	
Methane Characteristics:	n/a	n/a	
Reflectance Data:			0.054 ppm, Cl 121 p

COAL PRODUCTION

2003 Production (tons): 6,472,760

2004 Production (tons): 6,591,183

Cumulative Production through 2004 (tons): 66,759,788

Projected Production for 2005 (tons): 6,500,000

Production per Shift (tons):

Shifts per Day: 2 x 12 hr daily

Reserves (tons): 90 million short tons

Preparation Plant: Rotary Breaker

Tipple: Silos, batch weigh

Haulage: Belt haulage out of mine

Equipment: Joy 6LS-2 DDR 1720 longwall mining system with continuous

SALES DATA

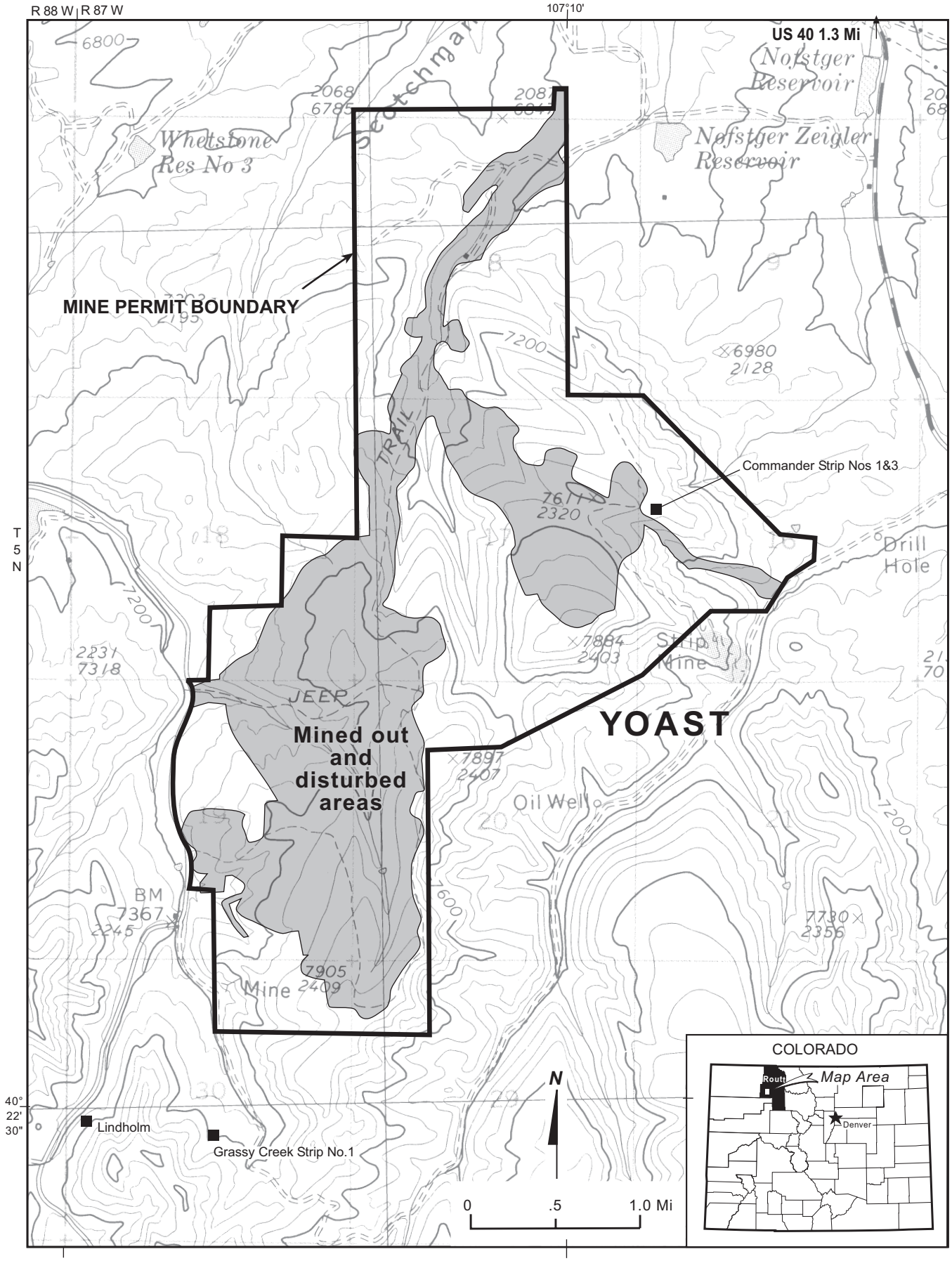
	SALES	USE	DESTINATION
In-State:	10%	Steam, Industrial	Lyons, Boulder, Denver
Out-of-State:	90%	Steam	IL, IA, TN, TX, NV
Foreign:	0%		

Mode of Transportation: Rail (Union Pacific)

ADDITIONAL INFORMATION AND COMMENTS

West Elk Mine is the 27th largest coal mine in the US, and the 7th largest underground coal mine nationally.
Geologic Reference Map: Dunrud, R.C., 1989, Geologic map and coal stratigraphic framework of the Paonia area, Delta and Gunnison Counties, Colorado: U.S. Geological Survey Map C-115, scale 1:50,000

YOAST MINE


R 88 W
R 87 W
107°10'
US 40 1.3 Mi
MINE PERMIT BOUNDARY
Commander Strip Nos 1&3
Mined out and disturbed areas
YOAST
Drill Hole
Strip Mine
Oil Well
Mine
JEEP TRAIL
Whetstone Res No 3
Nofstger Reservoir
Nofstger Zeigler Reservoir
Lindholm
Grassy Creek Strip No.1
T 5 N
40° 22' 30"
N
0 .5 1.0 Mi
COLORADO
Routt
Map Area
Denver

YOAST MINE

CDMG Permit: C-1994-082

LOCATION INFORMATION

Previous Mine Names:

Permit Location: Sec. 5, 8, 16-20, 29, 30, T. 5 N., R. 87 W.; Sec. 28, 29, 32, T. 6 N., R. 87 W.

Topographic Quadrangle(s):
Dunckley, Mt. Harris

Coal Region: Green River

Field: Yampa

County Routt

COMPANY INFORMATION

Parent Company:
Peabody Energy

701 Market St., Suite 765, St. Louis, MO 63101

(314) 342-3400

Contact: Charles A. Burggraf, Group Executive, Colorado

Local Mine Operator:
Seneca Coal Company

P.O. Box 670, Hayden, CO 81639-0670

Contact: Greg Kitchen
Phone: (970) 276-3707
Fax: (970) 276-3014

Web Site: *http://www.peabodyenergy.com/index-ie.html*

GENERAL INFORMATION

Mine Type: Surface

Mine Status: Producing

Mining Method: Dragline

Start-Up Date: 1996

No. of Acres in Permit: 2,318

No. of Employees: 99 union, 18 salary

Union Affiliation: UMWA

Surface: Federal/State/Private

Mineral: Federal/State/Private

GEOLOGIC INFORMATION

Geologic Age: Upper Cretaceous

Geologic Unit: Middle Coal Group, Williams Fork Formation

Coal Zone(s) or Bed(s):
Wadge, Wolf Creek

Coal Bed Thickness(es):
Wadge: 0.39-14.2 ft (avg. 12.2 ft); Wolf Creek: 15.8-16.7 ft (avg. 16.0 ft)

Contact for Geologic Information at Mine:

Strike of Bedding:

Dip of Bedding: 12°

Cleat Orientation and Spacing:

Thickness of Overburden:
Range 0-120 ft. Wadge: avg. 55.0 ft; Wolf Creek: avg. 76.0 ft

Thickness of Interburden:

YOAST MINE

COAL QUALITY

	SAMPLE 1	SAMPLE 2	SAMPLE 3
Seam:	Wadge	Wolf Creek	
Rank:			
Moisture (%):	12.66	12.42	
Ash (%):	7.62	13.21	
Fixed Carbon (%):			
Volatile Matter (%):			
Sulfur (%):	0-1	0-1	0.66
Heating Value (Btu/lb):	12,426	11,645	
Free Swelling Index:			
Hardgrove Grindability:			
Ash-Softening Temperature (F°):			
Methane Characteristics:			
Reflectance Data:			

COAL PRODUCTION

2003 Production (tons): 728,740

2004 Production (tons): 815,925

Cumulative Production through 2004 (tons): 8,592,587

Projected Production for 2005 (tons): 785,000

Production per Shift (tons): 2,500-3,500

Shifts per Day: 3 (8 hours)

Reserves (tons): 1 Year

Preparation Plant: none

Tipple:

Haulage: 72 ton tandem trailers

Equipment: Draglines, overburden drills, coal drills, loaders, haul trucks

SALES DATA

	SALES	USE	DESTINATION
In-State:	100%	Steam	Hayden Power Plant
Out-of-State:	0		
Foreign:			

Mode of Transportation: Haulage truck

ADDITIONAL INFORMATION AND COMMENTS

Coal produced in 2004 was from private, federal, and Peabody leases. Mine scheduled to close at end of 2005. Geologic Map References: Dames & Moore, 1979, Coal resource and development of the Milner quad: USGS OFR 79-815; Dames & Moore, 1979, Coal resource and development maps of the Rattlesnake Butte quad: USGS OFR 1396; Carroll, C.J., and Morgan, M.L., 2000, Demonstrated reserve base for coal in Colorado; Yampa coal field: CGS OFR 00-12; Carroll, C.J., Papp, A.R., and Kinnes, D.W., 2003, Available coal resources of the Williams Fork Formation, Yampa Coal Field, CGS Resources Series 41.

ELECTRICITY GENERATION

Gross electric generation at Colorado's major electric power plants and wind generation facilities is estimated to exceed 47 billion kilowatt-hours (kWh) in 2004 (Table 2). This produced power comes from electric utilities, independent power producers, and commercial and industrial sectors. Of this total, over 37.5 billion kWh were produced by coal-fired power plants. Natural gas fueled power plants were second in the state for electricity generation, but is rising in market share. Wind-generated electricity has grown significantly (over 500 percent generation increase in 2004) in the last five years in Colorado and now represents about two percent of all electric generation in Colorado. Hydroelectric generation was lower in 2004 than five years ago due to on-going drought conditions in the west. Numerous small, city-owned generation facilities operate on a stand-by basis for emergency use only and are only included where significant.

Coal is the predominant fuel burned in steam-generated electrical plants. In 2004 a total of 18,946,481 tons were consumed at the state's 13 coal-fired power plants. Along with 1.4 billion cubic feet of natural gas and 0.5 million barrels of heating oil consumed at these plants, the gross electric generation at coal-fired power plants is nearly 81 percent of the total Colorado electric generation (Table 3). About 58 percent (or 11 million tons) of the coal consumed at these plants was mined in Colorado; the remainer is imported from Wyoming's Powder River Basin.

Table 2. Summary of electricity generated by fuel type in Colorado for 2004. Coal-fired power plants may also burn natural gas and oil to augment power supply, for start-up and maintenance operations, and for back-up or emergency use.

Power Source	Nameplate Rating (mW)	Electric Generation (kWh x 1000)	Fuel Consumed		
			Coal (tons)	Gas (mcf)	Oil (bbls)
Coal Plants	4,958	37,522,238	18,946,481	1,440,002	499,790
Natural Gas/Oil Plants	3,546	7,013,073	0	65,842,787	336,188
Hydroelectric Plants	1,106	1,812,304	-----	-----	-----
Wind Power	230	679,734	-----	-----	-----
Total	**9,840**	**47,027,349**	**18,946,481**	**67,282,789**	**835,978**

Abbreviations: mW—megaWatts; KWh—kiloWatt hours; mcf—million cubic feet; bbls—barrels

Table 3. Electric generation and fuel consumption at major coal-fired power plants in Colorado. Coal-fired power plants may also burn natural gas and oil to augment power supply, for start-up and maintenance operations, and for back-up or emergency use.

Owner/Plant	Nameplate Rating (mW)	Electric Generation (kWh x 1000)	Fuel Consumed		
			Coal (tons)	Gas (mcf)	Oil (bbls)
City of Colorado Springs					
Martin Drake	281	1,830,722	872,564	220,886	0
Ray D. Nixon	225	1,865,968	991,696	73,919	118,218
Subtotal	**506**	**3,696,690**	**1,864,260**	**294,805**	**118,218**
Platte River Power Authority					
Rawhide	**270**	**2,252,742**	**1,296,357**	**310,694**	**65,253**
Xcel Energy (Public Service Co. of Colorado)					
Arapahoe	144	987,184	604,636	19,406	0
Cameo	66	471,707	295,601	35,488	0
Cherokee	710	5,400,031	2,227,080	462,443	0
Comanche	700	4,720,155	2,606,392	120,875	0
Hayden	447	3,797,560	1,813,067	14,270	1,957
Pawnee	547	3,760,418	2,182,976	94,748	0
Valmont	166	1,433,818	588,140	19,711	0
Subtotal	**2,780**	**20,570,873**	**10,317,892**	**766,941**	**1,957**
Tri-State Generation & Transmission Association					
Craig	1,264	9,969,190	4,889,228	67,562	314,362
Nucla	100	747,743	418,744	0	0
Subtotal	**1,364**	**10,716,933**	**5,307,972**	**67,562**	**314,362**
Aquila, Inc.					
W.N. Clark	38	285,000	160,000	0	0
Total	**4,958**	**37,522,238**	**18,946,481**	**1,440,002**	**499,790**

Abbreviations: mW—megaWatts; KWh—kiloWatt hours; mcf—million cubic feet; bbls—barrels

Table 4. Electric generation and fuel consumption at major gas-fired power plants in Colorado for 2004.

Owner/Plant	Electric Nameplate Rating (mW)	Generation (kWh x 1000)	Fuel Consumed Gas (mcf)	Fuel Consumed Oil (bbl)
Calpine Corp.				
Rocky Mountain Energy Center	601	2,061,000	15,119,969	0
Blue Spruce	300	149,514	1,580,000	0
Subtotal	**901**	**2,210,514**	**16,699,969**	**0**
Colorado Energy Management				
Brush Electric Generating Facility	273	262,050	2,534,756	0
Manchief Electric Generating Facility	302	62,753	655,523	0
Subtotal	**575**	**324,803**	**3,190,279**	**0**
Colorado Springs Utilities				
Martin Drake*	281	1,830,722*	220,886	**0**
George Birdsall	60	1,756	32,624	3,675
Ray D. Nixon	225	1,865,968*	73,919	118,218
Subtotal	**566**	**3,698,446***	**327,429**	**121,893**
University of Colorado Boulder	**33**	**117,234**	**1,648,869**	**0**
Delta Light & Power	**5**	**---**	**3,285**	**0**
Xcel Energy (Public Service Co. of Colorado)				
Alamosa Turbine	33	1,283	2,425	315
Arapahoe*	144	1,077,812*	19,406	0
Cameo*	66	512,407*	35,448	0
Cherokee*	710	5,400,031*	462,443	0
Comanche*	700	4,720,155*	120,443	0
Fort Lupton Turbine	78	5,100	95,376	446
Fort St. Vrain	485	3,760,418	28,494,677	0
Fruita Turbine	19	149	3,629	51
Hayden*	447	3,797,560*	14,270	1,957
Pawnee*	547	3,760,641*	94,748	0
Valmont*	166	1,433,818*	19,711	0
Valmont CT	45	558	10,046	0
Zuni	101	997	348,498	986
Subtotal	**3,541**	**24,470,929***	**29,721,120**	**3,755**
Tri-State Generation & Transmission Association				
Craig Generating Station*	1,264	9,969,190*	67,562	314,362
Frank R. Knudsen Station	100	5,256	34,290	0
Limon Generating Station	100	3,209	39,102	5,632
Rifle Generating Station	85	16,497	283,010	0
Subtotal	**1,549**	**9,994,152***	**423,964**	**319,994**
Thermo Cogeneration Partnership				
Fort Lupton	**272**	**742,915**	**7,237,360**	**0**
Kinder-Morgan Power				
Greeley Cogeneration Facility	**36**	**199,783**	**2,009,490**	**0**
Primary Energy				
UNC Greeley	**618**	**618,641**	**5,298,000**	**0**
Platte River Power Authority				
Rawhide*	**270**	**2,252,742***	**310,694**	**65,253**
Total	**8,366**	**44,630,159***	**66,870,459**	**510,895**

*Mostly coal generated electricity, but plant also consumes a significant amount of natural gas.
Abbreviations: mW—megaWatts; KWh—kiloWatt hours; mcf—million cubic feet; bbls—barrels

Table 5. Electric generation at hydroelectric power plants in Colorado. Data sorted by electric power generation for 2004.

Plant Name	Parent Company	Plant Address	Nameplate Rating (mW)	Electric Generation (kWh x 1000)
Mount Elbert	US Bureau of Reclamation	Twin Lakes Field Office, Granite Star Route, Granite, CO 81228	200.00	344,142
Flatiron	US Bureau of Reclamation	11056 West County Road 18E, Loveland, CO 80537-9711	94.50	227,386
Morrow Point	US Bureau of Reclamation	Montrose, CO	120.00	195,118
Pole Hill	US Bureau of Reclamation	11056 West County Road 18E, Loveland, CO 80537-9711	38.20	179,448
Cabin Creek Station	Xcel Energy	6276 County Road 381, Georgetown, CO 80444	324.00	175,383
Blue Mesa	US Bureau of Reclamation	Gunnison, CO	60.00	142,539
Estes	US Bureau of Reclamation	PO Box 960, Estes Park, CO 80517-0960	45.00	106,625
Tesla	Colorado Springs Utilities	690 W. Monument Creek Rd., USAFA, Colorado Springs, CO 80840	28.00	44,457
Shoshone Hydro	Xcel Energy	60111 Hwy. 6&24, Glenwood Canyon, P.O. Box 1067, Glenwood Springs, CO 81602	14.40	42,681
Mary's Lake	US Bureau of Reclamation	PO Box 960, Estes Park, CO 80517-0960	8.10	38,304
Green Mountain (Reservoir)	US Bureau of Reclamation	Building 17, 170, County Road 1813, Silverthorne, CO 80498	26.00	26,975
Tacoma Station	Xcel Energy	North of Rockwood, CO	8.00	26,631
Upper Molina	US Bureau of Reclamation	Molina, CO	8.60	25,612
Lakewood	City of Boulder	WTP Hydro, 1094 Betasso Rd, Boulder, CO 80302	3.40	19,622
Roberts Tunnel	Denver Water	Grant, CO	6.00	17,757
Towaoc	US Bureau of Reclamation	Cortez, CO	11.50	16,486
Lower Molina	US Bureau of Reclamation	Molina, CO	4.90	14,797
Ames Hydro	Xcel Energy	650 Ames Road, P.O. Box 668, Ophir, CO 81426	3.600	13,362
Ptarmigan/Vallecito	Ptarmigan Resources and Energy	Vallecito Reservoir	5.00	11,674
Ruedi Reservoir	City of Aspen	Aspen, CO	5.00	10,833
Silver Lake	City of Boulder	WTP Hydro, 1094 Betasso Rd, Boulder, CO 80302	3.20	10,000
Big Thompson	US Bureau of Reclamation	11056 West County Road, Loveland, CO 80537-9711	4.50	9,900
Foothills	Denver Water	Littleton, CO	3.10	9,400
Dillon (Lake Dillon)	Denver Water	Dillon Dam, CO	1.90	9,366
Palisade	Xcel Energy	PO Box J, Palisade, CO 81526	3.00	9,213

Plant Name	Parent Company	Plant Address	Nameplate Rating (mW)	Electric Generation (kWh x 1000)
Boulder Hydro	City of Boulder	37788 Boulder Canyon Dr., P.O. Box 1728, Nederland, CO 80466	20.00	8,140
Williams Fork	Denver Water	Williams Fork Dam, CO	3.20	8,109
Hillcrest	Denver Water	Denver, CO	2.00	6,771
Betasso	City of Boulder	Betasso, WTP Hydro, 1094 Betasso Rd, Boulder, CO 80302	2.40	6,200
Strontia Springs	Denver Water	Waterton Canyon, CO	1.10	6,195
Redlands	Redlands Water and Power Co.	2216 S. Broadway, Grand Junction , CO 81503	1.40	5,200
Salida	Xcel Energy	Poncha Springs, CO	1.30	4,962
Crystal	US Bureau of Reclamation	Montrose, CO	28.00	4,705
Manitou	Colorado Springs Utilities	540 Manitou Springs, CO 80829	5.00	4,066
Idylwilde	City of Loveland	Loveland, CO	0.90	3,807
Ouray	Eric Jacobson	Ouray, CO	0.90	3,700
Sunshine	City of Boulder	WTP Hydro, 1094 Betasso Rd, Boulder, CO 80302	0.80	3,565
Georgetown Hydro	Xcel Energy	6276 CR 381, Georgetown, CO 80444	1.40	2,952
John Fetcher Power Plant, Stagecoach Reservoir	Upper Yampa Water Cons. Dist.	Oak Creek, CO	0.80	2,893
Longmont Hydro Plant	City of Longmont	Lyons Canyon	0.50	2,704
McPhee	US Bureau of Reclamation	Cortez, CO	1.30	2,655
Sugarloaf	STS Hydropower, Ltd.	Sugarloaf Dam, Turquoise Lake, Leadville, CO	2.50	2,600
Maroon Creek	City of Aspen	Aspen, CO	0.45	1,978
Bridal Veil Power Station	Eric Jacobson	Telluride, CO	0.30	1,300
Kohler	City of Boulder	Betasso, WTP Hydro, 1094 Betasso Rd, Boulder, CO 80302	0.14	736
Orodell	City of Boulder	WTP Hydro, 1094 Betasso Rd, Boulder, CO 80302	0.18	727
Maxwell	City of Boulder	WTP Hydro, 1094 Betasso Rd, Boulder, CO 80302	0.08	572
Ruxton	Colorado Springs Utilities	Manitou Springs, CO	1.00	56
		Total	**1,105.55**	**1,812,304**

REFERENCES

Averitt, Paul, 1975, Coal resources of the United States, January 1, 1974: U.S. Geological Survey Bulletin 1412, 131 p.

Carroll, C.J., 2004, 2003 Summary of coal resources in Colorado: Colorado Geological Survey Special Publication 54, 25 p.

Carroll, C.J., and Bauer, MA., 2002, Historic coal mines of Colorado: Colorado Geological Survey Information Series 64, CD-ROM.

Carroll, C.J., and Widmann, B.L., 2001, Colorado coal directory 2000: Colorado Geological Survey Information Series 55, 79 p., 1 plate.

Colorado Division of Minerals and Geology, 2005, monthly coal mining production records and miscellaneous mining maps from permit files.

U.S. Department of Energy, 2005, Energy Information Administration Quarterly Coal Report, October-December 2004: http://www.eia.doe.gov/cneaf/coal/quarterly/qcr_sum.html.

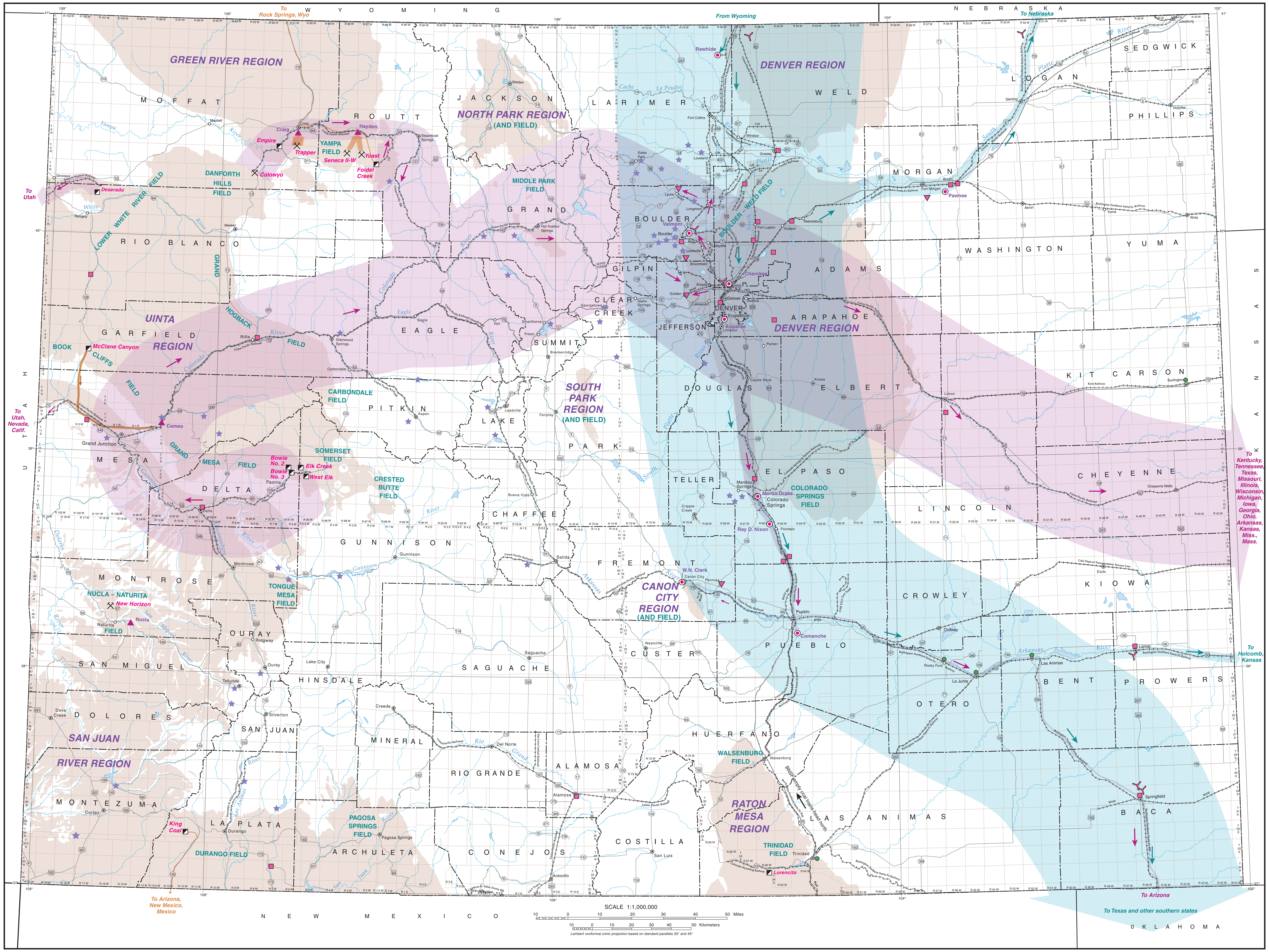
U.S. Department of Energy, 2003, Energy Information Administration Annual Coal Report 2003: DOE-EIA-0584 (2003), http://www.eia.doe.gov/cneaf/coal/page/acr/acr_sum.html.

COLORADO GEOLOGICAL SURVEY
DEPARTMENT OF NATURAL RESOURCES
DENVER, COLORADO

COAL PRODUCTION, DISTRIBUTION, AND ELECTRIC GENERATION MAP OF COLORADO, 2005

By Christopher J. Carroll

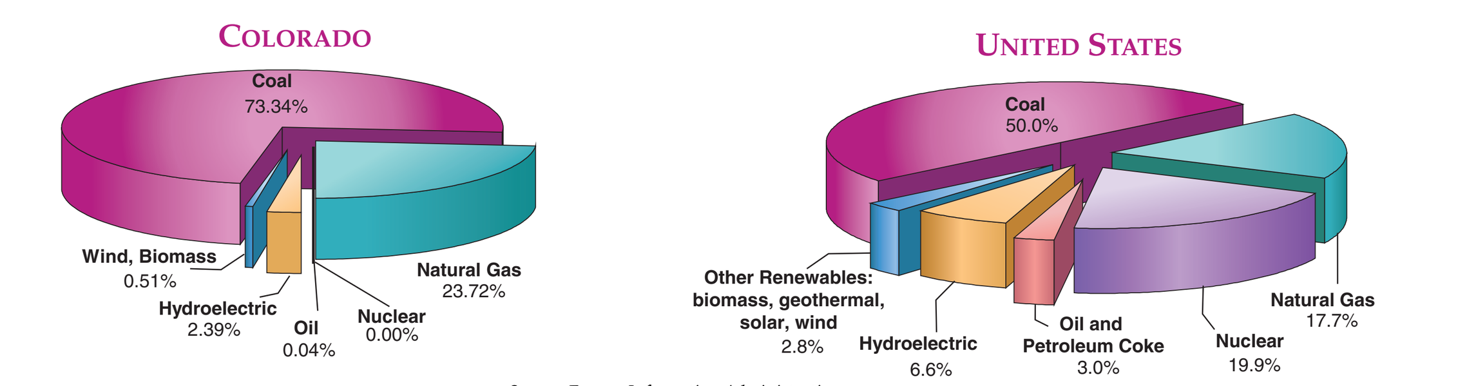
INFORMATION SERIES 71
PLATE 1
2005



Base map data sources: counties, highways, and railroads—Colo. Dept. of Transportation; township and range—Tobin International, Ltd.

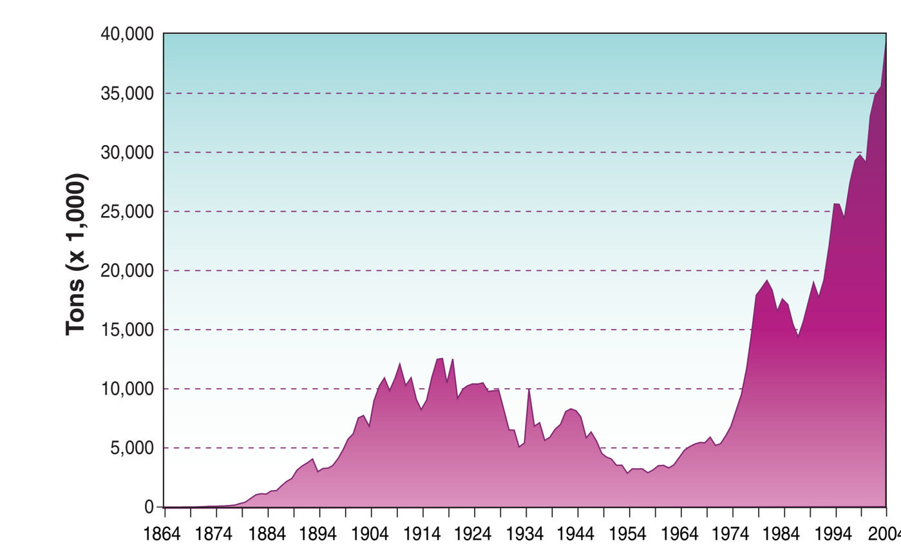
Digital cartography by Cheryl Brchan

Electric Generation by Energy Source, 2005



Source: Energy Information Administration

Historic Coal Production in Colorado, 1864–2004



Source: Colorado Division of Minerals and Geology

Coal Resources

Coal companies in Colorado produced a record 40 million tons in 2004. Most of the coal produced in Colorado today is used as steam coal for electric power generation. Colorado coal is classified as compliance coal as it is generally low in sulfur, ash, and trace elements. This steam coal is blended with lower quality coal for environmental compliance at power plants in the Midwest and South. In 2004, 11.78 million tons of Colorado coal were burned at power plants and industrial plants within the state and about 26.62 million tons were shipped to 20 different states and one foreign country. An additional 8 million tons of Wyoming coal were burned at Colorado power plants as well. Colorado ranks sixth in the nation in annual coal production.

Coal-bearing geologic strata underlies nearly one-third of the state. It is estimated that more than 129 billion tons of coal lie less than 3,000 ft below the land surface in Colorado. Not all of this coal can be mined. The mineable coal includes coal beds at least 28 inches thick, less than 2,000 ft deep, and of bituminous rank. Subbituminous coal up 60 inches thick is also included. The total Demonstrated Reserve Base for Colorado coal is 16.365 billion short tons, with only 9.837 billion short tons estimated as recoverable reserves. Recoverable reserves under lease at active coal mines in Colorado today is 427 million tons.

Colorado ranks second nationally in bituminous coal reserves, but first in "clean coal" bituminous reserves. This is compliance coal which meets sulfur dioxide emission standards for air quality. Over 80 percent of Colorado's coal reserves are bituminous.

2004 Coal Production and Distribution Estimated Statistics by County and Mine

		Tons Shipped (x 1000)			
County	Mine*	In-State	Out-of-State	Out-of-Country	Total Production
Delta	Bowie No. 2	0	4,108	0	4,108
	Bowie No. 3	0	588	0	588
Gunnison	Elk Creek	412	6,137	0	6,549
	West Elk	659	5,932	0	6,591
La Plata	King Coal	46	276	138	460
Mesa	McClane Canyon	289	0	0	289
Moffat	Colowyo	3,636	2,744	0	6,380
	Trapper	1,837	0	0	1,837
Montrose	New Horizon	413	0	0	413
Rio Blanco	Deserado	0	2,553	0	2,553
Routt	Seneca II-W	673	0	0	673
	Yoast	816	0	0	816
	Foidel Creek	2,995	4,279	1,284	8,558
Total		11,776*	26,617*	1,422*	39,815*

*Rounded to nearest 1,000

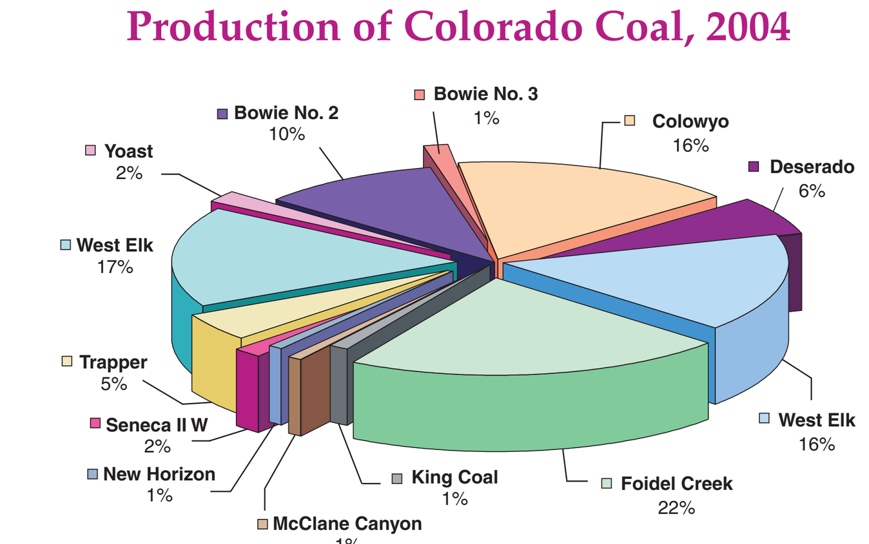
Source: Estimated from distribution percentages reported by mines; Colorado Division of Minerals and Geology

Industrial Coal Consumption in Colorado, 2004

Owner/Plant	Coal (tons)	Source of Coal
HOLCIM, INC.		
Florence Plant	171,404	Twenymile/Foidel Creek Mine, Colo.
CEMEX, INC.		
Lyons Plant	90,178	West Elk Mine, Colo.
TEXAS INDUSTRIES, INC.		
Boulder Plant	21,000	Elk Creek Mine, Colo.
TRI-GEN (COORS BREWING COLO.)		
Golden Plant	328,594	Elk Creek Mine, Colo.
WESTERN SUGAR COMPANY		
Fort Morgan Plant	40,150	N. Antelope/Rochelle Mine, Wyo.
Total	651,326	

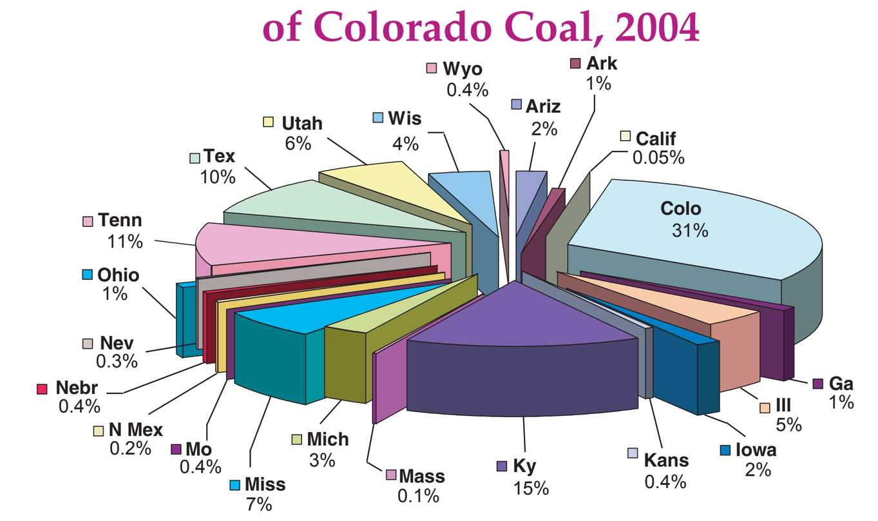
Source: Individual plant managers

Production of Colorado Coal, 2004



Source: Colorado Division of Minerals and Geology

Domestic Distribution of Colorado Coal, 2004



Source: Energy Information Administration

Electric Generation and Fuel Consumption at Major Coal-Fired Power Plants, 2004

Owner/Plant	Nameplate Rating (mW)	Gross Electric Generation (kWh x 1000)	Fuel Consumed: Coal (tons)	Fuel Consumed: Gas (mcf)	Fuel Consumed: Oil (bbl)	Coal Source
COLORADO SPRINGS UTILITIES						
Martin Drake	281	1,830,722	872,564	220,886	0	Foidel Creek Mine, Colo.; N.Antelope/Rochelle, Caballo, Wyo.
Ray D. Nixon	225	1,865,968	991,696	73,919	118,218	Foidel Creek Mine, Colo.; N. Antelope/Rochelle, Caballo, Wyo.
Subtotal	506	2,252,690	1,864,260	294,805	118,218	
PLATTE RIVER POWER AUTHORITY						
Rawhide	270	2,252,742	1,296,357	310,694	65,253	Antelope Mine, Wyo.
XCEL ENERGY (PUBLIC SERVICE CO. OF COLORADO)						
Arapahoe	144	987,184	604,636	19,405	0	Antelope, Black Thunder Mines, Wyo.
Cameo	66	471,707	295,601	35,488	0	McClane Canyon Mine, Colo.
Cherokee	710	5,400,031	2,227,080	462,443	0	Foidel Creek, Colowyo Mines, Colo.
Comanche	700	4,720,155	2,606,392	120,875	0	Belle Ayr, Eagle Butte Mines, Wyo.
Hayden	447	3,797,560	1,813,967	14,270	1,957	Seneca Mines, Colo.
Pawnee	547	3,760,418	2,182,976	94,748	0	Belle Ayr, Eagle Butte Mines, Wyo.
Valmont	166	1,433,818	588,140	19,711	2	Foidel Creek, Colowyo, Elk Creek Mines, Colo.
Subtotal	2,780	20,570,873	10,317,892	766,941	1,957	
TRI-STATE GENERATION AND TRANSMISSION ASSOCIATION						
Craig	1,264	9,969,190	4,889,228	67,562	314,362	Colowyo, Trapper, Foidel Creek Mines, Colo.
Nucla	100	747,743	418,744	0	0	New Horizon Mine, Colo.
Subtotal	1,364	10,716,933	5,307,972	67,562	314,362	
UTILICORP UNITED, INC.						
W.N. Clark	38	285,000	160,000	0	0	Foidel Creek Mine, Colo.
Total	4,958	37,522,238	18,946,481	1,440,002	499,790	

Source: Individual company managers

Acknowledgments

The author wishes to thank all of the coal producers, industrial coal consumers, and electric power producers (including hydroelectric stations) for their cooperation and assistance with special thanks to the following people: Bob Gaines, Aquila, Inc.; Pam Butler and Nancy Ash, Gerry Zimmerman, Toni Martinez, Kent Johnson, Xcel Energy; Price Hatcher, Xcel Renewables; Jerry McCauley, Xcel Fort St. Vrain Plant; Rusty Leech, Xcel Cameo Power Station; Jane Bittner, Xcel Cabin Creek Hyrdo; Bill Haffner, Beth Bingham, Tri-State Generation & Transmission Association; Ron Thompson, Lorencito Coal Company; Jake Gesner, City of Boulder; Raymond Dubois and Tonia Perkins, Trapper Mining Co.; Bill Ewer, City of Longmont; Bob Young, Juan Garcia and Kelly Sanders, Colowyo Coal Company, L.P.; Jerry Foster, Denver Water; Jack Burman, City of Delta; Kathy Bonitz, and Gary Aron, Calpine; Alan Hillard, Jeff Dubbert, Blue Mountain Energy, Inc.; Myra McDermott, Lamar Light & Power; Greg Hunt and Colin Stewart, Bowie Resources, Ltd.; Bob Shevling, Peabody/Seneca Coal Co.; Janine Klinge, STS Hydropower, Ltd; Michele Fujimoto, Colorado Springs Utilities; Walt Payne, Chuck Pedersen, US Bureau of Reclamation; Ken Ball, Jim Cooper, Bob Koch and Rob Thurman, Oxbow Mining, Inc.; Alice Jewell, Arkansas River Power Authority; Bruce Runyan, Excel Comanche Station; Wendell Koontz and Phillip Schmidt, Mountain Coal Co.; Jerry Bartlett, Burlington Northern Santa Fe; Victor Mendez, Regents of the University of Colorado; Levi McEwen, Franklin Sams, Union Pacific Railroad; Milt McBride, ThermoCogeneration Partnership; Joe Keefe, Colorado Energy Management; Todd Richmond, Ptarmigan Resources and Energy; Mark O'Meara, City of Aspen; Trent Peterson and Tom Bird, National King Coal, LLC; Tim Cowger, Western Sugar Company; Greg Strong, Redlands Water and Power Company; John Skubiz and Rocky Thompson, Twentymile Coal Company; Heather Banks, Platte River Power Authority; Lance Wade, Western Fuels Colorado, LLC; Jeff Richie, Tri-Gen Colorado Energy Co. The staff at the Colorado Division of Minerals and Geology were also very helpful including Sandra Brown and Kent Gorham. Other valuable sources of information included the Bureau of Land Management Web Site http://www.blm.gov/ nhp/index.htm; the Xcel Energy Web Site http://www.xcelenergy.com/XLWEB/CDA/; the U.S. Department of Energy's Energy Information Administration web site http://www.eia.doe.gov/; the U.S. Bureau of Reclamation Colorado hydroelectric plants http://www.usbr.gov/dataweb/html/codams. html; and the American Wind Energy Association Colorado projects page http://www.awea.org/projects/colorado.html.

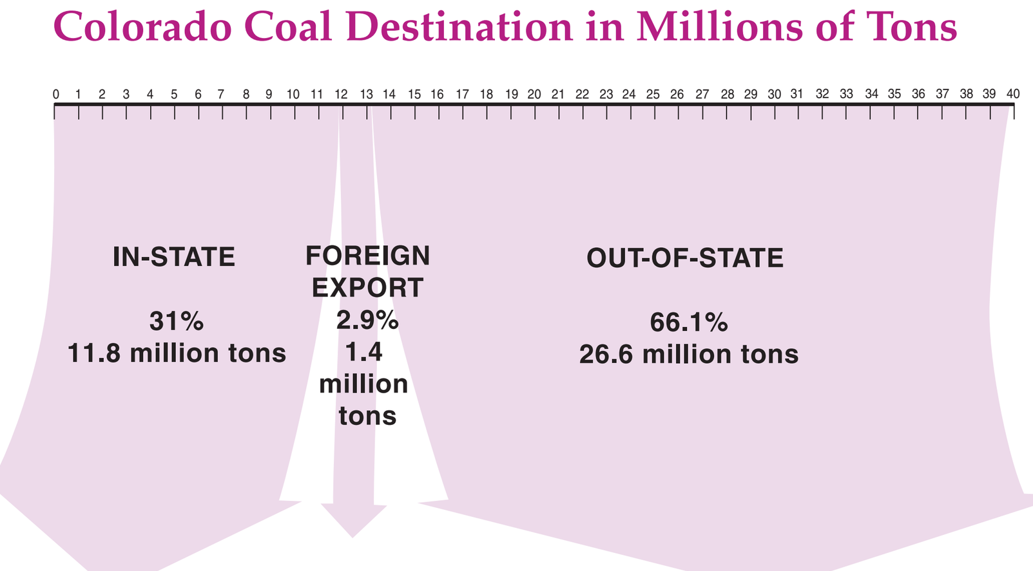
This map is a revision of Plate 1 of Colorado Geological Survey Information Series 55 (2000) by C.J. Carroll and B.L. Widmann.

Explanation

- Coal region boundary
- DENVER REGION — Coal region name
- TRINIDAD FIELD — Coal field name
- Trapper — Surface mine and name
- West Elk — Underground mine and name
- Union Pacific Railroad — Railroad line and ownership
- Direction of Colorado coal transported by truck (see graph at right for scale)
- Direction of Colorado coal transported by rail (Union Pacific) (see graph at right for scale)
- Direction of Wyoming coal transported by rail (Burlington Northern Santa Fe) (see graph at right for scale)
- Cherokee — Coal-fired power plant and name*
- Hayden — Mine-mouth coal-fired power plant and name
- Hydroelectric power plant
- Fuel oil power plant
- Natural gas power plant (utility and gas processing plants)
- Industrial coal consumers
- Alternative energy power plant (wind or biogas)

*NOTE: Some coal-fired plants also burn natural gas and fuel oil. See Tables 3 and 4 of booklet.

Colorado Coal Destination in Millions of Tons



Scale: 1/8 in. = 1 million tons of coal