

GEOLOGIC MAP OF THE MT. AXTELL QUADRANGLE,
GUNNISON COUNTY, COLORADO

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Table 1.—Coal mine inventory and summary, Mt. Axtell quadrangle, Gunnison County, Colorado
[Leaders (---) mean no data]

Coal mine location no.	Coal mine names(s); operator(s)	Years operated	Coal bed(s) and thickness in feet (meters)	Coal rank ¹	Production in short tons (metric tons)	Numerals keyed to reference list		Remarks
						Coal analyses	General	
1	Alpine No. 1; Rocky Mtn. Fuel Co.	1897-98	Bed B, 4.5-8.5 (1.4-2.6)	b	4,815 (4,368)	---	9, 10, 30	Original opening of White Ash mine. Slightly coking.
2	Alpine No. 2; Rocky Mtn. Fuel Co., Alpine Fuel Co.	1900-46	Bed B, 6.0-8.0 (1.8-2.4)	sub A-hvb A	2,132,260 (1,934,386)	4, 11, 13, 17, 18, 30, 33, 34, 39	4, 8-12, 17-26, 30, 36, 37, 44, 45	153 ft (47 m) deep shaft; workings coextensive with Alpine No. 1, Smith, Sunbeam, and White Ash mines.
3	Baldwin (South Park, Citizen); Union Coal Co., Union Pacific Coal Co., Citizen Coal Co.	1881-93	Bed B, 4.0-6.8 (1.2-2.1)	hvb C-hvb B	268,467+ (243,553+)	4, 13, 18	4, 8-10, 15, 19, 21, 23, 26-28, 30, 42-45	150 ft (46 m) deep shaft; workings coextensive with Black Diamond, Union, and Superior(?) mines. Slightly coking. Worked in 1893 and later(?) as the Citizen mine.
---	Becket; W. C. Becket	1883-84	Bed C?, 5.0 (1.5)	an	500 (454)	---	4, 20	Original site(?) of Richardson mine.
---	Bentley	---	---	---	---	---	---	May refer to White Ash mine or to the Star mine in the adjacent Squirrel Creek quadrangle.
4	Black Diamond (B. D.); Black Diamond Coal Co.	1894-98	Bed B, 5.0-6.0 (1.5-1.8)	b	22,069 (20,021)	---	4, 9, 30, 44	---
5	Carbon Creek; Carbon Creek Coal Co., W. Waugh, A. G. Smith, L. G. White	1925-27 1931-44 1948-50	Bed B, 4.0-6.0 (1.2-1.8)	b-sa	11,489 (10,423)	---	4, 8-10, 24, 29, 30	Many faults. Original location of the Augusta coal claim in 1880.
8	Castle Creek	About 1910 and later	1.0-3.0± (0.3-0.9±)	b	un	---	---	Several short, caved adits with small dumps on the south side of Castle Creek. Coal zone estimated to be about 300 ft (91 m) above coal bed B.
---	Citizen	---	---	---	---	---	---	See Baldwin mine.
7	Holley; N. A. Holley Coal Co.	1894-97	Bed C?, 5.0-6.0 (1.5-1.8)	b	8,426 (7,644)	---	4, 9, 20, 44	---
8	Kubler (New Baldwin); Kubler Coal Co., LaPlante and Sons, Rocky Mtn. Fuel Co.	1881- ? 1885-98 1907-13 1913-15 1934-39 1946-49	Bed B, 5.0-7.0 (1.5-2.1)	hvb C	283,000+ (256,738+)	1, 4, 11, 17, 18, 30, 39, 40	4, 8-11, 13, 17-19, 22, 44, 45	Workings coextensive with Nu No. 2 Mine. 4-5 percent pitch of coal bed. Two beds may have been mined. Lower mined bed reported to be about 70 ft (21 m) below bed B.
9	LaPlante; D. L. LaPlante	1884-85	Bed A, 4.0± (1.2±)	b	un	17, 18, 30, 39	10, 17, 30	Shaft and 400 ft (122 m) long drift.
10	Lewis	About 1890	Bed B?, 3.9 (1.2)	b	un	---	23	---
---	Mount Carbon Coal Extension	1881	Bed C, 3.5-4.5 (1.1-1.4)	b	un	---	20, 22	Located between Nu No. 2 and Holley mines. Two adits with sizable dumps in coal bed about 115 ft (35 m) above bed B in area of Nu No. 2 workings.
11	Mount Carbon Coal Tunnel; Mount Carbon Anthracite Coal Co., Ohio Creek Anthracite Coal Co., W. Hinds	1885-91	3.5 (1.1)	b-sa	un	15, 16, 30	20, 22, 27, 30, 42, 44	1,148 ft (350 m) long adit cuts three steeply inclined coal beds on west flank of Carbon Peak. Large mine dump; 20 coke ovens. Mined coal bed about 600 ft (183 m) stratigraphically below top of Mesaverde Formation.
---	New Baldwin	---	---	---	---	---	---	See Kubler mine. May also refer to the LaPlante No. 2 mine in adjacent Squirrel Creek quadrangle.

Table 1.—Coal mine inventory and summary, Mt. Axtell quadrangle, Gunnison County, Colorado—Continued

[Leaders (—) mean no data]

Coal mine location no.	Coal mine names(s); operator(s)	Years operated	Coal bed(s) and thickness in feet (meters)	Coal rank ¹	Production in short tons (metric tons)	Numerals keyed to reference list		Remarks
						Coal analyses	General	
12	Nu No. 1; Partch Brothers	1939-55	Bed B, 4.0-6.0 (1.2-1.8)	hvb C-hvb B	222,740 (149,035)	4, 13, 18, 34, 40	1, 2, 4, 8, 9, 19, 24, 34, 35, 44	Connects with the Ohio Creek No. 2 mine.
13	Nu No. 2; Nu Coal Co., Partch Brothers	1954-69	Bed B, 5.0-7.0 (1.5-2.1)	hvb C-hvb A	221,982 (201,382)	3, 13, 18, 34	2, 4, 6, 8, 9, 20, 30, 34	Coextensive with the Kubler mine.
14	Ohio Creek No. 1; Ohio Creek Coal Co., C. M. Long, G. D. Manfield, Staples Brothers	1917-51	Bed B, 5.5-8.3 (1.7-1.9)	hvb C-hvb B	186,312 (169,022)	3, 4, 13, 18, 33, 34	1, 4, 7-9, 17, 24, 34	Coextensive with the Great Western Coal mine in the adjacent Crested Butte and Flattop Mountain quadrangles. Entry adit in adjoining Squirrel Creek quadrangle.
15	Ohio Creek No. 2 (O-C Mine); Ohio Creek Coal Co., S. L. Staples, Weaver Brothers	1952-80	Bed B, 5.0-6.0 (1.5-1.8)	hvb C	94,371 (85,613)	3, 4, 13, 17, 18, 33, 34	7-10, 18-20, 24, 25, 34	Coking qualities. Coextensive with the Ohio Creek No. 1 and Nu No. 1 mines. Entry adit in adjoining Squirrel Creek quadrangle.
16	Owen	About 1880	>1.0 (>0.3)	b	un	—	22	—
17	Purrier; Henry Purrier Coal Co.	1888-92	Bed C?, 4.0± (1.2±)	b	un	30	8, 20	—
18	Richardson; Richardson Coal Co., Mount Carbon-Anthracite Coal Co., Gomer Dollard, Weaver Brothers	1874-? 1884-86 1930-34 1936-45 1947-51	Zone C?, upper bed, 1.6 (0.5) lower bed, 2.8-5.0 (0.9-1.5)	lvb B an	24,000 (21,773)	4, 11, 16-18, 30, 34	4, 8-10, 12, 17-19, 22, 30, 31, 34, 44, 45	Coking and anthracite coal. Locally mined two beds, separated by about 4.5 ft (1.4 m) of shale. Coal underlies Mount Carbon laccolith.
19	Ruby-Anthracite (Floresta No. 1); Caledonia Fuel Co., Union Pacific Coal Co., Colorado Fuel and Iron Co.	1893-1900	3.5-4.5 (1.1-1.4)	an	118,194 (107,226)	4, 11, 15-18, 26, 30, 44	4, 8-10, 12, 14, 15, 17-23, 26, 28, 30, 32, 36, 38, 41, 42, 44, 45	Premium quality anthracite coal; some coking coal. Faulted and intruded by dikes. In the Paonia Shale Member about 1,400 ft (427 m) below the top of the Mesaverde Formation. Overlies the roof of the Anthracite Range laccolith.
20	Smith (Old Baldwin); A. G. and J. M. Smith, R. Stajdohar, E. L. Dutcher and L. D. Hardin	1947-66	Bed B, 4.5-8.0 (1.4-1.8)	hvb C	32,238 (29,246)	3, 34	1, 5, 9, 20, 34	Part of the Alpine No. 2 workings. Smith operations mined pillars.
21	Sunbeam; Gunnison Coal Co., Sunbeam Coal & Coke Co., Thomas Nesbeth	1894-97	Bed B, 8.0-8.0 (1.8-2.4)	hvb C	28,769 (26,099)	4	4, 20, 30, 36, 44	Coextensive with the Alpine No. 2 mine. Entry adit in adjoining Squirrel Creek quadrangle.
—	Superior; Superior Coal Co., Alex Waugh	1895-97	Bed B(?), 4.0-5.0 (1.2-1.5)	sub B	3,654 (3,315)	4	4, 9, 20, 44	Location uncertain; probably in sec. 8, T. 15 S., R. B6 W. and coextensive with Baldwin, Union, and Black Diamond mines.
22	Unknown	—	Bed A	—	—	—	—	Old mine at junction of Carbon Creek and Owens Gulch.
23	Unknown	—	3.6-5.0 (1.1-1.5)	b-an	un	—	—	Several adits and prospects with dumps between Ohio Pass and the Ruby-Anthracite mine.
24	Unknown	About 1908	Bed B, 5.0 (1.5)	—	—	—	30	30 ft (9 m) deep shaft.
25	Union (H. & H. Union); Union Coal Co., Union Pacific Coal Co., Hare & Hirdman	1897-1902 1951-52	Bed B, 6.0 (1.8)	hvb C	58,080 (52,690)	—	4, 8, 9, 16, 20, 42	Coextensive with the Baldwin (South Park) mine.
—	White Ash; G. I. Bentley	1895-97	Bed B, 8.0 (2.4)	b	12,000+ (10,887+)	—	4, 20	Called Alpine No. 1 mine (1897-98).

¹Abbreviations:

un, unknown
b, bituminous
hvb A, high-volatile bituminous A, B, or C
sa, semianthracite
an, anthracite
sub A, subbituminous A or B
lvb B, low-volatile bituminous B

Table 2.—Partial list of metaliferous mines and prospects

(Leaders (—) mean no data)

Metal mine, prospect, or mining claim location no.	Mine, prospect, or lode claim name and mineral survey no.	Reported metal occurrence	Remarks
1	Boomerang, 4401	--	Adit and several prospect pits. May intersect Forest Queen vein system on west side of Coal Creek. Vein breccia, quartz gangue, and sulfides on dumps.
2	Blind King, 2757	Ag	Two adits on N. 30° W. and N. 10° W.-trending shears (elevation 9,900–9,990 ft). Quartz-sulfide veins cut porphyry sill.
3	Burlington, 3137	Ag	Includes group of four timbered shafts and shaft house at junction of nearly vertical, mineralized fault fissures trending N. 10° W. and N. 45° W. Shaft about 1,200 ft (366 m) north of above at junction of N. 10° W. fissure and crosscutting mineralized structure. Two timbered shafts along N. 10° W. mineralized vein to west may be on Burlington claim.
4	Daisy M.	--	Adit about 500 ft (152 m) east of Coal Creek. Mostly unaltered sandstone on large dump.
5 ¹	Davy Crockett, 3299	--	Two adits. Sulfide minerals on dumps.
6	Eclipse	--	--
7	Ella (Ellis), 3802	Ag	Two timbered shafts and trench, head frame, and older boiler. N. 10° E.-trending quartz-sulfide vein. Same vein as the Eureka.
8	Eureka	Ag	800-ft (244-m) tunnel along N. 10° E. fault and mineralized vein connects three timbered shafts. Shaft, 150 ft (46 m) deep, connected with 75-ft (23-m) drift and tunnel in 1883. Quartz veins contain ruby silver.
9	Fairview	Ag	Several shafts and prospects along N. 15° E., mineralized fault fissure which is 5–6 ft (2 m) wide. Same vein as Yellow Jacket.
10 ¹	Forest Queen, 745	Ag, Au, Zn, Pb, Cu, Sn, Mo	Main production period 1879–97. Intermittent activity 1901–02, 1917–19, 1934–35, 1945–51, and 1959 to present. Connects with Ruby King and Mountain Gem workings along same veins(s). 3,000–4,000 ft (914–1219 m) of lateral workings on seven or eight levels. About 1,500 ft (457 m) of shafts, raises, and stopes in a vertical interval of about 450 ft (137 m). 800-ft (244-m) drainage tunnel on 200-ft (61-m) level (flooded). Developed along complex fault zone, downthrown about 200 ft (61 m) to southeast. Zone includes numerous fissure veins 20–100 ft (6–30 m) or more apart. Forest Queen vein averages about 5 ft (1.5 m) wide, is vertical to nearly vertical in upper 300 ft (91 m), then pitches southeast. Ore minerals include sulfides, arsenides, and antimonides of silver: proustite and pyrrhotite (ruby silver), stephanite (wire silver), argyrodite, argentite, argentiferous tetrahedrite, native silver, gold and ruby silver in arsenopyrite, minor sphalerite and galena, traces of copper (chalcocopyrite and enargite), molybdenum, and tin. Chief ore is argentiferous arsenopyrite. Ore averaged about 140 oz Ag/ton in early years. Later shipments averaged nearer 20 oz Ag/ton and about 0.3 oz Au/ton. Gangue minerals mostly quartz, calcite, clay minerals, and pyrite. Some rhodochrosite, barite, and siderite locally. Main shaft 285 ft (87 m) deep.
11 ¹	Forfeit, 5525	Ag	Adit and prospects along several N. 7° W.-trending, nearly vertical faults and mineralized veins.
12	General Moltke, 2389	--	Adit with mineralized vein rock on dump.
13	Granddad	--	--
14	Keystone	Zn, Pb, Ag, Cu, Au	Largest and most productive metal mine in this quadrangle and periodically the largest in the county. Eight levels connected by shafts and three entries. Developed along two high-angle fault-fissure veins. Keystone vein explored more than 3,000 ft (914 m) laterally and 1,100 ft (335 m) vertically. Fault zone up to 9 ft (3 m) wide. Union vein explored in lower levels of mine, about 2,000 ft (607 m) laterally and 300 ft (91 m) vertically. About 13,000 ft (3962 m) of lateral workings and 4,600 ft (1402 m) of shafts and raises by 1961. Ore minerals include pyrrhotite, argentiferous tetrahedrite, chalcocopyrite, sphalerite, argentiferous galena, gold, and some ruby silver. Ore bodies 3–6 ft (1–2 m) wide. Periodically third in production of silver and zinc and fourth in production of lead in Colorado. Active from about 1883–89, 1914, 1945–56, 1958–72, and 1974 to present.
15 ¹	Last Chance, 4955	Ag, Au	Vertical fault-fissure vein parallel to Forest Queen vein.
16	Little Frank, 3138	--	Several adits with large dumps. Shaft and prospect pits aligned along two parallel quartz-pyrite veins trending N. 10° W. Veins about 250 ft (76 m) apart.
17	Louisa Tunnel	--	500 (800?) ft (152 (244?) m) tunnel driven to intersect the Mammoth vein. Entry strikes S. 70° E.
18	Lyons, 2755	--	Probably includes a timbered shaft and large dump on 10,600-ft contour and two adits at about 10,800- and 10,900-ft elevations near north quadrangle boundary. Workings on quartz-sulfide veins trending about N. 15–30° W. on west side of Elk Creek.
19	Mammoth, 19527, and Great Eastern, 4262	Ag	Four deep shafts (two timbered), adits, and numerous prospect pits along fault and quartz-sulfide veins trending N. 10–30° E. Wasatch beds are west of fault and a porphyry sill is east of fault.
20 ¹	Mountain Gem, 4257, 4258	Ag, Au	Connected with Forest Queen workings along same vein system. Several hundred feet (meters) of lateral workings with large stoped areas. Main shaft 250 ft (76 m) deep.
21	My Boys	--	--
22	National, 3737	Ag	Two adits and shaft. Native silver.
23	Priceless, 3736A-B	--	Several pits, adits, and shafts(?). Dumps in this area were used to construct dam at Lake Irwin north of quadrangle.
24 ¹	Republic, 1348	--	Tunnel and shaft. Shaft at corner of ore bin behind John Hahn cabin, probably on the Last Chance vein.
25	Roosevelt No. 1	--	Three deep pits or caved shafts on vertical, N. 30° W., mineralized fault fissure that is 4 ft (1 m) wide. Two shafts at top of the 10,805-ft hill are on a 3 ft (1 m) wide, N. 10° E., quartz-sulfide fissure.
26	Roosevelt No. 2	--	Timbered shaft on top of ridge at 10,750-ft elevation on vertical, pyritized N. 35° E. fault fissure that is 5 ft (1.5 m) wide. Prospect on N. 10° W. altered zone is about 600 ft (183 m) southeast of above.
27	Roosevelt No. 3	--	Complex of four shafts and adit near southwest side of Copley Lake on N. 60° E. mineralized fault fissure. Wasatch beds north of fault; porphyry sill south of fault.

Table 2.—Partial list of metaliferous mines and prospects—Continued

[Leaders (—) mean no data]

Metal mine, prospect, or mining claim location no.	Mine, prospect, or lode claim name and mineral survey no.	Reported metal occurrence	Remarks
28 ¹	Ruby King, 1209	Ag, Au, Pb, Zn	Connected with Forest Queen workings by four levels. Main shaft 400 ft (122 m) deep. Three levels in main shaft at 150, 200, and 260 ft (46, 61, and 79 m) below collar. About 1,400 ft (427 m) of lateral workings, about 480 ft (146 m) of shafts and winzes, and several hundred feet of raises and stopes. 800-ft (244-m) drainage tunnel on 200-ft (61-m) level (flooded). Upper 70 ft (21 m) of main shaft in moraine. 6-in. (15-cm) coal seam cut in shaft at 280 ft (85 m). Remarks apply to the Forest Queen fault zone; mineralization and mining activity also apply to the Ruby King workings.
29	Ruby Queen, 3138	—	Two shafts and prospects on north-south shear. Ruins of shaft house. Timbered shaft about 100 ft (30 m) south-west of above on N. 10° W. quartz-sulfide vein.
30	Silver Queen	—	Adit driven in Wasatch beds. Several adits and prospects in altered rock aligned along east-trending veins near the southwest corner of the Silver Queen claim.
31	Venango, 2679	Ag, Pb, Cu	Adit at 10,880-ft contour: (90 ft (27 m) long, with 200-ft (61-m) winze and 100-ft (30-m) drift) on 40-ft (12-m) wide, altered and mineralized shear zone trending N. 25° W. A barren tunnel 420 ft (128 m) long, at the 10,740-ft contour is about 250 ft (76 m) southwest of above.
32	Yellow Jacket, 15036	—	Shaft on N. 15° E. fault fissure. Same vein as Fairview.
33	Yellow Dog and Pearl B	U	Prospect pits and adit in conglomeratic and carbonaceous sandstone.

¹See inset map of the Forest Queen mine area. Most of the unnamed prospects, adits and shafts without a coal symbol (c) show some sulfide mineralization.

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