United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form.* If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions.

1. Name of Property

historic name Frontenac and Aduddell Mine Complex

other names/site number Frontenac and Aduddell Mines (5GL.108), Original Frontenac Mine Shaft (5GL.2386), Gilpin County Tramway (5GL.2104.4)

2. Location

street & number 0.25 miles southwest of the junction of Church Placer Road and Pewabic Mountain Road

n/a not for publication

X vicinity

city or town Russell Gulch

state Colorado county Gilpin zip code 80452

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended,

I hereby certify that this _X_ nomination ___ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.

In my opinion, the property _X_ meets ___ does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance:

___ national ___ statewide _X_ local

Deputy State Historic Preservation Officer
Signature of certifying official/Title — Date

History Colorado
State or Federal agency/bureau or Tribal Government

In my opinion, the property ___ meets ___ does not meet the National Register criteria.

Signature of commenting official — Date

Title — State or Federal agency/bureau or Tribal Government

4. National Park Service Certification

I hereby certify that this property is:

___ entered in the National Register
___ determined eligible for the National Register
___ determined not eligible for the National Register
___ removed from the National Register
___ other (explain:) _____

Signature of the Keeper — Date of Action

Frontenac and Aduddell Mine Complex
Name of Property

Gilpin County, Colorado
County and State

5. Classification

Ownership of Property
(Check as many boxes as apply.)

x	private
	public - Local
	public - State
	public - Federal

Category of Property
(Check only **one** box.)

	building(s)
x	district
	site
	structure
	object

Number of Resources within Property
(Do not include previously listed resources in the count.)

Contributing	Noncontributing	
3	1	buildings
2		sites
5	1	structures
		objects
10	2	**Total**

Name of related multiple property listing
(Enter "N/A" if property is not part of a multiple property listing)

The Mining Industry in Colorado (Fell & Twitty 2008)

Number of contributing resources previously listed in the National Register

n/a

6. Function or Use

Historic Functions
(Enter categories from instructions.)

Industry/Processing/Extraction: Extractive Facility

Current Functions
(Enter categories from instructions.)

Vacant/Not In Use

7. Description

Architectural Classification
(Enter categories from instructions.)

No Style

Materials
(Enter categories from instructions.)

foundation: Stone
walls: Wood
Metal
roof: Metal
other:

Narrative Description

(Describe the historic and current physical appearance of the property. Explain contributing and noncontributing resources if necessary. Begin with **a summary paragraph** that briefly describes the general characteristics of the property, such as its location, setting, size, and significant features.)

Summary Paragraph

The 17.0-acre Frontenac and Aduddell Mine Complex (5GL.108) includes three interrelated resources: the Frontenac and Aduddell Mines (5GL.108, 5GL.2368), and a segment of the Gilpin County Tramway (5GL.2104.4). The Complex is located in Gilpin County about one mile southeast of the town of Russell Gulch on private land. Specifically, the Complex is near the head of South Willis Gulch, situated on the southern slopes of the gulch with its aspect trending generally northeast. The Complex ranges in elevation from about 9,200' to 9,700' with vegetation consisting primarily of subalpine conifer forest, which creates a pine-duff layer on the steeply-sloping ground. The Frontenac and Aduddell Mine Complex is within the historic boundaries of the Russell Mining District, which begins at the mouth of Willis Gulch on Russell Gulch, heads southwest along the ridgetop dividing South Willis Gulch and Elkhorn Gulch, follows the line dividing Gilpin and Clear Creek counties generally northwest, then circles around to its beginning point over Alps Hill and along the ridge dividing Illinois Gulch and Leavenworth Gulch.[1]

The Frontenac and Aduddell Mine Complex includes two of three major historic gold mines on the Young Ranch West LLC Property, all of which date to the late 1800s. The Frontenac and Aduddell Mines were worked together, developed the same vein, and are connected subsurface; the neighboring Druid Mine, downslope to the northeast, operated alone and under separate management. The Frontenac and Aduddell Mines were both opened in 1869 to take advantage of the rich mineral resources of the Frontenac and Aduddell lodes, and the Frontenac Lode specifically was characterized in a 1911 publication as having four fissure veins of 4' to 6' width, bearing "auriferous and argentiferous chalcopyrite and tetrahedrite" or, in laymen's terms, ore containing gold, silver, and other desirable minerals.[2] As an example of a highly successful late-nineteenth/early-twentieth century production-class hard rock mine, the Complex is representative of a long-term financial investment with facilities designed to maximize production and minimize costs by incorporating state-of-the-art mechanization and engineering.[3] The Frontenac and Aduddell Mine Complex includes several contributing features characteristic of hard rock mining enterprises as delineated in *The Mining Industry in Colorado Multiple Properties Documentation Form* (Fell and Twitty 2008). The Complex includes shafts, an adit, depressions, building platforms, waste rock piles, prospect pits, surface plant structures (including a likely office, an outbuilding, an explosives magazine, and an outhouse), access roads, a Gilpin County Tramway rail line remnant, and perhaps most notably, intact remnants of an intricate shaft house including a headframe, hoist elements, ore bins, and ore chutes.

After the denouement of the mining era, South Willis Gulch experienced a second wave of occupation during the mid-twentieth century related to hunting and recreation, and although few features from that time period remain within the district boundary, they do not have a detrimental effect on the mining-era complex. Together, the extant elements of the Frontenac and Aduddell Mines and the Gilpin Tramway express a cohesive and interpretable hard rock mining operation representative of successful industrialized mining endeavors undertaken between ca. 1869 and 1922.

[1] Thomas Maitland Marshall, "Early Records of Gilpin County, Colorado, 1859-1861, Volume 2" (1920): 48; Michelle Slaughter and Deon Wolfenbarger, "Russell Gulch, Gilpin County, Colorado Historic Resources Survey: Phase 1 & Archaeology Survey Plan," prepared for Gilpin County Historic Preservation Commission (2017): 8-20.
[2] Horace J. Stevens, *The Copper Handbook: A Manual of the Copper Industry of the World*, 10 (1911): 829.
[3] Eric Twitty, "Historic Mining Resources of San Juan County, Colorado National Register of Historic Places Multiple Property Documentation Form" (2010): 179.

Narrative Description

The Frontenac and Aduddell Mine Complex includes features related to the Frontenac and Aduddell Mines and the Gilpin County Tramway. Elements of the Complex are addressed as individual structures/buildings and also as features of an industrial mining landscape site that takes up the entire district. Table 1 details the mining landscape site and its key features followed by each separate structure, building, or site. The features included in the landscape site are not counted separately but as elements of the overall contributing site of which they are a part. Table 1 also provides map references to be used in viewing the attached maps. For the following description, the elements of the Complex are presented generally from south to north as they are distributed across the property, beginning with the features within the Landscape and then moving on with the individual buildings, structure, and site.

Table 1. Elements of the Frontenac and Aduddell Mine Complex

Map Reference	Feature Name	Type	Year	Contributing Status
	Frontenac and Aduddell Mining Landscape	Site	Ca. 1869-1922	Contributing
A	*Frontenac Mine Shaft access road*	*Site Feature*	Ca. 1877	n/a
B	*Prospect pit grouping*	*Site Feature*	Ca. 1877	n/a
C	*Prospect pit grouping*	*Site Feature*	Ca. 1877	n/a
D	*Earthen building platform*	*Site Feature*	Mining era	n/a
E	*Depression*	*Site Feature*	Mining era	n/a
F	*Frontenac Mine Adit access roads*	*Site Feature*	Ca. 1877	n/a
G	*Earthen building platform with stone retaining wall*	*Site Feature*	Mining era	n/a
H	*Large waste rock pile*	*Site Feature*	Ca. 1875	n/a
I	*Small waste rock pile*	*Site Feature*	Mining era	n/a
J	*Depression*	*Site Feature*	Mining era	n/a
K	*Adit channel*	*Site Feature*	Mining era	n/a
L	*Outdoor toilet*	*Site Feature*	Mid-twentieth century	n/a
M	*Rock wall*	*Site Feature*	Mid-twentieth century	n/a
N	*Fire pit*	*Site Feature*	Mid-twentieth century	n/a
O	*Outbuilding remnants*	*Site Feature*	Mid-twentieth century	n/a
1a & 1b	Frontenac Mine Shaft and Waste Rock Pile	Structure	Ca. 1877	Contributing
2a & 2b	Frontenac Mine Adit and Waste Rock Pile	Structure	Ca. 1877	Contributing
3	Wood Cabin and associated fire pit	Building	Mid-twentieth century	Non-contributing
4	Frontenac Shaft House	Site	Ca. 1877-88	Contributing
5	Aduddell Mine West Shaft	Structure	Ca. 1875	Contributing
6	Stone Building	Building	Mining era	Contributing
7	Wood Outbuilding	Building	Mining era	Contributing
8	Explosives Magazine	Structure	Mining era	Contributing
9	Outhouse	Building	Mining era	Contributing
10	Aduddell Mine East Shaft	Structure	Mining era	Non-contributing
11	Gilpin County Tramway Remnant	Structure	1909	Contributing

THE FRONTENAC AND ADUDDELL MINES

The Frontenac and Aduddell Mining Landscape, ca. 1869-1922, contributing site (Photos 1-20)

Overall Landscape Description

The 17.0-acre property that comprises the Frontenac and Aduddell Mining Landscape extends along the southern slopes of South Willis Gulch and includes several features that, collectively, make up the cohesive historic fabric of the mining landscape. The features, which include access roads, multiple prospect pits, one prospect adit channel, earthen building platforms, depressions, and waste rock piles, clearly demonstrate the interrelated resources and operations at a producing hard rock mine. The features are distributed across the entire site and are described below. The site also includes four features from the mid-twentieth century use of the area, and although they fall outside of the Period of

Significance and do not support the overall contributing status of the site to the district, they are also described and mapped. The individual features are marked on the accompanying map by their assigned Feature letters (A, B, C, etc.).

Site Feature A - Frontenac Mine Shaft access road, ca. 1877 (Photos 1-2)
A narrow dirt road trace, that more resembles a wide trail, leads to and from the original Frontenac Mine Shaft (map key 1), trending generally northwest to southeast, indicating the route used to access the original workings. The road trace is about 8' wide and is about 100' long within the landscape/district boundary.

Site Feature B - Prospect pit grouping, ca. 1877 (Photos 3-4)
A grouping of about two dozen prospect pits surrounds the original Frontenac Mine Shaft and Waste rock pile (map key 1a and 1b) to the northeast and southwest, demonstrating the process of prospecting for the ideal location to sink a shaft. The pits range greatly in size, from as small as about 4' in diameter and 2' deep to as large as 25' in diameter and 15' deep. The area encompassing the pits measures about 800' northeast/southwest x 150' northwest/southeast.

Site Feature C - Prospect pit grouping, ca. 1877 (Photo 5)
A grouping of three prospect pits is located immediately downslope/northeast of the Frontenac Mine Adit and Waste rock pile (map key 2a and 2b). The pits are 6', 10', and 20' in diameter and demonstrate the process of prospecting for the ideal location to drive a tunnel or sink a shaft. The area encompassing the pits and their waste rock measures approximately 55' north/south x 35' east/west.

Site Feature D - Earthen building platform, exact date unknown (mining era) (Photo 6)
A leveled earthen platform that measures about 10' northeast/southwest x 8' northwest/southeast is located just downslope/northeast of Site Feature C (prospect pit grouping). Some tin and stove pipe remnants are in the vicinity, suggesting the platform may have been a building foundation.

Site Feature E - Depression, exact date unknown (mining era) (Photo 7)
A roughly square-shaped depression rimmed with locally procured stones is located about 20' northwest of the Frontenac Mine Adit (map key 2a). The depression is about 6' in diameter and could be an abandoned privy pit or a prospect pit.

Site Feature F - Frontenac Mine Adit access roads, ca. 1877 (Photos 8-9)
Two faint, parallel dirt road traces are located just northwest of the Frontenac Mine Adit (map key 2a) and likely served as access to the adit workings. The road traces trend generally east/west, are partially reclaimed by vegetation, and terminate at the Frontenac Mine Adit Waste Rock Pile (map key 2b). They are both about 6'6" wide and discernible for about 35' of length within the landscape/district boundary.

Site Feature G - Earthen building platform with stone retaining wall, exact date unknown (mining era) (Photos 10-11)
An earthen structure platform and associated stacked stone retaining wall is located immediately southeast of the Aduddell Mine West Shaft (map key 5). The leveled platform itself measures about 23' northwest/southeast x 13' northeast/southwest. Collapsed or purposefully piled stones are found along the north and east sides of the platform, and the intact stretch of dry-laid stone retaining wall is northeast of the collapsed or piled stones. The retaining wall runs along the southwest side of the recently developed interpretive trail and ranges in height from about 1.5' tall to 8' tall. The full area encompassing the platform and stones/wall measures about 40' north/south x 30' east/west.

Site Feature H - Large waste rock pile, ca. 1875 (Photos 12-13)
A large area of mine waste rock that measures about 165' east/west x 45' north/south is immediately east of Aduddell Mine West Shaft (map key 5) and is likely the waste from the excavation of that shaft. This large tailing pile has been leveled across its top, and the mining era Stone Building along with the mid-twentieth century outbuilding remnants, rock wall, outdoor toilet, and fire pit are atop the waste rock pile.

Site Feature I - Small waste rock pile, exact date unknown (mining era) (Photo 14)
A small waste rock pile is located about 400' northeast of the Stone Building (map key 6). The pile measures about 26' diameter by 4' high. No evidence of a prospect pit is present, making its origin unclear.

Site Feature J - Depression, exact date unknown (mining era) (Photo 15)
An earthen depression is about 12' south-southwest of the Explosives Magazine (map key 8). The depression is about 4' in diameter and 1' deep and, given its size, is likely a privy pit.

Site Feature K – Adit channel, exact date unknown (mining era) (Photo 16)
An adit channel is located about 120' east-northeast of the Stone Building (map key 6). The adit channel is generally oriented north/south with the mouth of the adit on the north end. A pile of waste rock is located on the northeast corner of its mouth. The channel measures about 30' north/south x 9' east/west maximum. The adit channel does not correspond with any available mining era maps and, given its size and relatively small waste rock pile, is likely a prospect adit.[4]

Site Feature L – Outdoor toilet, mid-twentieth century (Photo 17)
The minimal remains of an outdoor toilet built of dimensional lumber and corrugated metal are located about 33' northeast of the Site Feature G (earthen platform and stone retaining wall). The outdoor toilet is opportunistically set between a small group of pine trees and measures about 3' northwest/southeast x 5' northeast/southwest.

Site Feature M - Rock wall, mid-twentieth century (Photo 18)
A low-lying stacked rock wall is located about 33' east-northeast from Site Feature K (outdoor toilet). The wall runs generally north/south, measures about 13' long x 1.5' wide, and, based on its comparatively unsullied appearance, is associated with the mid-twentieth century use of the area.

Site Feature N - Fire pit, mid-twentieth century (Photo 19)
A fire pit is located about 14' southeast of Site Feature L (rock wall). The fire pit is about 4' in diameter and consists of a simple ring of locally procured rocks.

Site Feature O - Outbuilding remnants, mid-twentieth century (Photo 20)
The remnants of a temporary outbuilding are about 15' northeast of the Stone Building (map key 6). The outbuilding remnants consist of a rectangular stone foundation with collapsed dimensional lumber fragments piled within. An associated low-lying rock wall also runs generally east/west to the feature from the northwest. The remnants measure about 12' east/west x 7' north/south, and the associated rock wall measures about 14' long and 1'6" wide.

Alterations
In 2010, the Colorado Division of Reclamation, Mining, and Safety (DRMS) performed reclamation in the area generally north of the site, with a small portion of the reclaimed lands present inside the northeast boundary of the landscape/district (see Aduddell Mine East Shaft description below). Additionally, a pedestrian trail was developed through the landscape/district in 2019. This trail, built on the natural ground surface with locally procured stones used as stairs in some places, blends in well with the environment and does not have an adverse impact on the setting or feeling of the property, nor does it adversely impact any features within the site. The trail is intended for public educational use (see Developmental History for more detail).

Frontenac Mine Shaft and Waste Rock Pile, ca. 1877, contributing structure (Map Key 1a & 1b) (Photos 21-22)
The original shaft for the Frontenac Mine is located toward the southwest end of the Frontenac Lode 461A claim and corresponds to the location of the "Shaft House" plotted on the 1877 plat map (see Figure 1). No remnants of a shaft house remain, but some heavy timber remnants can still be seen in the walls of the shaft and in the associated waste rock

pile. The shaft itself is a large, deep hole in the ground that measures about 45' in diameter and at least 60' deep. The associated waste rock pile is immediately northeast/downslope and measures about 130' northeast/southwest x 120' northwest/southeast. The waste rock pile rises at least 50' above the slope upon which it is piled. This shaft also appears to be depicted on the 1912 and 1966 profile diagrams of the Frontenac and Aduddell Mines' underground workings (see Figures 3 and 4).

Frontenac Mine Adit and Waste Rock Pile, ca. 1877, contributing structure (Map Key 2a & 2b) (Photos 23-24)

This Frontenac Mine Adit is located toward the northeast end of the Frontenac Lode Claim 461A and corresponds to the location of an "adit" plotted on the 1877 plat map (see Figure 1). This adit also appears to be depicted on the 1912 and 1966 profile diagrams of the Frontenac and Aduddell Mines' underground workings (see Figures 3 and 4).The adit channel is slumped and opens to the northeast; it measures about 65' long and ranges from 8' to 20' wide. Notable rock retaining wall is built up at the mouth of the adit channel on its southeast side. The mid-twentieth century wood cabin (map key 3) is located immediately at the mouth of the adit. The large waste rock pile associated with the adit is located downslope/northeast of the channel, on the opposite side of the wood cabin. The waste rock pile measures about 70' northeast/southwest x 50' northwest/southeast.

Wood cabin and associated fire pit, mid-twentieth century, non-contributing building (Map Key 3) (Photos 25-26)

A small, gable-roof cabin built of dimensional lumber and raw logs with wire nails is located immediately at the mouth of the Frontenac Mine Adit (map key 2a). The cabin measures 9' northeast/southwest x 10' northwest/southeast. The cabin has a rectangular plan, and the northwest wall is the primary façade. An entryway is built onto the northwest wall to shelter the entrance doorway. The cabin is built into the generally northeast-trending slope on its southwest and southeast sides, and the southwest eave of the roof rests on the stone retaining wall stacked up at the mouth of the Frontenac Mine Adit. A roughly square, stacked-stone fire pit is located just outside the cabin entrance. The cabin and the fire pit date to the mid-twentieth century and likely represent a temporary habitation or seasonal hunting residence. Locals remember the cabin being present by the 1970s. The cabin and its fire pit are considered non-contributing elements of the district because they fall outside of the Period of Significance.

Frontenac Shaft House ruins, ca. 1877-88, contributing site (Map Key 4) (Photos 27-42)

Exterior

The Frontenac Mine Shaft House stands on a cut-and-fill earthen platform, reinforced by a stone and concrete mortar retaining wall visible beneath the building along portions of its east wall. The shaft house likely replaced earlier temporary buildings or structures, as the level platform would have been formed by workers as they initially excavated material from the hillside and removed waste rock from the mouth of the mine shaft. The building has an irregular, roughly L-shaped footprint. As it stands, it measures approximately 50' northwest/southeast x 60' northeast/southwest. The overall footprint is about 2,150 square feet and the building is oriented at a roughly forty-five-degree angle to cardinal directions, on a northeast-facing slope.[5]

The building, which was once three stories high, is an example of post-and-beam construction built with heavy milled timbers. As noted above, the foundation largely consists of a combination of masonry footings and timber sills. The exterior is clad in wood planks, fixed vertically to the building's frame with wire nails. Corrugated steel siding is present on much of the building, acting as a secondary siding material as well as the roof covering. The corrugated steel siding likely dates to the first two decades of the twentieth century. It does not appear in historic photographs from ca. 1908 (see Figure 10); however, by 1910 the material, which was first available as early as the 1890s, became the chosen siding for

[4] James E. Fell and Eric Twitty, "The Mining Industry in Colorado National Register of Historic Places Multiple Property Documentation Form" (2008): F-172.

[5] Although the Frontenac Shaft House faces roughly northeast, at a forty-five degree angle, the cardinal directions are used throughout this description for simplicity. Northeast is east; southeast is south; southwest is west; and northwest is north.

industrial applications due to its affordability, rigidity, and ability to be easily shipped.[6] Many intact features are still present at the Frontenac Shaft House (see Figure 5), and they are described in detail below.

The north side of the extant building displays, from east to west, the exterior of the tramway extension, a small ore bin, walls that enclose interior chutes, the main ore bin with an ore chute opening, and a bucket skid that ascends from a capped shaft up to a hoist at the top of the building. Note that what is discussed as a bucket skid could possibly be track for a skip, however, the vertical lumber guides running between the shaft opening and the hoist above are lacking the typical metal rails that provided tracking for a skip. As such, it has been deemed a bucket skid. Running above the shaft and into the bucket skid are extant rails from the original 1888 Frontenac spur of the Gilpin Tramway, the cars of which were assuredly fed by the aforementioned chute in the wall of the main ore bin. Still present are remnants of stacked log and stone retaining walls that supported the original set of rails that carried ore carts in and out of the building on the Gilpin Tramway. Otherwise, the original 1888 rail bed is no longer extant, and it is unknown if the 1888 rail continued to be used or was abandoned after the introduction of a new Gilpin Tramway spur to the building in 1909. Farthest west is the remnant of an exterior wall that enclosed other workings within the shaft house, with a doorway clearly centered along this portion of extant wall (see Figure 6).

The west side displays, from the north to south, the bucket skid ascending from the capped shaft to the hoist system (which is more clearly visible on this wall), the main ore bin, and the two-post and back-brace headframe. A large capped shaft is beneath the headframe. Also visible on the west side of the building is the remnant of an exterior wall that enclosed other shaft house workings, with four rectangular window openings still discernible. A wood plank lined subterranean cistern, 7’ in diameter, is located across from the shaft, just inside the extant wall remnants (see Figure 7).

The south side displays, from west to east, the two-post and back-brace headframe, ladder-like stairs that ascend from the ground surface up to the hoist at the top of the building, the main ore bin beneath the hoist/headframe, walls that enclose interior chutes, a smaller ore bin, and the tramway extension. Toward where the south exterior wall would have stood, two concrete machinery mounts are present at ground level. The northeastern-most mount measures 11’ northeast/southwest x 9’5” northwest/southeast and still has heavy duty metal bolts protruding up from the concrete along with one metal fixture of some sort. The southwestern-most mount measures 8’ northeast/southwest x 8’8” northwest/southeast and also has heavy duty bolts still protruding up. Although the machinery itself is gone, these mounts demonstrate the distribution of workings inside the shaft house and likely represent at least the location of the main engine (see Figure 8).

The east side displays, from south to north, the two-post and back-brace headframe, the east walls of the smaller ore bins that sit on the sides of the tramway extension, and the gable end of the tramway extension under which the 1909 spur of the Gilpin Tramway ran. Distinct piles of structural debris are present along the east and west sides of the building. Other structural debris original to the building, including lumber, wire nails, bolts, bricks, and sheet metal, are scattered throughout the extant building and its footprint.

Interior

The Shaft House was a multi-use building that sheltered a variety of activities at the mine and historically enclosed the shaft collar; the substantial headframe that would have held cables, pulleys, and sheaves used to raise and lower workers and materials in the shaft; the hoist; the main ore bin; ore chutes; and the power system. It also may have housed a blacksmith shop. Although the exact location of designated workspaces and machinery has not been determined beyond the extant machinery mounts, several key features within the building have been identified (see Figure 5 and Figure 9).

Still intact within the shaft house is an impressive system of ore bins and chutes. The large main ore bin has one metal chute opening at its bottom-most point. Another central chute, higher up on the east wall of the main ore bin, slopes

[6] Twitty, 2010: 207.

toward the tramway extension into the enclosed area of chutes that eventually empty under the tramway; the chute is lined with metal at its mouth. Above this central chute, two more wood box chutes descend toward the tramway on either side of the lower central chute to empty into the two smaller ore bins that are set on the south and north sides of the tramway extension. On the east side of this enclosed chute area, a metal-lined chute opening empties beneath the tramway extension, which would have fed into waiting Gilpin Tramway cars below. Both of the smaller ore bins also have unlined openings on their east walls under the tramway.

As mentioned above, a large capped shaft is beneath the headframe back brace, and a smaller capped shaft is located at the bottom of the bucket skid on the north side of the building, under the 1888 tramway rail remnants. A sifter or grizzly is also present at the top of the building under the hoist.

The frame design of the Frontenac Shaft House is typical of larger mining operations; the heavy timbers were capable of supporting the roof without structural support of its walls. The interiors remained unfinished. The upper stories had plank floors. No evidence has been found to indicate the first story had floor coverings, though historically, many shaft houses did have raised wood floors. Large multi-light windows allowed for natural light to penetrate the interior workspaces but, as evidenced by the ceramic insulators found on-site and affixed to standing portions of the building, electrical lighting was available as well. All historic machinery that was once inside the Shaft House has been removed.

Alterations

The Frontenac Shaft House was originally constructed with a rectangular floor plan (see Figure 10) that was amended into a roughly L-shaped plan around 1909 when the tramway/tipple extension was added to accommodate the newly constructed spur of the Gilpin County Tramway (see Figure 12). However, the first Frontenac spur of the Gilpin Tramway arrived at the Shaft House in 1888, and an ore chute, noted above, was built out from the main ore bin on its north side to meet the tram.[7] Originally, the Shaft House was three stories high on the north end and one story on the south end, but a later addition to the north added a ventilating fourth-story monitor (see Figure 11). The original timber construction with wood-plank siding was eventually covered with corrugated steel sheets (see Figure 10 and Figure 12).

During the fall of 2019, the Frontenac Shaft House underwent stabilization work that followed the Secretary of the Interior's Standards for the Treatment of Historic Properties. The stabilization efforts include using modern milled lumber to brace remnants of external walls on the west and north sides to preserve evidence of the building's footprint and to brace other compromised sections of the building, particularly the tramway extension. The stabilization efforts do not have an adverse effect on the integrity of the building and are imperative to the building's preservation.

Aduddell Mine West Shaft, ca.1875, contributing structure (Map Key 5) (Photo 43)

A capped shaft is located toward the southwest end of the Aduddell Lode (Mineral Survey No. 302) claim and corresponds with the southwestern-most "Shaft" plotted on the 1875 plat map (see Figure 2). This shaft also appears to be plotted as the "Aduddell West Shaft" on the 1966 profile diagram of the Frontenac and Aduddell Mines' underground workings (see Figure 4), which is modeled after the original 1912 diagram (see Figure 3). The shaft is capped with the standard metal grate used during reclamation efforts that took place in 1989.[8] Remnants of a timber headframe are located immediately southeast of the shaft and are still bolted into the ground. The area encompassing the shaft and headframe remnants measures about 13' northeast/southwest x 19' northwest/southeast.

Stone Building, exact date unknown (mining era), contributing building (Map Key 6) (Photos 44-50)

A stone masonry building is located about 80' northeast of the earthen platform and stone retaining wall (Site Feature G). The building is generally oriented north/south, with the north wall being the primary façade. The building is a single-story, has a rectangular plan, and is side gabled. The building measures 17'3" east/west x 11' north/south x about 10' tall. The

[7] Michael and Noreen Kompanik. "Historical Research and Analysis Report: Young Ranch West LLC Property, Gilpin County, Colorado," prepared for Elk Horn Acquisitions, LLC. (2018): 25.
[8] James Herron and Lisa Thompson, Colorado Cultural Resource Survey Cultural Resource Re-Evaluation Form for 5GL.108 (2010).

south wall of the building is built into the generally north-northeast trending slope. All four walls are built of locally procured granitic stones and groggy cement mortar; abundant pebbles are visible throughout the mortar. No foundation is evident beyond the stones. The gable roof was historically framed with dimensional lumber and was covered with asphalt roll and then corrugated sheet metal. A stovepipe protruded from the west end of the roof on the north slope. Also, a wood, gable-roofed cupola-type feature was present toward the east end of the roof on the north slope, and the cupola had an opening on its north side, covered with screen (see *Alterations* section below for further discussion of the roof). The building may have served as a superintendent's office.[9]

The north wall of the building includes the entrance doorway, which is centered along the wall. The doorway measures 6'11" tall x 3'3" wide. The doorway has recently been re-framed with dimensional lumber, and a restored historic door made of vertical wood boards has been added. A landing made of locally-procured stones and mortar has also been added at the foot of the door (see Alterations section below).

The east wall includes one rectangular dimensional-lumber-framed window. The window is centered along the wall. The wood framing, which includes wire nails, appears original. A recently restored historic wood, four-pane, awning window has been placed into the frame (see Alterations section below). The window measures 2'8" wide x 2'3" high.

The south wall was built into the slope and includes no special features.

The west wall mirrors the east wall and includes one rectangular, dimensional-lumber-framed window. The window is centered along the wall. The wood framing, which includes wire nails, appears original. A recently restored historic wood, four-pane, awning window has been placed into the frame (see Alterations section below). The window measures 2'8" wide x 2'3" high. Unique to the west wall is the comparatively heavy use of historic mortar. The natural slope of the earth hugs the west wall, deeper toward the south end.

The interior of the building shows the roof open to the rafters, which has recently been replaced. According to historic preservation contractor Randy Kilgore, there is evidence that there was likely a framed wood floor inside the building, and as such, a framed wood floor has been recently added to the building. In the northwest corner of the building, the flooring consists of locally-procured stone and mortar. This area of stone flooring is the intended location of a wood stove. See the Alterations section below for more discussion of the recent restoration work inside the building. No other special features are present inside the building.

Alterations

A gable-roofed, cupola-type feature was added to the east end of the roof on the north slope at an unknown date. According to historic preservation contractor Randy Kilgore, the cupola did not fit or make sense with the original roof and was clearly a later addition.

In 2019 and 2020, the Stone Building underwent stabilization and preservation. All work followed the Secretary of the Interior's Standards for the Treatment of Historic Properties. The collapsed roof, walls, and interior flooring all received restoration work. Deteriorated areas of the walls have been rebuilt by a professional stone mason who was able to salvage and re-use stones original to the building for about 80 percent of the restored masonry. The remaining 20 percent of stones were procured locally, in-kind and method with the original stones. New mortar was mixed with Portland-lime, sand, gravels, and appropriate coloring to match composition and coloring of the historic mortar.

The north wall has had some minor masonry repair conducted along the top of the wall at the roof attachment and around the top of the doorway. The doorway has been re-framed with dimensional lumber, and a restored historic door made of

[9] Kompanik and Kompanik, 2018: 22.

vertical wood boards has been added to the framing. A landing made of locally-procured stones and mortar has been added at the foot of the door.

Like the north wall, the east wall has had some minor masonry repair conducted along the top of the wall at roof attachment. Additionally, the aforementioned restored historic wood, four-pane, awning window has been added to the historic frame.

The south wall, which was bulging severely, has received the most masonry restoration work with the majority of the wall having been rebuilt or repaired. As it was built into a slope, a trench was excavated along the south wall to allow access for the restoration. Upon completion of the masonry restoration, the backdirt was replaced and covered/reinforced with locally procures stones.

The west wall has had some minor masonry repair conducted along the top of the wall at the roof attachment. Additionally, the aforementioned restored historic wood, four-pane, awning window has been added to the historic frame.

The interior of the building's walls have received a fair amount of restoration work, exhibiting new mortar on all walls, but especially on the south wall and toward the south end of the west wall.

The once-collapsed roof has been completely rebuilt with newly milled, rough-cut, pine lumber. Rafter ends are now visible under the eaves on the north and south walls, and new screws are present in the new boards. The re-framed roof has been covered in corrugated steel sheets, as it was historically. The steel sheets have been rusted with acid to replicate the appearance of historic roofing. A stovepipe opening has been placed in its original location on the west end of the roof on the north slope, and a wood burning stove is to be reintroduced into the building. Given the evidence that there was once a framed wood floor in the building, a structural pine floor was built inside. As noted above, in the northwest corner of the building, the flooring consists of locally-procured stones and mortar. This area of stone flooring, located directly under the stovepipe opening in the roof, is the intended location of a wood stove.

Throughout the building, all of the new lumber has been stained to give the appearance of being historic.

Wood Outbuilding, exact date unknown (mining era), contributing building (Map Key 7) (Photos 51-54)

A wood outbuilding from the mining era is located about 102' northeast of the small waste rock pile (Site Feature I). The building is generally oriented north/south and measures 8' long x 8' wide x 7'7" tall. It is built into the slope on its south side and has a generally square plan and a shed roof. The entrance to the building is located on the downslope/north wall with a small landing outside the door; a partition has been built onto the west side of the entrance door. The building is wood-post framed and constructed of dimensional lumber with wire nails throughout; the interior finish is horizontal boards and the exterior siding is diagonal boards. The entrance door and associated partition are of vertical boards. Minimal stone foundation can be seen on the northwest corner of the building. The shed roof is highly degraded, and the upslope/south wall is gone, completely exposing the interior of the building. Much of the siding on the east wall is also gone. Despite the roof and south and east walls degradation, the building retains a fair amount of structural integrity. Its exact purpose is unknown, but it likely served as storage. A single white ceramic insulator is present on the top of the north wall, suggesting that the building had electricity.

Explosives Magazine, exact date unknown (mining era), contributing structure (Map Key 8) (Photos 55-58)

A small, gable-roofed structure from the mining era is located about 43' east-northeast of the Wood Outbuilding (map key 7). The structure is generally oriented north/south, has a rectangular plan, and measures 6'3" long x 4'3" wide x 6' tall with no foundation evident. It resembles a large dog house and is built of dimensional lumber that is then clad entirely in sheet metal. All nails in the construction are wire. The structure has an opening on the downslope/north side. *The Mining*

Industry in Colorado Multiple Property Documentation Form (Fell and Twitty 2008) describes some explosives magazines as being "small sheds much like dog houses,"[10] indicating that this structure was most likely used for explosives storage.

Outhouse, exact date unknown (mining era), contributing building (Map Key 9) (Photos 59-62)

A two-seater outhouse from the mining era is about 20' north-northeast of the Explosives Magazine (map key 8). The outhouse is generally oriented northeast/southwest, has a rectangular plan, and measures 6'2" long x 4'7" wide x 7'9" tall. The building is highly intact and is wood post framed with dimensional lumber siding that, like the Explosives Magazine, is then clad entirely in sheet metal. The north and south walls are of vertical-board siding and the east and west walls are of horizontal-board siding. All nails used in the construction are wire. The building has a shed roof covered in corrugated sheet metal. The opening into the outhouse is located on the downslope/northeast side of the building, though the door is gone. The building rests on a wood beam sill set atop locally procured stones. Inside the outhouse, the box and seats are intact, but there is a hole in the floor below the east seat.

Aduddell Mine East Shaft, exact date unknown (mining era), non-contributing structure (Map Key 10) (Photos 63-65)

A capped shaft is located about 85' west-northwest of the Outhouse (map key 9). The shaft likely corresponds with what is depicted as the "Aduddell East Shaft" plotted on the 1966 profile diagram of the Frontenac and Aduddell Mines' underground workings (see Figure 4), which is modeled after the original 1912 diagram (see Figure 3). The capped shaft is located at the bottom of a large hole that measures about 50' in diameter and 20' deep. This shaft is known to have been closed by the Colorado Mined Land Reclamation Division (CMLRD) in the 1980s during a reclamation effort and is capped with the standard metal grate.[11] The Colorado Division of Reclamation and Mining Safety (DRMS) performed reclamation at and near the shaft in 2010.[12] Due to the reclamation activities, this area is disturbed, including evidence of bulldozing. The general area is overgrown with post-reclamation grasses. An area of burned brick and wood headframe elements is located immediately south/upslope of the capped shaft in a bulldozed area. This shaft and the associated burned debris are considered non-contributing elements of the Complex because they do not retain sufficient integrity and are within the small area within the nomination boundary that is considerably altered by the reclamation activities.

GILPIN COUNTY TRAMWAY

Gilpin Tramway Remnant, 1909, contributing structure (Map Key 11) (Photos 66-68)

An intact remnant of the Frontenac spur of the Gilpin Tramway (5GL.2104.4) is present on the east side of the Frontenac Shaft House (map key 4). This remnant is manifest as a defined rail bed through the conifer forest that averages 4' wide, measures 577' long, and represents the second spur that was built to the shaft house in 1909 to run beneath the tramway extension that was built the same year. The rail bed demonstrates the path and relationship of the tramway to and from the Shaft House, the development of which facilitated easier and faster transport of ores to the sampling works in Black Hawk, increasing production efficiency.

Integrity

The Frontenac and Aduddell Mine Complex retains sufficient integrity to meet the registration requirements outlined in *The Mining Industry in Colorado Multiple Property Documentation Form* (Fell and Twitty 2008). According to Fell and Twitty, most of the seven aspects of integrity apply to mine sites, and those possessing standing structures must retain integrity of location. The contributing standing buildings and structures at the Frontenac and Aduddell Mine Complex, including the distinctive Frontenac Shaft House, the Stone Building, the Wood Outbuilding, the Explosives Magazine, and the Outhouse, all stand in their original locations, allowing the Complex to retain integrity of *location.* Although all are suffering from some dilapidation and/or undergoing stabilization and restoration, the Frontenac Shaft House, the Stone Building, the Wood Outbuilding, the Explosives Magazine, and the Outhouse, in particular, all retain integrity of *materials*

[10] Fell and Twitty, 2008: F-180.
[11] D. Killam and M. Slaughter, Colorado Cultural Resource Survey Cultural Resource Re-Evaluation Form for 5GL.108 (2007).
[12] Herron and Thompson, 2010.

and *workmanship* as the historic materials and building techniques used in their construction can still be discerned in the extant components. The Complex retains integrity of *design* as the original distribution of the interrelated mining features is still discernible and easily interpretable across the landscape, continuing to demonstrate the purposeful functionality and layout of the mining operation. Little has changed since the period of significance in the surrounding environment, which can easily be characterized as a mining landscape replete with mines and industrial features. Therefore, the Frontenac and Aduddell Mine Complex's integrity of *setting* is intact and, on a similar basis, the Complex retains integrity of *feeling*. The experience of visiting the Complex still offers a glimpse through time to being at a late nineteenth- or early twentieth-century mining operation. Finally, the Frontenac and Aduddell Mine Complex also retains *association*, there is sufficient physical material and historic integrity to convey association with the significant mining history in Gilpin County and the Russell Mining District.

Frontenac and Aduddell Mine Complex
Name of Property

Gilpin County, Colorado
County and State

8. Statement of Significance

Applicable National Register Criteria

(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

- [X] A Property is associated with events that have made a significant contribution to the broad patterns of our history.
- [ ] B Property is associated with the lives of persons significant in our past.
- [ ] C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- [ ] D Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations

(Mark "x" in all the boxes that apply.)

Property is:

- [ ] A Owned by a religious institution or used for religious purposes.
- [ ] B removed from its original location.
- [ ] C a birthplace or grave.
- [ ] D a cemetery.
- [ ] E a reconstructed building, object, or structure.
- [ ] F a commemorative property.
- [ ] G less than 50 years old or achieving significance within the past 50 years.

Areas of Significance

(Enter categories from instructions.)

Industry

Period of Significance

ca. 1869-1922

Significant Dates

1888

1909

Significant Person

(Complete only if Criterion B is marked above.)

Cultural Affiliation

Architect/Builder

Unknown

Statement of Significance Summary Paragraph (Provide a summary paragraph that includes level of significance, applicable criteria, areas of significance, justification for the period of significance, and any applicable criteria considerations.)

The Frontenac and Aduddell Mine Complex is locally significant under Criterion A in the area of Industry. The highly successful mines first opened ca. 1869, came under the same ownership in 1909, and operated at a prominent level until 1922, being touted as the "heaviest producer" in Gilpin County.[13] Comprehensively, the collection of features that contribute to the district clearly reflect the components and operations of a late-nineteenth/early-twentieth century lucrative hard rock mine. The Complex continues to possess key features of hard rock mining operations, including shafts, an adit, depressions, building platforms, waste rock piles, prospect pits, surface plant structures (including a likely office, an outbuilding, an explosives magazine, and an outhouse), access roads, a Gilpin County Tramway rail line remnant, and, most notably, intact remnants of an intricate shaft house, a feature that is unique within the Russell Mining District.

Narrative Statement of Significance (Provide at least **one** paragraph for each area of significance.)

Industry

Under Criterion A, the Frontenac and Aduddell Mine Complex exemplifies a well-capitalized mining operation in the heart of Colorado's mountainous mining country during the principal period of hard rock mining in the state. The Complex includes representations of both production and transportation elements. The features at the Complex can be easily interpreted and retain sufficient integrity to be readily recognized as important elements of the mining landscape. Character-defining attributes of the hard rock mine complex include the extant shafts; an adit; prospect pits and an adit; depressions; building platforms; waste rock piles; access roads; surface plant structures, including a Stone Building that was likely an office, a Wood Outbuilding, an Explosives Magazine, and an Outhouse; a Gilpin County Tramway rail line remnant; and intact remnants of an substantial and shaft house. Collectively, these features continue to demonstrate the Frontenac and Aduddell Mine Complex's association with the significant late-nineteenth and early-twentieth century mining industry in Colorado.

Of particular note at the Frontenac and Aduddell Mine Complex is the extant portion of the Frontenac Shaft House and the related remnant of the associated spur of the Gilpin County Tramway. The intact elements of the Frontenac Shaft House distinctly convey aspects of the mining operation of which it was a part.[14] Although suffering from deterioration, the Frontenac Shaft House retains many character defining features: the still-discernible originally rectangular and later L-shaped floor plan; stone masonry foundation; timber construction with wood plank siding later covered in corrugated steel sheets; and one discernible entry door and a few lumber-framed window openings. Typically, shaft houses were single-story buildings with a vaulted interior cupola enclosing the headframe within; however, the Frontenac Shaft House is unique in that it was a three-story building, the height of which can still be discerned through the extant headframe and hoist.[15]

Beyond the aforementioned character-defined features, the inner workings of the Frontenac Shaft House remain intact enough to illustrate their functionality in the mining operation, particularly through the discernible systematic series of ore bins and chutes that loaded ore onto the waiting cars on the Gilpin Tramway, and the associated rail bed, which is also still discernible. The extant parts of the Shaft House reflect industrial building design and construction methods employed to meet the needs of underground workings, particularly the architectural adaptation of familiar forms with added features to fulfill required functions.[16] Originally constructed between 1877 and 1888 as a timber-framed, gable-roofed, rectangular-plan building, the Shaft House was of typical design for the mining industry.[17] With the arrival of the first spur of the Gilpin Tramway in 1888, an adaptation was made by way of adding an ore chute to directly load ore onto the tramway's cars inside the north wall; this ore chute and remnants of the rails are still present on the north side of the building. When a second spur of the Gilpin Tramway arrived in 1909, the notable 1.5-story tipple extension was added to the east wall of the original rectangular-plan building, resulting in a roughly L-shaped plan that better served the current

[13] "Frontenac Mine heaviest producer in Gilpin County," *Idaho Springs News*, December 9, 1892, Colorado Historic Newspapers Collection.
[14] Fell and Twitty, 2008: F-188.
[15] Eric Twitty, "Historic Context: Interstate-70 Mountain Corridor," prepared for Colorado Department of Transportation (2014): B 1-320.
[16] Twitty, 2014: B 1-285.
[17] Ibid.: B 1-320.

needs of the workings in relationship to tramway transportation. The added tramway extension and associated rail bed are also still extant.

A files search conducted through the Colorado Office of Archaeology and Historic Preservation for all previously recorded sites within the Russell Mining District revealed few examples of mines with extant shaft houses. Of 144 total sites, 12 other sites are said to include a shaft house feature.[18] Comparison with the online COMPASS database confirmed the files search data. Further investigation has revealed that of the 12 sites identified as including a shaft house through the files search, three include headframes rather than extant shaft houses (5GL.110, 5GL.111, and 5GL.112); one includes only remnants of a collapsed hoist building (5GL.1134); one lacks any extant shaft house (5GL.132); and one is a general documentation of an area encompassing a mining claim (5GL.2029).[19] Only six sites actually contain features that can be classified as shaft house buildings, all in various conditions (5GL.115, 5GL.117, 5GL.134, 5GL.394, 5GL.595, and 5GL.1118). These six sites are summarized in Table 2:

Table 2: Mines with Extant Shaft Houses in the Russell Mining District

SITE #	Site Name	Site Date	Features	Condition	Current Designation
5GL.115	Federal Mine	1900-1948	Shaft, Shaft House	Deteriorating	Field Eligible (2019)
5GL.117	Chase Mine	1860-1869	Shaft House, Ore Chute/Bin, Machinery	Excellent, Undisturbed	Field Not Eligible (1982)
5GL.134	Jefferson-Calhoun; Jefferson-Calhoun Vein	1868-1955	Dump, Tailings, Shaft House, Foundations, Structures	Deteriorating, Heavy Disturbance	Officially Eligible (1990)
5GL.394	IXL/Thurman Mine	1870- ca. 1915	Mine Shafts, Shaft House, Structural Remains, Boiler House	Ruins, Total Disturbance	Officially Needs Data (2015)
5GL.595	West Calhoun	1870-1918	Mine, Shaft House	Not given	Officially Needs Data (1993)
5GL.1118	Missouri Mine (Mississippi Claim)	ca. 1880 – ca. 1917	Shafts, Shaft House, Headframe, Trash Scatter	Deteriorating, Heavy Disturbance	Field Eligible (2019)

Although the Federal Mine (5GL.115), the West Calhoun (5GL.595), and the Missouri Mine (Mississippi Claim) (5GL.1118) retain relatively intact shaft house buildings, none are as substantial as that of the Frontenac, nor do their workings remain as intact. The Federal Mine's 1.5-story building and the West Calhoun and the Missouri Mine's single-story buildings are dwarfed by the Frontenac Shaft House's towering three stories. Furthermore, the preservation of the Frontenac's workings is superior to those of the other shaft houses. The Frontenac's ore bin system and tram-related elements collectively continue to demonstrate the complexities of hardrock mining and transportation in a way that other extant shaft houses do not.

Also notable is that the Frontenac Shaft House's history and intact components clearly convey the application of innovative engineering and technology throughout the period of significance.[20] As an example of a building type typical of a late-nineteenth/early-twentieth century production-class surface plant, the Shaft House is representative of long-term financial investment in facilities that were designed to increase production and minimize costs by incorporating state-of-the-art mechanization and engineering.[21] The Shaft House's extant configuration, primarily ore bins, ore chutes, and tram-related features, is reflective of planning and organization efforts made to maximize operations in regard to the underground workings and related ore transportation.[22]

[18] Kae McDonald and Deon Wolfenbarger, "Russell Gulch Historic Resources Survey: Phase II," prepared for Gilpin County Historic Preservation Commission (2019): 43—51.
[19] Ibid.: 25.
[20] Fell and Twitty, 2008: F-188.
[21] Twitty, 2010: 179.
[22] Twitty, 2014: B 1-286.

After its original construction between 1877 and 1888, the Shaft House quickly saw new engineering and technological adaptations. As discussed previously, a new ore chute was designed and added in 1888 to accommodate the first Gilpin Tramway spur. By 1893, a new 35-horsepower engine and double friction improved hoister had been installed.[23] As early as 1907, the introduction of impressive, state-of-the-art technologies were being undertaken, such as the installation of an automated conveyor system for loading ore cars; construction of electric and steam plants with 10-, 40-, and 82-horsepower hoists; the purchase of a 20-drill Rand Imperial two-stage belt-driven air compressor; and the garnering of a massive, cutting-edge electric concentrator with a 275-horsepower output.[24] The Frontenac operations were touted as being "equipped with the finest electric plant in the district, perhaps in the state."[25] By 1909, the tramway extension/tipple addition was designed and added to serve the new Gilpin Tramway spur. These engineering and technological adaptations tie the Frontenac Shaft House and the full Frontenac and Aduddell Mine Complex to advanced technologies and highly complex mechanized operations.[26] Indeed, given its obvious success, being described as one of the best producers in Gilpin County, the Frontenac and Aduddell Mine Complex is a prime demonstration of "those practices and applications of engineering and technology that were effective" for the environment.[27]

Developmental history/additional historic context information (if appropriate)

Colorado Mining Industry

"Pike's Peak Gold Rush," aka Colorado Gold Rush

Throughout the 1850s, informal discoveries of placer gold deposits were made by miners heading west through the Colorado Rockies toward the famed gold fields in California. As aspiring miners traveled westward along the existing trail systems that led to California, many passed through the broad area that what would become Denver, and innumerable gold discoveries were made along Cherry Creek in the process.[28] Word began to spread about the gold present in this area of Colorado, and, as Pike's Peak was the only major landform plotted on maps of the time (although a good 60 miles away), the rumors of gold became attached to that prominent peak. In the late spring of 1858, William Green Russell, along with a group of companions, located a substantial deposit of placer gold at the confluence of Cherry Creek and the South Platte River. This major discovery kicked off what became known as the Pike's Peak Gold Rush, inducing a large number of miners to flock to the Front Range in search of gold. This initial wave of mining activity focused on placer operations: surface exploration at creeks primarily utilizing the ubiquitous gold pan and later rockers and sluices or sluice-boxes. The capital required to participate in placer mining was very low, meaning nearly any ordinary person could try their luck at placer mining in hopes of striking it rich. The influx of placer miners led to the development of the first mining camps, towns, and townsites along the Front Range and in the foothills. However, as the reality set in that very little lucrative gold was actually present in the placer deposits washing downstream from the rugged peaks above, thousands of miners headed west into the mountains.[29] As miners moved into the mountains, they quickly depleted the easily accessible placer deposits along the streams. As a result, they soon transitioned into utilizing hydraulic mining techniques, blasting away landforms containing gold-laden gravels with high-pressure hoses and processing them through sluice boxes. It did not take long for these more easily accessible gold deposits to become exhausted as well, prompting many miners to head even deeper into the mountains in search of untapped streams. Others, though, realized that the real wealth lay underground.[30]

Transition into hardrock mining

The transition from placer mining to hardrock mining began in the early 1860s and was initiated on the forks of Clear Creek at Central City and Black Hawk, spreading from there. By 1861 or 1862, production from hardrock mining had

[23] "Frontenac Mine has new engine and hoister," *Idaho Springs News*, October 7, 1893, Colorado Historic Newspapers Collection.
[24] Stevens, 1911: 829.
[25] Kompanik and Kompanik, 2018: 26.
[26] Fell and Twitty, 2008: F-186; Twitty, 2014: B 1-287.
[27] Fell and Twitty, 2008: F-187.
[28] Ibid.: E-2 – E-3.
[29] Ibid.: E-2 – E-7.
[30] Kompanik and Kompanik, 2018: 10.

surpassed that of placer operations, thereby ending the Pike's Peak Gold Rush and the era of "any ordinary man" being a miner.[31] Hardrock mining required "capital investment, a steady labor force, skillful management, and new technology, all beyond the reach of most placer miners."[32] The first forays into hardrock mining likely resembled quarrying but soon gave way to more effective techniques for reaching subterranean deposits, like sinking shafts or tunneling adits. As hardrock mining continued to develop, surface plants began to appear. Surface plants included "buildings to house offices and machinery, tracks and structures to move ore, and buildings to provide power. Their most characteristic element was the vertical headframe…that was often enclosed in a shaft house. More than anything else, shaft houses and headframes became symbolic of mining areas."[33] Also of particular importance in the surface plant workings was the trestle, which was designed to move ore cars to a separate structure to wait for shipment or processing, or to carry waste rock to the dump.[34] Beyond surface workings, the next step in the growth of hardrock mining was the development of technology for processing ore to recover gold. The first apparatus used to accomplish metal recovery was the arrastra, which, given its inefficiency, was quickly replaced by stamp mills. Hardrock mining operations continued to grow and improve, leading to a denouement of placer activities and the subsequent end of the Gold Rush by the early 1860s. Mining rapidly became industrial, and for several years that industrialization focused mainly on two areas of Colorado: Clear Creek County and Gilpin County.[35]

Mining in Gilpin County

The Hub of Colorado Mining

In the winter of 1858, John Gregory located a rich placer deposit in a gulch south of what is now known as North Clear Creek. The gulch where he found his bounty now bears his name, Gregory Gulch, and is between what became the towns of Black Hawk and Central City. By late winter and early spring of 1859, Gregory and a group of companions began developing the deposit. As 1859 continued, word spread about the "Gregory Diggings" and other discoveries in the area, and hopeful miners, known as the '59ers, flocked to region. This influx of primarily men resulted in the development of new mining towns, including Black Hawk, Central City, and Nevadaville within the reach of the Gregory Diggings. The Pike's Peak Gold Rush had reached what became Gilpin County.[36]

As the transition from placer mining to hardrock mining took place in the early 1860s, Gilpin County and its neighbor to the south, Clear Creek County, became the epicenter of hardrock mining in Colorado. In Gilpin County, the focus was on gold. Corporations were often formed by individual owners or partnerships in an effort to raise capital and reduce liability. Stamp mills and custom mills were built to crush the ores and recover gold through amalgamation with mercury. However, as shafts were driven deeper and deeper underground, the composition of the ores changed, and, especially in Gilpin County, the deeper ores proved more difficult to process. In dealing with these more difficult ores, gold yields from stamp mill processing dropped as low as 10 to 20 percent. Desperation regarding processing and recovery difficulties led to the appearance of self-proclaimed "professors" and "scientists" who claimed to have answers for processing the more "rebellious" ores. Unsurprisingly, all of the inventions put forward during this "process mania" of the mid-1860s failed completely.[37]

The "process mania," limitations of stamp mills, the stock market roller coaster that was a result of the Civil War, and the development of the Indian Wars in eastern Colorado all combined to severely impact the mining industry. After a peak production of gold and other metals was reached in 1864 and 1865, production plunged over the next three years. This resulted in lost mining jobs, closed mines and mills, deserted towns, and a general population decrease.[38]

[31] Fell and Twitty, 2008: E-8 – E-9.
[32] Fell and Twitty, 2008: E-8.
[33] Ibid.: E-9.
[34] Ibid.
[35] Ibid: E-10 – E-11.
[36] Ibid: E-5 – E-6.
[37] Ibid: E-11 – E-12.
[38] Ibid.: E-12.

Part of the recovery from that dip of the mid-1860s began in Gilpin County at Black Hawk. In 1864, a man named James E. Lyon made the first attempts at developing an effective smelting technique that could process the difficult, deeper ores. His endeavor, and that of others, failed. However, the efforts of Lyon and others set the stage for the development of successful technology. In 1868, Nathaniel P. Hill, a college professor at Brown University in Providence, Rhode Island, convinced Boston investors to fund the Boston and Colorado Smelting Company. They built their first smelting plant at Black Hawk, modeled after the Welsh or Swansea smelting process that Hill had studied in Wales. The new smelting plant was immediately successful and meant that the "rebellious" ores could finally be effectively processed, and gold could be recovered. The success of Hill's smelter spurred a turnaround in the lagging economy, and many mines in the Central City area were revitalized as a result. Furthering the boom in the Black Hawk/Central City area was the arrival of the Colorado Central Railroad (5CC.427), which was built to Gilpin County from Golden through Clear Creek Canyon in 1872.[39]

Gilpin County Tramway

The Gilpin County Tramway had the distinction of being the only 2'-gauge railroad in the state of Colorado. Developed under the Gilpin Tramway Company, which was made up of local Black Hawk businessmen and mill owners, the Gilpin Tramway operated virtually year-round from 1887 to 1917 and served as the main transportation line carting ore from the mines surrounding Central City to the processing plants and smelters in Black Hawk. The tramway allowed mines producing lower-grade ore to stay in operation by significantly reducing the cost and labor of transporting lesser-quality ores to the processing centers that, prior to the introduction of the tramway, had to be transported by labor-intensive and expensive mule teams. The first 10 miles of track were laid in 1887, and, by the end of that year, the track reached various Black Hawk mills below Gregory Gulch. By late August 1888, 15 miles of track were in operation. By 1891, the Gilpin Tramway operated three locomotives with 120 cars and reached between 15 and 20 mines. As the years went by, it served nearly all of the productive mines surrounding Central City and Black Hawk. Given its success, the Gilpin Tramway was purchased by the Colorado & Southern Railroad in 1906 and was renamed the Gilpin Railroad. The rail reached its maximum length in 1910, running 26.46 miles and served mines from the southern end of Gilpin County to areas north, east, and west of Central City and Black Hawk. However, in response to the declining profitability of the mining industry, the Gilpin Tramway/Gilpin Railroad made its last run in 1917, and, later that year, its components were sold for scrap. Today, much of the right-of-way remains intact and identifiable on the ground, although the track has been removed.[40]

The Gilpin Tramway made its way to the Frontenac Mine in July 1888. In August 1888, an ore chute was built at the extant shaft house to load ore into the carts on the tram for transport to the Black Hawk Sampling Works. The ore chute and track remnants are still identifiable along the north side of the shaft house. The original 1888 spur leading to the Frontenac Shaft House ran 528' from the main line of the Gilpin Tramway. In 1909, an additional 3,643' of spur track was built to the shaft house. This spur is the length of track that ran under the extant tipple located on the east wall of the shaft house.[41] The development of the new Gilpin Tramway spur surely prompted the addition of the tipple to the existing building. It is unknown if the 1909 spur replaced the 1888 spur entirely or if the original 1888 spur continued to be used simultaneously in any capacity. While track remnants from the 1888 spur are still present on the north side of the shaft house along with the remnants of stacked log and stone retaining walls that supported the original set of rails, the associated 1888 rail bed is otherwise unidentifiable on the ground, likely destroyed by later road developments.

The Frontenac and Aduddell Mines

Located midway between the processing centers of Central City and Idaho Springs, the Frontenac and Aduddell Mines were of the most successful in southern Gilpin County. Situated at the head of South Willis Gulch, the Frontenac Mine, near the top of the slope, is neighbored by the Aduddell Mine approximately 1,000' to the northeast (downslope). Both the Frontenac and Aduddell were opened in 1869 and have an intertwined history.[42] Specifically regarding the Frontenac, the Frontenac Lode and Frontenac Mill Site claims (Mineral Survey No. 416A and No. 461B, respectively) were patented to

[39] Fell and Twitty, 2008: E-12 – E-15.
[40] Kompanik and Kompanik, 2018: 17-19.
[41] Ibid.: 25.
[42] Ibid.: 23.

Edward W. Williams in February 1877, encompassing 9.75 acres in the Russell Mining District. The single plat map displays the two adjacent claims, with the rectangular lode claim (Survey No. 461A) running southwest/northeast. Toward the southwest end of the lode claim, an "adit" and "shaft house" are plotted. Just northeast of the center of the claim, another "adit" is plotted. A "discovery shaft" and separate "shaft" are both plotted toward the northeast end of the claim (see Figure 1).[43] The shaft house that is extant today is near, if not on, the "discovery shaft." The shaft house that appears on the 1877 plat, toward the southwest end of the claim, is no longer extant as discussed above in the description of the Frontenac Mine Shaft.

On the 1877 plat, the aforementioned Frontenac Mill Site claim (Mineral Survey No. 461B) is generally shaped like a backward "L," with its southeast corner abutting the northeast end of the Lode claim (Mineral Survey No. 461A). Within the Mill Site claim, an "adit" and a "blacksmith shop" are plotted toward the south end of the claim.[44] No evidence of these features is extant today.

Specifically regarding the Aduddell Mine, the Aduddell Lode claim (Mineral Survey No. 302) was patented to J. S. Raynolds in July 1875, encompassing 2.35 acres (see Figure 2). The patent states that the claim is within the "Pleasant Valley" Mining District; however, in reality, the claim clearly falls within the Russell Mining District, being located in South Willis Gulch which is explicitly included within the boundaries of the Russell Mining District as it was established in 1859.[45] The 1875 plat map displays the long, thin, rectangular claim as running southwest/northeast. The quality of the available map is not particularly crisp, but it appears that approximately 15 "shaft[s]" are depicted on the plat running the length of the claim. An "engine house" also appears to be depicted slightly northeast of the center of the claim; however, no evidence of an engine house is extant today.[46]

It has been previously asserted that the extant Frontenac Shaft House was built ca. 1870.[47] However, if a shaft house was present in 1877 in the location occupied by the extant building, it is reasonable to assume that it would have been plotted on the aforementioned Frontenac Lode (Mineral Survey No. 461A) claim plat. Instead, we see only a "discovery shaft" in the immediate vicinity. Knowing definitely that the Gilpin Tramway branched its way to the location of the extant shaft house in 1888, it is safe to conclude that the extant Frontenac Shaft House was originally constructed sometime between 1877 and 1888.

Historic photographs document the appearance of the extant Frontenac Shaft House prior to the collapse of the exterior walls. The building once had a rectangular form and was originally three stories high on the north end and one story on the south end. As a result, the roof was designed to be an asymmetrical gable, with an extended south slope (see Figure 10). A later addition to the north added a ventilating fourth-story monitor (see Figure 11).

The shaft house had several points of entry, though most are no longer intact with the exception of one on the north side. Historic photographs show, for example, a standard door on the east gable end and the extant door at the west end of the north wall. The original ore cart entry was also through the north wall; the stacked-log and stone retaining walls still visible on the north side of the shaft house supported the original set of rails that carried ore carts in and out of the building on the Gilpin Tramway. A second access point for ore carts was located on the east side of the building in the form of a tipple beneath the transecting east wing. The tipple was added later, around 1909, when an additional spur of the Gilpin

[43] Bureau of Land Management, "Plat Map for Mineral Survey No. 461A and 461B," (1877). Available online at https://glorecords.blm.gov/default.aspx.
[44] Bureau of Land Management, 1877.
[45] Marshall, 1920: 48.
[46] Bureau of Land Management, "Plat Map for Mineral Survey No. 302," (1875). Available online at https://glorecords.blm.gov/default.aspx.
[47] Sally Pearce, "Colorado Cultural Resource Survey Inventory Record for 5GL108, Frontenac-Aduddell Mine," (1982). Available from the Colorado Office of Archaeology and Historic Preservation, Denver.

Tramway reached the Frontenac Mine.[48] These tracks do not enter the building, rather they pass beneath the projecting bay on the east side (see Figure 12).

The building once had numerous window openings that provided ventilation and natural light to the interior; several window openings are still intact. Window openings were irregularly spaced across the east gable end and more regularly spaced on the north and south. Openings were uniform in size, containing double-hung, six-over-six wood sash windows, surrounded by flat wood window trim. The trim on the original portion of the building had a simple drip cap and sill. On the east addition, there are no drip caps. This omission may have been due to the presence of metal gutters that appeared beneath the eaves of the addition along its north and south walls (see Figures 10, 11, and 12).

In 1886, the *Idaho Springs News* reported that the Frontenac was once known as the Clifton Mine and was previously owned, along with the Searle Mine, by an unnamed English company that ceased operations at the mines due to poor returns and resulting bad judgments. The same 1886 report describes the Frontenac as an "excellent [piece] of property" that had been producing considerable ore under a leasing system. However, the newspaper declared that the property was not worth what was being asked, indicating that the mine was for sale at that time.[49] In February 1887, the *Idaho Springs News* reported that the Frontenac, along with the Searle, had been sold "at London."[50] By 1891, the Frontenac and the Aduddell were described as "well known producers."[51] In 1892, the Frontenac Mine alone was reported by the *Idaho Springs News* as having been worked successfully by Williams, Harker & Co. for several years. The paper claimed it was "the heaviest producer in Gilpin County" with the ore bodies exposed in the lower workings being "most wonderful." Also noted was the convenience afforded by the Gilpin Tramway that ran directly under the ore house.[52] Likely due to its profitability, by 1893, the Frontenac Mine was reported as having a "new 35-horse power engine and double friction improved hoister, bought of the Overland Machine Company, of Denver."[53] In 1894 and 1895, the *Idaho Springs News* reported that large quantities of ore from the Frontenac were being transported to and concentrated at mills in Idaho Springs.[54]

The Frontenac and the Aduddell were both worked until the mid-1890s when an issue with excessive water caused closure.[55] Luckily, between 1893 and 1907, the Argo Tunnel (originally deemed the Newhouse Tunnel) was developed. Ultimately running 4.16 miles from its portal on Clear Creek in Idaho Springs to the Central City Mining District, the tunnel's primary purpose was to drain water from the mines along its trajectory. The tunnel's course ran beneath the Frontenac Mine, resolving the issues with excessive water. Indeed, the *Idaho Springs Siftings* reported that, by 1900, both the Frontenac and the Aduddell had been purchased by the John Owen Mining Company, and, in 1901, the company was reported as in process of "unwatering" both the Aduddell and the Frontenac mines, which were to be worked in connection with the Argo Tunnel as soon as the tunnel cut the mines.[56] Thus, both the Frontenac and Aduddell Mines were reopened by 1902, thanks to the Argo Tunnel. After that reopening, both the mines operated nearly continuously until 1922.[57]

In 1907, the Frontenac Mine was sold to an "English syndicate organized by Henry P. Lowe" with plans to "place a plant of machinery at the collar of the 450 shaft, consisting of a hundred [horsepower] electric motor to operate an air compressor

[48] Kompanik and Kompanik, 2018: 25.
[49] "Frontenac and Searle Mines for sale," *Idaho Springs News*, July 2, 1886, Colorado Historic Newspapers Collection.
[50] "Frontenac and Searle Mines sold," *Idaho Springs News*, February 25, 1887, Colorado Historic Newspapers Collection.
[51] "Frontenac and Aduddell Mines well known producers," *Idaho Springs News*, October 9, 1891, Colorado Historic Newspapers Collection.
[52] "Frontenac Mine heaviest producer in Gilpin County," *Idaho Springs News*, December 9, 1892, Colorado Historic Newspapers Collection.
[53] "Frontenac Mine has new engine and hoister," *Idaho Springs News*, October 7, 1893, Colorado Historic Newspapers Collection.
[54] "Ores from the Frontenac Mine treated at Idaho Springs," *Idaho Springs News*, November 16, 1894; December 14, 1894; and April 19, 1895, Colorado Historic Newspapers Collection.
[55] Kompanik and Kompanik, 2018: 23.
[56] "Aduddell bought by John Owen Company," *Idaho Springs Siftings,* November 9, 1900, Colorado Historic Newspapers Collection; and "Aduddell and Frontenac being unwatered," *Idaho Springs Siftings,* January 4, 1901, Colorado Historic Newspapers Collection.
[57] Kompanik and Kompanik, 2018: 23, 29.

and hoister."[58] New developments at the shaft house came to include installation of an automated conveyor system for loading ore cars, construction of electric and steam plants with 10-, 40-, and 82-horsepower hoists, and purchase of a 20-drill Rand Imperial two-stage, belt-driven air compressor.[59] In addition, the mine gained a cutting-edge concentrator, an apparatus used to recover fine particles. The concentrator was massive, with a 250-ton frame. It took up 9,000 square feet and was powered electrically by six motors with a cumulative output of 275-horsepower.[60] In 1909, Henry P. Lowe and that English syndicate also purchased the Aduddell Mine, with the intent to include the Frontenac as the western extension of the workings.[61] Thus, the Frontenac Mine and neighboring Aduddell Mine came under the uniform ownership of the London-based company known as Frontenac Consolidated Mines, Ltd.[62]

The two mines developed the same veins and were worked under the same management. They were developed by four inclined shafts, an adit, and multiple drifts.[63] The east shaft at the Frontenac was used for hoisting, and the west shaft at the Aduddell served as ventilation for both mines. The Frontenac's shaft "followed the dip of the lode and consisted of eight connected levels and one sub-level. Due to the slope of the gulch, the fourth level of the Frontenac workings connected with the fifth level of the Aduddell's west shaft. Likewise, the seventh level of the Frontenac connected through a rise with the fourth level of the main Aduddell shaft."[64] The Frontenac operations were "equipped with the finest electric plant in the district, perhaps in the state."[65] Inside the Frontenac Shaft House was a "great hoisting plant supplying air, light[,] and power for the entire property…the electric plant also included a two-stage Blaisdell compressor, an electric hoist, a belt or conveyor, and drilling machinery for the entire property."[66]

In 1909, Henry P. Lowe of Frontenac Consolidated Mines, Ltd. bought the Iron City Mill and Penn Mill Complex outside of Black Hawk. The Iron City Mill was modernized, and a new Frontenac Mill was built to process ores from the Frontenac, Aduddell, and Topeka mines. Both mills were in operation by 1911 and were highly successful by virtue of their modern engineering technology, able to recover gold at double the rate normally achievable. This efficiency made processing lower-grade ores economical and worthwhile. The superior abilities of the Frontenac Mill allowed for many previously closed area mines that tapped lower-grade ores to be reopened.[67]

In 1910, the Frontenac and Aduddell mines developmental workings averaged 1,180' per month, an amount equal to the average operation of a dozen ordinary mines. In one year, more development was done at the Frontenac than in all other 50 years of its history. Initially during this period, the Frontenac Shaft was used for hoisting ore, and the Aduddell Shaft was used for the developmental workings. The Aduddell Shaft became the main hoisting shaft at a later date.[68] In 1911, the Frontenac Mine was noted to be responsible for 60 percent of Gilpin County's output.[69]

In 1912, the Frontenac and Aduddell mines were reported to be shipping "from 160 to 200 tons of crude ore per day that average[d] $9.00 per ton…in addition [to] shipments of concentrates [amounting to] 75 to 90 cars per month that average[d] $25.00 per ton."[70] In 1913, the workings at the Frontenac and Aduddell Mines were visited by students from

[58] "Frontenac sold to English syndicate," *Idaho Springs Siftings,* June 29, 1907, Colorado Historic Newspapers Collection.
[59]Stevens, 1911: 829.
[60] Ibid.
[61] "Aduddell bought by Henry P. Lowe and associates," *Idaho Springs Siftings,* March 6, 1909, Colorado Historic Newspapers Collection.
[62] Kompanik and Kompanik, 2018: 23.
[63] Ibid.: 23-24.
[64] Ibid.: 23.
[65] Ibid.: 26.
[66] Ibid.
[67] Ibid.: 25.
[68] Ibid.: 26.
[69] "Frontenac Mine responsible for 60% of Gilpin County 1911 output," *Idaho Springs Siftings,* April 25, 1914, Colorado Historic Newspapers Collection.
[70] "Frontenac and Aduddell Mines output," *Idaho Springs Siftings,* May 4, 1912, Colorado Historic Newspapers Collection.

the Colorado School of Mines for "practical observations and experience," demonstrating the workings' significance at the time.[71]

Although the Frontenac Mill at Black Hawk was purchased and dismantled in 1916, and the Gilpin Tramway/Gilpin Railroad likewise ceased operations in 1917, the Frontenac and Aduddell Mines still had access to subterranean rail transport to concentration mills in Idaho Springs via the Argo Tunnel, which tapped the Frontenac Mine approximately 11,210' from the portal of the tunnel on Clear Creek in Idaho Springs.[72] In 1918, the Frontenac Mine was reported as being leased by "Ress & Co." with "ore averaging $20 to $25 a ton and found in fair sized bunches."[73] In 1921, the mine was still being worked by "Joe Ress" with ores being shipped to Idaho Springs for processing with return values of "$85 a ton, gold, silver, and copper."[74]

After closing in 1922, both the Frontenac and Aduddell mines reopened again in 1933 and worked until 1940 when they are presumed to have closed due to ownership difficulties, a common problem for mining operations.[75] There is no evidence that the production that took place between 1933 and 1940 was at a meaningful level.

Throughout its life, the Frontenac Mine was primarily a gold mine, but it also produced other metals, notably silver, given its location along the Silver Belt found between Central City and Idaho Springs. Assay data from the Idaho Springs Sampling Works dated 1912 indicates that ore from the Frontenac and Aduddell mines returned more than one ounce of gold per ton. Assay data dated 1939 from the Arkansas Valley Smelter Plant in Leadville indicates that ore from the Frontenac Mine returned 0.4 ounces of gold per ton and 20.17 ounces of silver per ton.[76]

Between 1902 and 1940, the Frontenac specifically "produced 51,746 tons of crude ore and 50,423 tons of concentrates, yielding 37,407 ounces of gold; 791,360 ounces of silver; 2,791,524 pounds of copper; 4,951,332 pounds of lead; and 125,765 pounds of zinc."[77] At 2020 prices, this ore would have a value of around $127 million. Before 1899, the mine was reported to have produced around $1.25 million, with $980,000 of that total coming from the fourth level of the workings.[78]

In 2019, a pedestrian trail was developed through the Young Ranch West LLC property, connecting the historic mining features of South Willis Gulch. The trail, built on the natural ground surface with locally procured stones used as stair steps in places, blends in well with the environment and has no adverse impact on the setting or feeling of the mining landscape or any of its features. The trail passes through the Frontenac and Aduddell Mine Complex, linking the interrelated elements of the mining operation together. With assistance from the Colorado Division of Reclamation, Mining, and Safety (DRMS), there are plans to install interpretive signage along the trail. Intended to be open to the public, the interpretive trail is designed to not only provide patrons with the chance to get outside and get some exercise climbing the steep slopes of South Willis Gulch, but also to provide the opportunity to engage in place-based learning about the fascinating history of the state's mining industry and the significant role that the Frontenac and Aduddell Mine Complex had in the story of hard rock mining in Colorado.

[71] "School of Mines students visit the Frontenac and Aduddell Mines," *Idaho Springs Siftings,* March 1, 1913, Colorado Historic Newspapers Collection.
[72] Kompanik and Kompanik, 2018: 24, 27.
[73] "Frontenac Mine leased by Ress & Co.," *Idaho Springs Siftings,* December 13, 1918, Colorado Historic Newspapers Collection.
[74] "Frontenac Mine ores shipped to Idaho Springs," *Idaho Springs Siftings,* June 29, 1921, Colorado Historic Newspapers Collection.
[75] Kompanik and Kompanik, 2018: 23.
[76] Ibid.: 27.
[77] Ibid.: 23-24.
[78] Ibid.

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Frontenac and Aduddell Mine Complex
Name of Property

Gilpin County, Colorado
County and State

Stevens, Horace J. *The Copper Handbook: A Manual of the Copper Industry of the World, Volume 10,* 1911.

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Previous documentation on file (NPS):

____preliminary determination of individual listing (36 CFR 67 has been requested)
____previously listed in the National Register
____previously determined eligible by the National Register
____designated a National Historic Landmark
____recorded by Historic American Buildings Survey #_____
____recorded by Historic American Engineering Record # _____
____recorded by Historic American Landscape Survey # _____

Primary location of additional data:

__X__State Historic Preservation Office
____Other State agency
____Federal agency
____Local government
____University
____Other
Name of repository: _____

Historic Resources Survey Number (if assigned): 5GL.108, 5GL.2386, 5GL.2104.4

Frontenac and Aduddell Mine Complex
Name of Property

Gilpin County, Colorado
County and State

10. Geographical Data

Acreage of Property 17.0
(Do not include previously listed resource acreage.)

Latitude/Longitude
Datum if other than WGS84**:** _____
(Insert additional points as needed.)

1	Latitude	Longitude	3	Latitude	Longitude
2	Latitude	Longitude	4	Latitude	Longitude

or

UTM References
Datum:
NAD 1927 _____ or **NAD 1983** x
(Insert additional UTM references as needed.)

The following UTMs correspond to the labeled points on the boundary corners on the attached 1:4,000 scale sketch map and are referenced in the verbal boundary description below.

1	13N	455161	4402097	2	13N	455465	4402387
	Zone	Easting	Northing		Zone	Easting	Northing
3	13N	455367	4402487	4	13N	455433	4402551
	Zone	Easting	Northing		Zone	Easting	Northing
5	13N	455519	4402465	6	13N	455613	4402525
	Zone	Easting	Northing		Zone	Easting	Northing
7	13N	455639	4402486	8	13N	455699	4402486
	Zone	Easting	Northing		Zone	Easting	Northing
9	13N	455713	4402472	10	13N	455646	4402299
	Zone	Easting	Northing		Zone	Easting	Northing
11	13N	455439	4402299	12	13N	455200	4402071
	Zone	Easting	Northing		Zone	Easting	Northing

Verbal Boundary Description (Describe the boundaries of the property.)
The nomination boundary is defined by the associated mining claims and also the visible surface extent of intact buildings, structures, and features that are associated with the operation of the Frontenac and Aduddell Mines. The boundary, encompassing a contiguous expanse of land contained in an irregular polygon, is shown as a solid black line on the accompanying map. Beginning at UTM Point 1 (the southwest corner of the Frontenac Lode 461B claim), the boundary extends 1,377.5' (0.26 miles) northeast to UTM Point 2 (the northwest corner of the Frontenac Lode 461A claim); then extends 457.8' northwest to UTM Point 3 (the southwest corner of the Frontenac Mill 461B claim); then extends 301.2' northeast to UTM Point 4 (the northwest corner of the Frontenac Mill 461B claim); then extends 402.0' southeast to UTM Point 5 (the inner corner of the L-shaped Frontenac Mill 461B claim); then extends 365.4' northeast to UTM Point 6 (the northeast corner of the Frontenac Mill 461B claim); then extends 153.4' southeast to UTM Point 7 (the southeast corner of the Frontenac Mill 461B claim); then extends 196.7' east to UTM Point 8 (enclosing surface workings); then extends 64.5'

southeast to UTM Point 9 (enclosing surface workings); then extends 607.2' southwest to UTM Point 10 (enclosing surface workings); then extends west 681.6' west to UTM Point 11 (enclosing surface workings and meeting up with the southwest boundary of the Frontenac Lode 461A claim); then extends 1,081.0' southwest to UTM Point 12 (the southeast corner of the Frontenac Lode 461A claim); then extends 154.5' northwest back to UTM Point 1.

Boundary Justification (Explain why the boundaries were selected.)
The boundary of the Frontenac and Aduddell Mine Complex was drawn to include the claims associated with the mine workings and the extant buildings, structures, and features associated with the life and operation of the mines on the ground surface. The boundary includes the Frontenac Lode 461A and Frontenac Mill 461B claims in their entirety. A portion of the Aduddell Lode 302 claim is included, however, the northeastern-most approximate 1,300' of the long, thin Aduddell Lode 302 Claim is excluded from the boundary because it was developed by the Druid Mine, which was owned and operated separately from the Frontenac and Aduddell, and for which some surface plant features are still extant on the ground surface. The southwest and northwest boundary lines specifically reflect the associated claim boundaries, while the northeast and southeast boundaries encompass surface features related to the operation of the Frontenac and Aduddell Mines, including those that are present beyond the limits of the associated claims, particularly the full extent of the 1909 Frontenac spur of the Gilpin Tramway.

11. Form Prepared By

name/title Natasha Krasnow, Archaeologist/Project Director; and Emily Sakariassen, Architectural Historian (for the property owners)

organization Metcalf Archaeological Consultants, Inc. date July 15, 2020

street & number 3094 I-70 Business Loop, Suite B telephone 970-434-9080

city or town Grand Junction state Colorado zip code 81501

e-mail nkrasnow@metcalfarchaeology.com; esakariassen@metcalfarchaeology.com

Additional Documentation

Submit the following items with the completed form:

- **Maps:** A **USGS map** (7.5 or 15 minute series) or **Google Earth** map indicating the property's location.

  A **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.

- **Additional items:** (Check with the SHPO or FPO for any additional items.)

Photographs:

Submit clear and descriptive photographs. The size of each image must be 1600x1200 pixels at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map.

Name of Property: Frontenac and Aduddell Mine Complex
City or Vicinity: Russell Gulch Vicinity
County: Gilpin State: Colorado
Photographer: Cody Anderson; Natasha Krasnow
Date Photographed: June 27, 2019 and July 27, 2019; July 8-9, 2020; October 9, 2020

Description of Photograph(s) and number:

1 of 68. Overview of the northwest portion of the Frontenac Mine Shaft access road (Site Feature A). View northwest.

2 of 68. Overview of the southeast portion of the Frontenac Mine Shaft access road (Site Feature A). View east.

3 of 68. Representative view of prospect pits within the large grouping that comprises Site Feature B. View north-northwest.

4 of 68. Representative view of prospect pits within the large grouping that comprises Site Feature B. View northwest.

5 of 68. Overview of the smaller prospect pit grouping that comprises Site Feature C. View northwest.

6 of 68. Overview of earthen building platform (Site Feature D). View southeast.

7 of 68. Overview of depression (Site Feature E). View east.

8 of 68. Overview of Frontenac Mine Adit access roads, upslope road (Site Feature F). View west.

9 of 68. Overview of Frontenac Mine Adit access roads, downslope road (Site Feature F). Note the Frontenac Mine Adit waste rock pile in the distance where the road terminates. View east.

10 of 68. Overview of earthen building platform (foreground) with stone retaining wall (background) (Site Feature G). View northeast.

11 of 68. Detail of the tallest portion of the stone retaining wall (Site Feature G). View northeast.

12 of 68. Overview of large waste rock pile (Site Feature H) from below to the north. View east-northeast.

13 of 68. Overview of leveled area atop the large waste rock pile (Site Feature H). Note the Stone Building photo right. View east-northeast.

14 of 68. Overview of small waste rock pile (Site Feature I). View northeast.

15 of 68. Overview of depression (Site Feature J). View northeast.

16 of 68. Overview of adit channel (Site Feature K). View southwest.

17 of 68. Overview of mid-twentieth century outdoor toilet (Site Feature L). View southwest.

18 of 68. Overview of mid-twentieth century rock wall (Site Feature M). View north.

19 of 68. Overview of mid-twentieth century fire pit (Site Feature N). View west.

20 of 68. Overview of mid-twentieth century outbuilding remnants (Site Feature O). View north.

21 of 68. Overview of Frontenac Mine Shaft with waste rock pile in the distance (Map Key 1a and 1b). View northeast.

22 of 68. Overview of Frontenac Mine Shaft waste rock pile. Note interpretive trail with stone steps (Map Key 1b). View west-northwest.

23 of 68. Overview of Frontenac Mine Adit (Map Key 2a). View southwest.

24 of 68. Overview of Frontenac Mine Adit Channel waste rock pile (Map Key 2b). View northwest.

25 of 68. Overview of mid-twentieth century wood cabin (Map Key 3). Note the stone retaining at the mouth of the Frontenac Mine Adit photo right. View southeast

26 of 68. Overview of fire pit associated with wood cabin. View north.

27 of 68. View of the north wall of the Frontenac Shaft House (Map Key 4). View east.

28 of 68. Oblique view of the northwest corner of the Frontenac Shaft House. View east.

29 of 68. View of the west wall of the Frontenac Shaft House. View northeast.

30 of 68. Oblique view of the southwest corner of the Frontenac Shaft House. View north.

31 of 68. View of the south wall of the Frontenac Shaft House. View northwest.

32 of 68. Oblique view of the southeast corner of the Frontenac Shaft House. View west.

33 of 68. View of the east wall of the Frontenac Shaft House. southwest.

34 of 68. Oblique view of the northeast corner of the Frontenac Shaft House. Note the intact timber and stone retaining for the original Gilpin County Tramway rail line photo right. View south.

35 of 68. Detail of the south side of the tramway extension and ore bin. View northwest.

36 of 68. Detail of the north side of the tramway extension and ore bin. View east.

37 of 68. Detail of the hoist and the top of the bucket skid on the north wall of the Frontenac Shaft House. View east.

38 of 68. Detail of ore chute opening on the north side of the main ore bin under the bucket skid on the north wall of the Frontenac Shaft House. This was likely added in 1888 to accommodate the Gilpin Tramway Spur. View east-northeast.

39 of 68. Detail of the bottom of the bucket skid, the capped shaft below, and the extant 1888 Gilpin County Tramway rails that run over the shaft on the north wall of the Frontenac Shaft House. View southeast.

40 of 68. Detail of the central interior ore chute on the east side of the main ore bin, running into the tramway extension. View southwest.

41 of 68. Detail of the interior wood ore chute located above the central ore chute, emptying into the ore bin on the south side of the tramway. View east.

42 of 68. Detail of the ore chute that opens under the tramway extension. View southwest.

43 of 68. Overview of capped Aduddell Mine West Shaft with associated headframe remnants (Map Key 5). View southwest.

44 of 68. Overview of Stone Building (Map Key 6), north wall. View south.

45 of 68. Overview of Stone Building, northwest corner. View southeast.

46 of 68. Overview of Stone Building, west wall. View east.

47 of 68. Overview of Stone Building, southwest corner. View northeast.

48 of 68. Overview of Stone Building, southeast corner. View northwest.

49 of 68. Overview of Stone Building, east wall. View south-southwest.

50 of 68. Overview of Stone Building, northeast corner. View southwest.

51 of 68. Overview of north wall of Wood Outbuilding (Map Key 8). View southwest.

52 of 68. Overview of west wall of Wood Outbuilding. View northeast.

53 of 68. Overview of south wall of Wood Outbuilding. View northwest.

54 of 68. Overview of east wall of Wood Outbuilding. View west-southwest.

55 of 68. Overview of north wall of Explosives Magazine (Map Key 9). View south-southwest.

56 of 68. Overview of west wall of Explosives Magazine. View northeast.

57 of 68. Overview of south wall of Explosives Magazine. View north-northwest.

58 of 68. Overview of east wall of Explosives Magazine. View southwest.

59 of 68. Overview of northeast wall of Outhouse (Map Key 9). View southwest.

60 of 68. Overview of northwest wall of Outhouse. View east.

61 of 68. Overview of southwest wall of Outhouse. View northeast.

62 of 68. Overview of southeast wall of Outhouse. View northwest.

63 of 68. Overview of Aduddell Mine East Shaft (Map Key 10). View northwest.

64 of 68. Overview of area with burned brick and headframe elements at Aduddell Mine East Shaft. View south.

65 of 68. Overview of Aduddell Mine East Shaft (lower left) and area of burned brick and headframe remnants above. View southeast.

66 of 68. Overview of Gilpin Tramway Remnant (rail bed) (Map Key 11). View northeast.

67 of 68. Overview of Gilpin Tramway Remnant (rail bed). View southwest.

68 of 68. Overview of Gilpin Tramway Remnant (rail bed) looking toward the Frontenac Shaft House. View west.

Figures:

Description of Figures and number:

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Figure 2. Plat map for the Patent on the Aduddell Lode (Survey No. 302) dated 1875. Available from https://glorecords.blm.gov/.

Figure 3. Vertical Longitudinal Projection of the Frontenac and Aduddell Mines dated 1912. Available from “Frontenac Mine and Aduddell Mine,” http://www.gilpintram.com/.

Figure 4. Vertical Longitudinal Projection of the Frontenac and Aduddell Mines dated 1966 (USGS). Available from https://pubs.usgs.gov/of/1966/0087/plate-35.pdf.

Figure 5: Plan map depicting major extant elements of the Frontenac Shaft House.

Figure 6: Labeled photo of extant Frontenac Shaft House elements, north side of the building. View east.

Figure 7: Labeled photo of extant Frontenac Shaft House elements, west side of the building. View northeast.

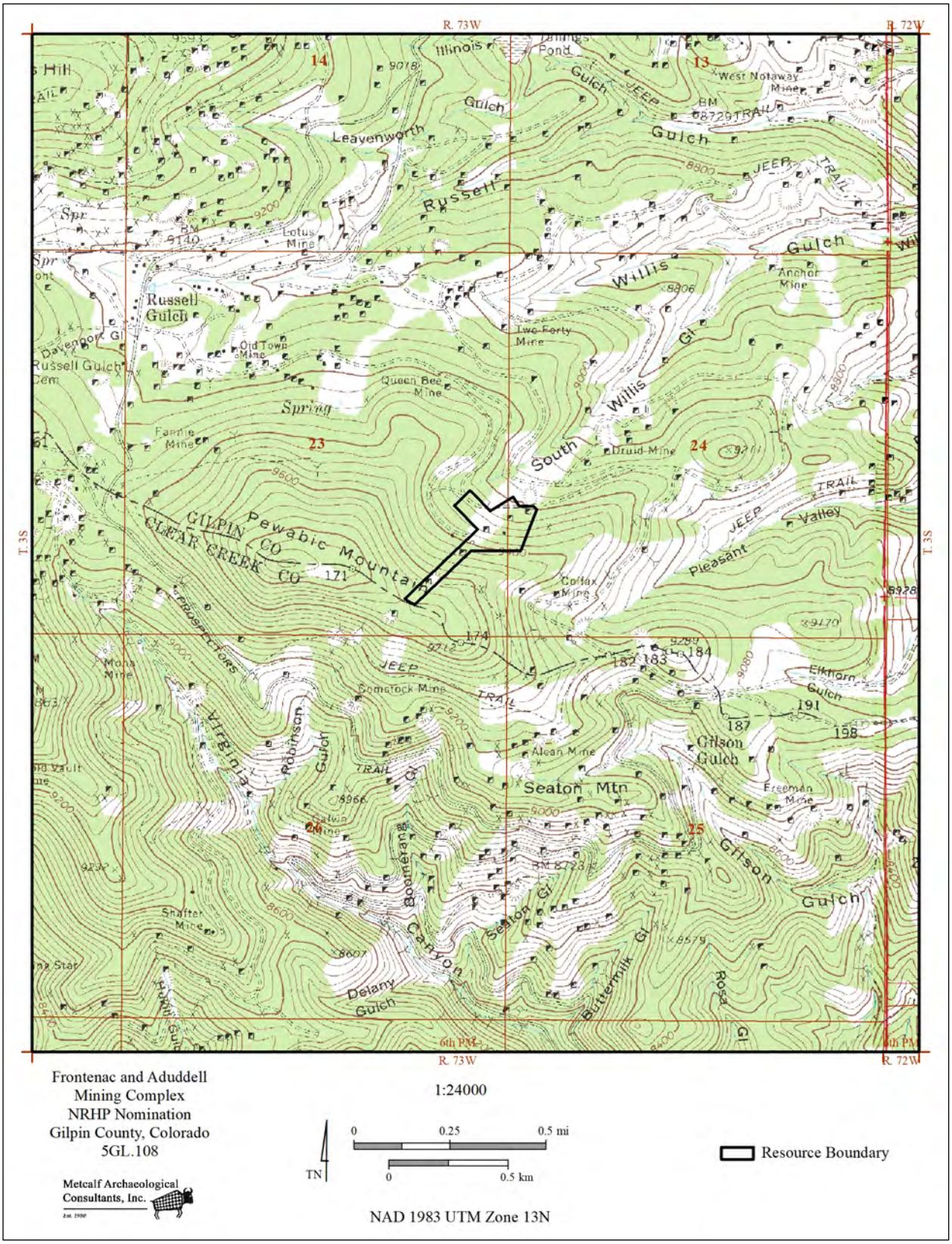
Figure 8: Labeled photo of extant Frontenac Shaft House elements, south side of the building. View northwest.

Figure 9: Floor plan of the Frontenac Shaft House, first floor. Courtesy of Form+Works Design Group, LLC. 2019.

Figure 10: Historical photograph ca. 1908 depicting the Frontenac Shaft House. Note the lack of the transecting tramway extension on the east (downslope) wall. Available from "Frontenac Mine and Aduddell Mine," http://www.gilpintram.com/.

Figure 11: View of the east wall of the Frontenac Shaft House during the original survey work. Photo from Pearce 1982.

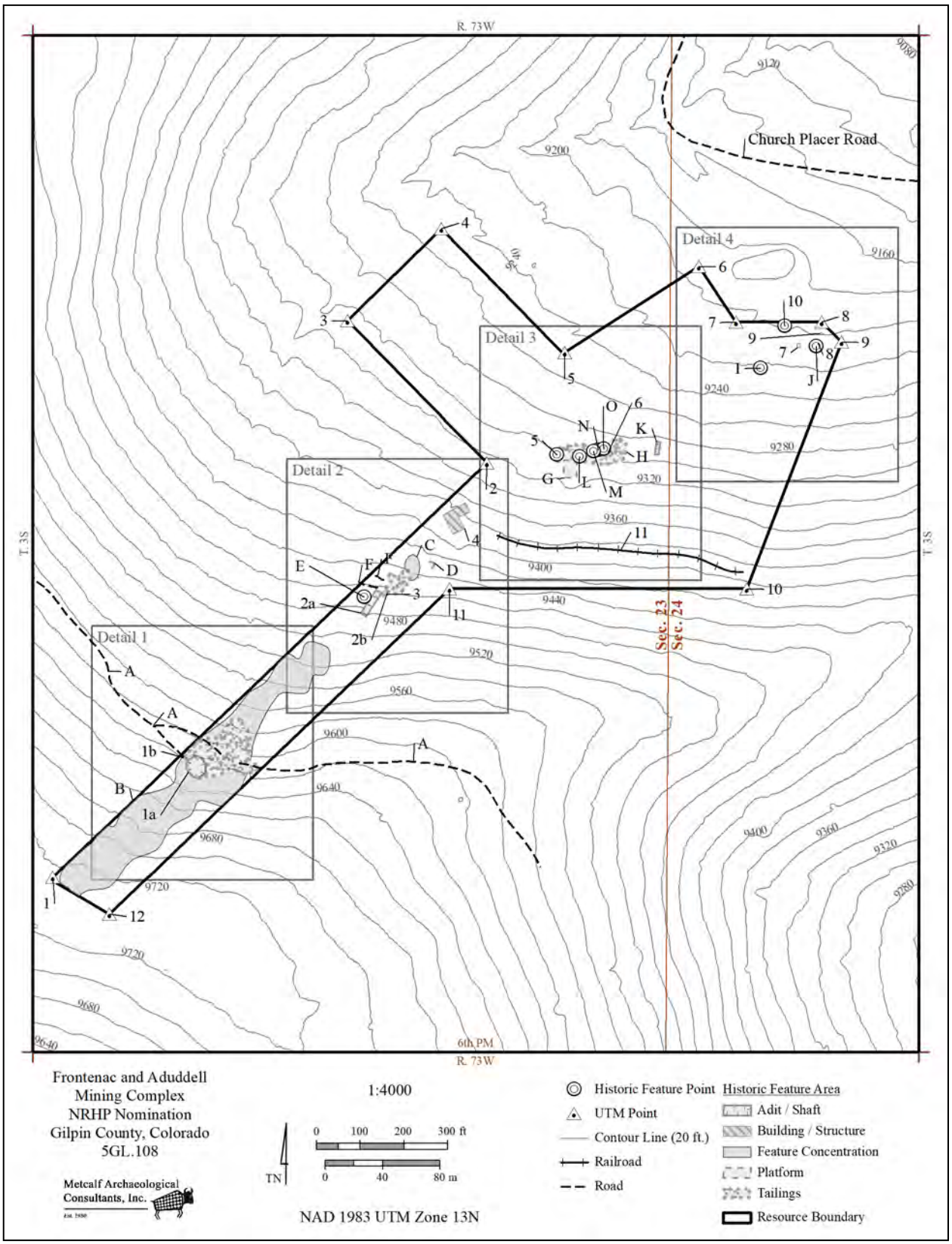
Figure 12: Historical photograph ca. 1910 depicting workers along the south side of the Frontenac Shaft House at the Gilpin Tramway extension. Available from "Frontenac Mine and Aduddell Mine," http://www.gilpintram.com/.



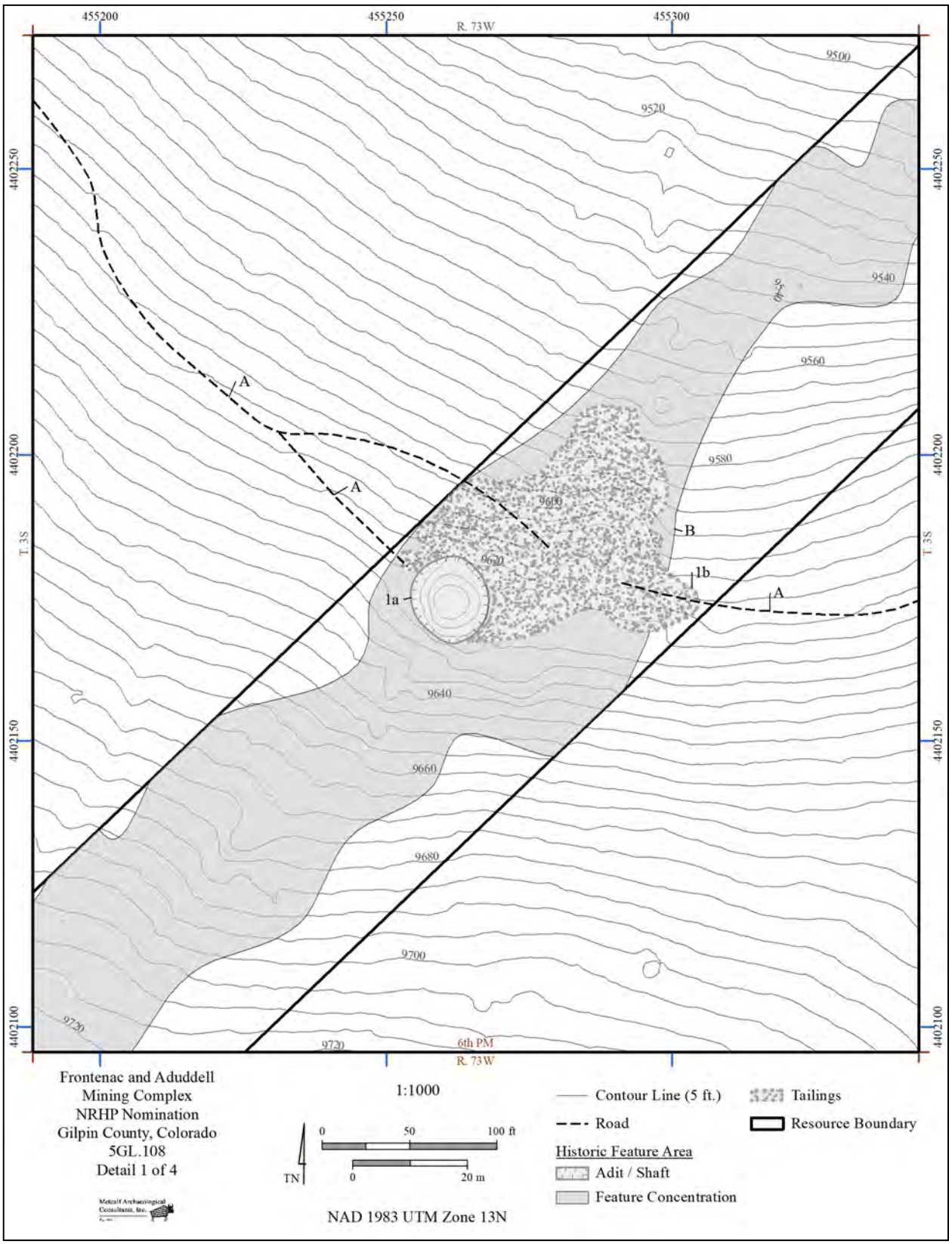
Location Map

Frontenac and Aduddell Mine Complex
Name of Property

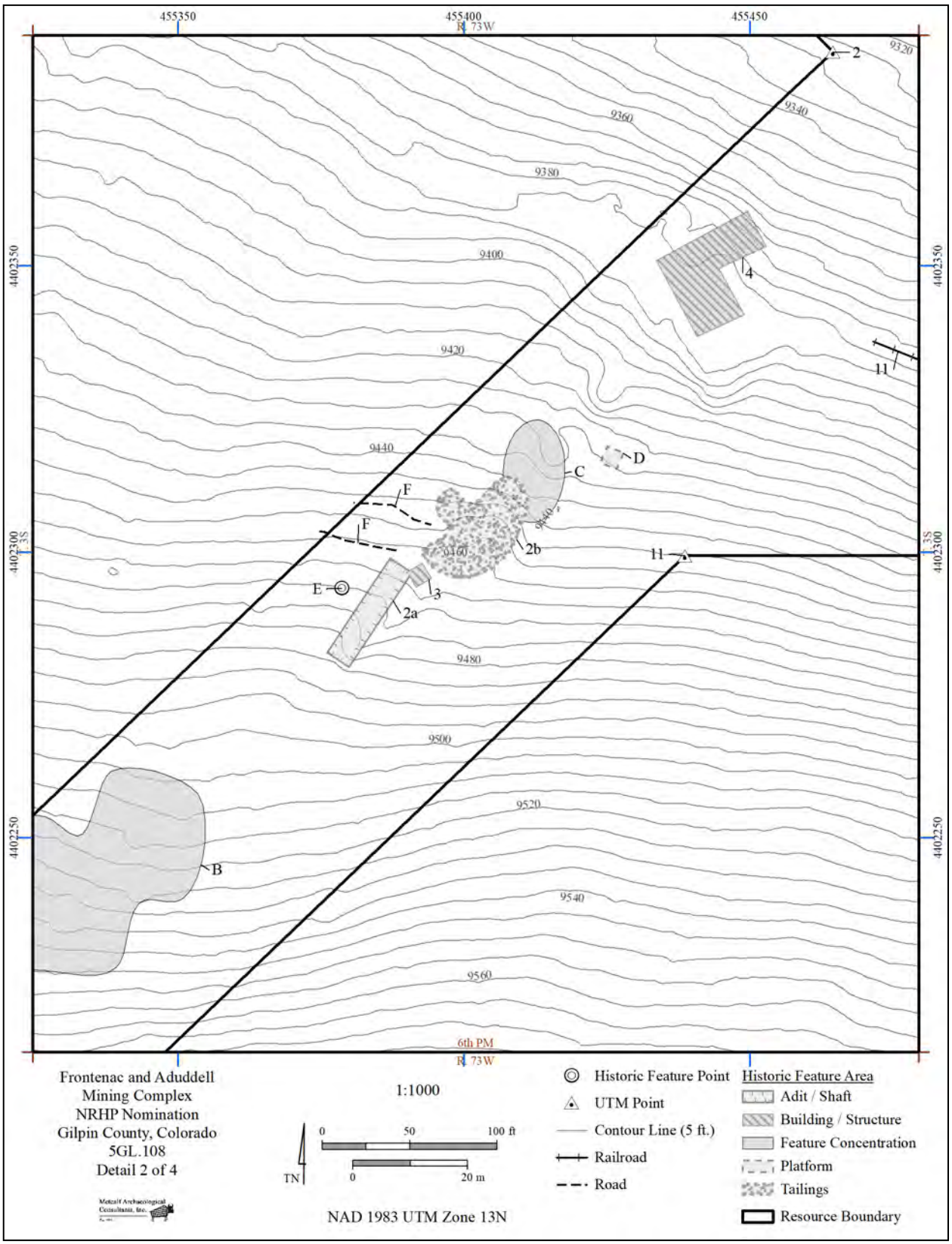
Gilpin County, Colorado
County and State


R. 73W
Church Placer Road
Detail 1
Detail 2
Detail 3
Detail 4
T. 3S
Sec. 23
Sec. 24
6th PM
R. 73W
Frontenac and Aduddell
Mining Complex
NRHP Nomination
Gilpin County, Colorado
5GL.108
Metcalf Archaeological
Consultants, Inc.
1:4000
0 100 200 300 ft
0 40 80 m
TN
NAD 1983 UTM Zone 13N
Historic Feature Point
UTM Point
Contour Line (20 ft.)
Railroad
Road
Historic Feature Area
Adit / Shaft
Building / Structure
Feature Concentration
Platform
Tailings
Resource Boundary

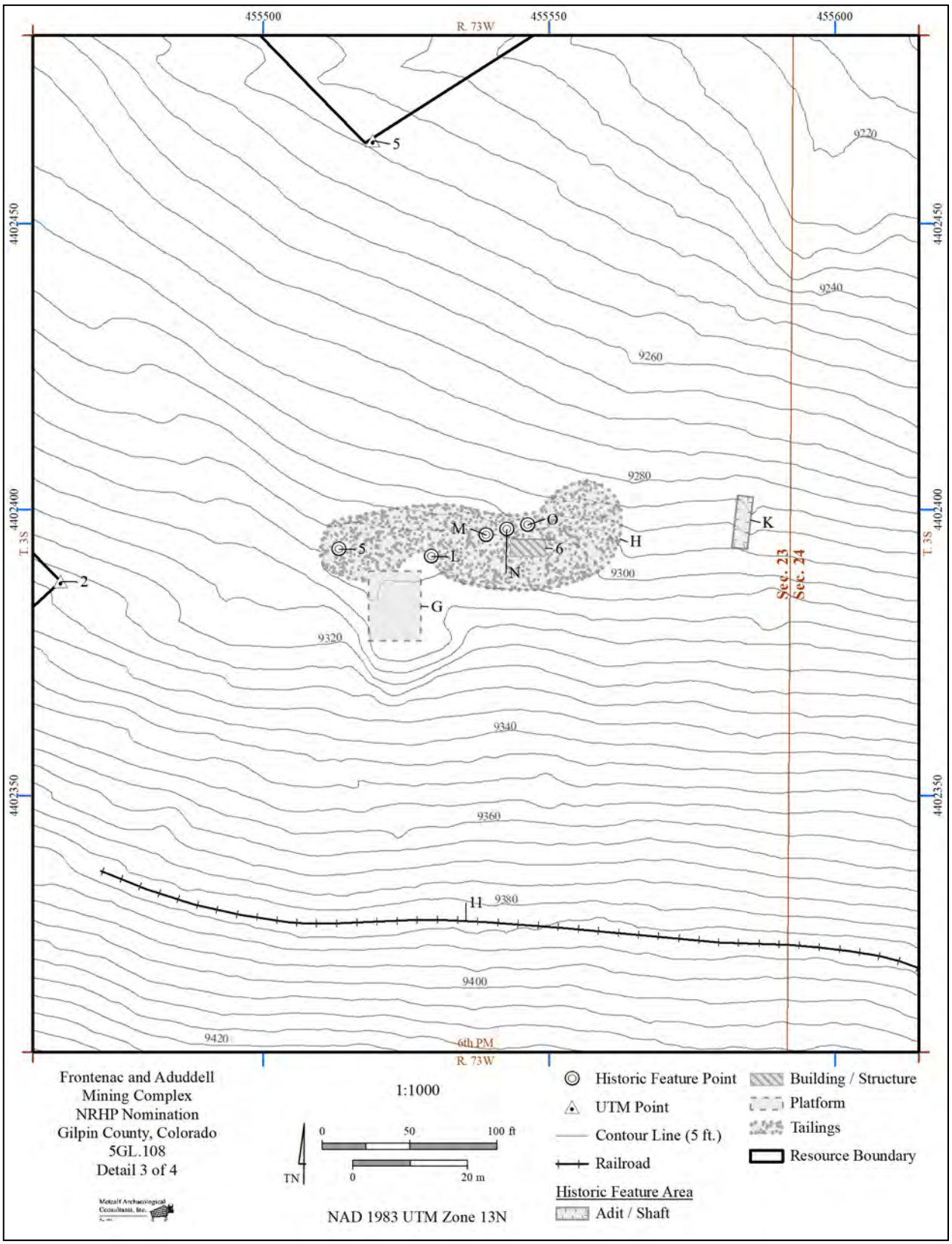
Sketch Map A



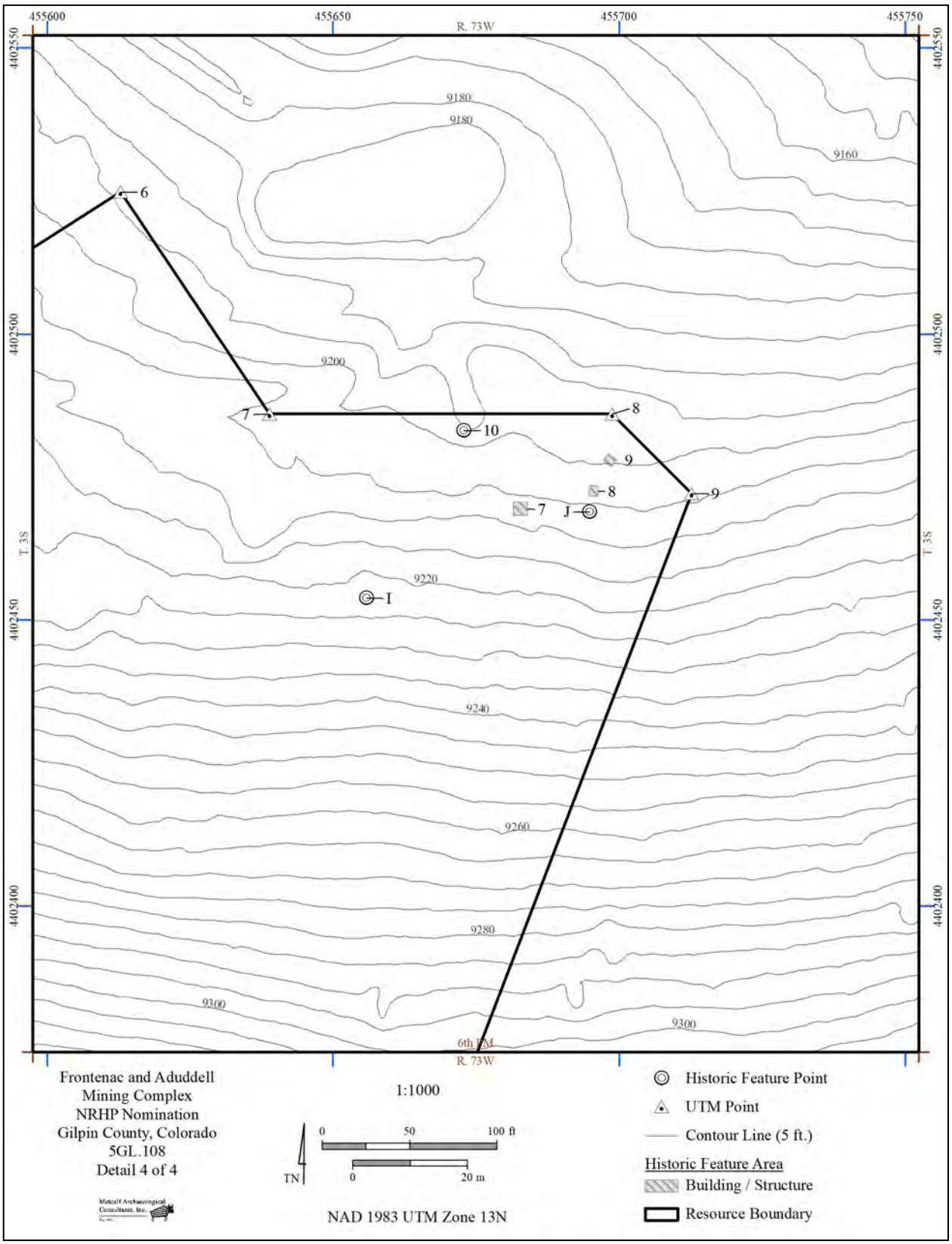
Sketch Map B (Detail 1 of 4)



Sketch Map C (Detail 2 of 4)



Sketch Map D (Detail 3 of 4)



Sketch Map E (Detail 4 of 4)

Photo 1: Overview of the northwest portion of the Frontenac Mine Shaft access road (Site Feature A). View northwest.

Photo 2: Overview of the southeast portion of the Frontenac Mine Shaft access road (Site Feature A). View east.

Photo 3: Representative view of prospect pits within the large grouping that comprises Site Feature B. View north-northwest.

Photo 4: Representative view of prospect pits within the large grouping that comprises Site Feature B. View northwest.

Photo 5: Overview of the smaller prospect pit grouping that comprises Site Feature C. View northwest.

Photo 6: Overview of earthen building platform (Site Feature D). View southeast.

Photo 7: Overview of depression (Site Feature E). View east.

Photo 8: Overview of Frontenac Mine Adit access roads, upslope road (Site Feature F). View west.

Photo 9: Overview of Frontenac Mine Adit access roads, downslope road (Site Feature F). Note the Frontenac Mine Adit waste rock pile in the distance where the road terminates. View east.

Photo 10: Overview of earthen building platform (foreground) with stone retaining wall (background) (Site Feature G). View northeast.

Photo 11: Detail of the tallest portion of the stone retaining wall (Site Feature G). View northeast.

Photo 12: Overview of large waste rock pile (Site Feature H) from below to the north. View east-northeast.

Photo 13: Overview of leveled area atop the large waste rock pile (Site Feature H). Note the Stone Building photo right. View east-northeast.

Photo 14: Overview of small waste rock pile (Site Feature I). View northeast.

Photo 15: Overview of depression (Site Feature J). View northeast.

Photo 16: Overview of adit channel (Site Feature K). View southwest.

Photo 17: Overview of mid-twentieth century outdoor toilet (Site Feature L). View southwest.

Photo 18: Overview of mid-twentieth century rock wall (Site Feature M). View north.

Photo 19: Overview of mid-twentieth century fire pit (Site Feature N). View west.

Photo 20: Overview of mid-twentieth century outbuilding remnants (Site Feature O). View north.

Photo 21: Overview of Frontenac Mine Shaft with waste rock pile in the distance (Map Key 1a and 1b). View northeast.

Photo 22: Overview of Frontenac Mine Shaft waste rock pile. Note interpretive trail with stone steps (Map Key 1b). View west-northwest.

Photo 23: Overview of Frontenac Mine Adit (Map Key 2a). View southwest.

Photo 24: Overview of Frontenac Mine Adit Waste rock pile (Map Key 2b). View northwest.

Photo 25: Overview of mid-twentieth century wood cabin (Map Key 3). Note the stone retaining at the mouth of the Frontenac Mine Adit photo right. View southeast.

Photo 26: Overview of fire pit associated with wood cabin. View north.

Photo 27: View of the north wall of the Frontenac Shaft House (Map Key 4). View east.

Photo 28: Oblique view of the northwest corner of the Frontenac Shaft House. View east.

Photo 29: View of the west wall of the Frontenac Shaft House. View northeast.

Photo 30: Oblique view of the southwest corner of the Frontenac Shaft House. View north.

Photo 31: View of the south wall of the Frontenac Shaft House. View northwest.

Photo 32: Oblique view of the southeast corner of the Frontenac Shaft House. View west.

Photo 33: View of the east wall of the Frontenac Shaft House. southwest.

Photo 34: Oblique view of the northeast corner of the Frontenac Shaft House. Note the intact timber and stone retaining for the original 1888 Gilpin Tramway rail line photo right. View south.

Photo 35: Detail of the south side of the tramway extension and ore bin. View northwest.

Photo 36: Detail of the north side of the tramway extension and ore bin. View east.

Photo 37: Detail of the hoist and the top of the bucket skid on the north wall of the Frontenac Shaft House. View east.

Photo 38: Ore chute opening on the north side of the main ore bin under the bucket skid on the north wall of the Frontenac Shaft House. This was likely added in 1888 to accommodate the Gilpin Tramway spur. View east-northeast.

Photo 39: Detail of the bottom of the bucket skid, the capped shaft below, and the extant 1888 Gilpin County Tramway rails that run over the shaft on the north wall of the Frontenac Shaft House. View southeast.

Photo 40: Detail of the central interior ore chute on the east side of the main ore bin, running into the tramway extension. View southwest.

Photo 41: Detail of the interior wood ore chute located above the central ore chute, emptying into the ore bin on the south side of the tramway. View east.

Photo 42: Detail of the ore chute that opens under the tramway extension. View southwest.

Photo 43: Overview of capped Aduddell Mine West Shaft with associated headframe remnants (Map Key 5). View southwest.

Photo 44: Overview of Stone Building (Map Key 6), north wall. View south.

Photo 45: Overview of Stone Building, northwest corner. View southeast.

Photo 46: Overview of Stone Building, west wall. View east.

Photo 47: Overview of Stone Building, southwest corner. View northeast.

Photo 48: Overview of Stone Building, southeast corner. View northwest.

Photo 49: Overview of Stone Building, east wall. View south-southwest.

Photo 50: Overview of Stone Building, northeast corner. View southwest.

Photo 51: Overview of north wall of Wood Outbuilding (Map Key 8). View southwest.

Photo 52: Overview of west wall of Wood Outbuilding. View northeast.

Photo 53: Overview of south wall of Wood Outbuilding. View northwest.

Photo 54: Overview of east wall of Wood Outbuilding. View west-southwest.

Photo 55: Overview of north wall of Explosives Magazine (Map Key 9). View south-southwest.

Photo 56: Overview of west wall of Explosives Magazine. View northeast.

Photo 57: Overview of south wall of Explosives Magazine. View north-northwest.

Photo 58: Overview of east wall of Explosives Magazine. View southwest.

Photo 59: Overview of northeast wall of Outhouse (Map Key 9). View southwest.

Photo 60: Overview of northwest wall of Outhouse. View east.

Photo 61: Overview of southwest wall of Outhouse. View northeast.

Photo 62: Overview of southeast wall of Outhouse. View northwest.

Photo 63: Overview of Aduddell Mine East Shaft (Map Key 10). View northwest.

Photo 64. Overview of area with burned brick and headframe elements at Aduddell Mine East Shaft. View south.

Photo 65: Overview of Aduddell Mine East Shaft (lower left) and area of burned brick and headframe remnants above. View southeast.

Photo 66: Overview of Gilpin Tramway Remnant (rail bed) (Map Key 11). View northeast.

Photo 67: Overview of Gilpin Tramway Remnant (rail bed). View southwest.

Photo 68: Overview of Gilpin Tramway Remnant (rail bed) looking toward the Frontenac Shaft House. View west.

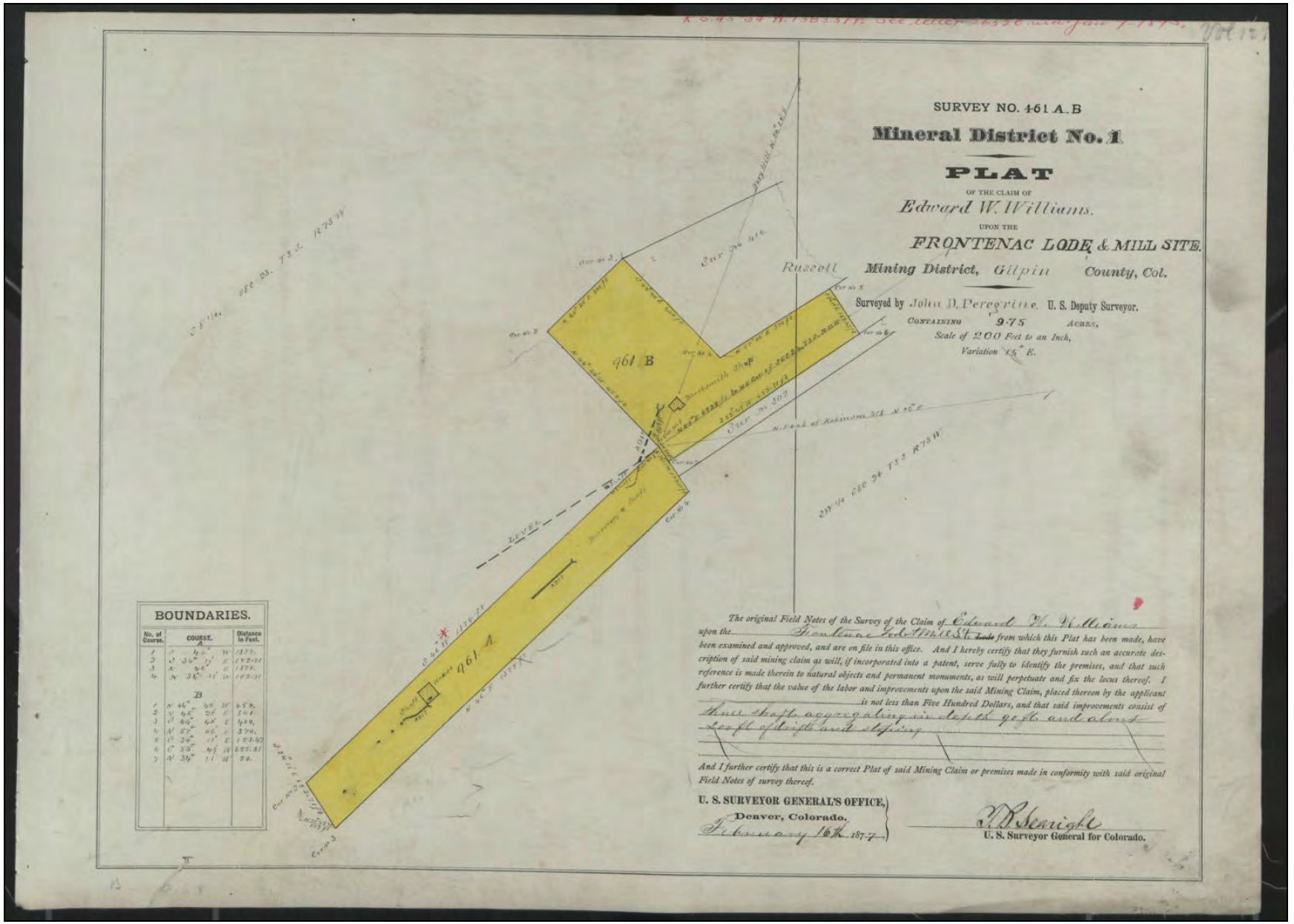


Figure 1: Plat map for the Patent on the Frontenac Lode and Mill Site (Survey No. 461A & B) dated 1877. Available from https://glorecords.blm.gov/.

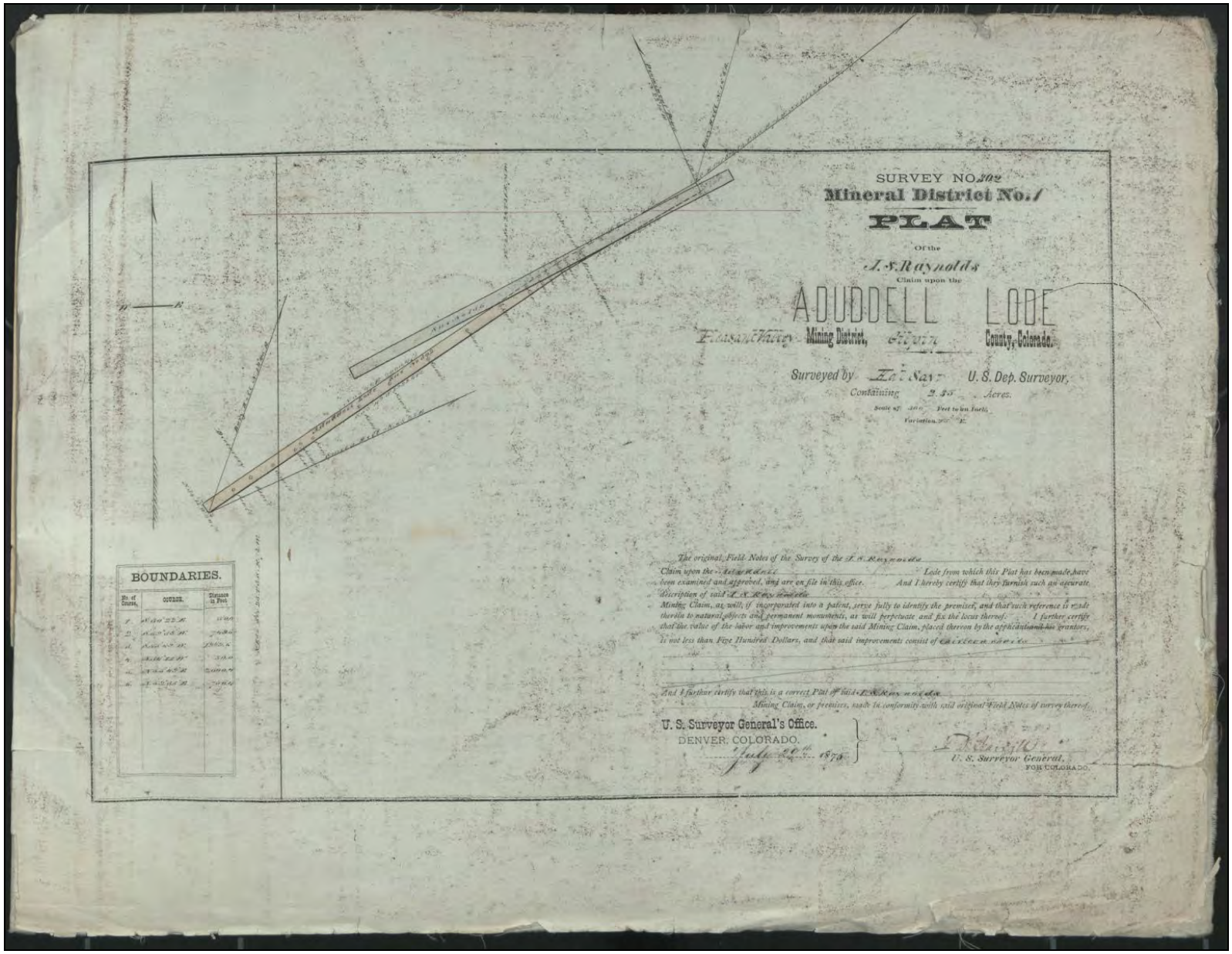


Figure 2: Plat map for the Patent on the Aduddell Lode (Survey No. 302) dated 1875. Available from https://glorecords.blm.gov/.

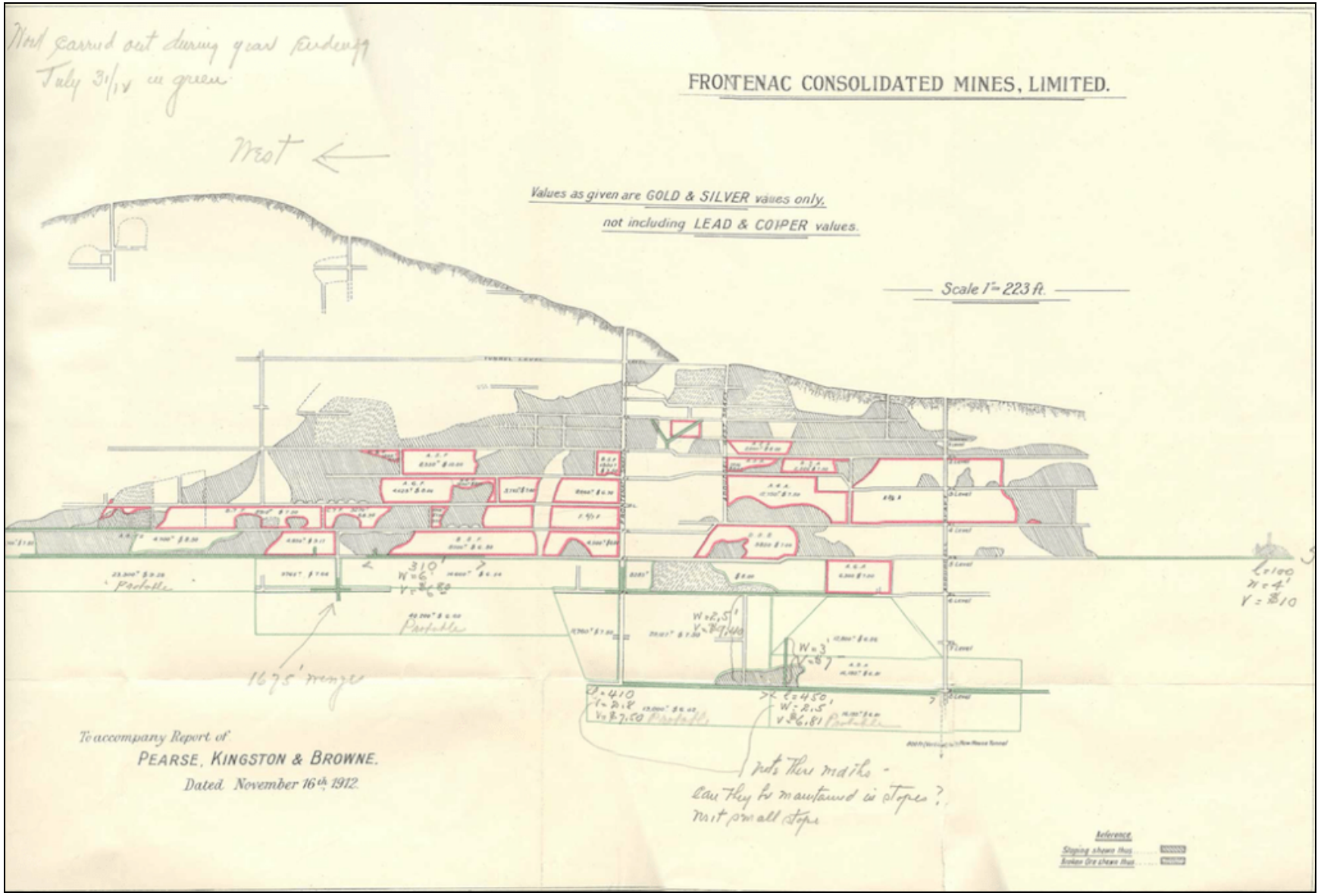


Figure 3: Vertical Longitudinal Projection of the Frontenac and Aduddell Mines dated 1912. Available from "Frontenac Mine and Aduddell Mine," http://www.gilpintram.com/.

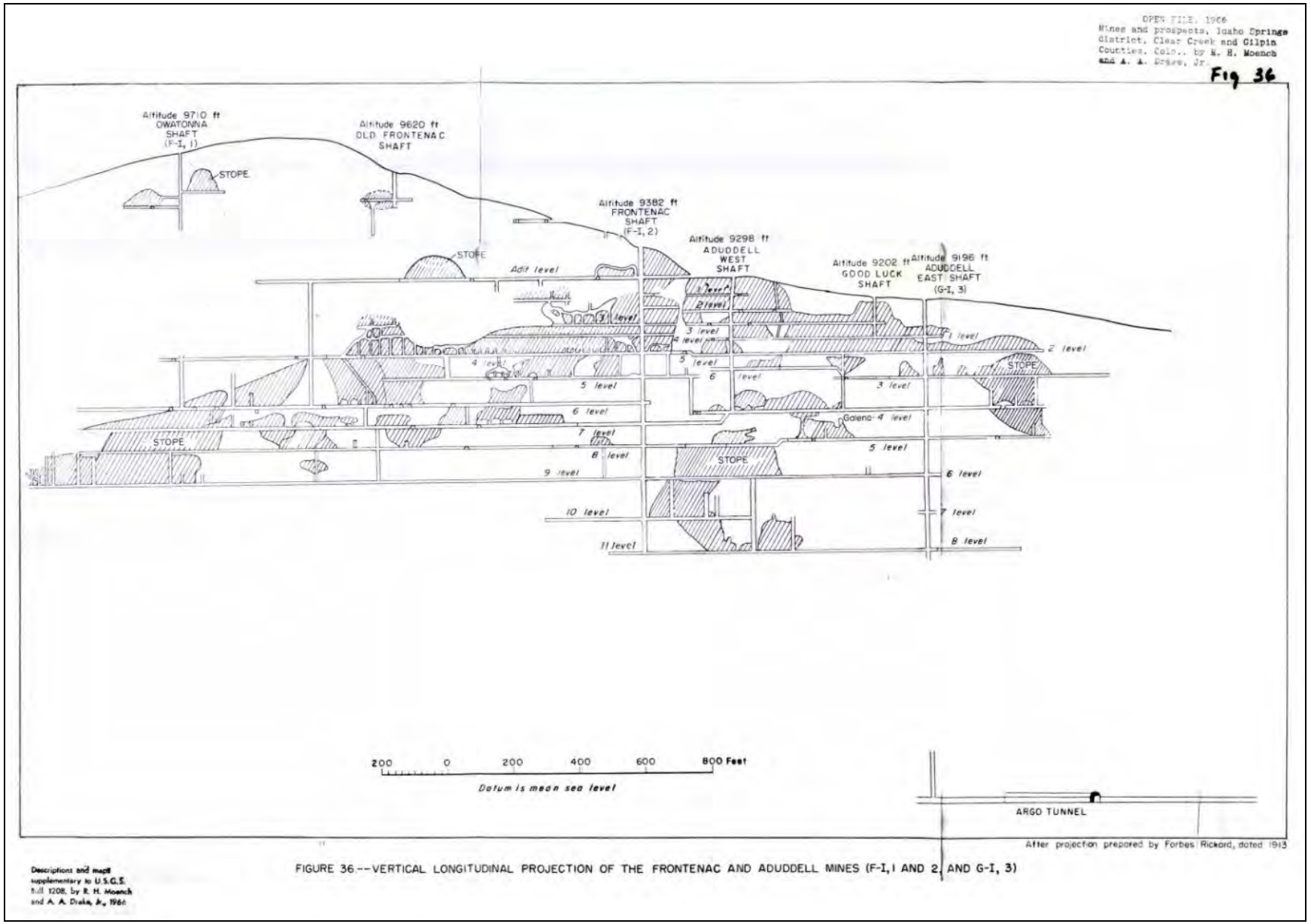


FIGURE 36.--VERTICAL LONGITUDINAL PROJECTION OF THE FRONTENAC AND ADUDDELL MINES (F-I, 1 AND 2, AND G-I, 3)

Figure 4: Vertical Longitudinal Projection of the Frontenac and Aduddell Mines dated 1966 (USGS).

Available from https://pubs.usgs.gov/of/1966/0087/plate-35.pdf.

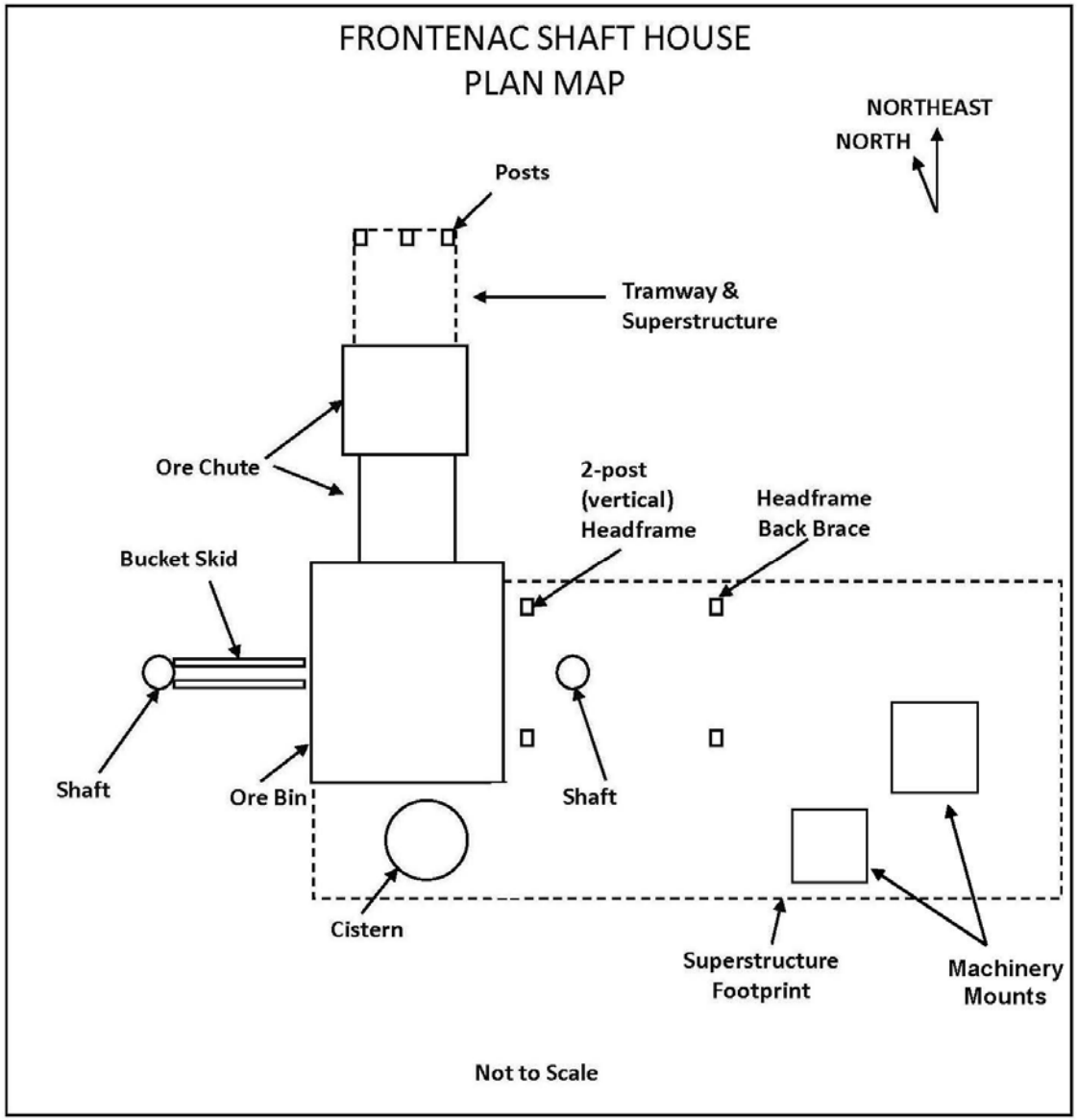


Figure 5: Plan map depicting major extant elements of the Frontenac Shaft House.

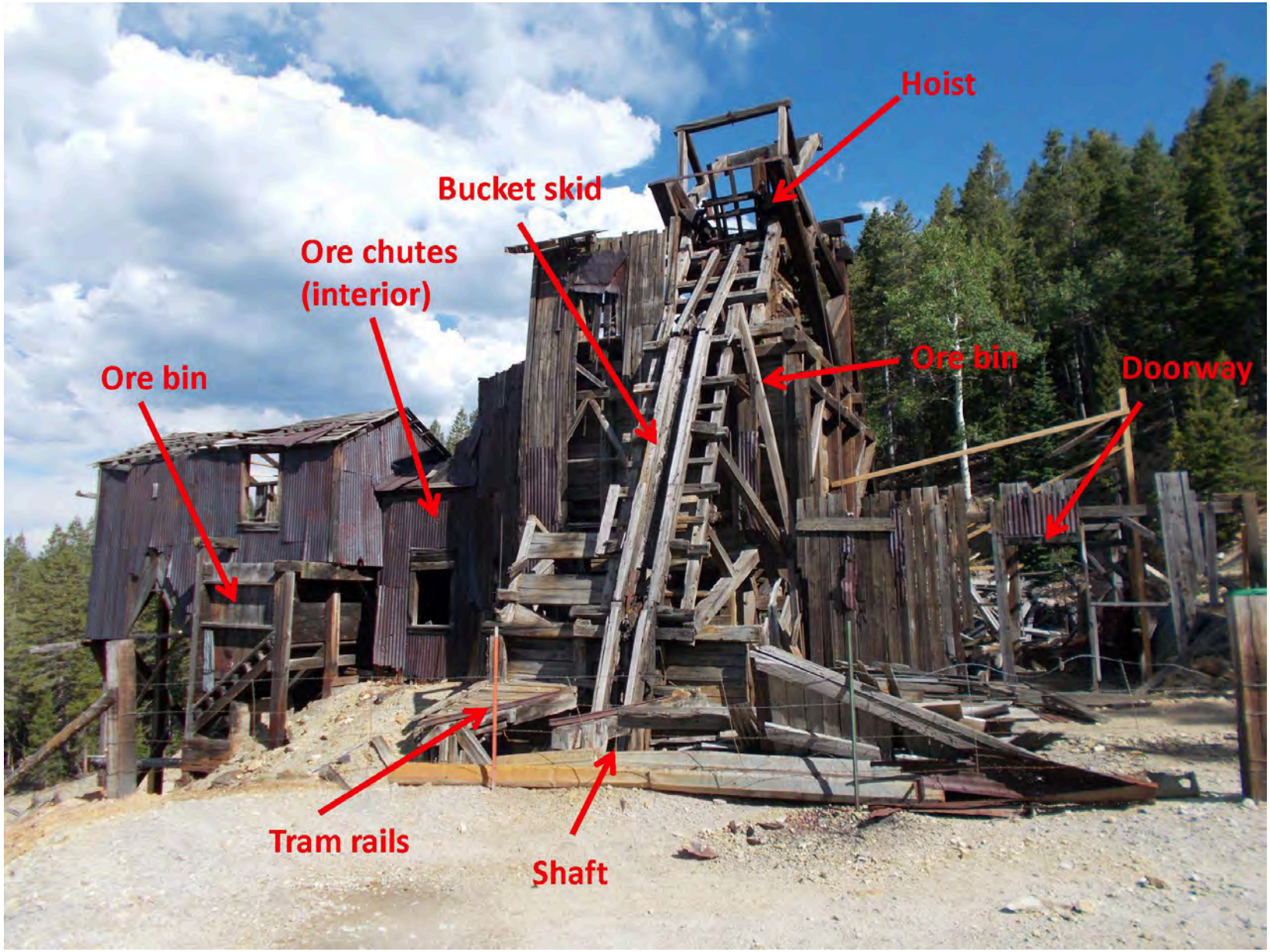


Figure 6: Labeled photo of extant Frontenac Shaft House elements, north side of the building. View east.

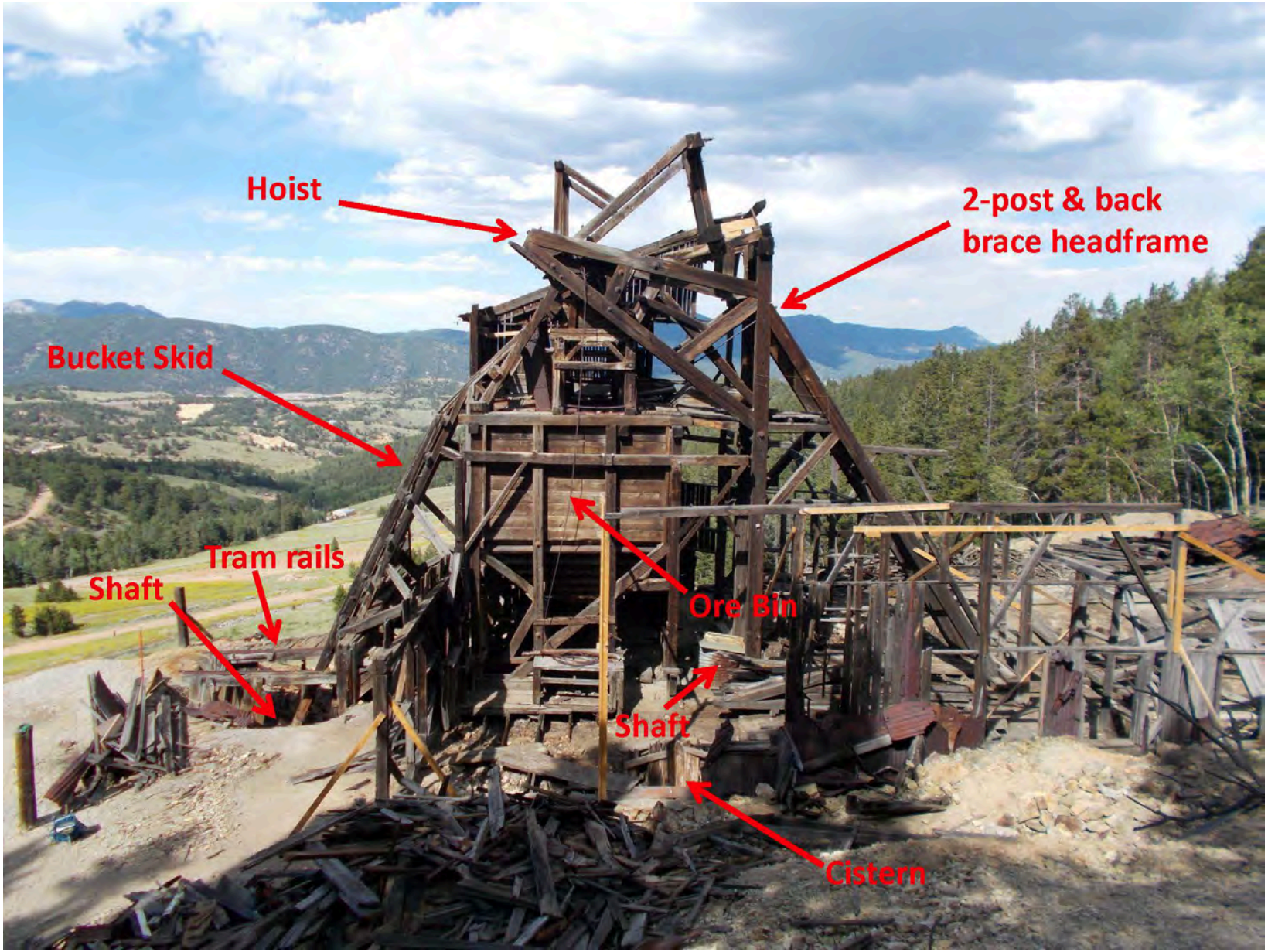

Hoist
2-post & back brace headframe
Bucket Skid
Tram rails
Shaft
Ore Bin
Shaft
Cistern

Figure 7: Labeled photo of extant Frontenac Shaft House elements, west side of the building. View northeast.

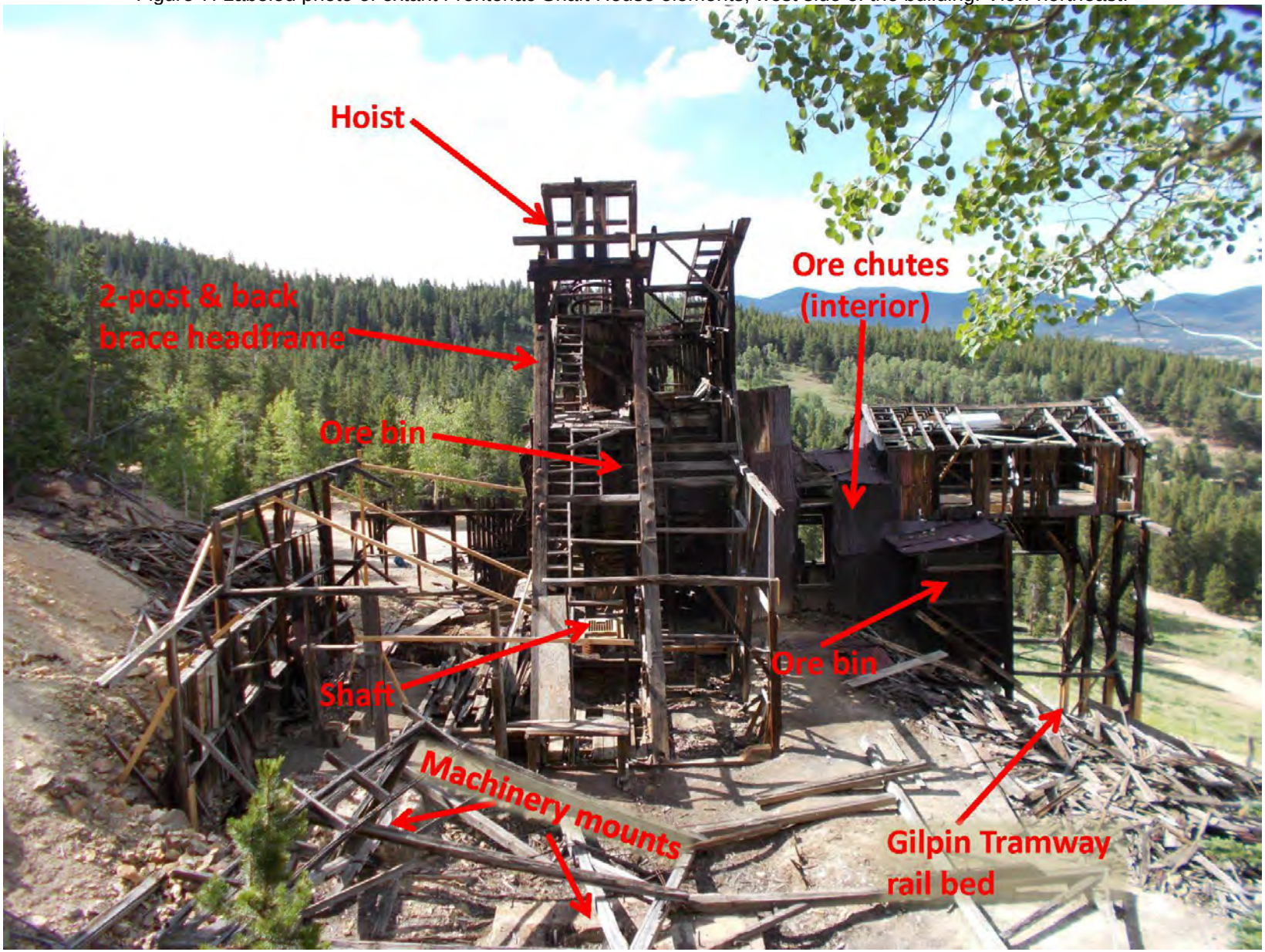


Figure 8: Labeled photo of extant Frontenac Shaft House elements, south side of the building. View northwest.

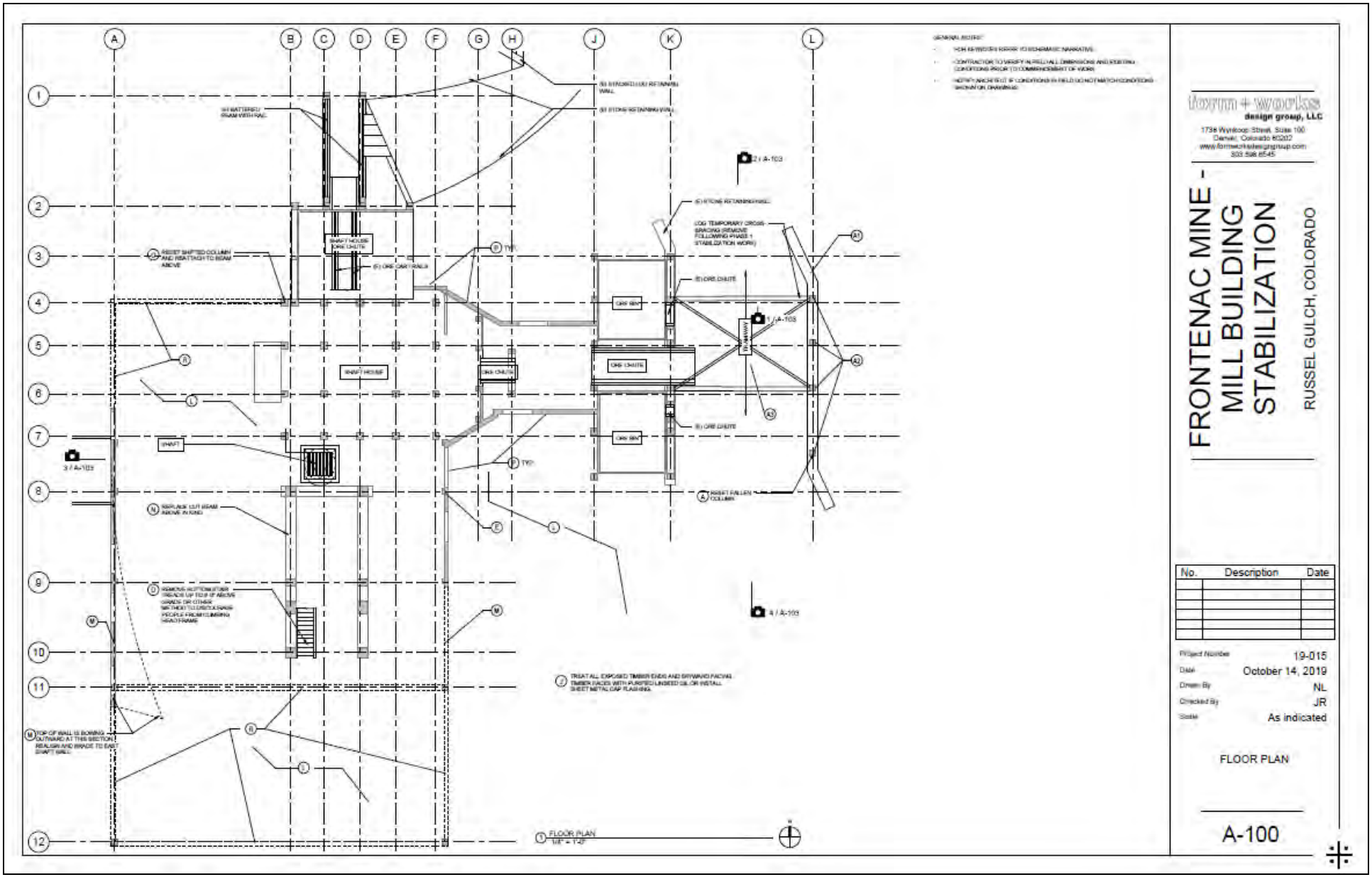


Figure 9: Floor plan of the Frontenac Shaft House, first floor. Courtesy of Form+Works Design Group, LLC. 2019.

Historical photograph ca. 1908 depicting the Frontenac Shaft House. Note the lack of the transecting tramway extension on the east (downslope) wall. Available from "Frontenac Mine and Aduddell Mine," http://www.gilpintram.com/.

Figure 11: View of the east wall of the Frontenac Shaft House during the original survey work. Photo from Pearce 1982.

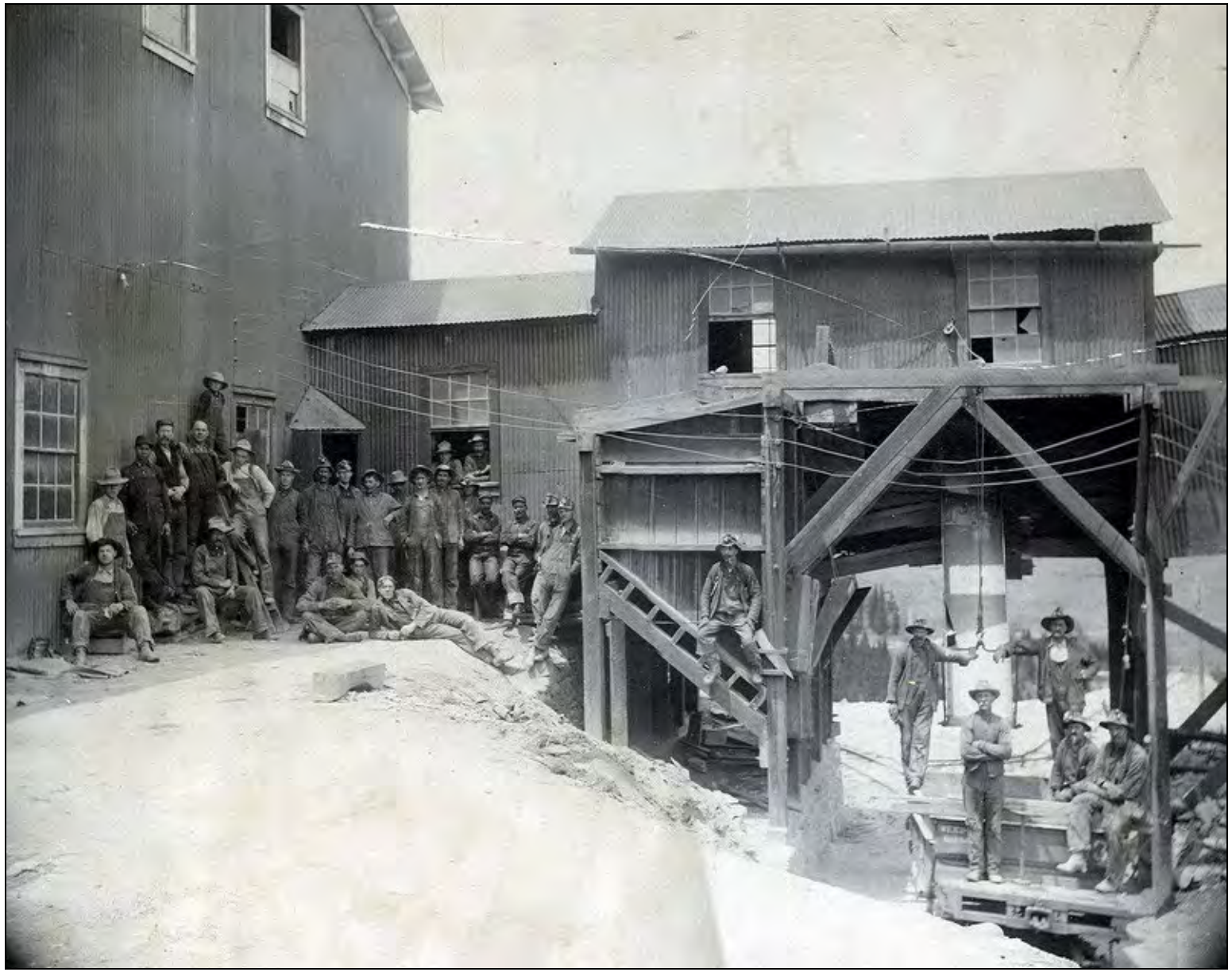


Figure 12: Historical photograph ca. 1910 depicting workers along the south side of the Frontenac Shaft House at the Gilpin Tramway extension. Available from "Frontenac Mine and Aduddell Mine," http://www.gilpintram.com/.