

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 Frisco-Bagley Mill and Tunnel

other names/site number Frisco-Bagley Mining Complex; Bagley Tunnel; Frisco Mill / 5SA.36

## 2. Location

street & number 820 County Road 9

X

not for publication

city or town Silverton

vicinity

state Colorado County San Juan zip code 81433

## 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

Shelley K. Norton  
Signature of certifying official/Title

Deputy State Historic Preservation Officer 11 March 2020  
Date

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

Frisco-Bagley Mill and Tunnel  
Name of Property

San Juan County, Colorado  
County and State

**5. Classification**

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

- private
- public - Local
- public - State
- public - Federal

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

- building(s)
- district
- site
- structure
- object

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

Contributing	Noncontributing	
1	2	buildings
1		sites
1		structures
		objects
3	2	<b>Total</b>

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

Mining Industry of Colorado and Historic Mining Resources of San Juan County, Colorado

**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: Processing site

**Current Functions**  
(Enter categories from instructions.)

Not in use

**7. Description**

**Architectural Classification**  
(Enter categories from instructions.)

Concentration Mill

**Materials**  
(Enter categories from instructions.)

foundation: CONCRETE

walls: WOOD

roof: N/A

other: \_\_\_\_\_

Frisco-Bagley Mill and Tunnel  
Name of Property

San Juan County, Colorado  
County and State

---

### **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 Frisco-Bagley Mill and Tunnel complex is located twelve miles northwest of Silverton, Colorado, and one-half mile up the West Fork of the Animas River in California Gulch at an elevation of 11,400'. The mill, tunnel, and primary mine dump are part of the Gorilla Mining Claim, which is located on the southwest slope of Houghton Mountain. California Mountain and Treasure Mountain are to the south and west. These mountains range in elevation from 12,000' to 13,000'. County Road 9 cuts across the 1,500' x 300' claim, directly below the waste rock dump and the mill. County Road 9 is a roughly 15'-wide gravel road extending west from County Road 2 at Grouse Gulch, approximately 1.25 miles southeast of Animas Forks, to the site of the Gold Prince Mine where it turns north, traveling through Placer Gulch to meet County Road 19 before turning east toward the Frisco-Bagley Mill and Tunnel and Animas Forks. After leaving Animas Forks the road turns south east to return to County Road 2, creating a loop around Treasure Mountain.

The mining site is a popular stopping point for tourists and recreational users of the Alpine Loop Scenic and Historic Byway, a four-wheel drive loop connecting Ouray, Lake City, and Silverton over Engineer and Cinnamon passes. As a result, heavy tourist traffic frequents the site. The site includes a partially collapsed 150-ton reduction mill, a tunnel mine, concrete foundations that once anchored compressors on an approximately two-acre mine dump, and a ca. 1999 cabin with its accompanying modern comfort station. The ruins of a surface plant building associated with the mine are approximately 125' southwest of the tunnel on the adjacent Shamrock Mining Claim.<sup>1</sup>

The mill is in a state of disrepair. Over the years, unknown parties have scavenged the building in order to sell the weathered timbers and lumber. This occurred primarily between the time of a 1976 site inventory record and the 1991 sale to the current owner. Due to this activity and exposure to the harsh high-altitude climate and heavy snow loads, most of the second and third floors and roof of the mill's south section is missing. The metal fixtures and equipment were removed, including the galvanized roofing material, sometime before 1991. The remaining framing, which is substantial, is still in good condition in spite of partial exposure to the elements.

---

### **Narrative Description**

#### **Mill, 1912, contributing building**

The Frisco Mill was designed and built to be completely modern in 1912 with the latest in processing technology, including electrification. Coal was only used in a small heating stove to keep the workers warm in the mill office. Markings on the building's structural timbers indicate the mill was pre-fabricated. The large reduction mill dominates the landscape and is comprised of three gable-roof sections; each lower than the other as it progresses down slope along a northwest-to-southeast axis. The second and third floors of the south section, the largest portion of the building, have largely collapsed. A small portion of the second and third floor framing remains in place at the north end where it meets the south wall of the central gable-roof section. The surviving timber framing documents the height and pitch of the missing roof.

The building is milled post-and-beam construction with the timber joints through-bolted and dapped. All major framing timbers were pre-cut, pre-fit, and number/letter coded using painted ink that is clearly visible today. It is rectangular in shape, 150'-long x 50'-wide and 65' high at the tallest peak. Timber post sizes are 8" x 8" on the upper floors, 10" x 10" and 12" x 12" on the lower floors and rear wall. Footing timbers that sit on top of concrete pillars are 12" x 12". Exterior walls have 3" x 6" vertical and horizontal blocking, which fastens vertical 1" x 12" pine boards on the exterior. The roof is decked with 1" x 12" pine boards and was originally covered with tar paper and corrugated galvanized metal roofing. Lower floor joists are 4" x 10" on 2-foot centers and flooring is double-laid 2" x 10" boards, with some areas single laid. Upper floor joists are 3" x 8" with 2" x 10" floorboards. Beams are mostly 10" x 10" with some 8" x 8". The roof trusses form a 16'-high peak and span 50'. They are constructed of 8" x 8" pine timbers and 1-1/2" metal truss rods. The mill originally featured fifty six-over-six, double-hung wood windows. Thirty-three window openings are intact on the north and central gable-roof sections today. Several window openings retain their wood sills and trim, one wood sash, sans muntins, appears to survive in the gable of the north wall. Three door openings remain intact, one on the north side, one on the

---

<sup>1</sup> The Shamrock Mining Claim is under different ownership and is not included in this nomination.

Frisco-Bagley Mill and Tunnel

Name of Property

San Juan County, Colorado

County and State

west side, and one on the east side. No doors and a small amount of wood door trim survive. The foundation is poured concrete piers, footings, and footing walls; all of which are in excellent condition with no deterioration. Most of the heavy post-and-beam framing is in good condition. Inside the building there is still some evidence of the ore reduction process. Concrete foundations for the primary crusher, the secondary cone crushers, and lift belts are present, as are the collapsed wooden components of Wilfley tables and classifiers. Unfortunately, salvage efforts (dates unknown), and subsequent scavenging have removed all the metal components and equipment from the building.

**Tunnel, 1877-1911, contributing structure**

The Bagley Tunnel portal is approximately 200' northwest from the mill. It enters into solid rock and is sealed by an inset mortared rock wall with locked steel grate, installed sometime before 1997. The tunnel proceeds northwest for 1.5 miles and runs straight through solid rock without a bend or deviation. The bore measures 7' x 7.5' and required no timber framing. Work on the tunnel began in 1877 and reached its final length by 1911. As the miners cut through the various mineral veins, they drove drifts on these veins and brought the ore out for processing.

**Mine Dump, 1877-1914, contributing site**

The mine dump consists of waste rock extracted during tunnel excavation and produced by the mining and milling process. Excavation and milling produced a dump site of approximately two acres on which the balance of the surface plant was built (Figure 2). Waste rock was deposited in three distinct areas. The first area, north of County Road 9 and west of the mill held surface plant buildings and presumably consists largely of material extracted prior to the mill's construction.<sup>2</sup> It is 310' long across its base and approximately 40' tall with a slope of 45 degrees. The west edge extends onto the adjacent Shamrock Mining Claim. A smaller dump sits northeast of the mill, presumably consists primarily of waste material generated by the mill, and extends beyond the boundary of the Gorilla Mining Claim. A third waste rock area to the south is separated from the first by County Road 9 and lies on the Shamrock Mining Claim. It measures 75' feet across its top and drops 95' at a 45-degree slope. Historically, a mine track extended from the mine across a 20-foot-high bridge spanning from the top of the first mine dump section to the third. Remnants of the bridge supports are visible today on either side of County Road 9 and attract many travelers on the Alpine Loop road. This feature, plus the remains of the standing mill, create a spectacular tourist photo spot.

**Cabin and Comfort Station, 1999, non-contributing buildings**

Two small wood-frame buildings, constructed in 1999, are northeast of the tunnel portal. Both have walls of rough-cut pine boards and gabled roofs covered in red Pro Panel metal roofing. The summer cabin is 12' x 20' and has aluminum slider windows. The accompanying comfort station is 8' x 8' and contains a chemical toilet. These two recently constructed buildings are considered non-contributing.

**Alterations**

The Frisco-Bagley Mill and Tunnel complex originally included many buildings in addition to the tunnel and large reduction mill. A surface plant existed at the site before the 1912 construction of the mill and photographs taken in the 1910s and 20s show the complex included a large boarding house, a compressor building, a large tool shed, a blacksmith shed, a mine manager's house, an unidentified log cabin, an unidentified second house, plus several other outbuildings and privies.<sup>3</sup> It is not known when the majority of these buildings were removed from the property. A 1976 site inventory record noted only a prefabricated mill building and a "boarding house."<sup>4</sup>

During the late 1970s a few local people were planning to raze the mill building, presumably to sell the weathered wood and scrap what metal was left in the truss rods and fasteners. The owners at the time stopped this process, but not before extensive damage was done.

<sup>2</sup> Surface and subsurface archaeological deposits of unknown integrity and significance may exist in the mine complex area. Should any ground disturbing work be planned on the property, care should be taken to identify and document any significant historical archaeological deposits that may be affected by the work.

<sup>3</sup> A complete archaeological investigation of the property has not been conducted; however, future investigations may uncover significant archaeological deposits on site.

<sup>4</sup> Steve Baker, Site Inventory Record (5SA.36), 1976. On file with the Office of Archaeology and Historic Preservation, History Colorado.

Frisco-Bagley Mill and Tunnel

Name of Property

San Juan County, Colorado

County and State

Stabilization of the mill building was undertaken in 1990. Wire scaffolding was installed to stabilize the east wall with the wire bolted to the foundation and attached to the mid-section of the wall. By 1997, only the mill and the ruins of a small wood frame "office building," presumably the aforementioned "boarding house," remained (Medville 1997).<sup>5</sup> At some point prior to 1997, a masonry rock wall and steel grate were installed to prevent access to the tunnel.

Considerable damage to the south end of the mill building occurred between 1976 and 1997. According to the owners, the collapsed condition is due to the siding being removed for the weathered wood, not from weather-related causes. In 1999, the small summer cabin and comfort station was built on the slope above the tunnel.

In 2001, the large waste rock piles that surrounded the mill were threatening the building, pushing in on its walls. In response, waste rock was moved away from the west wall of the mill. The building, being relieved of its side load, immediately came back to square on its own. In 2002, the rear covered platform was removed to facilitate moving waste rock away from the north side of the building.<sup>6</sup>

Further stabilization was completed in 2012 by replacing a compromised post, replacing a top sill beam, re-established the bottom cord of a truss and linking it back together and replacing a foundation sill beam that had been compromised. By accomplishing this work the building is now square and straight. This work was funded under a grant furnished by the Colorado Division of Reclamation, Mining and Safety.

### **Integrity**

The Frisco-Bagley Mill and Tunnel complex retains sufficient integrity to meet the registration requirements outlined in the *Historic Mining Resources of San Juan County, Colorado*, Multiple Property Documentation Form (NRIS.64501107). The Bagley Tunnel, Frisco Mill and associated mine dump have not been moved and therefore retain integrity of location. Removal of the surface plant buildings east of the mine and mill has altered their setting; however, the large mine dump remains intact and the landscape immediately surrounding the mill has changed relatively little over time. The larger mountain setting plainly conveys the rugged quality of the site's isolated location. The two modern buildings added in 1999 did not significantly detract from the integrity of setting; both buildings are small, constructed of compatible materials, and located outside the perimeter of the historic complex. Though the majority of the south section of the mill has collapse, there is sufficient integrity of design to convey its floor plan, size, massing, roof form and other characteristics that contribute to its significance. Concrete foundations indicate the location of milling machinery and collapsed components of Wilfley tables and classifiers provide sufficient evidence to discern the milling processes and workflow employed at the mill. A sufficient portion of the mill remains intact to provide an understanding of the materials used to construct the mill. Structural timbers retain the markings that indicate the mill's prefabricated quality and workmanship remains evident in the design of the building's structural framework and the joinery and fasteners employed (Figure 7). The sympathetic material and method used to seal the tunnel portal preserves the portal's size, shape, and the feel of a historic mine. As a whole, the complex continues to convey the feeling of a historic high-elevation mining site within a remote region of the San Juan Mountains and clearly reads as a site associated with the history of the mining industry in the Animas Forks area.

---

<sup>5</sup> The 2005 Colorado State Register of Historic Properties nomination for the Frisco-Bagley Mill and Tunnel (5SA.165) noted a "mine manager's house" in the location of the ruins documented in 1976 as a boarding house. The sketch map included in the nomination erroneously documented the ruins as located within the Gorilla Mining Claim. The ruins are on the adjacent Shamrock Mining Claim.

<sup>6</sup> Drawings were made of this deck before removal.

Frisco-Bagley Mill and Tunnel  
Name of Property

San Juan 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.)

- 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.)

Architecture

Engineering

Industry

**Period of Significance**

1877 – 1914

**Significant Dates**

Tunnel: 1877-1911

Mill: 1912

**Significant Person**

(Complete only if Criterion B is marked above.)

**Cultural Affiliation**

**Architect/Builder**

Unknown

**Period of Significance (justification)**

The period of significance extends from 1877, when work began on what was then known as the Mineral Point Tunnel, to 1914, when significant mining operations on the Gorilla Mining Claim effectively ceased. The period of significance includes completion of the Bagley Tunnel in 1911 and construction of the Frisco Mill in 1912.

Frisco-Bagley Mill and Tunnel  
Name of Property

San Juan County, Colorado  
County and State

**Statement of Significance Summary Paragraph** (Provide a summary paragraph that includes level of significance and applicable criteria.)

The Frisco-Bagley Mill and Tunnel complex is locally significant under Criterion C in the areas of Architecture and Engineering. Constructed in 1912, the Frisco-Bagley Mill is significant as a rare example of a prefabricated early 1900s concentration mill in northern San Juan County. The Frisco-Bagley Mill is also significant in the area of Engineering as an innovative adaptation of the standard concentration mill design that sought to reduce operation costs by placing the majority of the milling equipment on a single level sheltered by a gable-roof superstructure. Concentration mills that retain a significant portion of their superstructure are rare in northern San Juan County and the Frisco-Bagley is the only known example of this design variation.

The Bagley Tunnel is an excellent example of a cross-cut hard-rock tunnel developed in northern San Juan County between 1877 and 1911. The tunnel is notable for its size, symmetry, absolutely straight northwesterly course through Houghton Mountain, and lack of timbering due to the strength of the surrounding rock. The tunnel did not follow a specific vein but rather was driven to cut major mineral veins a perpendicular angle.<sup>7</sup> This allowed all the veins to be worked while providing a haulage tunnel for moving material in and out of the mine. It was a very expensive project, a front-loaded expense with no financial return for the first nine years. Although work on the tunnel began in 1877, the “great bore” began in earnest in 1904 and was planned to extend 2-1/2 to 3 miles. By 1911, it reached its final length of 7,500’. The tunnel may be one of the earliest examples of crosscut tunneling designed to intersect multiple known and unknown veins in northern San Juan County. The period of significance for Engineering extends from 1877, when work on the tunnel began, to 1912, when mill’s construction was complete. The period of significance for Architecture is 1912, the year of the mill’s construction.

The Frisco-Bagley Mill and Tunnel complex is further locally significant under Criterion A in the area of Industry for its association with the development of the mining industry in northern San Juan County between 1877 and 1914. The complex is closely associated with historic trends in the local mining industry associated with the Settlement and Establishment of Industry (1875-1881) and Great Mining Revival (1898-1910) periods documented in the *Historic Mining Resources of San Juan County, Colorado* Multiple Property Documentation Form. The site represents the extent to which early investors speculated in hopes that rich mineral ores could be reached as well as later efforts to revive the local mining industry by utilizing existing technology in new ways to increase efficiency and profits. The property retains sufficient integrity to satisfy the registration requirements for the concentration mill and hard rock tunnel mine property sub-types identified in the *Mining Industry in Colorado* and *Historic Mining Resources of San Juan County* Multiple Property Documentation Forms.

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

**Architecture**

The 150-ton Frisco Mill is significant for its construction method. The mill was pre-fabricated in Silverton and assembled on the Frisco Mines & Tunnel Co.’s Gorilla Mining Claim during the spring and summer of 1912. The mill’s structural components were pre-cut, pre-fit, and number/letter coded before being transported via the Silverton Northern Railroad to the mining town of Animas Forks. From there the components were loaded into wagons and then hauled 1/2 mile to the Gorilla Claim for assembly. All the framing timbers still carry an identifying letter and number location code. Construction crews assembled the pre-cut and pre-fit framing pieces in proper order and sequence based on the location code. None of these pieces had need of cutting on site; the process was similar to a very large jigsaw puzzle.

A search of COMPASS revealed nine recorded concentration mills within the Mineral Point, Poughkeepsie, Animas Forks, and northern Eureka mining districts in northern San Juan County. These are summarized in the following table:

**Table 1: Recorded concentration mills in northern San Juan County**

Site #	Name	Date	Resource Type	Designation
5SA.165	Bagley-Frisco Mill	1912	Building	State Register listed May 18, 2005
5SA.1335	Gold Prince Mill	1906	Site (Ruin)	National Register listed Oct 13, 2011

<sup>7</sup> Eric Twitty, *Historic Mining Resources of San Juan County, Colorado*, Multiple Property Documentation Form, 2010. On file with the National Park Service (NRIS.64501107), E-199.

Frisco-Bagley Mill and Tunnel  
Name of Property

San Juan County, Colorado  
County and State

5SA.37	Sunnyside Extension Mill/Hanson Mill	1889	Site (Ruin)	National Register listed Oct 13, 2011
5SA.349	Sound Democrat Mill	1905	Building	National Register listed Apr 28, 2015
5SA.554	Mastodon Mill		Site (Ruin)	None
5SA.178	Silver Wing Mill		Site (Ruin)	None
5SA.38	San Juan Chief Mill		Site (Ruin)	None
5SA.983	Sunnyside Mill		Site (Ruin)	None
5SA.984	Terry's Mill		Site (Ruin)	None
5SA.982	Sunnyside Midway		Site (Ruin)	None
5SA.153	Columbus Mill		Building	None

Of the recorded mills, only three retain the majority of their superstructure, the Frisco, Columbus and Sound Democrat mills. There is no evidence that either the Sound Democrat or the Columbus mills were pre-fabricated.

**Engineering**

In the area of Engineering, the Frisco Mill represents an innovative adaption of the typical early 1900s mill design. Engineers usually followed a general template when designing concentration mills and a mill's physical form reflected the functions housed within. During the process of concentration (also known as reduction), mineral within the ore was separated from the sand, clay, and rock in order to reduce the amount of material that had to be shipped to a smelter for further refining, thus reducing transportation costs. There were several steps to this process and each step utilized specific types of machinery. Gravity was used to move the ore during processing. Most mills were constructed to stair-step down a mountainside; creating vertical separation between the various processing stages and allowing the ore to move downhill during the concentration process. Most mills featured multiple platforms with a sizable drop between each level. The shed-roof form of the typical concentration mill, such as the Sound Democrat Mill, reflected this internal organization (Figure 6).

The Frisco-Bagley Mill is distinctive for its relatively low vertical fall and atypical, gable-roof form. There are two steps; one of 5' and a second of 15'. This produced a flat-floored mill when compared with other mills. The rationale behind this design was explained in the August 31 issue of the *Silverton Standard*:

A unique and economical feature in the operation of the mill as designed, which in a measure is a departure from the ordinary, will be the placing of all the heavy machinery on one floor in easy view of the foreman and the enabling of the whole mill to be operated with an unusual small force of men.<sup>8</sup>

To continue to harness the power of gravity, the necessary vertical fall was produced by lifting the ore up. There were two vertical lift belts; each contained many small scoops and each belt lifted the ore 40'. The first belt was situated south of the primary crusher and lifted the ore from this crusher up into adjacent bins. These bins gravity-fed the secondary cone crushers located south of the bins. The crushed ore then fell onto a second lift belt to be lifted to the top floor and into settling tanks. Material from the settling tanks was directed onto Wilfley tables on the main floor below where the mineral was captured and the final waste material directed into to the mill's drain system on the lower level (Figure 5).

The mill's design carried forward a tradition of engineering innovation that began when the Bagley Tunnel was envisioned in the mid-1870s by the Mineral Point Tunnel Company. At the time mines in the Mineral Point district had reached a state of diminishing returns and it became apparent that a more cost-effective way to handle the many tons of lower grade ore in the area was needed. In order to reach these vast quantities of ore, Franklin Josiah Pratt and group of wealthy eastern investors envisioned an innovative solution: a cross-cut tunnel that would extend under Houghton Mountain and under Mineral Point, with a proposed exit in Poughkeepsie Gulch near the San Juan Chief Mill.

The tunnel would provide access to the most promising property in the Mineral Point area, the Red Cloud Vein, as well as other potentially profitable veins within the Mineral Point Mining District. Eric Twitty documented the early development of the tunnel, which harnessed the latest in mining technology, in *Historic Mining Resources of San Juan County, Colorado*:

The operation started well, and Pratt took the highly progressive approach of using rock drills to expedite the drilling and blasting process. In 1878, Pratt lured drill expert Whittemore away from the Highland Mary

<sup>8</sup> "The Bagley Tunnel and New Mill at Animas Forks," *Silverton Standard*, August 31, 2912.



Frisco-Bagley Mill and Tunnel

Name of Property

San Juan County, Colorado

County and State

to install a compressed air system at Mineral Point. The system was the second in the county and among the earliest in Colorado. ...rock drills and air compression were new technologies in the late 1870s, and became indispensable for mining around twenty years later.<sup>9</sup>

Pratt's plan was expensive to implement and the Mineral Point Tunnel Company went bankrupt in 1881 without realizing a profit. In 1903, N.R. Bagley and the Frisco Mines & Tunnel Company revived work on the tunnel, eventually reaching the Red Cloud Vein in 1908 and the tunnel reached its final length of 7,500' in 1911. Like many ventures, the tunnel did not live up to its promise, but represents a significant feat of engineering and is notable for both its early date and ambitious plan. Only the Silver Lake Cross Cut, undertaken by one of the area's largest producers, the Shenandoah-Dives company, in 1937 or 1938, appears to have pursued a comparable approach.<sup>10</sup>

### Industry

As a small to mid-size mining venture that began with innovative ideas and high hopes but saw little success despite continuing efforts to adapt in response to changing technology and ore quality, the Frisco-Bagley Mill and Tunnel complex exemplifies the mining industry's highly speculative nature during its early development in northern San Juan County and its subsequent boom and bust cycles. After 1875, the county's mining industry flourished and investors were quick to fund projects that promised great wealth. Franklin Josiah Pratt's innovative plan to tunnel more than three miles straight through Houghton Mountain to reach the difficult-to-access mineral veins within the Mineral Point Mining District may have made sense in theory but proved difficult and expensive to implement. Despite installation of a compressed air drilling system—new technology at the time—and expending hundreds of thousands of dollars, the venture went bankrupt in 1881 before reaching its first vein. Work continued briefly under the ownership of the Silver Peak Mining Company, but ceased again in 1884. The closure was in keeping with general trends in San Juan County's mining industry, which entered a downturn during the mid-1880s. In 1886, production waned as silver and copper prices fell and miners, "exhausted the shallow veins, overestimated their ore reserves, and found that the substantial veins decreased in value and increased in complexity with depth. In short, miners had finished off the easily treated, shallow ore and were left with deeper unprofitable material. ... The net result was that the mine owners and operators in San Juan County saw their profits evaporate and closed many of the remaining operations."

Activities at the tunnel again paralleled local industry trends when N. R. Bagley and Franklin Rockefeller revived Pratt's plans to undercut the mineral reserves within the Mineral Point district. Between 1898 and 1910, San Juan County's mining industry experienced a substantial boom spurred by a variety of factors including improved transportation, advances in mining and milling technology, and increased demand for industrial metals such as copper, lead and zinc as the nation recovered from the economic challenges of the early 1890s.<sup>11</sup> In 1904, the Silverton Northern Railroad reached Animas Forks, drastically reducing transportation costs and making low-grade ores ore economically viable.<sup>12</sup>

Operations at the renamed Bagley Tunnel remained relatively modest, though, in comparison with the larger operations in the area, such as the Gold Prince Mine with its 500-ton capacity steel-frame mill, completed in 1905. An economic downturn in 1907 deeply affected mining operations in San Juan County. The Gold Prince Mill was forced to shut down at the end of 1907 and operated only sporadically until permanently closing in 1910. As a major employer, the Gold Prince operation played a critical role in the economic health of Animas Forks; after its closure the Bagley Tunnel operation helped keep the mining town afloat.

Closure of the Gold Prince Mill may have influenced the decision to construct the Frisco Mill when the Bagley Tunnel finally reached profitable areas of the Red Cloud Vein in 1910. Far more modest in size and efficiently constructed using prefabricated members, the Frisco Mill was designed to operate economically with the latest technology. Unfortunately, the supply of profitable ore from the Red Cloud Vein was limited. As area ventures like the Frisco-Bagley struggled, so did Animas Forks. In 1913, the business district burned and rather than rebuild, most people left. When the Frisco-Bagley closed in 1914, Animas Forks essentially became a ghost town.

---

<sup>9</sup> Twitty, E-51.

<sup>10</sup> Ibid., E-157,

<sup>11</sup> Ibid., E-92.

<sup>12</sup> The Silverton Northern right of way crews graded a branch line up to the Bagley Tunnel sometime after 1907. There is evidence of this grade utilizing two switchbacks however, there has been no evidence found indicating rails were ever laid.

Frisco-Bagley Mill and Tunnel

Name of Property

San Juan County, Colorado

County and State

An industry revival that took place during World War I did not extend to the Animas Forks area, but some small ventures attempted to reopen a few area mines, including the Bagley Tunnel. The effort to open the mine began in 1917, but does not appear to have resulted in any significant production. The statewide collapse of the mining industry after 1921 appears to have ended all activity at the mine and mill. Today Animas Forks is a well-preserved ghost town and the mill a popular tourist destination.

---

**Developmental history/additional historic context information** (if appropriate)

In 1860, the first significant gold rush in southwestern Colorado occurred along the Animas River drainage in San Juan County. The rush was short-lived, but encouraged hardrock prospectors to continue the search for gold and silver. During the early 1870s, Albert W. Burrows and Charles H. McIntyre prospected the area around Mineral Creek in northern San Juan County, establishing a number of mining claims in the Mineral Point Mining District. A mining camp established by Burrows on Mineral Creek officially become known as Mineral Point in 1875. That same year, the community of Animas Forks was established approximately two miles southeast at the confluence of the East and West Forks of the Animas River in the Eureka Mining District.

By the mid-1870s, the mining industry in San Juan County was poised for a boom. Mining historian Eric Twitty described the state of affairs at the time:

Prospectors had proven rich silver ore and regularly made new strikes, the limitless mountains offered plenty of unexplored territory, the Animas River drainage featured several towns, and residents could live on site year round. The only key element missing was outside investment, and developments elsewhere in Colorado siphoned off the attention of capitalists willing to risk money in the frontier.

In 1875, Charles McIntyre organized the Dakota & San Juan Mining Company. Headquartered in Mineral Point, McIntyre's company sought to develop the Red Cloud claim, among others, and build a concentration mill. McIntyre planned a milling facility that would separate as much waste from the valuable mineral as possible, avoiding the cost of transporting waste-laden ore to the smelters for treatment. The prospects at Mineral Point, however, were not producing enough ore to support a mill and McIntyre planned to build his mill in Animas Forks.

McIntyre ran short of funds for his mill in 1877, the year that he sold the Red Cloud claim to Franklin Josiah Pratt, who, with a group of wealthy investors, formed the Mineral Point Tunnel Company. Twitty documented the innovative approach that Pratt envisioned for working the Red Cloud Vein:

Instead of developing the vein from the top down through a shaft, Pratt promoted the idea of undercutting the formation at depth with a long haulage tunnel. Even though the Red Cloud was near Mineral Point, Pratt proposed driving the tunnel northward from California Gulch because this offered the lowest point of entry. The tunnel would have to penetrate around one mile of rock to reach the vein, and Pratt probably forecasted that the tunnel was likely to intersect other ore formations over this distance. If these veins were not claimed, then Pratt and partners could obtain rights, and if they were, then the owners could work them from bottom up through the tunnel and pay a royalty. Such a scheme made the tunnel attractive in theory, and the investors provided Pratt with the funds to start. Pratt then commissioned what was known as both the Bonanza and the Mineral Point tunnel in 1877, and the following year, organized the Mineral Point Tunnel Company. Animas Forks benefited as the nearest commercial and communication center, and Mineral Point, where the target vein was located, received some publicity as well.<sup>13</sup>

Work on the tunnel commenced in 1877, however Pratt greatly underestimated the cost of boring a mile-long tunnel through unbroken rhyolite. In 1879, he sold the Red Cloud claim and adjoining claims in the Mineral Park Mining District to E.B. Greenleaf, possibly to raise additional funds for the tunnel.<sup>14</sup> By 1880, \$300,000 to \$400,000 had been spent, the tunnel had only progressed 1,000' to 1,500', and the venture not yet turned a profit. The Mineral Point Tunnel Company

---

<sup>13</sup> Twitty, E-39.

<sup>14</sup> Ibid., E-52.

Frisco-Bagley Mill and Tunnel

Name of Property

San Juan County, Colorado

County and State

went bankrupt in 1881, and the Silver Peak Mining Company of London bought the property and continued work. The company suffered a similar fate and suspended operations in 1884.<sup>15</sup>

While the costly and ambitious plans of the Mineral Point Tunnel Company stalled, the mining industry in San Juan County generally prospered during the early 1880s, in part due to the completion of the Denver & Rio Grande Extension from Durango to Silverton in 1882 and the opening of the New York & San Juan Smelter in Durango. Easy access to a large smelter encouraged the construction of a number of concentration mills throughout the county.

As the area recovered from the effects of the Silver Crash of 1893, investors gained confidence and sought to revive idle mining operations by harnessing new technologies to improve profitability. By this time, advances in mining technology and engineering had decreased the costs of ore production and milling methods had improved. As of 1900, the county population had reached 2,342, nearly double the population in 1880, and the number of mines nearly tripled since 1890.

In 1903, N. R. Bagley and Franklin Rockefeller (brother of John D. Rockefeller) revived Platt's vision of a crosscut tunnel that could access potential profitable veins within the Mineral Point Mining District. They formed the Frisco Mines and Tunnel Company and by 1905, the company had acquired 140 mineral claims in the Mineral Point district and the Gorilla Claim in the Eureka District. Work on the renamed Bagley Tunnel began anew. It would not be long when the first major vein, the Hadley, would be reached at a distance of 1,600' from the mine's portal. In 1907, the *Silverton Miner* described the workings, "It is the delight and admiration of all tunnel and mining men who have visited it. It is a marvel of perfection, stability, and safety."<sup>16</sup>

The following year, the tunnel reached its target, but the ore from the Red Cloud Vein proved uneconomical at depth. Work paused until 1910, when mine manager Charles Gagner confirm that the Red Cloud's upper reaches held value and miners drove a raise upward on the vein from within the Bagley Tunnel. By 1911, the tunnel reached its final length of 7,500'. The *Silverton Standard* provided a description of the tunnel in August 1912:

The tunnel itself is one of the most perfect mining engineering feats and works ever performed in the San Juan district...it penetrates the center of Houghton Mountain on an even grade and is as straight as an arrow. The whole working system is lighted by [an] electric light system with powerful incandescent lights at frequent and regular intervals and when the mine is in full operation it presents a scene as enchanting as a fairyland picture.<sup>17</sup>

Electric power was often established in these remote mining areas before it was available to the general public. The tunnel and its associated surface plant were completely electrically powered and connected via telephone service to Animas Forks. In 1912, Paul Hansen, a well-respected mill man who had overseen operations at the Gold Prince Mill in Animas Forks before its closure in 1910, was hired to supervise construction of a concentration mill near the Bagley Tunnel.

The *Silverton Standard* reported in April 1912 that framing timbers were being cut and fit at the San Juan Lumber yard in Silverton and in June the timbers were ready to ship.<sup>18</sup> By early August, work on the mill was progressing rapidly; the roof was being installed and much of the mill equipment on site.<sup>19</sup> By the end of the month, the machinery was being installed on newly completed concrete foundations.<sup>20</sup> When completed, the Frisco Mill contained 20,000 square feet of floor space, with the majority of that space located within the mill's large, gable-roof southern section.

Early twentieth-century mills were fairly efficient, recovering about 85 percent of the mineral present in the ore, and utilized a variety of mechanical and chemical processes to produce concentrates. The Frisco Mill was completely electrically powered and designed to maximize efficiency, incorporating the latest in modern technology. Ore cars approached the mill from a mine spur track and stopped on a scale to be weighed. They were then pushed across a bridge onto a covered platform on the north side of the mill. On the other side of a large opening in the mill wall was a small ore bin that fed the primary crusher below. Ore was dumped into the bin and a mill worker fed the crusher. This was

<sup>15</sup> Ibid., E-51.

<sup>16</sup> *Silverton Miner*, 1907.

<sup>17</sup> "The Bagley Tunnel and New Mill at Animas Forks," *Silverton Standard*, August 31, 1912.

<sup>18</sup> "Framing Timbers for the New Bagley Mill." *Silverton Standard*, April 27, 1912; *Silverton Standard*, June 1912.

<sup>19</sup> "New Bagley Mill Rapidly Nearing Its Completion," *Silverton Standard*, August 10, 1912.

<sup>20</sup> "The Bagley Tunnel and New Mill at Animas Forks," *Silverton Standard*, August 31, 1912.

Frisco-Bagley Mill and Tunnel

Name of Property

San Juan County, Colorado

County and State

a rod-type crusher, which looked like a long drum with one end higher than the other. As it turned, heavy alloy rods inside the crusher pulverized the ore. At the low end of the crusher, gravel-sized pieces and powder fell into a hollow in the floor where the first lift belt raised the material 40' and dropped it into large ore bins. The bins gravity fed the ore into the secondary crushers. These consists of two very large and heavy cone crushers on massive concrete foundations. The ore was further reduced to powder in these machines and dropped down into a hollow in the floor where a second lift belt raised the material 40' for further processing. At this point in the process, the equipment was typically more portable and lighter. There were many variations and forms of equipment used in this intermediate process. Unfortunately, there is no evidence indicating exactly what type of intermediary equipment and processes were used at this mill.

The end of the process, however, remains clear. Large settling tanks were installed at the third-floor level. These were funnel-shaped, the smaller being 8' in diameter at the top and the larger 12'. There were historical twelve of these in place and five remain intact. Within the settling tanks, the heavy, dense material was separated from the lighter sands. On the second floor below these tanks, the heavier material from the tanks flowed onto several Wilfley tables. These machines had a very stout base of iron and a mechanism for shaking the tabletop. Its motion was similar to an orbital sander. The top was adjustable with one end higher and one side higher. As the ore moved across the table, the vibrating motion would begin to separate larger bits from the smaller, and the denser (heavier) material from the lighter. The heavier and smaller pieces would "walk" to the high side, the heaviest being highest with the lightest at the bottom. The ore would separate into bands with the help of riffles in the tabletop. Water was added as a wash and to help the separation process. The bands of mineral were then identified by the operator and caught, dried, bagged, and then sent to the smelter.

The Frisco-Bagley Mill and Tunnel complex employed up to thirty-two miners plus eight to ten mill workers. Production records from 1913 and 1914 show 7,166 tons of ore produced from the various veins serviced by the tunnel, yielding 92 ounces of gold; 13,363 ounces of silver, 11,177 pounds of copper; 326,404 pounds of lead; and 119,451 pounds zinc.

When the profitable ore from the Red Cloud Vein was exhausted, the company struggled and suspended mining operations in 1914.<sup>21</sup> An attempt was made to revive the mine again in 1917, but does not appear to have resulted in significant production.<sup>22</sup> Mining operations on the claim apparently ceased for good during the 1920s.

---

<sup>21</sup> Twitty, E, 127.

<sup>22</sup> Ibid., E-141.

Frisco-Bagley Mill and Tunnel  
Name of Property

San Juan County, Colorado  
County and State

**9. Major Bibliographical References**

**Bibliography** (Cite the books, articles, and other sources used in preparing this form.)

Campbell, J.O. *Examination and Report Frisco Tunnel Co.*, 1912.

Campbell, J.O. Personal correspondence to N.R. Bagley, 1908.

Dallas, Sandra. *Colorado Ghost Towns and Mining Camps*. Norman, OK: University of Oklahoma Press, 1985.

Eberhart, Perry. *Guide to Colorado Ghost Towns and Mining Camps*. Denver: Sage Books, 1959.

Fell, James E. and Erick Twitty. *The Mining Industry in Colorado*, Multiple Property Documentation Form, 2008. On file with the National Park Service, NRIS.64501020.

Harlow, Gregg. *Colorado State Register of Historic Properties Nomination Form* for the Frisco-Bagley Mill and Tunnel (5SA.165). On file with the Office of Archaeology and Historic Preservation, History Colorado.

Harlow, Gregg. *Colorado Cultural Resource Survey Form for Bagley Tunnel-Frisco Mill (5SA.36)*, 1992. On file with the Office of Archaeology and Historic Preservation, History Colorado.

Lakes, Arthur. *Profile Map of Engineer Mountain, Mineral Point Mountain, Animas Forks, and Surrounding Region, with General Description of Mines. History and Geology of the San Juan*. Golden: Colorado School of Mines, 1882.

Marshall, John and Zeke Zaroni. *Mining the Hard Rock in the Silverton San Juan's, A Sense of Place, A Sense of Time*. Silverton, CO: Simpler Way Book Company, 1996.

Nossaman, Allen. *Many More Mountains, Volume 1 and 2*. Denver: Sundance Publications, 1989.

Reed, D.R. Personal correspondence to N.R. Bagley, 1906.

Frisco Mines and Tunnel Company, *Some facts concerning Frisco Mines and Tunnel Co., ca. 1915*. Colorado School of Mines, Arthur Lakes Library Mining History Archive.

*Silverton Miner*. Nov. 1907 – June 1908

*Silverton Standard*. Dec. 1903, Aug. 1904, June 1905, April 1911, April 1912, June 1912, Aug. 1912.

Sloan, Robert and Skowronski, Carl. *The Rainbow Route*. Denver: Sundance Publications, 1975.

*Stockholders Report of Frisco Mines & Tunnel Co.* June 9, 1910.

Twitty, Eric. *Historic Mining Resources of San Juan County, Colorado*, Multiple Property Documentation Form, 2010. On file with the National Park Service, NRIS.64501107.

**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:**

- State Historic Preservation Office
- Other State agency
- Federal agency
- Local government
- University
- Other

Name of repository: \_\_\_\_\_

Historic Resources Survey Number (if assigned):

5SA.36

Frisco-Bagley Mill and Tunnel  
Name of Property

San Juan County, Colorado  
County and State

**10. Geographical Data**

**Acreage of Property** 10.3 acres

(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.)

1 13 273000 4201644  
Zone Easting Northing

3 13 273339 4201346  
Zone Easting Northing

2 13 273074 4201694  
Zone Easting Northing

4 13 273260 4201283  
Zone Easting Northing

**Verbal Boundary Description** (Describe the boundaries of the property.)

The boundary comprises 10.33 acres, the full extent of the 1500' x 300' Gorilla Mining Claim as defined in Mineral Survey #17549. The boundary is depicted on the following Boundary Map and more precisely defined as follows: Commencing at United States Location Monument No. 9, extending N 81° 8' E for 2777.25 feet to corner no. 1; then S 538° 2' E for 1500 feet to corner no. 2; then N 51° 58' E for 300 ft. to corner no. 3; then N 38° 2' W for 1500 feet to corner 4; then S 51° 58' W for 300 feet to return to corner no. 1.

**Boundary Justification** (Explain why the boundaries were selected.)

The boundary comprises the full extent of the Gorilla Mining Claim, and includes the Frisco Mill, the portion of the Bagley Tunnel that lies within the claim and the majority of the waste rock piles associated with the mining and milling operations that took place on the claim between 1877 and 1914. A portion of the waste rock piles extend onto adjacent properties under different ownership than the Gorilla Mining Claim and are not included in the nomination boundary. The boundary includes a sufficient portion of the waste rock piles to retain the mill and tunnel's integrity of feeling, setting and association.

**11. Form Prepared By**

name/title Gregg Harlow (property owner)

organization N/A date \_\_\_\_\_

street & number PO Box 884 telephone 970-799-2361

city or town Durango state Co zip code 81302

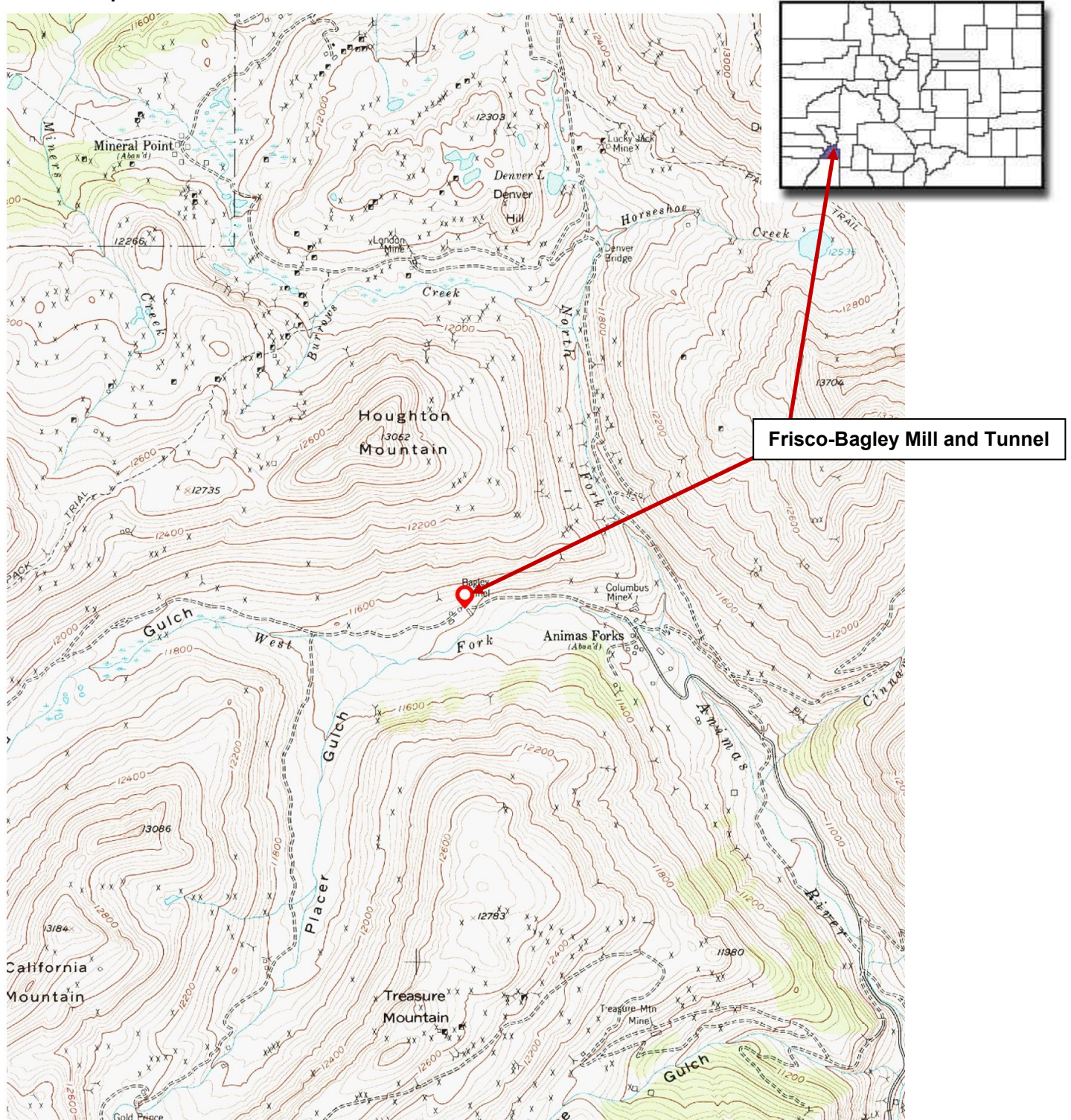
e-mail harlowgjt@hotmail.com

Frisco-Bagley Mill and Tunnel  
Name of Property

San Juan County, Colorado  
County and State

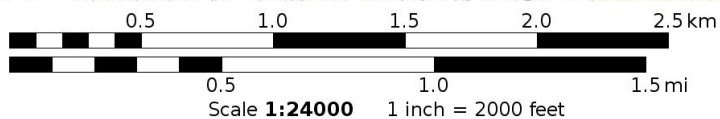
**Additional Documentation**

**Location Map**



**Frisco-Bagley Mill and Tunnel**

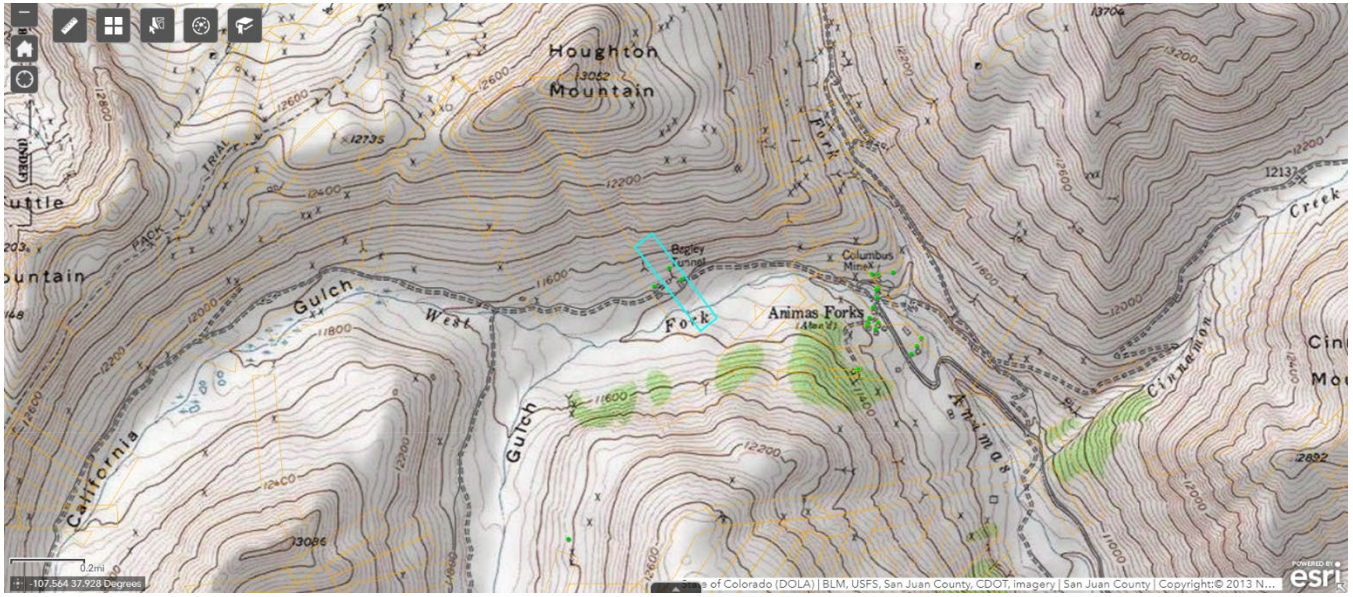
Mercator Projection  
WGS84  
USNG 13SBB-13SBC  
CalTopo



Frisco-Bagley Mill and Tunnel  
Name of Property

San Juan County, Colorado  
County and State

### Boundary Maps

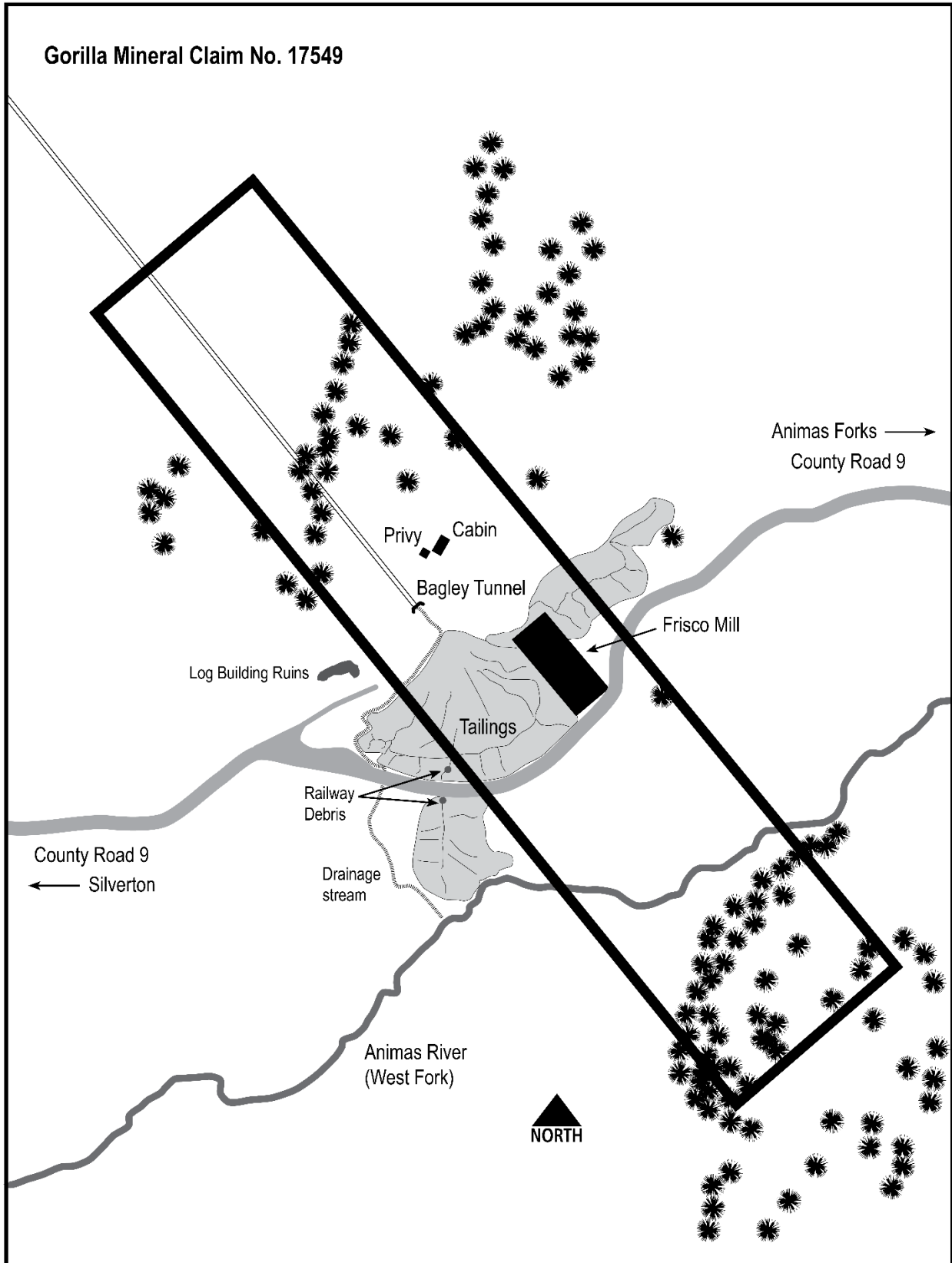




Frisco-Bagley Mill and Tunnel  
Name of Property

San Juan County, Colorado  
County and State

**Sketch Map**



Frisco-Bagley Mill and Tunnel  
Name of Property

San Juan County, Colorado  
County and State

## Historic Figures

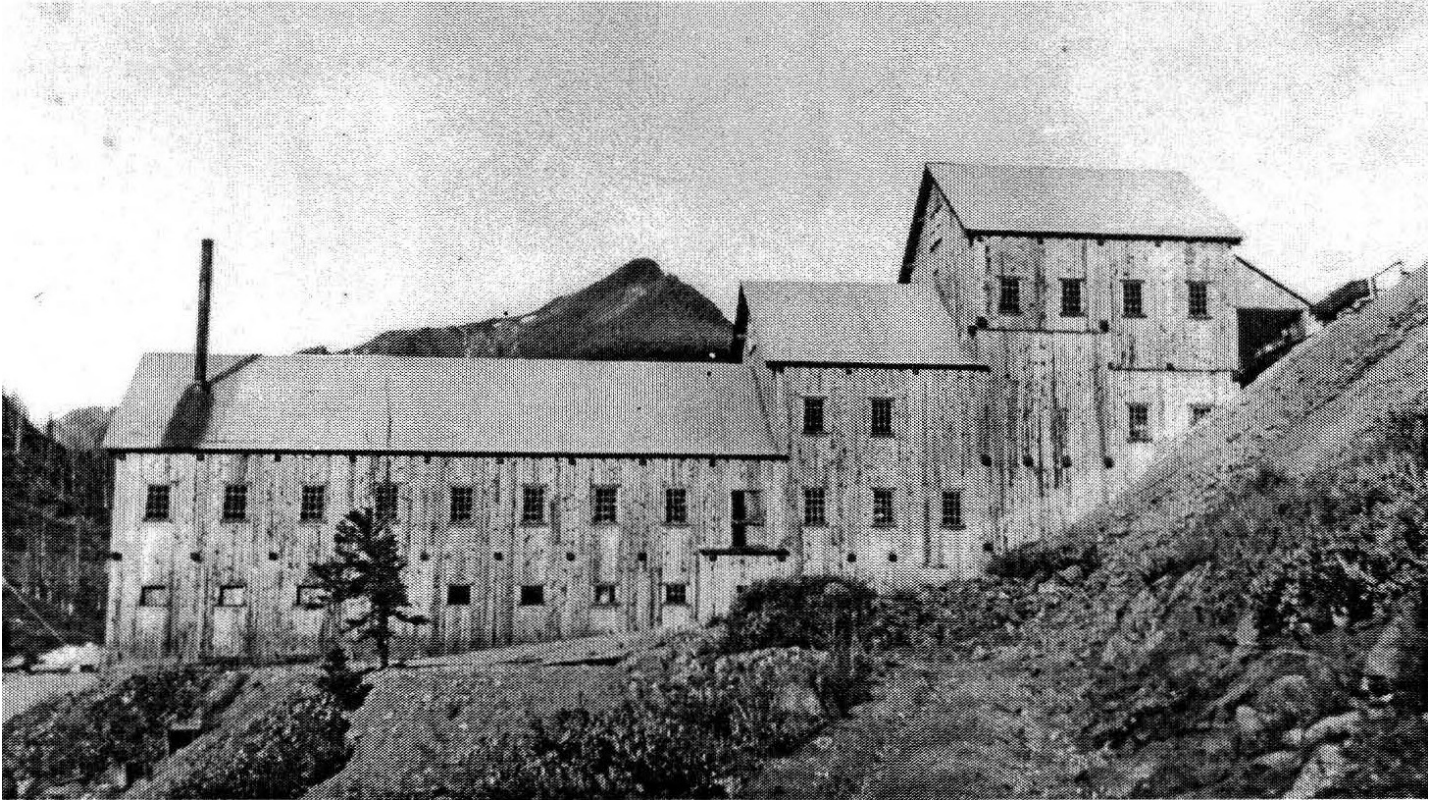


Figure 1: Frisco Mill ca. 1922. (Source: Gregg and Jean Harlow)



Figure 2: Bagley Tunnel Surface Plant ca. 1922. (Source: Gregg and Jean Harlow)

Frisco-Bagley Mill and Tunnel  
Name of Property

San Juan County, Colorado  
County and State



Figure 3: Third floor of the Frisco Mill ca. 1922. (Source: Gregg and Jean Harlow)

Frisco-Bagley Mill and Tunnel  
Name of Property

San Juan County, Colorado  
County and State



**Figure 4: A ca. 1922 photo of the mill illustrates the massive size of the building. (Source: Gregg and Jean Harlow)**

Frisco-Bagley Mill and Tunnel  
Name of Property

San Juan County, Colorado  
County and State

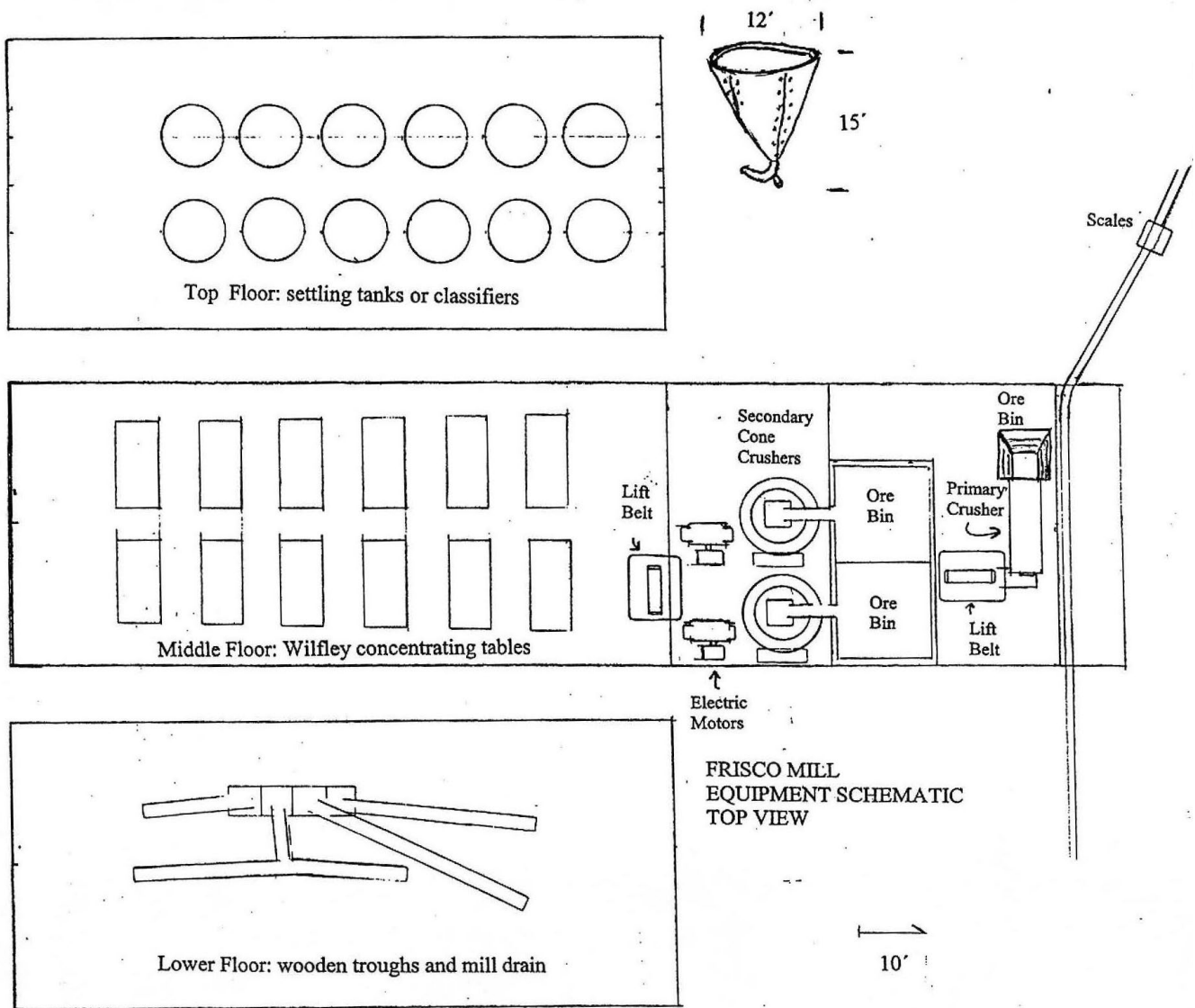


Figure 5: Frisco Mill equipment schematic. (Source: State Register Nomination, Frisco-Bagley Mille and Tunnel)

Frisco-Bagley Mill and Tunnel  
Name of Property

San Juan County, Colorado  
County and State



**Figure 6: The Sound Democrat Mill in northern San Juan County exemplifies the traditional shed-roof mill design typically employed in the 1900s. (Wikimedia Commons)**

Frisco-Bagley Mill and Tunnel  
Name of Property

San Juan County, Colorado  
County and State



**Figure 7: Frisco Mill interior, structural timbers with historic markings. Left photo taken 1997; right photo taken 2011. (Source: 1997 survey form completed by Susan Medville and 2011 survey form completed by James Herron, on file with History Colorado)**

Frisco-Bagley Mill and Tunnel  
Name of Property

San Juan County, Colorado  
County and State

---

**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: Frisco-Bagley Mill and Tunnel

City or Vicinity: Silverton vicinity

County: San Juan State: Colorado

Photographer: Gregg Harlow

Date Photographed: 2019

Description of Photograph(s) and number:

1 of 10: East side of Frisco Mill, camera facing west.

2 of 10: West side of Frisco Mill, camera facing east.

3 of 10: South side of Frisco Mill, camera facing northeast.

4 of 10: North side, Frisco Mill, camera facing southwest.

5 of 10: Bagley Tunnel portal, camera facing north. Waste rock pile in foreground; non-contributing cabin and comfort station upper right.

6 of 10: Bagley Tunnel portal, camera facing north.

7 of 10: Bagley Tunnel portal, camera facing northeast.

8 of 10: Frisco Mill, north section, first-floor interior, camera facing east.

9 of 10: Frisco Mill, middle section, middle floor interior, camera facing west.

10 of 10: Frisco Mill, middle section, middle floor interior, camera facing north.

**Paperwork Reduction Act Statement:** This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C.460 et seq.).

**Estimated Burden Statement:** Public reporting burden for this form is estimated to average 18 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Office of Planning and Performance Management, U.S. Dept. of the Interior, 1849 C. Street, NW, Washington, DC.