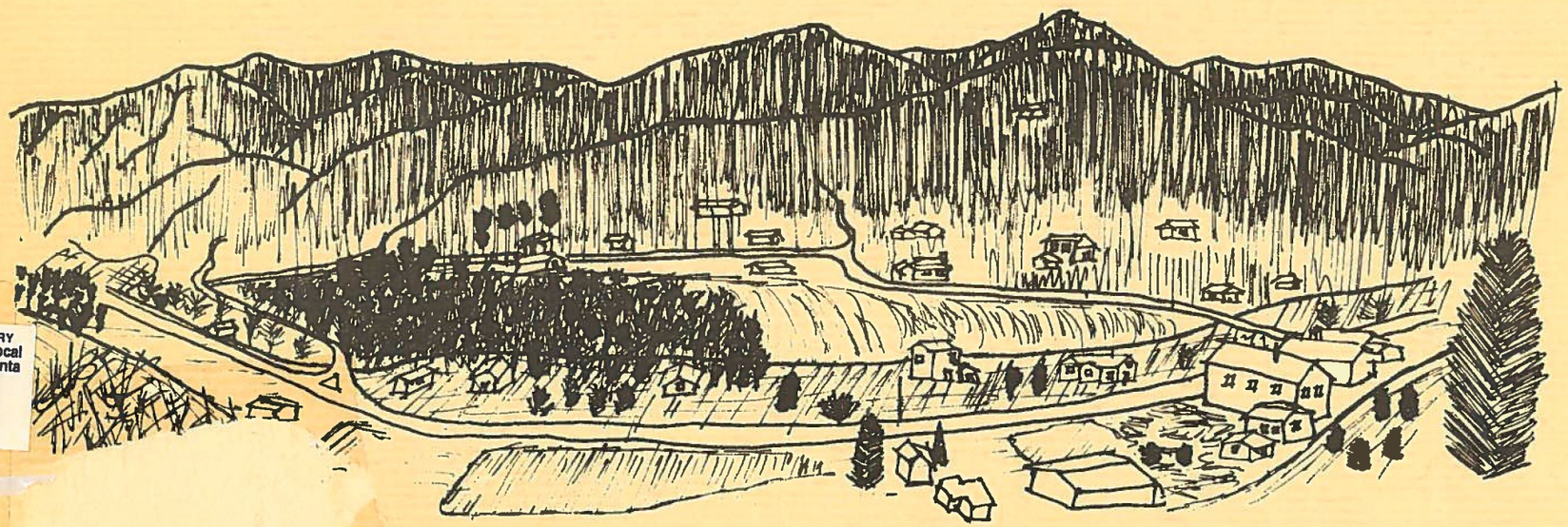
ENVIRONMENTAL REPORT

JAMESTOWN ENVIRONMENTAL ANALYSIS



THE JAMESTOWN ENVIRONMENTAL ANALYSIS:

ENVIRONMENTAL REPORT

(PART II)

BY

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IN COOPERATION WITH :

THE CENTER FOR COMMUNITY DEVELOPMENT AND DESIGN
UNIVERSITY OF COLORADO - DENVER
COLLEGE OF ENVIRONMENTAL DESIGN

AND

THE JAMESTOWN BOARD OF TRUSTEES
JAMESTOWN, COLORADO

ALSO PREPARED FOR PLANNING STUDIO 3 AS AN EXIT REQUIREMENT FOR A MASTERS DEGREE OF URBAN AND REGIONAL PLANNING FROM THE UNIVERSITY OF COLORADO - DENVER, COLLEGE OF ENVIRONMENTAL DESIGN.

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NOTE ON THE MAPS: Town boundaries on all maps are approximate.

ACKNOWLEDGEMENTS

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Special thanks to the citizens of Jamestown who participated in the Jamestown Environmental Study Group.

Sincere appreciation goes to Mark Murphy, Director of Small Town and Rural Planning for the Center for Community Development and Design for extraordinary strength in guidance, support, sanity within insanity and letting his motivation be contagious.

CHAPTER ONE

SETTING THE STAGE

INTRODUCTION

This report represents Part II of a two-part documentation of the Jamestown Environmental Analysis. The environmental inventory and analysis is documented here, while the report on the interactive planning process used in the study is discussed in Part I.

The Jamestown Environmental Analysis was carried out together by a team of citizens from Jamestown, myself as project co-ordinator, and an assistant. We worked through the project together via a series of six meetings in the spring of 1979 where environmental elements of importance to Jamestown were identified, analyzed and mapped (See Figure 1). The citizens' values in terms of the importance of each element in Jamestown were elicited after the analysis phase and a composite map was constructed using an overlay process. This map shows the areas of varying degrees of environmental concern in the Jamestown study area as represented by the collective judgement of the study group.

The information presented in the Jamestown Environmental Analysis (Part II) is representative of data gathering from outside agencies by myself and the study group, information and opinions from the citizens attending meetings and my own general research in environmental analysis and environmental planning. Recommendations in the text will be those felt by the author to be appropriate and those of other outside resource people and agencies as noted. The citizens' views will be discussed in Chapter 9 on Land Suitability.

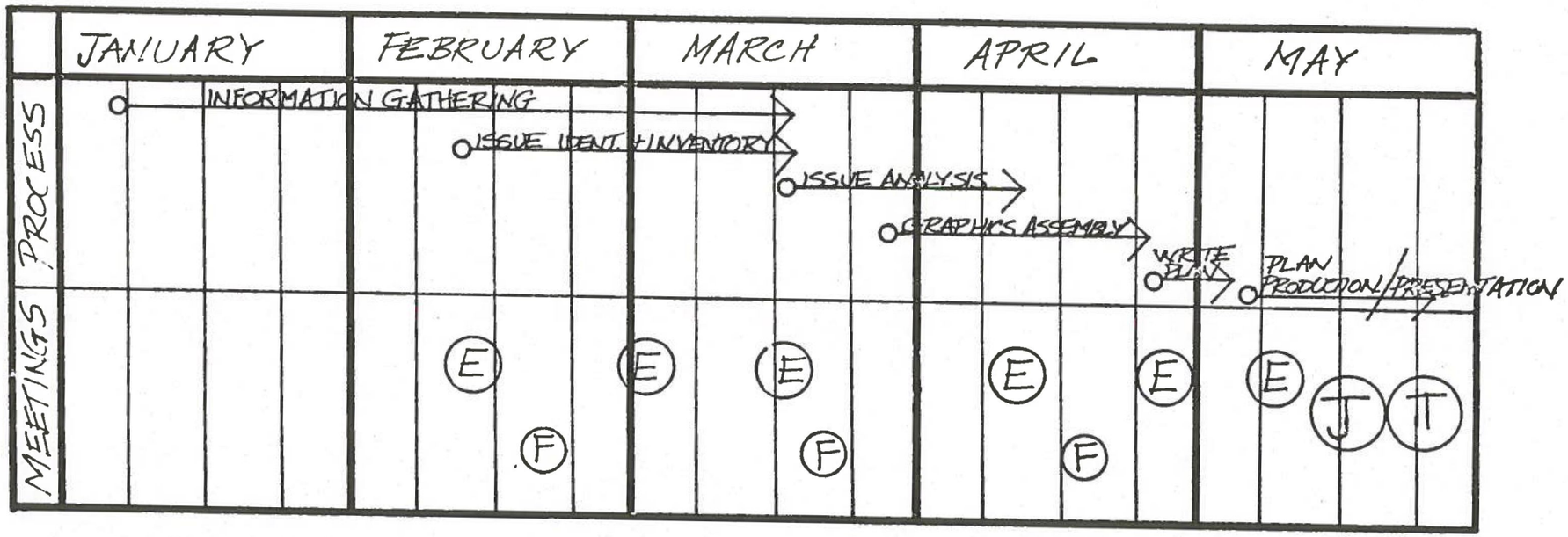
CONCERNS LEADING TO THE STUDY

1. Man is an integral part of nature and his activities must be planned with this reality in mind so that a harmonious

TIME FLOW CHART

JAMESTOWN ENVIRONMENTAL ANALYSIS

SPRING 1979



(E) JAMESTOWN ENVIRONMENTAL STUDY GROUP

(F) FACULTY COMMITTEE

(T) PROJECT PRESENTATION TO JAMESTOWN

(J) PROJECT PRESENTATION TO FACULTY JURY

FIGURE 1

balance is achieved between man's developments and the natural environment's capabilities and constraints.

2. "Tremendous pressures, originating from a variety of sources, are producing through carelessness, lack of planning and lack of awareness, manmade environments and physical changes that are neither sensitive to nor integrated with the delicate character and physical capability of the natural ecosystems that characterize the region." (Colorado and the Rocky Mountain West). [1]

3. Jamestown, Colorado is at a proximity close enough to Boulder and other rapidly growing front range cities that it is susceptible to growth pressures of the nature expressed above.

4. Jamestown's physical environment is extraordinarily beautiful and filled with all the assets of "living in the mountains." On the other side, the Jamestown area contains easily disturbed ecosystems possessing significant hazards and constraints to urban development.

METHODOLOGY AND OBJECTIVES

The method employed was a natural systems inventory analysis. The primary objective in this type of study is the development of a natural features information base which can be used in the planning process to protect the environment from development. Ian McHarg popularized this ecological approach in 1969 in Design With Nature. McHarg describes the purpose of this type of study done for the Twin Cities Metropolitan Area:

> "The purpose was to inventory phenomena and natural processes, to reconstitute these as a value system, and to perceive the degree to which land, air and water processes offer both opportunities and restraints to single and combined prospective land uses." [2]

The Jamestown Environmental Analysis takes the McHargian approach but differs in that a four month time restriction did not lend itself to in-depth analysis of various land uses upon the environment.

The map overlay process, in which McHarg made famous his ecological planning, was utilized to arrive at the composite map. This is a method which involves mapping each important environmental feature or constraint, assigning values to each in relative importance to each other, and finally overlaying them so that areas of varying degrees of severity or suitability are identified for a particular land use.

STUDY LIMITATIONS

Geographic Scope - The analysis was limited, for most of the mapped element, to a study area of approximately 2150 acres with the developed part of Jamestown located just to the southeast of the study area's center point. Mining activities and wildlife habitat were examined in an expanded area of about 4300 acres.

Environmental Elements - It was not considered feasible to enter an in-depth analysis of all the possible environmental phenomena in the Jamestown area. The study's main concerns were identified by the planning group as being the most important elements and most of the analysis was restricted to these.

Purpose of Study Group - The study group was not formulated as a policy making body and there existed no authority to go beyond a recommendation-type of action. Thus, our findings and results (composite map and associated recommendations) are not representative of official Town positions and are suggestive in character.

Status of Local Planning - Jamestown's only official development controls are presently embodied in the building code regula-

tions, no comprehensive planning or other land use controls exist. This produced no centralized location for previous studies or information sources to refer to or develop a frame of reference from. Jurisdictional control in the study area is also somewhat complicated and unclear with Jamestown (an incorporated, home-rule town), Boulder County, and the National Forest Service all involved. Patented and unpatented mining claims, shoddy surveys on these claims and a general lack of knowledge on exact land status complicate the situation. This may be resolved as the Town continues planning efforts in the fall of 1979, partially as a result of this study.

FOOTNOTES

[1] Rocky Mountain Center on Environment, Summary Report - Environmental Study of Proposed Recreation Area Development Alternatives Avon - Beaver Creek, Colorado (Denver, Colorado, 1974), page 1.

[2] Wallace, McHarg, Roberts and Todd, An Ecological Study of the Twin Cities Metropolitan Area (St. Paul: Twin Cities Metropolitan Counceil, 1969), page 1.

CHAPTER TWO

HISTORY

Jamestown, Colorado is a small mountain community in the attractive valley of James Creek, a tributary to Left Hand Creek which empties onto the plains just north of Boulder. Historically a mining town, Jamestown is now a residential community of 200 about 10 miles northwest of Boulder and 12.5 miles east of the Continental Divide.

Jamestown's history revolves around mining, but the original residents were the Southern Arapahoe Indians, led by the famed Chief Niwot. The Indians had several campsites near the present townsite and used James Creek as their trail to higher elevations. The Indians believed that Porphyry Mountain, a picturesque rock outcropping above their campgrounds, and the present townsite, was a sacred site.

Jamestown's past is marked by a series of boom--bust periods associated with mining activities. When the first boom arrived in 1864, "someone had called the stream 'Jim Creek' and the town 'Jimtown'." [1] When the post office was established in 1867, it was granted under the more dignified name of Jamestown. [2] The name of Jimtown has withstood the test of time as the current residents retain the name. This first boom was the result of findings of silver, lead and rich veins of galena in James Creek gulch. More than 500 people flocked to Jimtown as the word got out. The harsh winter climate forced many who had brought few supplies away and a 3 foot snow fall stranded 600 miners for 6 days in May of 1866. In 1870, Jimtown's population was back down to 60 miners and 6 families.

The second boom came in 1871 and lasted 4 years. The discovery of tellurium in the gold ore attracted thousands to the Argo Mine, built in 1872, the same year George Walker, the first of 5 generations of Walkers to reside in Jimtown, came to town. The original Walker home is an historic site still preserved in almost original appearance and condition.

The discovery of gold on Golden Age Hill, just northeast of the mining camp sparked the third boom. In 1878, the Golden Age Mine yielded $40,000 and produced the "richest gold specimens as well as the largest amount of income from any mine in Boulder County."[3] The Bueno, a high producing fluorspar mine, was opened in 1875 by Charles Wright, member of another famous Jimtown family. This boom--bust period was characterized by many "rags to riches" and vice versa stories of the buying and selling of mines in the Jamestown Mineral District.

A period of construction began in about 1880 and lasted for 12 years. The hills above the townsite were denuded to build two hotels, a church, a school, 30 saloons, gambling parlors, dance halls and a community hall. 1882 saw 10,000 people living in the mining camp and in the next year the town was incorporated. One of the hotels was called the Martin House where miners would stay overnight to get an early start on hauling the gold ore down to the plains in horse drawn wagons. Today, the house is lived in by the Goodard family and stands as a significant landmark.

Floods marked the 20 years around the turn of the century, occurring in 1894 and 1913. All homes on the north side of the main street were washed away as was the church (but the church bell was salvaged and remains in the present day church bell tower). Milling of gold ore was a significant activity around town and remnants of the Golden Age and Wano mills can be found around town today. The Jamestown Cemetery, now a Colorado Historical Society landmark, was founded in the 1890's and includes some Civil War military markers. Some of the region's original settlers and residents of Jamestown are buried here.

A not uncommon sight on Main Street in Jimtown around the turn of the century was a team of four to six horses pulling an ore wagon. A young boy of ten or twelve years would race the wagon through town as he stood straddling the horses. This young man was Douglas Fairbanks, who eventually went on to conquer the early motion picture world. His father lived in Jamestown for some years and his grandparents operated one of the first boarding houses in Jamestown.[4]

World War I produced a demand for fluorspar, a valuable element in steel production, and the U.S. War Production Board requested the remodeling of the Wano Mill so that the rich deposits of fluorspar in the area would be mined and processed to help out the country's efforts. This produced yet another boom period revolving around the mining of fluorspar and marked the birth of the Emmit and Burlington mines, which closed after the war and then reopened during World War II.

The Depression years saw some of the present buildings go up, such as the Town Hall and the Community Church. Electricity was brought to the approximately 100 people in Jimtown, with the water system appearing in 1958. In 1969 another serious flood isolated the town. These past 45 years have been somewhat stable post mining times for Jimtown, as compared with the boom and busts which characterized Jimtown's past.

The historical/architectural resources map represents the structures and areas which the Jamestown Environmental study group felt were the most significant. Each resource has been discussed in the above text.

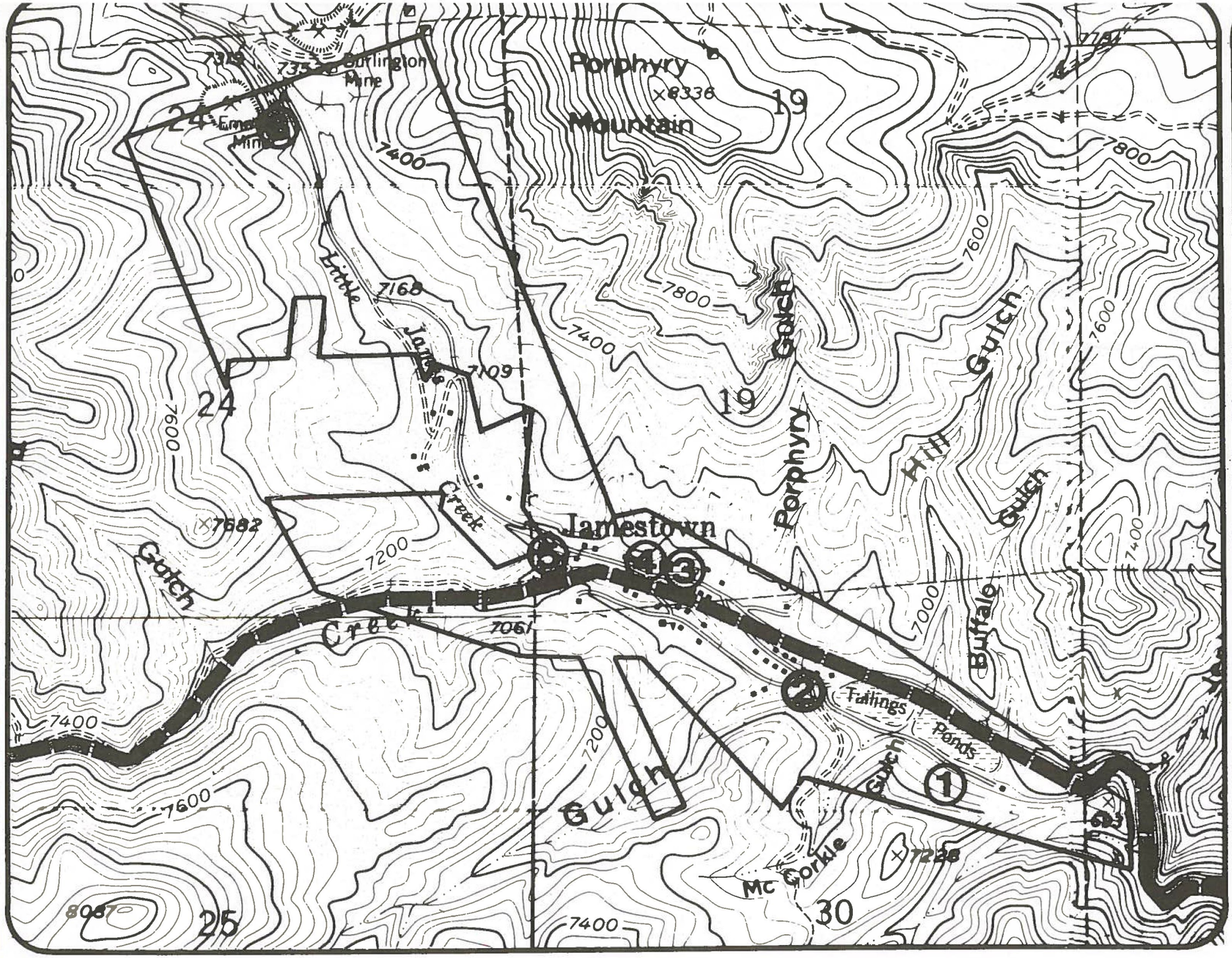
FOOTNOTES

1 An interview with Johnny Knoop, Rocky Mountain News, March 18, 1883, page 7, from: Roberta Winn "Survey and Outdoor Center Use Plan for Balarat Outdoor Center - Jamestown, Colorado," (Denver, Colorado: National Audobon Society, 1969), page A-14.

2 "Place Names in Colorado," Colorado Magazine 18(5): 189-90, September 1941, from Roberta Winn.

3 Jann Gurnsey, Barbara Heston and Jean King, Mountain Memories - A History of Jimtown, Colorado, Boulder Valley Vocational Technical Center, 1976, page 8.

4 Ibid., page 20.



HISTORIC AND ARCHITECTURAL RESOURCES

KEY:

1. Jamestown Cemetery
2. Historic Martin House
3. Historic Walker House
4. Jamestown Church (original bell)
5. Douglas Fairbanks Homesite
6. Emmet Mine

Designated Indian Migration Trail

Sources:

1. Jamestown Env. Study Group
2. Boulder County Comprehensive Plan
3. State Historical Register
4. History of Jamestown

JAMESTOWN ENVIRONMENTAL ANALYSIS

NORTH

SCALE: 500' 0 1000'

CHAPTER THREE

GENERAL ENVIRONMENTAL CHARACTERISTICS

SITUATION

Jamestown is found in north central Colorado near the center of Boulder County in the valley of James Creek. The City of Boulder, with a population of 83,000 is about 10 miles to the southeast while Longmont lies 16 miles to the east. Relief in the study area is about 1720 feet with the elevations ranging from 6760 feet on the far southeast of the study area to 8480 feet on the extreme western border, just east of the Bueno Mountain peak.

CLIMATE

Climate in the Jamestown area is mild in the summer, cold and snowy in the winter with the mean temperature of the warmest month around 71°F (22°C).[1] Rainfall averages about 24 inches[2] annually with precipitation in all seasons. The air in Jamestown is clean, fresh "mountain" air, a pleasure to breathe in contrast to Denver's.

VEGETATION/ECOSYSTEMS

The mountain vegetation contributes greatly to the unique beauty of the Jamestown area. Vegetational patterns are associated with corresponding ecosystems and are determined by a large variety of factors such as altitude, exposure, slope, moisture, wind, geology and soil conditions. An ecosystem includes the "physical and organic components as well as the

energy and materials that flow through the system, and the processes involved." [3] The type, variety and conditions of vegetation of an ecosystem are indicators of the ecosystem's diversity and stability (high diversity reflects stableness and a healthy ecosystem).

The north facing slopes of the study area contain a very dense ecosystem of Ponderosa Pine--Douglas Fir mix. This is a very beautiful but unnaturally thick environment which presents a severe hazard in the event of a wildfire. The south facing slopes are vegetated in a less-dense, more natural density mostly with Ponderosa Pine and Douglas Fir but with the occurrence of Limberpine, Aspen and Lodgepole Pine. The area has been hard hit, especially on the dense north facing slopes, with beetle kill trees and there is a local effort underway to cut down and dispose of these trees.

Another significant ecosystem in the area is the mountain meadow. Some beautiful short grass and low shrub mix meadows are sprinkled around town. Yucca plants, stub-like cacti and mountain wildflowers vegetate these meadows. These are quite fragile ecosystems easily disturbed by man.

Over 4 miles of mountain streams run through the study area producing some pristeen riparian ecosystems along the watercourses. Because of its floral and animal diversity, the riparian ecosystems are relatively stable but require ample water supply for maintenance. Water quality is critical, also. "Improper land clearing, construction and channelization could easily destroy this ecosystem." [4] Moreover, if trees and shrubs are cleared near a stream, the water temperature may rise to a sufficient level to kill trout, a fish dependent upon cold water.

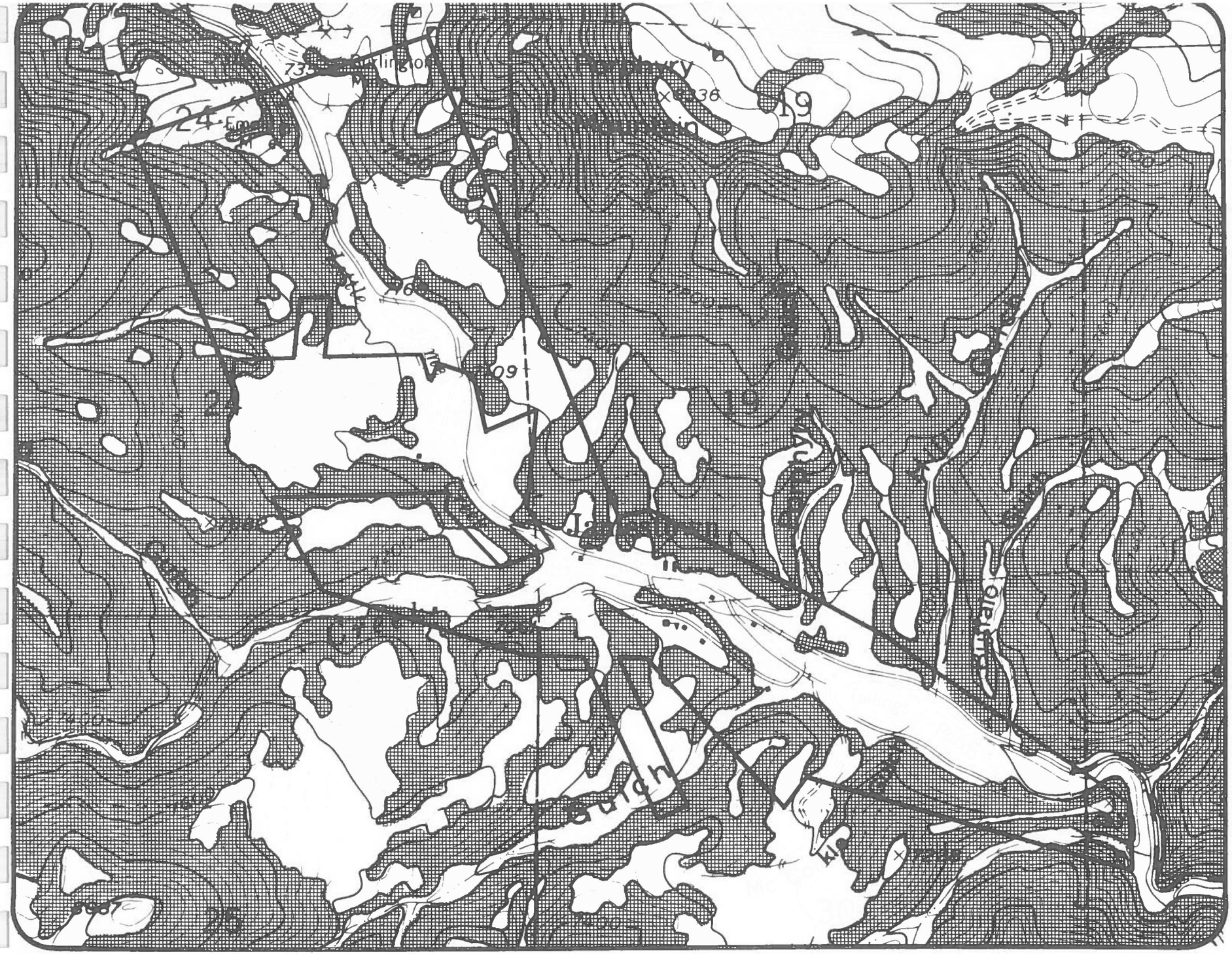
TOPOGRAPHY

The terrain is mountainous with steep slopes. Slopes range from level ground to over 100% with an average of about 30-40%. The slope map shows areas of 30% slope or greater and accurately depicts the steepness of the study area. Narrow gulches drain the study area on both sides of James Creek.

Slopes and their associated soils can produce severe problems for development. Septic system runoff may be very difficult to control, erosion tendency can be increased and slope failure is also a potential negative factor. Provision of water services and other utilities is difficult on steep slopes. Moreover, extensive grading, cutting and filling are common in steep hillside development.

Despite all these constraints, the engineering technology to develop safely (but expensively) on slopes of up to 50% is now available. A tour of the mountainous portion of Boulder County reveals this fact as the assets of tremendous views and privacy, combined with available technology, have begun to overcome the natural environmental constraints.

In Jimtown, one of the largest concerns is the aesthetic deterioration which could result from houses creeping higher and higher up the now unspoiled hillsides. Indeed, steep hillside development is a threat to Jamestown and the study group expressed rather strong feelings that controls need to be developed. Regulation of hillside development by special ordinance or other methods would be advantageous.



SLOPE ANALYSIS

KEY:

Slopes of 30% or Greater

Source: CODD, May 1979

JAMESTOWN ENVIRONMENTAL ANALYSIS

NORTH

SCALE: 500' 0 1000'

VISUAL RESOURCES

The views in the study area are striking, and, in some places, breathtaking. Views of particular importance to residents are those of Porphyry Mountain, the beautiful rock outcropping north of the townsite and the previously mentioned hillsides. One can view the expanse of the plains looking eastward from the Gillespie Gulch area, south of the townsite. Moreover, a particularly beautiful view of Mount Audubon can be seen from the road going to Balarat Outdoor Education Center in the northwest corner of the study area.

Views are so abundant in the Jamestown area that a map would be meaningless. The higher up from the valley floor, the better the view, in general. Despoilation of views can be written into hillside ordinances or reviewed on a building permit or subdivision level. Firm policies on view preservation may be established if the protected views are predesignated to developers.

FOOTNOTES

[1] Thomas C. Gray, Environmental Geology - An Element of the Boulder County Comprehensive Plan (Boulder, Colorado: January, 1978), page 9.

[2] Flood Insurance Study - Town of Jamestown, Colorado, U.S. Department of Housing and Urban Development, Federal Insurance Administration, February, 1978, page 2.

[3] Regional Resource Inventory - Nederland, Colorado (Boulder, Colorado: Synersign, Inc., 1975), pages 1 - 7.

[4] Rocky Mountain Center on Environment, An Environmental Study of Proposed Recreation Area Development Alternatives: Avon - Beaver Creek, Colorado, prepared for Vail Associates, Inc., Denver, Colorado, 1974, page 21.

CHAPTER FOUR

GEOLOGY AND SOILS

GEOLOGY

Surficial deposits of complex igneous-metamorphic rocks, called the basement complex,[1] occur in the study area. Basement rocks are exposures of the kinds of rocks which underlie most continents deep under sedimentary rocks.[2] Geological processes have caused outcroppings of these rocks throughout the Colorado Mountains. Silver Plume Granite, Boulder Creek Granite and other undifferentiated rock bodies make up the igneous (exposed bedrock) rocks on the surface, while quartzites, gneisses and shists represent the metamorphic rocks. These basement complex rocks are over 1.7 billion years old (pre-Cambrian age).[3] The bedrock geology of the area consists of igneous, or intrusive rocks of granites and other undifferentiated rock bodies.

In Tertiary time, these pre-Cambrian rocks were geochemically altered by mineral-bearing fluids and bases which formed the ore veins of the Jamestown Mineral District. Later, a series of small regional faults coinciding with the gulches broke the basement complex rocks. The rich mineralization of the area occurs in these fault areas. These faults are geotechnically inactive and are important in the consideration of groundwater availability and septic drain field functions, as well as the location of valuable minerals.

MINERAL RESOURCES

Jamestown's minerals lie at the north end of the Colorado mountains' mineral belt which is a relatively narrow zone extending for 250 miles northeasterly from the San Juan Mountains to north central Boulder County. The mineral zone is

characterized by bodies of intrusive igneous rocks called porphyries (where Porphyry Mountain received its name) and the associated ore deposits. The same geological processes (faulting, folding and uplifting) which caused the Colorado mineral belt and regional faults in the Jamestown District have created the attractive landscape forms in the study area. Beautiful Porphyry Mountain is an example of granite outcropping into an extremely interesting physical feature of the landscape in the study area. Man's need for the minerals which nature deposited in these beautiful areas causes a natural conflict between their extraction and maintenance of environmental integrity.

Indeed, the Jamestown area is abundant in mineral resources; it is estimated that more than 7 million dollars worth of minerals have been taken from the district. Moreover, Jimtown owes its existence and continued livelihood to the mining industry. On the other hand, Jimtown's environment has not escaped the negative impacts of mineral extraction (as discussed in Chapter 6 under mining impacts).

Gold claims the largest share of the 7 million in production, with about 1 million from lead-silver ores, and about 1.3 million from fluorspar, which has led recent production. Uranium has also been mined in Jimtown and to a much larger degree in the general region of a 2 mile radius from the town. (See Chapter 6 under mine tailings.)

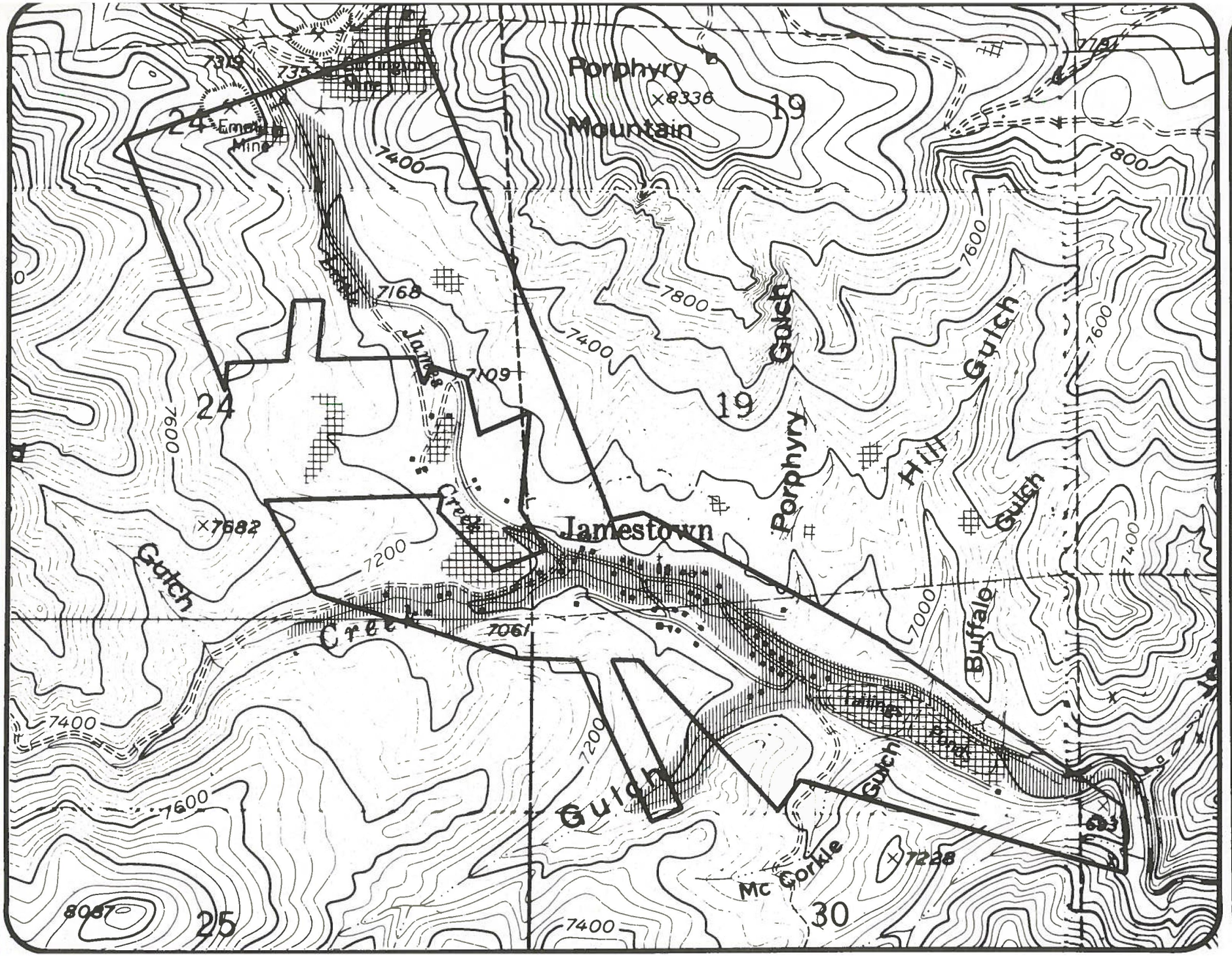
The State of Colorado has made the protection of mineral resources its business in designating these areas to be protected for possible future extraction. House Bill 1041 calls for an inventory and local controls to be drawn to protect areas of state interest (mineral resource areas and geologic hazards are among such areas). Proved, probable and possible reserves which are economically feasible to extract are included. The dynamic economic and technological factors contributing to "economic feasibility" of a mineral's extraction make specific predictions difficult. It is certain that the Jamestown area contains rich mineral deposits and these have been mined or ignored with respect to the state and nation's need for the minerals at that time.

SOILS

The soils of the Allens Park series, formed in the mountains between the elevations of 6300 and 8200 feet, and the Fern Cliff Series on short fans and valley side slopes in the same elevation range, are predominant in the study area. [5] The Allens Park soils, coinciding with the surficial geology, are loamy colluvium and weathered granite residuum. The loamy colluvium is a complex product of downslope movement and intermixing of residual or glacial soils. The weathered granite residuum is a basically non-transported, in-place product of direct weathering of the underlying parent bedrock, [6] consisting mainly of various granite rock types. The latter soils represent good to excellent conditions for building foundations.

The Fern Cliff series is loamy mixed alluvium, a complex product of the intermixing of residual, colluvial, and/or glacial soils as reworked by water and deposited in streams or drainage courses. [7] These soils are synonymous with alluvial (or debris) fans where the gulches drain into the stream flowing through the valley floor. The high permeability (water flows very fast through it) of these soils makes them troublesome for septic systems, especially since these areas are usually adjacent to streams where contamination and pollution can easily occur.

A final type of soil occurring in the study area is artificial fill. These soils are made up of mine tailings and wastes in the Jamestown area and present significant problems for building foundations and septic systems. As these soils are generally uncompacted and loose, significant problems arise in the poor soil stability and high permeability characteristics.



SOIL HAZARD AREAS AND MINE TAILINGS

KEY:

- Generally Stable Bedrock Soils
- Alluvial Soils
- Artificial Fill Soils (Mine Tailings)

Source:
Tom Gray, Boulder County Geologist
May 1979

JAMESTOWN
ENVIRONMENTAL
ANALYSIS

NORTH

SCALE:
500' 0 1000'

FOOTNOTES

[1] Thomas C. Gray, Environmental Geology - An Element of the Boulder County Comprehensive Plan, Boulder, Colorado, 1978, page 18.

[2] Ibid., page 18.

[3] Ibid., page 18.

[4] T.S. Lovering and E.N. Goddard, Geology and Ore Deposits of the Front Range, Colorado (U.S. Geological Survey, Professional Paper 223), page 256. Recent uranium and fluorspar production not included in this figure.

[5] Flood Insurance Study - Town of Jamestown, Colorado, U.S. Department of Housing and Urban Development, Federal Insurance Administration, February, 1978, page 2.

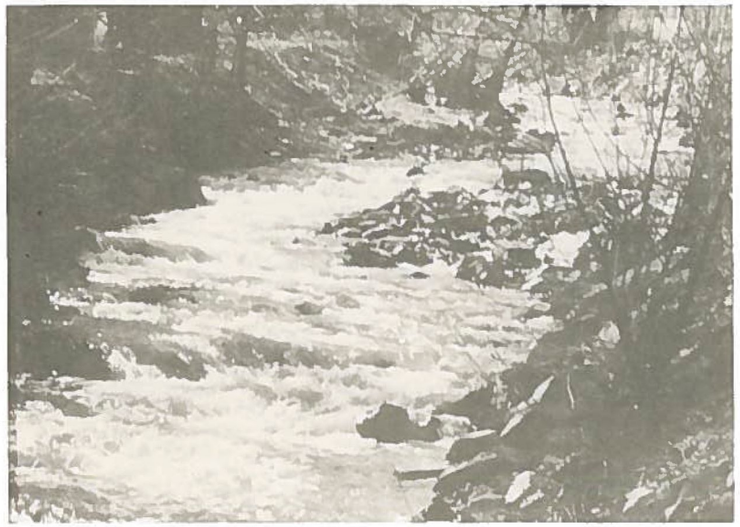
[6] Thomas C. Gray, page 10.

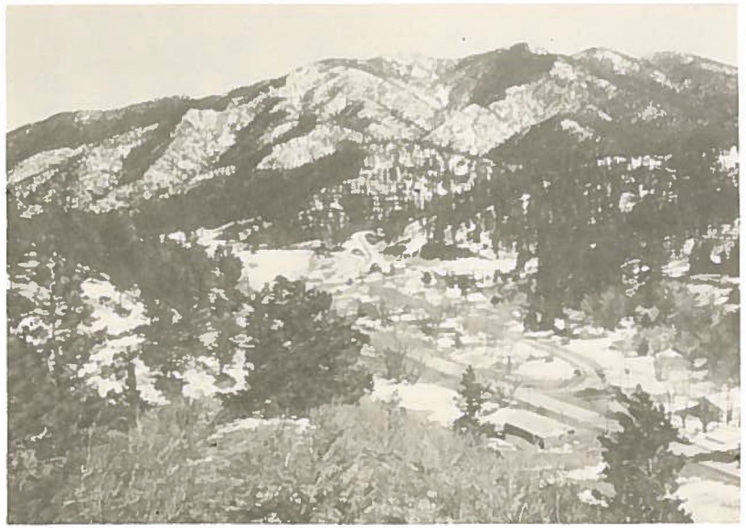
[7] Ibid., page 10.

Left: View looking northeast from town shows the well defined, steep terrain.

Right: The mouth of one of the many narrow gulches which drain the surrounding hillsides into James Creek.

Below: James Creek flowing through Jamestown.





Left: View showing the southeast part of town and the terrain above. This is looking southeast toward Boulder.

Right: Little Jim Creek in early spring before the heavy runoff season.

Above: A view of Mt. Audobon from the road to Balarat Outdoor Education Center.

Below: A fantastic view out to the plains from just above Owens Flats - southwest of town.

Above: Porphyry Mt., a granite rock outcropping viewed from Jamestown. Note the rock-slide below the cliffs.

Below: Formerly the Walker House, this structure is over a century old and is now part of a similarly-designed house.

Above: A plot in Historic Jamestown Cemetery.

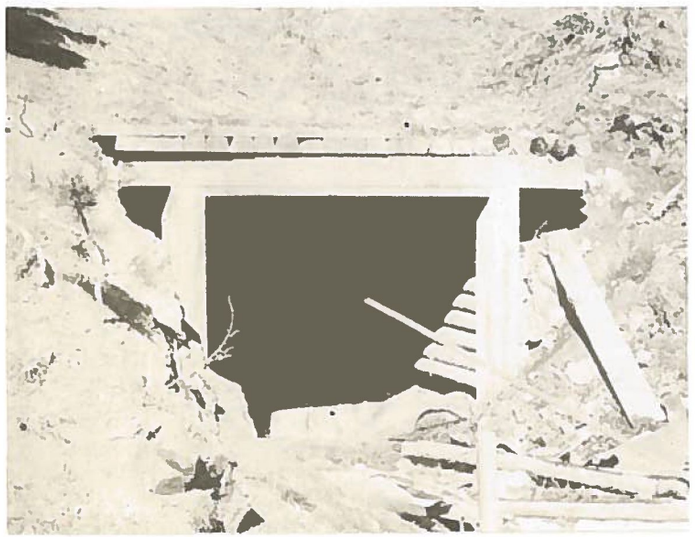
Below: Dade Goodard and companion on the porch of what was formerly the Martin House, a boarding house for gold ore drivers. The house is over 100 years old.

Reminiscent of Jamestown's past is this boarded-up underground mining shaft (above) and the Blue Jay Mine, a past producer of fluorite and uranium (below).

Above: An abandoned tailings pile pollutes surface water near the site of the former Wano Mill.

Below: A response to the above problem - this concrete wall diverts acidic runoff produced by the tailings on the top of the hill away from homes.

Examples of other mining impacts experienced by Jamestown are this snow-covered eroded hillside on the Burlington Mine site and the visual impact upon the landscape by tailings dumps (below). This is north of Porphyry Mt. near Balarat Outdoor Recreation Center.



CHAPTER FIVE

WATER RESOURCES

SURFACE WATER

Little James Creek flows southwesterly and joins James Creek which flows generally to the west, in Jamestown. Together, they represent about 4.4 miles of surface water flow. Little James drains an area of about 3 square miles while James Creek's basin is 14.5 square miles at the downstream limit of the study area. James Creek meets Lefthand Creek approximately 3 miles southeast of town which then forms a confluence with St. Vrain Creek near Longmont. James Creek basin receives about 24 inches of rainfall each year.

Stream slopes in the study area on Little James Creek range from 4 to 9%, while James Creek slopes between 3 and 16%. Stream elevations range from 6760 to 7440 feet, a difference of 680 feet over a distance of 2.84 miles, representing an average stream gradient of approximately 240 feet per mile.

These are typically clean, clear mountain streams of high water quality with the exception of some areas where pollution from mine wastes, non-functioning septic systems or eroded areas occurs. Jimtown has evolved with a dependence upon these creeks as potable water sources. This remains unchanged as today the town relies upon water from James Creek for their water system.

Numerous narrow gulches drain the hillsides from both the north and south sides of James Creek. These are intermittent streams flowing during the spring runoff and during periods of heavy rainfall.

GROUNDWATER

As groundwater availability is highly related to geologic structure, it is not surprising to find Jamestown in an area

of variable-yield fracture acquifers. An acquifer is the bedrock unit that stores groundwater making it available to wells. The major bedrock acquifers consist of large fault zones and can store large quantities of high quality water, [1] although this development requires detailed geological investigation because of possible effects upon existing surface water quantity.

The water bearing properties of the igneous and metamorphic rocks are such that the acquifers are of extremely variable yield. Volume and interconnectedness of the rock fractures are factors which determine their permeability and, thus, water bearing capacity. [2] The less the fracture, the poorer the water source. The variable nature of these water sources makes this a site-specific consideration. Recent studies in other areas of the Colorado mountains, have resulted in high-yield acquifers [3] and nearly dry holes. [4]

FLOODING

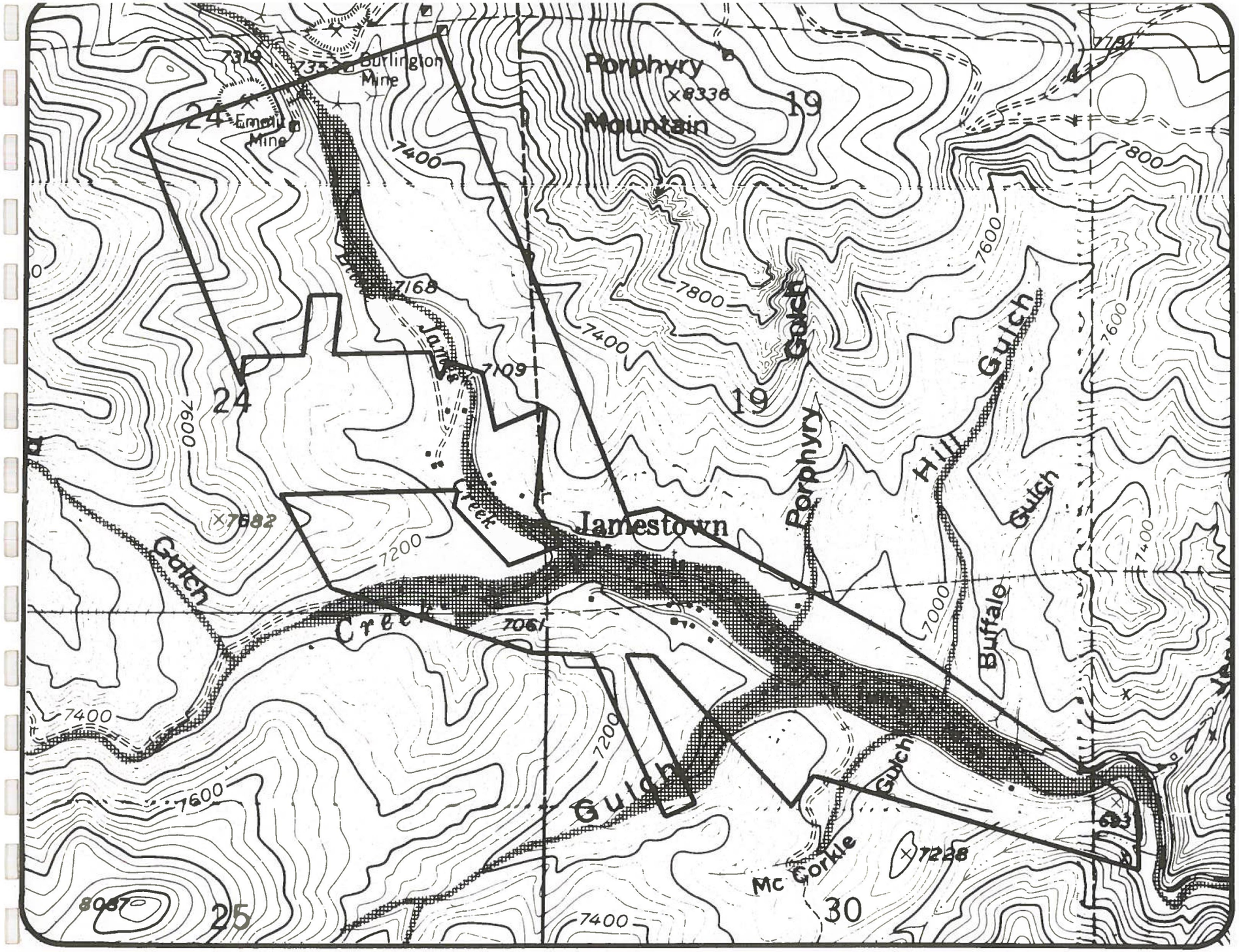
As mentioned in Chapter 2, Jimtown has a history of flooding. Floods usually occur during the period between May and September. The mountain snowmelt in May and June produces significant runoff but heavy flooding occurs at this time of year only when heavy rainfall accompanies this snowmelt. [5] Peak flooding generally is experienced within a few hours after a single rainfall event due to the fast runoff on the surrounding hillsides.

Five major floods have plagued Jimtown in the past century beginning in 1894 when much of the town located in low areas was washed away. Only 19 years later, in 1913, a similar flood hit town and washed out footbridges and wagon roads. It was 2 weeks before the roads re-opened to traffic. [6] A flash flood occurred in 1955, resulting from a cloudburst of only half an hour, depositing several inches of mud in some homes. 1965 and 1969 saw floods hit town again. 3 days of heavy snow and rain caused the serious and most recent 1969 flood.

According to Tom Gray, the Boulder County Geologist, the hazard from flash flooding presents the most serious potential environmental problem in Jimtown. [7] Flash floods, or mountain torrents, occur as a result of large, stationary, hyperactive thunderstorm cells which drop huge amounts of rain in a matter of minutes or hours. [8] Cyclonic storms, on the other hand, usually contain only moderate amounts of rainfall over a relatively large area in a time frame measured in days. Storms of this type determine the area normally referred to as the floodplain (designated for land use planning purposes). A recent Federal Flood Insurance Study for Jamestown was conducted for this purpose and shows the 100-year floodplain (area inundated in a flood likely to occur once in a time span of 100 years). Because of the imminent danger and relative potential severity of a flash flood (similar to the Big Thompson tragedy in 1976) in Jamestown, the flash flood corridors were considered more important to the map.

The map reflects the Boulder County Geologist's feeling and, to a significant extent, Boulder County policy, that habitable structures be located at least 15 vertical feet from the existing flow line of the major creeks. The gulches follow a similar recommendation staying 10 vertical feet above flow line. A horizontal protection area of 100 feet is also recommended, unless structures are footed upon stable, undisturbed bedrock.

Alluvial, or debris, fans are landforms which occur from the deposition of material at the intersection of a tributary valley or gulch, with a larger valley. The force of a flash flood picks up large amounts of stream sediments and debris material consisting of boulders and cobble-sized stones mixed with displaced soil and vegetation. The force of the water deposits them where the stream gradient changes to meet the valley floor. [9] Jamestown contains several significant areas of alluvial fans causing severe problems for building founda-



FLASH FLOOD HAZARD AREAS

KEY:

Flash Flood Hazard Corridors and Associated Alluvial Fans

Source:
Tom Gray, Boulder County Geologist
May 1979

JAMESTOWN ENVIRONMENTAL ANALYSIS

NORTH

SCALE:
500' 0 1000'

tions and septic systems (an identified problem in Jimtown) besides the hazard of building in a flash flood corridor. County recommendations state that "in no case should the footing of a habitable structure be founded on any debris fan in any of the designated drainage courses . . . " [10]

FOOTNOTES

[1] Thomas C. Gray, Environmental Geology - An Element in the Boulder County Comprehensive Plan, Boulder, Colorado, 1978, pages 22, 23.

[2] Regional Resource Inventory - Nederland, Colorado. Prepared for Nederland Planning Commission. Boulder, Colorado, July, 1975

[3] Thomas C. Gray, page 23.

[4] Regional Resource Inventory - Nederland, Colorado, pages 1-22.

[5] Flood Insurance Study: Jamestown, Colorado, U.S. Department of Housing and Urban Development, February, 1978, page 4.

[6] Ibid., page 4.

[7] Personal interview with Tom Gray, Boulder County Geologist, Boulder, Colorado, February 21, 1979.

[8] Thomas C. Gray, pages 50, 51.

[9] W.P. Rogers, et al., Guidelines and Criteria for Identification and Land-Use Controls of Geologic Hazard and Mineral Resource Areas, Colorado Geological Survey, Special Publication no. 6, Denver, Colorado, 1974, pages 26-37.

[10] Thomas C. Gray, page 59.

CHAPTER SIX

GEOLOGIC HAZARDS AND MINING IMPACTS

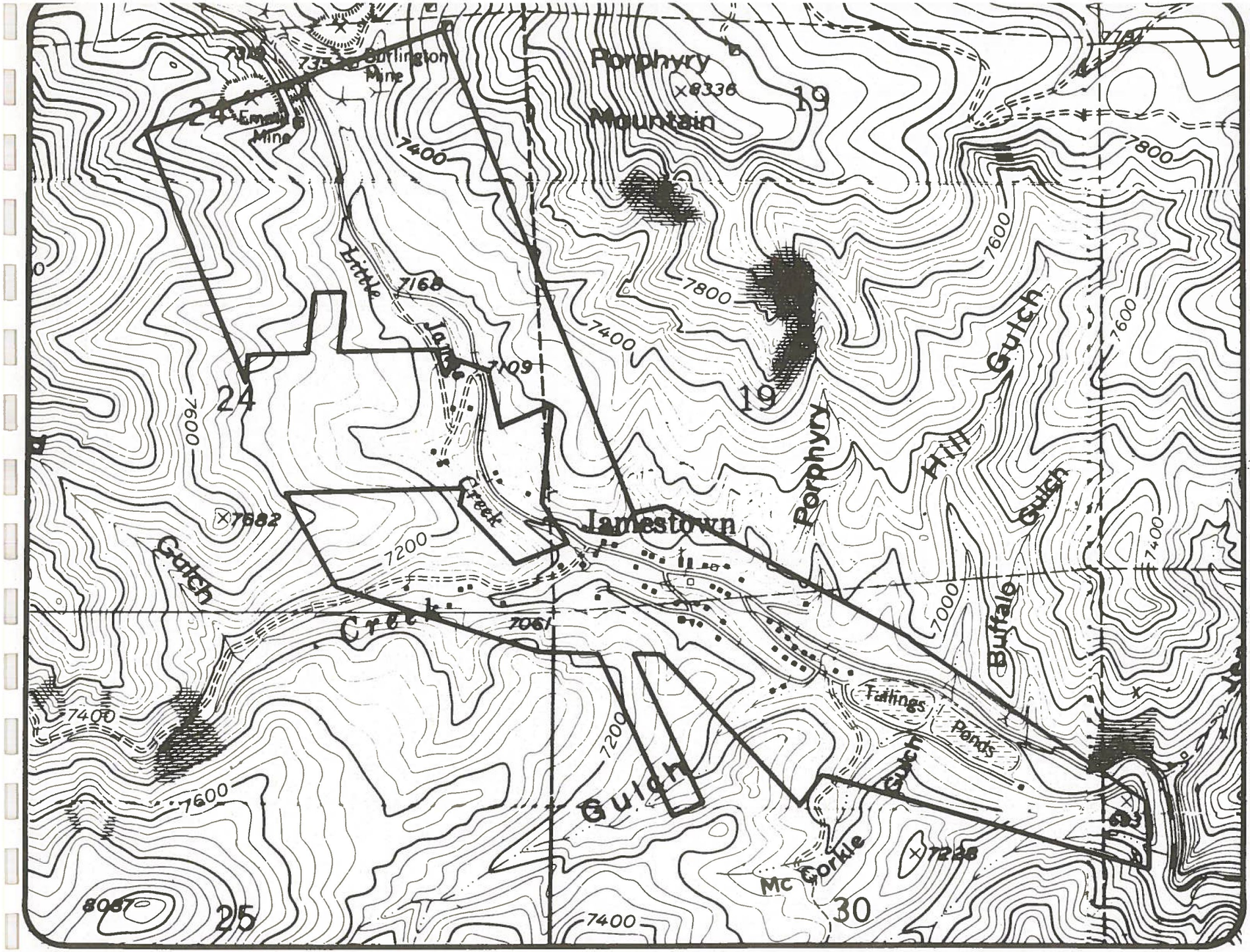
Because of Jamestown's elevation level, the area is generally not subjected to landslide or avalanche hazards, but field studies have revealed indications of rockfall, subsidence, slope failure and some relatively severe impacts from mining. All of these hazards and mining impacts require further study and specific detailing of impacts, on both a study area and site-specific level.

ROCKFALL

Two different types of rockfall occur in the study area, however, rockfall in general is not a severe constraint within the Jamestown area because of the remote or highly unlikely possibility of building in the identified areas. Porphyry Mountain, located high above the townsite, contains some rockslides of highly fissured rock. These rockslides appear to be a natural, reoccurring phenomenon leaving an area of loose-lying, fragmented rock under the cliffs of Porphyry Mountain. The area of rockslide is remote enough so that it doesn't present a hazard to existing or potential structures.

A second type of rockfall occurs on the steep slopes adjacent to the road coming up from the plains. The very southeast part of the study area along the road contains some rockfall which, because of the multiple freeze--thaw cycles occurring in spring, are more active in this time of year. The expansion-reduction of water volumes upon freezing and thawing produce effects upon the rocks enough to initiate their movement. This deposits a relatively small number of rocks near the roads. These rockfalls are also relatively insignificant in their effects upon man, except to an occasional motorist who finds the rocks on the road surface.

Some other areas of 100% slope (or more) present potential rockfall problems and are identified on the rockfall map.



ROCKFALL HAZARD AREAS

KEY:

Areas of Identified Rockfall

source: CCDD, May 1979

JAMESTOWN ENVIRONMENTAL ANALYSIS

NORTH

SCALE: 500' 0 1000'

SLOPE FAILURE

Unstable slopes are common under both natural and modified conditions. Potentially unstable slopes are difficult to recognize areas of complex geologic occurrences, and, unlike on-going processes such as landslide, mudflow and rockfall, is an imminent process. Field studies have revealed at least one area of soil ripples indicating a suspicion of accelerated soil creep, "a normal, slow geologic process acting on nearly all slopes not composed of strong bedrock." [2] It is basically a slow downslope movement of soils and/or weak bedrock in response to gravity. If built upon, slopes of accelerated creep can exert increased pressures on the upslope side of structures and possibly initiate active sliding.

A potentially more significant problem in the study area is slope failure due to man-modified conditions. Due to the extensive mining activity there are many areas where foot slopes have been cut away leaving the slope susceptible to failure. A tension crack found in the soil in one such area indicates an unstable slope. These areas should be re-vegetated so that the slopes can be stabilized and erosion reduced. It is also recommended these unstable slopes be identified and building be avoided in areas of extremely hazardous, localized areas of unstable slopes.

MINING IMPACTS

Mining has taken its toll on the environment in the Jamestown area. The benefits of mining to Jimtown have been stated, but the lack of environmental or land use controls has resulted in significant, and in some cases, severe environmental disturbance. The impacts of subsidence, scarred extraction areas and mine tailings are discussed below.

Subsidence - Ground subsidence in the Jimtown area is caused from the past underground mining. The severity of the problem is uncertain in the study area but is mentioned because of a field sighting of suspected subsidence and the extent to which underground mining has taken place. Extensive removal of minerals by underground mining causes the above support material to weaken and subsequent natural processes (fracturing, chemical changes and caving) often cause surface subsidence, fissures and tilting of the land surface. Areas of potential subsidence are difficult to specify because of such geologic complications, the lack of accurate mine maps and inaccurate surveys. If building is proposed near a mine area, subsidence potential should be investigated because of the possible severe hazard to structures.

Scarred Extraction Areas - There are several large hillside areas in and around Jamestown which have been mined-out and left as de-vegetated scarred areas. Severe erosion has taken place in several of these areas and has resulted in high levels of siltation in the streams during heavy runoff periods.

The most noticeable impact of scarred areas is the visual blight upon the otherwise beautiful landscape. The mining companies did not reclaim their surroundings and have thus destroyed visual resources. Further, these areas present potential slope failure conditions by cutting into and thus, weakening hillsides. Revegetation would not only reduce water pollution by alleviating erosion, but would help stabilize the slopes (roots aid in holding the soil in place) and restore aesthetic conditions.

Mine Tailings - Mine tailings are waste material from mines and mills, and portions of washed ore that are too poor to be treated further. Mine tailings from old operations have been a long-recognized concern in the mountains as they present

numerous environmental problems. Among these problems are sediment and chemical pollution of surface waters, low slope stability, poor soil conditions, aesthetic deterioration and potentially high radioactivity levels. Mine tailings are mapped as artificial fill soils on the soils map in Chapter 4.

When rain falls and snow melts on mine tailings, the runoff picks up the acid nature of the tailings and water pollution results. This problem was severe enough in one area of Jimtown that a concrete wall was constructed in the back of some homes to divert the acid pollution coming from the mine tailings above. Field studies have revealed one other area of serious water pollution from mine tailings near the site of the old Wano Mill. Large tailings dumps also may cause sediment pollution in surface waters because they are so easily washed away by moderate runoff levels.

Radioactivity contamination is, potentially, a significant problem in the study area. Within the general study area there are 4 mines which have produced at least 454 tons of uranium.[3] The Fairday Mine, lying 2 miles west of Jamestown in the northwest quarter of the Jamestown Mineral District, has produced 20,934 tons of uranium prior to 1971. This represents about 95% of Boulder County's production through 1970. Moreover, there are seven mines in the Jamestown area which contain uranium but have not produced any.

The potential for renewed uranium mining exists. The nation's need for uranium to fuel nuclear power plants is resulting in stepped-up research levels to find new methods for uranium mining and potential new sources. In a recent Colorado Geological Survey report concerning radioactivity occurrences in Colorado, they state: "Soda Granite on Porphyry Mountain north of Jamestown is an example of alkaline rocks that are being studied as possible hosts for uranium."[4] In January of 1978, extensive core drilling in the Jamestown Mineral District found some low grade uranium ores intermingled with low grade gold ore. The Boulder County Geologist, Tom Gray, feels that: "If higher firm prices for both gold and uranium might be established, it is possible that the Jamestown ores can be profitably mined with gold and uranium as co-products."[5] Gray also notes the possibility of applications to conduct open-pit mining for near-surface, low-grade uranium ores in the Jamestown District if such areas can be delineated and market conditions were favorable.

Groundwater quality and quantity can easily be disturbed by underground mining and can, in the case of uranium, pollute the water with radioisotopes. The mine tailings around Jamestown have been suspected of higher than normal radioactivity levels, especially in the areas near the 4 uranium producing mines. While it is possible that most of the waste and scarred areas will not present significant radioactivity problems, a recent radiometric survey in 3 mine tailings areas has produced an identified radioactive "hot spot" near the opening of an underground shaft. The mine is a past producer of uranium and had a reading of 800 microrims per hour (mr/hr) compared to a normal background reading for the general area of 25 mr/hr. A reading of 400 mr/hr was registered on a nearby tailings dump with an average reading of 100 mr/hr in the area of that mine.[6] It is recommended by the Boulder County Geologist that a complete radiometric survey of the Jamestown area be conducted. Some people representing the Environmental Protection Agency (EPA) who were part of the field study team, will reportedly recommend that:[7]

1) When a septic system permit is requested from the Boulder County Health Department (they have jurisdiction in both incorporated and unincorporated areas in the County) a radiometric reading be taken. Any reading over 50 mr/hr will warrant further investigation to alleviate the problem. The Boulder County building code may be similarly revised to include such regulations.

2) Because the most substantial threat to humans comes from

the radon gas which is formed and released as the uranium wastes slowly break down, a measuring device for radon gas should be installed in the basements of homes in the town. If this radon gas leaks into a house, usually into the basement, and remains for long periods of time (such as the winter season when the house is not ventilated) exposure may occur at harmful levels.

Another hazard which has occurred in Jimtown is produced when winds pick up the loose tailings and transport them into the air currents, causing possible inhalation of the contaminated particles. Moreover, risk of exposure to children playing in or near the "hot-spot" area(s) exists. It would be beneficial to the general health and welfare of Jamestown's residents to take action toward the alleviation and/or removal of any harmful tailings.

Regulations and controls for renewed mining activity of any kind, as desired by the citizens of the town, would also be advantageous. Because the potential for more mining in and around town exists, Jamestown could take an offensive position letting the mining companies know what will be expected of them before, during and after extraction. Strict controls over the disposal of wastes and reclamation procedures would aid in avoiding some of the environmental problems produced by past mining.

FOOTNOTES

1 Field studies by Peter Patten in Spring 1979.

2 Rogers, W.P., et al., Guidelines and Criteria for Identification and Land-Use Controls of Geologic Hazard and Mineral Resource Areas, Colorado Geological Survey, Special Publication No. 6, Denver, Colorado, 1974.

3 James L. Nelson-Moore, Donna Bishop Collins and A.L. Hornbaker, Radioactive Mineral Occurrences of Colorado (Denver Colorado: Colorado Geologic Survey, Bulletin 40, 1978).

4 Ibid., page 80.

5 Thomas C. Gray, Environmental Geology - An Element in the Boulder County Comprehensive Plan, Boulder, Colorado, 1978, page 26.

6 Personal communications with Thomas Gray, Boulder County Geologist, May 9, 1979.

7 Ibid.

CHAPTER SEVEN

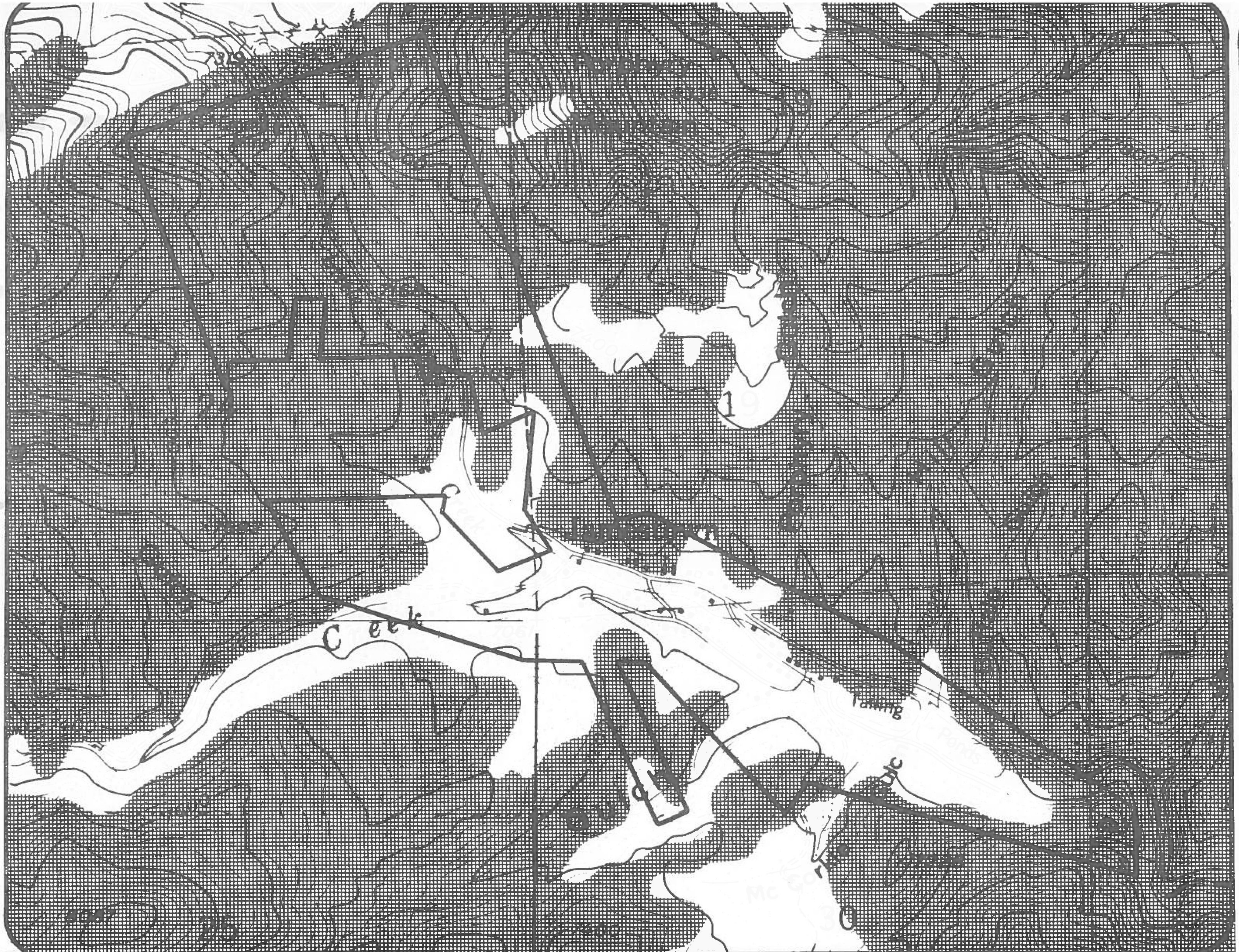
WILDFIRE HAZARD

Identification and mapping of wildfire hazard areas for Boulder County is a function of four criteria: slope percentage, aspect (direction which slope faces) crown density of trees, and vegetation type. Each of these is mapped according to specific categories or criteria within each topic and the maps are then overlayed for designation of wildfire hazard areas. This procedure is recommended by the Colorado State Forest Service.

When a slope is greater than 30%, the steepness actually generates wind during a wildfire so that a wildfire on a slope of this steepness spreads twice as fast as on level ground. Problems in aspect include the south-facing slopes containing vegetation which is drier and spaced further apart attract lightening bolts. These south slopes are usually the most desirable for building because of sun exposure. A dense crown cover in conifer trees spreads fire rapidly. The areas where the forest is thick is also where tourists tend to congregate, furthering the chance of a ground fire being started. Vegetation mapping generally identifies where potential problem areas may exist.

Jamestown and the surrounding vicinity fall into a severe wildfire hazard area, according to the above criteria as mapped by the county (See Wildfire Hazard Map). Severe areas possess potential for difficult to contain, rapidly spreading crown fires which can spread several hundred acres per hour. All living things within control lines will probably be destroyed and control of these fires is generally restricted to areas close to settlements due to the access problems on 30% slopes. Jimtown's situation is worsened due to the presence of extensive beetle kill areas, both those affected trees standing and those cut down but not removed.

If development is allowed to occur without regard for the wildfire, the potential hazard and consequently, the hazard rating increases due to the way population density increases the hazard rating. Boulder County recommends wildfire hazard on both the building permit and, the subdivision and/or special use review processes. [2]



WILDFIRE HAZARD AREAS

KEY

Severe Wildfire Hazard

Source:
Boulder County Planning Dept.
May, 1971

JAMESTOWN
ENVIRONMENTAL
ANALYSIS

NORTH

SCALE:
500' 0 1000'

Measures which could be taken on a large scale include:

1) Avoid building in the dense Ponderosa Pine--Douglas Fir mix areas.

2) Construct fire breaks on the western side of town (most likely direction for a major fire to come from) by extending existing meadow areas around the perimeter of town.

3) Conduct public education programs on wildfire potential, causes, danger and prevention.

4) Initiate town efforts to clean-up and dispose of the ground fuels (branches, litter, beetle kill trees, etc.) which worsen fires by allowing flames to reach tree crown levels where control is difficult.

Preventative measures which could be taken on a smaller scale include:

1) Place firewood and other potential fuel sources away from a structure's foundation.

2) Utilize materials and euqipment on houses such as low flammability roofing material and chimney spark arresters.

3) Keep tree branches away from chimneys.

4) Use extreme care when disposing of fireplace ashes.

FOOTNOTES

[1] Boulder County Land Use Department, Environmental Resources - An Element of the Boulder County Comrehensive Plan, Boulder Colorado, January 1978, page 54.

[2] Ibid., page 60.

CHAPTER EIGHT

WILDLIFE

The Jimtown area contains abundant wildlife. Wildlife is directly related to quality and quantity of habitat, which is again related to natural phenomena and man's intrusion. The most significant intrusion of man upon wildlife habitat in the study area has been the result of mining activities. But conflicts between man's activities and the wildlife are not abundant today in Jamestown.

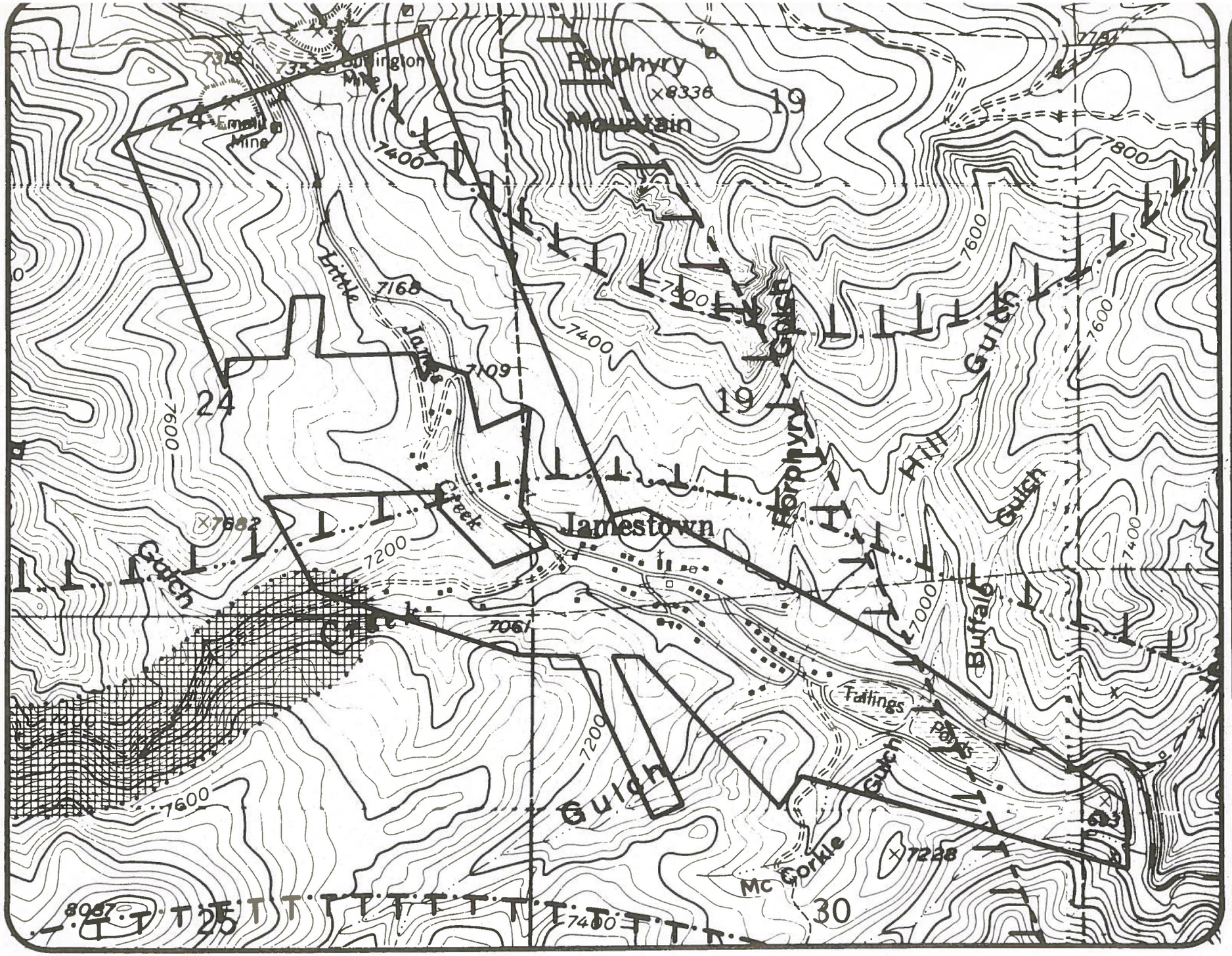
Wildlife was inventoried in three different ways in the analysis. The principal source was members of the study group offering their own sightings and experiences of wildlife in the area, while field studies and the Colorado Division of Wildlife also made contributions. Information from each of these was generally consistent so that a reliable inventory of animals frequenting the study area in general was constructed. Habitat and distribution areas as inventoried by the Colorado Division of Wildlife (DOW) are mapped. The corresponding data for the map and other major species as identified by DOW are found in Figure 2.

BIRDS

The exact number of bird species in the study area is not known. Game birds such as turkey and blue grouse are found in the study area. Golden Eagles have been observed in the study area as well as the more common robins, sparrows, chickadees, blue jays and so on.

LARGE MAMMALS

Both elk and deer have important winter range habitat in the study area. This is very significant because of the recent



SELECTED WILDLIFE HABITAT

KEY:

- Golden Eagle (107)
- Elk (205)(204)
- Beaver (900)
- Turkey (300)

* numbers in parentheses refer to area numbers on following chart

Source: Colo. Division of Wildlife

JAMESTOWN ENVIRONMENTAL ANALYSIS

NORTH

SCALE: 500' 0

SPECIE	AREA NO.	TYPE OF AREA	SQ. MI. IN AREA	POP. IN AREA	POP. [1] STATUS	BIO [2] STATUS	TOTAL [3]
ELK	203	CRITICAL WINTER RANGE	1.2	35	3	4	7
ELK	204	CRITICAL WINTER RANGE	5.5	40	3	4	7
MULE DEER	201	WINTER RANGE	181	1500	3	4	7
MOUNTAIN LION	—	OVERALL DISTRI-BUTION	460	14	—	—	—
BLACK BEAR	JAMESTOWN	SIGHTINGS	1. 1.3 NW OF TOWN ON JIM CREEK 2. GILLESPIE GULCH SO. OF TOWN 3. NEAR OLD BLUE JAY MINE				—
ABERT'S SQUIRREL	—	OVERALL DISTRI-BUTION	238	7616	3	0	3
BEAVER	900	OVERALL DISTRI-BUTION	2.3	12	3	0	3
GOLDEN EAGLE	107	OBSERVA-TION AREA	6	2	3	2	5
TURKEY	300	OVERALL DISTRI-BUTION	20	50	3	0	3

1 - POPULATION STATIS is a ranking from 3 to 5 on the following basis:

5 - endangered
4 - threatened to become endangered
3 - common to see species

2 - BIOLOGICAL STATUS is a Department of Wildlife judgement on the biological importance of the area to continuing the species, 1 being the least important and 5 being the most important.

3 - TOTAL adds up population and biological status. Any total of 6 or more indicates an important habitat area to protect.

FIGURE 2. SELECTED WILDLIFE HABITAT (JAMESTOWN AREA)

history of large scale destruction of these critical areas in the Colorado mountains. Many places have ignored the importance of these areas and have allowed subdivisions and other destructive land uses resulting in substantial reductions in both elk and deer populations. Many sightings by residents and during field studies verify the abundance of elk and deer in the Jamestown area.

Several sighting of both Black Bear and Mountain Lion have been made by Jamestown residents, as well as DOW personnel.

SMALL MAMMALS

DOW has noted significant beaver habitat in the riparian ecosystem of James Creek, within the study area. Abert's squirrel occurs in an overall distribution in the area with a density (32/sq.mi) many times that of the state's average. Some of the other small mammal residents of Jamestown are raccoons, skunks, fox, lynx, and marmots.

FISH

James Creek is fished for trout and has had, reportedly, quite a history of successful production. The Creek is more productive to the east of town where flow levels are greater, but residents report it is not difficult to catch rainbow trout from the bridges in town.

Open space planning can maintain winter range habitat for deer and elk and preserve migration routes between habitat areas. Protection of riparian ecosystems, as stated in Chapter 3, is important because of their abundant breeding and nesting areas. Greenbelt systems along streams and strict controls on water pollution sources, construction impacts and water levels are useful in riparian ecosystem protection.

Finally, people should be aware of the presence of Black Bear and Mountain Lion and know what to do in case of confrontation.

CHAPTER NINE

LAND SUITABILITY: COMPOSITE MAP

After the analysis of the important environmental opportunities and constraints had been accomplished, the suitability of the land in general for the planning area was constructed. Suitability, it is important to note, is a value judgement.

One of the value judgements decides the land use priorities: what types of land use should be planned for? In Jamestown, the predominant land use is now, and will undoubtedly continue to be, residential development. This is due to many factors beyond the scope of this report.

Any policy document, such as a comprehensive plan, makes value and priority judgements to place emphasis upon attracting the desired changes while reducing the unwanted ones. Similarly, an environmental assessment must utilize value judgements toward the relative importance or severity of environmental phenomena. For this study, it is only proper that the citizens of Jamestown make these value judgements which affect their own environment.

Before the value judgements were made, it was necessary to look at the general environmental impacts of developing in the various constraint areas. This was accomplished by the group examining and revising an environmental impact "matrix" chart constructed by me. Another part of the value judgement exercise (See Part I of the Jamestown Environmental Analysis: An Interactive Approach to Planning, in Chapter 4, 5th Meeting) was to briefly review all the collected information on each element. After this review process and a look at the impact chart, a value judgement would be formulated by each individual at the study group meeting.

The first value judgement was the individual's own feeling as to the degree of restriction which town policy should reflect. We, as the planners, prepared some policy statements for each item which represented low, moderate and severe degrees of restriction (See Appendix A) so the participants had a general

idea of what those varying degrees of restriction meant to us. These values were to be used as general suggestive recommendations to the Town Board for future policy making processes.

A second value judgement was made so that a composite map could be constructed which reflected residents' values. This required ranking the relative importance of each constraint in relation to the others--a priority judgement so that the composite map would put emphasis upon the elements felt to be the most severe. This was carried out using a number priority 1 - 5, one being least important, 5 being the most important.

The results of this exercise was tabulated and the rankings were divided into 3 categories according to natural breakpoints in the array of averages. The following chart (Figure 3) shows the general environmental impacts of development in the various constraint areas and the tabulated results of the value judgements. In the 3 degree of restriction columns are the raw number of choices for that box. The relative ranking column shows the average of the 1 - 5 judgements and the resulting categories from 1 to 3 that each fell into (in parentheses).

The recommendations to the Town Board will actually take two forms. One is the degree of restriction for each constraint as indicated on the chart. Secondly, the composite map makes a recommendation as to specific physical areas which need to be further examined and restricted, with the reasons for restriction outlined in the analysis section of this report. It is important to note that this project took place in preface to an upcoming larger-scale planning project which will eventually result in a Community Plan. Thus, the information gathered and recommendations produced can be utilized as a guide and an information source for that project.

The composite map may be surprising and produce skeptical reactions to those unfamiliar with the area because it indicates a very large portion of the study area as being in the area of most concern and restriction. However, the map accurately depicts the severity of environmental constraints in the study area, and is not at all unrealistic upon honest evaluation and analysis of the physical environment of the area. Furthermore, it represents a value judgement upon the citizens' part that these are indeed, areas to be concerned with and where restrictions should be formulated. The principal cause of the widespread "most concern" area is the wildfire map which was in the number 1 category and thus is represented in this category with the steep slope and flood hazard maps.

Areas of moderate importance include mine tailings, played-out extraction areas (not mapped) and rockfall areas. The areas of least concern include wildlife habitat areas, historic/architectural resources and alluvial (debris) fans (alluvial fans occur with flash flood areas and thus had to be mapped along with flash flood corridors in category 1).

The map shows, in a general manner, the restrictions which are probable on that site or area. It allows the town to prioritize further studies and to take the first steps toward pursuance of policies and controls aimed at protecting and enhancing the physical environment while at the same time reducing potential health and safety hazards to Jamestown's residents.

ENVIRONMENTAL IMPACTS of constraints and development in constraint areas for Jimtown* (FIGURE 3)

	Human Health or Safety Hazard	Water Quality	Water Quantity	Air Quality	Aesthetic Deterioration	Erosion	Slope Failure	Unstable Soil	Vegetation	Wildlife Habitat	Deterioration of Scenic/Visual Resources	Deterioration of Hist./Arch. Resources	Soil Problems for Septic Tank Systems	Potential Structural Damage	Degree of Restriction: Low/None	Degree of Restriction: Moderate	Degree of Restriction: Severe	Relative Ranking of Constraint Importance
Mine Tailings	◍?	●?		○	◍	◍	●	●	◍	○	◍					4	4	2.75 (2)
"Played-out"/Scarred Extraction Areas	◍?	●?		◍	●	●	○?		●		●				1	4	2	2.71 (2)
Potential Mining Activity	◍?	●?	◍?	◍	●	○		◍	●	○	○							—
Steep Hillside Development	◍		◍		●	◍	◍?	○?	◍		●			○		3	5	3.5 (1)
Rockfall Area (Dev. In)	◍													◍	2	3	3	2.75 (2)
Flood Hazard Area (Dev. In)	●	○						○		◍			●	●	1	3	4	3.88 (1)
Debris (Alluvial) Fans	●					◍		○					◍	●	3	5		1.75 (3)
Dev. In Severe Wildfire Area	●			○	●				●	●	●			●	3	2	3	3.25 (1)
" " Sign. Wildlife Habitat					◍				○	●?	◍				4	4		2.38 (3)
Development Causing Deterioration of Historic/Arch. Resources					○						○	●			4	2	2	2.50 (3)

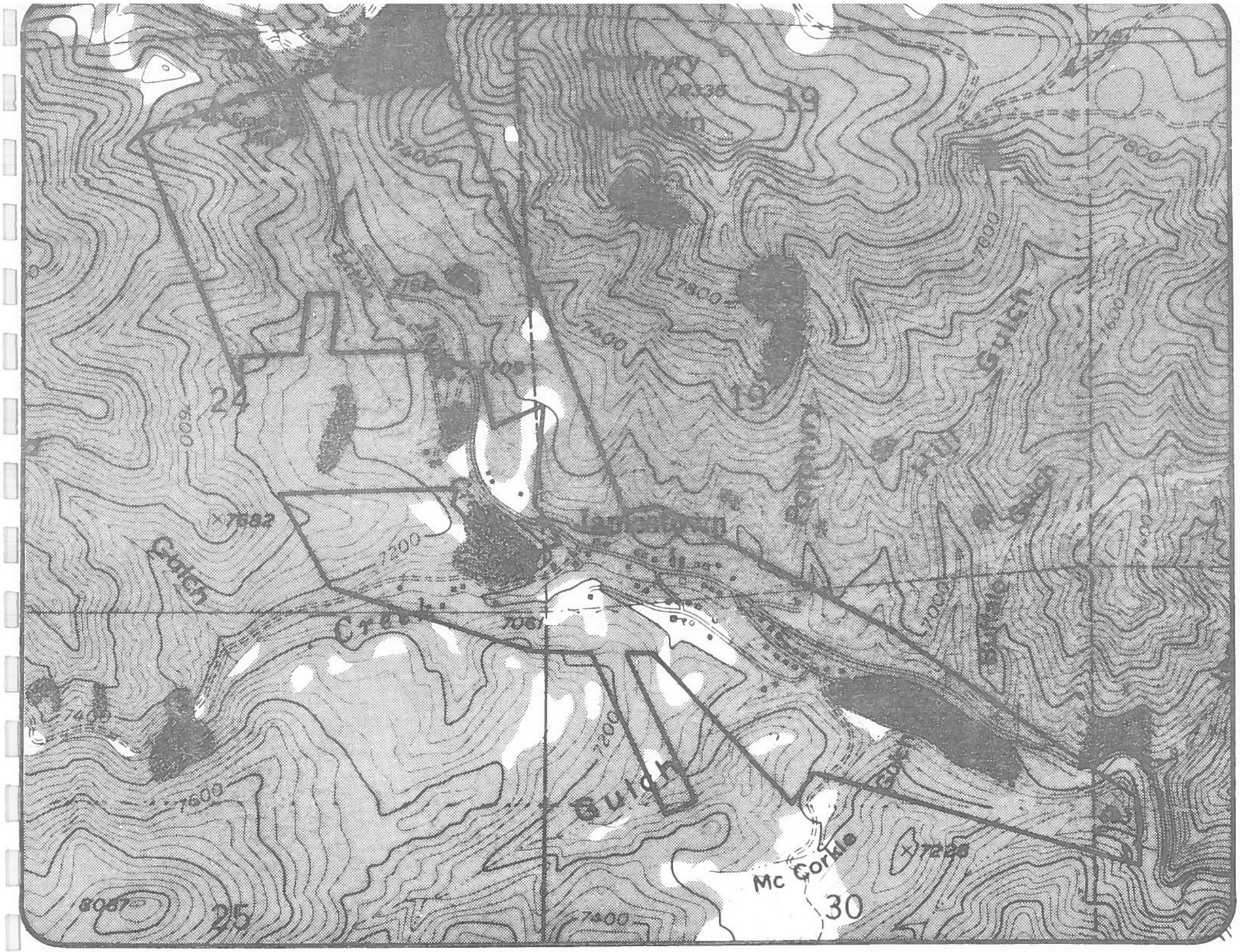
○ MINOR IMPACT

◍ MODERATE IMPACT

● MAJOR IMPACT

? RELATIONSHIP OF CONSTRAINT TO IMPACT NEEDS FURTHER STUDY

* CHART REFLECTS BOTH EXISTING AND ESTIMATED POTENTIAL IMPACTS



COMPOSITE MAP

KEY:

AREA OF MOST CONCERN

AREA OF MODERATE CONCERN

AREA OF LEAST CONCERN

SOURCE: CGDD MAY 1979

JAMESTOWN ENVIRONMENTAL ANALYSIS

NORTH

SCALE: 500' 0 1000'

APPENDIX A

The following is a general, suggestive list of policy statement possibilities as seen by Peter Patten, project coordinator and Ginny Chesney, project assistant. These are extremely rough in nature and represent merely a helpful guide to future policy-making processes in Jamestown.

1. MINE TAILINGS - RADIOACTIVITY PROBLEM

MODERATE A. "In addition to known areas of mining and milling of radioactive material (as the primary product or as a contaminant), if geologic conditions suggest a radiation hazard, a survey should be conducted to identify and locate any possible source(s) of radiation. This type of survey should be conducted using scientifically accepted standard procedures for identification and evaluation." (Colorado Geological Survey, Guidelines & Criteria . . ., p. 59)

MODERATE B. Jamestown should have a radioactivity study performed of the area to identify any "hot spots" which should be mitigated. (Tom Gray, Boulder County Geologist, personal interview on 4/18/79)

C. MORE EXTREME: All mine tailings should be fenced off to avoid human contact and a plan for their elimination should be constructed.

D. LESS EXTREME: Jamestown need not have a survey of radioactivity done but should consider effects of nearby tailings in development proposals.

2. MINE TAILINGS - SOIL PROBLEM

A. MODERATE: Mine tailings areas present problems of artificial fill soils for urban development and thus present a severe restriction to such development.

B. MORE EXTREME: No buildings or structures should be permitted on artificial fill soils of mine tailings areas.

C. LESS EXTREME: Same as "A" except substitute "moderate" for "severe."

3. PLAYED-OUT AND SCARRED MINERAL EXTRACTION AREAS

A. Efforts should be made to re-vegetate these areas to stabilize soils, reduce water pollution and erosion, and reduce visual blight. Silver Plume: "Continue to develop programs to encourage reforestation of denuded mountainsides."

B. LESS EXTREME: No policy.

C. MORE EXTREME: Immediate action should be taken by Jamestown to force owners of such areas to re-forest.

4. RENEWED OR NEW MINING ACTIVITY

MODERATE - SEVERE A. Jamestown should develop strict regulations on mining activity to avoid land use conflicts and environmental degradation.

LESS EXTREME

B. Jamestown should not develop regulations for mining activity but should require mining companies to mitigate environmental problems they have contributed to.

4a. PROTECTION OF MINERAL RESOURCES

MODERATE - EXTREME

A. No buildings will be permitted on land considered to be underlain by "commercial mineral deposits" as defined by 34-1-102(1) CRS 1973 and which are intended under the provisions of Colorado H.B. 1529 of 1973, to serve as resource preservation areas as part of Boulder County's Master Plan for Extraction.

LOW - MODERATE

B. The town shall forewarn any applicant for non-mining related building on a patented claim within area identified as "commercial mineral deposit" by the County that mineral extraction activities may occur in proximity to the site.

LOW

C. No special requirements or restrictions will be placed on building on mineral deposit areas.

EXTREME

D. No building will be allowed on any area defined as a "lode mineral area" in the Boulder County Comprehensive Plan.

6. SLOPES

SEVERE

A. No building will be permitted on slopes greater than 20^{o}.

MODERATE - SEVERE

B. No building will be permitted on slopes greater than 30^{o}.

MODERATE

C. No building will be permitted on slopes greater than 30^{o} unless a study by a qualified soil engineer is obtained and documents the stability of the site for construction. No building on slopes where structures are determined to have negative visual impact.

LOW - MODERATE

D. Building allowed on any slope upon approval by qualified soil engineer.

LOW

E. No restrictions at all.

7. ROCKFALL AREAS

SEVERE

A. No building will be permitted below known rockfall areas.

MODERATE

B. ". . . the platting of building lots and the issuance of building permits in rockfall hazard areas should be preceded by the submittal of reports composed by rock mechanics engineers, and/or engineering geologists where the recommendations of such reports are incorporated into the site plan." (Boulder County Comprehensive Plan)

LOW - MODERATE

C. Development in rockfall hazard areas should be avoided when possible.

8. FLOOD HAZARD AREA

MODERATE - EXTREME

A. No additional development should be allowed in the flash flood corridor or the 100-year floodplain as designated by FIA study. Building is allowable "no closer than 15 vertical feet to the existing flow line of any designated drainage course measured at right angles to the center line of the drainage course," and "all footings for habitable structures located within 100 horizontal feet of the flow line, or the center line of the existing flow of any designated drainage course, be founded on stable, undisturbed bedrock." (Boulder County Comprehensive Plan) Measures will be taken to mitigate adverse impacts of existing structures on water quality. Discontinuation of habitation and use of buildings in flood hazard area should be encouraged.

LOW

B. Development will be permitted in flood hazard area when appropriate mitigation measures are incorporated into building plans.

9. DEBRIS (ALLUVIAL) FANS

MODERATE

A. Strict mitigative measures as required by certified engineering and soil reports should be enforced when development is proposed upon an alluvial (debris) fan.

SEVERE

B. "In no case should the footing of any structure be founded on or near any debris fan in any of the designated drainage courses, nor should any overnight camp sites be located on or near the debris fans. Existing development should be relocated." (Boulder County Comprehensive Plan)

LOW

C. No restrictions

10. DEVELOPMENT IN WILDFIRE AREAS

LOW

A. No restrictions

MODERATE

B. No development allowed unless moderate preventative measures are taken.

EXTREME

C. Strict preventative measures required throughout severe wildfire hazard area before development permitted; all owners required to have wildfire insurance.

11. WILDLIFE HABITAT

LOW

A. No restriction.

MODERATE

B. An inventory of significant wildlife habitats within a proposed development area should be required, and steps to mitigate intrusion on habitat should be required before approval of proposed development.

EXTREME

C. All significant wildlife habitats should be identified and protected from development, including heavy camping, hiking or vehicular traffic.

12. HISTORIC/ARCHIECTURAL/ARCHAEOLOGICAL RESOURCES

LOW	A. These resources should be identified.
LOW - MODERATE	B. These resources should be identified and marked with appropriate signs or plaques.
MODERATE	C. These resources should be identified and actively preserved. Research on historical background pursued.
MODERATE - EXTREME	D. Regulations governing alteration of such structures should be adopted to insure preservation of historic/architectural character.
EXTREME	E. Jimtown should adopt ordinances controlling preservation of identified historic/architectural resources, and should implement a vigorous program to enhance appreciation of these resources.

ENVIRONMENTAL IMPACTS of constraints and development in constraint areas for Jimtown*

APPENDIX B

	HUMAN HEALTH OR SAFETY HAZARD	WATER QUALITY	WATER QUANTITY	AIR QUALITY	AESTHETIC DETERIORATION	EROSION	SLOPE FAILURE	UNSTABLE SOIL	VEGETATION	WILDLIFE HABITAT	DETERIORATION OF SCENIC/VISUAL RESOURCES	OBLITERATION OF HIST./ARCH. RESOURCES	SOIL PROBLEMS FOR SEPTIC TANK/SYSTEMS	POTENTIAL STRUCTURAL DAMAGE	DEGREE OF RESTRICTION* LOW/NONE	MODERATE	SEVERE	RELATIVE RANKING OF CONSTRAINT IMPORTANCE *
MINE TAILINGS	◍?	●?		○	◍	◍	●	●	◍	○	◍						X	4
"PLAYED-OUT"/SCARCED EXTRACTION AREAS	◍?	●?		◍	●	●	○?		●		●					X		4
POTENTIAL MINING ACTIVITY	◍?	●?	◍?	◍	●	○		◍	●	○	○						X	1
STEEP HILLSIDE DEVELOPMENT	◍		◍		●	◍	◍?	○?	◍		●			○			X	4
ROCKFALL AREA (DEV. IN)	◍													◍	X			2
FLOOD HAZARD AREA (DEV. IN)	●	○						○		◍			●	●			X	5
DEBRIS (ALLUVIAL) FANS	●					◍		○					◍	●			X	4
DEV. IN SEVERE WILDFIRE AREA	●			○	●				●	●	●			●		X		4
" " SIGN. WILDLIFE HABITAT					◍				○	●?	◍					X		3
DEVELOPMENT CAUSING DETERIORATION OF HISTORIC/ARCH. RESOURCES					○						○	●				X		3

○ MINOR IMPACT

◍ MODERATE IMPACT

● MAJOR IMPACT

? RELATIONSHIP OF CONSTRAINT TO IMPACT NEEDS FURTHER STUDY

* VALUE JUDGEMENTS OF PETER PATTEN (PROJECT COORDINATOR)

* CHART REFLECTS BOTH EXISTING AND ESTIMATED POTENTIAL IMPACTS

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