



## ENVIRONMENTAL ASSESSMENT

Little El and Bonanza Claim Group Mining Plan of Operations

Chisana Mining District, Alaska

June 2016

---

# Little El and Bonanza Claim Groups Mining Plan of Operations

## *Environmental Assessment* *June 2016*

---

### **Note to Reviewers**

If you wish to comment on this document, you may mail comments to:

Bruce Rogers  
Wrangell St. Elias National Park and Preserve  
P.O. Box 439  
Copper Center, Alaska 99573

You may also comment online. Go to <http://parkplanning.nps.gov> and retrieve this document on the website to provide comments electronically.

The comment period will end on July 8, 2016.

**Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment, including the personal identifying information, may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee we would be able to do so.**

## Table of Contents

CHAPTER 1: PURPOSE AND NEED .....	6
1.1 Purpose and Need.....	6
1.2 Background .....	7
1.3 Laws, Regulations and Policies.....	7
1.3.1 General Mining Act of 1872 (30 USC 21 et. Seq.) .....	7
1.3.2 NPS Organic Act and General Authorities Act.....	8
1.3.3 Mining in the Parks Act of 1976 (PL 94-429).....	8
1.3.4 Alaska National Interest Lands Conservation Act of 1980 (PL 96-487).....	8
1.4 RELATIONSHIP TO OTHER PLANNING PROJECTS .....	9
1.4.1 Relationship to Access to Inholdings.....	9
1.4.2 Relationship to other Mining Plans of Operations.....	9
1.4.3 1990 WRST Cumulative Impacts of Mining EIS and ROD .....	10
1.5 SPECIFIC ISSUES.....	10
1.5.1 Issues Selected for Detailed Analysis .....	11
1.5.2 Issues Dismissed from Further Analysis.....	12
1.6 PERMITS AND APPROVALS RELATED TO THIS ACTION .....	14
CHAPTER 2: ALTERNATIVES.....	15
2.1 ALTERNATIVE A (NO ACTION): NO MINING OPERATIONS AUTHORIZED ON LITTLE EL AND BONANZA GROUP CLAIMS.....	15
2.2 ALTERNATIVE B (PROPOSED ACTION WITH STIPULATIONS).....	15
2.2.1 Access to the Bonanza and Little El group claims using the Chicken Creek Airstrip and established trails. ....	15
2.2.2 Proposed Mining Plan of Operations – for Bonanza and Little El group claims .....	15
2.3 MITIGATING MEASURES .....	21
2.4 COMPARISON OF ENVIRONMENTAL EFFECTS .....	21
CHAPTER 3: ENVIRONMENTAL CONSEQUENCES.....	23
3.1 Project Area.....	23

3.2.1 Current Conditions of Aquatic and Water Resources .....	24
3.2.2 Effects on Aquatic and Water Resources from Alternative A (No Action).....	25
3.3 Cultural Resources .....	26
3.3.1 Current Conditions of Cultural Resources.....	26
3.3.2 Effects on Cultural Resources from Alternative A, No Action.....	32
3.3.3 Effects on Cultural Resources from Alternative B, Proposed Action with Stipulations .....	32
3.4 Floodplains .....	33
3.4.1 Current Condition of Floodplains.....	33
3.4.2 Effects on Floodplains from Alternative A, No Action .....	33
3.4.3 Effect on Floodplains from Alternative B, Proposed Action with Stipulations .....	33
3.5 Soils .....	35
3.5.1 Current Condition of Soils .....	35
3.5.2 Effects on Soils from Alternative A, No Action.....	35
3.5.3 Effects on Soils from Alternative B, Proposed Action with Stipulations .....	35
3.6.1 Current Condition of Vegetation.....	36
3.6.2 Effects on Vegetation from Alternative A, No Action .....	36
3.6.3 Effects on Vegetation from Alternative B, Proposed Action with Stipulations .....	37
3.7 Wetlands .....	37
3.7.1 Current Condition of Wetlands.....	37
3.7.2 Effects on Wetlands from Alternative A, No Action .....	39
3.7.3 Effects on Wetlands from Alternative B, Proposed Action with Stipulations .....	39
3.8 Visual Resources.....	40
3.8.1 Current Condition of Visual Resources .....	40
3.8.2 Effects on Visual Resources from Alternative A, No Action.....	40
3.8.3 Effects on Visual Resources from Alternative B, Proposed Action with Stipulations .....	40

## **APPENDICES**

Appendix A: Mining Plan of Operations

Appendix B: Right of Way Certificate of Access

Appendix C: ANILCA 810 analysis

Appendix D: Stipulations

Appendix E: Floodplains Statement of Findings

# CHAPTER 1: PURPOSE AND NEED

## 1.1 Purpose and Need

The National Park Service (NPS) is considering approval of a mining plan of operations (MPO) which was submitted by Chisana Mining LLC for the purpose of conducting a suction dredge placer gold mining operation on the Little Eldorado (Little El) unpatented mining claims located in the Gold Hill area within the preserve of Wrangell-St. Elias National Park and Preserve (WRST). Chisana Mining LLC also wish to continue placer gold mining operation on the Bonanza unpatented mining claims and these proposed operations are included in the MPO. Chisana Mining LLC submitted an MPO, after consultation with NPS specialists, as required by Title 36 of the Code of Federal Regulations (CFR), Part 9A, detailing their proposed means and methods. Copies of the MPO are available in NPS offices in Copper Center and Anchorage per Federal Register Notice (FR Doc. 2016–08698) on April 15, 2016. Access to both claim groups (Little El and Bonanza) is via fixed wing aircraft to the Chicken Creek Airstrip, then via off road vehicle (ORV) to the claim groups. This access is authorized by an existing Right Of Way Certificate of Access (RWCA), issued to Chisana Mining LLC by the NPS in 2013.

The mineral rights to the Little El (tract #WRST-33-108) and Bonanza (tract #WRST-33-111) claims are owned by Chisana Mining LLC. See Table 1 for general claim information. This environmental assessment (EA) examines and analyzes the proposed mining operations and reasonable alternatives.

This EA has been prepared in accordance with National Environmental Policy Act (NEPA) of 1969, regulations of the Council of Environmental Quality (40 CFR 1508.9), the Mining in the Parks Act of 1976 and its implementing regulations (36 CFR 9A), as well as ANILCA 1110(b). The surface of the claims has been disturbed for the purposes of mineral extraction prior to 1977.

Table 1. Mining claims covered in this mining plan of operations/EA.

BLM Serial Number	Claim Group	Claim Name	Location Date	Validity Date	Legal Location Description: Copper River Meridian, Alaska, Township 04 North
AA-027047	Little El	Little Eldorado 1	9/5/1966	4/22/2014	Range 19 East, portions of Sections 24 and 25
AA-027048	Little El	Little Eldorado 2	6/30/1963	4/22/2014	Range 19 East, portions of Section 24
AA-027049	Little El	Bench 1	9/5/1966	4/22/2014	Range 19 East, portions of Section 24
AA-027050	Little El	Bench 2	9/5/1966	4/22/2014	Range 20 East, portions of Sections 19 and 30 and Range 19 East, portions of Sections 24 and 25
AA-027051	Little El	Snow Gulch 1	6/30/1963	4/22/2014	Range 19 East, portions of Section 24
AA-029712	Bonanza	Bonanza 1	8/30/1969	4/20/1990	Range 19 East, portions of Section 35
AA-029713	Bonanza	Bonanza 2	8/30/1969	4/20/1990	Range 19 East, portions of Sections 35 and 36
AA-029714	Bonanza	Bonanza 3	8/30/1969	4/20/1990	Range 19 East, portions of Sections 25 and 36
AA-029715	Bonanza	Bonanza 4	8/30/1969	11/8/2010	Range 19 East, portions of Sections 25 and 36
AA-029716	Bonanza	Bonanza 5	8/30/1969	11/8/2010	Range 19 East, portions of Section 25
AA-029717	Bonanza	Bonanza 6	8/30/1969	4/20/1990	Range 19 East, portions of Sections 25 and 30

## **1.2 Background**

Prospectors first discovered gold in Bonanza Creek in 1913. This led to the Chisana Gold Rush with mineral exploration and placer mining along Big Eldorado, Little Eldorado, Gold Run and Bonanza Creek drainages during the 1913 – 1919 period. Subsequently, in the 1930s hydraulic mining occurred in Bonanza Creek and along upland benches.

The Bonanza and Little El claims are unpatented and have been previously mined. Historic mining directly impacted 131 acres of lands in the Gold Hill area which includes the Bonanza and Little El claims (NPS 1990). Physiographic environments that were most affected by past mining include the stream channel, floodplain, stream terraces and some upland benches located in and along drainage bottoms. No mining operations have been conducted or approved by the NPS on the Little El claims since WRST was established. Placer mining on the Bonanza claims has been authorized by NPS since 1988.

Most of Bonanza Creek stream bed from its confluence with Chathenda Creek to its upper reaches has been disturbed or mined; some sections were disturbed three or more times. Virtually all stream bottoms have been affected and many adjacent upland benches have also been mined or otherwise developed. Chisana miners employed hydraulic methods and major water diversion projects were common. Miners also used mechanized equipment in the district. The amount of mining activity at Gold Hill has fluctuated with the price of gold; this district has been an intermittent producer. Gold production between 1913 and 1942 at Gold Hill is estimated at 45,000 ounces. Though there is no accurate estimate of recent gold production, it is likely that another 10,000 to 20,000 ounces have been produced since 1942.

History of ownership on the Little El and Bonanza claims is long and complicated and described in detail in Section I.C of the Mining Plan of Operations (Appendix A). Mineral exams were completed for Bonanza 1 – 3 and 6 in 1990 (Brown 1990, see Appendix A), Bonanza 4 – 5 in 2010 (Ellefson et al. 2010, see Appendix A), and the Little El claim group in 2014 (Kurtak et al. 2014, see Appendix A).

The NPS minerals management program in WRST is guided by the 1990 WRST Mining EIS Record of Decision (ROD). That ROD authorized acquisition of mining claims within WRST from willing sellers. The Bonanza and Little El claimants of record have not expressed an interest in selling the claims to the NPS. Hence, the NPS is directed to process proposed MPOs and authorize those MPOs which would not result in significant impact to park resources and values.

## **1.3 Laws, Regulations and Policies**

### **1.3.1 General Mining Act of 1872 (30 USC 21 et. Seq.)**

The General Mining Act of 1872 authorized and governed prospecting and mining for economic minerals, such as gold, platinum, and silver, on federal public lands. This law codified the previously informal system of acquiring and protecting mining claims on public lands. All United States citizens 18 years or older have the right under the 1872 mining law to locate lode (hard rock) or placer (gravel) mining claims on federal lands open to mineral entry, and such claims may be recorded once a local mineral discovery is

made. The Little El and Bonanza unpatented placer mining claims were originally located under the terms of this act.

### **1.3.2 NPS Organic Act and General Authorities Act**

The NPS Organic Act and General Authorities Act prohibit impairment of park resources and values. The 2006 NPS Management Policies uses the terms “resources and values” to mean the full spectrum of tangible and intangible attributes for which the park is established and managed, including the Organic Act’s fundamental purpose and any additional purposes as stated in the park’s establishing legislation. The impairment of park resources and values may not be allowed unless directly and specifically provided by statute. The primary responsibility of the NPS is to ensure that park resources and values continue to exist in a condition that will allow the American people to have present and future opportunities for enjoyment of them.

The evaluation of whether impacts of a proposed action would lead to an impairment of park resources and values is included in this environmental assessment. Impairment is more likely when there are potential impacts to a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or
- Identified as a goal in the park’s general management plan or other relevant NPS planning documents.

### **1.3.3 Mining in the Parks Act of 1976 (PL 94-429)**

The Mining in the Parks Act of 1976 closed six national park system units to mineral entry following a congressional finding that if the application of the United States mining laws was not discontinued, they would conflict with the purposes for which individual park units were established. Congress also directed that all mining operations in national parks should be conducted in a manner which prevents or minimizes damage to the environment and other park resources. Consequently, the act also authorized the Secretary of the Interior to regulate mining and associated activities on federal mining claims located within park units. These regulations, found at 36 CFR Subpart 9A, apply to both patented and valid unpatented mining claims.

### **1.3.4 Alaska National Interest Lands Conservation Act of 1980 (PL 96-487)**

On December 2, 1980, the U.S. Congress passed the Alaska National Interest Lands Conservation Act (ANILCA), enlarging and re-designating Wrangell-St. Elias National Monument as Wrangell-St. Elias National Park and Preserve. ANILCA gave the NPS authority to administer the lands and interests within the park pursuant to the provisions of the NPS Organic Act of August 25, 1916, as amended (16 USC.1), and other pertinent legislation. Like Proclamation 4625, ANILCA closed the park to mineral location under the existing mining laws (16 USC. 410hh-5).



## **1.4 RELATIONSHIP TO OTHER PLANNING PROJECTS**

### **1.4.1 Relationship to Access to Inholdings**

ANILCA Section 1110(b) provides for private landowners to be given “such rights as may be necessary to assure adequate and feasible access for economic and other purposes to the concerned land by such...private owner or occupier and their successor in interest,” while such rights would be subject “to reasonable regulations issued by the Secretary to protect the natural and other values of such lands.” Access to mining claims situated within Alaska parks is governed by the Department of the Interior transportation and utility system regulations at 43 CFR Part 36. Section 36.10 of these access regulations specifies procedures for access across park lands to valid inholdings, including patented and valid unpatented claims. Section 36.10(c) allows mining claimants who acquired their rights under the General Mining Act of 1872 to file their request for access as part of their mining plan of operations.

Chisana Mining LLC submitted an SF-299 application for access to the Bonanza claims in 2013. The NPS Alaska Region uses the July 2007 “Interim User’s Guide to Accessing Inholdings in National Park System Units in Alaska” and employs the criteria and processes articulated in WRST’s 2008 “Established and Maintainable Access to Inholdings Programmatic Plan and EA” to describe, analyze and grant the operator an ANILCA, Section 1110(b) RWCA for access to Bonanza and Little El claim groups to conduct mining operations. The NPS issued a RWCA to Chisana Mining LLC in 2013. The RWCA includes the terms and conditions for use of motorized equipment along a bladed route that serves as an existing ORV trail between Chicken Creek Airstrip and the Little El and Bonanza claims as well as the use and maintenance of the Chicken Creek Airstrip. The RWCA for Chisana Mining LLC access is shown in Appendix B.

The direct and indirect environmental effects related to ANILCA Section 1110(b) access are covered in the 2007 “Established and Maintainable Access to Inholdings Programmatic Plan and EA.” NEPA compliance for the Chisana Mining LLC’s access to the Bonanza and Little El claim groups to conduct mining operations is tiered to the 2007 document.

### **1.4.2 Relationship to other Mining Plans of Operations**

The NPS has prepared multiple mining and access EAs related to proposed mining and access activities in the Chisana – Gold Hill Area. These EAs analyzed effects on the environment and are listed below:

- EA – Access to Placer Claims on Big Eldorado Creek and Gold Run and Access route maintenance to Chicken Creek Airstrip Little Eldorado Trail, WRST: Operations ORVs, trail and airstrip maintenance.
- EA – Mining Claim Validity Examinations 1987 and 1988: Accessing and sampling unpatented mining claims using mining equipment.
- EA – Five Year Plan of Operations on Bonanza Nos. 4, 5, and 6 Placer Claims, WRST 1989: Access and mining operations analysis.
- EA – Five Year Plan of Operations on Bonanza Creek 1 – 6 Placer Claims, WRST – 1995: Access and mining operations analysis for suction dredge, highbanker and metal detector mining

operations, and access to Bonanza Creek claims and Little Eldorado camp with ORVs. Supplemental analysis circa 2000.

- CE - Five Year Plan of Operations on Bonanza Creek 1 – 6 Placer Claims, WRST 2002: Access and mining operations analysis for suction dredge, highbanker and metal detector mining operations, and access to Bonanza Creek claims and Little Eldorado camp with ORVs.
- Little Eldorado Creek Trail prescription – 2009: Trail maintenance included ditching, placement of cobbles and geotextiles.
- EA – Ten Year Mining Plan of Operations Big Eldorado Creek Claim Group WRST – 2001: Mechanized and suction placer mining operations. Overland winter access and use of ORVs on existing trails.
- EA – Winter Access Chisana to Horsfeld, WRST – 1991
- CE - Five Year Plan of Operations on Bonanza Creek 1 – 6 Placer Claims for 2007-2011, WRST 2004: Access and mining operations analysis for suction dredge, highbanker and metal detector mining operations, and access to Bonanza Creek claims and Little Eldorado camp with ORVs.
- EA – Shamrock Group Mining Plan of Operations - 2013: Mining operations analysis for suction dredge, highbanker and metal detector mining operations.

### **1.4.3 1990 WRST Cumulative Impacts of Mining EIS and ROD**

As a result of a 1985 lawsuit filed by a group of environmental organizations, the U.S. District Court found that the NPS in Alaska had not fully complied with the 1976 Mining in the Parks Act and the 1969 National Environmental Policy Act. The Court ordered NPS to prepare an Environmental Impact Statement (EIS) on the cumulative impacts of multiple mining operations within each of three Alaska park units, including WRST, and enjoined the NPS from permitting mining operations prior to completion and Court approval of the EIS. As a result of actions proposed in WRST's EIS, the NPS submitted a ROD to the Federal Court recommending acquisition of all patented and valid unpatented mining claims. However, the ROD (signed August 21, 1990) also stipulated that until such time as sufficient funds were available for acquisition, the NPS would continue to process mining plans of operation according to 36 CFR 9A – Mining and Mining Claims, 43 CFR Part 36 – Transportation and Access Into Conservation System Units in Alaska and approve those plans that meet regulatory requirements. On December 28, 1990, the Federal Court approved the findings of the EIS (NPS, 1990). Congress subsequently appropriated funds for acquisition of mining claims in WRST, and the NPS has pursued the acquisition of mining claims in WRST from willing sellers since the late 1990s.

## **1.5 SPECIFIC ISSUES**

To focus this environmental assessment, the NPS selected specific impact topics for analysis and eliminated other from further evaluation. Impact topics are defined as resources in WRST that may be affected by the proposed action. A brief rationale for the selection of each topic is given below, as well as the rationale for dismissing specific topics from further consideration.

### **1.5.1 Issues Selected for Detailed Analysis**

#### **Aquatic and Water Resources**

Bonanza Creek is one of three drainages with unpatented placer claims and historic mining in the Gold Hill area. Proposed mining operations would occur within the Bonanza Creek drainage fluvial system. Potential resources at risk proximal to the claims include invertebrates and water quality.

Placer mining discharge and disturbance directly impacts fluvial systems. Placer mining wastewater discharge would generate elevated levels of suspended sediments which could degrade water quality. Surface disturbance removes soils and vegetation, exposing areas to erosion which could also adversely affect water quality. Improper transportation, use, or storage of fuels could endanger water quality and dependent resources.

#### **Cultural Resources**

The Chisana Historic Mining Landscape is listed on the National Register of Historic Places (Feldman 1997). Bonanza Creek is associated with the 1913 – 1914 Chisana Gold Rush. The drainage contains numerous elements of the historic mining landscape. Loss or degradation of cultural resources would adversely affect the historic district. Cultural resource staff have conducted an archeological inventory of this action's area of potential effect in an effort to identify historic properties pursuant to NHPA, Section 106. NPS staff would provide recommendations to the operator regarding protection and preservation of historic artifacts or features.

#### **Floodplains**

Historic mining operations in Bonanza Creek have profoundly altered the river corridor area and function of its floodplain and numerous historic mining structures and artifacts are located in the floodplain. The proposed mining operations and associated activity would occur in the existing or historic floodplain.

#### **Soils**

All proposed mining would occur in previously disturbed areas that lack a discernible soil horizon. Mining would directly and adversely impact some soils, but would generally be confined to either barren ground or gravel bars lacking well developed soils. No new impacts to pristine soils are anticipated.

#### **Vegetation**

The proposed mining would directly impact some vegetation within the claim block. Some existing vegetation within the project area would be destroyed, disturbed or lost due to overburden removal and/or mining until successional vegetation is reestablished.

The Federal Noxious Weed Control Act and Executive Order 13112 require federal agencies to analyze the potential to contribute to the introduction, continued existence, or spread of noxious weeds or non-native species or actions that may promote the introduction, growth, or expansion of the range of such species.

## **Wetlands**

The proposed mining would directly impact previously disturbed wetlands within the claim block. Placer mining occurs in riverine wetlands and alters flow and wetland function.

## **Visual Resources**

The proposed mining would directly impact some components of the natural landscape associated with natural beauty, like vegetation, wildlife, and aquatic resources. Although the action's direct effects would remain largely confined to previously disturbed areas within the Little El and Bonanza claim groups, such impacts could also directly affect visual resources viewed from adjacent preserve lands.

### **1.5.2 Issues Dismissed from Further Analysis**

## **Air Resources**

WRST is considered a Class II airshed under the Clean Air Act, which requires consideration of impacts on air resources. While construction and mining activities would generate some short term and highly localized machinery emissions and airborne dust, these impacts would be negligible.

## **Climate Change**

Proposed mining operations would not have a measureable effect on greenhouse gas emissions and climate change.

## **Socioeconomic Environment**

Mining is a commercial operation with the potential to benefit the mine operators, employees and investors directly. Placer mining on the Gold Hill claims in the last 20 years has been small scale and has not resulted in high levels of gold production. Mining operations in the Gold Hill area provide a direct benefit to air taxis, primarily out of Tok, Alaska. Mining in the Gold Hill area results in low levels of local and regional socioeconomic benefits. Effects of the actions considered in this document would not result in significant impacts to the socioeconomic environment.

## **Environmental Justice**

This action would not result in changes to human health or the environment with disproportionately high and adverse effects on minority or low-income populations or communities.

## **Indian Trust Resources**

Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, requires early consultation if a proposal is to have substantial direct effect on Indian Trust Resources. The proposed project area (and most of the State of Alaska) does not contain Indian Trust Resources, therefore the proposed action would not affect these resources.

## **Subsistence**

ANILCA Section 810 requires federal agencies to analyze the impacts of federal actions on subsistence resources and lifestyles. Some local rural residents conduct subsistence activities including hunting, trapping and gathering within the general vicinity of this proposed action. This action has no potential to result in additional subsistence restrictions. The ANILCA 810 analysis for this project is attached as Appendix C.

## **Threatened and Endangered Species**

The Endangered Species Act requires an analysis of impacts on all federally listed, threatened, and endangered species, as well as species of special concern listed by the State of Alaska. There are no listed or proposed threatened or endangered species, or designated or proposed critical habitat within the project area. Therefore, no Endangered Species Act Section 7 consultation with the U.S. Fish and Wildlife Service is required.

## **Visitor Use and Experience**

Recreation and visitor use of the Gold Hill area is low due to its remote location and access difficulties. Access is via fixed wing aircraft to the Chicken Creek Airstrip. NPS commercial use records for the years 2007 – 2014 show a total of 44 visitors dropped at the Chicken Creek Airstrip, mostly sport hunters. Despite the small scale mining operations in the area, there is still opportunity for scenic hiking and backpacking in the area. Some visitors seek out the area specifically because of an interest in the historic mining that occurred there. Overall, given the small scale of operations proposed and the small number of visitors to the area, the mining activities proposed would have little impact on visitor use and experience.

## **Wildlife**

Moose, bear, caribou and Dall's sheep use or travel through the Gold Hill area (NPS 1990). The proposed mining and access activities would potentially impact small amounts (approximately 0.137 acres per year) of wildlife habitat within previously disturbed areas. Proposed mining operations could also indirectly affect wildlife using nearby lands during the summer months because of noise and human activity. Past and sporadic small-scale mining activities on this and other claims in the Gold Hill area have not resulted in long-term displacement of wildlife, as evidenced by frequent sightings of caribou in the area and the use of the Chicken Creek Airstrip as a drop-off point for Dall sheep hunters. Because of the anticipated minor effects to wildlife and wildlife habitat, this topic will not be analyzed in detail.

## **Wilderness**

The WRST 1986 General Management Plan classified the area around Chisana and Gold Hill as ineligible for inclusion in the National Wilderness Preservation System. The designated wilderness boundary is located approximately 3.2 miles southeast of the project area.

## **1.6 PERMITS AND APPROVALS RELATED TO THIS ACTION**

The decision by the NPS to approve or not approve a proposed mining plan of operations on the Little El and Bonanza placer claims is classified as a federal action. Approval to conduct mining would be contingent upon compliance with all applicable State of Alaska and federal statutes and regulations.

A RWCA has been granted for access to the Little El and Bonanza claim groups to conduct mining operations (See Appendix B).

The claimants have an existing performance bond for their Bonanza claim mining operations. This bond is sufficient to cover the proposed operations on the Little El and Bonanza claim groups.

## **CHAPTER 2: ALTERNATIVES**

### **2.1 ALTERNATIVE A (NO ACTION): NO MINING OPERATIONS AUTHORIZED ON LITTLE EL AND BONANZA GROUP CLAIMS.**

Under this alternative, the NPS Alaska Regional Director would not approve the operator's proposed mining plan of operations. As a result, authorized mining would not occur on the Little El or Bonanza placer claims at Gold Hill. This alternative provides a baseline for evaluating the changes and impacts of the proposed alternative.

### **2.2 ALTERNATIVE B (PROPOSED ACTION WITH STIPULATIONS)**

Under this alternative, the NPS Alaska Regional Director would approve the operator's mining plan of operations on the Little El and Bonanza unpatented mining claims. This authorization would include NPS stipulations for resource protection. These stipulations would constitute a mitigation plan designed to minimize and/or prevent potential environmental impacts to park resources and values and would be conditions to the authorization to mine. The proposed mining stipulations are presented in Appendix D.

#### **2.2.1 Access to the Bonanza and Little El group claims using the Chicken Creek Airstrip and established trails.**

Access is described in Section 1.4.1 of this EA and is covered by a RWCA issued in 2013, Appendix B. No new access is proposed. This plan/EA would not alter the terms of that RWCA.

#### **2.2.2 Proposed Mining Plan of Operations – for Bonanza and Little El group claims**

##### **Mine Support Structures and Related Operations**

**Mine Support Camp:** The primary support camp (Little Eldorado Creek) is located within the Little El claim group near Little Eldorado Creek (see Figure 1). Proposed maintenance and repairs to historic structures as outlined below is in accord with the *Secretary of the Interior Standards for the Treatment of Historic Properties* and would be managed with technical assistance and direction by NPS staff. There are a number of existing structures on the claims:

- Little Eldorado support camp consists of seven buildings (NAB-51 [NAB numbers refer to the cultural site inventory system maintained by the Alaska State Office of History and Archeology], Figure 1). Two of these buildings would have roof repairs to maintain the viability and structural integrity. Before and after photos would be taken. Roofing material would match the other 5 structures in the camp per discussions with NPS cultural resources staff.
- Bonanza #5 (two tent frames, NAB-079 and NAB-80)
- Canyon Creek cabin on Bonanza #4 (NAB-047)
- Bonanza #3 (frame shed, IS#201)

- Bonanza #1 (three structures, NAB-046)

Figure 1: Little Eldorado Camp



Mining activities on Bonanzas 1 to 3 would be based out of a spike support tent camp consisting of 4 to 6 tents on Bonanza 1 or 2. Temporary tents would be erected at work sites on Bonanza No. 1, 2, 3, and 4 claims. Structures at the Little Eldorado Creek support camp would be used to house workers and store equipment and supplies. Spike camps would be on sparsely vegetated gravel bars on a sufficiently high terrace to minimize potential for washing out during high water events. Sensitive cultural resource areas would be avoided.

Domestic water supply would be from the nearest creeks at approximately 10 gallons per day per person. No use of storage tanks or piping systems is proposed.

**Petroleum Products, Transport Storage and Use:** Fuel would be transported to the Little Eldorado support camp from the Chicken Creek Airstrip via ORV and ORV trailers. All gasoline, heating oil, propane, and motor oil would be stored in the support camp. Fuel would be transported from the support camp to the work sites on an as needed basis. Estimated fuel use per season is 10 gallons per day, or 500 gallons of gasoline; 50 gallons of fuel oil; 100 gallons of propane; and 50 gallons of kerosene per year. The estimated amount of fuel stored in support camp is: 120 gallons gasoline, 50 gallons fuel oil, 80 gallons propane, and 50 gallons of kerosene.



Fuel would be stored in metal or other bear-proof material containers no larger than 55 gallons. No more than 400 total gallons would be stored on site at the support camp.

Spill containment for fuel would be near sheds at the support camp and at the work site. Containment would consist of an impermeable boundary such as a metal container or commercially available synthetic containment material. Absorbent pads would be located near the fuel storage area so that drips from fueling activities would be immediately cleaned up. When fueling the equipment a drip pan would be used to prevent spillage onto the ground.

**Human Waste:** An outhouse is located within the support camp. If there is a need to dig a new hole and relocate the outhouse, the claimant would request permission from the park. Other human waste would be deposited in a pit in the vicinity of the Bonanza spike camp and located off the floodplain and would not be located in the vicinity of archeological resources. The bottom of the pit would be no less than 4 feet from the water table and the pit would be covered with soil and vegetation at the end of the season.

**Solid Waste:** All burnable trash would be burned in a burn barrel at the support camp. Garbage and waste oil would be flown out to Tok for disposal at least once per season. All trash and other scent attractants would be kept safe from bears through the use of bear-proof containers or electric fences.

**Food Storage:** All food would be secured and/or stored in bear resistant containers or buildings. All food items would be removed at the end of the season.

### **Mining Equipment:**

*Suction dredge:* Current equipment on site includes a 2.5 inch and 4 inch Keene mini dredge, a 4-inch Dalke mini dredge, and a 4-inch Keene dredge powered by 5 or 8 horsepower Honda and Briggs motors. See Figure 2 (Keene 4" suction dredge). Each dredge could move a maximum of 3 yards of material through a sluice in one day. Use of a 6-inch Keene dredge is anticipated in future operations. This dredge could move a maximum of 5 yards of material in one day. No larger than a 6-inch suction dredge would be used in mining operations.

**Figure 2: Keene 4" suction dredge**



Suction dredge mining operations would be restricted to areas normally covered by water within the submerged portion of the active stream area.

*High Banker Power Sluice Box:* A high banker may be used for areas where suction dredging is not feasible, such as in the steep sections of the creeks. A highbanker is shown in Figure 3. Hand methods (buckets and shovels) would be used for the most part to transfer ore bearing gravels into the high banker. A mechanical method, such as a small excavator attachment to an ORV, may be used.

Figure 3: Highbanker



*Metal Detector:* A metal detector, such as the Fisher Gold Bug 2 which is on site, would be used to help in exploratory activities in bench deposits or in the creek bed. It operates on two 9-volt batteries and needs no other fuel.

*Miscellaneous tools:* Miscellaneous tools and equipment may be used during mining including gold pans, shovels, hand tools such as hammers and wrenches, picks, ax, generators, power tools (such as drills and saws), pry bars, and protective equipment such as safety glasses and ear protection. All equipment would be removed from the work sites at the end of each season and stored at the support camp. When mining is complete or the tools are obsolete they would be removed from the area entirely.

*Surface Transportation:* Two Canam 4-wheel ORVs and two Polaris ORVs would be used for surface transportation on the claims and for travel from the Chicken Creek Airstrip to the claims.

## **Mining Operations:**

The claimants propose to mine the whole length of the claimed streams possible up to the confluence with Snow Gulch (approximately 15,020 feet) but would focus on areas that are already disturbed by mining (see Figures 6 and 7 in the Mining Plan of Operations, Appendix A). At the rate estimated below, this would not be completed within the 10-year life of this plan.

The proposal is to primarily use the suction dredges to conduct mining operations. The dredges have a box sluice and rest on pontoons in the stream. Water and gravel would be drawn into the intake hose by the suction pump. The material would then be pumped into the sluice box to separate gold from the gravel. The processed gravel and used water would then be discharged into the stream from the sluice box. Each dredge could process from 3 – 5 cubic yards of gold-bearing gravel per day. Small temporary impoundments would be constructed in the stream using large rocks from the existing creek bed. A tarp or similar plastic may be draped over the rocks to impede drainage over the impoundment to create a pond for the dredge to float; however if an impermeable boundary is placed, it would be removed at the cessation of use of that particular impoundment.

Effluent would drain into the impoundment to allow solids to settle prior to being discharged over the temporary impoundment. Most likely, a new impoundment would be constructed every day, and removed every evening unless for some reason dredge activities for the current impoundment are not completed in a single day. In no event would an impoundment remain in place for longer than 7 days. There is no intent to redirect creek flow except as needed during high water events. Water impoundments would not use any material taken from cultural features.

All gravels five inches and smaller would be processed through the floating sluice box, and all materials larger than six inches would be hand moved out of the way and then moved back into the hole after the hole has been dredged. After the overburden is dredged the operators would use prying tools to break open the bedrock, and use the dredge to extract the concentrates from the bedrock. After processing the fractured bedrock, the operators would return the broken bedrock. As the operators move up the channel the dredge would redeposit smaller gravels over the bedrock. In this fashion, reclamation would be concurrent with the operation. Final reclamation would occur at the end of the season, when the final dredge site is leveled out. Dams that were constructed would be broken down and leveled back to the natural contour. The dredging operation is confined to the active stream channel, and would not exceed the annual high water mark.

The operation would start in early June each year and continue until mid-September, depending on the weather conditions. It is estimated that 1 – 10 yards of material would be processed each day, depending on the size of the material and the dredge being used. Maximum yardage would be 500 cubic yards per season, based on a 60 – 100 day season. On an average year, 100-400 linear feet of creek would be mined per season, depending on the depth of the overburden and the width of the creek. Overburden ranges from 1 – 14 feet deep, with an average of 4 – 6 feet. Creek width varies from 5 – 40 feet. The approximate length of creek bed (within the Bonanza and Little El claims, up to the confluence with Snow Gulch) is about 15,020 feet.

Average estimated disturbance from suction dredge activities would be approximately 6,000 square feet per year (.1377 acres/per year).

Metal detectors would be used for the purpose of prospecting and sniping exposed bedrock areas. Exploration activities are planned for all claims. Prospecting would be limited to already disturbed, un-vegetated areas. Test holes would be approximately 6 feet in diameter, and hand dug with a shovel. The maximum number of pits dug per season would be six. Some pits would be out of the active floodplain. Upon completion of testing, all holes would be backfilled into their previous state.

Average estimated disturbance from prospecting activities would be 216 square feet per year (.005 acres).

A Highbanker may be used for areas where suction dredging is not feasible, such as in the steep sections of the creeks. Mineral bearing deposits in these locations would be processed using the sluice box attached to the Highbanker. Gravels to be processed in the highbanker would be moved by hand. It is anticipated that the gravels to be processed in the exposed bench area on the Bonanza and Little El claims would be obtained only from areas that were previously disturbed.

Average estimated disturbance from Highbanker activities is less than 500 square feet per year (approximately .01 acres per year).

## **Water Management**

**Water Use for Operations:** Proposed operations consist of suction dredges with an intake diameter of six inches (or less) which may be operated up to 8 hours a day. Smaller dredges may be used. Maximum manufacturer's rating for the suction dredge pump is approximately 340 gallons of water per minute (gpm). Due to the intake of gravel during dredging, the operator estimates actual water usage at approximately 60 gpm. The operator has obtained a Permit to Appropriate Water (permit #ADL 403938-P) from the State of Alaska pursuant to state law AS 46.15. The permit was issued in 2010, and is valid until September, 2019. The permit is for the use of up to 400,000 gallons of water/day of water for seasonal placer mining within Bonanza claims 1 – 6. No construction of diversion ditches is proposed.

The proposed operation also includes the use of highbankers and a pump to feed the highbanker. Like the suction dredge operations, highbankers are considered by the Alaska Department of Natural Resources as non-consumptive use. For this operation, use of a pump to support highbanker operations would be limited according to the size of the pump to be used.

*Estimated volume of water for operations:* The operator has proposed using up to six suction dredges concurrently during operations. The use of two suction dredges intermittently (or one suction dredge and one highbanker) through the course of the day is more realistic to estimate potential water use. Using the figure of 60 gpm for an 8-hour day for two suction dredges, this would equate to 57,600 gallons per day in an average day of operation.

**Waste Water:** Suction dredge discharge water would be returned directly to the stream channel untreated. Water from the highbanker would be discharged onto barren ground and/or floodplain and allowed to flow back into the stream channel or seep into the ground.

### **Access Trails and Routes within the Claims:**

An ORV would be operated on the existing bladed trail between the support camp and suction dredge or upland bench workings, along bladed trails on the sparsely vegetated floodplain terraces and over previously disturbed, barren and/or sparsely vegetated ground.

### **Reclamation**

Reclamation is proposed as an ongoing process during all phases of the mining operation. The suction dredge would return processed gravel directly to the stream as it exits the sluice. At the end of the summer field season, the operator would level out tailings piles. There is no plan to replace top soil in previously disturbed, barren and/or sparsely vegetated areas that are mixed.

Dams used to enhance water depth for dredge operations would be removed and the dam sites recontoured to approximate the original grade/topography. Temporary holes or overburden stockpiles resulting from highbanker mining or excavation associated with use of the metal detector would be back-filled and/or leveled to approximate the original grade/topography.

Final reclamation at the end of the approved mining operations would consist of removing all equipment and supplies transported to the site to support authorized mining activity and removing and disposing of all garbage, refuse and waste transported to the claims in support of authorized mining activity.

## **2.3 MITIGATING MEASURES**

A complete description of stipulations is provided in Appendix D.

## **2.4 COMPARISON OF ENVIRONMENTAL EFFECTS**

**Table 2: A summary of the environmental effects resulting from each alternative.**

<b>Impact Topic</b>	<b>Effects from Alternative A - No Action</b>	<b>Effects from Alternative B – Proposed MPO</b>
Cultural Resources	No action would result in a negative impact to this cultural landscape because of historic structures not being maintained.	The authorization of small scale mining along with the stipulations would result in a positive, long term impact that would help retain the historic structures and the landscape.
Floodplains	No new direct or indirect impacts to floodplains would occur.	Impacts to floodplains from the proposed mining activities would be approximately 0.1

		acre per year.
Soils	No soil disturbance would occur.	Impacts to soils from the proposed mining activities would be less than .01 acre per year.
Vegetation	No direct and indirect effects to vegetation would take place.	Impacts to vegetation from the proposed mining activities would be slightly more than 0.1 acre per year.
Visual Resources	Past evidence of mining activities would still be visually evident.	The visual evidence of past and present mining has a positive impact on the cultural landscape and would add to the experience of some visitors.
Water and Aquatic Resources	No new impacts.	Proposed mining activities would not change the existing disturbed condition of the water resources.
Wetlands	There would be no new impacts to wetlands.	Impacts to wetlands from the proposed mining activities would be approximately 0.01 acres per year.



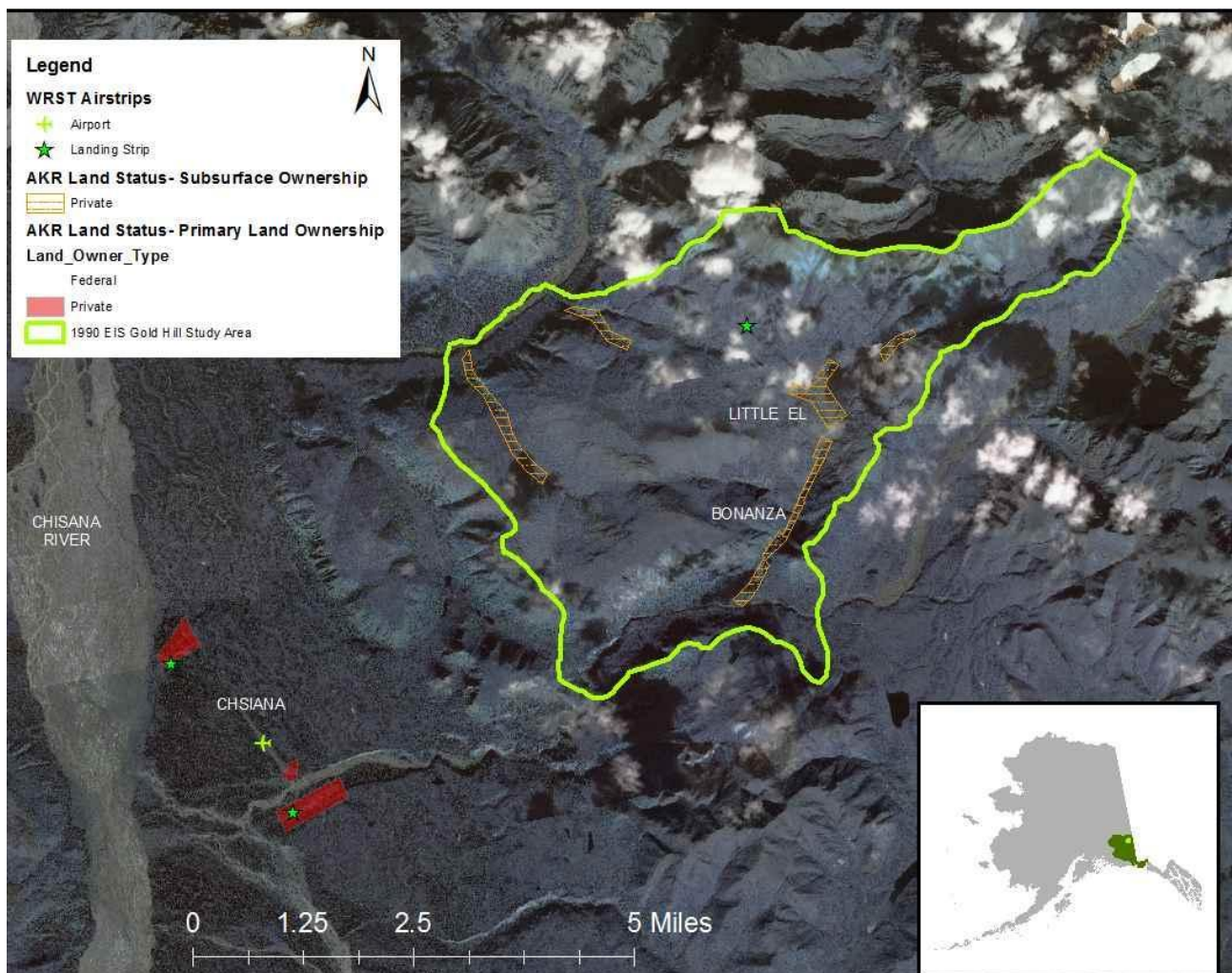
## CHAPTER 3: ENVIRONMENTAL CONSEQUENCES

**Introduction:** This chapter gives a brief description of the existing conditions for each of the impact topics listed in Chapter 1. It also discloses the anticipated direct, indirect, and cumulative impacts expected from the implementation of each alternative.

### 3.1 Project Area

The Gold Hill Project Area, which was analyzed in a 1990 Environmental Impact Statement on cumulative impacts of mining, is shown in Figure 4 and includes the Gold Hill area and all active mining claims in the Gold Hill area (Gold Run, Big Eldorado, Little Eldorado, Bonanza, and Shamrock). The project area is approximately 9,550 acres.

Figure 4: Gold Hill Project Area



## **3.2 Aquatic and Water Resources**

### **3.2.1 Current Conditions of Aquatic and Water Resources**

Bonanza Creek watershed is an unforested alpine drainage encompassing slightly less than 3 square miles. It originates in the Nuzotin Mountains at the 8,010 foot elevation and flows approximately 6 miles before joining Chathenda Creek. Water flow in the stream varies widely with rainfall and seasonal runoff. During times of high water stream flow reaches flood stage. Measured or estimated discharge above the Bonanza claim block ranges from less than 4.7 cubic feet per second (cfs) to over 45.2 cfs. Discharge below the claim block ranges from less than 10.4 cfs to 69.6 cfs. The average stream flow in the area of proposed mining is 11 cfs.

Stream resources were heavily impacted and degraded in the area of these mining claims by past mining operations that altered channel and floodplain morphometry on Bonanza and Skookum Creeks. Repeated placer mining in the creek beds and hydraulic mining of upland benches increased fine sediment loads and degraded water quality. Surface water diversions caused reduced natural flow regimes. Mining operations directly and adversely affected water quality through the loss of wetlands, riparian habitat, vegetation cover and soils. Although most of the soils and fine sediments have been flushed from the floodplain river systems, these disturbed lands continue to be subject to higher levels of erosion. Bonanza and Skookum creeks are not likely to return to pre-mining conditions because of the scope of the past mining and the authorization of continued mining, even if it is small scale.

The existing stream substrate on the claims is composed of boulder, large rock, and gravel with finer materials deposited between them. Bonanza Creek contains an abundance of pools and riffles. The depth of gold-bearing gravel varies with stream morphometry and currents. Gravel overlays and is mixed with fractured and decomposing bedrock to a depth of three to five feet.

The water quality of Bonanza Creek is within the acceptable range required to support aquatic life, according to Environmental Protection Agency and Alaska Department of Environmental Conservation standards (U.S. Geological Survey 1999). However, aquatic life and biomass of the creek is not abundant. Alterations to physical characteristics of the stream and the removal of riparian vegetation by past mining have impacted the aquatic habitat. Dominated by bare rock and near vertical walls, the Bonanza Creek canyon contains only sparse riparian vegetation. Above the canyon to Claim #6, the floodplain of the creek contains little soil to support vegetation. As a result, there is little riparian vegetation and little biomass entering the stream from the claims. The majority of the biomass entering the stream is apparently supplied from the smaller, more closely vegetated headwater streams of Bonanza Creek.

The lack of biomass in the creek results in stream substrate conditions which support only a small population of aquatic macroinvertebrates. Samples of macroinvertebrates were collected from Bonanza Creek by the NPS to identify species but no composition study was conducted. Samples collected indicated very few species of macroinvertebrates are present in the creek and their population is sparse.



The closest known fish to Bonanza Creek are arctic grayling (*Thymallus arcticus*) in the Beaver Creek drainage approximately three miles southeast of the mouth of Bonanza Creek. Beaver Creek and Bonanza Creek are separate drainages with no likelihood of fish passage between them. Neither Alaska Department of Fish & Game nor NPS have documentation of fish presence in Bonanza Creek or its tributaries.

### **3.2.2 Effects on Aquatic and Water Resources from Alternative A (No Action)**

Direct and Indirect Impacts: Under the no action alternative no new impacts to water resources would occur on park lands resulting from authorization to mine. Without new disturbance, some natural revegetation would occur. Erosion from natural disturbances (high water) would affect water quality and natural processes would slowly (over many years) reestablish pre-mining conditions.

Cumulative Impacts: Since there are no direct or indirect effects associated with this alternative, there would be no contribution to cumulative impacts.

### **3.2.3 Effects on Aquatic and Water Resources from Alternative B, Proposed Action with Stipulations**

Direct and Indirect Impacts: Monitoring of past suction dredge operations on Bonanza Creek indicates that the material being mined from the bed of Bonanza Creek would predominantly be gravel and coarse sand with minor amounts of fine sand and silt. Water quality data collected while a suction dredge processed material on Bonanza Creek indicates that, upon re-entering the stream from the sluice, coarse material would settle out relatively quickly. A small volume of fine material would be carried downstream but would settle out within several hundred feet. Shutting dredge operations off would stop the input of sediment and the water would clear up within several minutes.

Suction dredge mining operations would have short-term impacts on water quality from increased sediment load and turbidity proximal to the dredge or where highbanker waters would be returned to the channel. Turbidity and total suspended solids would elevate above background immediately below the discharge point. This turbidity increase would likely exceed background by 5 NTU or more (NPS, 1995). After the discharge plume has mixed with the stream flow, turbidity and total suspended solids would steadily decrease. Monitoring indicates that at 500 feet below the suction dredge, operations would generally meet water quality standards or return to a condition that approximates water quality parameters upstream of operations. This would be greatly dependent upon the existing stream discharge and background conditions at the time of mining. Other water quality parameters would not be notably greater below the suction dredge; however, manganese levels may be elevated in the 100 feet below the dredge, but these levels would also decrease.

The limited aquatic resources of Bonanza and Little El Creeks would be affected by the restructuring of stream substrate as a result of suction dredging. Some disturbance of the sparse plant biomass and macro invertebrates would occur. Impacts would be negligible over previously disturbed and naturally scoured reaches of the stream as a result of dredging operations.

The average measured stream discharge on the claims is approximately 11 cubic feet per second. The average flow translates to approximately 4,937 gallons per minute on Bonanza Creek. A 60 gallons per minute estimated rate of water usage per suction dredge would not reduce flow in Bonanza Creek because the water used during dredging would be immediately returned to the stream by the dredge. Overall, the discharge of Bonanza Creek would not change.

The direct and indirect impacts from mining activities would be temporary and low impact on an important park resource. These would result in minor impacts to water resources.

Conclusion: The proposed mining activities would have minor effects on aquatic and water resources, based on the following:

- **Intensity:** Relatively small scale of disturbance with effects limited to the area in proximity to the suction dredge activities.
- **Context:** Clearwater streams and water quality are referred to in the park's purpose statement: "to maintain unimpaired the scenic beauty and **quality** of high mountain peaks, foothills, glacial systems, lakes, **and streams**, valleys, and coastal landscapes in their natural state." Historic mining activities have resulted in an impacted existing condition for water resources but have also resulted in a cultural landscape that NPS is obligated to maintain. The proposed mining activities on the Little El and Bonanza claims, as well as potential concurrent mining activities on the Shamrock, Gold Run, and Big El claims, would have continuing effects on water quality, as mining operations are conducted. These activities would result in maintenance of the existing disturbed condition of the Bonanza and Skookum drainages.
- **Cumulative Impacts:** Past mining operations have contributed to the disturbed existing condition of aquatic and water resources that is described above in Section 3.2.1. Mining operations were approved for the Shamrock claim group in 2013. The Shamrock claims are located above the Bonanza and Little El claims on the upper portion of Bonanza Creek. Those operations are very similar to mining operations proposed for the Little El and Bonanza claim groups (suction dredge and highbanker operations). The 2013 EA for the Shamrock Group Mining Plan of Operations described a "temporary and low impact" on aquatic and water resources. Suction dredge and highbanker mining operations may also be occurring on the Gold Run and Big Eldorado claim groups in the reasonably foreseeable future. These claim groups are in different watersheds than Little El/Bonanza Creek claims, but involve very similar mining methods and impacts to water resources.

### **3.3 Cultural Resources**

#### **3.3.1 Current Conditions of Cultural Resources**

The Chisana Historic Mining Landscape is listed on the National Register of Historic Places. Bonanza and Little Eldorado Creeks are associated with the 1913-1914 Chisana Gold Rush. The drainages contain significant elements of the historic mining landscape. Cultural resource staff have conducted an archeological inventory of the area of potential effect (APE) in an effort to identify historic properties (36 CFR 800.4(b)) pursuant to the National Historic Preservation Act (NHPA), Section 106 (16 USC 470f).

NPS staff provided recommendations regarding protection and preservation of historic artifacts or features, and these recommendations would become permit conditions.

To the extent possible, cultural artifacts would not be disturbed during mining operations. Isolated artifacts lying on the ground would be temporarily moved to allow mineral extraction; these artifacts would be returned to the location they occupied prior to undertaking mining activities. Direct adverse impacts to cultural resources, such as hand-stacked piles and boomer dam remnants, would be avoided. The claim owners would continue cooperating with the NPS to remove non-historic debris from the area.

The Bonanza 1-6 claim areas are located within the “Lower Bonanza Creek Historic Mining Area” while the Little Eldorado Group claim areas are located within the “Little Eldorado Historic Mining Area” as defined in the Cultural Landscape Report (Feldman 1997:111, 114). The claims contain numerous historic buildings, structures, sites and objects (Table 3) and represent mining throughout the historic period of significance (1913-1945).

The claims were mined extensively after the initial Chisana Gold Rush and continued through the 1940s, primarily through drift mining, shoveling and sluicing. The existing mining landscape is still reflective of early historic mining practices as more recent mining activities (beyond the 1950s) have not re-worked the historic tailings, preserving the associated landform features (Feldman 1997:49-50). The recovery of vegetation, habitat and stream substrate has been minimal, and the whole reflects a landscape in which the cultural remains are an integral component. As a result, the claims and the resources they contain retain a high degree of historic integrity.

Primary character-defining features of the Lower Bonanza Creek Historic Mining Area include the “Earl Hirst Hydraulic System Cluster” (Feldman 1997:111; recorded as Alaska Heritage Resources Survey [AHRS] # 49NAB-00048 and 49NAB-00061) located within the Bonanza #3 claim, the “Eikland-Green Camp Cluster” (ibid.; recorded as AHRS # 49NAB-00047) located within the Bonanza #4 claim, the “Fred Best Camp Cluster” and the “Nelson Hydraulic Mining Cluster” (Feldman 1997:111-112; recorded as 49NAB-00049) located within the Bonanza #5 claim, the “Canyon Creek Prospect Cluster” (Feldman 1997:112) located on the Bonanza #5 claim and the “Bonanza Mining Cluster” (ibid.) located on the Bonanza #2 claim. In addition, two dams are also character-defining elements to the Lower Bonanza Creek Historic Mining Area and include the remains of a crib dam (recorded as 49NAB-00053) and the remains of a boomer dam (ibid; recorded as 49NAB-00060).

Primary character-defining features of the Little Eldorado Creek Historic Mining Area include the “Skookum Creek Mining Cluster” (Feldman 1997:115) located on the Skookum #1 mining claim, the “Snow Gulch Mining Cluster”, the “Snow Gulch Water Supply Cluster” and the “Snow Gulch Exploration Cluster” (ibid.; recorded as AHRS # 49NAB-00052) located on the Snow Gulch #1 claim, the “Little Eldorado Drift Mining Cluster” located just north of the Little Eldorado #2 claim and the “Little Eldorado Mining Camp Cluster” (ibid.; recorded as AHRS # 49NAB-00051) located on the Little Eldorado #2 claim.

The Upper Bonanza Creek Historic Mining Area is located adjacent to the Little Eldorado and Lower Bonanza Historic Mining Areas. This area includes two sites that are located adjacent to the project area and within two primary character-defining features of the Upper Bonanza Creek Historic Mining Area. The associated primary character-defining features include the “Upper Bonanza Habitation Cluster” (Feldman 1997:113; recorded as AHRS # 49NAB-00050) and the “Upper Bonanza Water Supply Cluster” (ibid.; recorded as AHRS # 49NAB-00064).

The cultural resources within the Bonanza #1-6, Skookum #1, Snow Gulch #1, Little Eldorado #1-2 and Little Eldorado Bench #1-2 claims have been extensively documented and mapped through the Cultural Landscape process (Feldman 1997). Although not individually significant, these structures, sites, and objects are contributing elements to the Chisana-Gold Hill Historic District, which is listed on the National Register of Historic Places.

Table 3 lists the cultural resources within and adjacent to the boundaries of the twelve claims. Cultural resources are listed with the Alaska Heritage Resources Survey (AHRS) under the site numbers 49NAB-00047, 49NAB-00053, 49NAB-00060, 49NAB-00061, 49NAB-00079, 49NAB-00059, 49NAB-00080, 49NAB-00090, 49NAB-00064, 49NAB-00052 and parent site numbers 49NAB-00009, 49NAB-00048, 49NAB-00049, 49NAB-00050 and 49NAB-00051. Several buildings have been split out and assigned their own individual numbers and have also been entered into the NPS’ List of Classified Structures (LCS). All of these buildings have been evaluated to be in Good to Poor condition by NPS Cultural Resources staff. Isolated artifacts were not included in the list but are present on the landscape and are contributing elements to the historic landscape. Examples of common isolated artifacts include: lumber scatters, stacked stone, ditch features, prospect pits and artifact scatters (pipe sections, freight sled parts, fuel drums, wagon parts etc...). Most isolates within the project area are large, non-portable features/artifacts and as such are not threatened by the mining operations. Ditch features or tailing piles are not to be disturbed by ground disturbance associated with mining activities. If any of the portable isolated items need to be moved to accommodate mining operations, they would be returned to their original location upon completion of the project.

In order to preserve the historical character of the mining landscape, the CLR treatment recommendations for these claims include “maintain mining as the primary use...” such that “continued mining on the active claims does not disturb the spatial patterns of the historic landscape” (Feldman 1997:152).

Table 3. Archeological Inventories of Bonanza and Little Eldorado Claim Groups.

<b>Bonanza Claim Group Archeological Inventory</b>			
<b>NAB-00047 Canyon Creek Doghouses</b>			
<b>Feature # (AHRS #, if different)</b>	<b>Description</b>	<b>LCS #</b>	<b>Claim #</b>
1	Cabin	38023	Bonanza #4
2	Windlass frame	38061	Bonanza #4
3	Doghouse	38061	Bonanza #4
4	Doghouse	38061	Bonanza #4
5	Doghouse	38061	Bonanza #4

6	Doghouse	38061	Bonanza #4
7	Doghouse	38061	Bonanza #4
8	Doghouse	38061	Bonanza #4
9	Boiler		Bonanza #4
10	Sled, coil, goldpan		Bonanza #4
11	Artifact scatter		Bonanza #4
<b>NAB-00048 Bonanza Creek #3 Claim (includes sites NAB-00154 and NAB-00155)</b>			
<b>Feature # (AHRS #, if different)</b>	<b>Description</b>	<b>LCS #</b>	<b>Claim #</b>
1	Collapsed structure (blacksmith shop)		Bonanza #3
2 (NAB-00154)	Shed	38080	Bonanza #3
3	Tent frame/platform		Bonanza #3
4	Collapsed log structure		Bonanza #3
5	Doghouse	38083	Bonanza #3
6 (NAB-00155)	Two story outhouse	38081	Bonanza #3
7	Boardwalk	38082	Bonanza #3
?	Headbox	38084	Bonanza #3
<b>NAB-00049 Bonanza Creek #5 (includes sites NAB-00149 and NAB-00150)</b>			
<b>Feature # (AHRS #, if different)</b>	<b>Description</b>	<b>LCS #</b>	<b>Claim#</b>
1 (NAB-00149)	Tent frame	38096	Bonanza #5
2 (NAB-00150)	Tent frame	38097	Bonanza #5
3	Wooden flume sections	38098	Bonanza #5
4	Motor		Bonanza #5
5	Boiler and timber scatter		Bonanza #5
6	Wheelbarrow		Bonanza #5
7	Stove		Bonanza #5
8	Flume remnant		Bonanza #5
9	Hand-stacked tailings		Bonanza #5
<b>NAB-00053 Mining Camp</b>			
<b>Feature # (AHRS #, if different)</b>	<b>Description</b>	<b>LCS #</b>	<b>Claim #</b>
1	Tent frame		Bonanza #5
2	Artifact scatter		Bonanza #5
3	Crib dam remains		Bonanza #5
<b>NAB-00060 Hydraulic Mining Site</b>			
<b>Feature # (AHRS #, if different)</b>	<b>Description</b>	<b>LCS #</b>	<b>Claim #</b>
1	Earthen dam		Bonanza #6
2	Sluiceline		Bonanza #6
3	Road		Bonanza #6
4	Sluiceline		Bonanza #6
5	Tent camp		Bonanza #6
6	Tailings dam		Bonanza #6
?	Artifact scatter		Bonanza #6
<b>NAB-00061 Hydraulic Mining Site</b>			
<b>Feature # (AHRS #, if different)</b>	<b>Description</b>	<b>LCS #</b>	<b>Claim #</b>
1	Hydraulic mining pit		Bonanza #3
1(a)	Regulator		Bonanza #3

1(b)	Monitor		Bonanza #3
1(c)	Turnout box		Bonanza #3
2	Bench		Bonanza #3
2(a)	Hydraulic channel		Bonanza #3
<b>NAB-00079 Mining Camp</b>			
<b>Feature # (AHRS #, if different)</b>	<b>Description</b>	<b>LCS #</b>	<b>Claim #</b>
1	Tent frame platform		Bonanza #3
2	Artifact scatter		Bonanza #3
<b>Archeology Sites Located Adjacent to Bonanza Claim Group</b>			
<b>NAB-00009 Bonanza City (Includes sites NAB-00118-00117, NAB-00165 and NAB-00167-00168)</b>			
<b>Feature # (AHRS #, if different)</b>	<b>Description</b>	<b>LCS #</b>	<b>Near Claim #</b>
1 (NAB-00118)	Cabin		Bonanza #1
2 (NAB-00117)	Brothel		Bonanza #1
3	Shed		Bonanza #1
4	Doghouse		Bonanza #1
5	Doghouse		Bonanza #1
6	Log cabin ruin		Bonanza #1
(NAB-00165)	Tailings piles (not relocated)	38054	Bonanza #1
(NAB-00167)	Rock claim markers (not relocated)	38056	Bonanza #1
(NAB-00168)	Wood claim markers (not relocated)	38057	Bonanza #1
<b>NAB-00059 Bonanza Creek Flume (East Bank)</b>			
<b>Feature # (AHRS #, if different)</b>	<b>Description</b>	<b>LCS#</b>	<b>Near Claim #</b>
1	Holding dam remnants		Bonanza #6
2	Wooden flume remnants	38149	Bonanza #6
3	Wooden flume foundation remnants	38149	Bonanza #6
4	Wooden flume segment	38149	Bonanza #6
5	Wooden flume foundation segment	38149	Bonanza #6
6	Ditch remains		Bonanza #6
<b>NAB-00080 Mining Camp</b>			
<b>Feature # (AHRS #, if different)</b>	<b>Description</b>	<b>LCS #</b>	<b>Near Claim #</b>
1	Pit		Bonanza #3
2	Tent frame and artifact scatter		Bonanza #3
3	Table and artifact scatter		Bonanza #3
<b>NAB-00090 Canyon Creek Ditch</b>			
<b>Feature # (AHRS #, if different)</b>	<b>Description</b>	<b>LCS #</b>	<b>Near Claim #</b>
1	Ditch		Bonanza #5

<b>Little Eldorado Claim Group Archeological Inventory</b>			
<b>NAB-00051 Big Eldorado, Dipple's Camp (includes sites NAB-00127-00133)</b>			
<b>Feature # (AHRS #, if different)</b>	<b>Description</b>	<b>LCS #</b>	<b>Claim#</b>
1 (NAB-00127)	Tent Frame	38133	Little Eldorado #2
2 (NAB-00128)	Main Cabin	38134	Little Eldorado #2
3 (NAB-00129)	Tent Frame	38135	Little Eldorado #2

4 (NAB-00130)	Tent Frame	38136	Little Eldorado #2
5 (NAB-00131)	Tent Frame	38137	Little Eldorado #2
6	Outhouse	38138	Little Eldorado #2
7 (NAB-00132)	Shed	38139	Little Eldorado #2
8 (NAB-00133)	Cache	38140	Little Eldorado #2
<b>NAB-00064 Bonanza Flume (West Bank)</b>			
<b>Feature # (AHRS #, if different)</b>	<b>Description</b>	<b>LCS#</b>	<b>Claim #</b>
A	Ditch		Little Eldorado #1
B	Flume box remnants	38150	Little Eldorado #1
B-1	Wooden trestle remains		Little Eldorado #1
A-1	Dam remnants		Little Eldorado #1
B-2	Coarse Money Dam remnants		Little Eldorado #1
C	Flume line foundation (bench cut)		Little Eldorado #1
D	Road		Little Eldorado #1
D-1	Flume box		Little Eldorado #1
D-2	Artifact scatter		Little Eldorado #1
<b>Archeology Sites Located Adjacent to Little Eldorado Claim Group</b>			
<b>NAB-00050 Bonanza Creek, Doghouses (Includes site NAB-00151)</b>			
<b>Feature # (AHRS #, if different)</b>	<b>Description</b>	<b>LCS #</b>	<b>Near Claim #</b>
1	Tent frame ruin		Little El. Bench #1
2 (NAB-00151)	Tent frame	38093	Little El. Bench #1
3	Doghouse	38094	Little El. Bench #1
4	Doghouse	38094	Little El. Bench #1
5	Outhouse		Little El. Bench #1
6	Wood scatter and tools		Little El. Bench #1
7	Overtaken doghouse		Little El. Bench #1
8	Trash scatter		Little El. Bench #1
9	Dam remnant		Little El. Bench #1
10	Flume ruins		Little El. Bench #1
?	Hand-stacked tailings	38095	Little El. Bench #1
<b>NAB-00052 Mining Site</b>			
<b>Feature # (AHRS #, if different)</b>	<b>Description</b>	<b>LCS#</b>	<b>Near Claim #</b>
1	Boiler		Snow Gulch #1
2	Test pit		Snow Gulch #1
3	Test pit		Snow Gulch #1
4	Test pit		Snow Gulch #1
5	Rocker box		Snow Gulch #1
6	Ditch		Snow Gulch #1
7	Artifact scatter		Snow Gulch #1
8	Tailings pile		Snow Gulch #1

### **3.3.2 Effects on Cultural Resources from Alternative A, No Action**

Direct and Indirect Impacts: The NPS would not permit mining activities; there would be no direct impacts to cultural resources from mining activities. Cultural resources would only be impacted by the passage of time and natural forces, which would result in gradual deterioration as vegetation encroaches on structures, roofs deteriorate and allow exposure to the elements, and structural integrity deteriorates. Without human presence on the claims, portable artifacts could be removed by visitors, who could also damage or destroy structures or cultural features (either intentionally or unintentionally). No action would result in a minor negative impact to this cultural landscape.

Cumulative Impacts: Past mining activities have shaped the historic landscape to roughly its current configuration, although activities later than the period of significance for the Historic District may have altered it in unknown ways. Although the cultural resources have been well documented and mapped, NPS has no plans for large-scale recovery or collection of artifacts, or substantial structural preservation operations. Other reasonably foreseeable mining that would occur on the Shamrock, Big Eldorado, or Gold Run claims would have a minor positive impact on maintaining the cultural landscape within the Historic District.

Conclusion: The Chisana Historic Mining Landscape is listed on the National Register of Historic Places. Bonanza and Little Eldorado Creeks are associated with the 1913-1914 Chisana Gold Rush. The drainages contain significant elements of the historic mining landscape. In order to preserve the historical character of the mining landscape, the Cultural Landscape Report treatment recommendations for these claims include “maintain mining as the primary use...” such that “continued mining on the active claims does not disturb the spatial patterns of the historic landscape” (Feldman 1997:152). With no small-scale placer mining, and no use of the historic structures, some gradual deterioration of cultural resources on the claims would occur, resulting in minor negative impacts to cultural resources.

### **3.3.3 Effects on Cultural Resources from Alternative B, Proposed Action with Stipulations**

Direct and Indirect Impacts: Active mining on the scale proposed would not notably alter the integrity of the landscape of the historic district. The Cultural Landscape Report proposed active mining as a suitable treatment for these claims, with the caveat that it not degrade, destroy, or alter the landscape, structures, or artifacts. Although there may be temporary impacts to individual artifacts that need to be moved during mining operations, they would be replaced when finished so the impact would be minimal. Moving of artifacts would need to follow the guidance provided by NPS (Stipulations, Appendix D). The proposed uses and repairs of structures, if done with in-kind materials, would be a positive, long term impact that would help retain the structures and the landscape.

Conclusion: The proposed mining activities would have a minor positive effect on cultural resources, based on the following:

- Intensity: Proposed uses and repairs of structures would result in a positive, long term impact that would help retain the structures and the cultural landscape.



- Context: The Chisana Historic Mining Landscape is listed on the National Register of Historic Places. Bonanza and Little Eldorado Creeks are associated with the 1913-1914 Chisana Gold Rush. The drainages contain significant elements of the historic mining landscape. In order to preserve the historical character of the mining landscape, the Cultural Landscape Report treatment recommendations for these claims include “maintain mining as the primary use...” such that “continued mining on the active claims does not disturb the spatial patterns of the historic landscape” (Feldman 1997:152). The authorization of small scale mining along with the stipulations described in Appendix D would result in a positive, long term impact that would help retain the historic structures and the landscape.
- Cumulative Impacts: Other reasonably foreseeable mining that would occur on the Shamrock, Big Eldorado, or Gold Run claims would have a minor positive impact on maintaining the cultural landscape within the Historic District.

### **3.4 Floodplains**

#### **3.4.1 Current Condition of Floodplains**

Most historic mining operations were situated within the floodplains and adjacent riparian zone within the Bonanza and Skookum drainages. These floodplains and riparian zones have been extensively disturbed, are dysfunctional, and have lost substantial components; they no longer resemble un-mined reaches elsewhere in the area. Past mining disturbance has altered most of the streambed, floodplain and associated wetlands along the drainage bottoms. Remnants of historic boomer dams, hand-stacked tailings, and prospect pits are situated in the floodplain and may adversely affect floodplain function.

At present, the riverine system wetlands consist of the upper perennial stream channel and intermittently flooded channel and bank gravel bars. Floodplain bars contain scrub-shrub wetlands in various stages of development. The channel width of Bonanza Creek ranges from 10 to 35 feet within the Bonanza claim blocks. The floodplain is widest on Bonanza claim #1, where the alluvial fan of Bonanza Creek is located. During times of high water, the entire floodplain may be covered on Bonanza claims 2 – 6. Periodic flooding increases the volume and size of the bed load and spreads it over the floodplain. This scours the stream bottom and riparian area, slows the establishment of aquatic and terrestrial vegetation, and often alters the physical characteristics of the stream channel.

#### **3.4.2 Effects on Floodplains from Alternative A, No Action**

Direct and Indirect Impacts: Under the No-Action alternative no new direct or indirect impacts to floodplains would occur.

Cumulative Impacts: Since there are no direct or indirect effects associated with this alternative, there would be no contribution to cumulative impacts.

#### **3.4.3 Effect on Floodplains from Alternative B, Proposed Action with Stipulations**

Direct and Indirect Impacts: Suction dredge placer mining operations would be, by necessity, conducted within the active floodplain of Bonanza and Little Eldorado creeks. Mining operations affect the active

floodplain by processing channel and bank gravel bars and temporarily altering local stream channel configuration and flow. Impacts generally consist of pulling up and mixing the stream substrate by dredge and by hand and laying the substrate back during discharge and reclamation. Some highbanker operations would occur in sparsely vegetated floodplain. These mining operations would have low intensity effects on the existing condition of the floodplain and stream channel because it is a barren floodplain over most reaches of the stream within the claim blocks. Most proposed suction dredging would occur in previously disturbed areas of the Bonanza and Little Eldorado floodplains. Additionally, the floodplain substrate is primarily gravel and cobbles with very little riparian vegetation.

Approximately 15,020 feet of floodplain along Bonanza and Little Eldorado Creeks could be mined under the proposed MPO. However, based on anticipated progression of mining described in Section 2.2.2 (Proposed Mining Plan of Operations), mining in the floodplain would occur at a rate of 200 – 400 linear feet per year. This equates to a disturbance area of approximately 6,000 square feet (or approximately 0.1 acre) per year.

Conclusion: The proposed mining activities would have minor effects to floodplains, based on the following:

- Intensity: Relatively small scale of disturbance to a previously disturbed floodplain.
- Context: Bonanza Creek is an integral part of the Chisana Historic Mining Landscape. The NPS manages the Gold Hill area and Bonanza Creek for its historic value and therefore preservation of the historic landscape takes precedent over some adverse impacts to natural resources and processes. Multiple historic features and structures have been identified, including wooden remnants of boomer dams and linear hand-stacked tailings. These features adversely impact the floodplain function within the Bonanza claim group but would be preserved to protect the cultural landscape.
- Context: The disturbed floodplains and creeks do not contain fish populations and do not represent a rare or unusual resource. The proposed action would continue low levels of disturbance in these floodplains for the life of the plan, estimated at 10 years.
- Cumulative Impacts: Past mining in the area has resulted in the existing conditions described above under 3.4.1. Within the Bonanza drainage, the Shamrock Mining Plan of Operations could disturb up to 2,650 linear feet of floodplains upstream of the Bonanza claims. Suction dredge and highbanker mining operations may also be occurring on the Gold Run and Big Eldorado claim groups in the reasonably foreseeable future. These claim groups are in different watersheds than the Little El/Bonanza Creek claims. The proposed action would continue to disturb approximately 6,000 feet of floodplains. The contribution of the proposed action to cumulative effects on floodplains is estimated to be minor, as the proposed action is within a previously disturbed area.

Executive Order 11988 Floodplain Management has been considered in this EA and a Floodplains Statement of Findings has been prepared (Appendix E).

## **3.5 Soils**

### **3.5.1 Current Condition of Soils**

Regional climatic conditions strongly control the character of upland soils in the area. Low soil temperature and sporadically discontinuous permafrost have limited soil development. Soils typically consist of a thin (5 to 7 cm) surface organic layer covering loamy to sandy loam weathered marine and volcanic and igneous bedrock, glaciofluvial deposits and recent volcanic tephra. The depth of the seasonally active soil layer ranges from 30 to 60 cm. Soil moisture regimes range from mesic to hydric. Soil oxygen content is low in the hydric soils.

Past mining activity within the floodplain and valley walls has altered much of the floodplain and bench soils. Mining has exposed mineral and organic soil, subjecting it to downstream transport and leaving a predominantly gravel and cobble substrate. Some new fine textured material has been deposited throughout the floodplain. However, the steep gradient, narrow character, and sparse vegetation of the floodplain increases channel scouring during high water events. High water carries and redistributes fine materials in the floodplain, and flushes fine materials from the drainage into Chathenda Creek.

Channel and bank gravel bars are present throughout much of Bonanza Creek floodplain. Most stream channel and bank gravel bars on the claims are the result of historic mining and associated redeposition of materials. These gravel bars do not contain soils with developed horizons.

### **3.5.2 Effects on Soils from Alternative A, No Action**

Direct and Indirect Effects: No mining would be authorized, no soil disturbance would occur as a result of mining activities.

Cumulative Impacts: Since there are no direct or indirect effects associated with this alternative, there would be no contribution to cumulative impacts.

### **3.5.3 Effects on Soils from Alternative B, Proposed Action with Stipulations**

Direct and Indirect Effects: Dredging of barren gravel bars would result in minimal soil loss and negligible additional impacts to floodplain soils because there are no soils in the channel. Highbanker operations would be confined to barren or disturbed lands with limited or no soil development. Hence this impact would be negligible. Digging small holes at metal detector locations would cause direct short-term impacts on established soil outside the floodplains, but concurrent reclamation would minimize these impacts. Overall there would be less than 0.01 acres of soil disturbance associated with this alternative.

Conclusion: The proposed mining activities would have minor effects to soils, based on the following:

- Intensity: Relatively small scale of disturbance to previously disturbed soils.
- Context: The impacts do not interfere with the park's ability to fulfill its purpose. Management for healthy soils is not identified as a specific purpose in the establishing legislation of the park

and soils are not specifically mentioned in the park's general management plan as being of significance. Soils are not a rare or unusual resource.

- Cumulative impacts: There are proposed mining operations on two other claim blocks (Gold Run and Big Eldorado) that are likely to proceed in the near future. These would result in similar direct and indirect impacts to soils, because most proposed mining is via suction dredge in gravel floodplains that have been previously impacted, and little to no soil exists. Cumulatively, impacts from these operations combined with the Bonanza/Little El operations would result in less than one acre of soil disturbance.

## 3.6 Vegetation

### 3.6.1 Current Condition of Vegetation

The Bonanza and Little Eldorado mining claims are sparsely vegetated. The tallest vegetation along the creek on claims 2-6 consists of several species of willow (*Salix spp.*). Several other shrub species are scattered along the creek where there is enough soil to support them. Grass, sedge and a variety of forbs grow in riparian areas where soil permits. The hillsides above Bonanza Creek are covered by a varied mosaic of subarctic vegetation cover types, including open and closed tall, low, and dwarf scrub, and mesic and dry graminoid herbaceous (Viereck et. al. 1992). Sedge (*Carex spp.*), willow, and dwarf birch (*Betula nana*) predominate in mesic areas. Close ground cover consists mainly of mosses and lichens. Tall shrubs, primarily willows, occur in drainages along the valley wall. Bonanza #1 has the least disturbed floodplain, and contains some isolated open poplar (*Populus spp.*) stands. Remnant stands of spruce (*Picea glauca*) woodland also occur on the bench above the Bonanza #1 floodplain.

Past actions that have impacted vegetation in the project area include clearing for past mining activities (approximately 130 acres within the entire project area); associated logging for construction materials and heating fuel; construction of the Chicken Creek Airstrip; use of ORV access supply routes; and horse grazing. Such activities have altered, damaged, and destroyed local vegetation, although some of that damage has been naturally mitigated by subsequent revegetation. Change detection between satellite imagery in the 1980's to more recently, shows that much of the originally disturbed land is in some stage of vegetation recovery.

To date, no non-native invasive plants have been documented in the Gold Hill project area (NPS 2012, Lain and Terwilliger 2003). Four Alaska Natural Heritage Program (AKNHP) rare plants have been documented within the Gold Hill project area. They are moonwort (*Botrychium ascendens*); lancepod whitlowgrass (*Draba praealta*); Bostock's minerslettuce (*Montia bostockii*); and bluegrass (*Poa secunda*).

### 3.6.2 Effects on Vegetation from Alternative A, No Action

Direct and Indirect Effects: No mining would occur and no direct or indirect effects to vegetation would take place.

Cumulative Impacts: Since there are no direct or indirect effects associated with this alternative, there would be no contribution to cumulative impacts.

### **3.6.3 Effects on Vegetation from Alternative B, Proposed Action with Stipulations**

Direct and Indirect Effects: Annual estimated disturbance from all proposed mining activities on the Little El and Bonanza claim blocks would be slightly more than 0.1 acre per year or up to 1.4 acres over a 10-year period. Most of these activities would be associated with suction dredge operations in previously disturbed and sparsely vegetated areas. Soil or vegetation disturbance could lead to an increased risk of introducing non-native vegetation to the area, but to date none has been found. It is not anticipated that the four AKNHP rare plants would be affected by the mining due to their distribution and habitats.

Conclusion: The proposed mining activities would have minor effects to vegetation, based on the following:

- Intensity: Relatively small scale of disturbance to previously disturbed vegetation.
- Context: The impacts do not interfere with the park's ability to fulfill its purpose. Management for healthy vegetation is not specifically identified as a specific purpose in the establishing legislation of the park and vegetation is not specifically mentioned in the park's general management plan as being of significance. No rare or unusual vegetation species would be disturbed.
- Cumulative Impacts: There are proposed mining operations on two other claim blocks (Gold Run and Big Eldorado) that are likely to proceed in the near future. These would result in similar direct and indirect impacts to vegetation, because most proposed mining is via suction dredge in gravel floodplains that have been previously impacted, and only sparse vegetation exists. Cumulatively, impacts from these operations combined with the Bonanza/Little El operations would result in less than one acre of vegetation disturbance per year and less than five acres vegetation disturbance over a ten-year period.

## **3.7 Wetlands**

### **3.7.1 Current Condition of Wetlands**

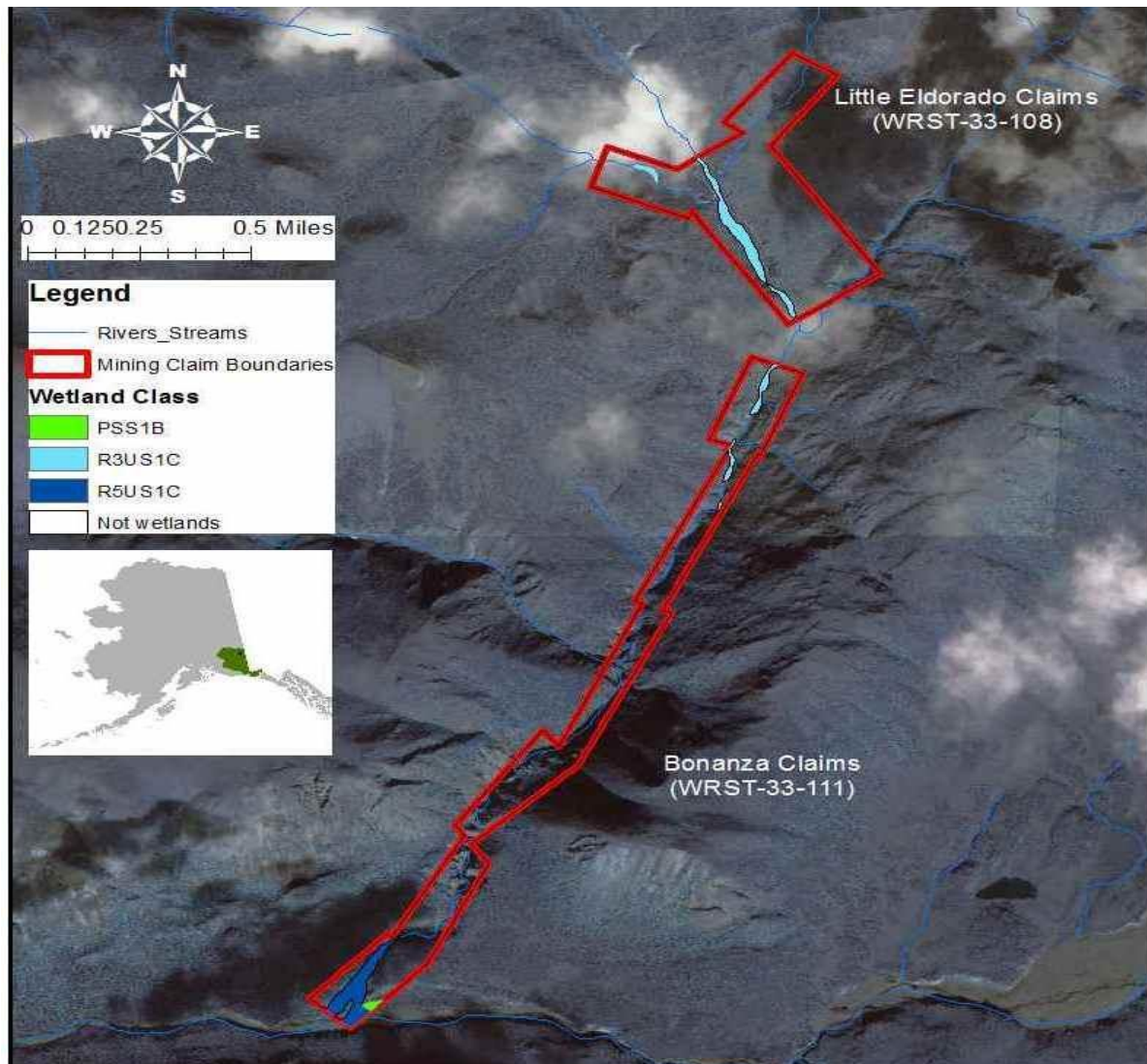
Wetlands were identified and mapped for the entire Gold Hill area using the standardized National Wetlands Inventory (Cowardin et al. 1979) methodology in 2013 and 2014 (Robertson et al. 2015). In total, three different kinds of wetlands were identified in the Bonanza and Little Eldorado claim areas, approximately 30 acres of riverine, tidal, unconsolidated shore, seasonally flooded, shrub-scrub wetlands (R3US1C, R5US1C in Figure 5) and approximately 6 acres of Palustrine, Scrub Shrub Broad-Leaved Deciduous, Saturated (PSS1B in Figure 5). Respectively, that is approximately 7 acres (R5US1C) in Little Eldorado and approximately 29 acres in the Bonanza claims (approximately 4 acres of R3US1C, approximately 19 acres of R5US1C, and approximately 6 acres of PSS1B).

The PSS1B designation is palustrine (saturated wetland); shrub-scrub dominated by broad-leaved deciduous species (here they were primarily dominated by willow, *Salix* sp., or alder *Alnus* sp.). The RUS1C designation translates as riverine (cobble/gravel areas), unknown (unknown length of saturation),

unconsolidated shore, and seasonally flooded (usually in the spring). The R3 designation includes cobble/gravel areas along stream beds with designated channels while the R5 designation included areas within a braided stream or river channel.

Past mining disturbance and periodic flooding have altered the stream channel and floodplain such that it is difficult to know what wetlands were originally there. Much of the original disturbance to the wetlands remains through contributing historical artifacts, such as boomer dams, ditches, and tailings piles. NPS manages features to preserve the cultural landscape of a historic district. Floodplain bars contain scrub-shrub wetlands in various stages of development along the stream channel.

Figure 5: Wetlands within the Bonanza and Little El claims



### 3.7.2 Effects on Wetlands from Alternative A, No Action

Direct and Indirect Impacts: Under this alternative, no mining would be authorized for the Bonanza or Little El claims. There would be no new impacts to wetlands.

Cumulative Impacts: Since there are no direct or indirect effects associated with this alternative, there would be no contribution to cumulative impacts.

### 3.7.3 Effects on Wetlands from Alternative B, Proposed Action with Stipulations

Direct and Indirect Impacts: Alternative B would result in some temporary, direct loss of wetlands due to mining activities. Approximately 500 cubic yards per season would be mined, mostly within previously disturbed riverine wetlands in the stream bed. Stipulations for the miners to use reclamation as an ongoing process during all phases of the mining operation would help minimize impacts to wetlands. Actions such as the suction dredge returning processed gravel directly to the stream as it exits the sluice and leveling out any tailings piles or dams at the end of the field season combined with the natural dynamics of this glacially fed system would result in a temporary, yearly disruption of wetland functions and features of 0.01 acre a year. Disturbed wetland area resulting from suction dredge and high-banker operation is estimated at approximately 1 acre over a ten-year period. All of these wetlands have been previously disturbed.

Cumulative Impacts: Past mining activities have contributed to the existing condition of wetlands described above under 3.7.1. There are proposed mining operations on two other claim blocks (Gold Run and Big Eldorado) that are likely to proceed in the near future. These would result in similar direct and indirect impacts to wetlands, because most proposed mining is via suction dredge in riverine wetlands. Cumulatively, impacts from these operations combined with the Bonanza/Little El operations would result in less than one acre of wetlands disturbance per year and less than five acres wetlands disturbance over a ten-year period.

Conclusion: The proposed mining activities would have minor effects to wetlands, based on the following:

- Intensity: Relatively small scale of disturbance to previously disturbed wetlands.
- Context: The impacts do not interfere with the park's ability to fulfill its purpose. Management for wetlands is not specifically identified as a specific purpose in the establishing legislation of the park and wetlands are not specifically mentioned in the park's general management plan as being of significance. Wetlands are a key component to "continuous intact ecological communities that create visually diverse scenery largely unaffected by humans" which is identified as significant for WRST in enabling legislation (ANILCA).
- Cumulative Impacts: Past mining activities have contributed to the existing condition of wetlands described above under 3.7.1. There are proposed mining operations on two other claim blocks (Gold Run and Big Eldorado) that are likely to proceed in the near future. These would result in similar direct and indirect impacts to wetlands, because most proposed mining is via suction dredge in riverine wetlands. Cumulatively, impacts from these operations combined with the Bonanza/Little El operations would result in less than one acre of wetlands disturbance per year and less than five acres wetlands disturbance over a ten-year period.

Based on the nature of the proposed mining, an annual wetlands disturbance of 0.01 acres is predicted. Because the claimants operate periodically (not every year), the total disturbance from this project over the life of the plan (10 years) would be less than 0.1 acres, all in previously disturbed wetlands. Consistent with NPS Procedural Manual #77-1, this project meets the criteria for not requiring the preparation of a Wetlands Statement of Findings.

## **3.8 Visual Resources**

### **3.8.1 Current Condition of Visual Resources**

The Gold Hill project area is characterized by rolling hills covered with moist tundra. From the top of rounded Gold Hill, several shallow valleys flow north and east. Bonanza Creek forms a steep sided, narrow and rocky canyon in its lower reaches, while Chavolda and Chathenda creeks, both wide, braided streams, have formed major, spruce-lined valleys on the north and south ends of the study area. A long barren ridge of talus forms the northeast edge of the project area.

Views from the project area are often down the broad shallow drainages, across the unseen valleys of Chavolda or Chathenda creeks, and are then limited by small, nearby, rocky mountains. From some of the higher sites in the project area, the very wide and braided channel of the Chisana River and the Nutzotin mountains can be seen.

Past and present mining has created visual impacts in the form of creek bed and riparian disturbance. More obvious visually are the historic roads that have become ORV trails and historic ditches used for water conveyance and diversion. These linear features have created visual scars across the landscape. However, these features are important components of the cultural landscape within a National Register Historic District.

### **3.8.2 Effects on Visual Resources from Alternative A, No Action**

Direct and Indirect Effects: Under this alternative, no mining activities would take place on the Bonanza and Little El claims. This alternative would not generate direct or indirect effects to visual resources. Past evidence of mining activities would still be apparent.

Cumulative Impacts: Since there are no direct or indirect effects associated with this alternative, there would be no contribution to cumulative impacts.

### **3.8.3 Effects on Visual Resources from Alternative B, Proposed Action with Stipulations**

Direct and Indirect Effects: This alternative would result in mining activities, including use of a suction dredge and highbanker in areas previously disturbed by mining. Annual area of disturbance from these activities is estimated to be very low (0.06 acres per year). Access to the claims would use existing



airstrips and ORV trails. There would be very little noticeable change to the existing condition of visual resources.

Conclusion: Alternative B would result in minor impacts to an already impacted visual resource, for the following reasons:

- Intensity: Relatively small scale of disturbance.
- Context: The features that impact visual resources, such as linear historic ditches, historic roads, and trails, are features that are important components of the cultural landscape within a National Register Historic District.
- Cumulative impacts: Reasonably foreseeable future actions include suction dredge and highbanker operations on the Shamrock, Gold Run, and Big Eldorado claim groups. ORV use to access these operations would continue on the established trails between the Chicken Creek Airstrip and those claims. Because of the small scale of mining operations proposed at these operations, there would be very little noticeable change to the existing condition of visual resources.

## 4.0 Literature Cited and Supporting Documents

Cowardin, L.M., V.Carter, F.C. Golet and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. Washington, D.C.: U.S. Fish and Wildlife Service. Biological Services Program publication FWS/OBS-79/31. 131 pp.

Felman, Carol, 1997. The Chisana-Gold Hill Landscape, A Cultural Landscape Report. National Park Service, Wrangell-St. Elias National Park and

NPS, 1990. Final Environmental Impact Statement, Cumulative Impacts of Mining, Wrangell St. Elias National Park and Preserve, Alaska. USDI, National Park Service, Alaska Regional Office, Anchorage, AK. 521 pp.

NPS, 1995. Environmental Assessment, Five year plan of operations, Bonanza Creek No. 1 – No. 6 placer claims, Wrangell St. Elias National park and Preserve, Alaska. USDI, National Park Service, Wrangell St. Elias National Park and Preserve, Copper Center, AK. 106 pp.

NPS 2012. Lain, AM and MLN Terwilliger. 2012. Invasive plant management in Wrangell St. Elias National Park and Preserve: 2012 summary Report. Natural Resources Data Series NPS/WRST/NRDS-2013/433. National Park Service, Fort Collins, Colorado.

USGS 1999. Eppinger, R.G., Briggs, P.H., Rosenkrans, D., and Ballestrazze, V., 2000, Environmental geochemical studies of select mineral deposits in Wrangell-St. Elias NP/P, Alaska: U.S. Geological Survey Professional Paper No. 1619.

Viereck, L.A., C.T. Dyrness, A.R. Batten, and K.J. Wenzlick. 1992. The Alaska vegetation classification. Gen. Tech Rep. PNW-GTR-286. Portland, OR, U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 278 pp.