The Geomorphic Evolution of the Adams Creek Drainage and Implications for Placer Gold Exploration

Claims 12 and 20-22
Adams Creek (115O/14), Yukon Territory
64 55' 30" lat. 139 23' long.

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Prepared for:
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This report has been examined by the Geological Evaluation Unit under Section 41 Yukon Placer Mining Act and is recommended as allowable representation work in the amount of $ 800.00.

for Chief Geologist, Exploration and Geological Services Division, Northern Affairs Program for Commissioner of Yukon Territory.

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1.0 Introduction and Objectives

A geomorphic analysis of the Adams Creek drainage aims to provide a better understanding of the evolution of the drainage (Figure 1). A more specific understanding of claim 6 and claims 12-22 are the focus of this study, however, the entire drainage is analized with respect to prosepective placers. The evolution of the Adams Creek drainage has likely parallelled the evolution of the Klondike River and Bonanza Creek systems. The analyses assumes that base level adjustments emplaced on higher order streams like the Klondike River influence the development of lower order streams like Adams Creek. By understanding the regional history, and through analyses of stream gradients and geomorphic features in Adams Creek, a drainage evolution is proposed with implications for placer gold development.

1.1 Methodology

The study is based on geomorphic analyses of air photographs and topographic map 115 O/14. Interpretation of the surficial geology, which included permafrost features, bench-like forms, and ground deposits, was completed using the air photographs. A longitudinal profile of Adams Creek and Stampede Creek, as well as a cross-valley profile, were constructed using the 1:50,000 scale topographic map.

1.2 Regional Setting

Adams Creek is located on the northern fringe of Klondike Plateau in Yukon Territory. This creek is a tributary to Bonanza Creek, which is part of the Klondike River drainage system. Adams Creek flows into Bonanza Creek from the west, approximately 2 km downstream from

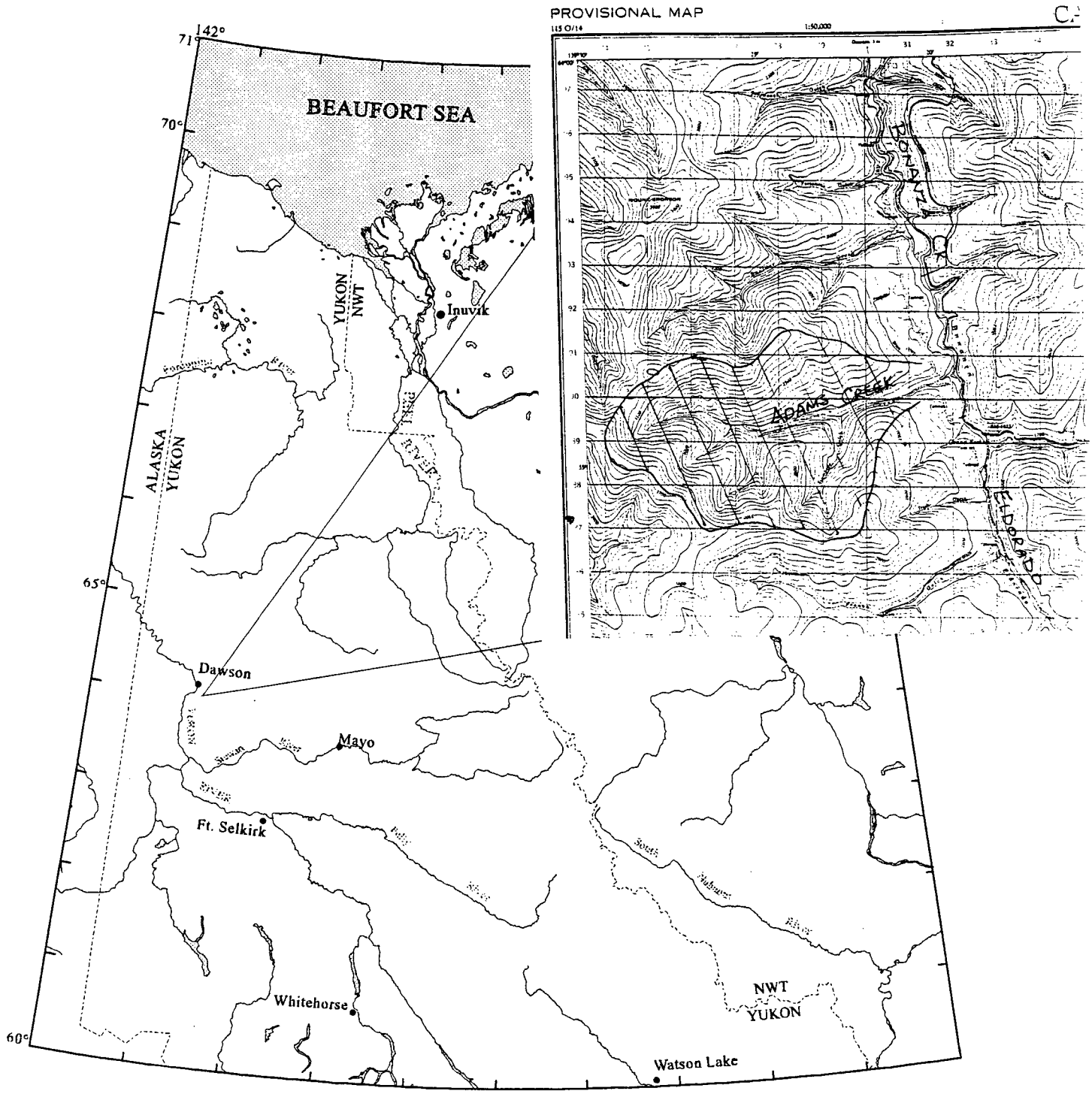

Figure 1: Location of Adams Creek

the confluence between Bonanza Creek and Eldorado Creek (Figure 2).

The region lies within the unglaciated terrain of central Yukon. Pre-Reid glaciations, which constitute multiple glaciations from approximately 300000 years to 2.58 million years ago, glaciated regions immediately to the east (Bond 1995; Froese personal communication 1996). Glacial melt water, emmitted from ice in Tintina Trench, flowed into the Klondike River drainage and finally into the Yukon River. These gravels were deposited over the White Channel fill in Klondike River valley near Dawson and marked the end of the aggrading White Channel system and the onset of the present glacial period. Regional glacial diversions included diversion of the former south flowing Yukon River to the north and diversion of the former Tintina Trench bound south flowing Klondike River into the Bonanza Creek area. Incision of the Klondike River into the Klondike glacial outwash and White Channel gravels resulted in a large drop in base level for all the north flowing streams in the goldfields. This initial base level adjustment followed by over 2.5 million years of erosion, provides the setting for the Klondike gold fields today.

1.3 Bedrock Geology

The Klondike goldfields lie within Yukon Crystalline Terrane found southwest of Tintina Trench (Green 1972). Klondike Series rocks, composed primarily of Klondike Schist, are found in the vicinity of Adams Creek in the Bonanza Creek drainage. Quartz-eye schist and quartz-feldspar-eye schist appear most abundant in the area of Eldorado, lower Bonanza Creek and ridges west of the Bonanza-Eldorado area, which includes the Adams Creek drainage (McConnell *in* Bostock 1957). Physical weathering tends to produce large blocky fragments and shaley material depending on the characteristics of the competent schist bands (Milner ?). The most

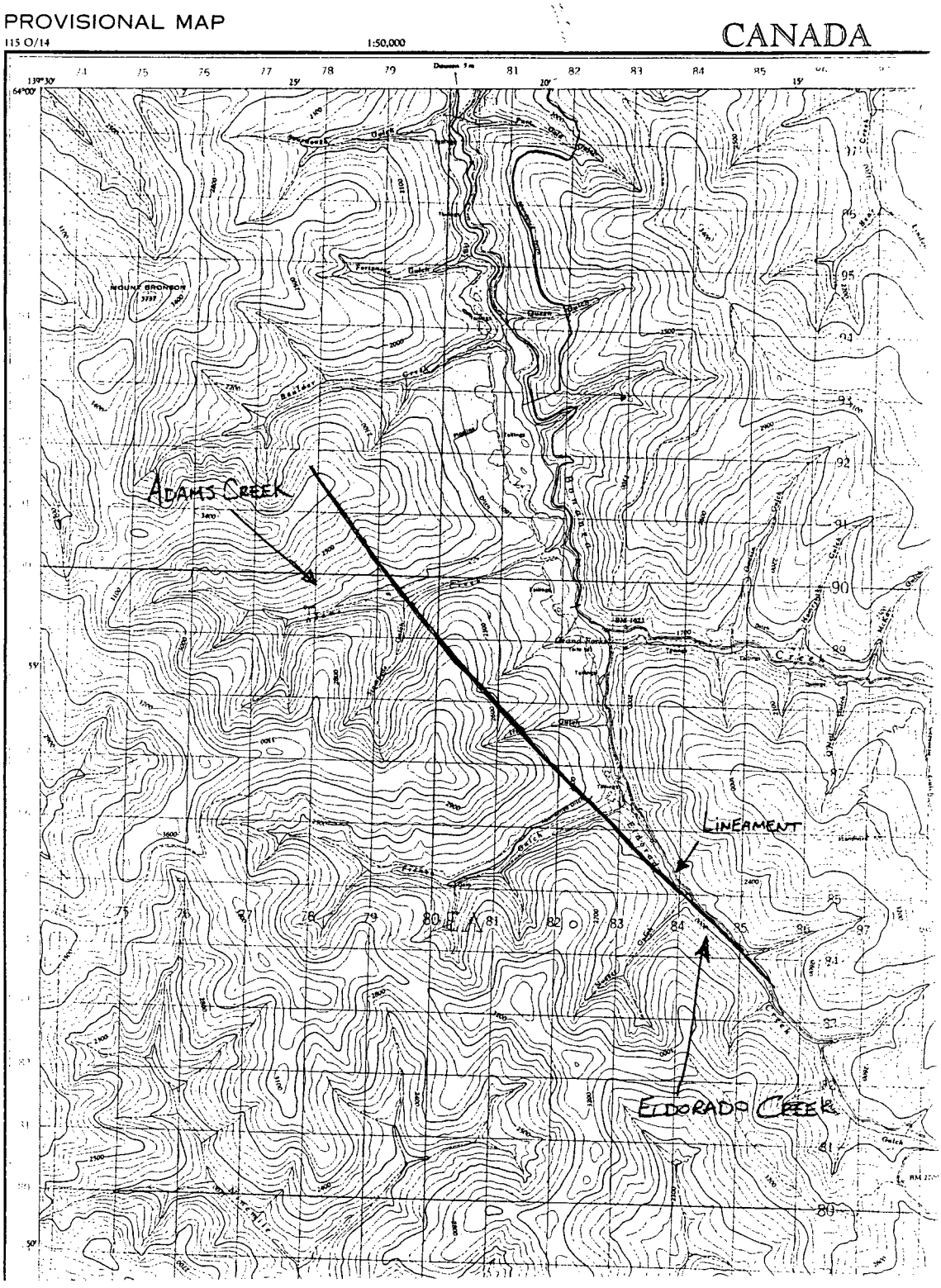

Figure 2: Location of Adams Creek with respect to Eldorado Creek and lineament.

important structural lineament in the Adams Creek area is the Eldorado Creek fault. The fault zone is 100 feet wide, trends at 136, and dips 60 southwest in upper Eldorado Creek (Milner ?). Placer gold in Eldorado Creek may be derived from this fault, which may point to a placer gold source for Adams Creek. Extrapolating the fault from Eldorado Creek to Adams Creek would indicate an intersection at approximately the junction between Stampede Gulch and Adams Creek. The lineament is better observed on the north side of the Adams Creek valley, where a small tributary appears to be confined by the fault (Figure 2). A pingo was identified on the north side of Adams Creek, immediately above the confluence with Stampede Gulch. The pingos presence supports the location of a fault through this part of Adams Creek valley. Hughes (1969) suggests that the distribution of pingos may be controlled by permeable fault or fracture zones that promote the flow of subpermafrost water. Subpermafrost water was noted on Eldorado Creek when "Deep-hole Thompson" and Dr. A.T. Hayden encountered artesian water at a depth of 221 feet flowing at 1000 gallons per minute below a fault breccia (Baird 1963; Tyrrell 1903). This fault and artesian system may coincide with the lineament that passes through Adams Creek.

2.0 Geomorphology of Adams Creek Drainage

Examining the geomorphology of Adams Creek from air photographs revealed subtle bench-like features on the north side of the valley below the confluence with Stampede Gulch (Figure 3). A second important feature is a pingo located just up stream from the confluence of Adams Creek and Stampede Gulch (Figure 3). This pingo is located on or adjacent to the previously mentioned northwest trending lineament. On either side of the mouth of Adams Creek high level benches were mapped as the White Channel deposits of Bonanza Creek valley.

Legend

Ap - Alluvial Plain (Floodplain)
Af - Alluvial Fan
Cv - Colluvial veneer (slope wash <1m thick)
Proposed location of Bench
MW - Mine Workings

N

2 Km

Figure 3: The Geomorphology of Adams Creek Drainage.

Interestingly, from aerial photos, it appears that mining cuts on the White Channel benches only penetrate about half of the bench width.

From a 1:50000 scale map sheet a longitudinal profile of Adams Creek and Stampede Gulch was constructed showing the average gradient of the stream between each contour elevation (Figure 4). On Adams Creek the intervals between 1600-1700 feet and 1900-2000 feet show a relatively gentle gradient (Figure 4). Development of the fluctuating stream gradient observed in figure 4 may be related to a number of influences including, the bedrock lithology, environmental effects on base level, or the hydrology of stream erosion near points of tributary confluence. This study explains the origin of the Adams Creek drainage profile according to its base level control governed by the history of Bonanza Creek and Klondike River valleys. The longitudinal profile of Adams Creek contains an upper remnant portion possibly correlative with two benches on the north side of Adams Creek and the White Channel benches on Bonanza Creek (White Channel phase). A period of incision followed which is evident in the profile of both Adams Creek and Stampede Gulch (post-Klondike outwash phase). A second period of incision on Adams Creek is localized near Bonanza Creek valley (Bonanza bedrock incision phase). Implications for placer gold development will follow.

2.1 White Channel Phase

The remnant portion of Adams Creek and Stampede Gulch from the initial erosional period or White Channel phase is identified as that section of the creek above 1900 feet (Figure 4). It is postulated that this section may coincide with development of the White Channel terraces on Bonanza Creek. Extrapolation of the longitudinal profile to Bonanza Creek indicates that it

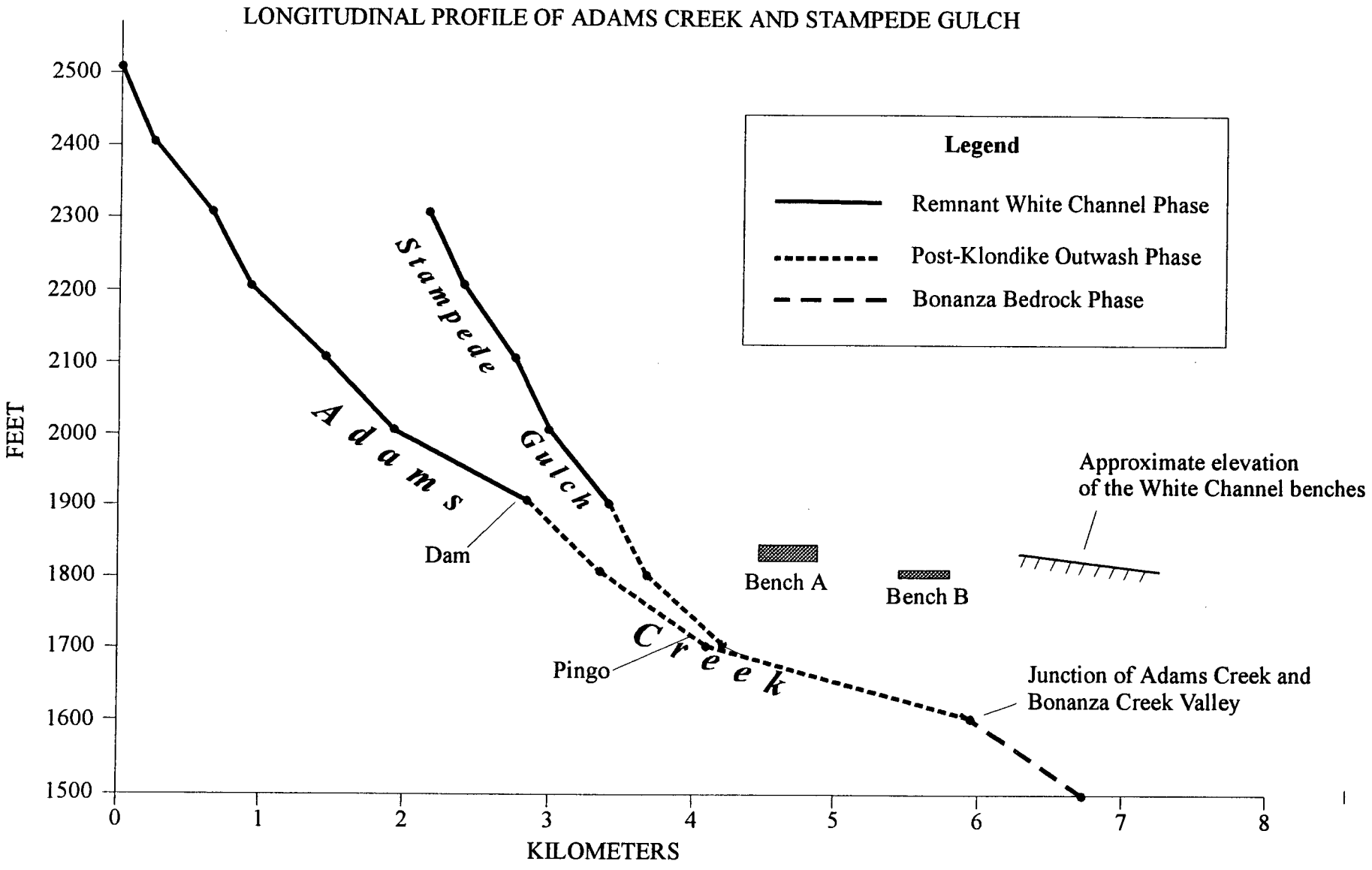

Figure 4: Longitudinal Profile of Adams Creek and Stampede Gulch showing developmental phases and benches.

may correlate with the elevation of the White Channel surface (Figure 5). This is supported by the presence of bench-like features on the north side of Adams Creek, below the confluence of Stampede Gulch and Adams Creek (Figure 5). A cross-valley profile of Adams Creek, 0.4 km below the confluence with Stampede Gulch, shows the positioning of bench A relative to the valley bottom (Figure 6). The approximate elevation of bench-like surface "A" is between 1900 and 2000 feet, correlative with the extrapolated profile. The surface morphology of the "bench" is subdued, possibly from slope wash and erosion. A second smaller bench (bench B), with a better defined surface morphology, is located 1.4 km downstream from the confluence of Adams Creek and Stampede Gulch (Figure 3). Bench B is positioned approximately between 1700 feet and 1800 feet, also correlative with the extrapolated profile to the White Channel surface at 1800 feet (Figure 5).

2.2 Post-Klondike Outwash Phase

The next stage of valley development followed incision of the Klondike glacial outwash and White Channel gravels in the Klondike River valley. Following deposition of the Klondike glacial outwash over the White Channel gravels, by an early pre-Reid glaciation in Klondike River valley, there was a period of stream readjustment. The Klondike River, diverted into its present course, began eroding into the thick Klondike valley fill to a new base level. The resulting incision into the White Channel gravels in the Klondike valley caused local base level changes and incision of Bonanza Creek into the White Channel fill. In response to the base level changes, Adams Creek also began downcutting (Figure 7). This period of incision is marked by the erosional form between 1900 feet and 1600 feet (Figure 4). This erosional event bottoms out at

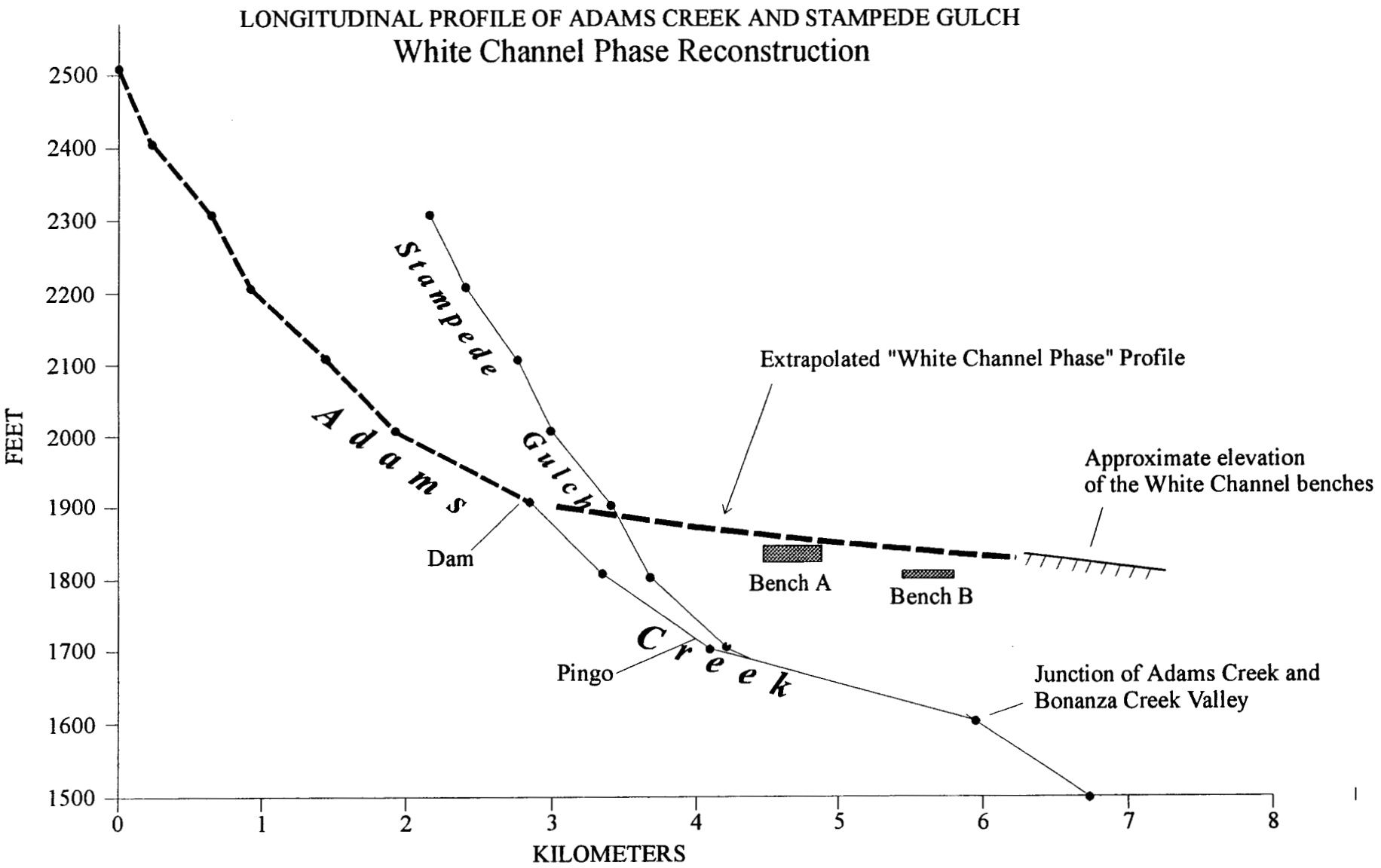

Figure 5: Longitudinal Profile of Adams Creek and Stampede Gulch showing White Channel Phase extrapolation.

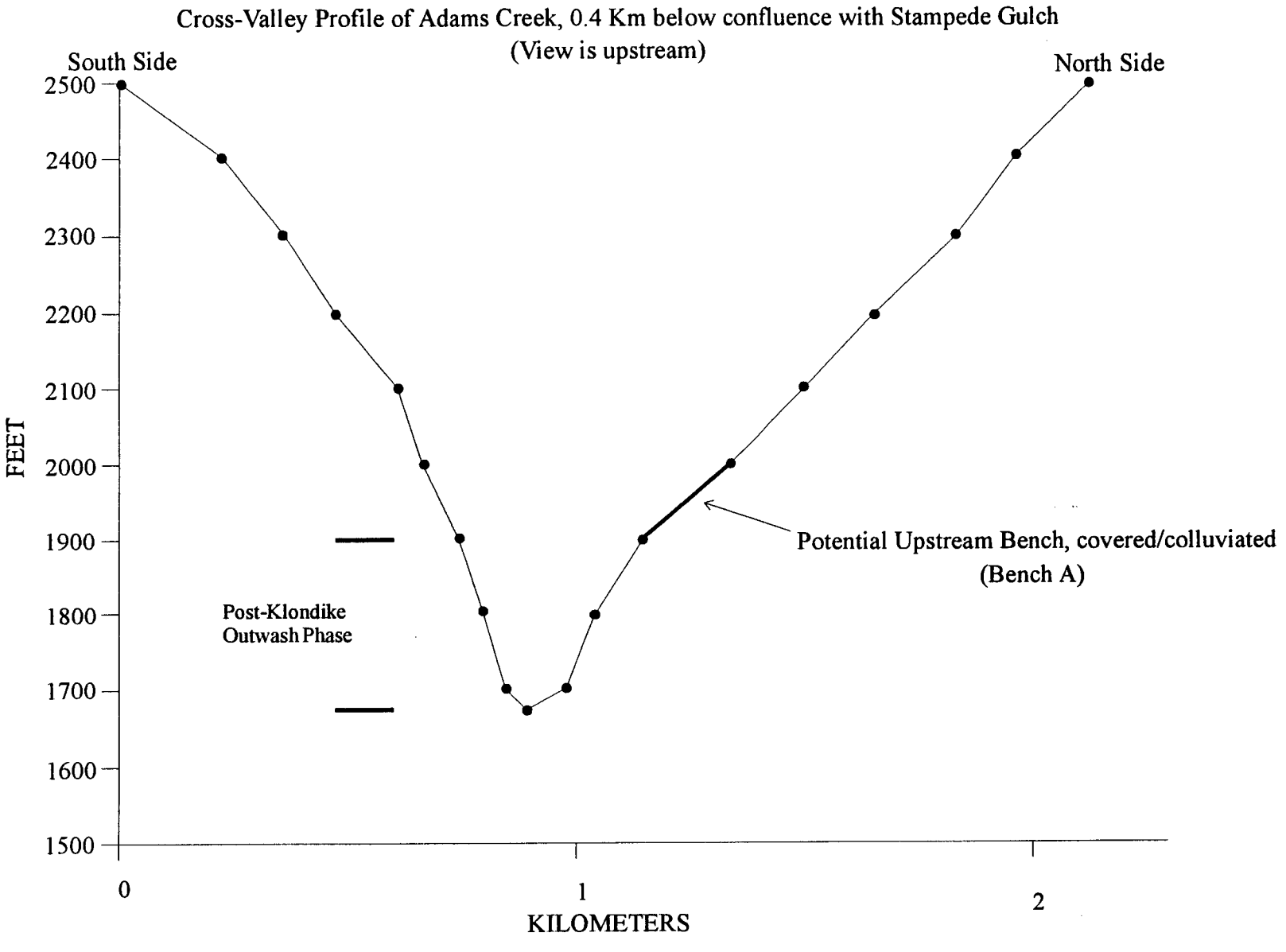

Figure 6: Cross-Valley Profile of Adams Creek, 0.4 Km below the confluence with Stampede Gulch

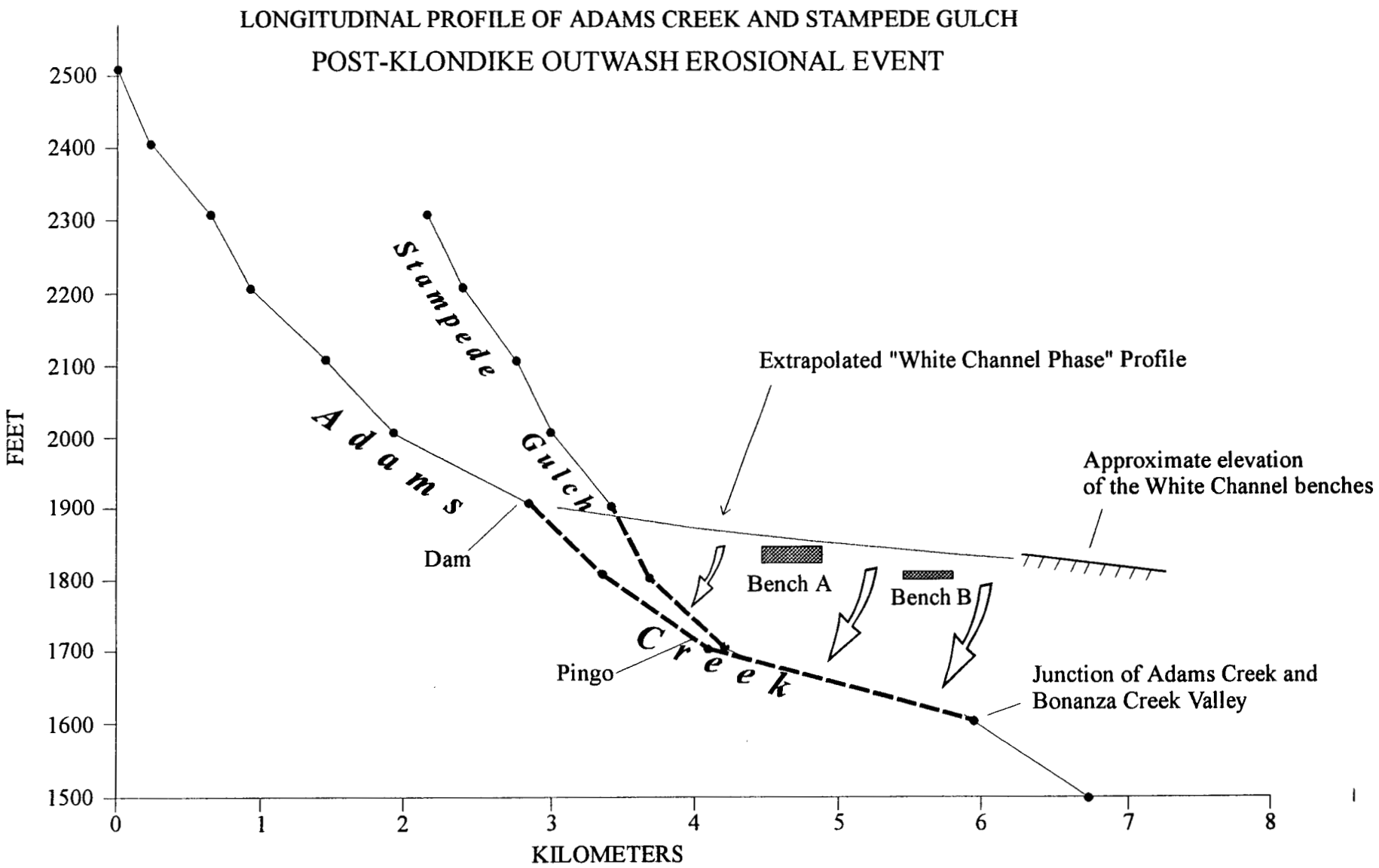

Figure 7: Longitudinal Profile of Adams Creek and Stampede Gulch showing Post-Klondike outwash erosional event..

the 1600 foot elevation corresponding with the elevation of bedrock in the terraces on Bonanza Creek. This erosional event also appears to be preserved in the cross-valley profile (Figure 6). In figure 6 the valley changes from a much broader shape to a narrower gulch below 1900 feet thought to represent the period of rapid incision or the post-Klondike outwash phase. It is evident from both the longitudinal and cross-valley profile that a period of incision occurred in Adams Creek valley, related to base level change of approximately 200-300 ft.

2.3 Bonanza Bedrock Incision Phase

A second base level adjustment caused incision of Bonanza Creek into bedrock. The cause of the incision is uncertain and may be related to base level tampering during a subsequent pre-Reid glaciation. This incision period is marked in Adams Creek by the drop in stream gradient between 1600 feet and 1500 feet (Figure 4).

2.4 Stampede Gulch

In reconstructing the profile of Stampede Gulch, it is evident that a similar erosional history to the Adams Creek profile is preserved. At 2000 feet the gradient of Stampede Gulch begins to decrease, similar to Adams Creek (White Channel phase), and at 1900 feet the profile drops off until its confluence with Adams Creek at approximately 1690 feet (Post-Klondike outwash phase) (Figure 4). This increase in gradient from 1900 feet to 1700 feet correlates directly with the Adams Creek profile. Preliminary comparisons suggest Stampede Gulch has reacted similarily to environmental effects that have affected the profile of Adams Creek. The lower incision event on Adams Creek, between 1600 feet and 1500 feet, is localized enough to the

bottom end near Bonanza Creek valley that it has no influence on the profile of Stampede Gulch.

3.0 Implications for Placer Gold Exploration

The presence of placer gold below the confluence of Stampede Gulch and Adams Creek has implications for placer gold occurrences at additional sites within the Adams Creek drainage. The flat grade on Adams Creek, between 1700 feet and 1600 feet, decreases the flow rate of the creek and creates a site for the deposition of placers. The placer potential is compounded by the additional trap produced at the confluence of the two streams (Figure 8a and 8b). If the lode source in Adams Creek extends to the headwaters of the drainage then a second site of exploration importance may be found between the 1900 and 2000 foot elevation (Figure 8a and 8b). This site is similar to the previous placer trap, in that it marks the confluence of tributaries and has a relatively gentle gradient. The third potential placer site comprises the two bench-like features on the north slope of Adams Creek associated with the White Channel phase (Figure 8a and 8b). They are particularly interesting because they parallel known occurrences of placer gold found below the junction of Adams Creek and Stampede Gulch in the current drainage. In other words, because of their downstream extent, and if the benches are fluvial in origin, then they should also contain some quantity of placer gold. This is of particular relevance for claims 6 and 12-19 that are located below the confluence of Adams Creek and Stampede Gulch and so may incorporate the bench-like forms. A fourth site that may contain placer gold is the small tributary that enters Adams Creek immediately above the confluence with Stampede Gulch (Figure 8a and 8b). This tributary flows into Adams Creek from the north slope and passes on the east flank of the pingo. The stream is of some importance because it appears to be confined within the same

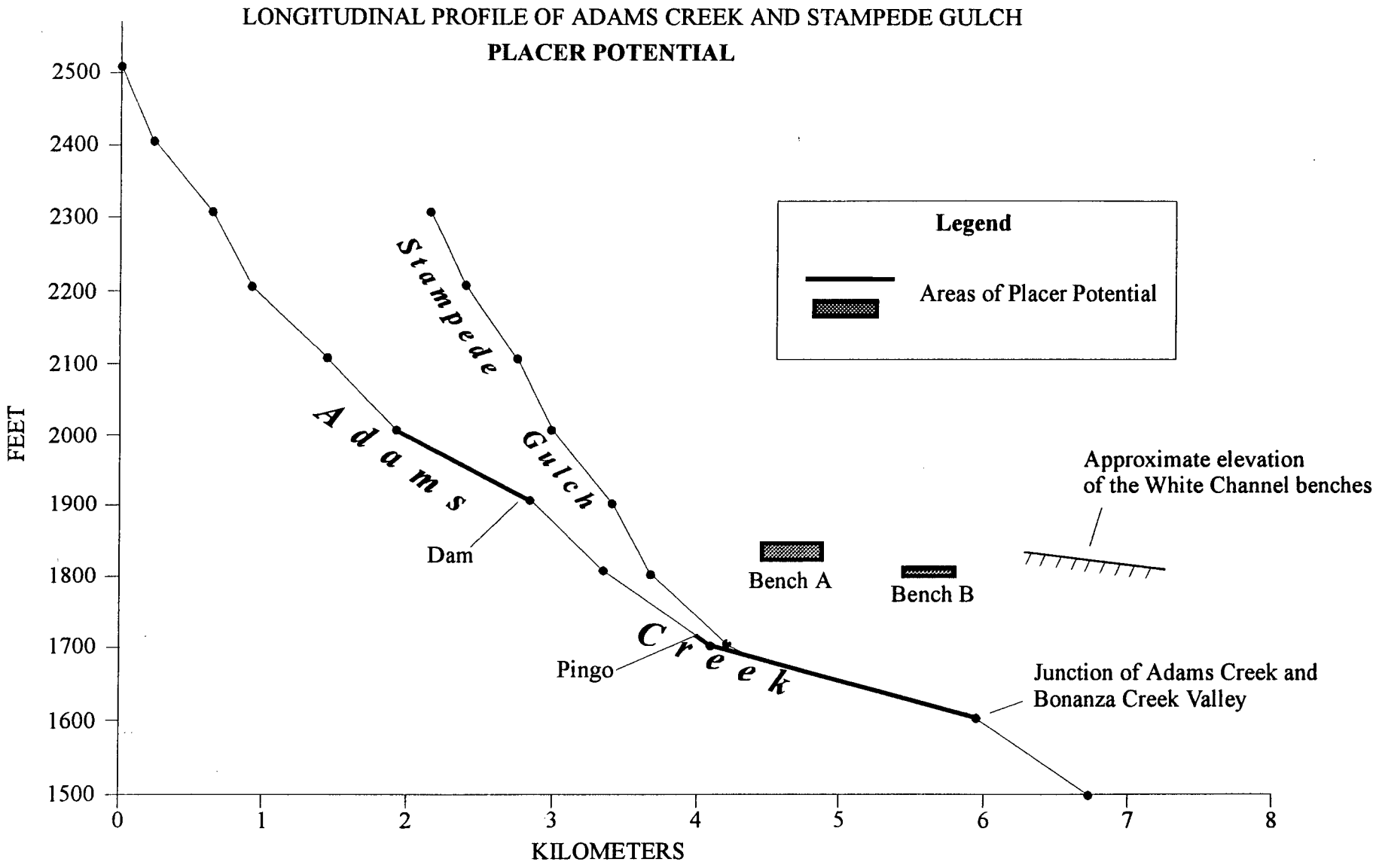

Figure 8a: Longitudinal Profile of Adams Creek and Stampede Gulch showing areas of placer potential.

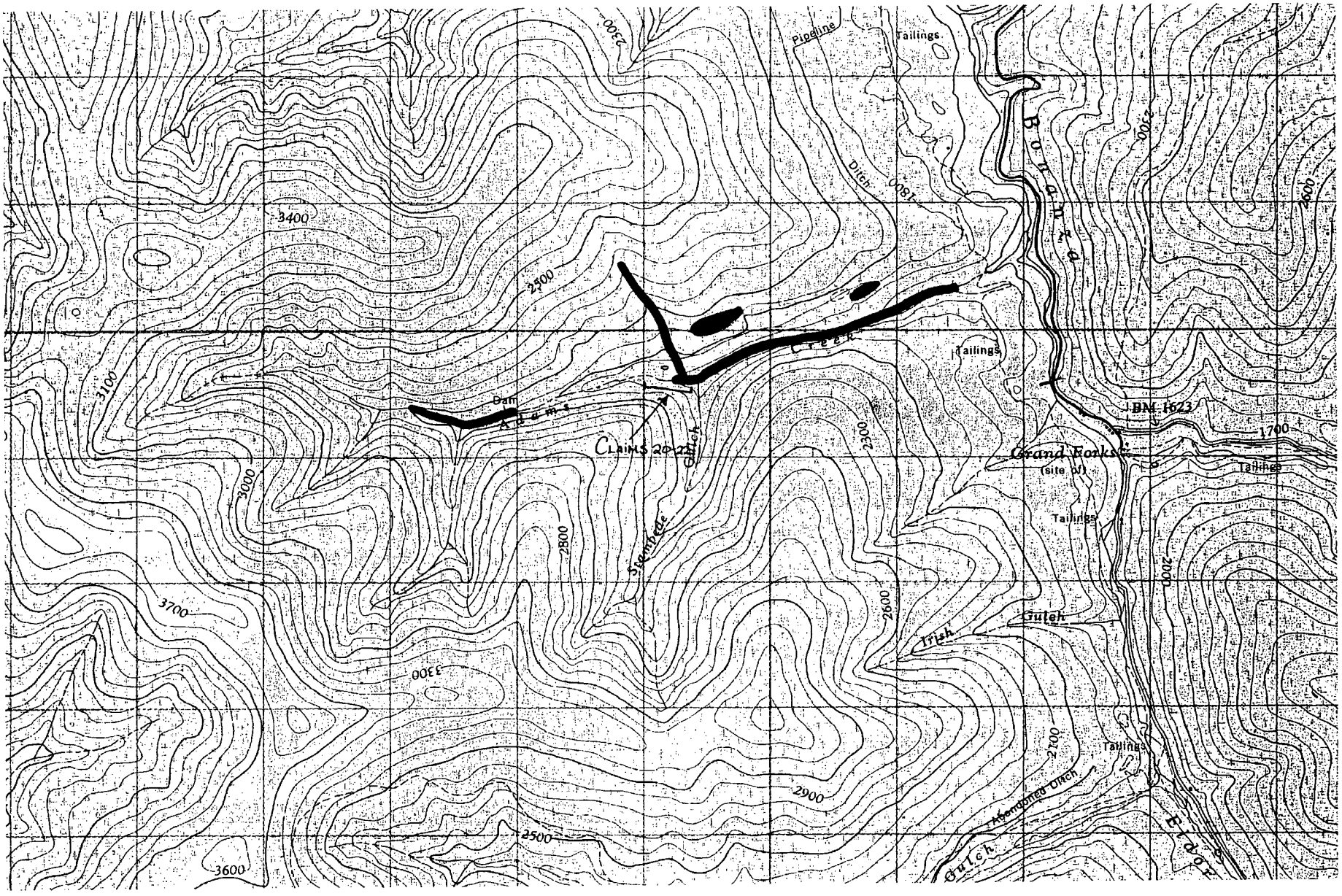

FIGURE 86: PROSPECTIVE PLACERS IN ADAMS CREEK RELATIVE TO CLAIMS 20-22

structural lineament (fault) identified to the southeast as the Eldorado Fault (Figure 2). If this tributary contains placer gold then the section of Adams Creek immediately above the confluence with Stampede Gulch would also be prospective. This is of particular relevance to claims 20-22 on Adams Creek that are located immediately above the confluence with Stampede Gulch. It is important to note, at the mouth of this small tributary in Adams Creek valley an alluvial fan has formed which may mask placer ground on the Adams Creek floodplain or even contain significant placer gold from the tributary itself (Figure 8b).

4.0 Conclusions and Recommendations

The proposed drainage evolution of Adams Creek and Stampede Gulch supports the presence of two high level bench-like forms on the north slope of Adams Creek that coincide with the White Channel terraces in Bonanza Creek. Abandonment of the former surface coincides with a base level change in the Klondike River valley and Bonanza Creek. Two sections of Adams Creek have distinctly flattened gradients relative to the rest of the drainage. These occur from 1900-2000 feet and from 1600-1700 feet. Origin of these flattened gradients is potentially related to incision of the entire drainage in response to base level changes in Bonanza Creek. As a result, the remnant valley bottom above 1900 feet is correlative with White Channel development and the section between 1600 and 1700 feet correlates with the incision of Bonanza Creek through the White Channel deposits to the level of the bedrock terrace. These three areas (the benches and the two sections with flattened gradients) are considered to have placer potential. A fourth area, identified by the pingo and the northwest trending lineament, is the tributary on the north side of Adams Creek immediately above the confluence with Stampede Gulch. If the

lineament is related to the Eldorado Creek fault and is a gold source, then the tributary, which is confined to the lineament, may contain gold placers within its alluvial plain and/or within the alluvial fan at the junction with Adams Creek.

Recommendations for follow up research would include field checking to further clarify these findings. A more accurate survey of the longitudinal profile and cross-valley profiles would be usefull to improve the accuracy. Localized sampling by hand methods or a light drill would then be required to test the recommended placer sites outlined in figure 8b.

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Certificate of Authenticity

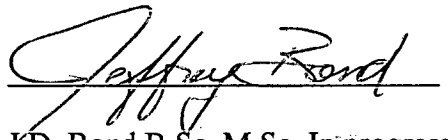
I, **Jeffrey David Bond**, of Okotoks, Alberta do hereby certify that;

1. I hold a Bachelors of Science degree in Geography from the University of Calgary and have partially completed my fulfillments for a Masters of Science in Geomorphology from the University of Alberta;

2. The geomorphological analyses and report preparation were performed by me personally;

3. I have based conclusions and recommendations contained in the report on my knowledge of geomorphology, and on my previous experience;

4. I hold no interest, directly or indirctly, in this property other than professional fees.



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Okotoks, Alberta

December 17th, 1996

The Geomorphic Evolution of the Adams Creek Drainage and Implications for Placer Gold Exploration

Mammoth Terrain Services

December 14 - 17th, 1996

Professional Fees:

J.D. Bond $200.00/day

Geomorphic analyses and air photo interpretation:	$400.00
Report Writing (includes reproduction, binding, and mailing costs):	$400.00
Total Costs:	$800.00

List of Claims to which the Report Refers

Holder of Claims:
W.J. Weigand

Claim #'s
12 - 42776
20 - PO7844
21 - PO7845
22 - PO7846

Claim Name	Claim No.	Grant No.	Expiry Date	Registered Owner	Excess
Claim	12	42776	1997/12/14	Jeri Weigand	0
				William J. Weigand	0
	20 - 22	P 07844 - P 07846		Jeri Weigand	0
				William J. Weigand	0

CLAIM LOCATION MAP

PLACER SHEET 115014N1

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ADAMS CREEK

STAMPEDE GULCH

SKOOKUM GULCH

ADAMS HILL

SADDLE GOLD

CHEECHAKO HILL

HAWLEY GULCH

ADAMS CREEK BASELINE

STAMPEDE GULCH BASELINE

SKOOKUM GULCH BASELINE

BIG RED

Bob Page 20/12/96

James Boulton 20 Dec 96

Robert Page POA Jude Baptiste 20 Dec 96

St. 2 Boulton POA Joe Vuillum 20 Dec 96

PL9597

PL9778 1 MILE 1st TIER

PL9004 2 MILE 1st TIER

PL9007 2 MILE 2nd TIER

PL9006 2 MILE 1st TIER

PL8803 1 MILE