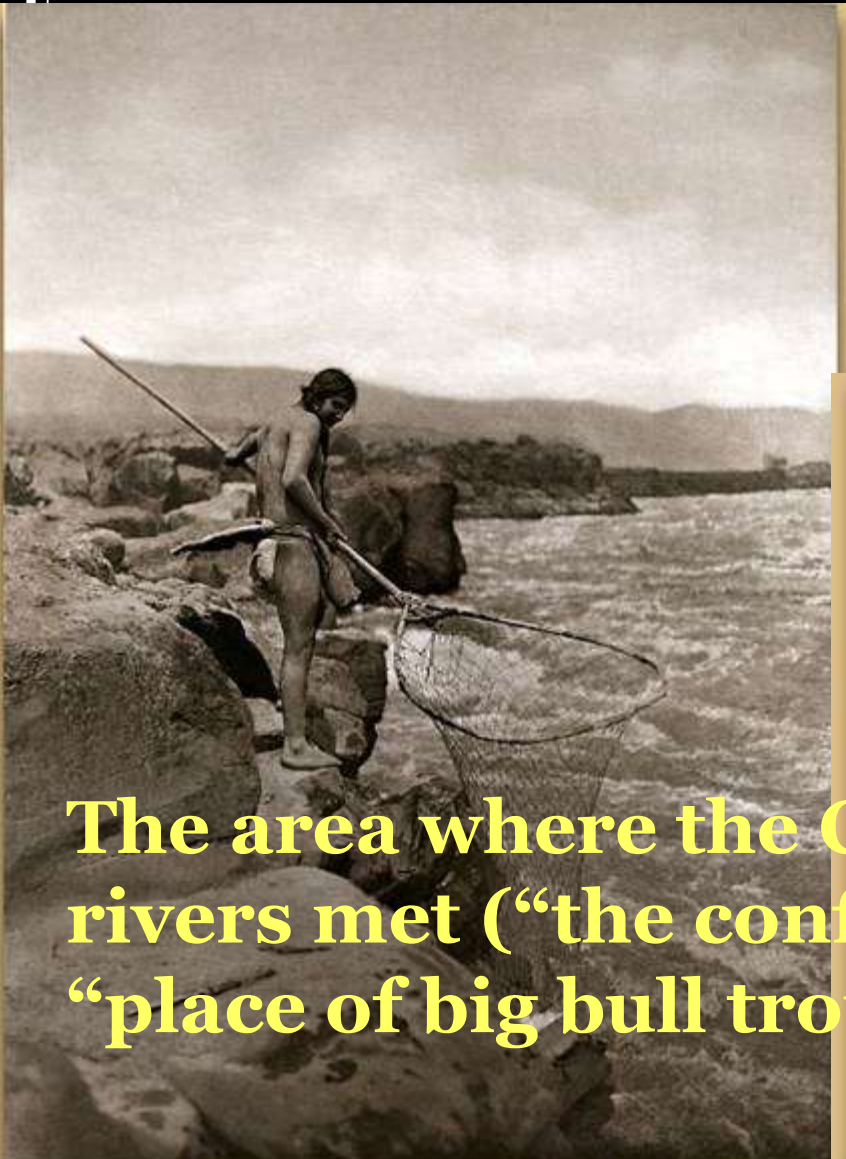


# Centennial of the Clark Fork's Great Flood

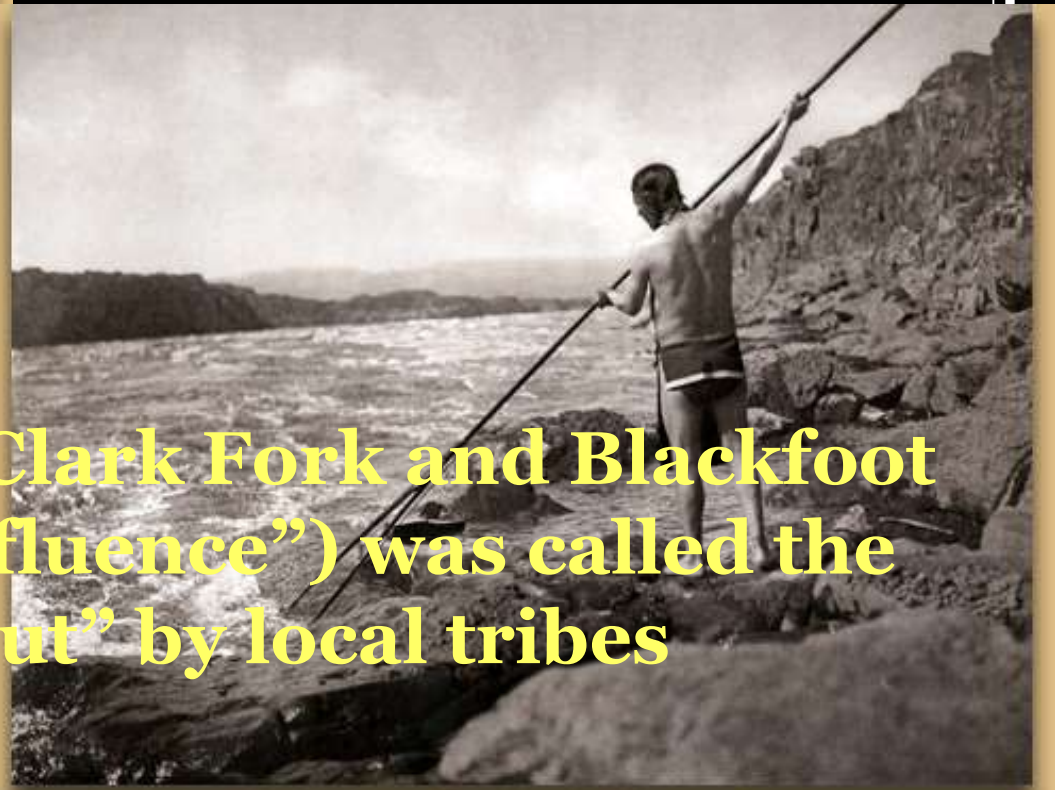
*June 1908 – June 2008*



# Once upon a time...

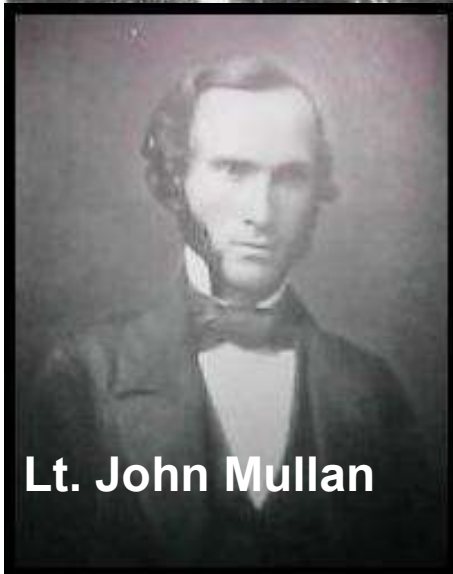
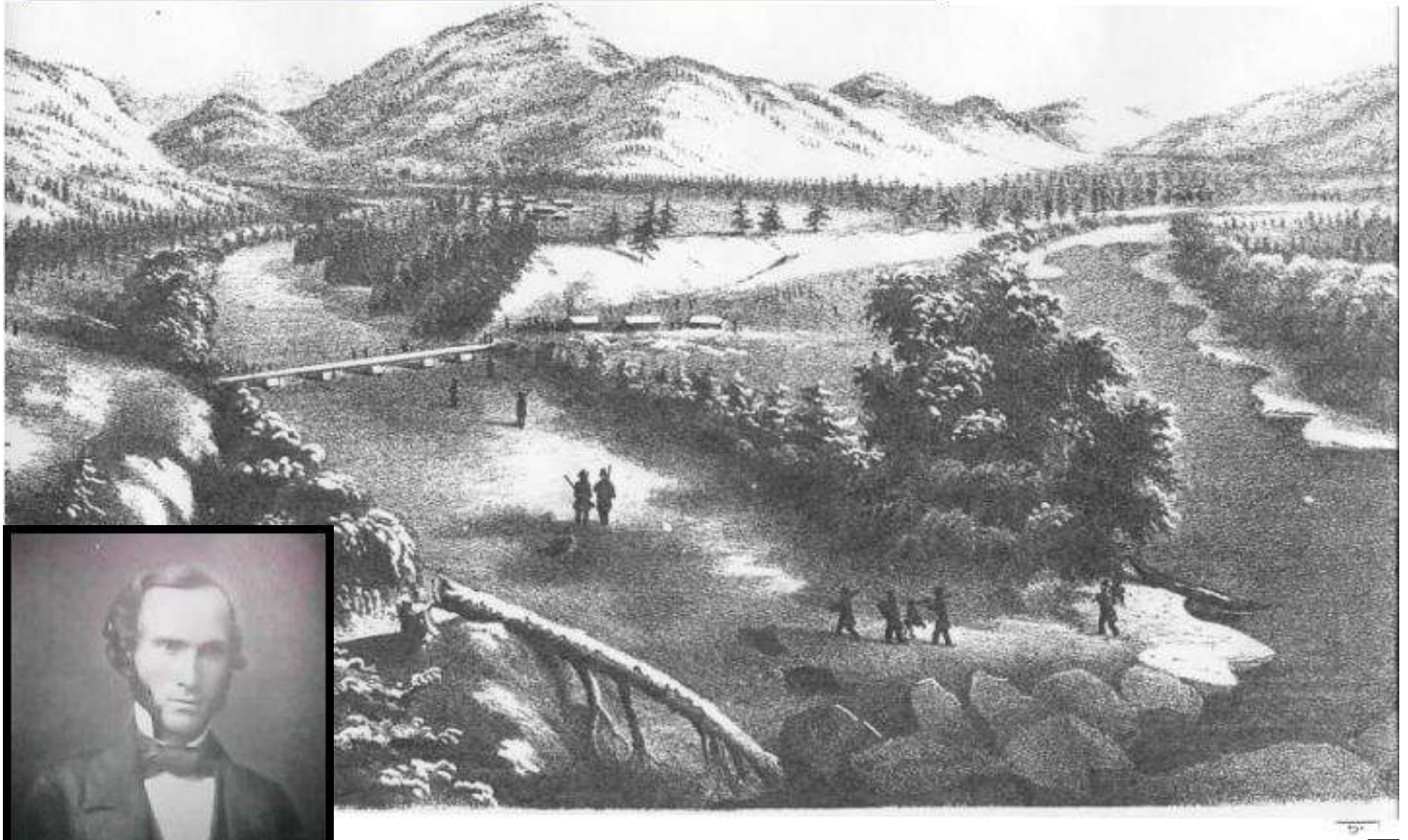


The area where the Clark Fork and Blackfoot rivers met (“the confluence”) was called the “place of big bull trout” by local tribes





# The Historic Confluence



Lt. John Mullan

**1850s to 1883, White settlement began to significantly change the region**

# **Other major developments in Montana industrial expansion**

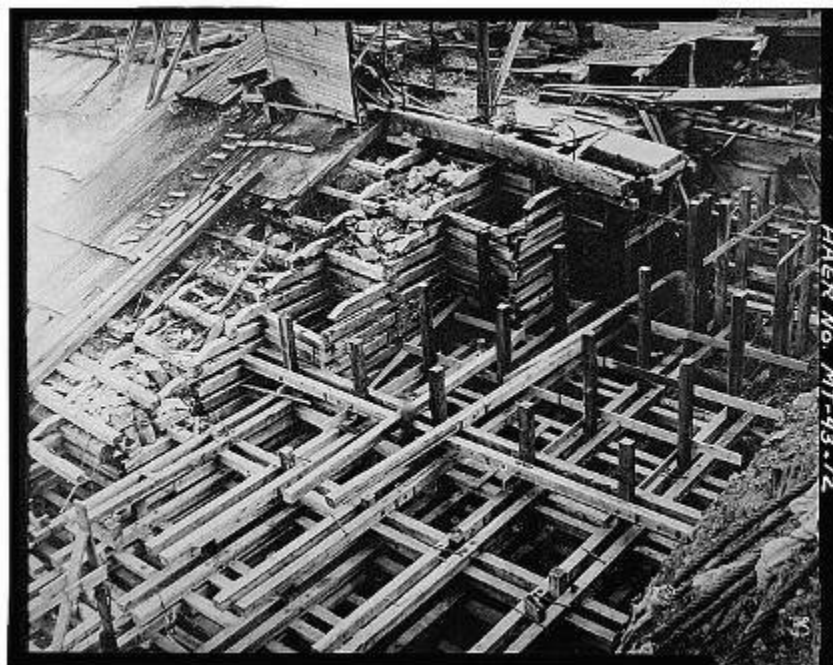
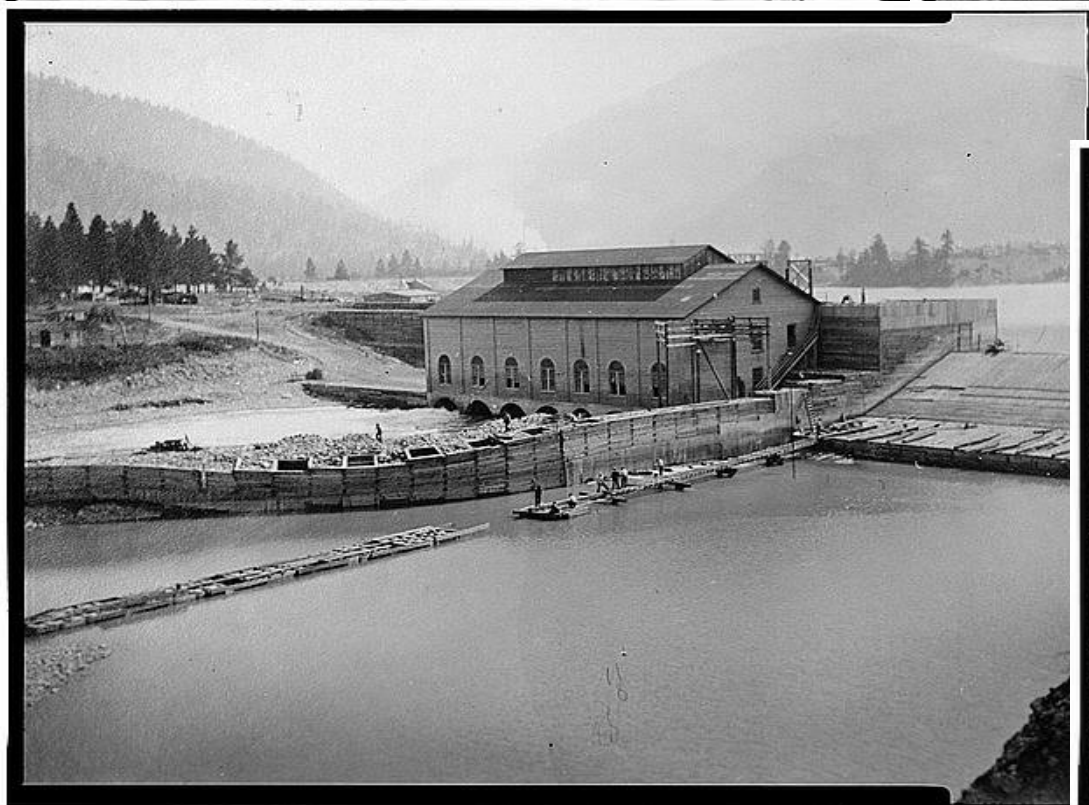
- **1852-1860 Survey and Construction of Mullan road.**
- **1858-1862 First “big” gold strikes (Gold Creek, Grasshopper Creek, Alder Gulch)**
- **1862 Homestead Act**
- **1864 Gold discovered on Silver Bow Creek**
- **Late 1850’s to 1866: Johnny Grant and Conrad Kohrs cattle ranching the Deer Lodge Valley**
- **1877 Copper mining takes hold in Butte**
- **1883 Completion of Northern Pacific Railroad**
- **1889 Montana statehood...”Oro y Plata”**

# ***TIMBER!*** Industrial Development



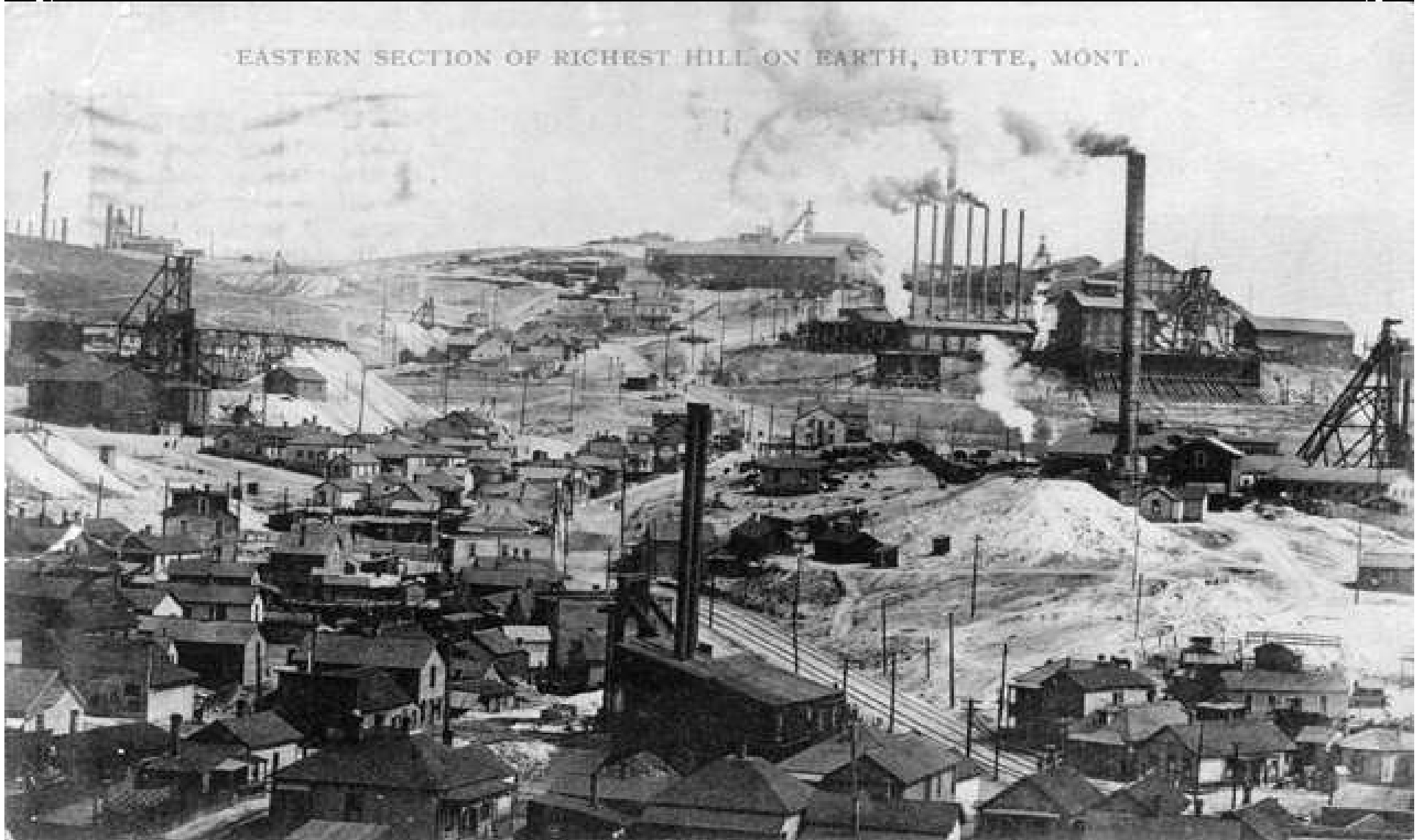


HAER No. MT-43-9



HAER No. MT-43-12

# Upstream Industrialization: *The Richest Hill on Earth*



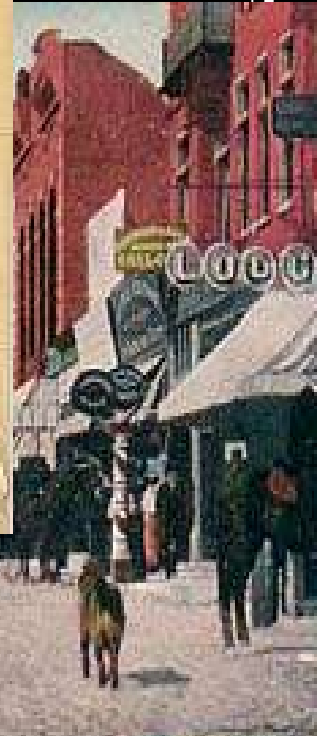
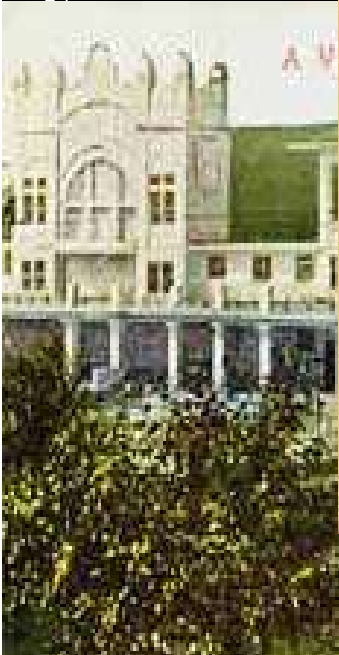
782

GREETINGS From

BUTTE

Metropolis of Montana

© 1914 Postcard Co.



WesternMiningHistory.com 1d-4



# MINING ECOLOGICAL IMPACTS

- Mining – Intense land and water disturbance; waste rock (acid mine drainage)
- Milling and Processing – Rock crushing; Concentration of metals; TAILINGS
- Smelting – Airborne contamination; impaired air quality

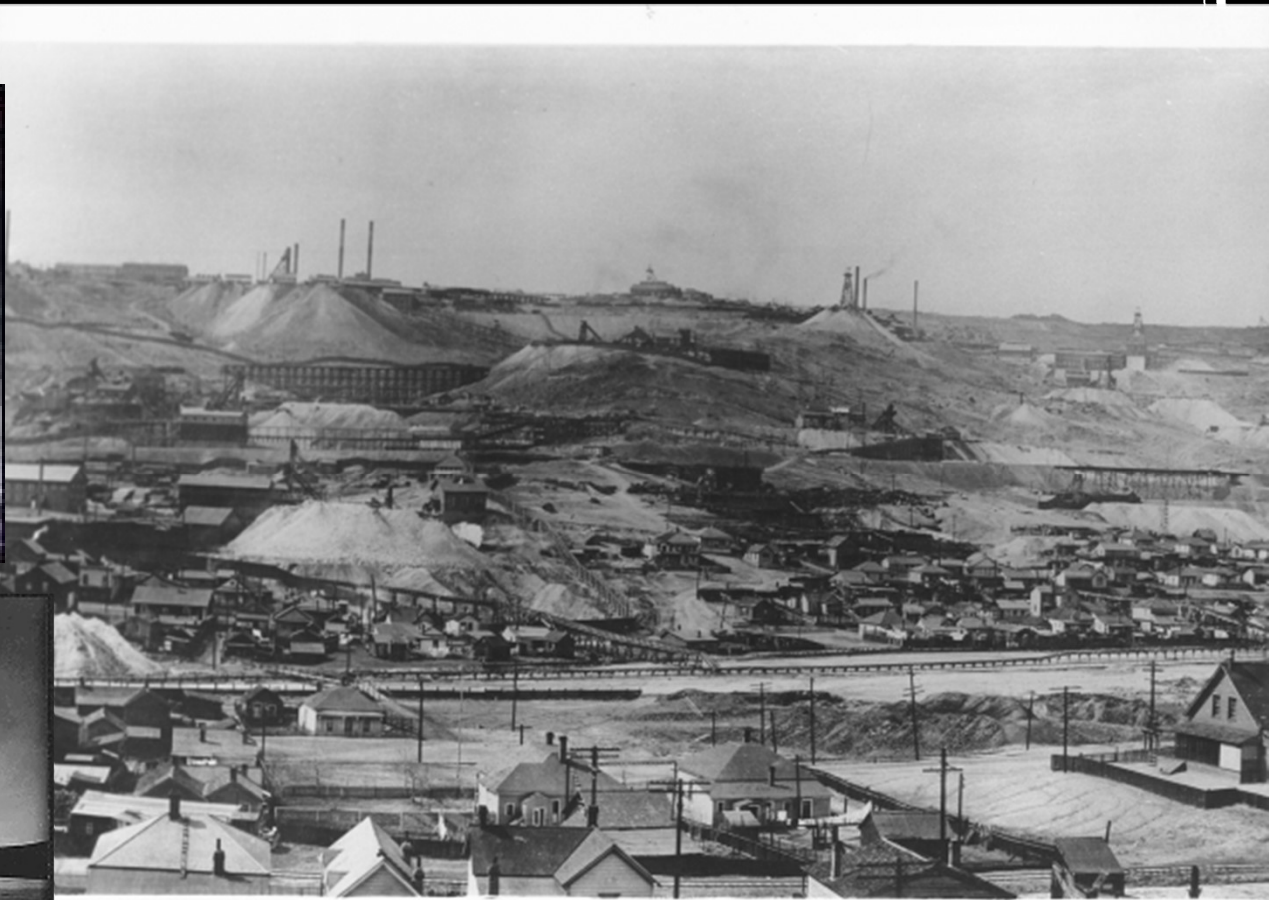


# Acid Rock Drainage

**Pyrite + water + air = rust + acid**



# How did Butte and Anaconda's mining affect the health of the Upper Clark Fork?



# Major impacts, Pre-1908

- ~~Smelting activities in Butte and Anaconda led to public outcry, resulting in some minor improvements to smelting practices;~~
- The “Smoke Wars”: Butte residents and later, Deer Lodge Valley ranchers were filing lawsuits and compiling evidence against the Anaconda Company as early as the 1880s for smelting damages to property and loss of life...because of ACM’s power, nothing became of the suits outside of minimal settlements and taller smokestacks, spreading the contamination further.
- Tailings and other wastes from Butte and Anaconda were discharged directly into the streams (Silver Bow Creek and Warm Springs Creek), sending contamination downstream on a constant basis;
- First lawsuits filed against ACM for water-borne damages in 1903, with many to follow.

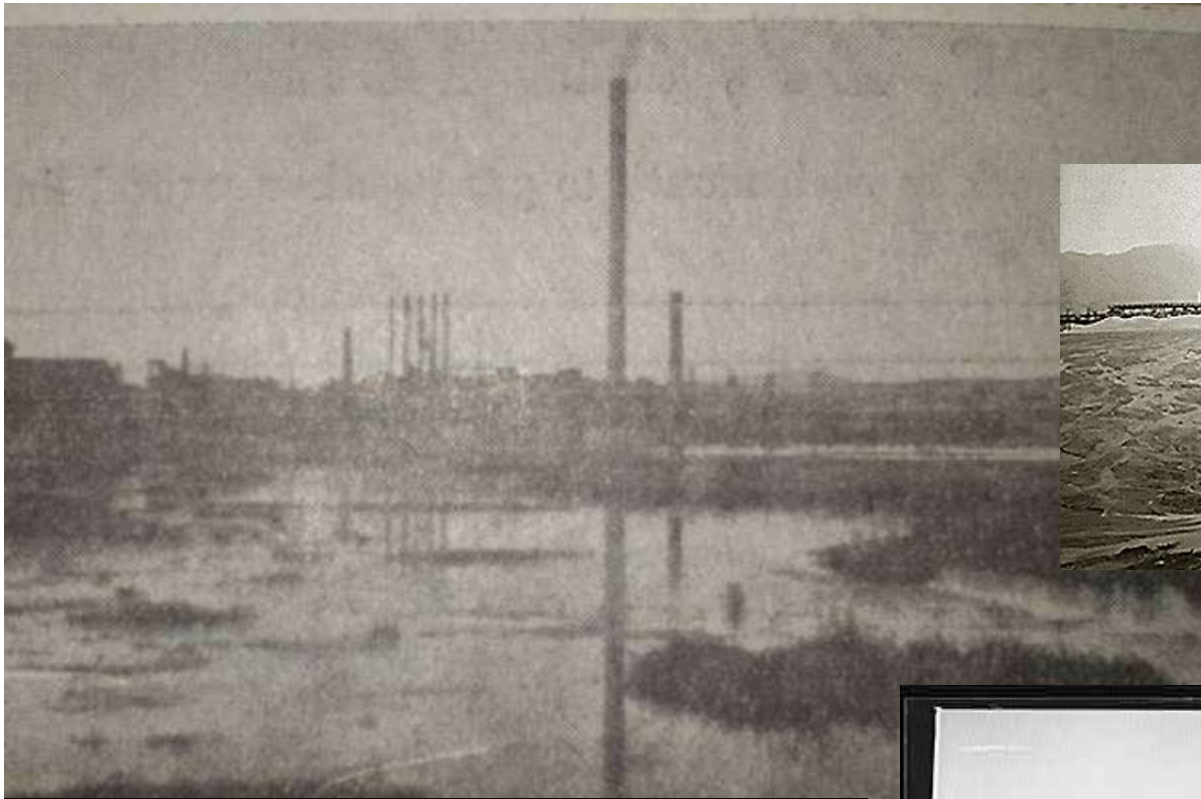
1896

The PERMANGANATE RAPH. (Trade Mark)  
Patented April 16, 1893. Other Patents Pending



H. C. WALTER CO., Gen'l Office, N. Kensington, Pa., U.S.A.  
Agents: Messrs. Wm. E. & G. S. Lusk.





# What happened in 1908?



# FIRM AS A MOUNTAIN IS THE DAM

CHARLES H. MARSH DESCRIBES  
CONDITIONS AT THE POWER  
PLANT AFTER A VISIT.

At 8 o'clock last night the water at the power dam began to lower, and at 11 o'clock, when the last word was received from there, it had fallen six inches, and the men who have been watching it felt certain that it was safe. The battle with the water had been a long and severe one, but it looks now as if the fight were won, and there is much encouragement in the situation. This was the word that came to The Missoulian office from the sub-station last night just before midnight. It was good news.

The official statement was confirmed by Charles H. Marsh, who walked in from Bonner, where he had been called on business. He was taken up at noon on a hand car, but he walked back, after he had looked over the situation at the mouth of the Blackfoot. He came home well satisfied that the worst was over.

■ **January 1908,**  
*Daily Missoulian*

“...when the last piece of timber is added to the dam it will be in such condition that the highest waters ever known in this vicinity will not affect it in the least.”

**George Slack,**  
*Milltown construction superintendent*



HAER No. MT-43-15

1-23-09

HAER No. MT-43-10

4-23-09

# The 1908 Flood in Perspective

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- Heralded as “the worst on record”...estimated 48,000 cfs of water at the Milltown confluence
- 1912 USGS records began...since the Clark Fork began daily flow records in 1929, the highest peak flow is 27,500 cfs (1975).
- 2008 Peak flow was on May 21 at 17,800 cfs
- Current flow as of 3:17 p.m., 6/20/2008 was 10,900 cfs.



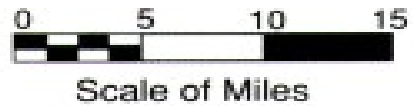
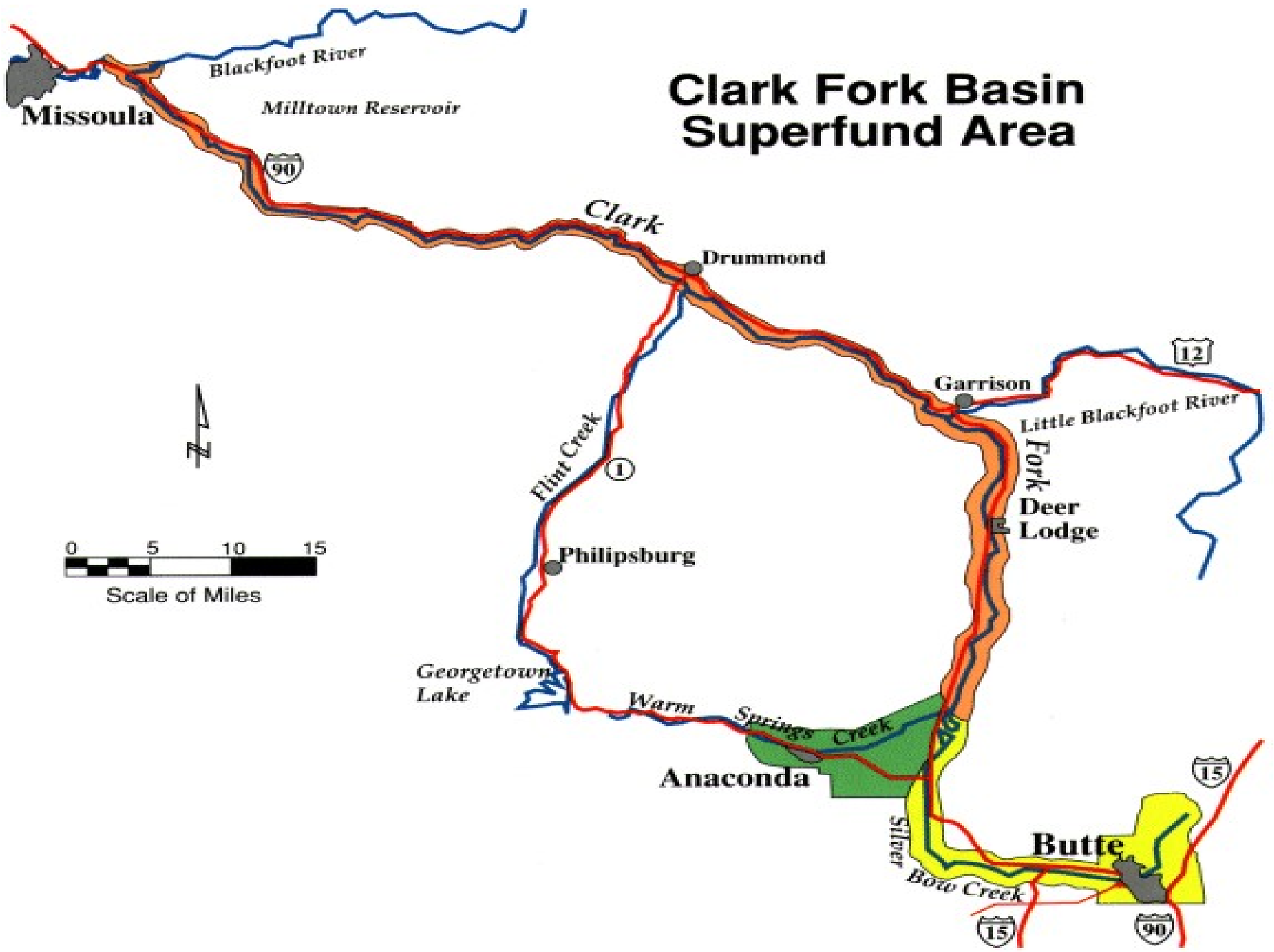
Image © 2007 DigitalGlobe

© 2007 Google™

52° W elev 4746 ft Streaming 100%

Eye alt 5746 ft

# Clark Fork Basin Superfund Area



# Remediation and Restoration

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- **Remediation:** (root word: remedy) clean up that reduces threats to human health and the environment within existing law. Superfund, EPA and DEQ.
- **Restoration:** (root word: restore) clean up that returns an area to a condition before the damage, in Milltown's case, "pre-dam" and "pre-mining." State of Montana vs. ARCO lawsuit; Department of Justice (Natural Resource Damage Program).

# What will Milltown look like?



HAER NO. MT-43-5

1930 Aerial photograph of Milltown

# **RESTORATION**

Blackfoot River

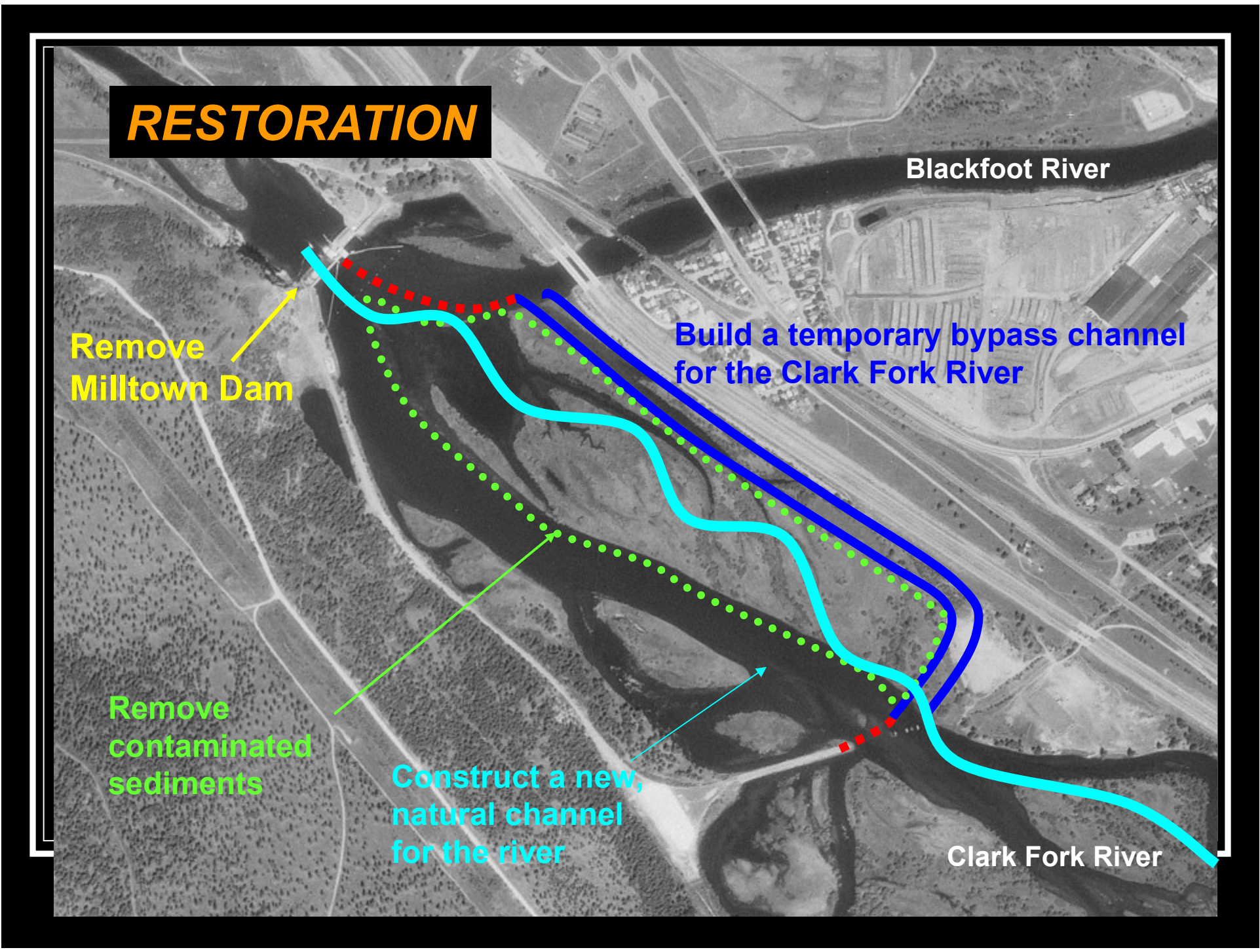
Remove Milltown Dam

Build a temporary bypass channel for the Clark Fork River

Remove contaminated sediments

Construct a new, natural channel for the river

Clark Fork River



COLUMBIA PICTURES PROUDLY PRESENTS  
A NEW FILM BY ACADEMY AWARD-WINNING DIRECTOR ROBERT REDFORD

Nothing perfect lasts forever,  
except in our memories.

# A RIVER RUNS THROUGH IT

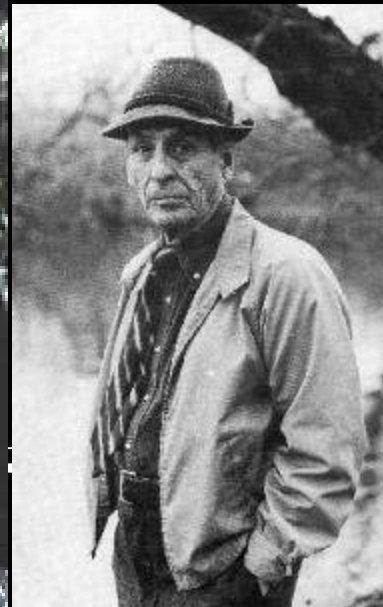
The story of an American family

COLUMBIA PICTURES PRESENTS  
A FILM BY ROBERT REDFORD  
A RIVER RUNS THROUGH IT  
CASTING BY CRAIG SHEPARD, HEAD OF  
CASTING TOM SKERRITT  
PRODUCTION DESIGNER BRENDA BEEBY  
EXECUTIVE PRODUCERS EMILY  
MILNER, BERNIE POLLACK  
PRODUCED BY KATHY CURRAN  
EDITED BY MARK ISHAM  
MUSIC BY ANNICK SMITH  
COSTUME DESIGNER WILLIAM KITTEREDGE  
EXECUTIVE PRODUCERS BARBARA MALBY  
EXECUTIVE PRODUCERS LYNZEE KLINGMAN  
EXECUTIVE PRODUCERS JON HUITMAN  
EXECUTIVE PRODUCERS PHILIPPE ROUSSELOT  
EXECUTIVE PRODUCERS PHILIPPE HERBERT  
EXECUTIVE PRODUCERS RICHARD MACLEAN  
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EXECUTIVE PRODUCERS ROBERT REDFORD

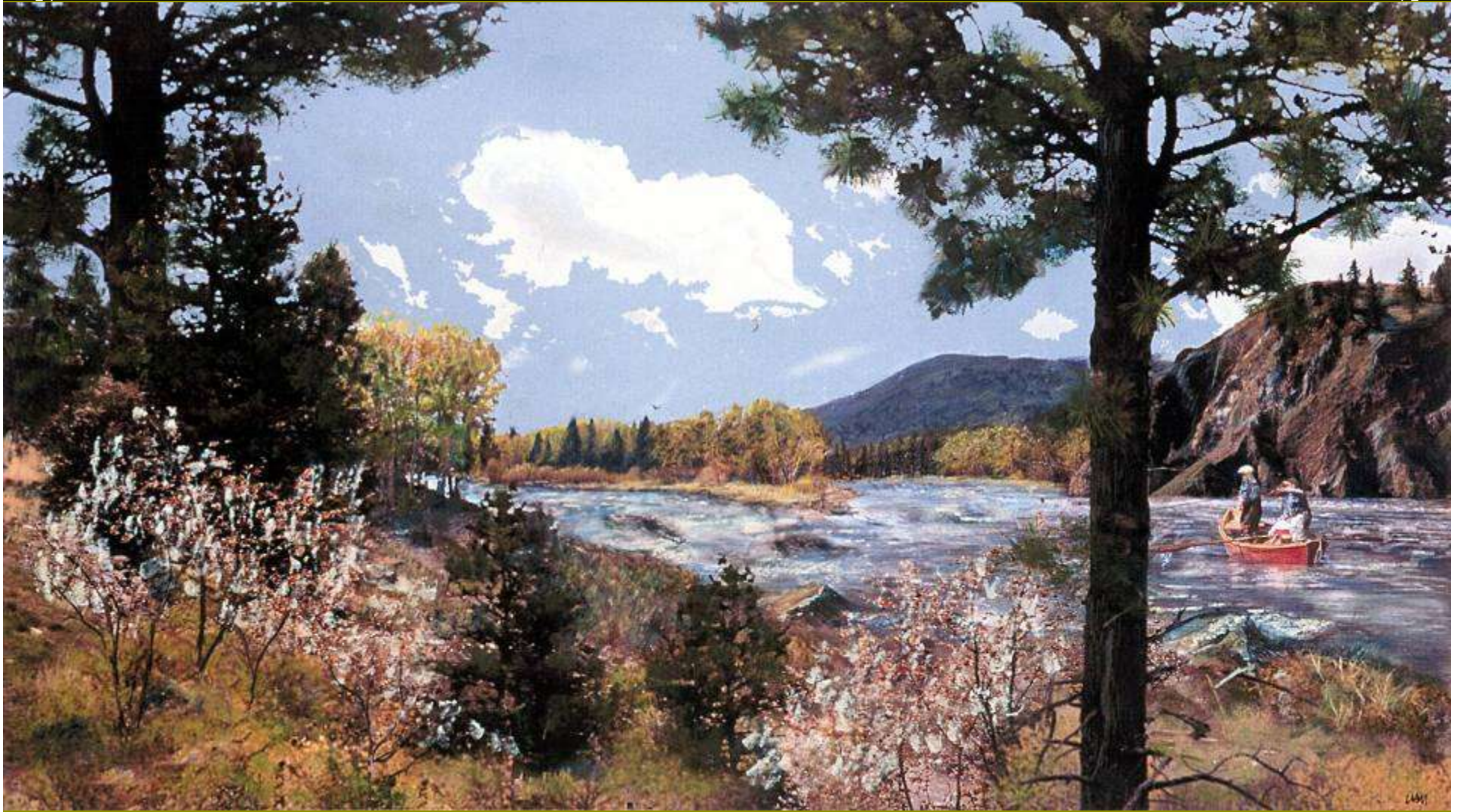
## *“The Big Blackfoot” and the Clark Fork Rivers*

*“We lived at  
the junction  
of great trout  
streams in  
Western  
Montana...”*

**Norman  
MacLean  
(1902-1990)**



# RESTORATION



Artwork courtesy of Clark Fork Coalition

# Before



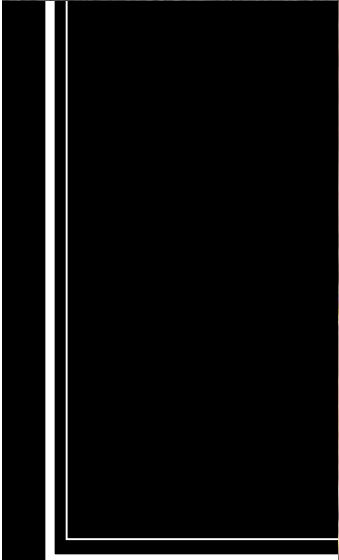
# During Construction



# Four Years After



# Opportunity: Where the Waste Is



© 2006 Navteq  
© 2006 Europa Technologies  
Image © 2006 TerraMetrics  
Image © 2006 DigitalGlobe  
Pointer 46°08'58.41" N 112°48'32.40" W elev 4895 ft Streaming |||||

# QUESTIONS?

