PL-566 Watershed Protection & Flood Prevention Program

Middle Fork of the Popo Agie River

Watershed Plan & Environmental Impact Statement

Lander, WY

Letter of Request for Planning Assistance

Dated: 10-7-1996

Local Sponsor's:

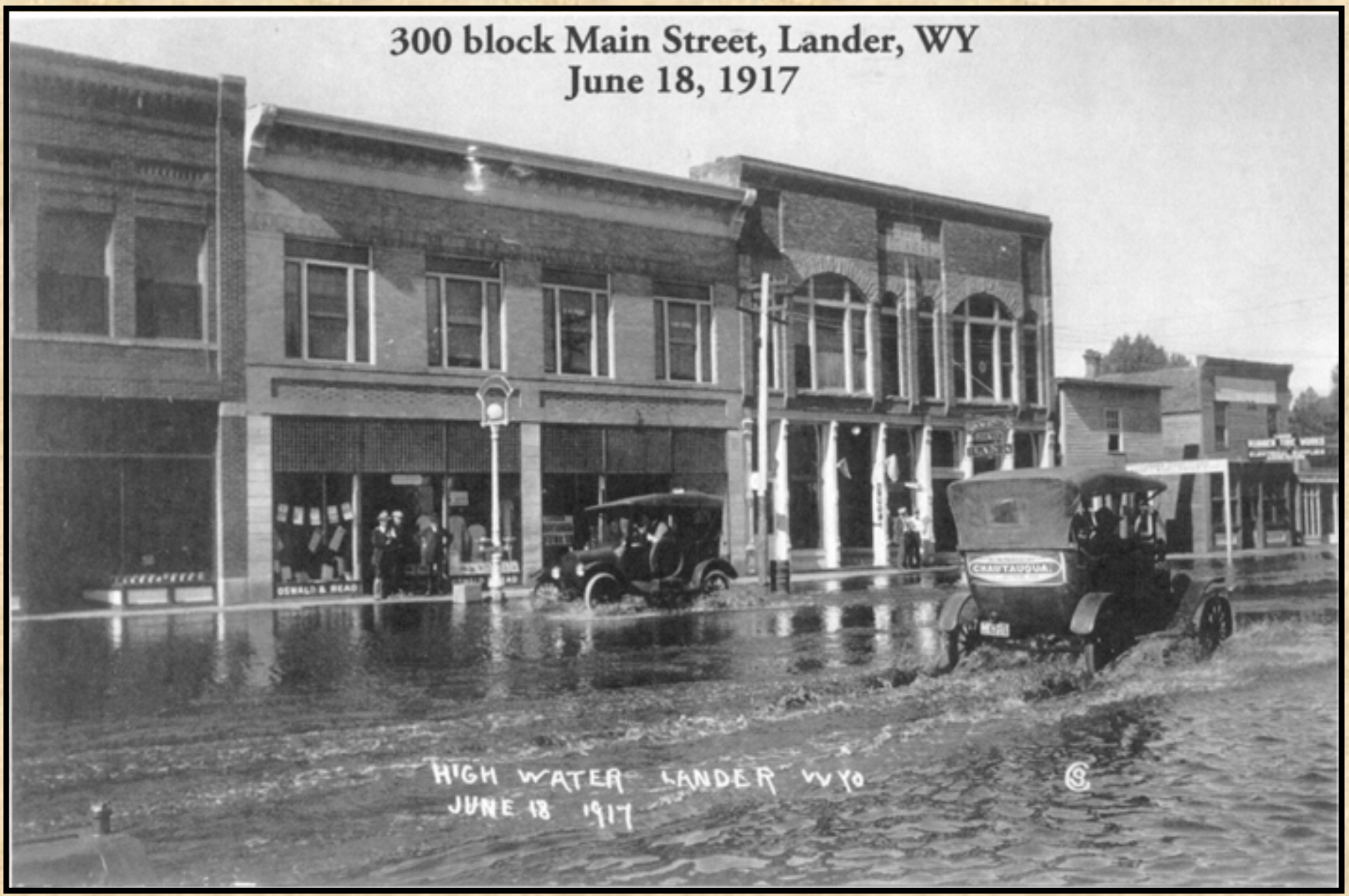
- **Popo Agie Conservation District**
- **City of Lander**
- **Fremont County Commissioners**

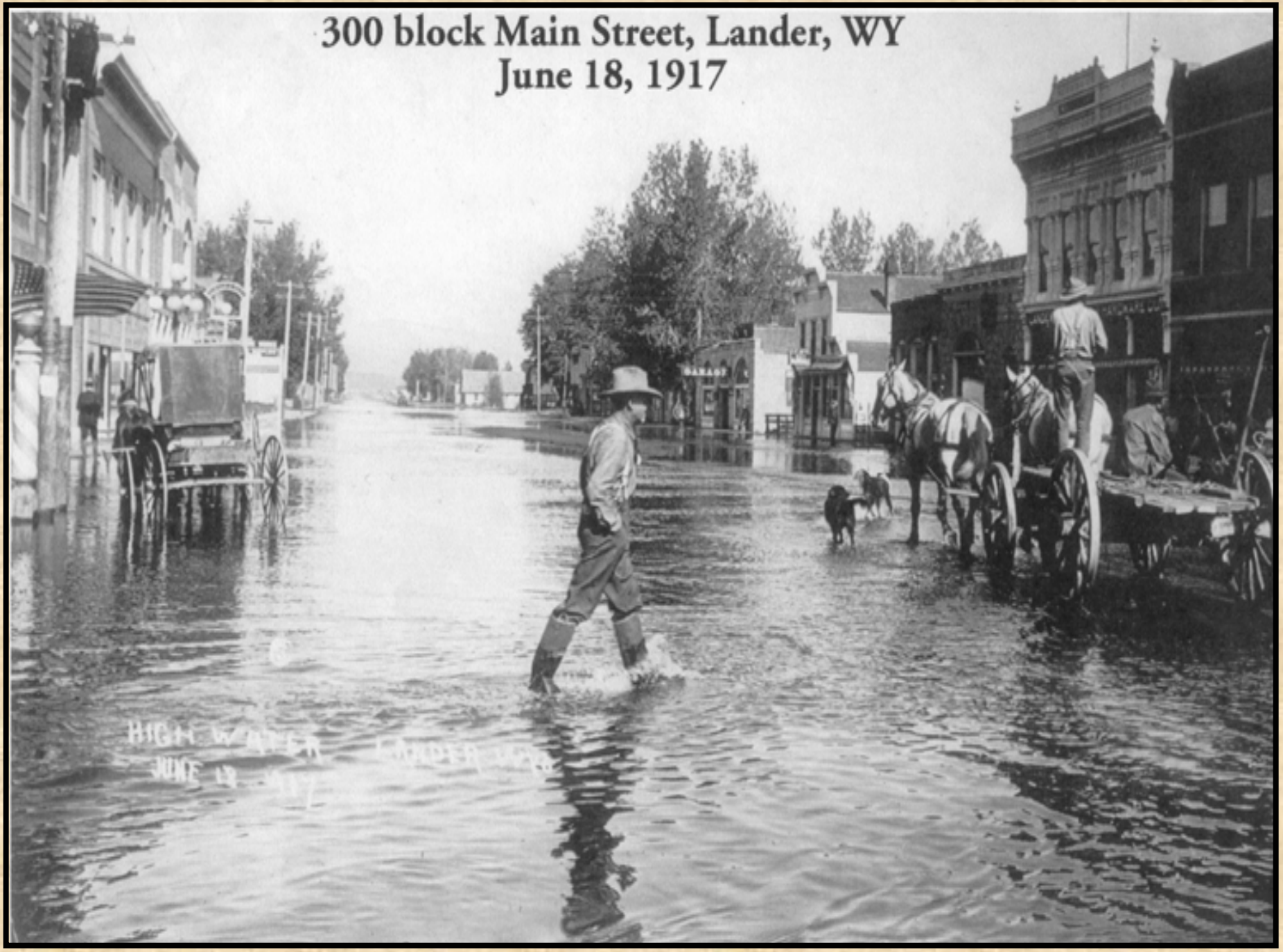
Letter of Request

Development of a Watershed Plan to address:

- **Flood prevention**
- **Watershed protection**
- **Agriculture water management**
- **Water quality & water quantity**
- **Riparian restoration**
- **Streambank stabilization**

300 block Main Street, Lander, WY
June 18, 1917




300 block Main Street, Lander, WY
June 18, 1917

1923 Flood

400 Block Main Street

This house was moved from a location near the Depot (Chamber of Commerce building) to the north several blocks by the flood.


Flood water
past 5th
Street
Downtown London June 1963

Watershed Protection and Flood Prevention Program PL83-566

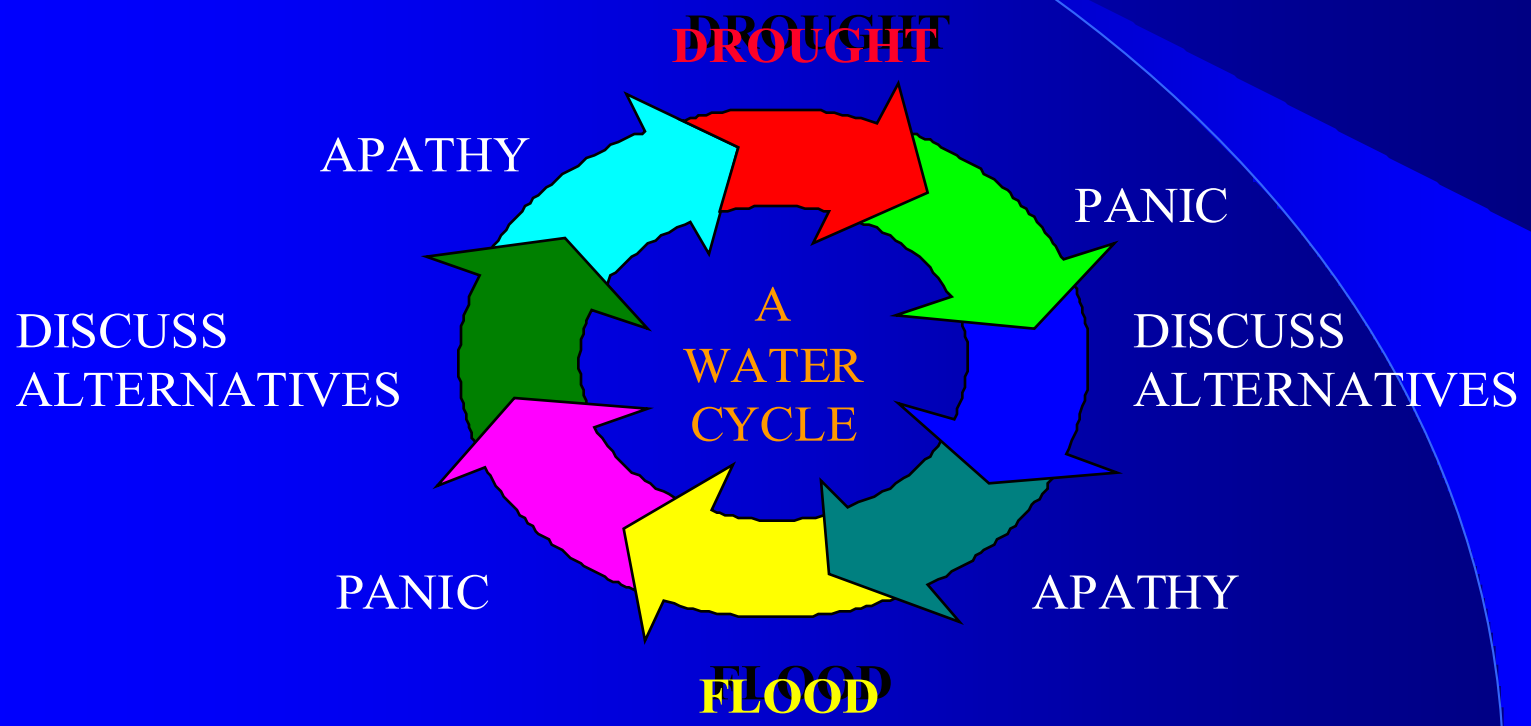
- **Law authorizes the Secretary of Agriculture to cooperate with state and local agencies in planning and carrying out works of improvement for soil conservation and other purposes.**
- **Law provides for technical and financial assistance from USDA to local organizations representing the people living in small watersheds.**
- **PL83-566 program requires the development of a physically environmentally, socially, and economically sound plan of improvements scheduled for implementation over a scheduled period of years. (Environmental Assessment of Environmental Impact Statement)**

Watershed Protection and Flood Prevention Program PL83-566

(b) Specific Purposes - Section 4 of the Act lists the following specific purposes as eligible for cost sharing:

- **Flood prevention**
- **The agricultural phases of the conservation, development, utilization, and disposal of water (ag water management)**
- **Fish and wildlife development**
- **Recreational development**
- **Ground water recharge**
- **Water quality management**
- **Conservation and proper utilization of land**
- **Municipal and industrial water supply**

THE HYDRO- ILLOGICAL CYCLE



This diagram illustrates the tendency for apathy to set in as time passes after a drought & flood event. This apathy often prevents planning and implementation to move forward to prevent future flooding, and it does not become an issue again until after the next flood event.

Historic Floods in Lander

- 1917
- 1924
- 1926
- 1944
- 1947
- 1952
- 1963
- 1971
- 1995
- ??

PRELIMINARY INVESTIGATION REPORT
on the

Middle Fork Popo Agie River through Lander

Prepared by

Natural Resources Conservation Service

For

Popo Agie Conservation District
City of Lander
Fremont County

April 2001

Preliminary Planning Alternatives

- Alt I - No Action
- Alt IIA - Diversion (Vegetated Channel & Rock Chutes)
- Alt IIB - Diversion (Underground pipes)
- Alternative III - Floodwall & Dike
- Alternative IV - Storage
- Alt V - Channel Stability & Restoration

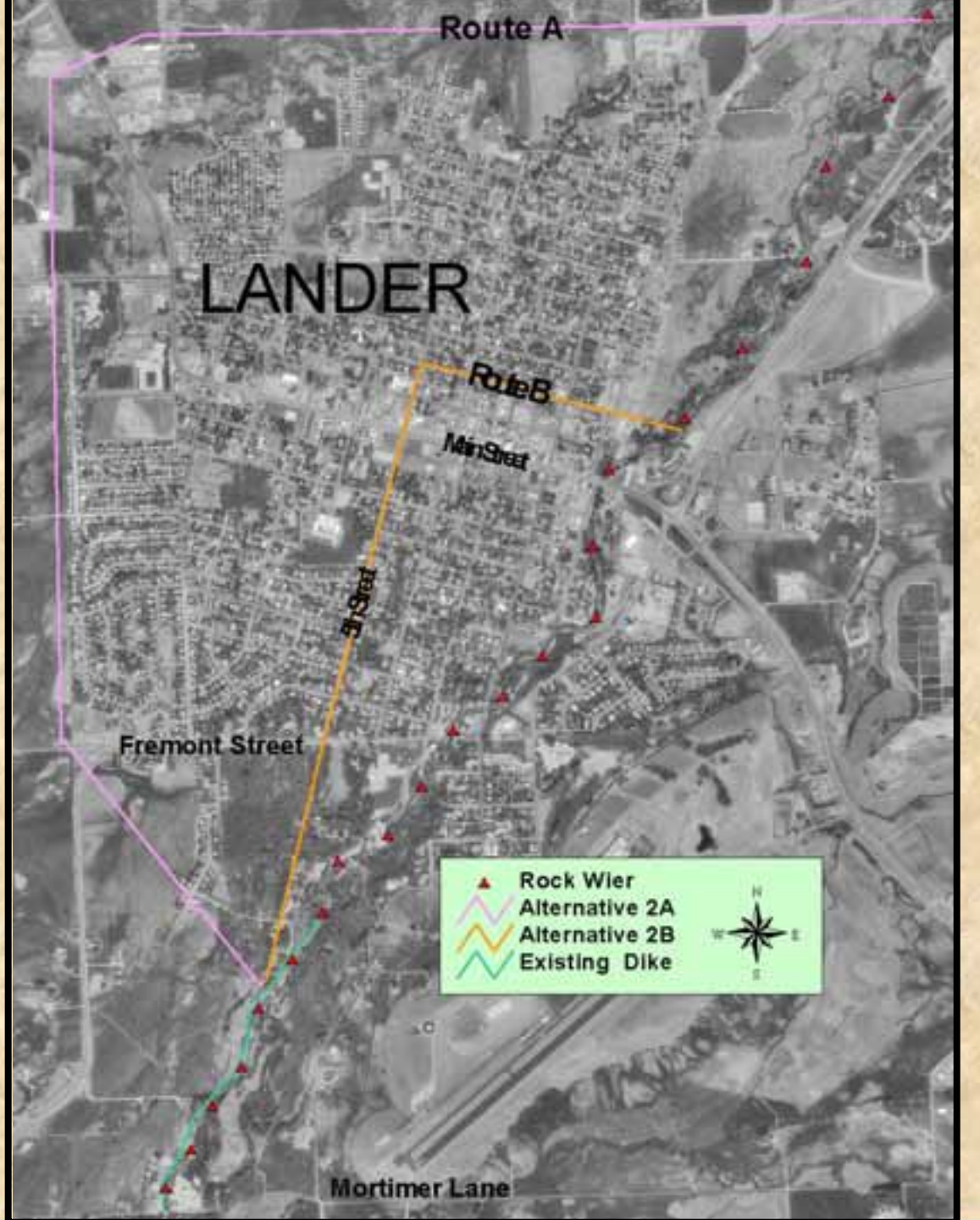
Alternative I: Future Without the Project (No Action Alternative)

- Flood hazards would remain, including: safety, property damage, and destruction of historical sites
- The city and landowners will continue to face costs associated with fighting the effects of flooding (estimated at $1,000,000 for 1995/1996 event alone).
- The stream channel will continue to erode: reducing water quality and aquatic habitat; increasing streambank erosion, deposition of material below town, and downstream flooding.

FLOOD & STREAM CHANNEL DAMAGE ESTIMATE FOR A 100 YEAR FLOOD EVENT IS $8,672,914

Damage estimate includes:

- **1000 residential/commercial buildings and their contents;**
- **residential clean-up;**
- **16 blocks of street, sidewalk, and utilities;**
- **streambank property;**
- **fences; pasture; irrigation systems; and access roads.**



Alternative II Diversion

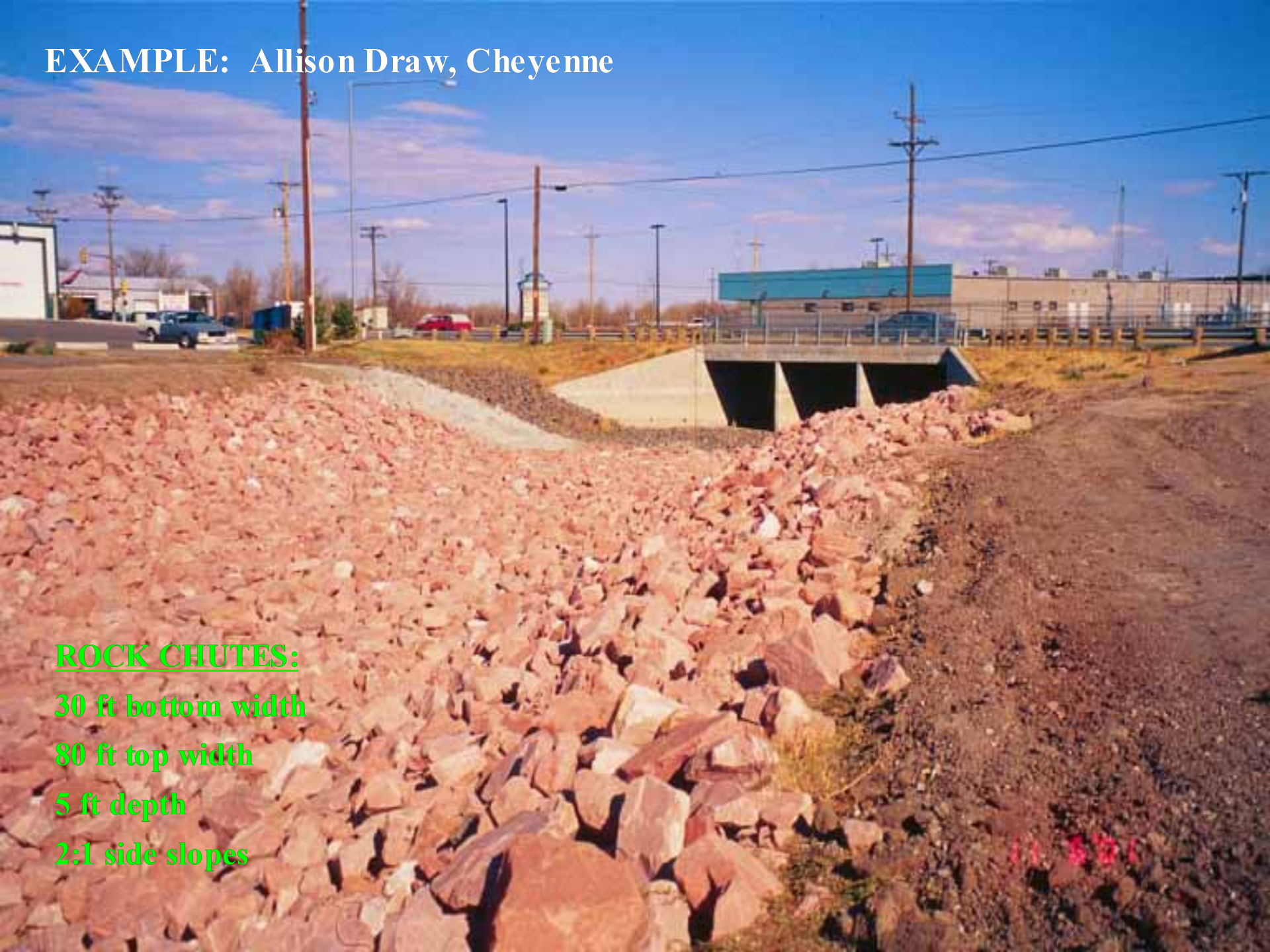
This alternative diverts 1000 cubic feet per second from the river during a flood around town, in addition to improving an existing flood dike from Mortimer Lane to the Dickinson Creek diversion. This map shows two routes, A and B.

The estimated cost for this alternative is approximately

$9,500,000 Route B

$5,631,000 Route A

Standing on College Drive, looking east towards Herford Ranch and Crow Creek


EXAMPLE: Allison Draw, Cheyenne
ROCK CHUTES:
30 ft bottom width
80 ft top width
5 ft depth
2:1 side slopes

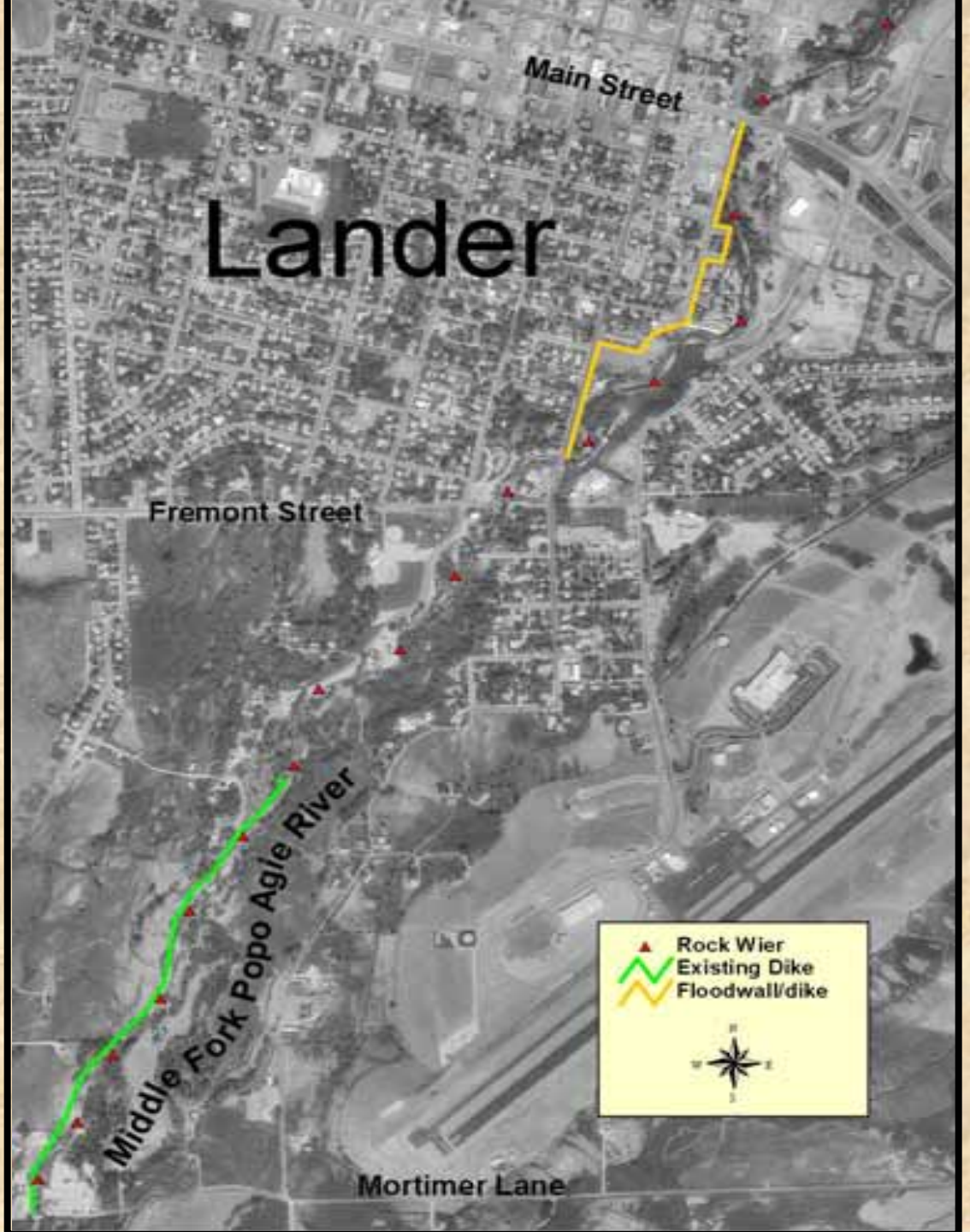
Alternative IIB Diversion (underground Pipes)

- 2 @ 78 inch diameter pipes
- Approximately 10, 450 feet length

Examples:

Jackson -Cache Creek

Thermopolis - Candy Jack Creek



Alternative III Floodwall

This alternative consists of rebuilding portions of 1st and 2nd Streets between Main and Fremont Streets to serve as flood dikes; or constructing a concrete floodwall along portions of 1st and 2nd Street between Main and Fremont Streets. This alternative also involves improving the existing flood dike from Mortimer Lane to the Dickinson Creek diversion.

The estimated cost for this alternative is Floodwall, stream-work & re-location @ $ 3,106,000

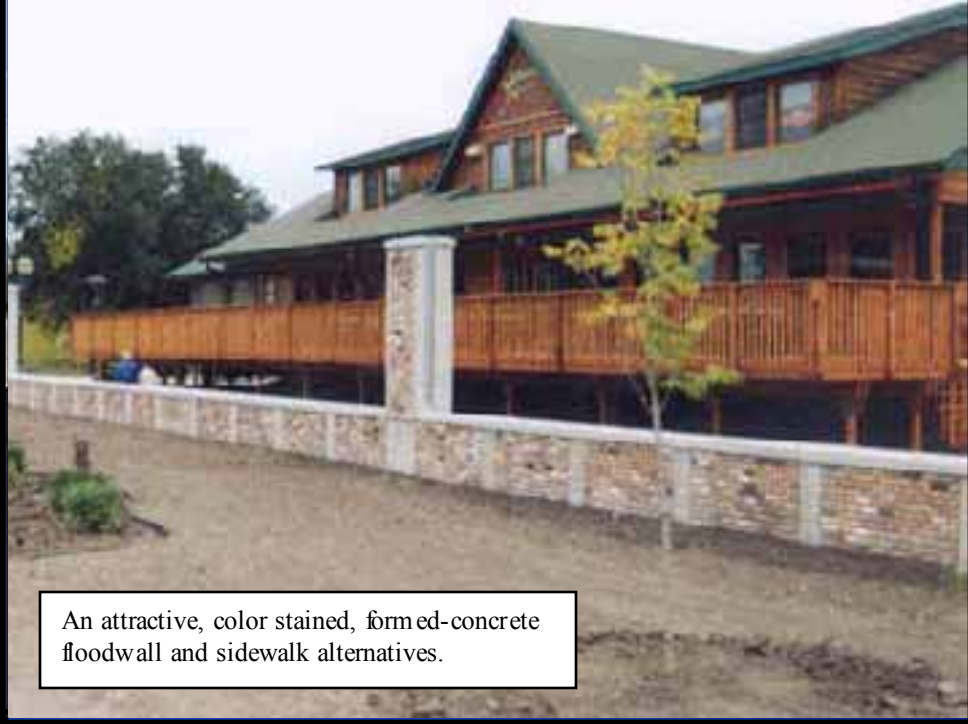
Floodwall

- 2,250 feet of length or 4.8 city blocks

- Height ranges from 0.1 feet to 6.5 feet

- 1-2 feet of height = 26% or 1.2 city blocks
- 2-4 feet of height = 16% or 0.8 city blocks
- 4-6.5 feet of height = 59% or 2.8 city blocks

This is the view looking south from Main Street and down 1st Street, showing the current guardrail, sidewalk, and street. This is the approximate area where Alternative III (Floodwall) would be located.



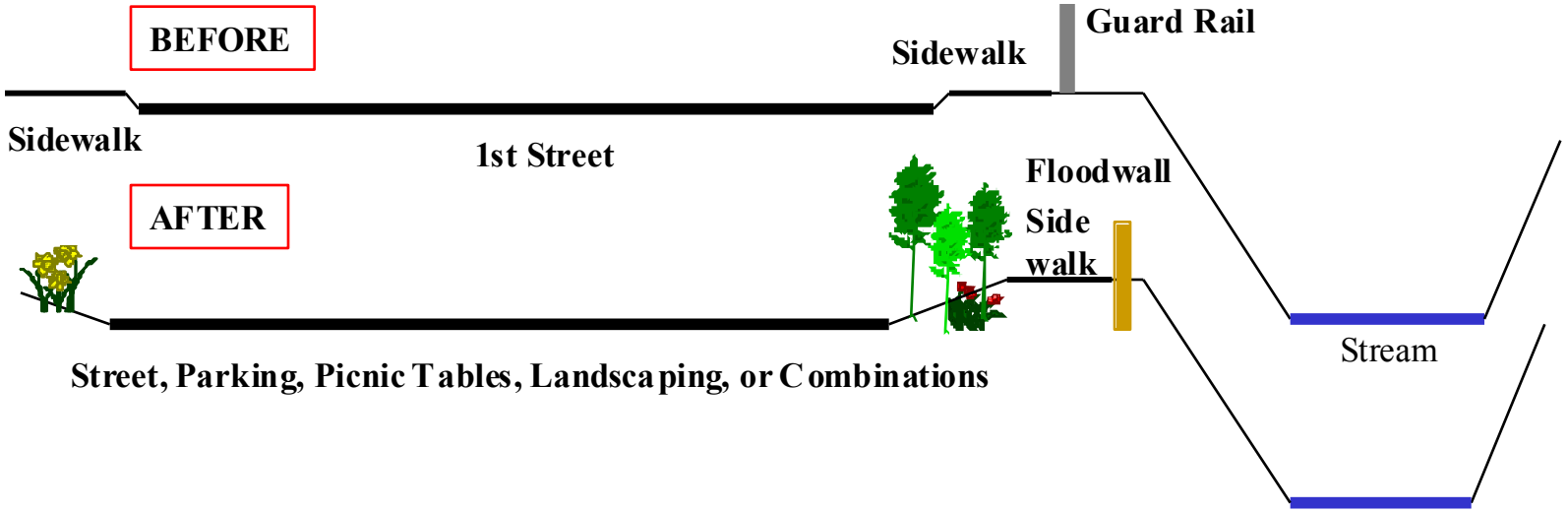
An attractive, color stained, formed-concrete floodwall and sidewalk alternatives.

Simulated brick, formed - concrete floodwall (1/2 of this floodwall is underground).

Concrete floodwall coloration before/after

This area has combined landscaping and parking into a flood channel with sidewalk and floodwall. Other versions incorporate parks, picnic areas, greenways, natural riparian areas, or some combination thereof.

The sketch below shows a similar potential adaptation of 1st Street for 2 blocks south of Main Street.



ESTIMATED COSTS ASSOCIATED WITH ALTERNATIVES II AND III INCLUDE:

- Construction & Installation
- Land Rights
- Property Buyout
- Stream Restoration

NRCS WOULD PROVIDE:

- 100 % Construction Costs
- Engineering
- Project Administration

Local Costs

- Purchasing land rights or easements
- Permits & Associated Fees
- Local Contract Administration
- Operation and Maintenance
- Others

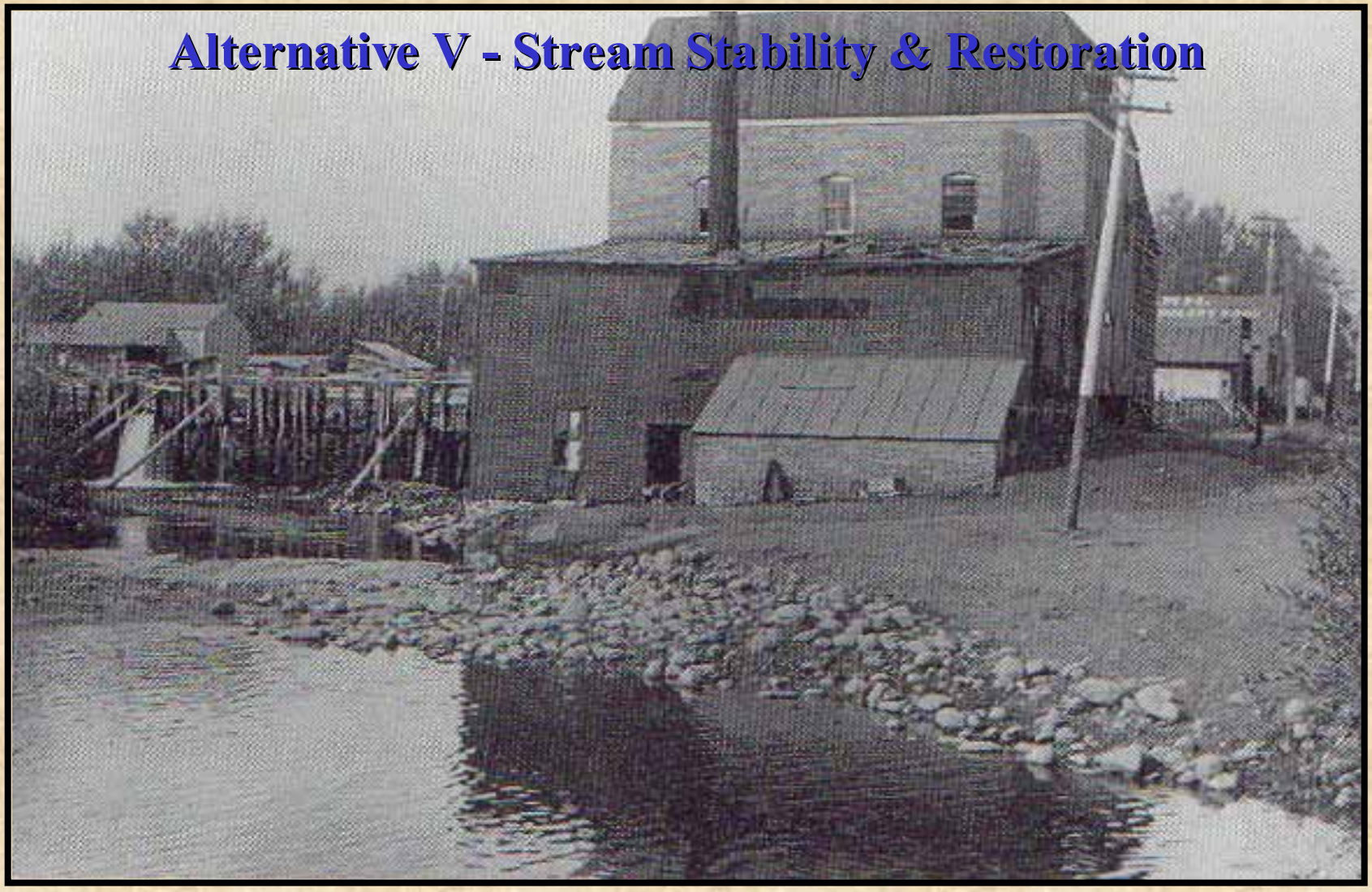
Alternative IV
Flood Control Storage

The initial NRCS Preliminary Investigation Report did not reveal any prospective storage sites. Potential sites identified by other entities did not appear effective (due to location too high in the watershed to protect against flooding through Lander). Also, high cost and added safety considerations did not make this alternative competitive with other alternatives.

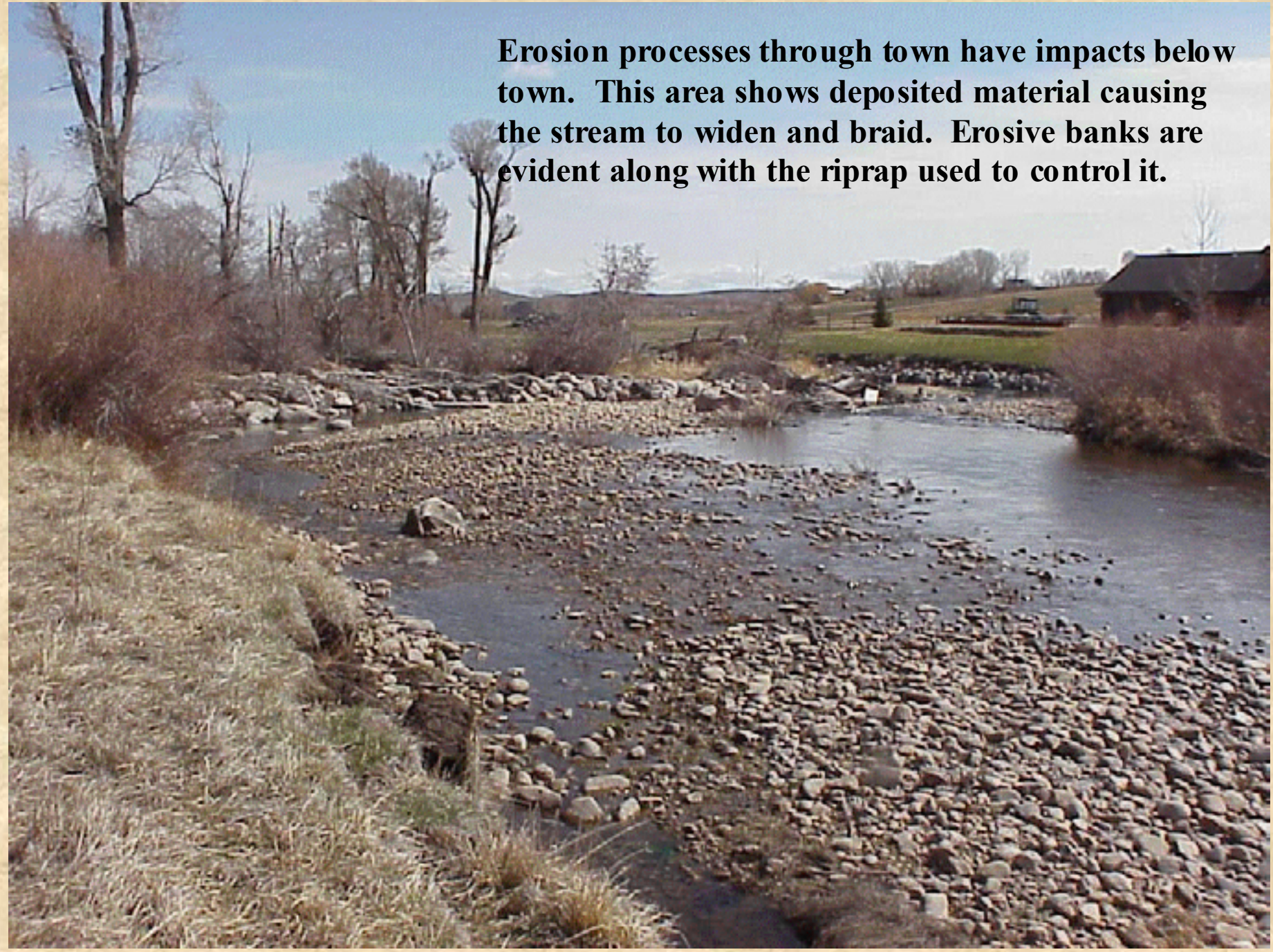
However, a recent report completed by Anderson Consulting Engineers for Wyoming Water Development Commission (WEDC), has identified sites in phase one of their study, that may provide potential flood storage capabilities.

NRCS will explore the potentials of these sites with the assistance of Anderson Consulting and WWDC.

Alternative V - Stream Stability & Restoration



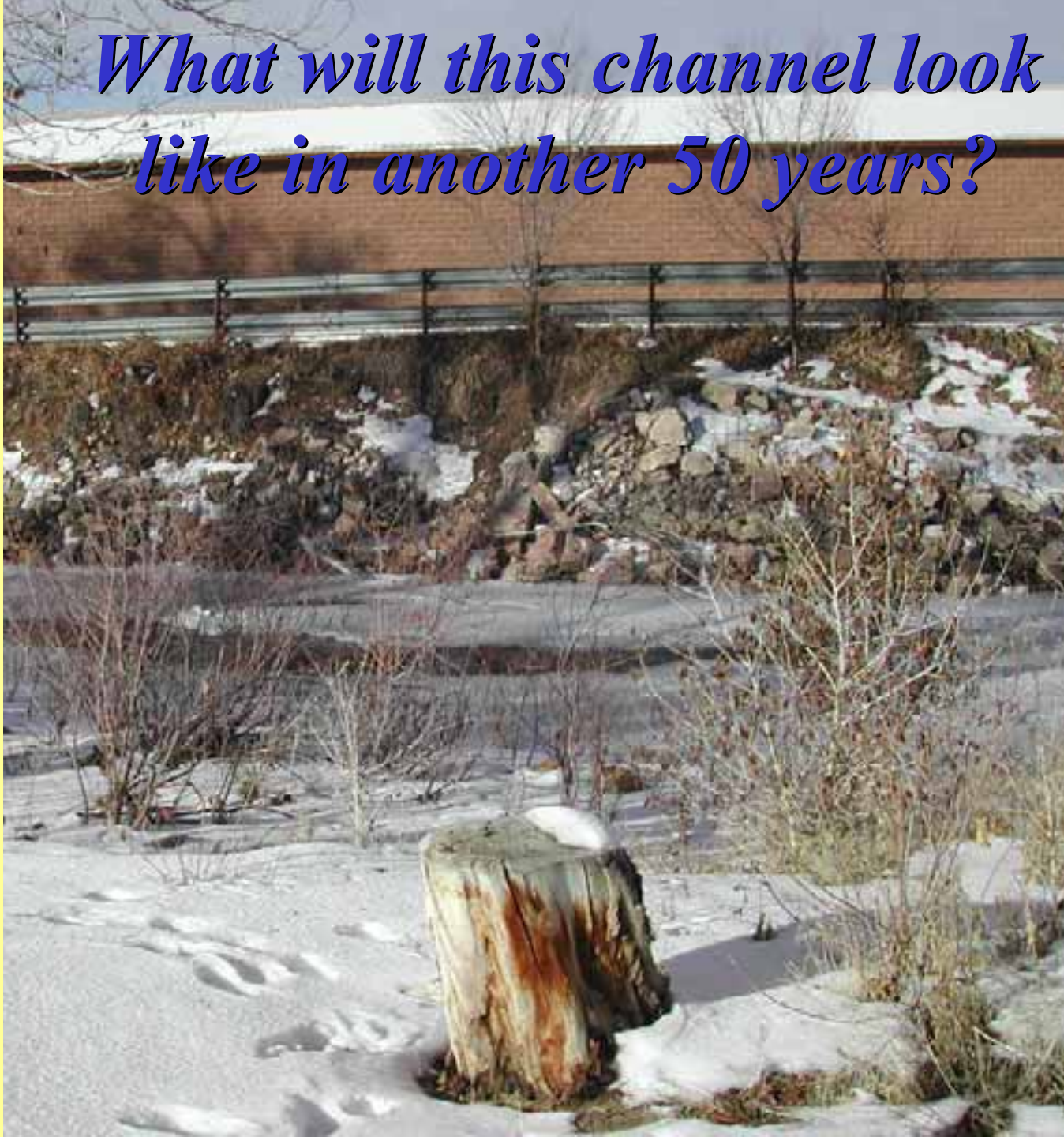
This view of the Lander Mill looks west down main street, showing the Middle Fork of the Popo Agie River where the bridge now stands. The channel appears to be 1 foot deep. Since that time, channel modifications (straightening and riprapping) have accelerated the velocity of the stream and increasing the erosive processes of the water. Today the channel at the bridge is 10 to 12 feet deep.

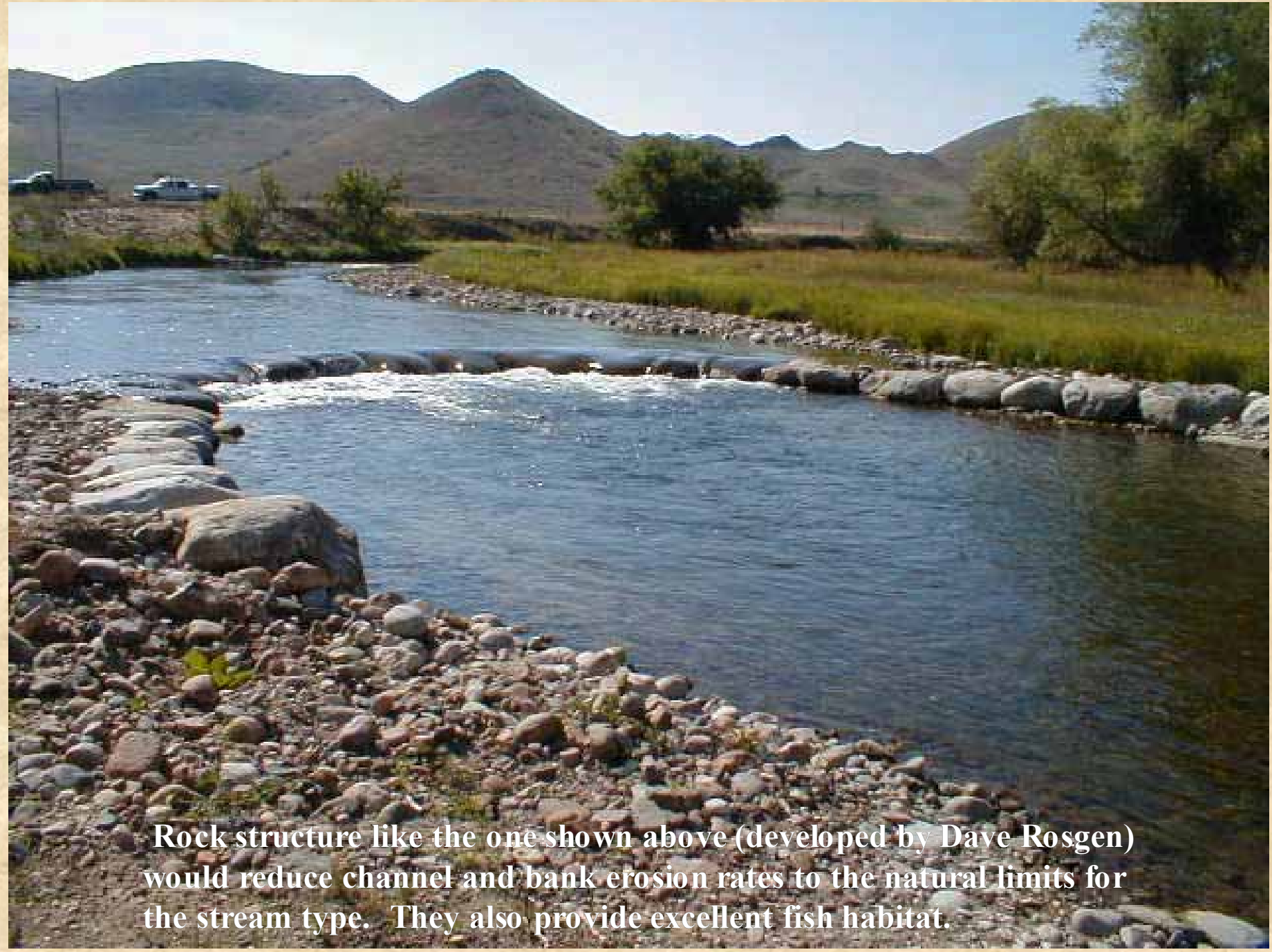

Erosion processes through town have impacts below town. This area shows deposited material causing the stream to widen and braid. Erosive banks are evident along with the riprap used to control it.

Continued down-cutting will deepen the channel, further reducing water quality and aquatic habitat, increasing streambank erosion and its affects to adjacent vegetation, streets, sidewalks, utilities, structures, etc.

The channel erosion will migrate upstream.

The channel and streambank erosion will deposit more material within the channel downstream, reducing channel depth, reducing aquatic habitat, and increasing steambank erosion and flooding





Rock structure like the one shown above (developed by Dave Rosgen) would reduce channel and bank erosion rates to the natural limits for the stream type. They also provide excellent fish habitat.

What is Next?

- Watershed Plan/Environmental Impact Statement (Imitated in January 2003)
  - Complete the 'scoping' process in spring 2004
- DRAFT Alternatives and Impacts
- DRAFT EIS - Presented to Public and Public Comments
- Final Watershed Plan/ EIS & Record of Decision

PROJECT BENEFIT SUMMARY

- **1000 protected residential/commercial buildings (including downtown historic district)**
- **Reduced stream degradation**
- **Aesthetics (in-stream structures, flood prevention structures, and landscaping)**
- **Improved aquatic habitat**
- **Reduced stream channel maintenance**

BENEFITS (Cont.)

- **Economic development ($ 'X' million investment, with a multiplier effect of 5, results in an infusion of $ 'X' million dollars into the community)**
- **SAFETY - reduced threat to flood related loss of life (piece of mind)**
- **Opportunities to enhance recreation, and the development of picnic areas, walkways, restrooms, and parking**
- **Many other benefits, not captured**