

Allison Creek Dam Removal & Stream Restoration

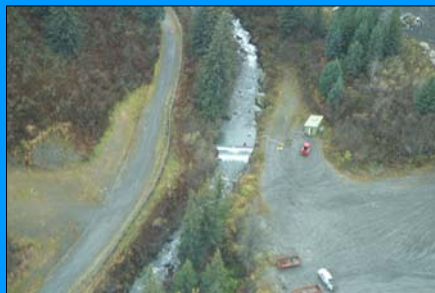


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Location & Site Conditions



- Valdez Marine Terminal
- Port Valdez
- Anadromous Stream
- Lake Fed
- Low Bedload
- Upper Channel
Bedrock/Boulder Control
- Gravel/ Cobble bed at Project Site
- Gradient changes at project site
- Pipeline Crossing D.S.
- Fiber Optic Communication Cable D.S.
- Water Intake Pipes U.S.



History

- VMT Terminus of Trans Alaska Pipeline
- 1976 – Installed water intake system and Dam
- Purpose of Dam – Low Flow Gaging and Increased Head
- History of sediment buildup/cleanout US of Dam
- During Dam Construction Stream re-routed



History

- Water Intake damaged in 1989
- End 34 ft of intake pipes replaced w/ 24” dia. wedgewire intake screens
- Temporary dam & flume constructed for surface flows
- Surface pumps and partial penetration wells for local dewatering
- Unable to dewater hole – tie in done under water
- Work site highly congested – concern with safety

History



- In 2002 system began failing again – corrosion
- Replaced original system due to uncertainty about dewatering / tie-in
- Work done at low water – open cut – no diversion
- New intake screens placed with crane / suspension frame
- Condition of dam a concern during project – Stated concerns to Client

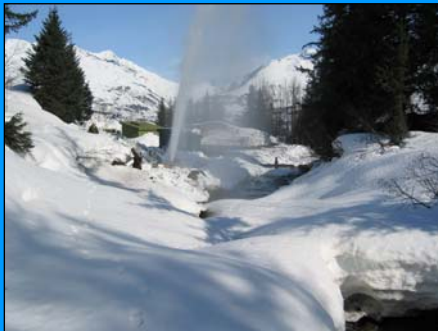


Dam Breach July 2003

- Undermining of Dam caused loss of sub grade & Dam Breach
- Stream flowed under dam
- Return run of salmon passed through under dam
- Emergency Repairs to plug breach
- Need for long term solution evident.

Alternatives Considered / Issues

- Repair – plug hole and reinforce DS Channel
- Remove Dam & Restore Stream (Selected)
- Sedimentation U.S. of dam causing problems with intake.
- Dam was nearly complete blockage to migration
- Local concern was spawning over intakes, water quality



Design / Pre-Construction Survey

- Construction window May 15 to July 15 – Salmon
- Pre-construction survey and on-site design
- Design drawings limited to hand sketches and post construction as-built
- Ref. Reach U.S., D.S., w/ Floodplain.
- Ref. Reach Bracketed Slope Range

Underground Utilities



- Fiber Optic Communication Cable
- 48" Dia. Crude Oil Pipeline
- Original Water Intake System – 2 ea. 24" Dia. Intake Screens
- New Intake System – 2 ea. 24" Dia. Intake Screens
- Electric Cables to Pump House, water lines

Design Concept

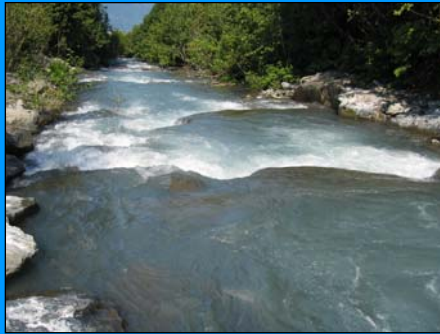


- Back wall to be removed, leaving floor of dam and abutments in-place
- Concern that floor of dam would be difficult to remove
- Bed to be raised from D.S. end working U.S.
- Spacing and skew of buried utilities required site specific design
- Low bedload system – main concern energy dissipation / grade control -not sediment transport



Design Concept

- Asymmetric multi-cell drop structures designed for 1' drop per sill
- Structures Reduce near bank depth & velocity, concentrate energy at mid-channel
- Grade Control provided by structures
- Scour pools set D.S. of each sill for fish holding / passage
- Total 3 Sills and 2 multi-step structures



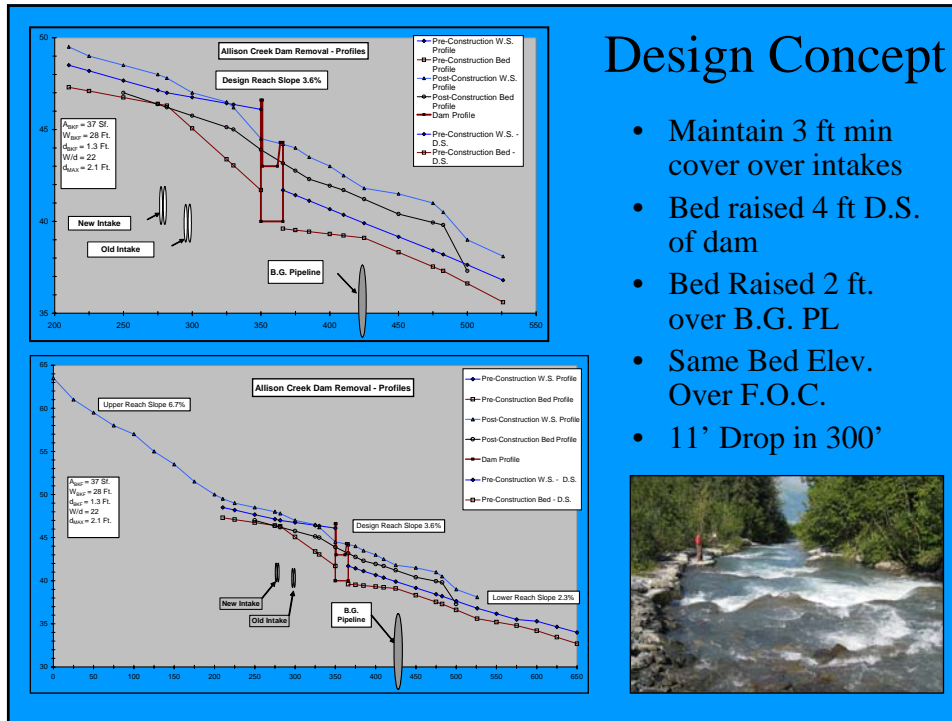
Design Concept

- Flow monitoring previously by V-notch weir and staff gage
- New stream gaging by pressure transducer and stage-discharge relationship
- Overland Flow from road and parking lot re-routed away from stream



Design Concept

- Maintain 3 ft min cover over intakes
- Bed raised 4 ft D.S. of dam
- Bed Raised 2 ft. over B.G. PL
- Same Bed Elev. Over F.O.C.
- 11' Drop in 300'



Construction

- Sill structures D.S. and U.S. installed first
- Structures constructed from D.S. toward U.S. end
- Worked from bank toward center of channel
- Worked in-stream due to local constraints
- Dam removed after grade re-established downstream
- First removed back-wall and built all structures to dam
- Removed floor and left abutment due to unacceptable hydraulics (fish passage)





Construction

- Hydraulics at dam unacceptable for fish passage w/ floor in-place.
- Floor of dam and left abutment removed.
- Broke up with Hoe, working from center.



Revegetation

- Maximized Floodplain area – bankfull bench L.B.
- R. Abutment covered with vegetation
- Reveg with spruce, alder, and sod mat transplants





Post Construction

- Monitoring Survey deferred to Spring 2005
- Walk-downs conducted July 04, September 04, October 04
- Fish Passage Restored to upper channel
- 1 rock moved from lower structure.
- Revegetation highly successful

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