Area = 665,384 sq. mi. (1,723,337 sq. km)
1,480 mi. (2,382 km) east to west
810 mi. (1,304 km) north to south
M9.2 Good Friday Earthquake of 1964
Frost jacking raised culverts 0.1 feet per year for 20 years, reducing freeboard to 4 inches
Lower Fire Lake Dam in Eagle River, Alaska

Concrete headwall at culvert spillway outlets

3.20.2005
Lower Fire Lake Dam in Eagle River, Alaska

Seepage around culverts through embankment  3.20.2005
Lower Fire Lake Dam in Eagle River, Alaska

Major rehabilitation raised crest of dam and replaced spillway with open channel.
Lower Fire Lake Dam in Eagle River, Alaska

Ice build up at bypass water discharge
Lower Fire Lake Dam in Eagle River, Alaska

Freeze up on rehabilitated dam
Lower Fire Lake Dam in Eagle River, Alaska

Low flow notch in spillway weir to concentrate winter base flow
Lower Fire Lake Dam in Eagle River, Alaska

Typical winter conditions
Lower Fire Lake Dam in Eagle River, Alaska

Typical winter conditions
Lower Fire Lake Dam in Eagle River, Alaska

Typical winter conditions
Lower Fire Lake Dam in Eagle River, Alaska

Typical winter conditions
Lower Fire Lake Dam in Eagle River, Alaska

Typical winter conditions
Itasigrook Dam in Utqiagvik (Barrow) Alaska

A tribute to Bruce Tschantz
Itasigrook Dam in Utqiagvik (Barrow) Alaska

NID Date of Construction: 1964

A tribute to Bruce Tschantz
Early in his career, Bruce was asked to design a dam in Barrow, Alaska.
Itasigrook Dam in Utqiagvik (Barrow) Alaska

He asked them what they had for construction materials.
And in a classic Alaskan fashion… make do with what you have.
Itasigrook Dam in Utqiagvik (Barrow) Alaska

40 years later
Itasigrook Dam in Utqiagvik (Barrow) Alaska

Subjected to extreme cold under the harshest conditions
Itasigrook Dam in Utqiagvik (Barrow) Alaska

Wind and tidal action from the Arctic Ocean
Itasigrook Dam in Utqiagvik (Barrow) Alaska

Sheet pile reinforcement added in 2006
Itasigrook Dam in Utqiagvik (Barrow) Alaska

Sheet pile weir with low flow notch and rip rap
Bruce Tschantz 1938-2017

Itasigrook Dam
Other Alaskan challenges
Alaska Dam Safety Program

Presentation Outline

– Other Alaska challenges
  • Upper Seldovia Dam
  • Mahoona Dam
  • Rock Creek Tailings Dam
FINAL REPORT

1994 REPAIRS
TO THE
SELODIA, ALASKA

UPPER AND LOWER (FISH CREEK)
WATER SUPPLY DAMS

PREPARED BY
CHUCK EGGLETON CONSULTING ENGINEERS
ANCHORAGE, ALASKA
DECEMBER 1994
Upper Seldovia Dam
Upper Seldovia Dam

DOWNSTREAM FACE AFTER ROTTED CONCRETE WAS REMOVED
Upper Seldovia Dam

UPSTREAM FACE AFTER COMPLETION OF PATCHWORK
APPLICATION OF IMPERVIOUS BARRIER TO UPSTREAM FACE
Upper Seldovia Dam

APPLICATION OF ULTRA-VIOLET BARRIER TO UPSTREAM FACE
Seldovia Upper Dam
AK 00024

PERIODIC SAFETY INSPECTION

Prepared for:
City of Seldovia

Prepared by:
PND
ENGINEERS, INC.
September 2016
Upper Seldovia Dam
Upper Seldovia Dam

Photograph No. 3

Description:

View of left side of upstream arch dam. Note possible ice damage to upper 2-feet of membrane.
Upper Seldovia Dam

Seldovia Upper Dam
Periodic Safety Inspection

Photograph No. 16

Description:

Downstream face of dam left of spillway. Note some calcite leaching noted. This was sounded with a geologist hammer and no voids were noted but should be monitored as part of O&M.
Photograph No. 17

Description:

Middle of downstream face left of spillway. Note some vegetation was cleared but some remained prior to the field inspection.
Upper Seldovia Dam

Photograph No. 18

Description:

Left downstream monolith.
Mahoona Dam

Water supply and hydropower for Village of Ouizinkie near Kodiak

June 2011
Mahoona Dam

May 2014
Concrete faced rockfill dam under construction
Ice causes dam on Alaska's Kodiak Island to empty

KODIAK, Alaska (AP) - Ouzinkie has requested emergency assistance after the southern Alaska city's mayor said the town's dam had to be completely drained after shifting ice broke a gate valve.

The Kodiak Daily Mirror reports Ouzinkie Mayor Dan Clarion says the dam was drained of water Friday.

Officials were able to get a backup pumping station working after initially encountering difficulties. Clarion says low temperatures have also caused sections of the water main to freeze, disrupting the entire system.

The dam was built in partnership with the Alaska Native Tribal Health Consortium.

March 28, 2017

“completely drained after shifting ice broke a gate valve”
And then there were the Rock Creek Mine Dams
Winter construction of Rock Creek Tailings Dam
Winter operation of Rock Creek Mine Dams
Winter inspection of Rock Creek Mine Dams
You when some and you lose some

Ice crushed CMP