DAMS
and
RESERVOIRS

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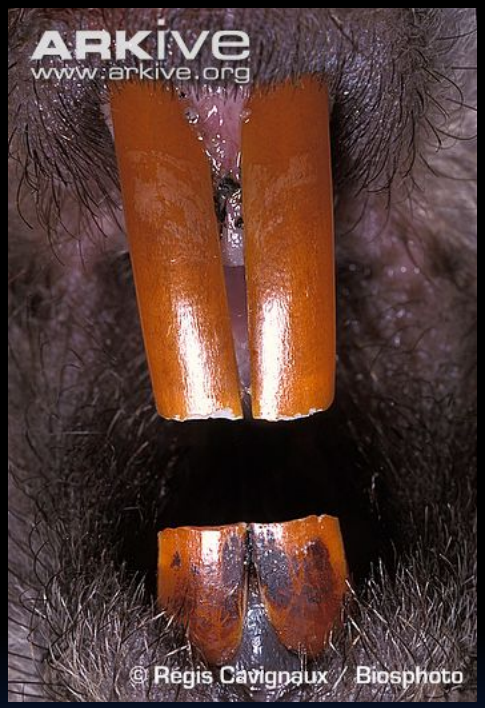
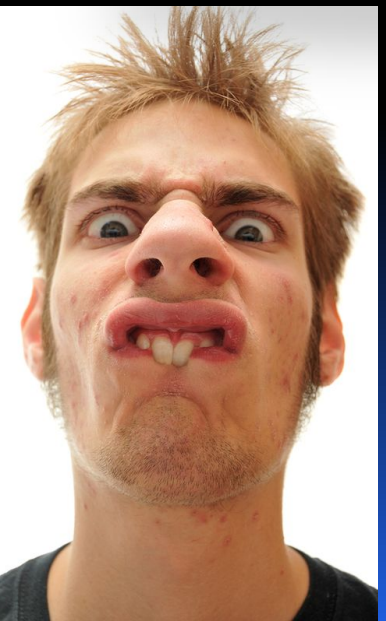
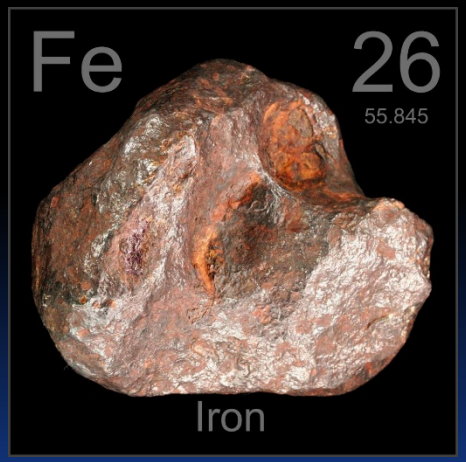
Can nibble and knock down 200-400 trees in a year and of course beavers teeth wears out cutting trees.

But they keep getting longer and longer

Has *iron* which is way stronger than ***fluoride***

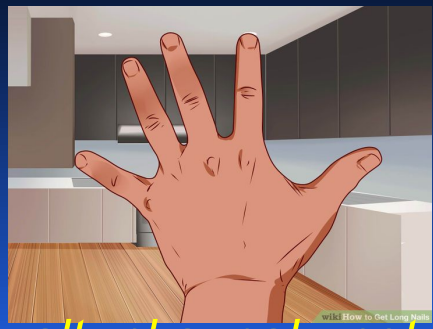






<u>*THANK GOD !!!*</u>

just our nails keep growing



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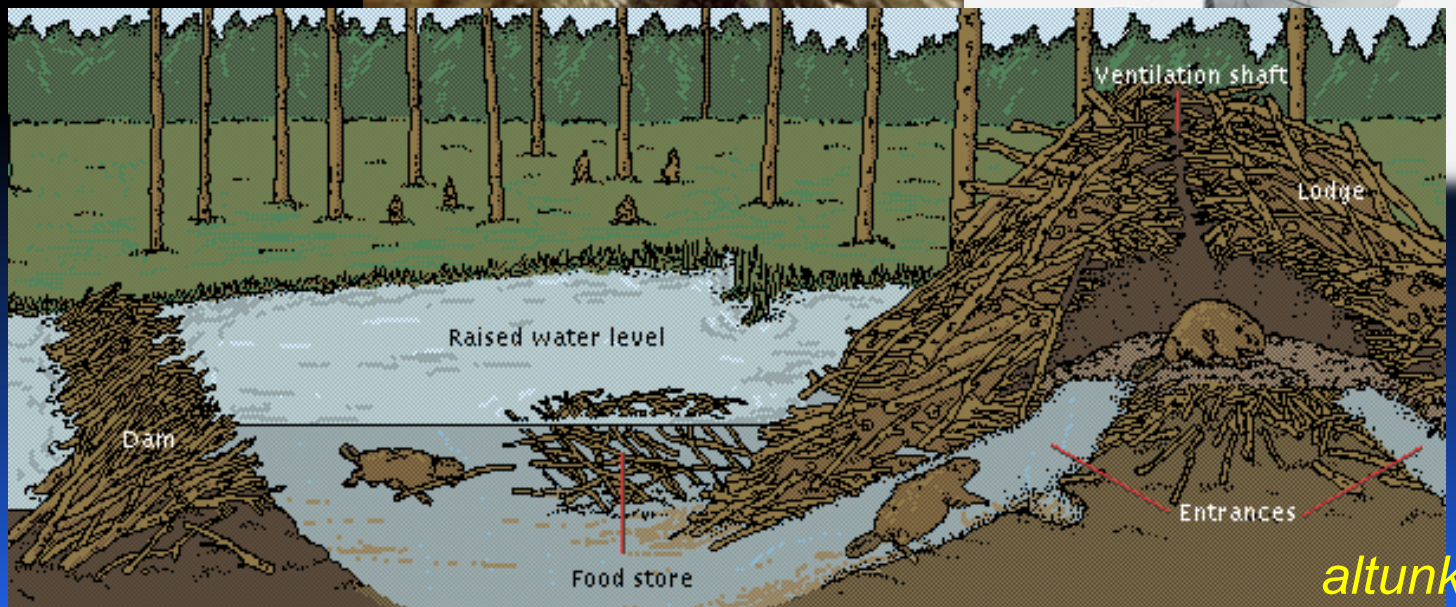
JUST ONE MORE THING !

The teeth of beavers ***self-sharpen*** because their inner surface is softer than the outer enamel and wears away faster to create a sharp edge



Drinking water

Irrigation

Flood control

Energy

Navigation

Recreational purposes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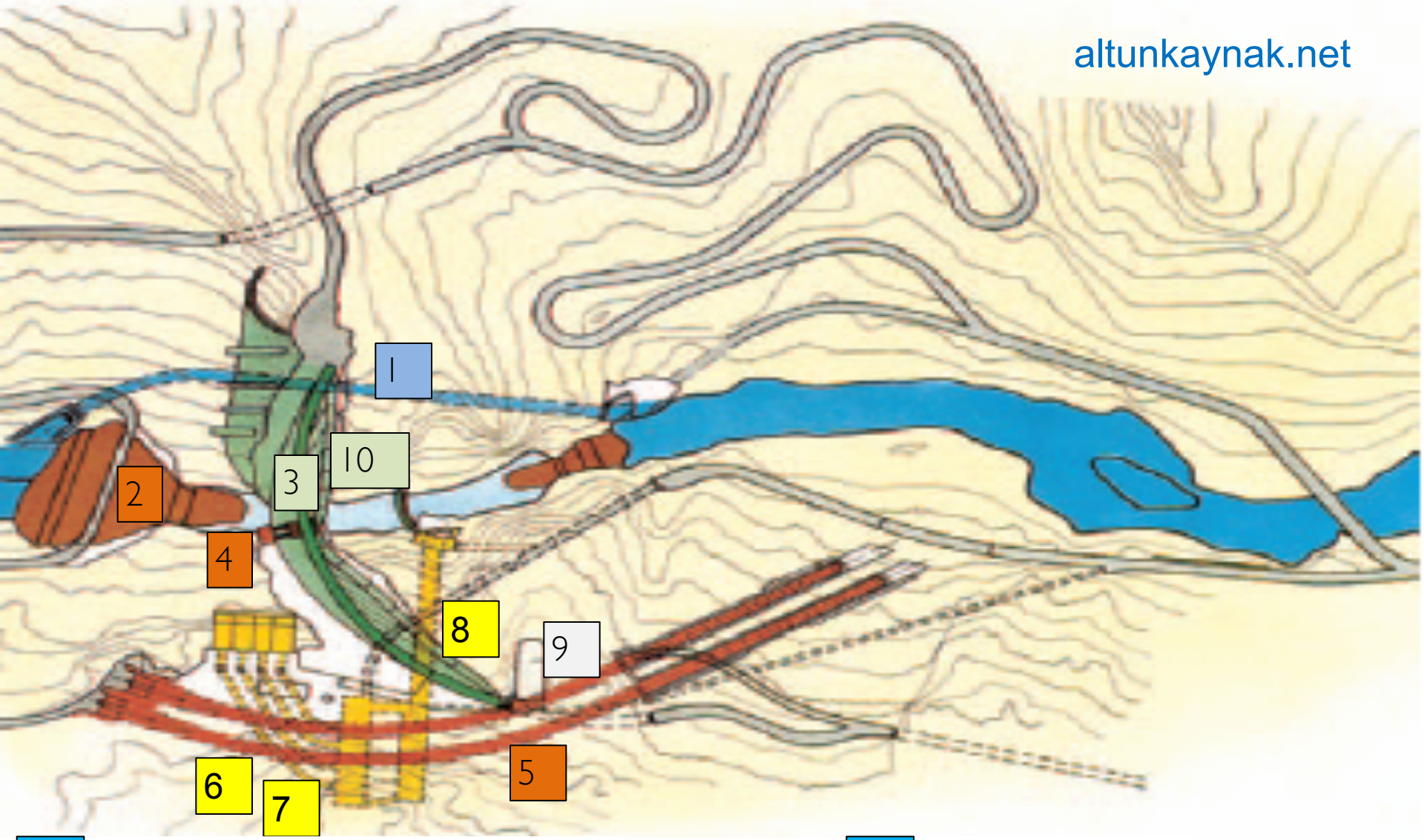

1	River diversion tunnel
2	Upstream coffer dam
3	Arch dam
4	Bottom outlet
5	Spillway
6	Penstocks
7	Powerhouse cavern
8	Tailrace tunnel
9	Switchyard
10	Stilling basin


Green River
Landslide
Small Depression Location
Drainage Tunnel
Spillway
Right Abutment
Embankment
Big Depression Location
Engineered Filter Blanket
Flood Control Tower
Eagle Gorge Reservoir
Fish Passage Facility Excavation
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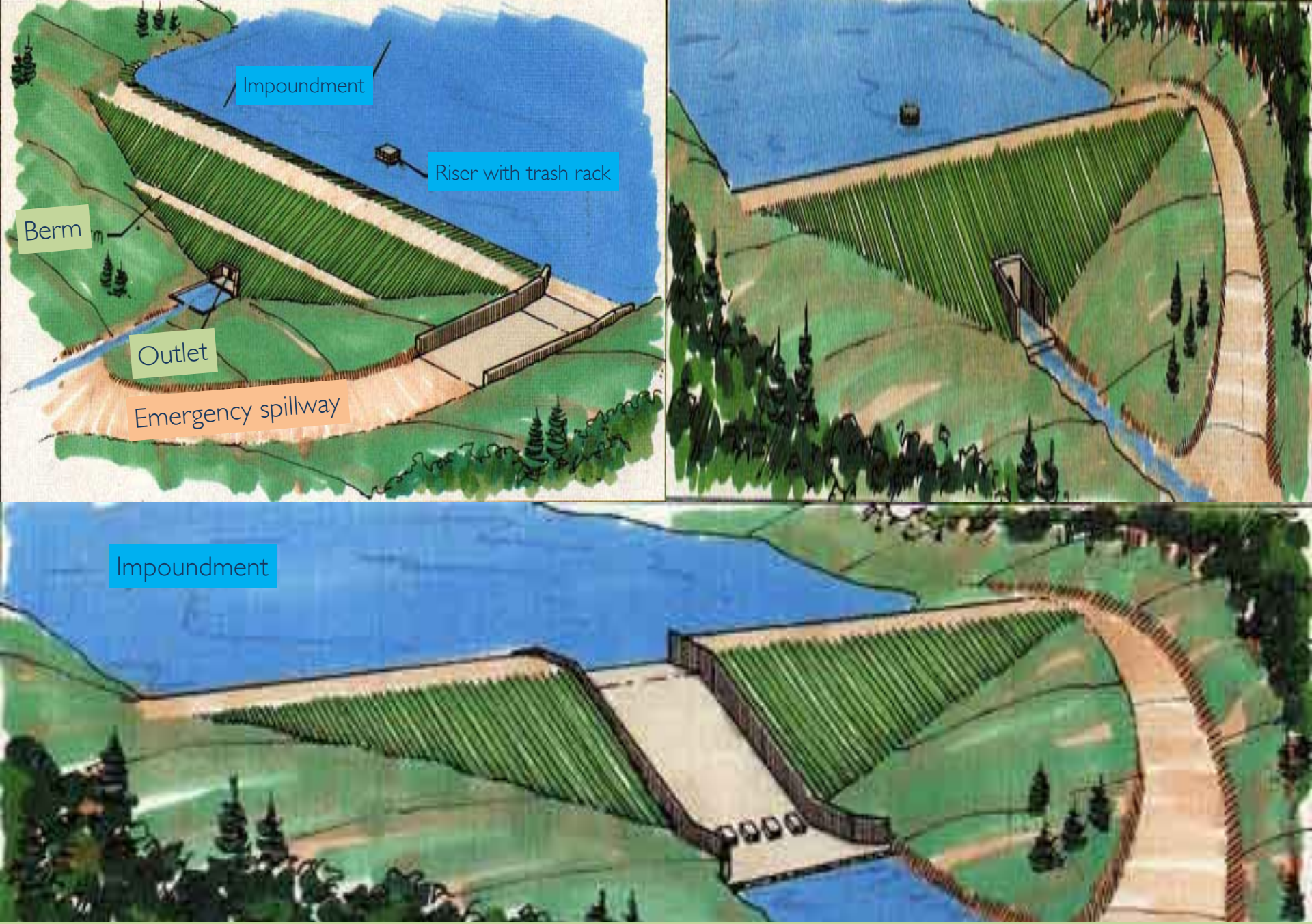
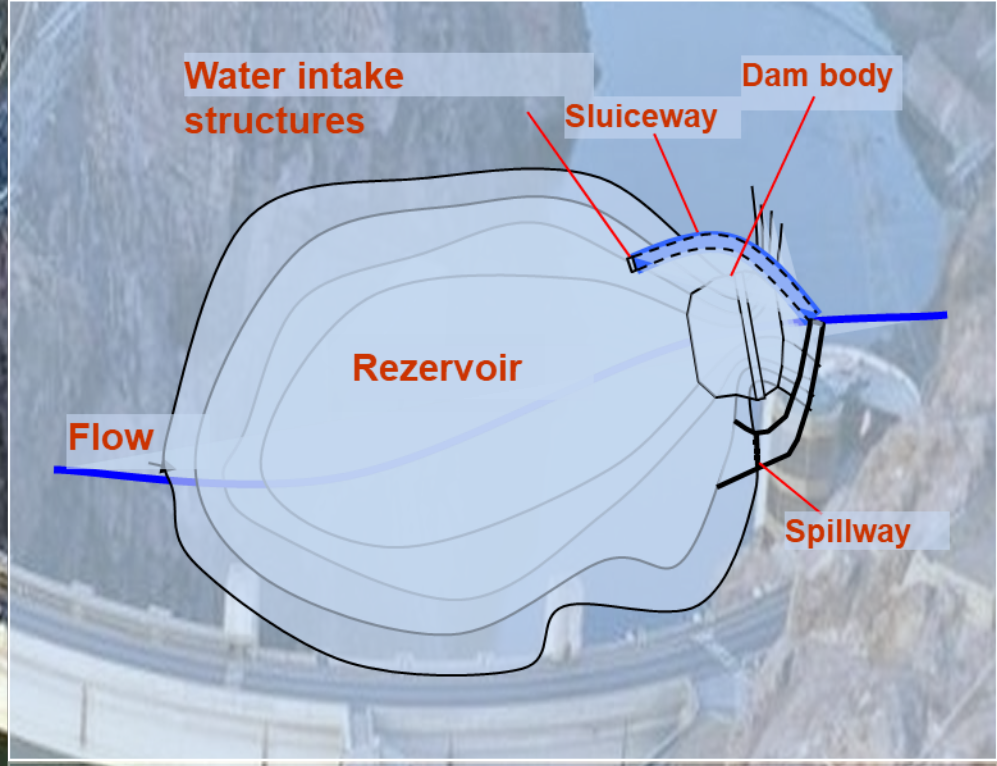


Embankment (Fill) Dams

Parts of Dam

- Dam body
- Reservoir
- Water intake structures
- Sluiceway
- Spillway
- Dam site
- Diversion facilities
- Other facilities



PHYSICAL CHARACTERISTICS OF RESERVOIRS

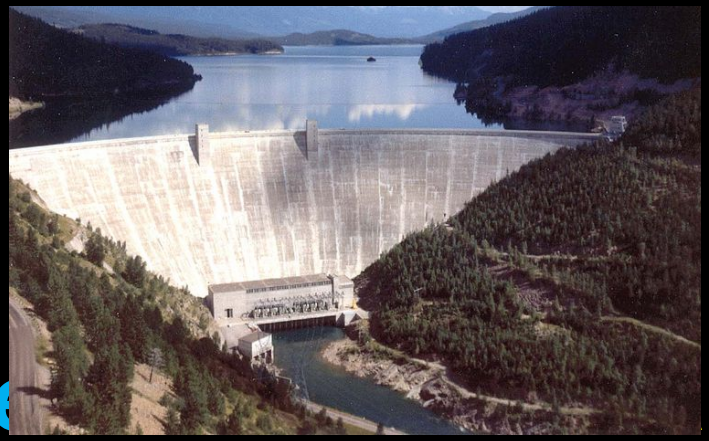
Primary function is to *store*

Most important physical characteristic is

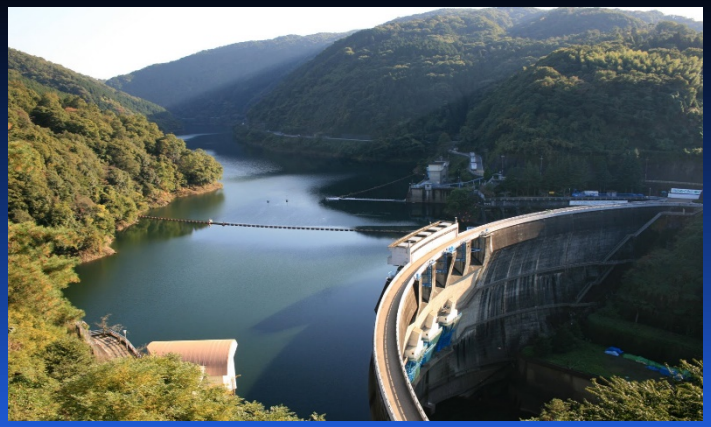
"storage capacity"

Parts of Dams

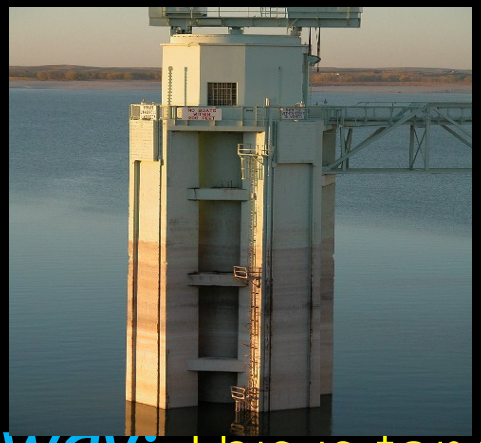
- ***Dam body:*** Body forms the main part of a dam as an impervious barrier to constitute an artificial lake.



- ***Re*** rtificial lake behind a dam body.



- ***Water intake structures:*** That is a facility to withdraw water from a reservoir.



- ***Sluiceway:*** This is for facilitating to evacuate reservoir, to reduce capacity of spillway and to release water to downstream when necessary.

- *Spillway:* This is part of a dam to evacuate the flood water from reservoir and to protect the dam.

Diversion facilities: This is the facility to provide dry environment for dam construction. This is made from diversion tunnel and coffer dam.

- ***Dam site:*** Some facilities including office, lab, storehouse, parking garage and parks.

- ***Other facilities:*** The structures such as power plants, drinking water purification units and fish way.

Determination of dam location

- **Characteristics of dam location**
  - *Geologic formation*
  - *Location and capacity of spillway*
  - *Diversion conditions*
  - *Sediment condition*
  - *Transportation facilities*
  - *Structural design*

Characteristics of lake site

- Topography
- Geologic formation
- Slope stability problems
- Landslide

An ideal reservoir location must have

- Sufficiently impervious
- Sound formations
- Without excessive seepage
- Deep and narrow reservoirs

Determination of dam location

- Features of basin
- Confiscation and Infrastructure cost
- Environment effect
- Features of Downstream
  - Living things
  - Water rights
  - Groundwater
  - Accommodation places

Purposes of building a dam

- *Water supply*
- *Irrigation*
- *Hydropower generation*
- *Flood control*
- *Transportation*
- *Recreational (Organizing flow, to protect life, to control sediment*

Effects of dam on Environment

- Social and economic Effects
- Ecologic Effects
- Effects on Regional climate
- Effects on Vegetation
- Effects on Fishery
- Effects on Navigation
- Effects on Upstream and Downstream navigation
- Effects on Tourism






Classification of Dams

- *According to dams height*
  - *Small Dam:* Dam height is less than 15 m.
  - *High Dam:* Dam height is greater than 50 m.
  - *Large Dam:* Crest elevation and foundation level is greater than 15 m.

Classification of Dams

- *According to construction purpose*

➢ *For single purpose*

- Storage Dams
- Diversion Dams
- Detention Dams
- Hydropower Dams

➢ *Multiple purposes*

- Serves for all or most of above the purposes

Classification of Dams

- *According to Materials of Construction*
  - Masonry dam
  - Stone, brick, concrete gravity dams
  - Concrete gravity dams
  - Prestressed concrete gravity dams
  - Solid concrete gravity dam compressed with cylinder
  - Embankment (Fill) Dams
    - *Earth-Fill Dams*
    - *Rock-Fill Dams*
  - Partial masonry dam, partial fill dam
  - Frame dams
    - *Steel dams*
    - *Timber dams*






According to Static Design

- Gravity Dams
- Arch Gravity Dams
- Arch Dams
- Buttress Dams
- Earth-Fill
- Rock-Fill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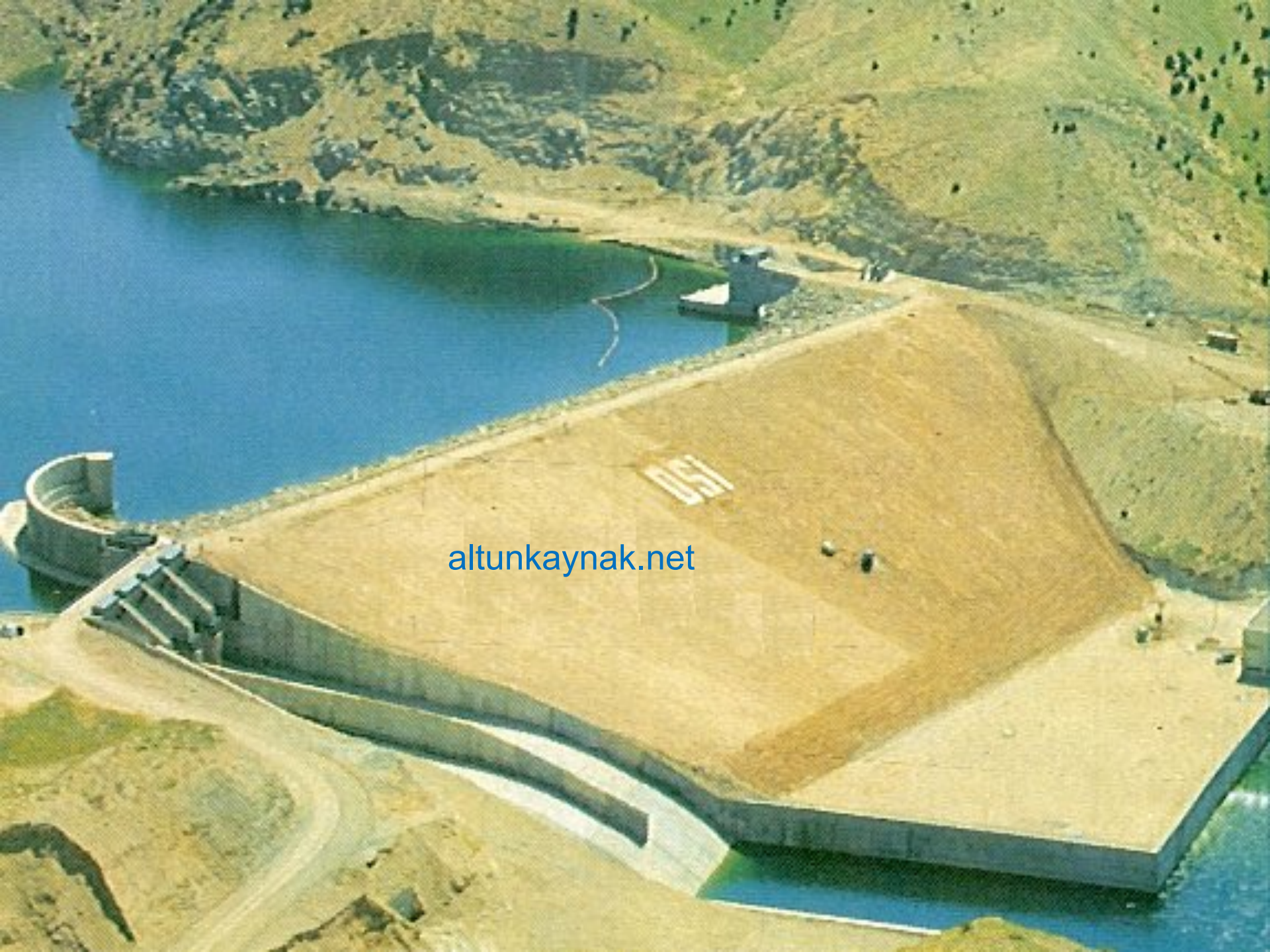
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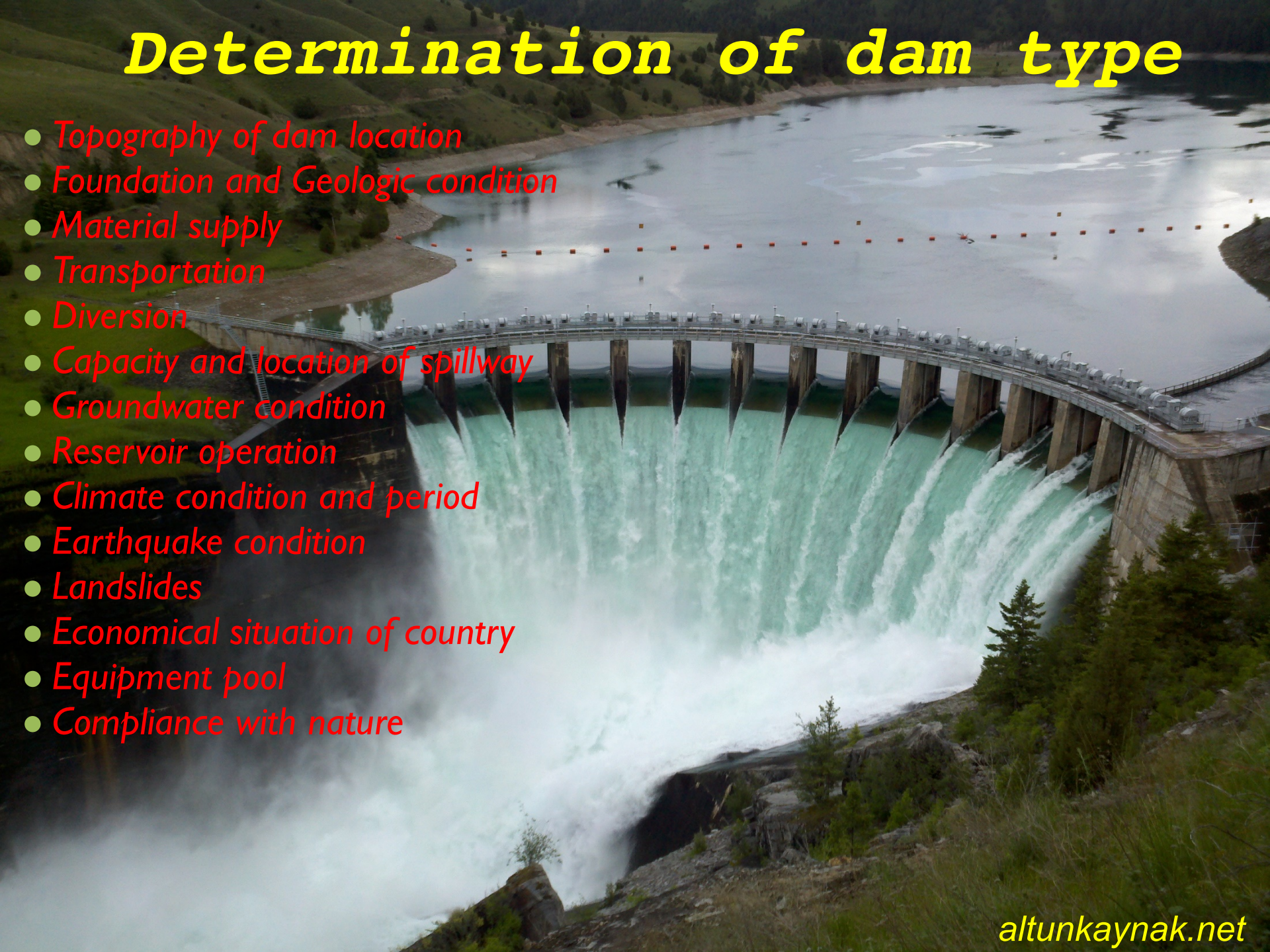
Determination of dam type



- Topography of dam location
- Foundation and Geologic condition
- Material supply
- Transportation
- Diversion
- Capacity and location of spillway
- Groundwater condition
- Reservoir operation
- Climate condition and period
- Earthquake condition
- Landslides
- Economical situation of country
- Equipment pool
- Compliance with nature

Abdüsselam ALTUNKAYNAK, PhD Lecture Notes

Applied Water Resources Engineering Prof. Dr. Melih Yanmaz

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