

# **ECI 141 - Engineering Hydraulics**

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# Engineering Hydraulics

Hydraulics is a name that we give to the study of problems associated with water motion. Water in particular is a FLUID.

At the same time, we focus on ENGINEERING, because we need to use water to satisfy the needs of the population: potable water, treatment of sewage, navigation, recreation purposes, etc.

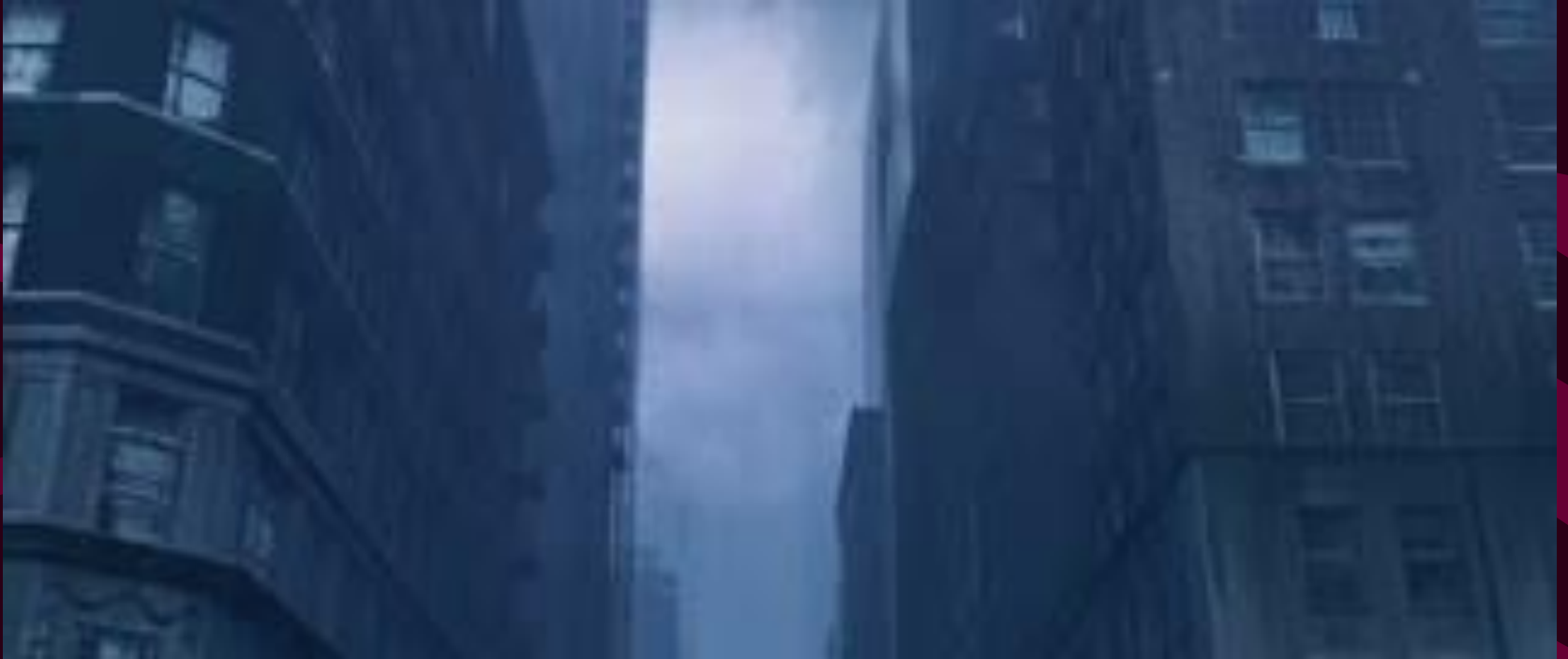
We make predictions in order to design hydraulic structures, for instance.

# What do we need to know?

*ECI-141 Engineering Hydraulics:*

- 1) Laws and principles of water motion.
- 2) Flow of water in pipes.
- 3) Flow of water in channels and rivers.
- 4) Backwater curves.
- 5) Design of weirs.
- 6) Design of spillways.
- 7) Energy losses.
- 8) Pumps and turbines.
- 9) Lift and drag (solid objects immersed in flows).

# HOLLYWOOD DOES IT BETTER !



# Why we study the motion of water in particular?

Engineering “problems” in water resources:

- 1) Floods.
- 2) Water quality in rivers.
- 3) Sediment transport in rivers.
- 4) Water quality in bays and estuaries.
- 5) Water quality in lakes.
- 6) Design and construction of dams for energy production, water storage, water diversion and navigation.
- 7) Design and construction of civil works for potable water.
- 8) Sewage treatment.

# Why we study the motion of water in particular (Engineering Hydraulics)?



Paraná River, Argentina, South America



# Why we study the motion of water in particular?



FLOODS!!! New Orleans, United States



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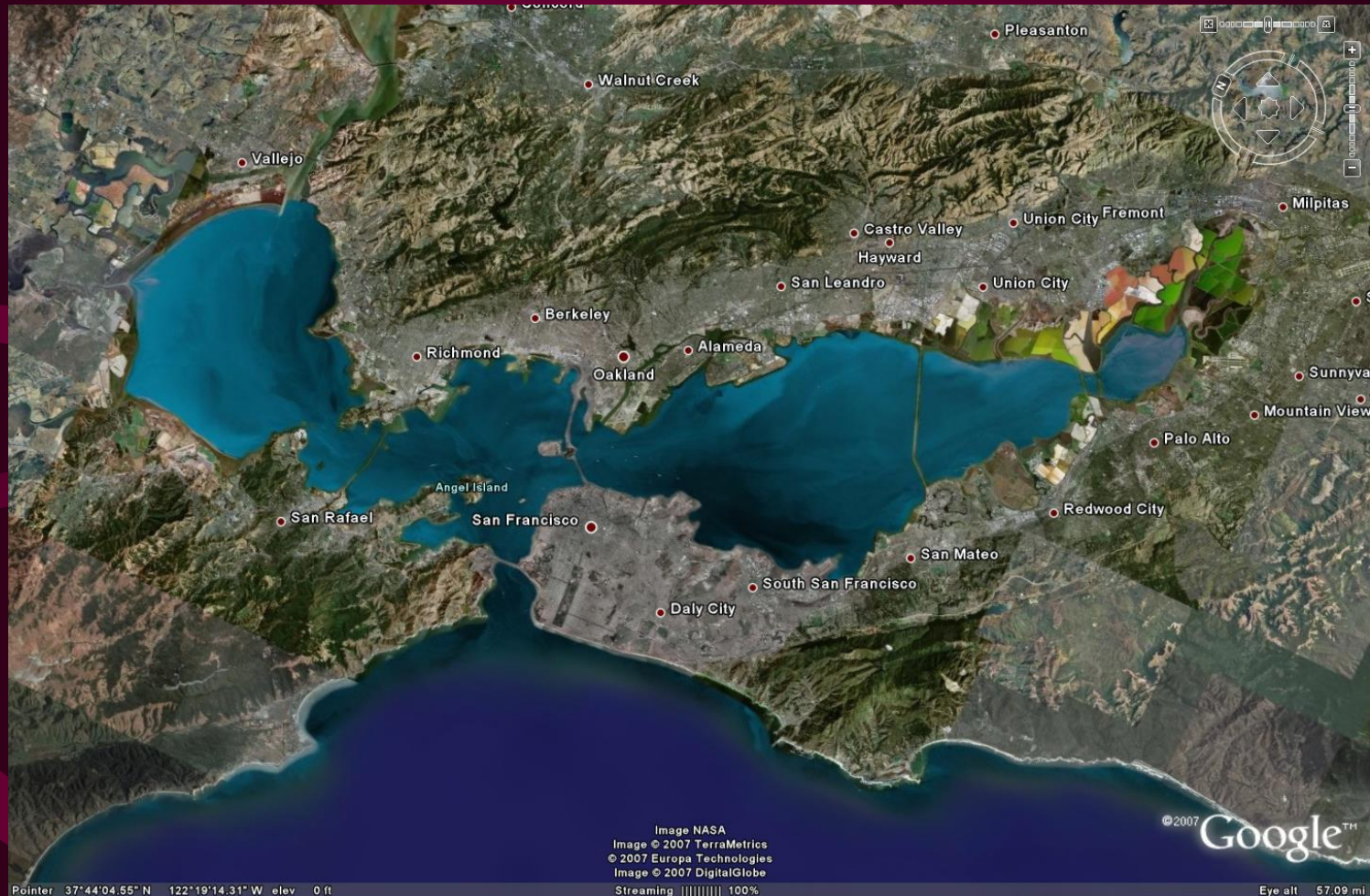
# Why we study the motion of water in particular?



FLOW AND WATER QUALITY IN RIVERS



# Why we study the motion of water in particular?



## WATER QUALITY IN BAYS AND ESTUARIES

# Why we study the motion of water in



WATER SUPPLY IN CALIFORNIA



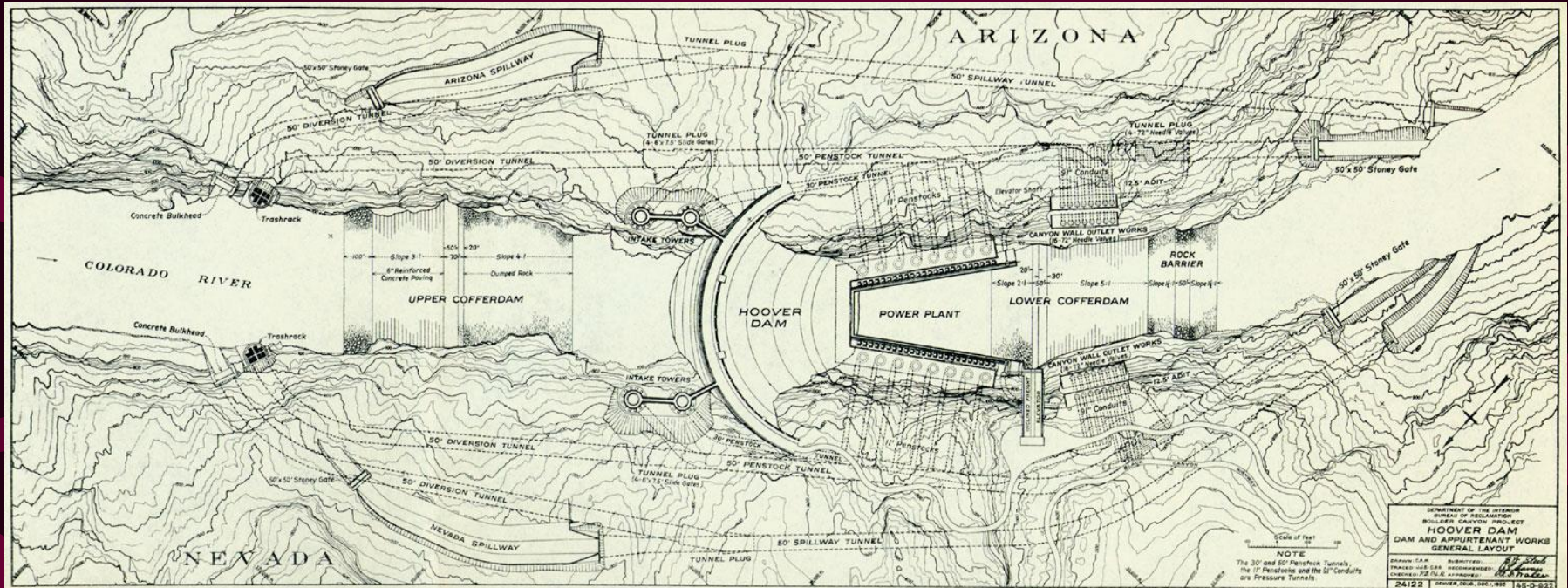
# Why we study the motion of water in particular?



Hoover Dam, Colorado River



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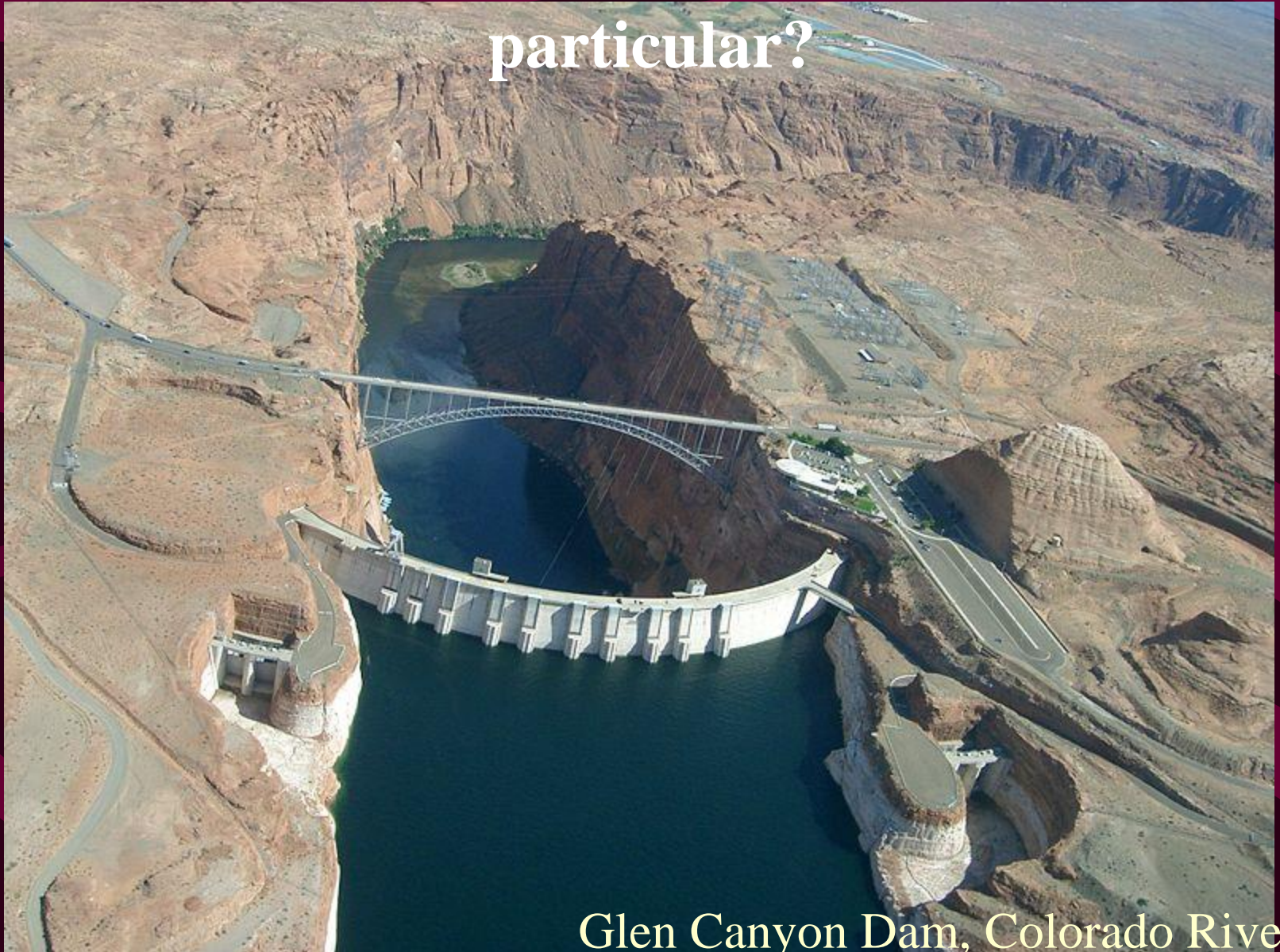


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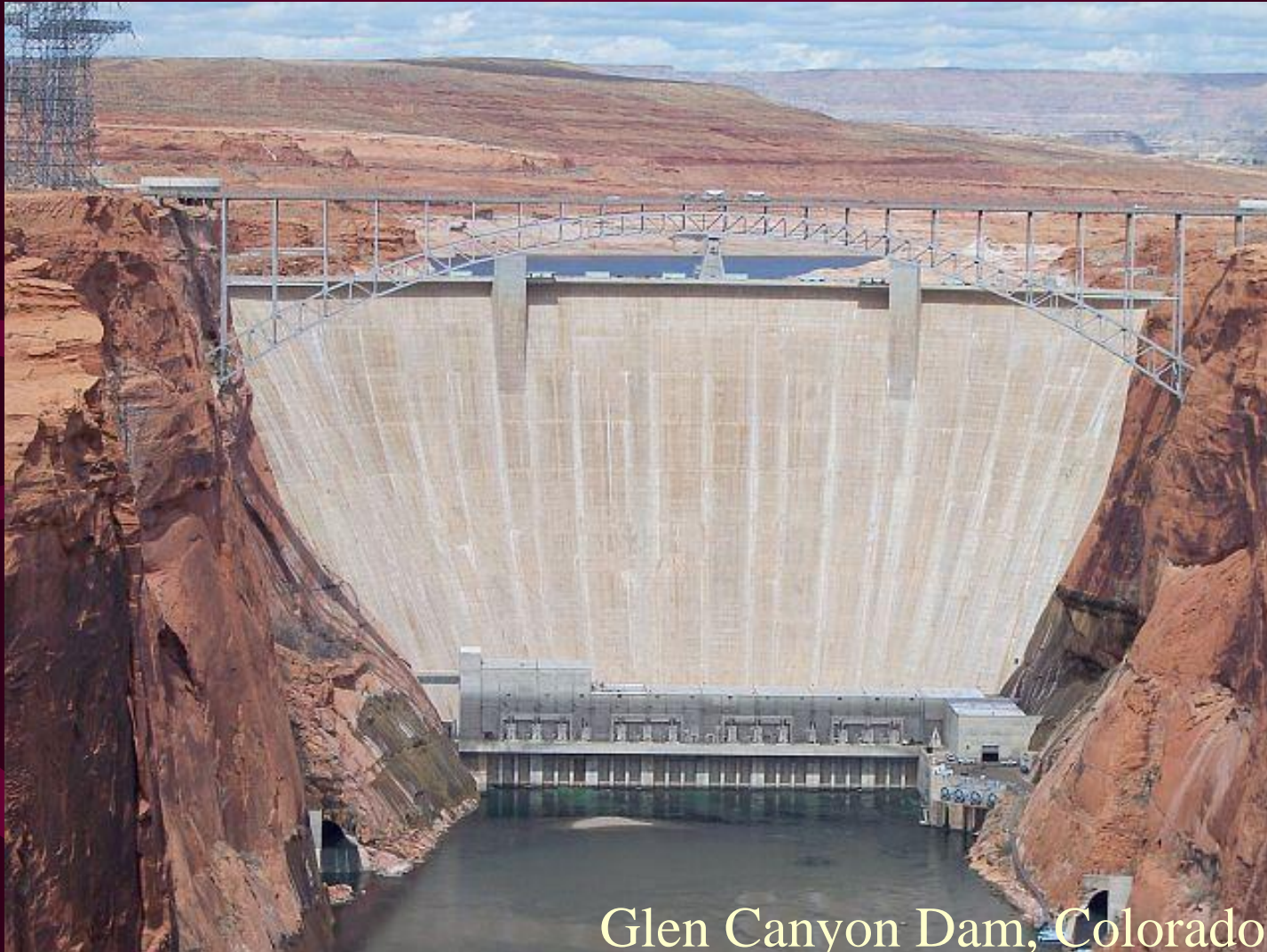
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Glen Canyon Dam, Colorado River



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