

# The Dramatic History of the Hoover Dam Construction

*Mike Palladino, PMP, CSM*



# What is the Hoover Dam?

Constructed from 1931 – 1936

Height: 221 meters high

Thickness, base: 201 meters

Thickness, top: 13.7 meters

Cost in 1936: € 44 million  
or 427 NOK million

Cost today: € 793 million  
or 7 713 NOK million



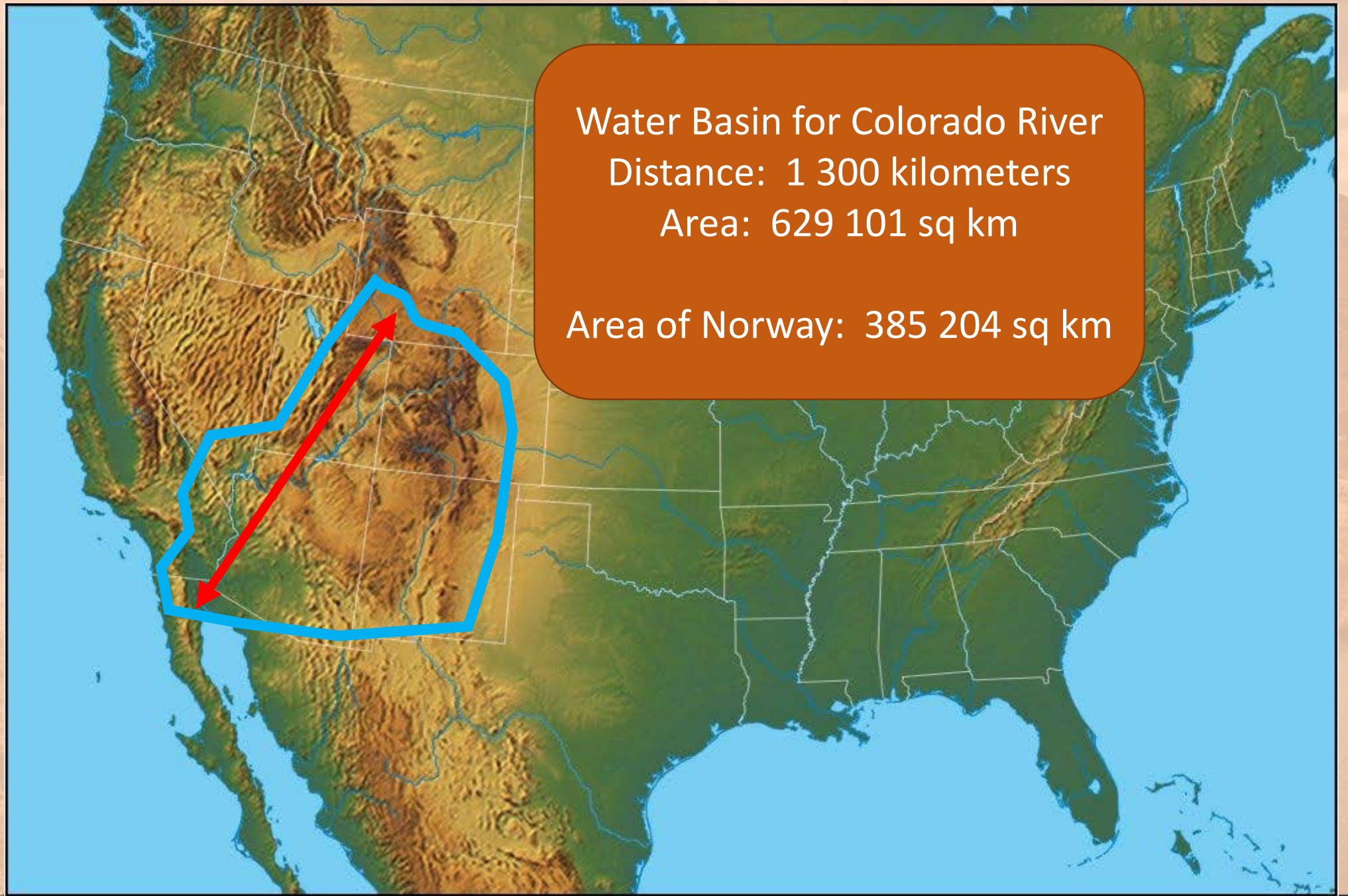


Where is the Hoover Dam?



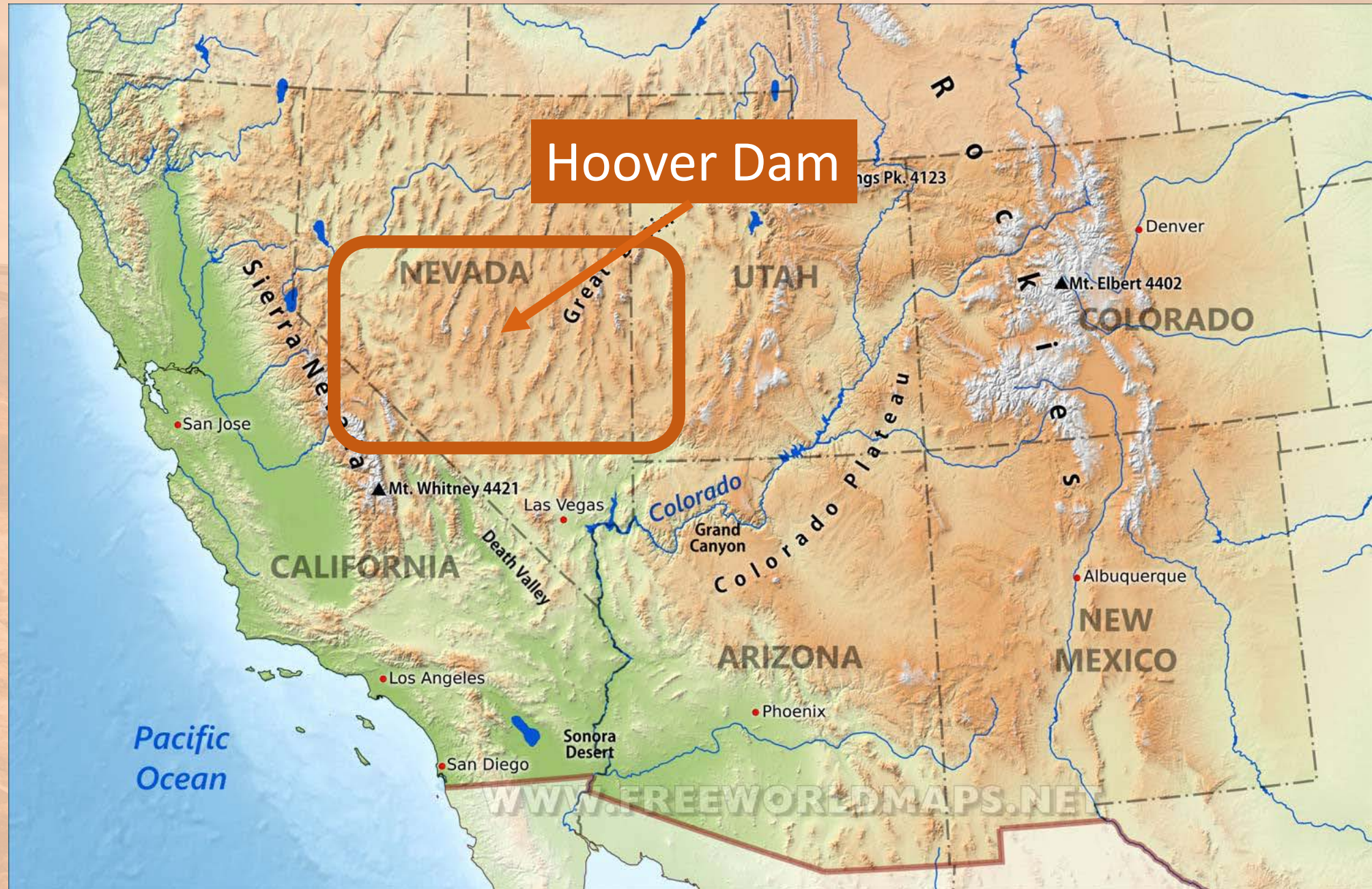


# Colorado River Water Basin





Where is the Hoover Dam?









# 1849 - Gold Rush Fever

- In 1849, gold was found in San Francisco
  - About 700 km NW of the Hoover Dam
  - Miners were called the 49'ers
  - American Football team in San Francisco
- Gold Rush triggered a massive migration to the west coast
- 1/3 of people took a southern route





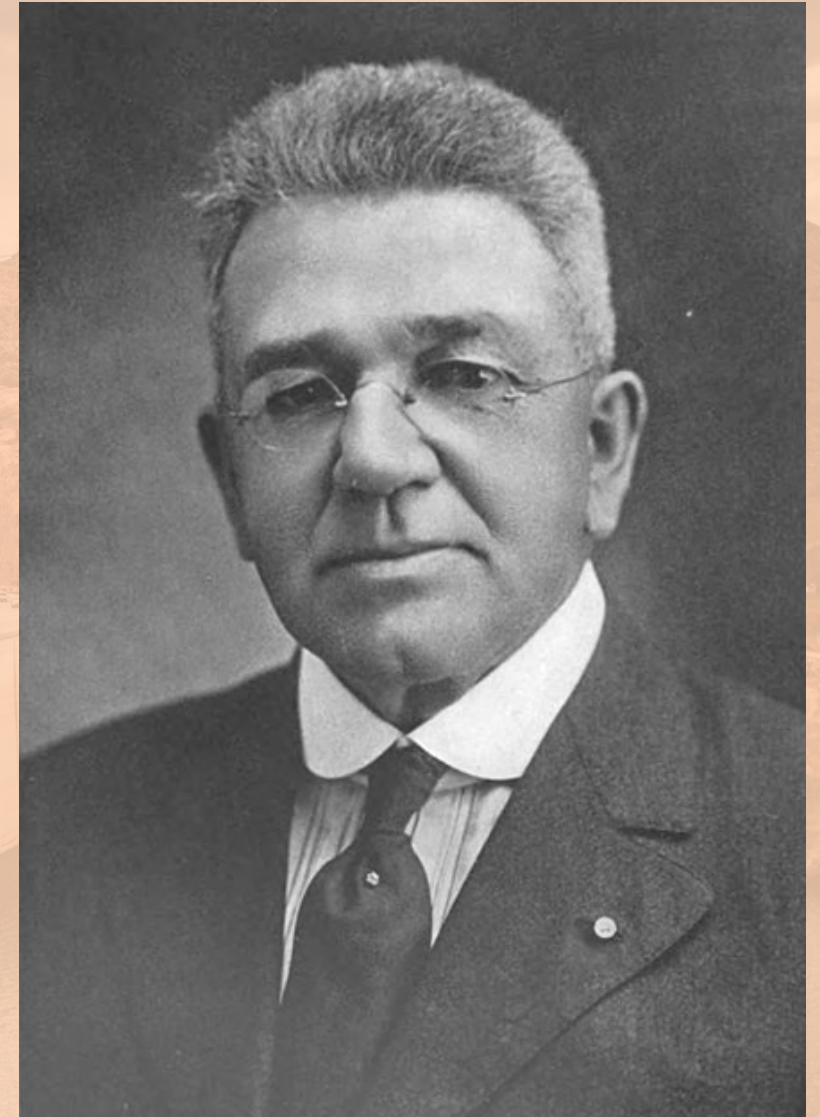
- Oliver Wozencraft created ideas to develop the land
- Imperial Valley land owned by the US Government
- Wozencraft requested land from the government
  - Land considered inhospitable
  - 1859, California said yes, but needs Federal Approval
  - Took over 30 years for federal approval
- Wozencraft was never granted the land
- Died in 1887 destitute and bankrupt from his pursuits of the land





# 1892-1898 California Development Company

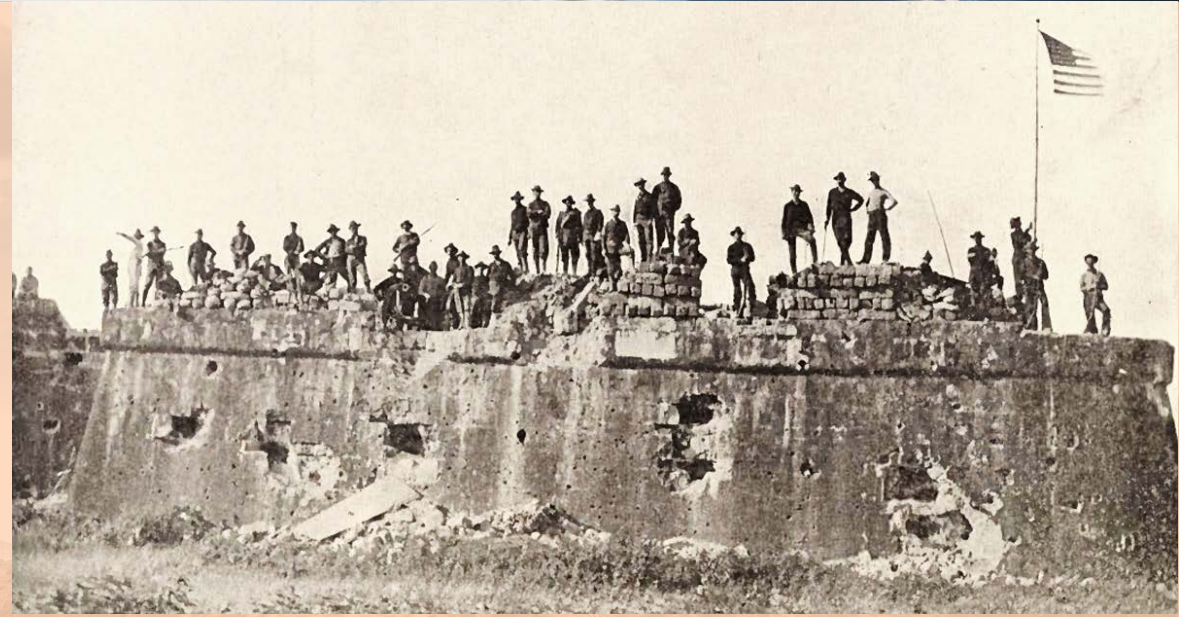
- 5 years later, Charles Rockwood formed the California Development Company (CDC)
- Began advertising the Imperial Valley in 1897
- Requested loan from the banks
- The bank was about to sign for a loan in 1898
- But...





# Spanish American War of 1898

- The Spanish American War
- Lasted less than 4 months
- Theodore (Teddy) Roosevelt
- Later became 26<sup>th</sup> president of the United States





- Rockwood partnered with George Chaffey from Canada
- Came up with name “Imperial Valley”
- Built 6.5 km canal from 1900 - 1902





# Problem with Silt



- “Too thick to pump...
- ...Too thin to shovel”
- Water must sit for one day to settle out



- Where does all this silt, clay and dirt come from?



Source - Grand Canyon





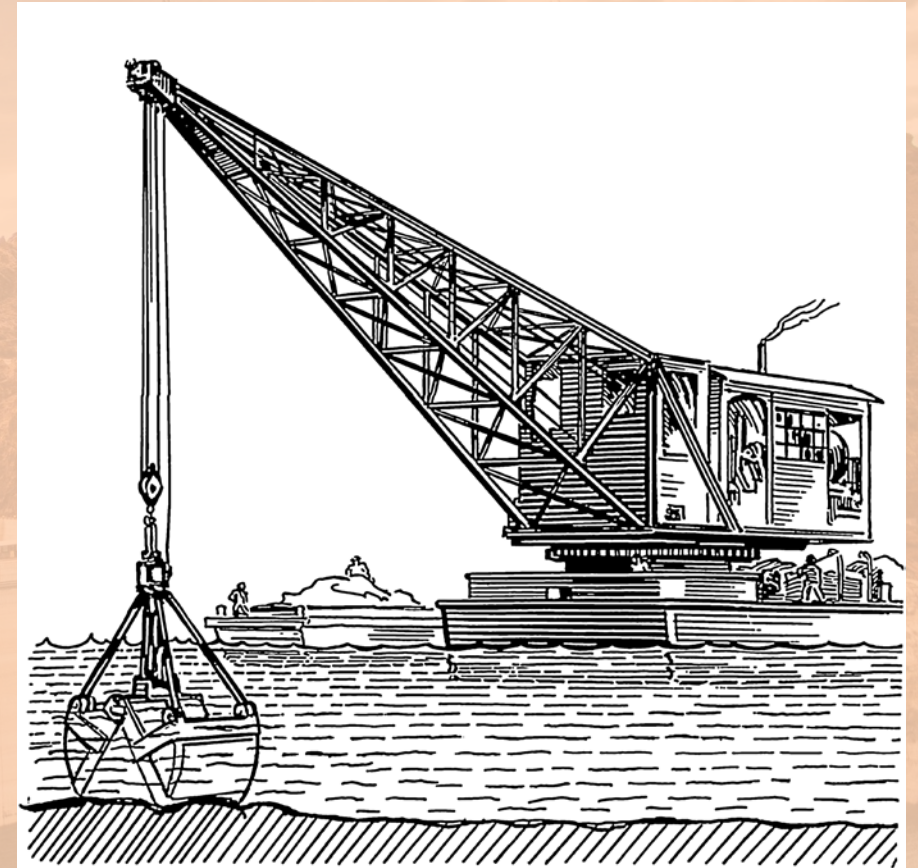
Grand Canyon





## 1900 – 1905 Canal Filling Up

- Farmers running out of water
- Dredge the canal
- The CDC running out of money again





## 1905 - Second River Opening

- Built a 2<sup>nd</sup> canal and opening
- “A blunder so serious as to be practically criminal”

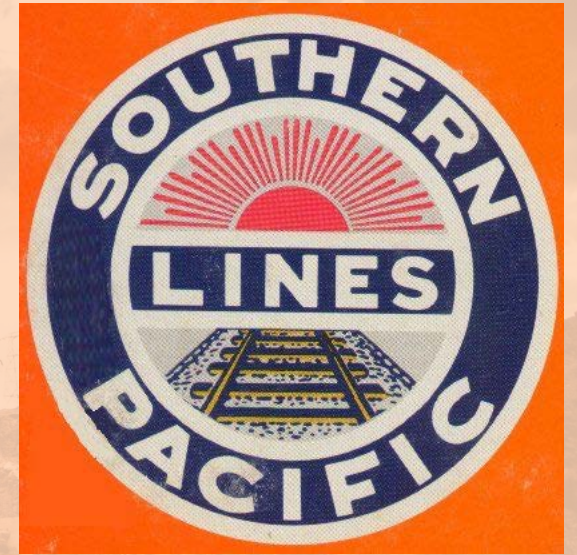
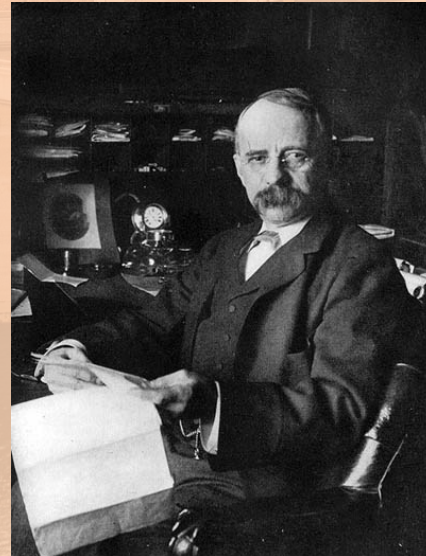
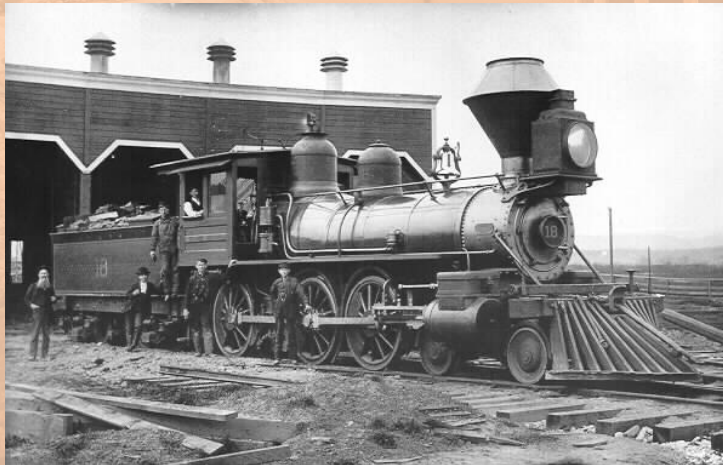


- Massive flood
- River opening grew to 45 meters wide



# 1905 - New Investors

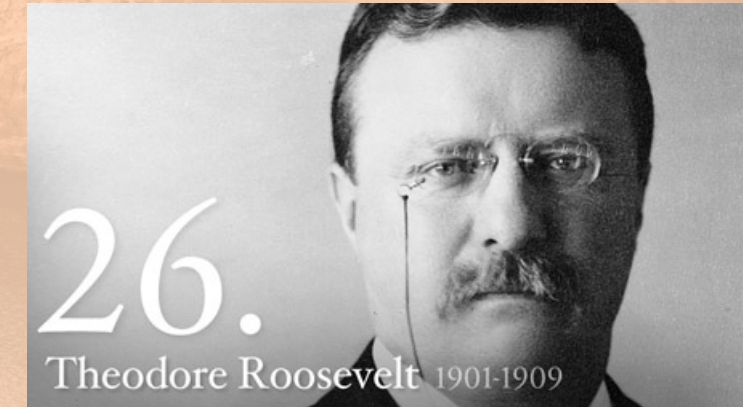
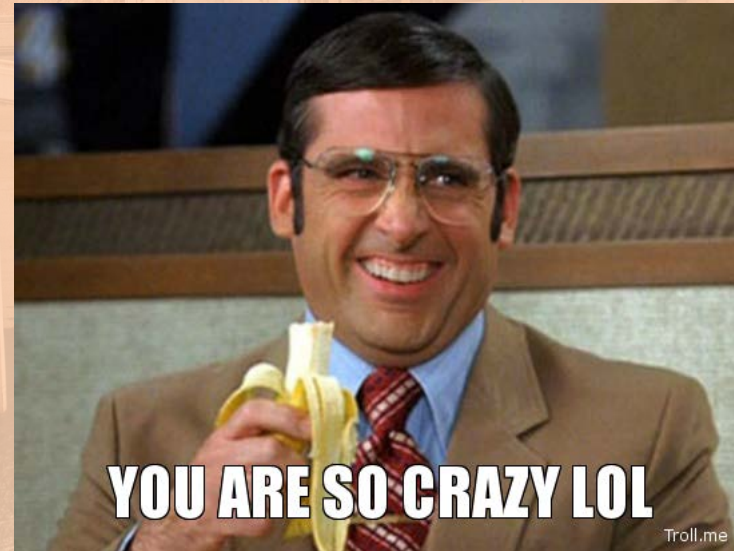
- Search for new investors
- Edward H Harriman
- Southern Pacific Railroad





# 1906 - Closing the breach

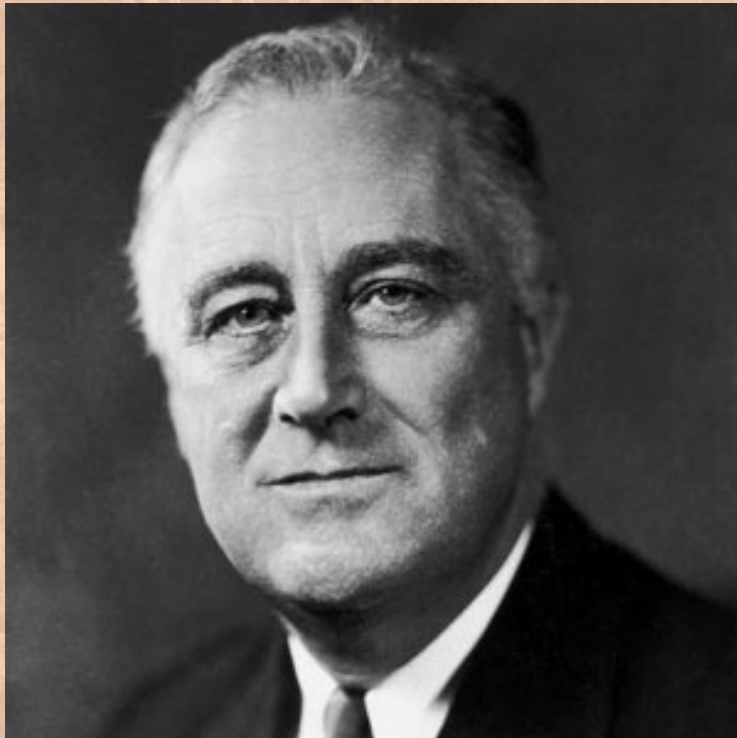
- Dumping boulders
- Total time: 18 months
- Total amount: € 3 million
- € 75 million today
- 722 NOK million
- Asked US government to reimburse the costs
  - No thank you
  - Who said no?
  - Teddy Roosevelt





## 1902 - 1920's - Ongoing Floods and Drought

- 1902 Teddy Roosevelt signs Reclamation Act
- Suggests using Dams
- Formed Bureau of Reclamation (BoR) in 1906



- Herbert Hoover appointed Secretary of Commerce
- Becomes 29<sup>th</sup> president form 1929 - 1933
- Later, 30<sup>th</sup> president Franklin Roosevelt claims the political credit



## Side Note: FDR Statue near Oslo Harbor

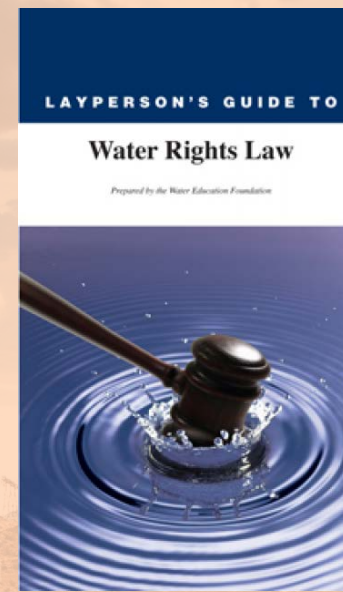
- President Roosevelt helped Queen Marthe and her three children escape Norway
- The family lived at the White House and became friends
- The Princess and Eleanor Roosevelt dedicated the statue in 1950 as a thank you
- Nose repaired in April 2017 thanks to
  - Oslo Municipality Art Collection
  - Oslo Municipality Cultural Office
  - Stonemason Johansen Monumenthuggeri
  - Artist Fredrik K.B.





# 1929 – Decision to Build a Dam

- Received approval
- But new questions arose
- Why spend lots of money for a small group of people?
- Water rights? Seven states working together
- Federal water rights with Mexico?





# 1929 – Funding the Dam Construction

## ***Funding the Dam***

- Hydro-electric power
- Thomas Edison
- Privately owned utilities
- Electricity only traveled 130 km
- Nearest town is Las Vegas



LAS VEGAS, N.M.

U.S. SAN JUAN COUNTY

1929







## 1930 - New Company Formation

- Too large for one company to build
- Needed € 2 million bond and € 5 million performance bond
  - € 24 million and € 60 million in today's numbers
  - 231 NOK million and 578 NOK million
- Eight companies come together
  - Kaiser and Bechtel
  - MacDonald and Kahn
  - Utah Construction
  - Morriston-Knudsen
  - Pacific Bridge
  - J.F. Shea Co
- New name, "Six Companies"





# 2019 – Impressions from a Recent Visit

- Impressions in 2019

- The smell and taste of **Dirt**
- The feeling of **Heat**
- The splendor of **Colors**
- The overwhelming sense of **Size**



- 97F = 36 C
- 106 F = 41 C

A screenshot of a smartphone screen displaying a weather app. The app shows the current temperature as 106°F and the weather as 'Mostly Sunny'. It also displays a 7-day forecast with icons for each day and the high/low temperatures. The background of the app is a blue sky with clouds.

9:52  
Search

Las Vegas  
Mostly Sunny

106°

Wednesday TODAY 106 81

Now	7PM	7:57PM	8PM	9PM	10PM
106°	106°	Sunset	102°	100°	97°

Thursday 106 78

Friday 98 77

Saturday 102 80

Sunday 102 77

Monday 101 78

Tuesday 104 80

Wednesday 104 78

The Weather Channel







# Recent Visit





# Recent Visit



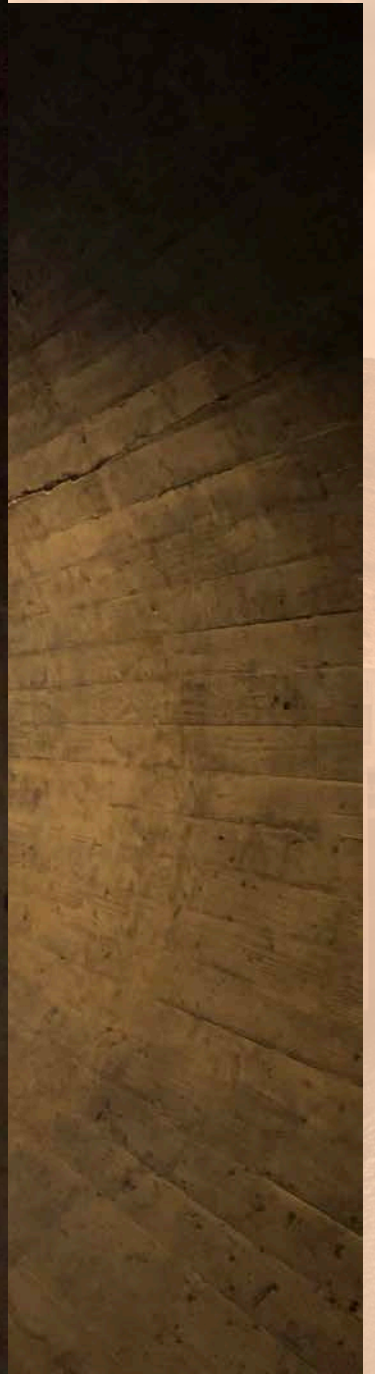


# Recent Visit





# Recent Visit





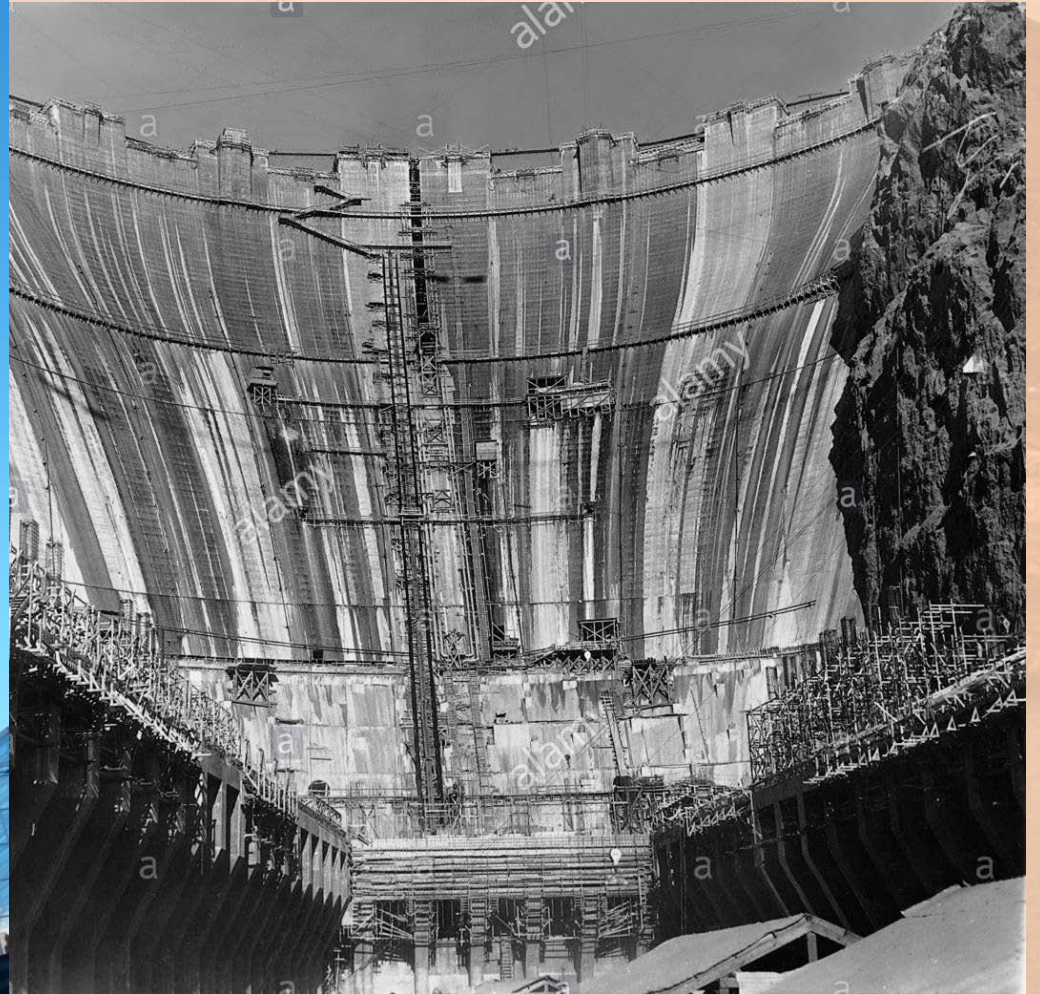




Size



Oslo Plaza: 117 m and 37 floors  
Hoover Dam: 221m and 70 floors

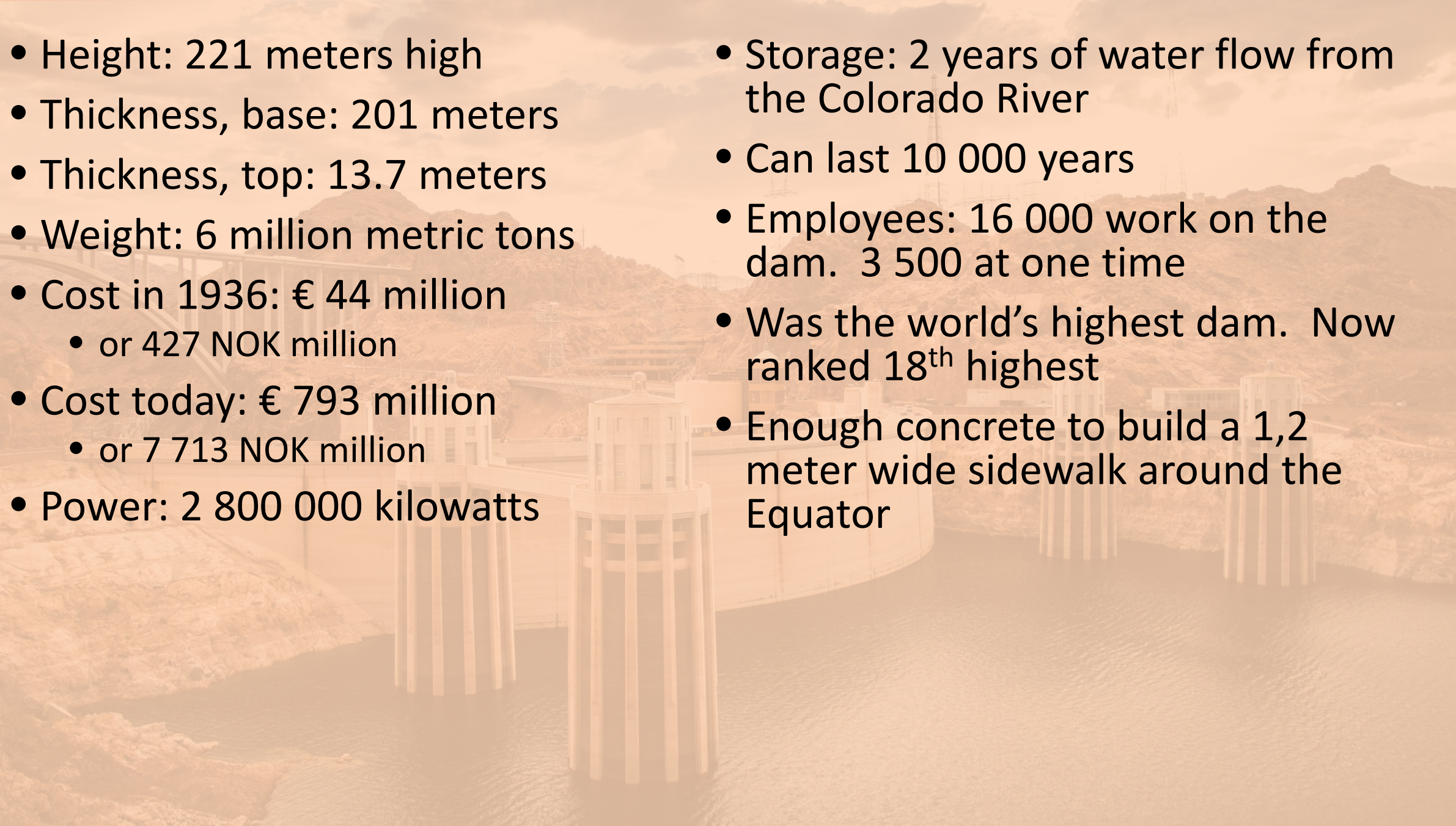






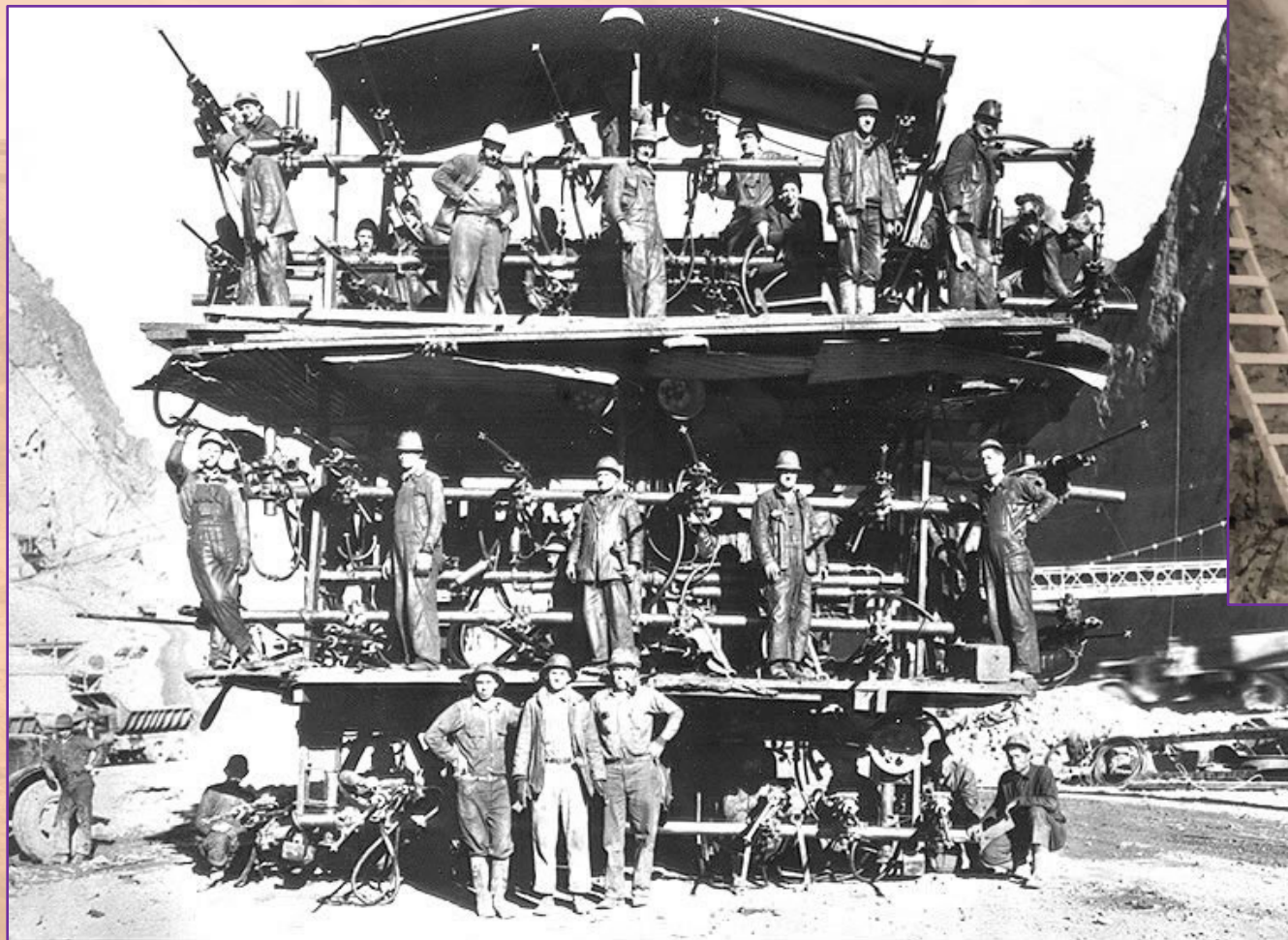
- Height: 221 meters high
- Thickness, base: 201 meters
- Thickness, top: 13.7 meters
- Weight: 6 million metric tons
- Cost in 1936: € 44 million
  - or 427 NOK million
- Cost today: € 793 million
  - or 7 713 NOK million
- Power: 2 800 000 kilowatts

- Storage: 2 years of water flow from the Colorado River
- Can last 10 000 years
- Employees: 16 000 work on the dam. 3 500 at one time
- Was the world's highest dam. Now ranked 18<sup>th</sup> highest
- Enough concrete to build a 1,2 meter wide sidewalk around the Equator





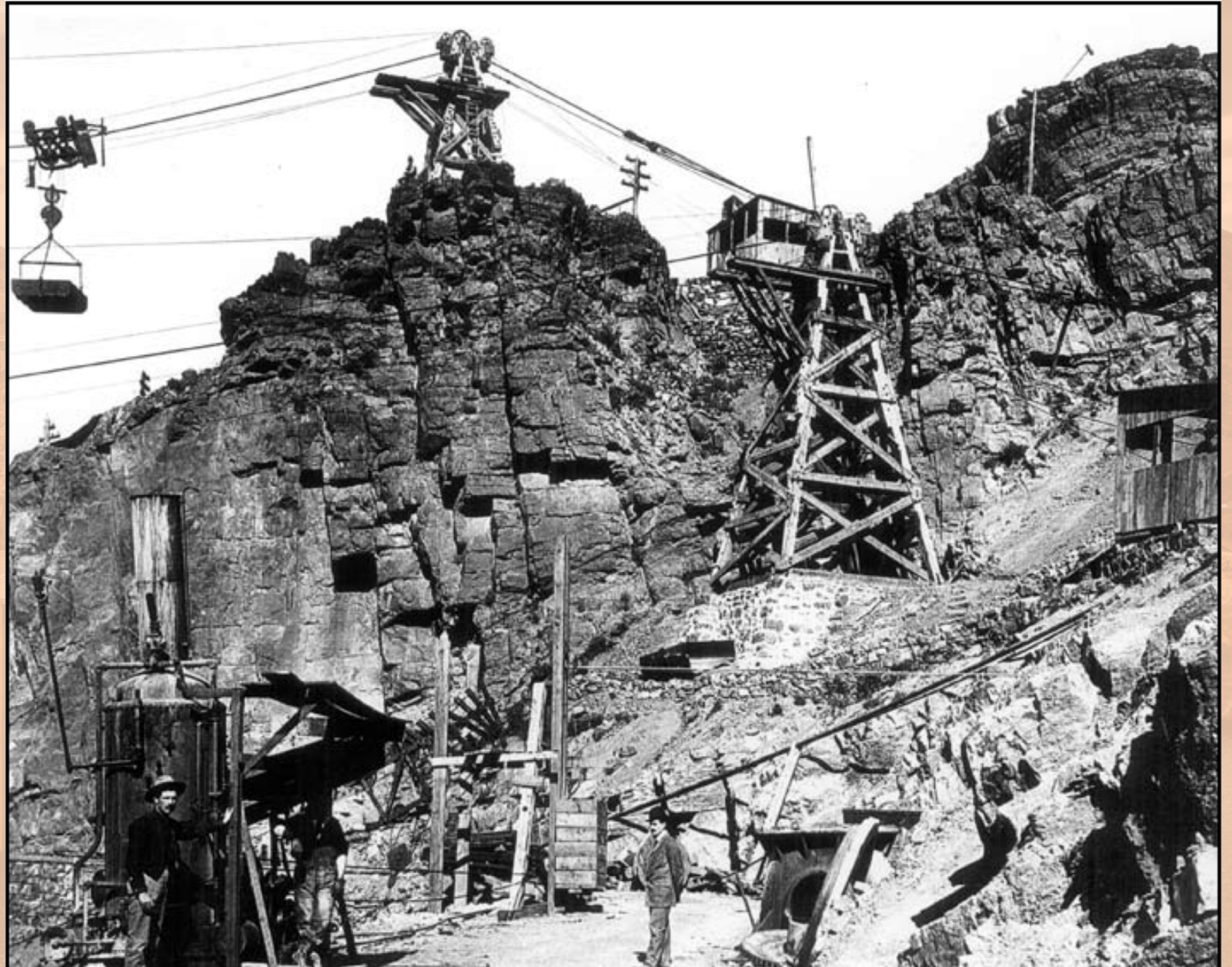
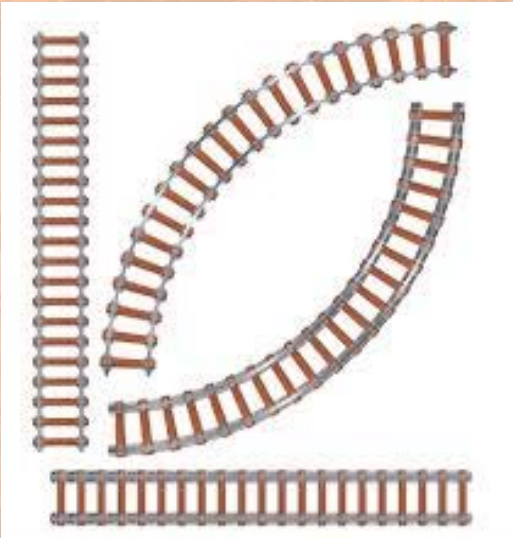
- Horizontal Drilling





# New Techniques

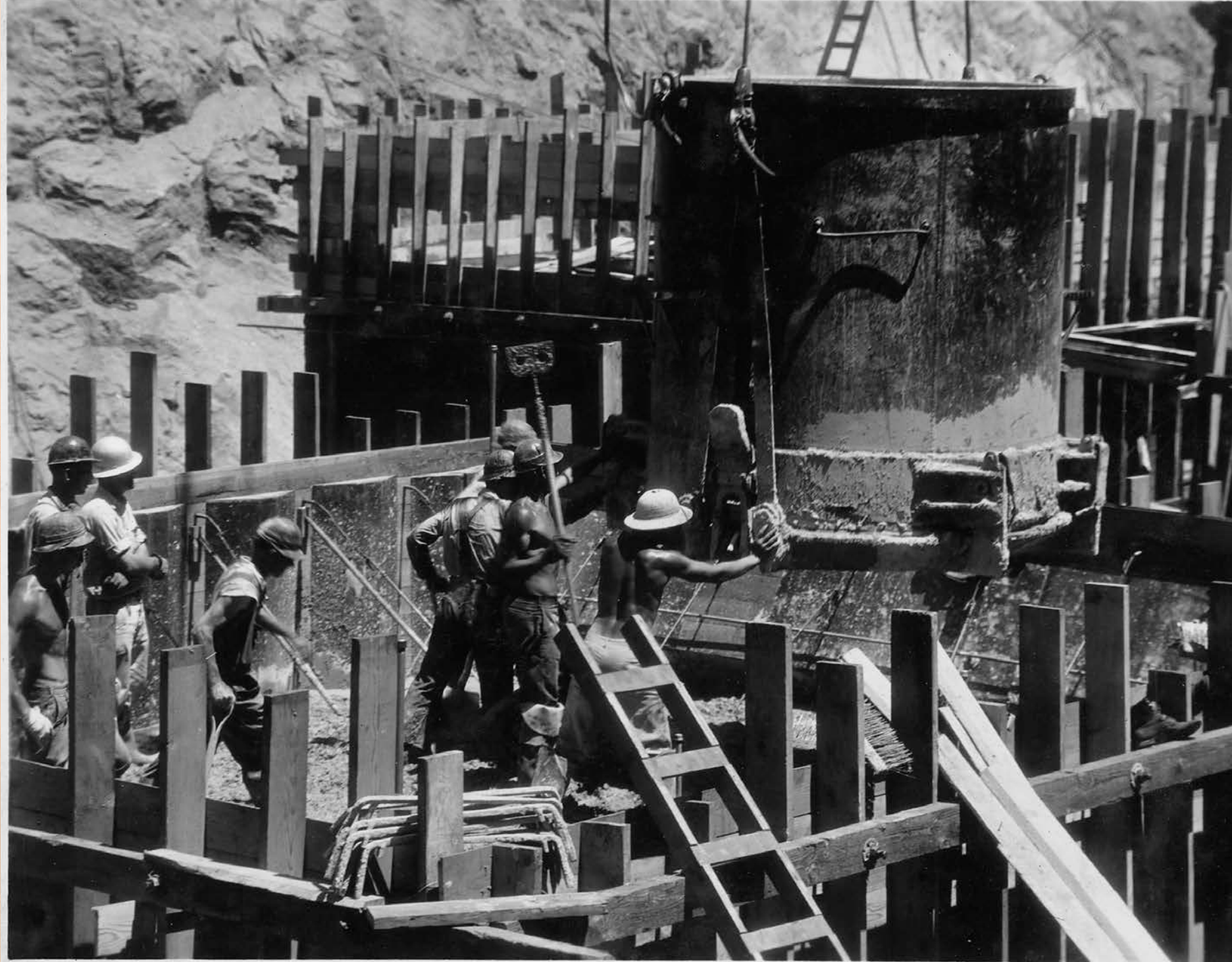
- Tower and Cable system
- Towers on train tracks





# New Techniques

- Buckets ever 7 seconds
- 24 hours/day
- 7 days/week
- 363 days per year
- Only 2 days off per year





# Construction

- If one big pour, 120 years to harden
- Instead, poured in sections
- Cooling pipes

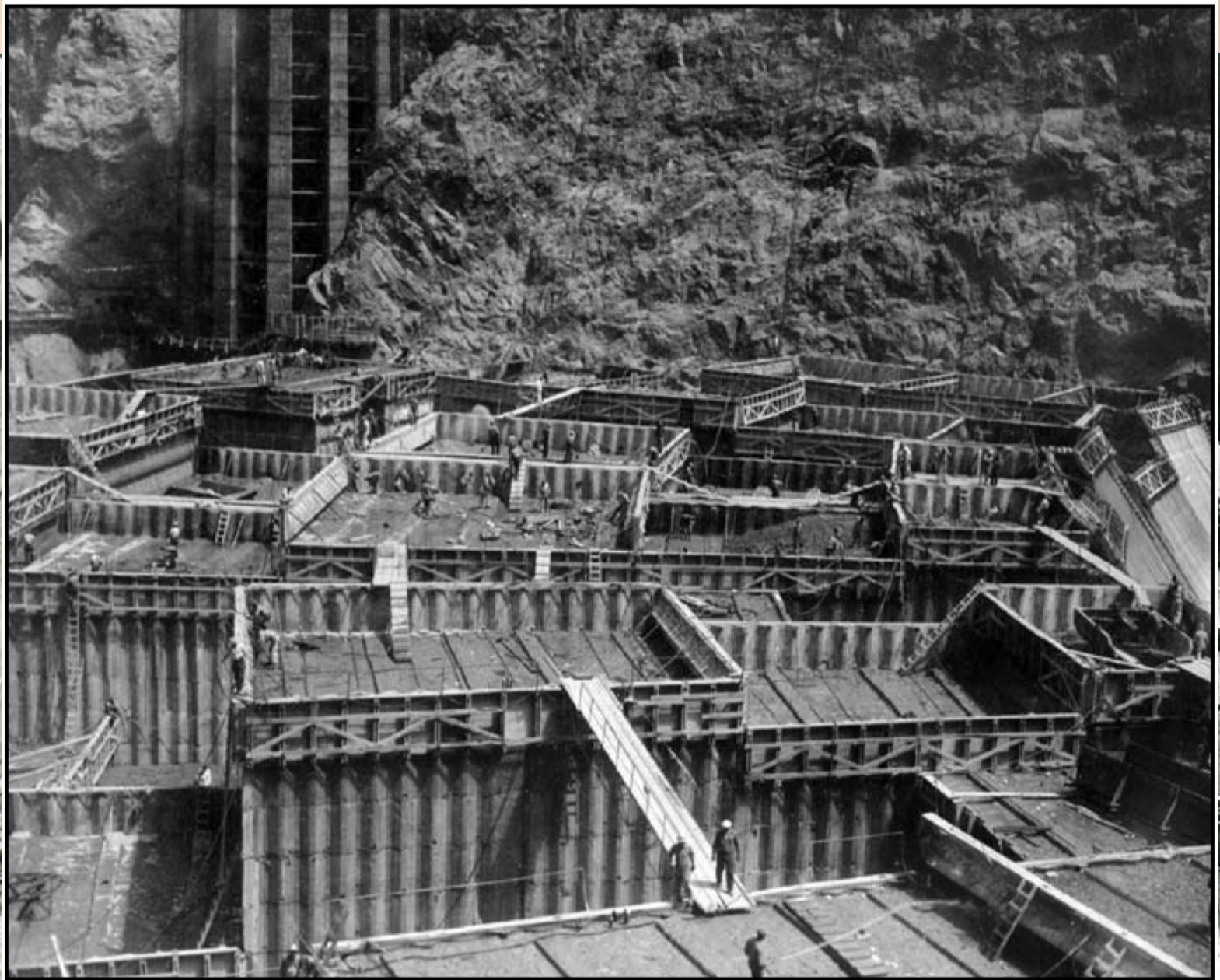
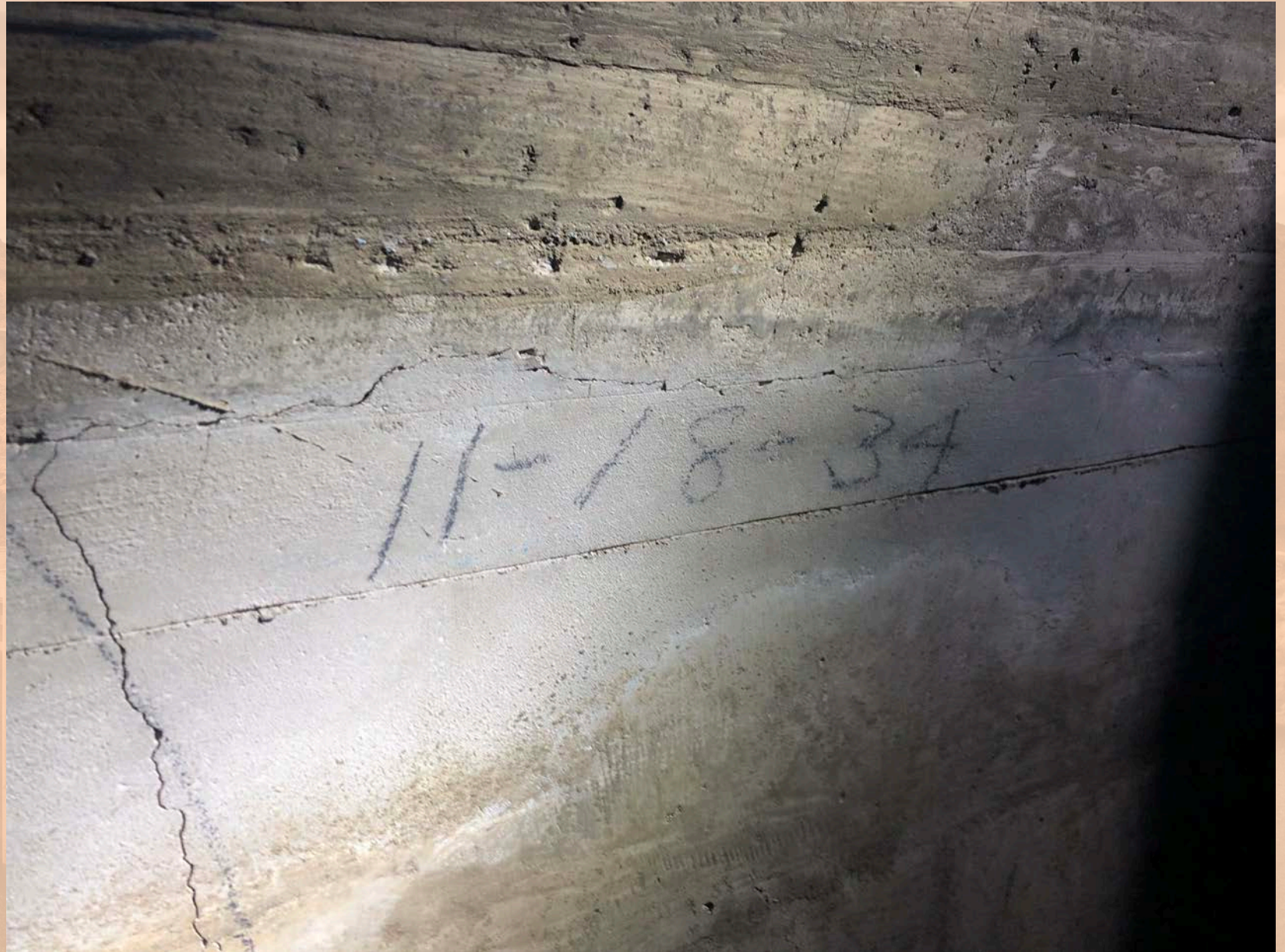


Figure 4-16: Looking across Hoover Dam during construction from the Nevada side on June 2, 1934. Source: Bureau of Reclamation.



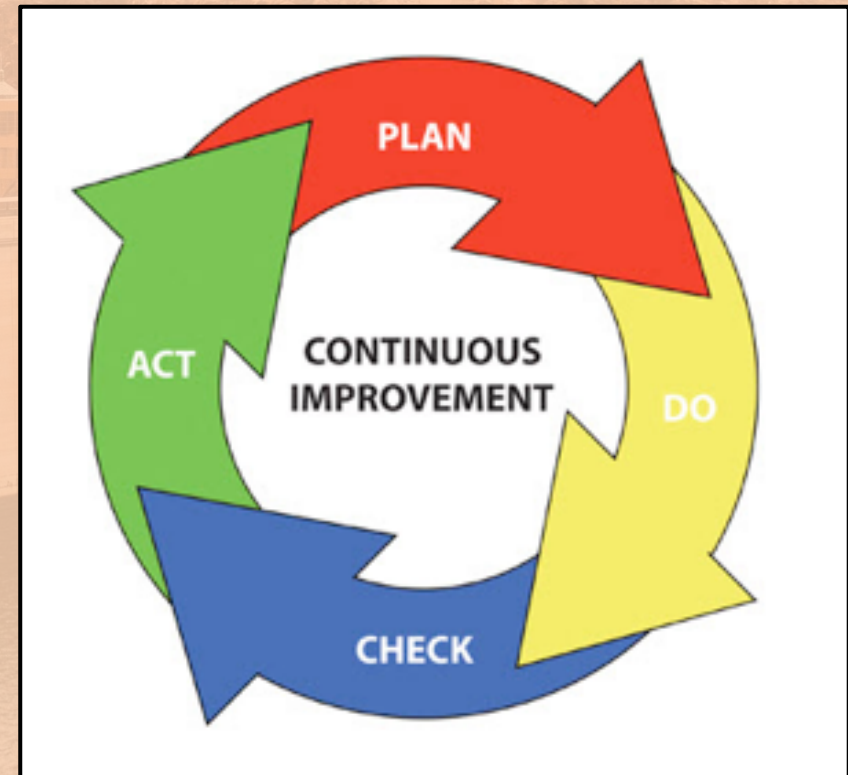
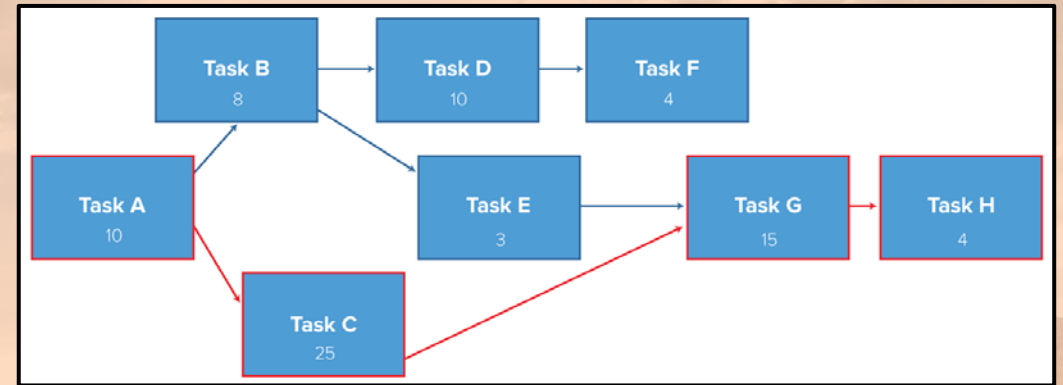
# New Techniques

- First recorded crack in the Hoover Dam
- Recorded on Nov. 18, 1934



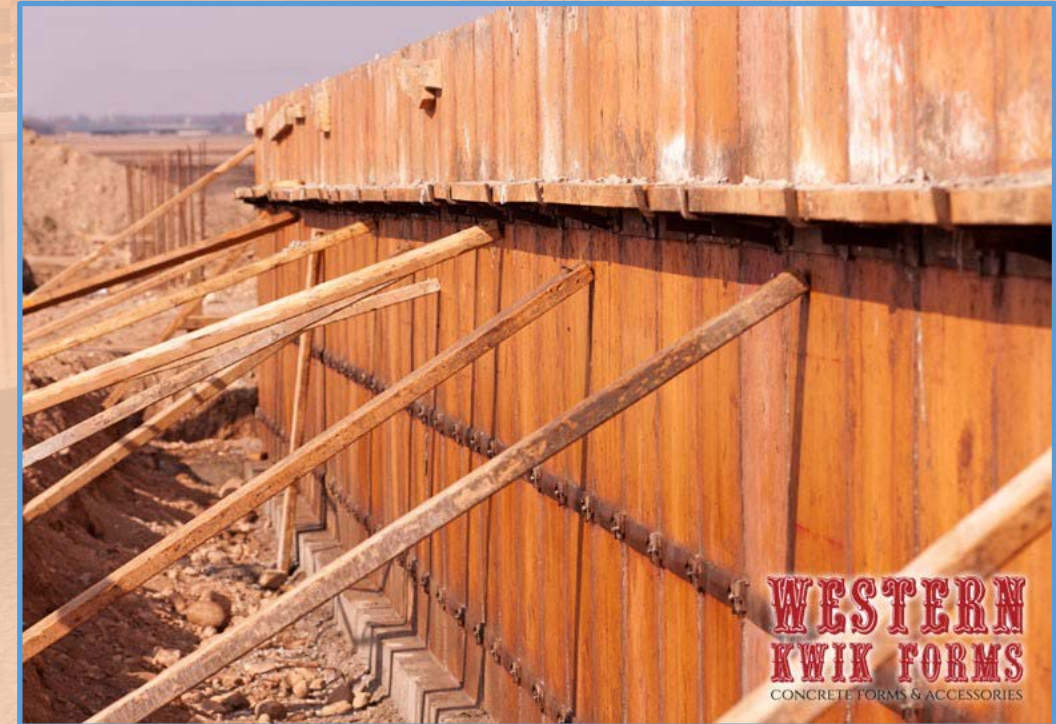


- Completed the dam two years early



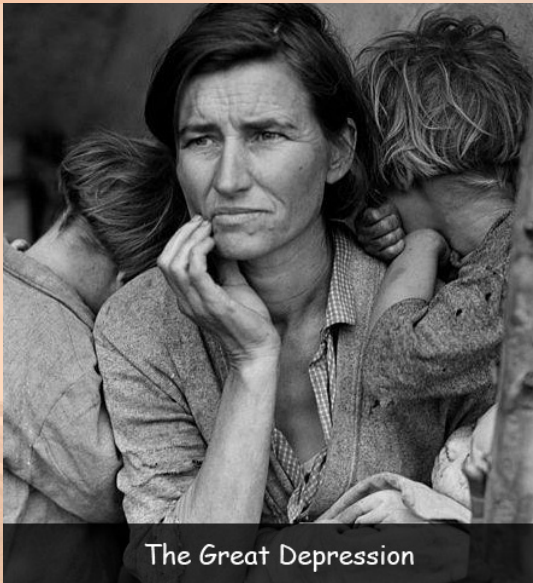


# Questionable Ethics





# Working Conditions and Great Depression



The Great Depression



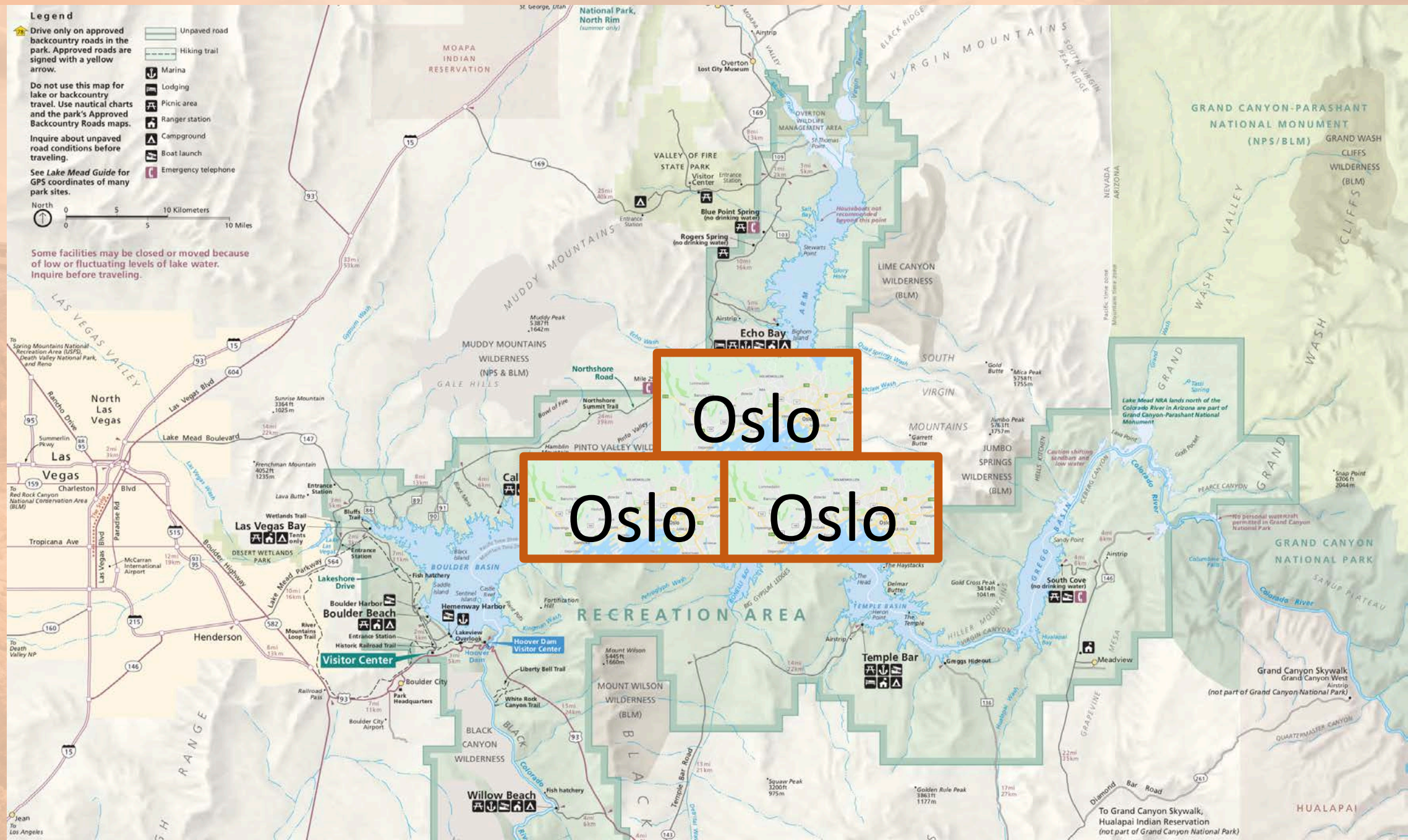


# Formation of Lake Mead



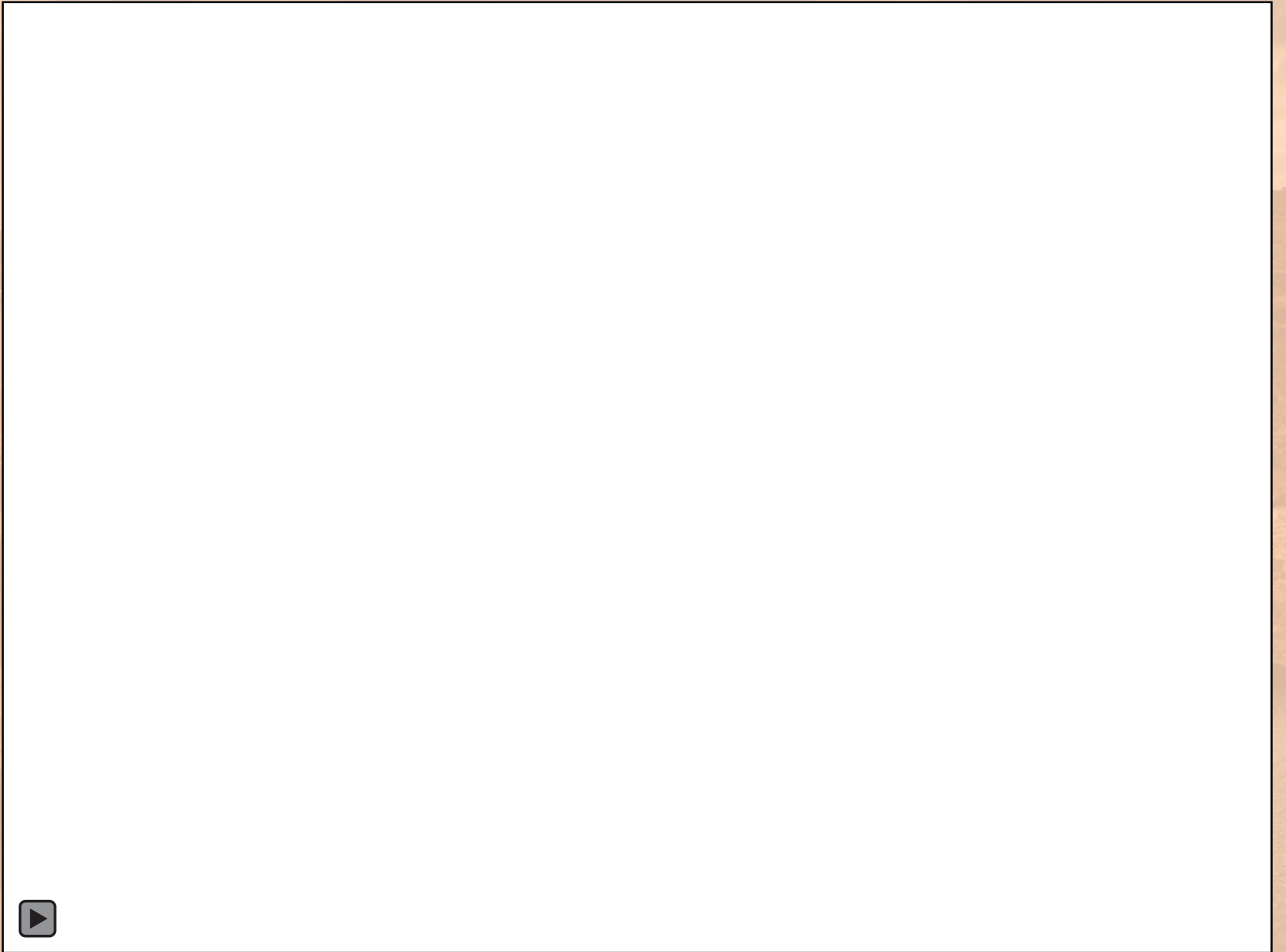


# Formation of Lake Mead





# Time Lapse





## ***Pros***

- Allowed a massive amount of people to move west
- Spurred the growth of Las Vegas
- Allowed Los Angeles to grow
- Transformed desert to farmable land
- Reduced flooding along the Colorado River
- 16 000 people able to feed their families during a major depression

## ***Cons***

- False sense of unfettered growth
- Too much water is used
- Altered natural life
  - Drop in water temperature → extinction of fish
  - Restricted water flow into Mexico
  - Groundwater table dropped 4 meters.
  - Organic material not making it to the gulf
- Mini earth quakes





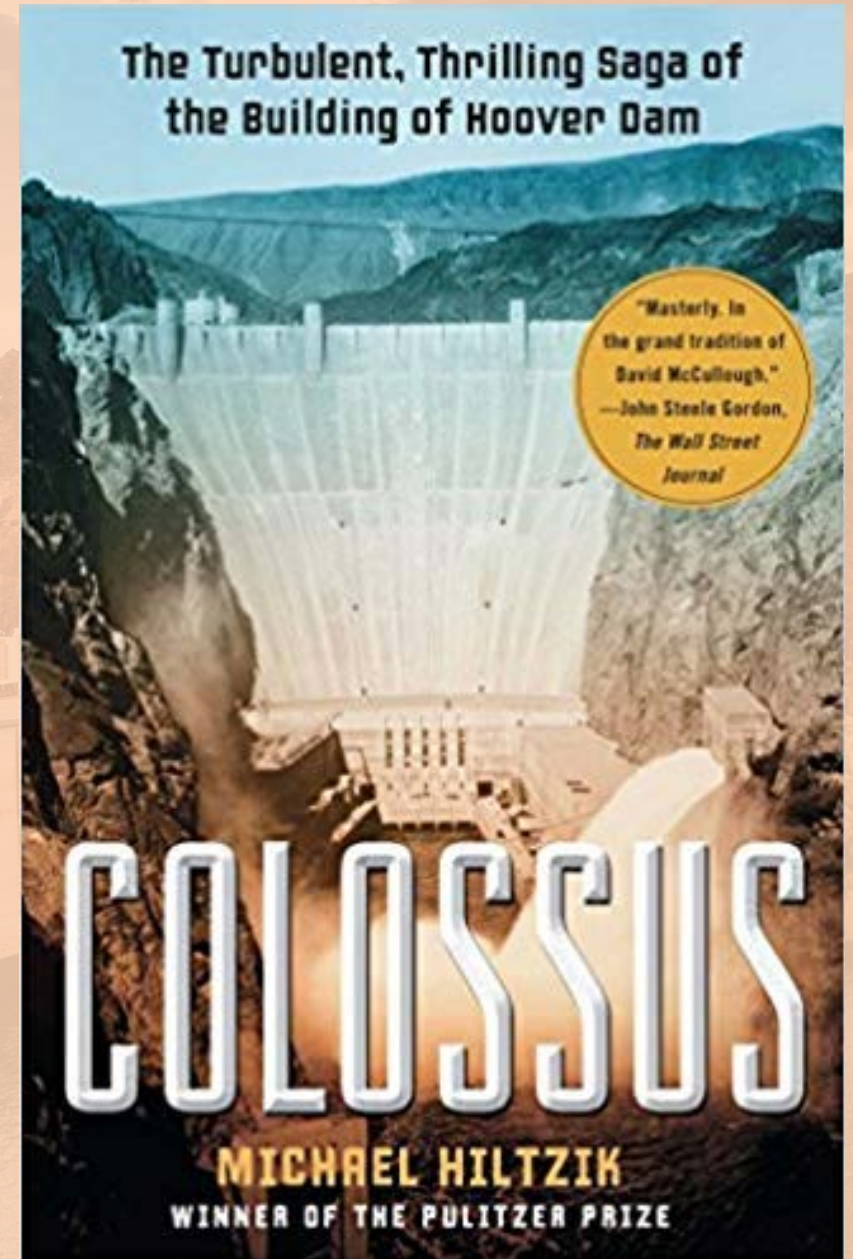
# A Norway Connection

- Oskar J. W. Hansen (1892 - 1971)
  - Norwegian-born
  - Naturalized American sculptor





- <https://www.youtube.com/watch?v=NyklSslhXkk>
- [https://www.youtube.com/watch?v=GLs3H\\_0yfKw](https://www.youtube.com/watch?v=GLs3H_0yfKw)
- <https://www.youtube.com/watch?v=n4o8NISa4Hs>
- [https://www.youtube.com/watch?v=Y\\_2OXXVuZec](https://www.youtube.com/watch?v=Y_2OXXVuZec)
- Book: Colossus by Michael Hiltzik







Questions ???  
Comments???