



*Why we need the CSB:
The PEPCON disaster of
1988*

NEAL LANGERMAN

Advanced Chemical Safety
San Diego, California, USA

- 
- *Why we need the CSB:*
 - *LESSONS WE SHOULD HAVE LEARNED*

Why we need the CSB

- U.S. Chemical Safety & Hazard Investigation Board
 - www.csb.gov
 - The CSB is an independent federal agency charged with investigating industrial chemical accidents. Headquartered in Washington, DC, the agency's board members are appointed by the President and confirmed by the Senate.

Why we need the CSB

- Objectives
 - CSB Update
 - Examine PEPCON incident
 - Importance of CSB to the chemical enterprise and more
 - What YOU can do

Why we need the CSB

- **Mission:**
 - **"drive chemical safety change through independent investigation to protect people and the environment."**
- **Vision:**
 - **"a nation safe from chemical disasters."**

Why we need the CSB

- CSB under attack in DC
 - Only 3 Board positions filled
 - Administration twice attempted to defund CSB
 - Poor internal morale & loss of experienced investigators
- Carefully executed, open, root cause studies help everyone

Why we need the CSB

- Review a major incident that preceded CSB - PEPCON
 - What happen & why
 - Lessons we did not learn

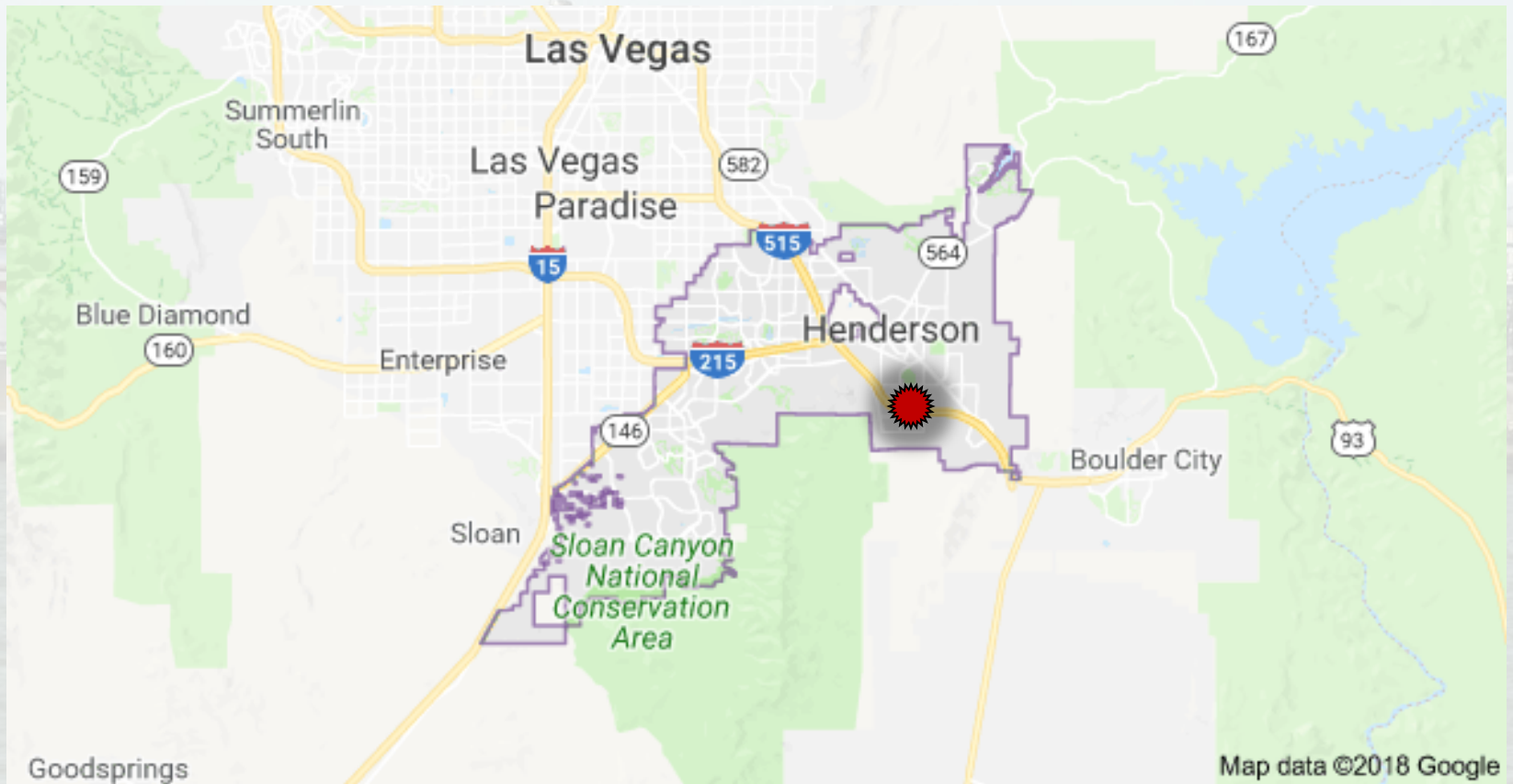
PEPCON detonations
Henderson, NV, 1988



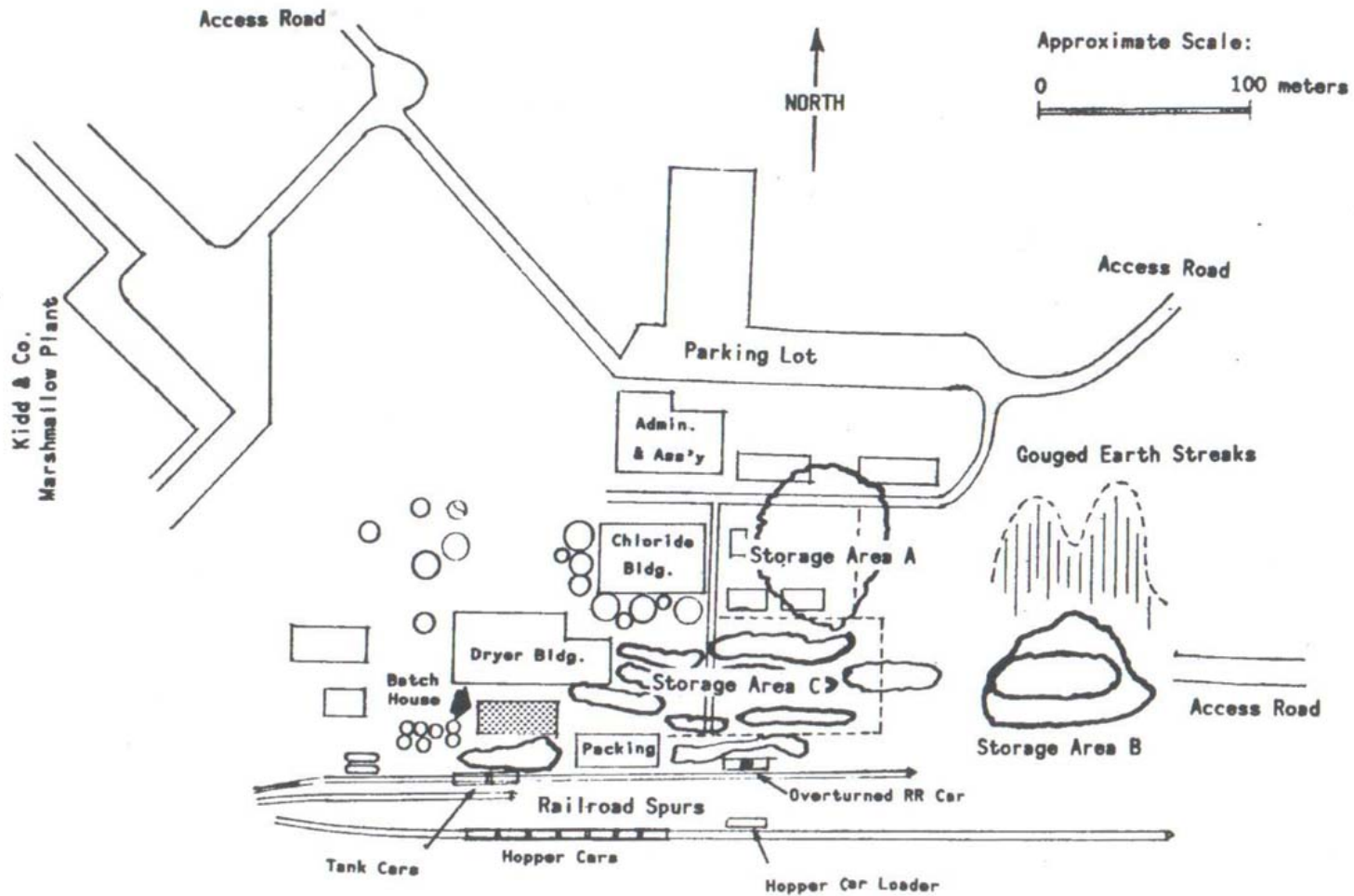
DURING THE FIRE



LOCATION



PEPCON PLANT LAYOUT



FACTS

- Fire started about 11:30 May 4, 1988
- First detonation at 11:51
- Largest detonation energy estimates
 - 1 kiloton nuclear free-air-burst
 - 250 ton TNT ground level burst

FACTS

- **PEPCON**
 - Pacific Engineering and Production Company of Nevada
- Produced **AMMONIUM PERCHLORATE**
- Excessive inventory resulting from production back-up following the Challenger failure.



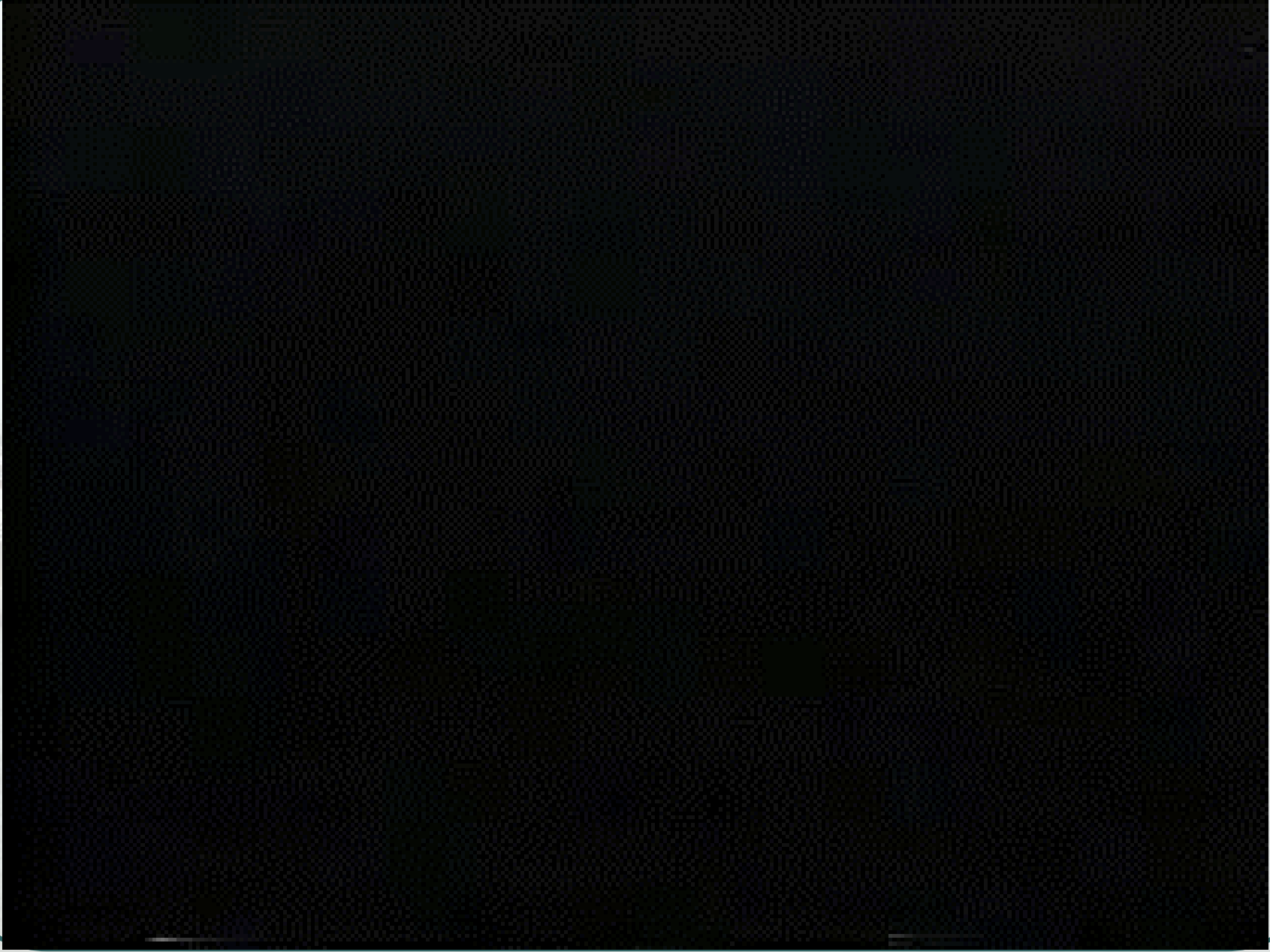
Cause & Origin

- Theories of cause
 - Welding fire
 - Natural gas leak/ignition
 - **Autoignition in Drying Oven Insulation**

VIDEOS

- FORENSIC ANIMATION
- BLACK MOUNTAIN VIDEO
 - Cable TV crew had a camera on Black Mountain summit, about five miles from PEPCON.
 - Filmed most of the fire
 - Drove to the plant after the large detonation
 - Earned \$330,000 selling the Rights to the video





NOT

LESSONS LEARNED

- Investigate & Resolve Incidents
 - Fires in the drying oven insulation ignored
- Manage system upsets properly
 - Challenger disaster initiated a chain of events which culminated in the PEPCON fire
- Dust accumulation can be a hazard
- Follow a proper emergency plan

EPILOG

- Nevada refused to permit the rebuilding of an AP plant in the state.
- Utah invited PEPCON to build a plant in Cedar City
- The Cedar City plant detonated about five years after start-up.
 - A survivor of the Henderson plant was among those who died in Cedar City



Those who don't
know history are
destined to
repeat it.

Edmund Burke, 1729-1797

We need the CSB

- Root Cause Reports
- Case Studies
- Incident Reconstruction Animations
- Recommendations for Improvement



We need the CSB

- Importance of CSB to local industry
 - Guidance for prevention of incidents
 - Assist with developing compliance standards
 - Combustible dust
 - Hot work
 - Process safety

We need the CSB

- What you can do – National Level
 - Your Members of Congress
 - CSB funding
 - CSB Board members
 - CFATS Reauthorization

We need the CSB

- What you can do –
Professional/Personal Level
 - Brethericks Handbook of Reactive Chemicals
 - American Chemical Society
 - Division of Chemical Health and Safety
 - Industrial Chemical Safety Forum
 - American Institute of Chemical Engineers
 - Center for Chemical Process Safety

We need the CSB

- **BE PREPARED**

- **R**ecognize local risks
- **A**ssess risk level
- **M**itigate the process risks
- **P**lan for something to go wrong





