

# 2015 NEWEA Spring Meeting

Monday June 8<sup>th</sup> - Session 1

## Operator's Forum

## A New Hampshire Perspective



## Operators Panel:

David Bernier – Superintendent, North Conway

Donna Hanscom – Assist. Director of Public Works, Keene

Fred McNeill – Chief Engineer, Manchester

Raymond Vermette Jr. – WWTF Supervisor, Dover

## Moderators:

Peter Goodwin – Ted Berry Company Inc.

Tim Vadney – Wright Pierce



# Operator's Forum – A New Hampshire Perspective

## Agenda

- o Introductions and Background
  - NH's WWTPs
  - Dover
  - Keene
  - Manchester
  - North Conway
- o Forum on Current Issues
- o Questions and Answers

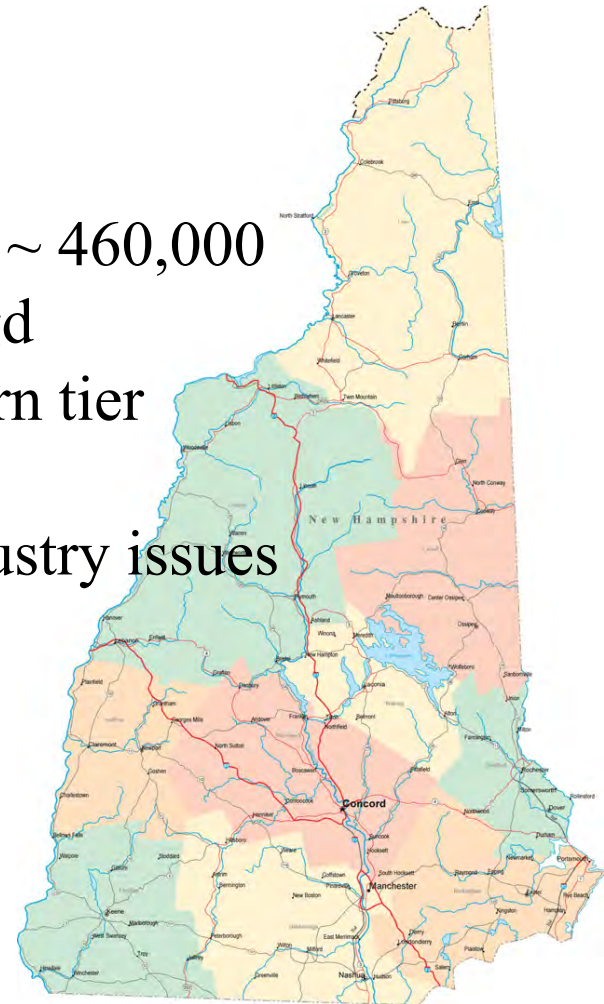


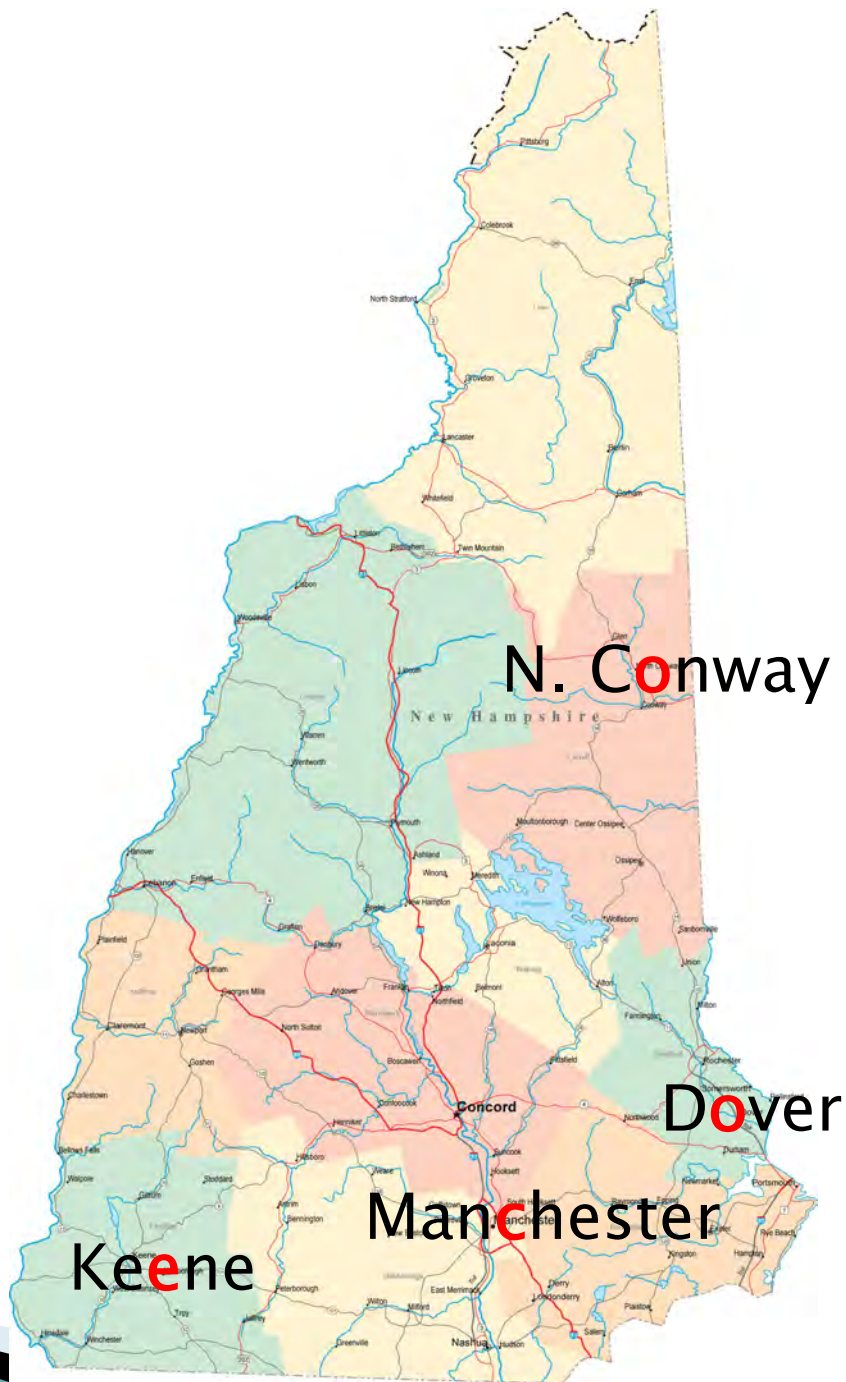
# New Hampshire – The Granite State “Live Free or Die”

- ▶ No Helmet Law
- ▶ No Mandatory Kindergarten
- ▶ No Sales or Income Tax
- ▶ “Open Carry” of firearms
- ▶ First in the nation Presidential Primary
- ▶ First Lottery in the Country
- ▶ Cheap Booze and Butts
- ▶ High Quality of Life
  - ▶ Four wonderful seasons
  - ▶ Mountains/Lakes/Seacoast
  - ▶ Lower Cost of Living

# New Hampshire WWTPs

- o Population 1.32 million
- o 98 Municipal WWTPs
  - Serves 35% of population ~ 460,000
  - Majority are under 1.0 mgd
  - Large plants are in southern tier
- o We will look at current industry issues in four communities
  - Three in southern tier
  - One in the north



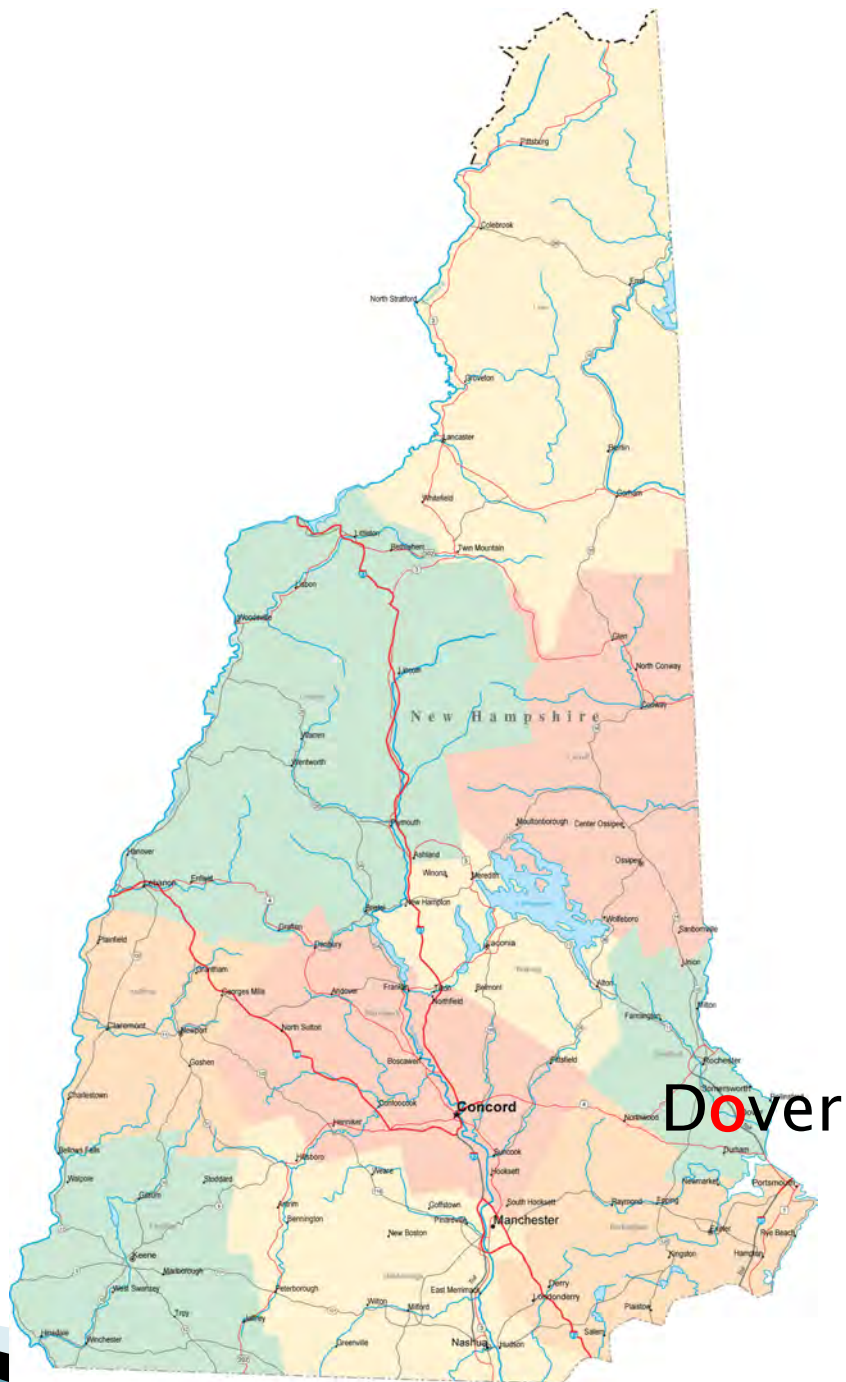


N. Conway

Dover

Manchester

Keene



Dover

# Background



- The Dover, NH wastewater treatment facility is a 4.7 MGD conventional secondary treatment facility.
- Wastewater is pumped to the facility through a 4 mile 36 inch force main from the River Street Pump Station.
- All preliminary treatment as well as Hypochlorite addition for odor control is completed at this station.
- Liquid treatment process located at the treatment facility includes:



- 2- Primary Sedimentation Basins  
Covered with Odor Control
- 4- Fine Bubble Aeration Basins  
Covered with Odor Control
- 2- Secondary Clarifiers
- 2- Channel Ultraviolet  
Disinfection System
- 1- River bottom outfall  
retrofitted with Duckbill  
Diffusers



The facility discharges treated Effluent into the Piscataqua River.



Keene

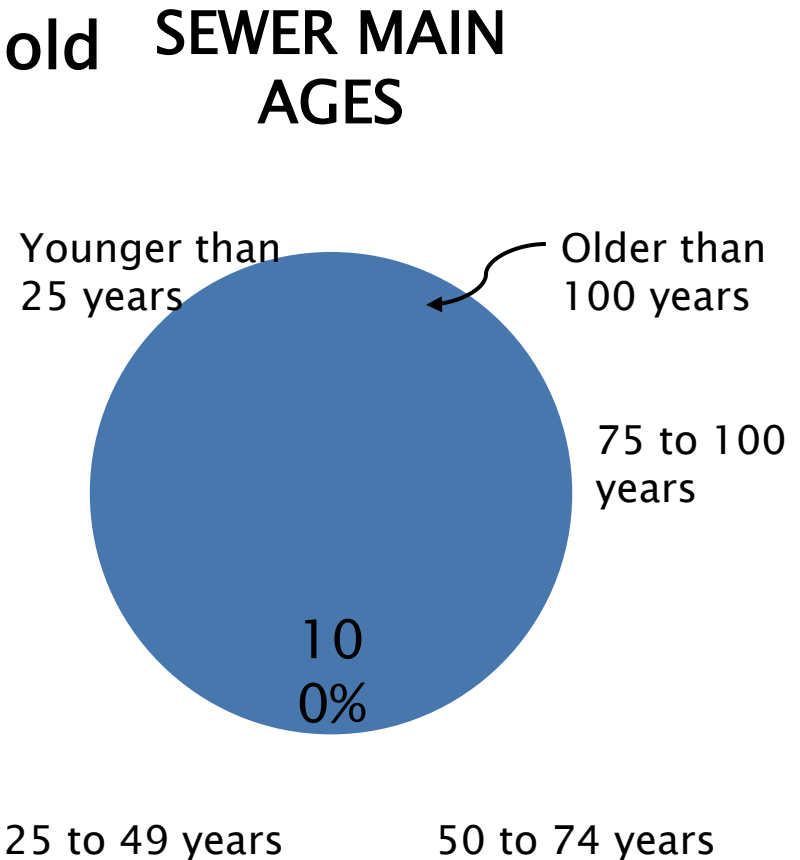
# Keene's Wastewater Infrastructure WWTP

- 1985– 20 mgd design
- Serves three communities
  - Keene
  - Swanzey
  - Marlborough
- Population Served approx. 24,000
- NPDES limits for phosphorus, copper, lead, zinc
- 50% dilution factor



# Keene's Wastewater Infrastructure

- 90 Miles of sewer
- Sewer ages – up to 125 years old
- 2100 Manholes
- 4 Pump stations
- ▶ Administrative order in 2005
- ▶ 6 person field crew (collection and distribution)
- ▶ I/I study 2014 – flows 3 to 16 MGD



# Keene, NH – The Elm City

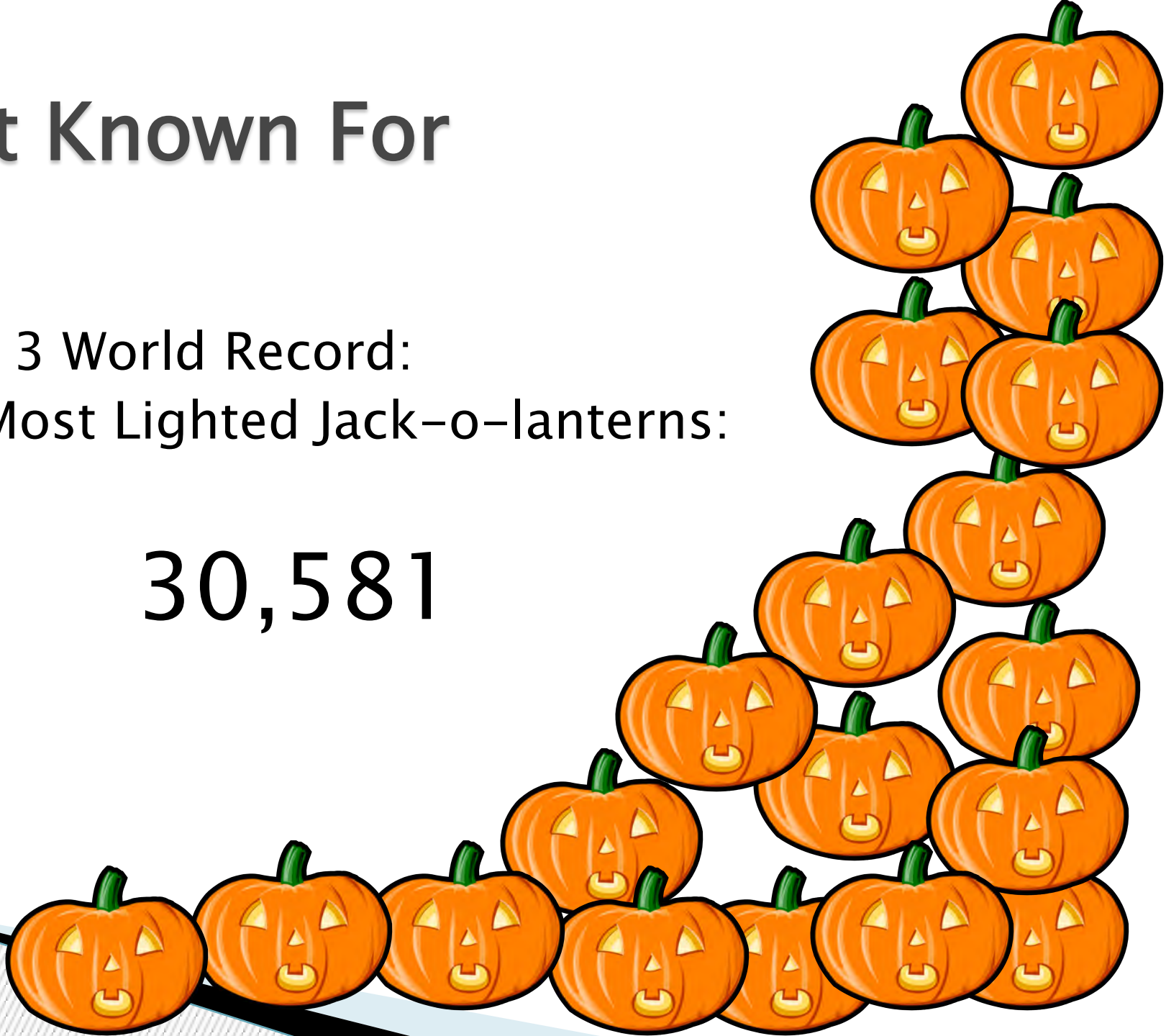


- ▶ Population: 22,563  
(triples during the day)
- ▶ Size: 34.7 Square Miles
- ▶ Home of Keene State College & Antioch University New England
- ▶ 125 miles of roads, 52 miles of sidewalks, 90+ miles of wastewater mains, 100+ miles of water mains
- ▶ County Seat
- ▶ City Council–City Manger Form of Government

# Best Known For

- ▶ 2013 World Record:  
Most Lighted Jack-o-lanterns:

30,581





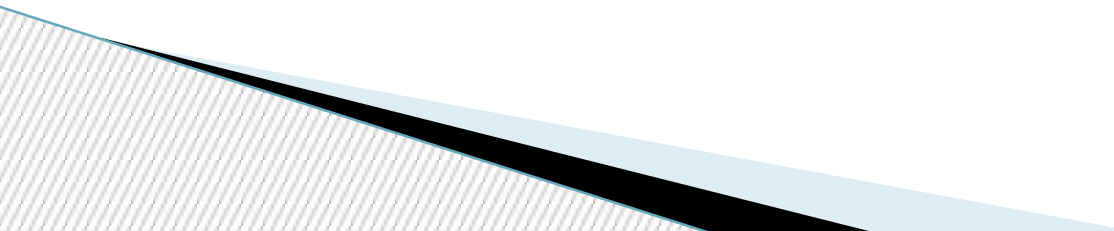
# City of Manchester

- ▶ Largest City North of Boston – 109,000 population
- ▶ Settled in 1725
- ▶ Evolved from Agricultural to Industrial: 1725 – 1815
- ▶ Amoskeag Mills: Largest single mill in the world 1915
- ▶ Post Industrial Depression: 1935 – 1980's
- ▶ Revitalization: 1990 to Present
- ▶ Revitalization = “ManchVegas”





# Environmental Protection Division

- ▶ Created in 1975
  - ▶ Division of Manchester's Public Works
  - ▶ An “enterprise”
  - ▶ Staff of 45
  - ▶ 15 acre campus at 300 Winston Street
  - ▶ 8 buildings
    - Admin
    - Operations
    - Maintenance
- 

# Manchester's Wastewater Infrastructure

## WWTP

- 1975 – 26 mgd
- 1994 – Upgrade to 34 mgd
- 2015 – Upgrade to 42 mgd
- Serves four communities
  - Bedford
  - Goffstown
  - Londonderry
  - Manchester
- Metro pop. 172,000



# Manchester's Wastewater Infrastructure Pump Stations

- 11 pump stations
- 50,000 gpd to 25 mgd



# Manchester's Sewer Infrastructure

- ▶ 375 Miles of sewer
  - 55% “combined”
  - 11,000 SMHs
  - 15 CSO outfalls



# Manchester's Stormwater Infrastructure

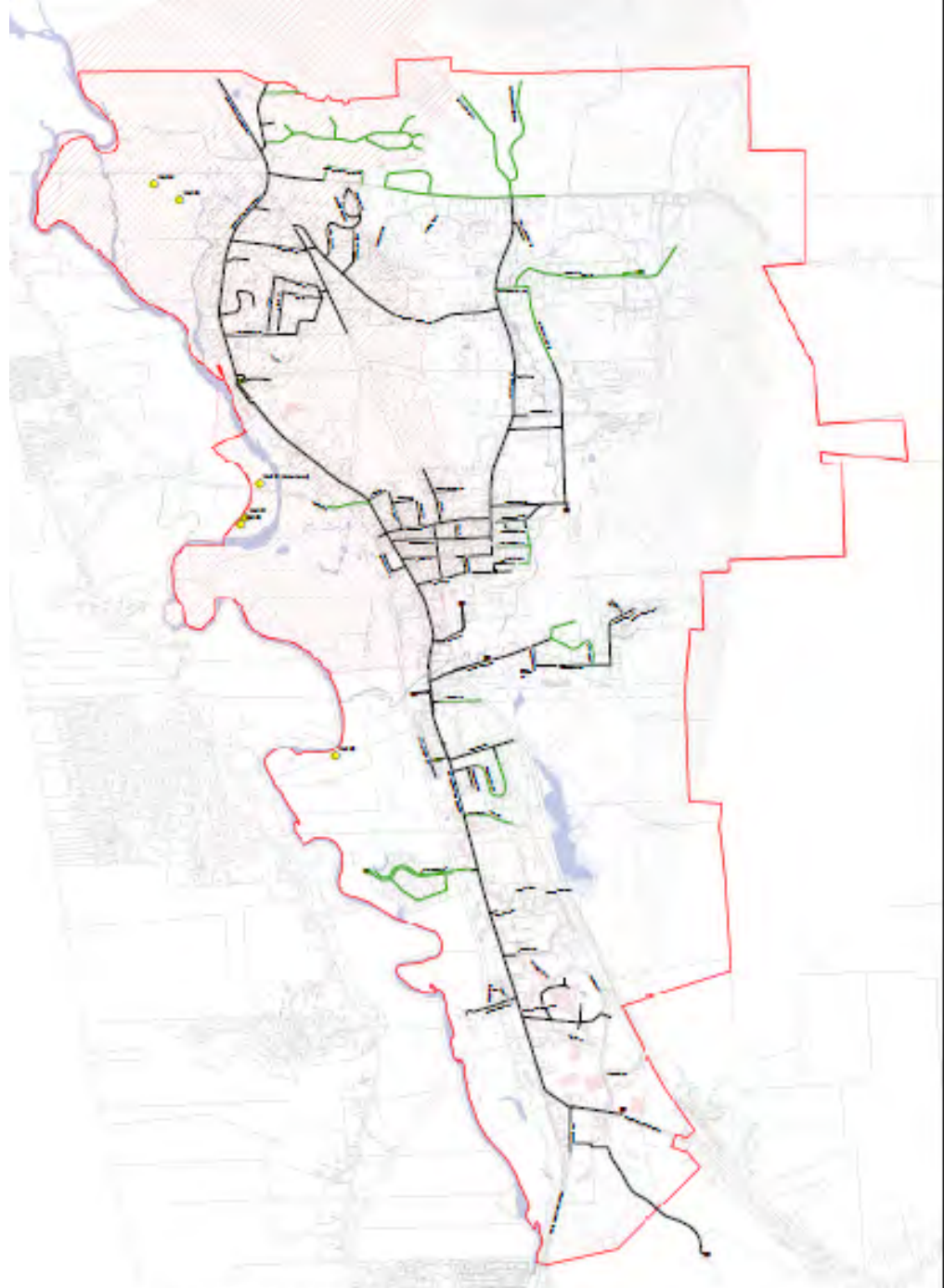
- 175 miles of drains
  - 14,000 CBs
  - 3,000 DMHs





N. Conway

# Sewer Infrastructure



# Projects completed

- ▶ Alternative Energy (Phase 1 and Phase 2) – 2011
  - NHDES ARRA 50% grant





# ACEC-NH Engineering Excellence 2011 Overall Winner

## Energy Efficiency Beneficial for the North Conway Water Precinct

*"This project allowed the Precinct to lower our operating budget as well as our carbon footprint. CDM's ability to fast track the design and provide construction services was nothing less than exceptional."*

– David Bernier,  
Superintendent

The dedication of the North Conway Water Precinct, and the communities it serves, is not only evident in their attention to the aesthetic and environmental impact on their surroundings, but also their commitment to reducing the energy consumption of the Precinct's facilities.



### Environmental Benefits

The project provides a reduction of 410,000 lbs of carbon dioxide annually, which equates to taking approximately 35 cars off the road. Additionally, the project decreases the Precinct's overall sulfur dioxide and nitrogen oxide emissions.

The facility's power supply is now being augmented by 744 solar panels, while 16 geothermal wells utilize the thermal properties of the ground for heating, ventilation, and air conditioning of the office and process areas within the plant.



The fixed mounted solar panels offset the facility's energy requirements by providing more than 200,000 kilowatt hours of electricity annually.



The geothermal system and new high efficiency condensing oil boilers help the facility save 6,000 gallons of oil per year.



**CDM**

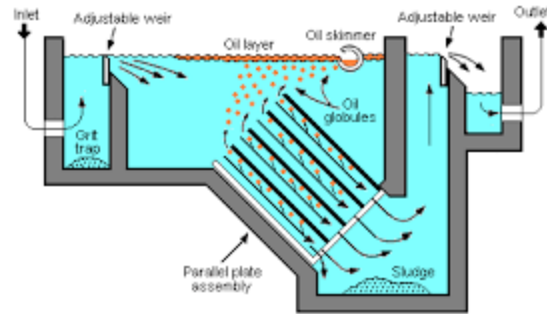
Manchester, New Hampshire

Wastewater Treatment Plant  
North Conway Water Precinct, North Conway, New Hampshire

**ACEC**

AMERICAN COUNCIL OF ENGINEERING COMPANIES

# How long have you worked in the wastewater Industry?



# Biggest WWTP mess you ever saw?



# One of Keene's Messes



# CIP Projects?



Why the Egyptians Stopped Building the Pyramids

# Dover CIPs:

- 1997 - Odor Control Upgrade - \$724,000
- 2003 - Primary Upgrade – \$177,000
- 2004 - Outfall Upgrade – \$335,000
- 2004 - UV Upgrade – \$1,000,000
- 2011 - Aeration Blower Upgrade – \$400,000
- 2012 - Dewatering Upgrade – \$2,600,000
- 2012 – River Street PS Upgrade 3,000,000
- 2014 - Phase 1 Facility Upgrade with MLE - \$8,600,000
- TOTAL - \$16,836,000



# Keene's CIPs



# Manchester WWTP CIPs

- **\$72 Million – 2005 to 2020**
  - Dewatering – completed
  - Secondary Clarifiers – completed
  - Incinerator – completed
  - Grit – completed
  - Aeration – \$23 million upgrade 80% complete
  - Primary Clarifiers – under design
  - Gravity Thickeners – next



# Manchester CIPs

- **Phase II CSO – \$165 million/20 years**
  - Contract No. 2 under construction
- **Cohas Brook Sewer Project – \$25 million/10 years**
  - Contracts No. 1 and 2 – completed
  - Contract No. 3 – under construction
  - Contract No. 4 – under design
- **CMOMs & Pump Stations – \$25 million/15 years**
  - Pumps station completed
  - \$1.5 million annually for CMOMs

# North Conway Projects on-going

- ▶ Contract 7 – Water and Sewer Infrastructure Improvements
  - 52% USDA Rural Development Grant
  - 30% NH Dept of Env. Services State Aid Grant for Eligible Streets
- ▶ Completed 2011  
Wyman, Longview, Yellow Brick, Duprey, Ash, Maple, Railroad Cross Country, Route 16A, Hurricane Mountain Road (Route 16 to Pendexter)
- ▶ Remaining 2012  
Thompson Road, Champney, Sunset Hill Road, Duprey Road Pump Station, Kearsarge (Remote) Trail, Valley View



# Warrant Article 2 – New Project

- ▶ Wastewater Treatment Plant Aeration Improvements
  - Received NHDES State Revolving Loan Capitalization Grant
  - Aeration system – too much dissolved oxygen (DO) in the winter months
  - Solves an existing problem and implements energy upgrades and is necessary to meet combined Year 2030 flows for both North Conway and Conway Village



# Warrant Article 3 – New Project

- ▶ Well 2 Replacement
  - Serves southern end of system
  - Eligible for interconnection grant funding
  - Applied for FEMA funding



# NPDES Permit?

- ▶ Nutrients
  - Nitrogen
  - Phosphorus
- ▶ Metals
  - Copper
    - Lead
    - Aluminum
- ▶ Legal Action

©



# Climate change?



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# Aging and failing Infrastructure?



# Increased Regulatory Requirements?





# Aging Workforce?



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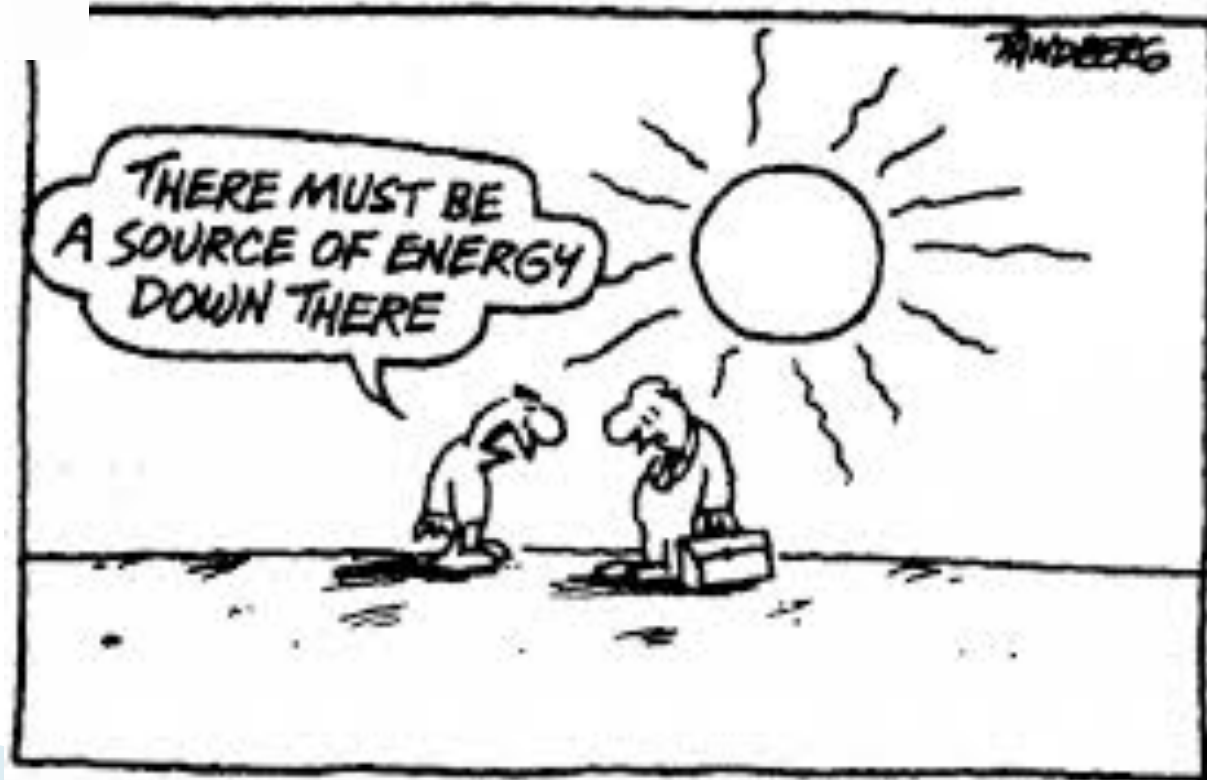
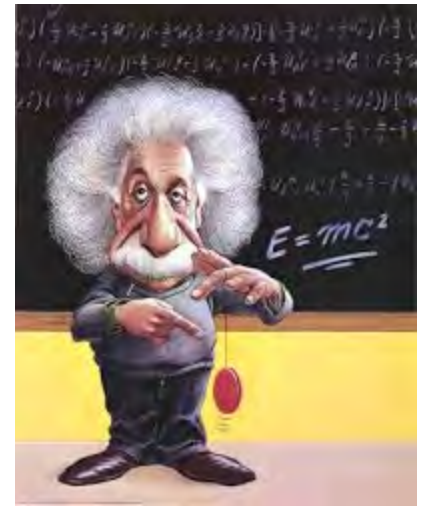


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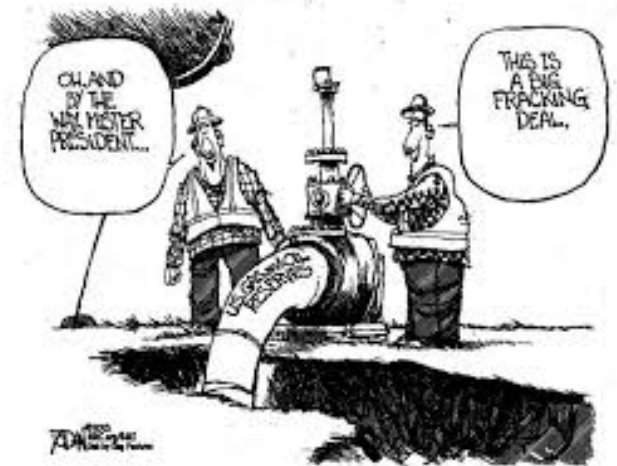
# Your Financial Outlook?



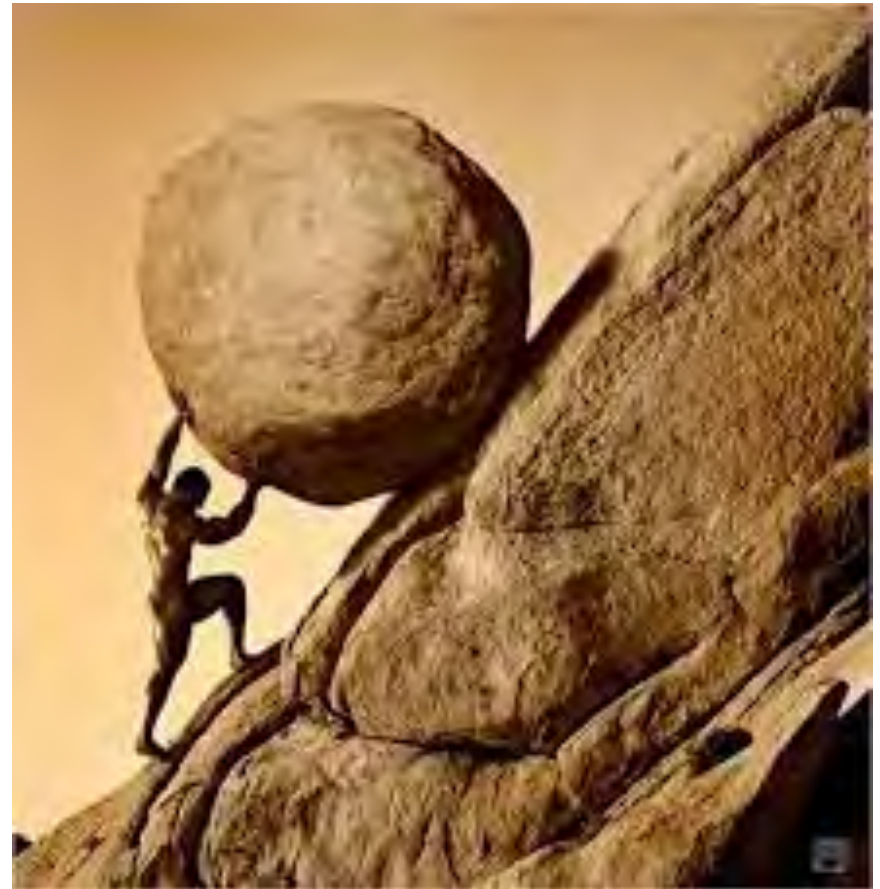
# Educational Outreach?



# One Unique Program Your Community Offers?



# Your Biggest Challenge in the Workplace?



# Questions?



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