

US EPA ARCHIVE DOCUMENT

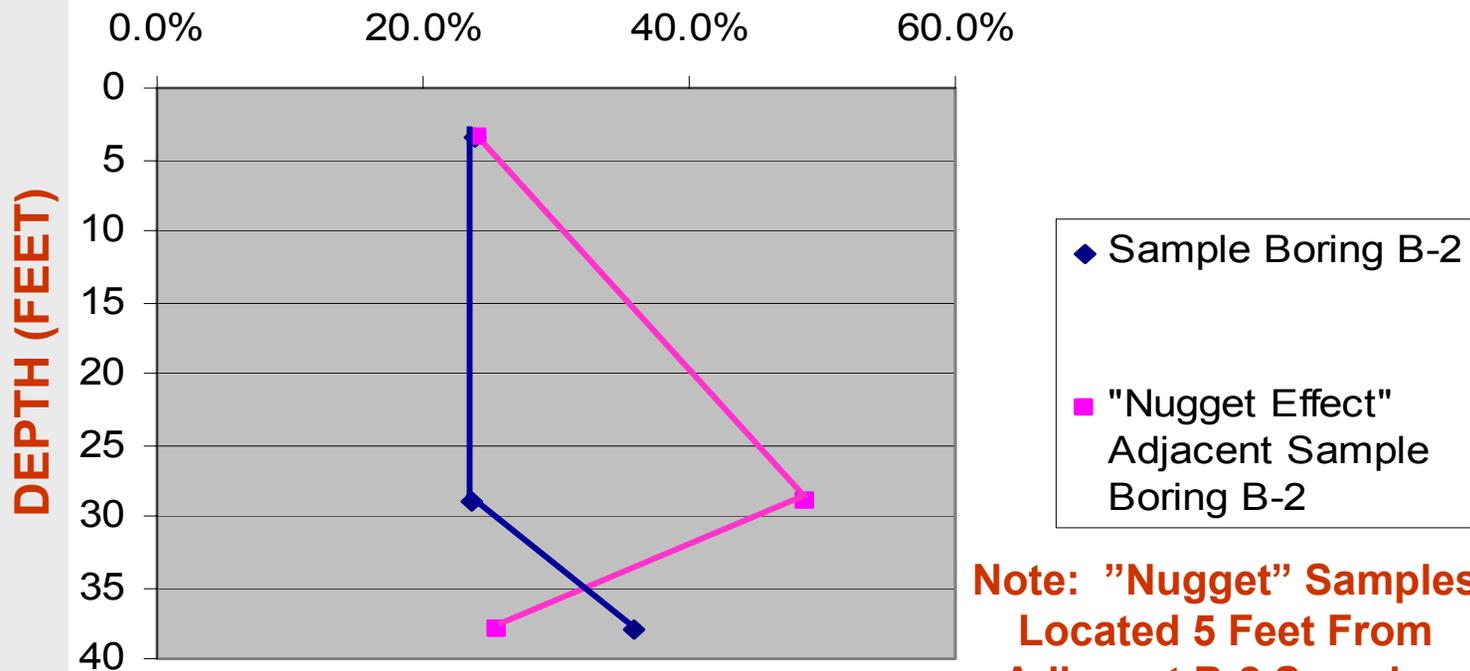
# MOISTURE DISTRIBUTION

- **The effectiveness of moisture distribution directly affects:**
  - **Air distribution**
  - **Water Availability for microorganisms**
- **Evidence of heterogeneous distribution of moisture, including saturated pockets and relatively dry areas**
- **For aerated systems, a tighter operating range of moisture content is needed**



# MOISTURE CONTENT DATA FROM OCTOBER 2002 SAMPLING EVENT

Moisture Content (Percent On Wet Weight Basis)



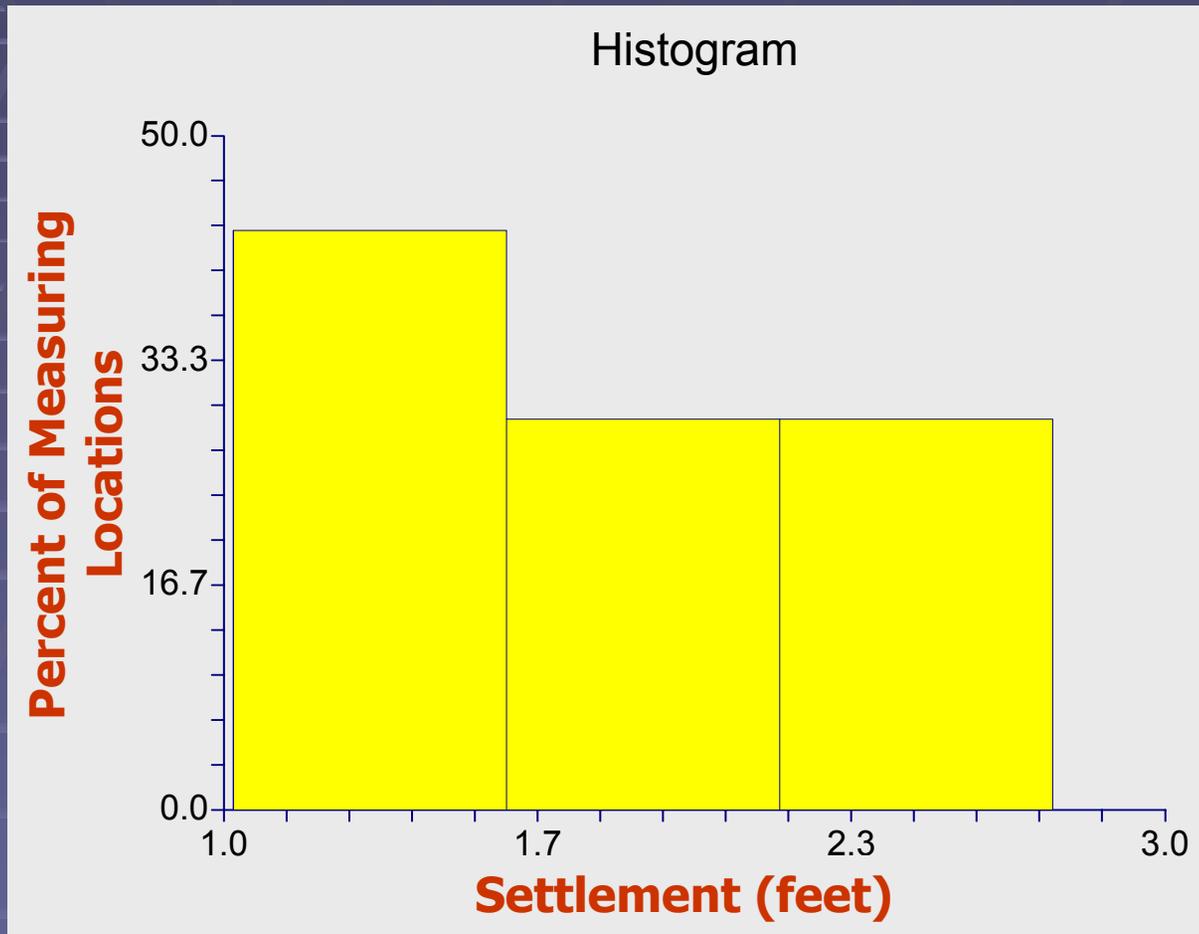
**Note: "Nugget" Samples Located 5 Feet From Adjacent B-2 Samples**

# NEEDED IMPROVEMENTS

- ***In-situ* moisture content measurements are necessary for effective operation relative to concerns over maintaining FAS**
- **For Retrofits - Improved methods and materials of construction in well and header system construction**
  - **auguring or sonic drilling for wells**
  - **greater well diameter**
  - **angular granular materials used in annular space backfill**
  - **HDPE pipe and fittings for header system**

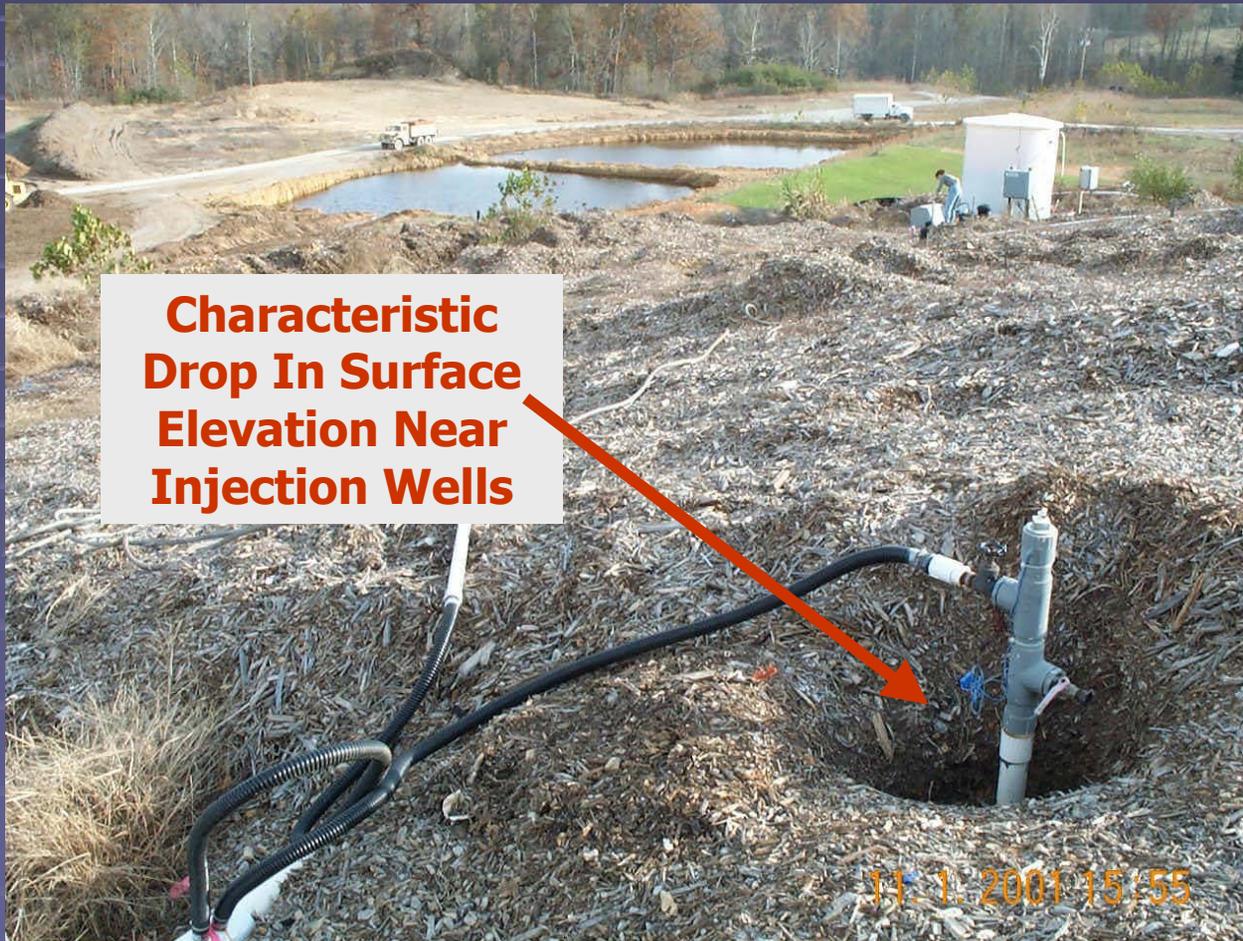


# SETTLEMENT (AS OF 1/28/03)



➤ Average Settlement Across Site = 22 inches or 4.9% of original avg. depth

# SETTLEMENT

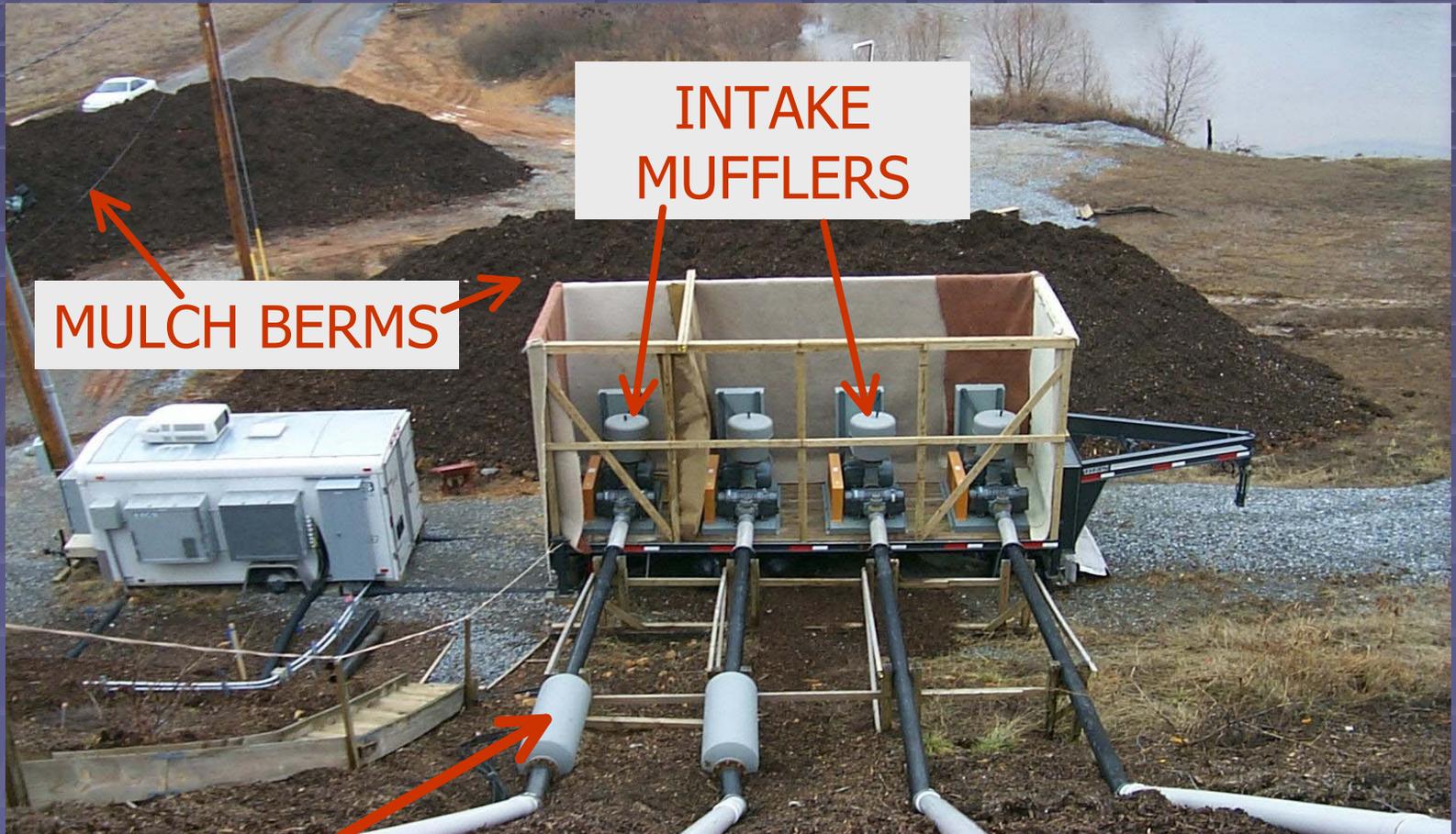


# OPERATIONAL PROBLEMS AND TROUBLESHOOTING

- **PROBLEM:** Noise from blowers (neighbor complaints)
  
- **SOLUTION:** Vibration dampeners on outlet air header pipes; mufflers on blower intakes; carpeted structure around blowers



# POSITIVE DISPLACEMENT BLOWERS WITH NOISE ABATEMENT MEASURES



MULCH BERMS

INTAKE  
MUFFLERS

DISCHARGE NOISE  
DAMPENERS

# OPERATIONAL PROBLEMS AND TROUBLESHOOTING

➤ **PROBLEM:** Maintaining air header pressure due to pipe leaks at cracks and due to inadequate sealing at joints

➤ **SOLUTION:**

➤ Replaced cracked pipe and all leaking joints

➤ Use HDPE pipe with butt-fused joints



# AIR HEADER LEAK

**Separation  
At PVC  
Glued  
Joints**



**Crack  
Formation  
In PVC  
Pipe**

# OPERATIONAL PROBLEMS AND TROUBLESHOOTING

## ➤ PROBLEM:

➤ Excessive air backpressures at air injection wells

➤ Related to the variability in waste/soil density and porosity (limited free air-space), volume of intermediate soil cover used, moisture content

➤ Related to the method of construction for the injection wells



# OPERATIONAL PROBLEMS AND TROUBLESHOOTING

- SOLUTION/RESPONSE:
- Construct waste cells in new bioreactor systems using methods to increase free air-space (waste processing, minimal compaction, shallow layering)
- Compare measured backpressures in the field using various delivery methods
- Internal examination of wells with down-hole camera



# OPERATIONAL PROBLEMS AND TROUBLESHOOTING

## ➤ PROBLEM: Thermocouples

- Sealing Connections
- Shielded wire was not used
- Accidental severing of Lines
- Wires wrapped around piping

## ➤ SOLUTION:

- Replacement of wire; use of shielded wire
- Shrink-Wrap Connections or replace with outdoor connectors (watertight)
- Remove wires from around piping

