

US EPA ARCHIVE DOCUMENT

# **WILLIAMSON COUNTY AERATED BIOREACTOR LANDFILL: OPERATIONS AND PERFORMANCE**



**Presented by  
Civil & Environmental Consultants  
for the  
U.S. Environmental Protection Agency  
Workshop On Bioreactor Landfills  
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# WILLIAMSON COUNTY LANDFILL



# **WILLIAMSON COUNTY BIOREACTOR FACT SHEET**

- **Waste footprint = 6 acres (2.43 hectares) at base**
- **Maximum waste depth is approximately 40 feet (12.2 meters)**
- **Total original waste tonnage = 69,880 short tons or 63,394 Mg**
- **Site is currently closed; received wastes from 1995 to 1998**



# **WILLIAMSON COUNTY BIOREACTOR FACT SHEET**

- **Shape of subject area resembles a truncated pyramid with steep sideslopes (Avg 1.5:1)**
- **Retrofit operation only. No pre-processing of wastes occurred before placement. No new waste placement is taking place**





# **WILLIAMSON COUNTY BIOREACTOR FACT SHEET**

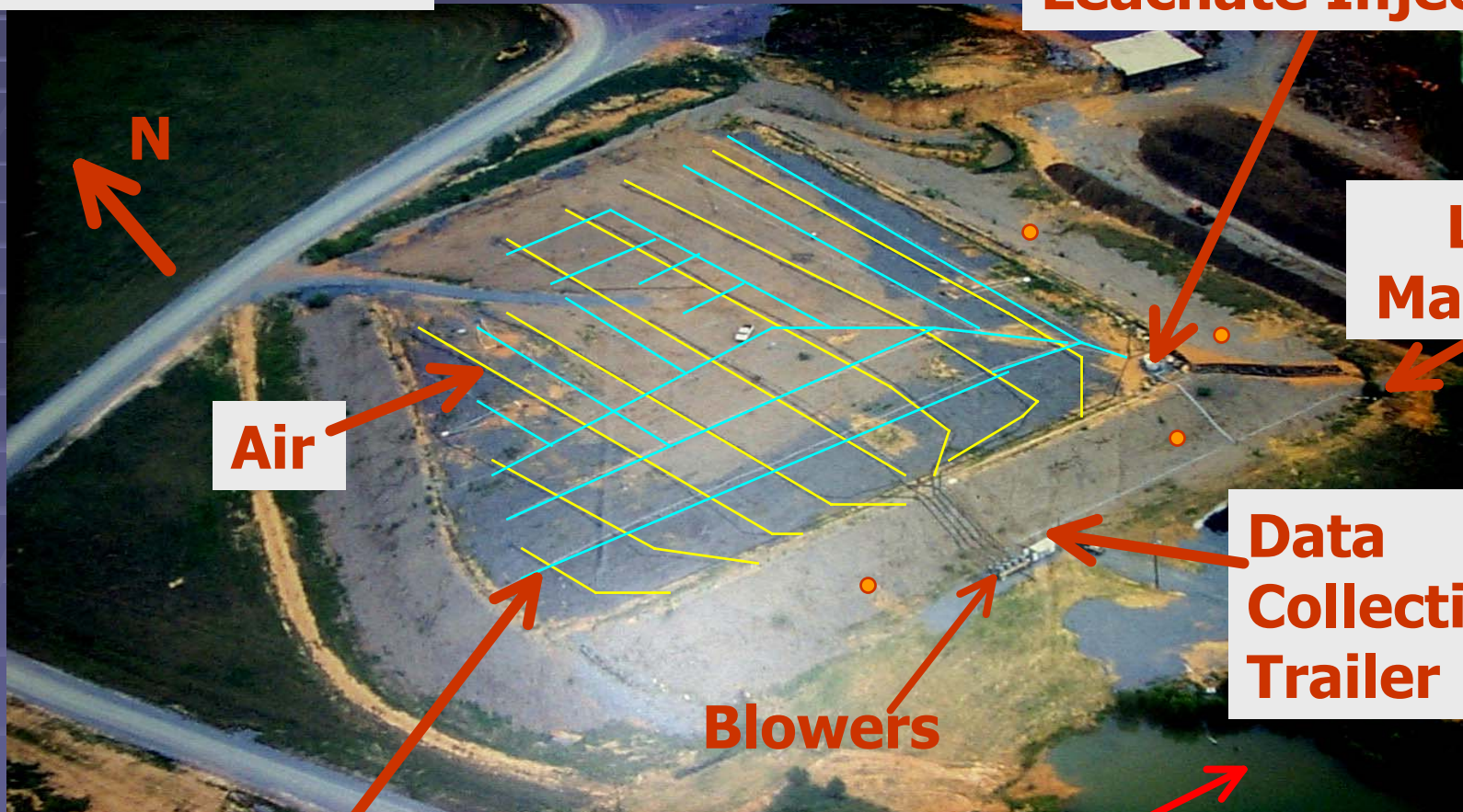
- **Site has been operating continuously as a forced-aeration bioreactor landfill since October 17, 2000 (with periodic shut-downs for maintenance and repair)**
- **Leachate, and occasionally storm water, is pumped into the mass via vertical screened wells**
- **This is a “temperature-feedback” operation**



# SYSTEM LAYOUT

Monitoring Locations  
For Leachate Head •

Mix Tank For  
Leachate Injection



LCS  
Manhole

Air

Data  
Collection  
Trailer

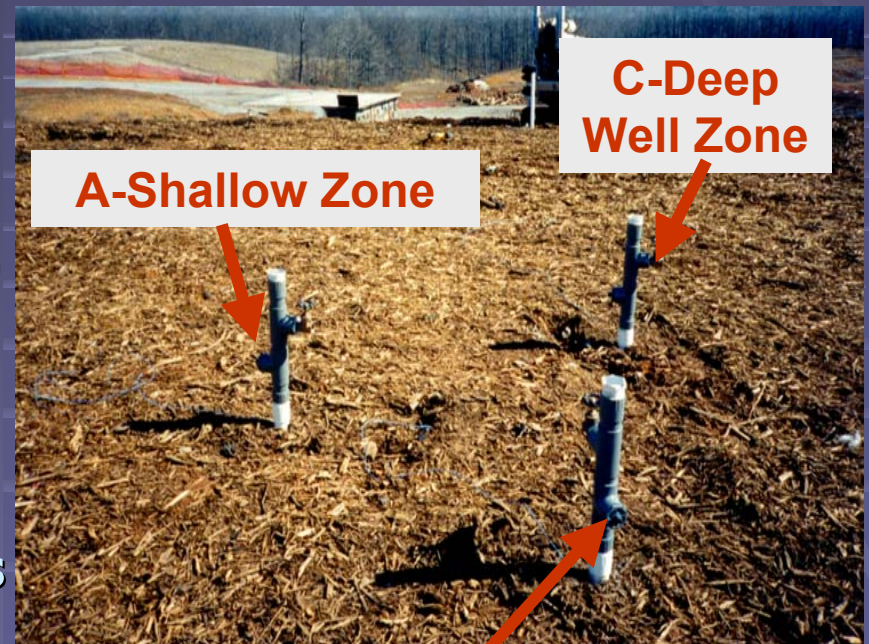
Blowers

Leachate

Storm Water Pond

# COMPRESSED AIR INJECTION

- Three 1000 acfm (28.3 m<sup>3</sup>/min) blowers are utilized on-site
  - Compressed air is injected into the waste via vertical screened wells
  - Preliminary figures: Average air injection as of Feb 2003 =  
\*27.5 acfm per well  
(95% C.I. = [20.78, 34.15])
- \* Based on most recent operations when system was running effectively



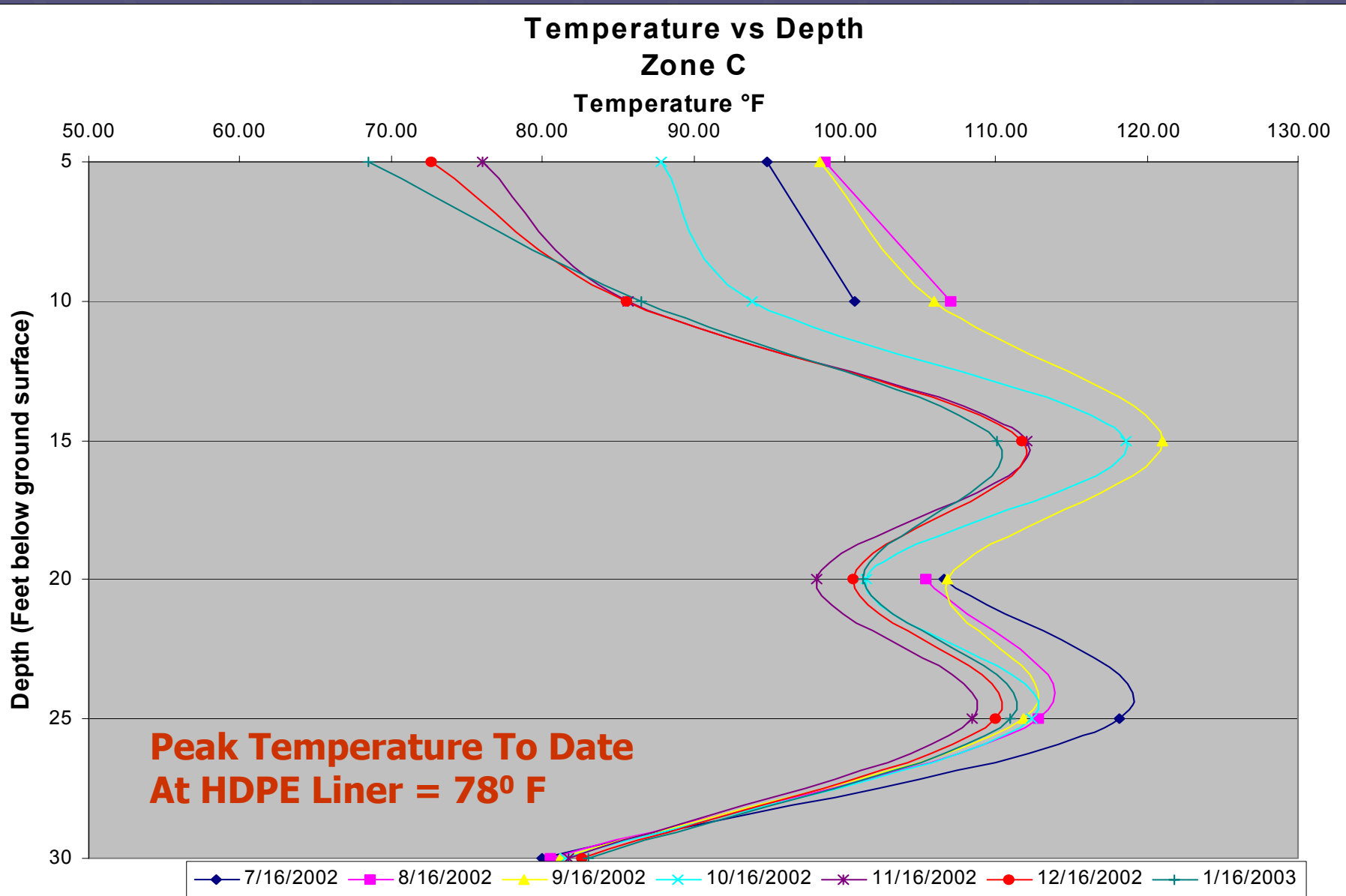
**B-Intermediate Depth Zone**



# OPERATIONAL ZONES (JULY 2002 TO JANUARY 2003)



# ZONE C TEMPERATURE PROFILE

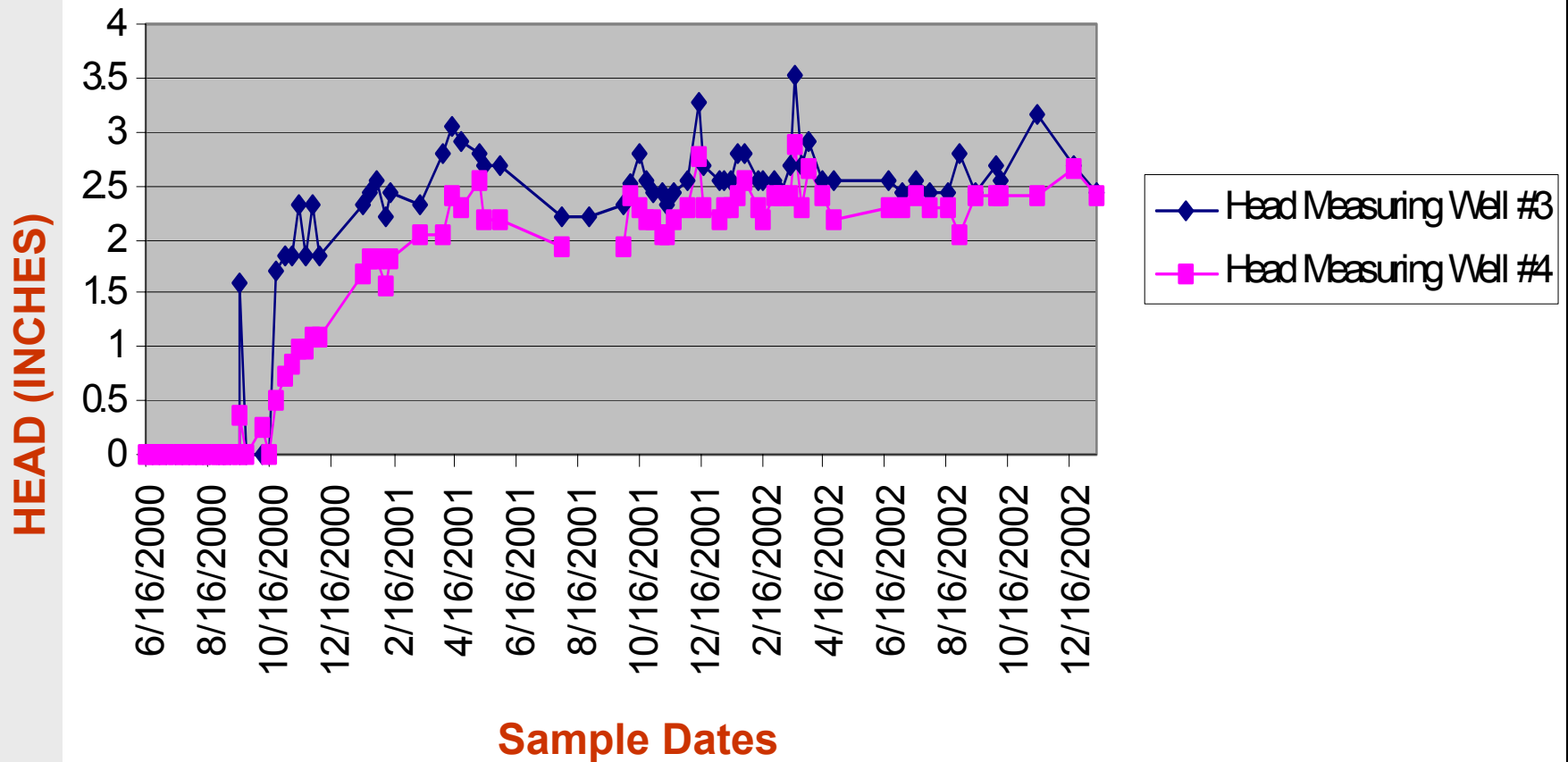


# LEACHATE INJECTION AND COLLECTION

- Composite-lined base with a granular-material underdrain LCS
- All leachate flow drains towards the southeast corner of the footprint
- Injected volume of leachate/storm water to date is approximately 4.8 million gallons (18.2 million liters)
- Leachate injection rate has varied from 0.01 to 0.07 gallon/cy waste/day (0.05 to 0.35 liters/m<sup>3</sup> waste/day)



# LEACHATE HEAD ON LINER





# **WATER BALANCE**

- **Roughly 10% of injected leachate has emerged via the leachate**
- **Data suggests that gas and compressed air injection pressures are influencing moisture routing throughout waste matrix**
- **Surface lysimeters are being influenced by upward movement of internal leachate**
- **Exit gas has had saturated humidity levels since the start of air injection**

