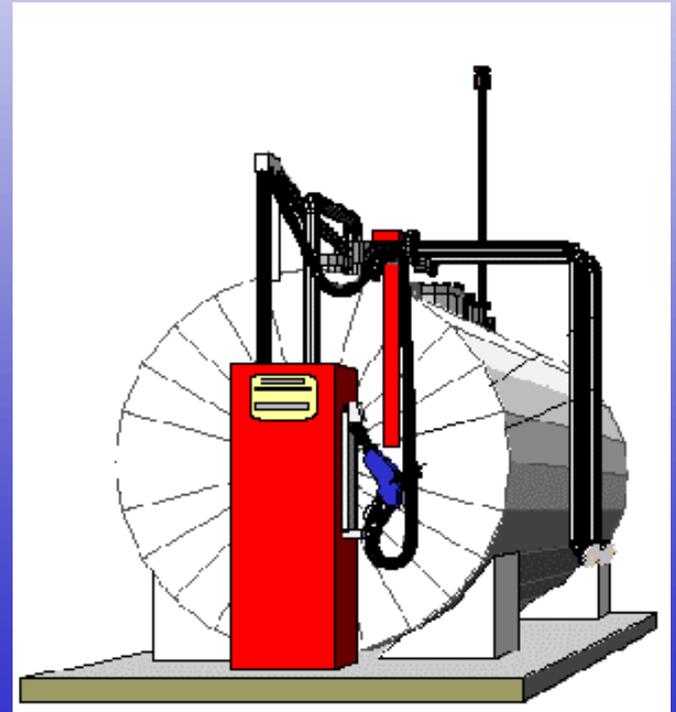


AST EVR WORKGROUP MEETING

July 23, 2002

Pat Bennett
Engineering Evaluation Section
Monitoring and Laboratory Division
California Air Resources Board



Workgroup Agenda

- Welcome & Sign-In
- Overview of April 17th Meeting
- AST Inventory Request
- Status of AST Monitoring Effort
- Estimating AST Fugitive Emissions
- Efficiency Testing / Procedure Development
- Open Discussion and Schedule Next Meeting
- Close

April 17th Meeting Highlights

- AST Definition - Consensus to include requirement for emergency vent into AST definition found in ARB's Interim AST Certification Guidelines
- AST Inventory - Current estimate of ASTs is very low. Recommend to contact AST manufacturers for more accurate number.

Revised AST Definition

A system that uses a gasoline storage tank that is intended for fixed installation, without backfill, is located above or below grade and requires emergency relief venting.

AST Inventory Request

- Letter Sent to AST Manufacturers
 - list included 279 manufacturers from UL Listed Storage Tanks Directory
 - requested response by August 15th
 - requested information on number of ASTs for agricultural and non-agricultural applications, and size distributions

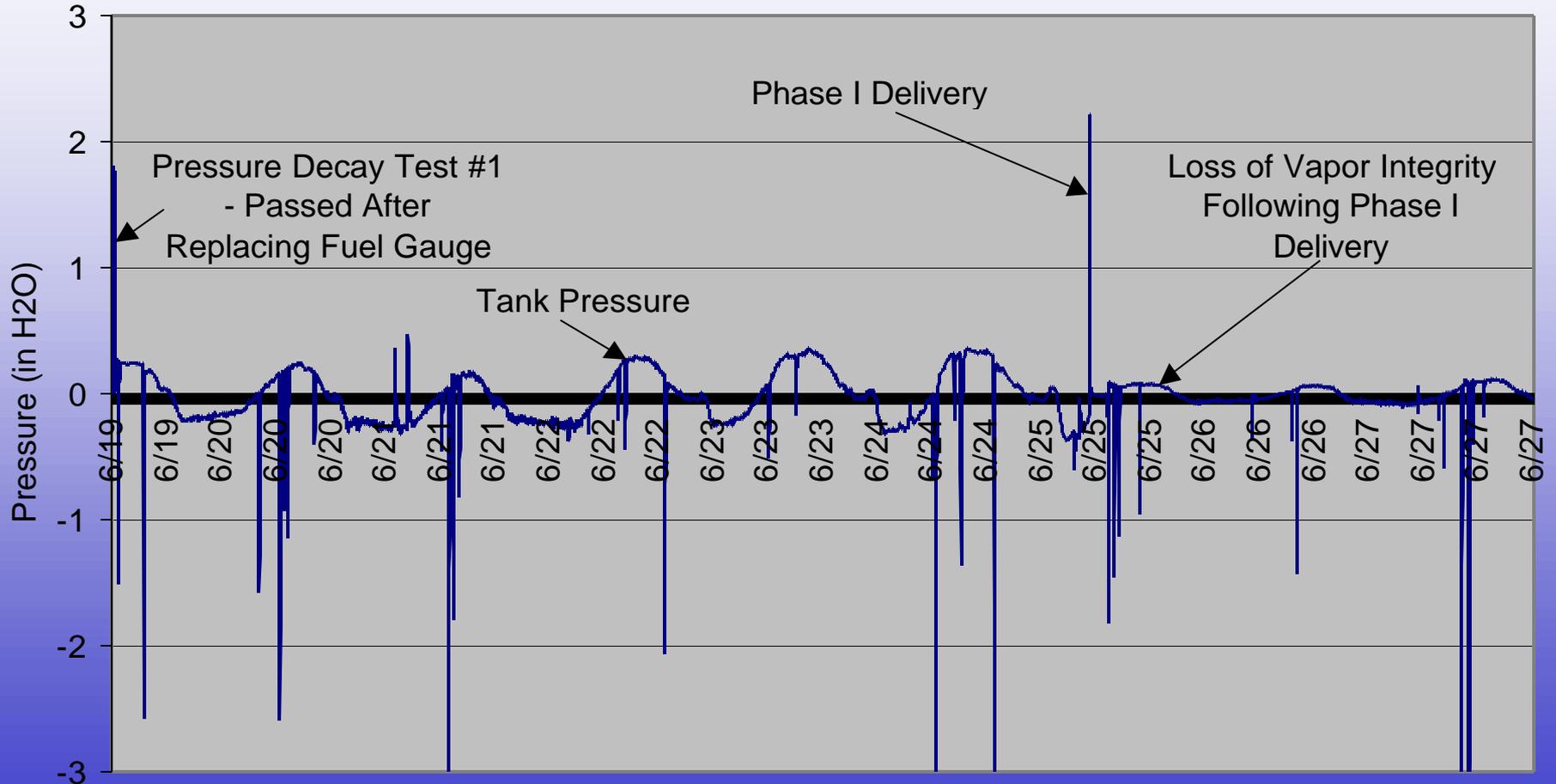
Status of AST Monitoring Effort

- Monitoring 1,000 and 6,000 gallon balance, single dispenser AST systems
- Difficulty in maintaining vapor integrity on 1,000 gallon AST due to component leakages and loose drain valve and tank bung following Phase I deliveries.

Status of AST Monitoring Effort (continued)

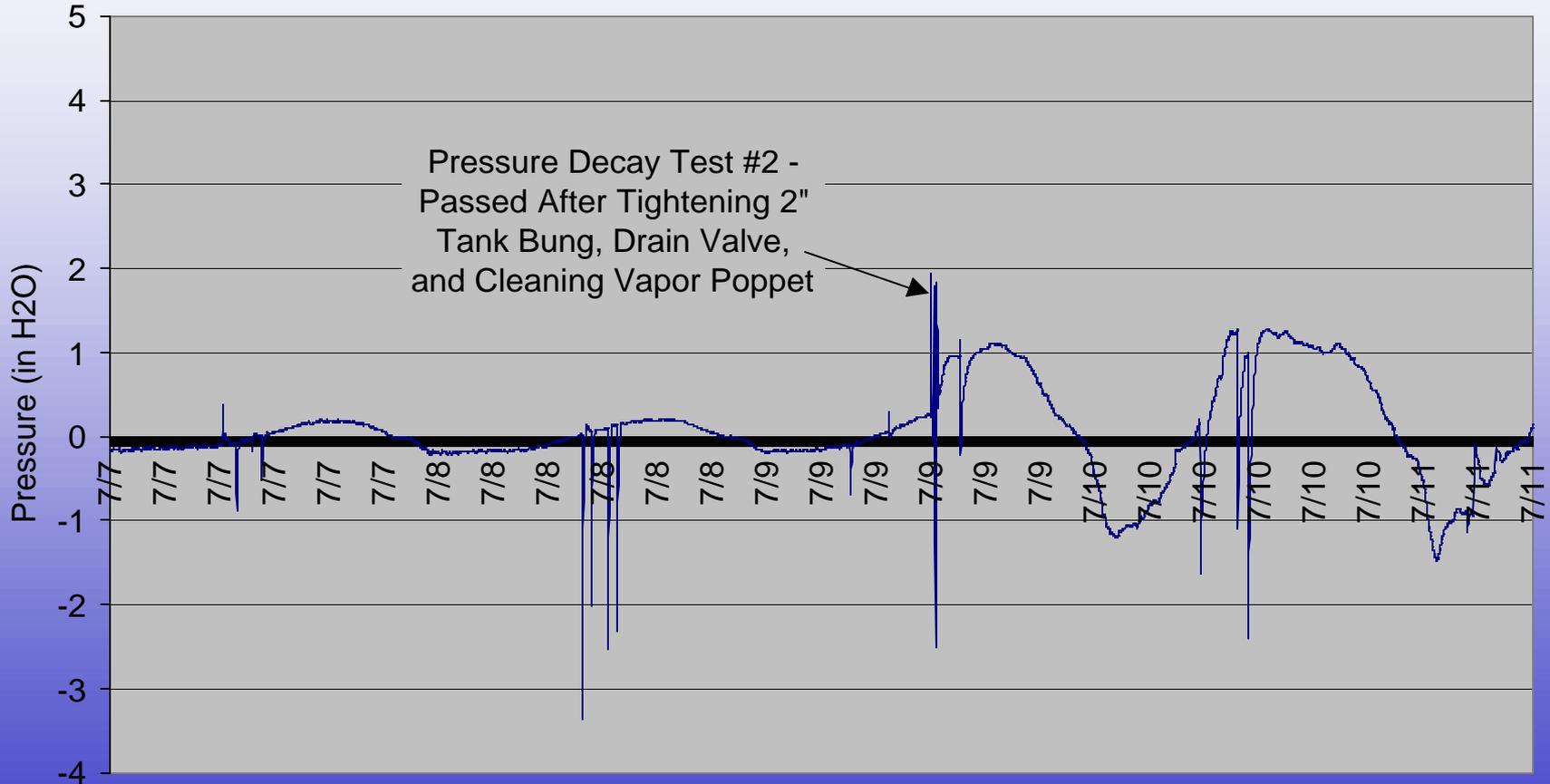
- High throughput of ORVR vehicles on 6,000 gallon AST
- Will not conduct pressure integrity test on 6,000 gallon tank until long-bolt manway emergency vent is replaced with new vent.

Vapor Integrity Maintained For Only 6 Days Following Successful Pressure Decay Test



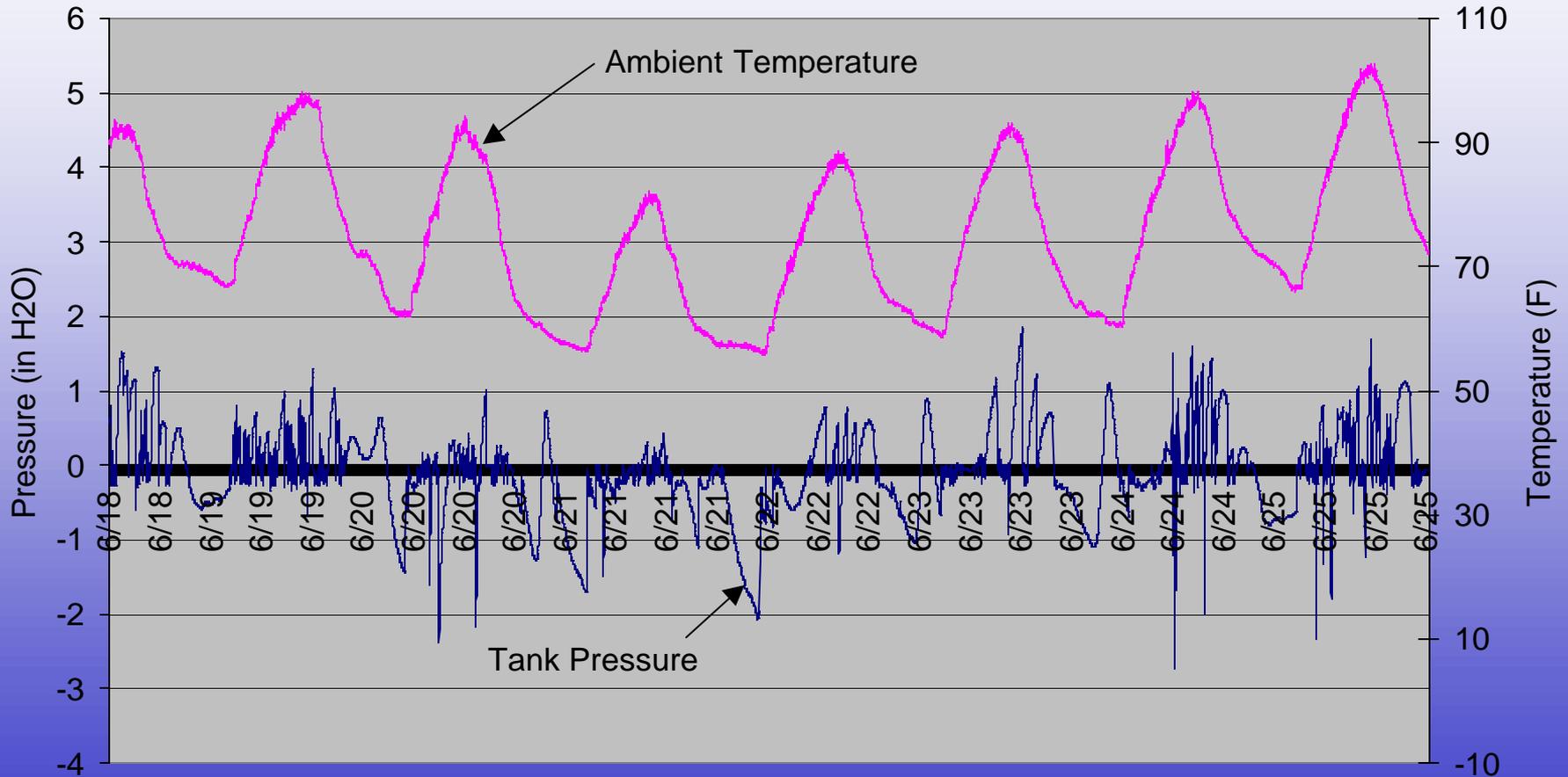
1,000 Gallon Capacity Balance Tank
≈3,000 Gallon/Month Throughput

2nd Pressure Decay Test Conducted Within 3 Weeks Identifies Further Leaking Components



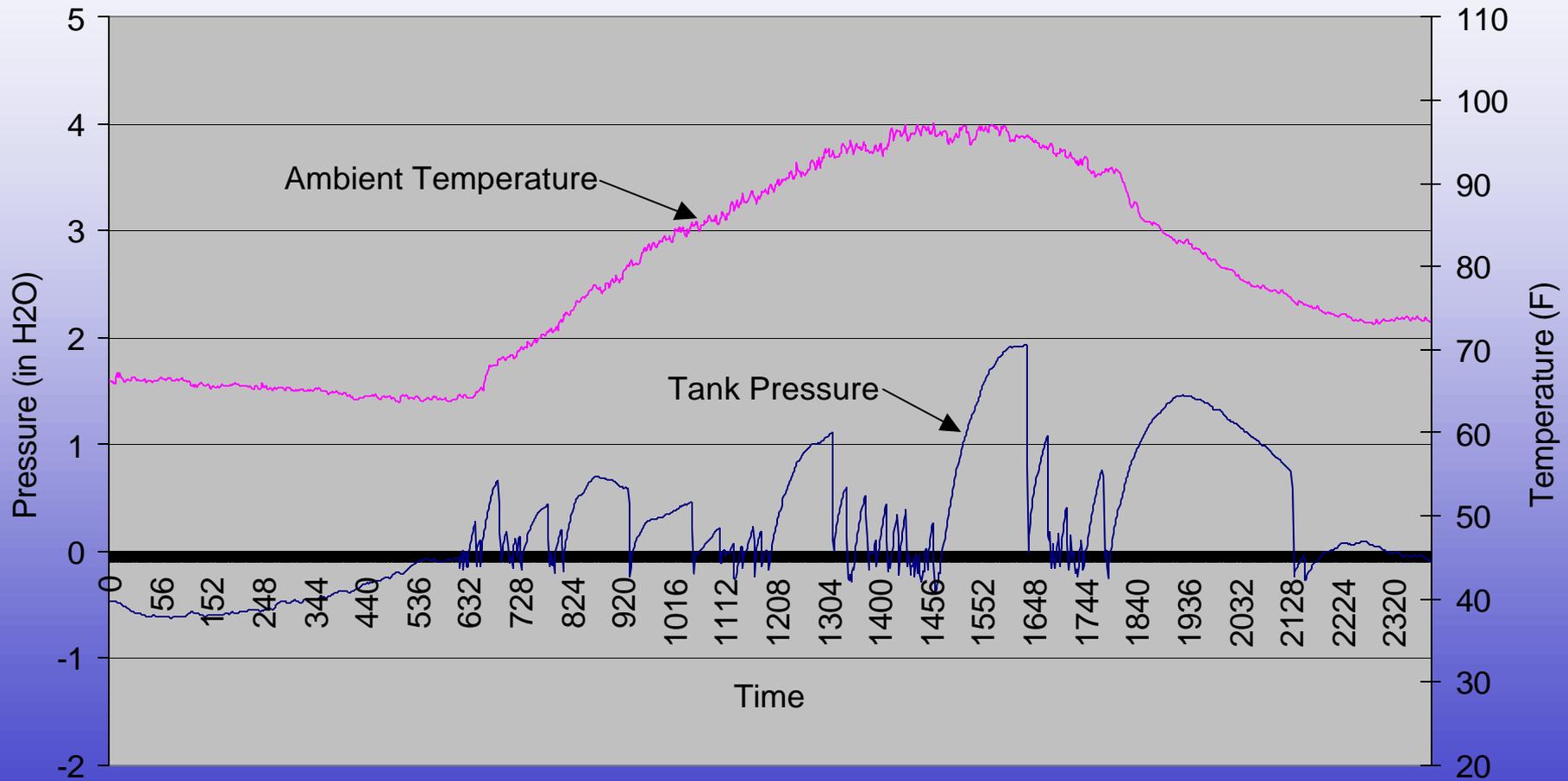
1,000 Gallon Capacity Balance Tank
≈3,000 Gallon/Month Throughput

High Throughput of ORVR Vehicles - Indicates Correlation Between Tank Pressure and Ambient Temperature



6,000 Gallon Capacity Balance Tank
≈20,000 Gallons/Month Throughput

High Throughput of ORVR Vehicles - One-Day Tank Pressure and Ambient Temperature Tank Still Operates at Positive Pressures

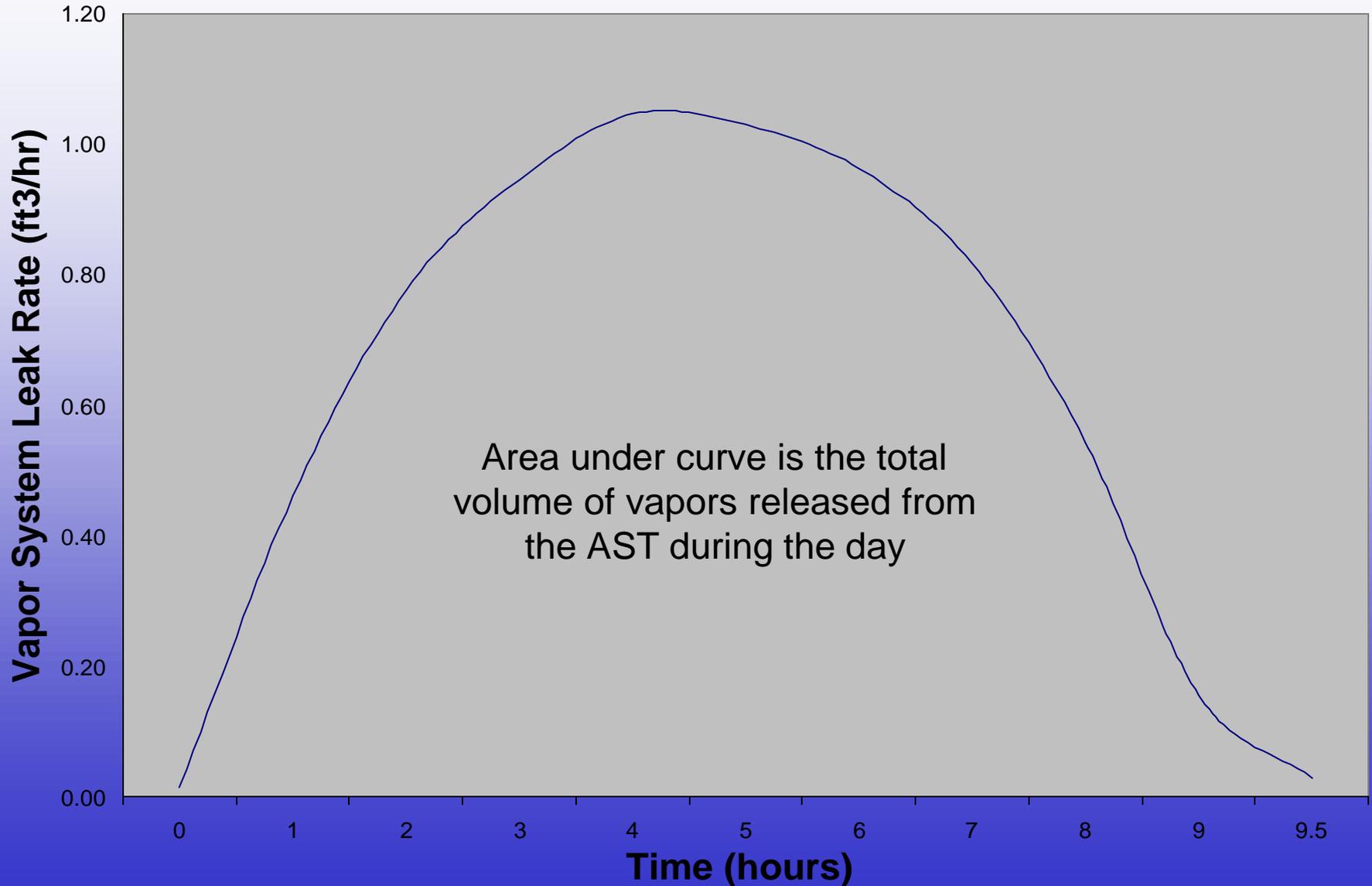


6,000 Gallon Capacity Balance Tank
≈20,000 Gallons/Month Throughput

Methodology for Estimating AST Fugitive Emissions

- Use vapor system pressure data and system leak data to establish a correlation between system leak flow over time.
- Determine fugitive emissions by calculating the area under the leak flow curve.

Example of Fugitive Emissions Estimate Over Time



Efficiency Testing / Procedure Development

- Plan to conduct Phase I and Phase II efficiency testing on a small and large balance AST vapor recovery system and a processor type system.
- Purpose is to estimate in-use efficiencies of existing systems and update the current baseline Phase I and Phase II emissions estimate

Open Discussion

- Rupture Disk Emergency Vent (2000 Uniform Fire Code Section 7902.2.6.2)
- Existing Emergency Vents
 - Lubrication
 - Maintenance
 - UL Certification Requirements
- Tank Sticking
 - Dedicated stick port w/drop-tube

Open Discussion (cont)

- Anti-Siphon Devices
 - Top-fill (holes in drop tube, size and location requirements)
 - Side or remote fills (check valves/anti-siphon devices, location requirements)
- Poppeted Fill Adapters (top fill application)
- Poppeted Fill Adapters w/Close Coupled Shut-Off Valves (side and remote fill applications)
- Operations and Maintenance Manuals
 - Minimal response from ARB request

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