Gas Well Unloading

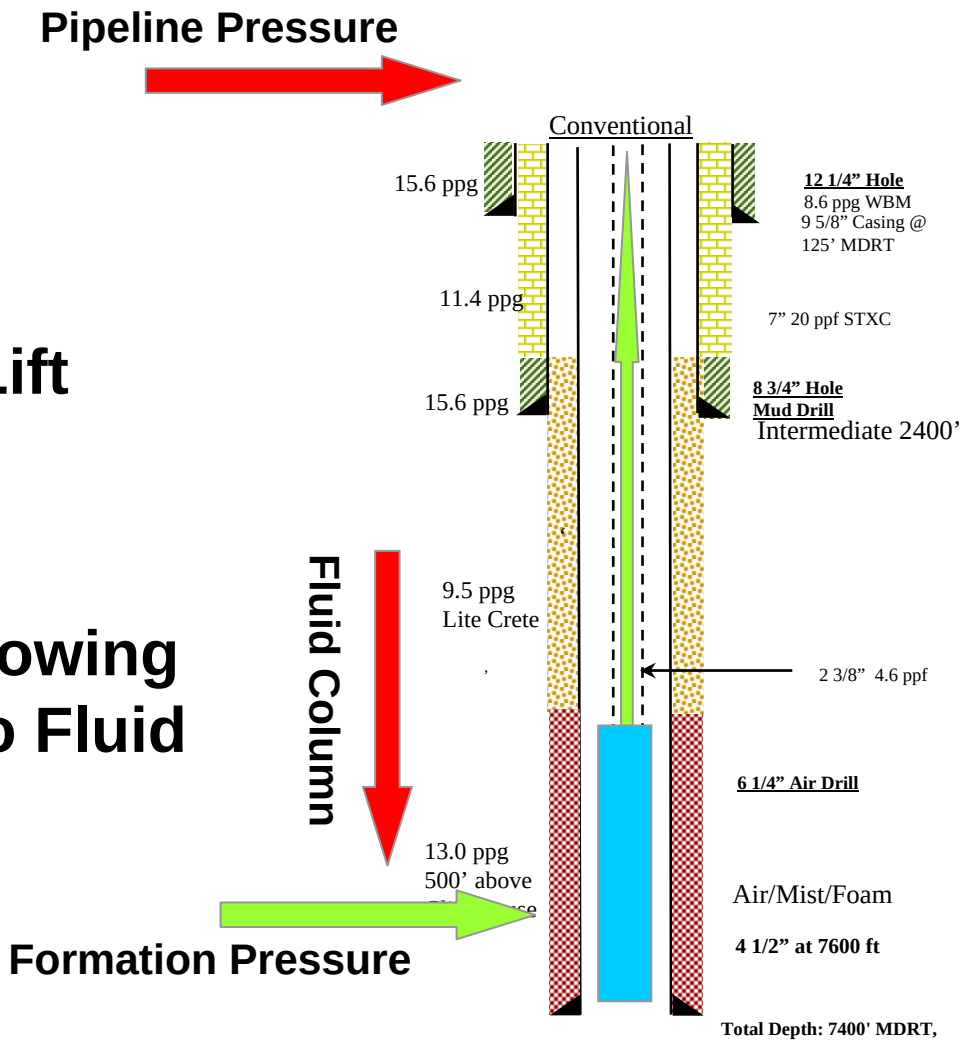
Well Unloading ??

Well Flow:

- Depends on Delta P
- Flow Rate is a f of Delta P
- Rate Determines Velocity
- Velocity Determines Fluid Lift

Formations:

- Deplete over Time
- Build P While Well is Not Flowing
- Shut-in Time is Important to Fluid Unloading

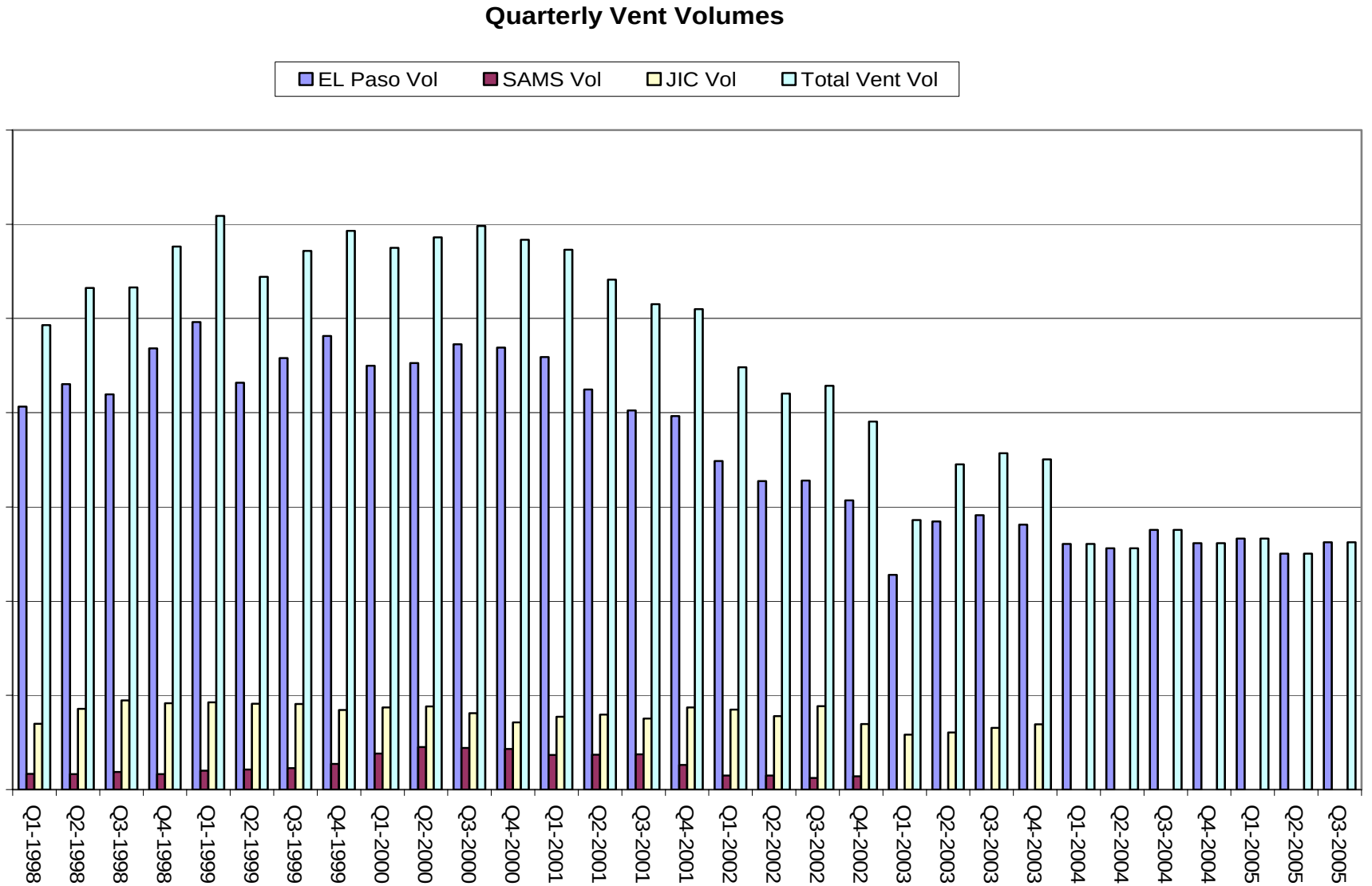


Low Energy Reservoir

“Smart” Automation

- **Both Plunger Equipped and No Plunger**
- **On-site PLC Based**
- **Custom Control Code – Based on “Turner” Lift**
- **RTU Transmission to Host**
- **~2300 Wells Under Control – Beginning in 2001**
- **Venting More than Halved – Production UP**

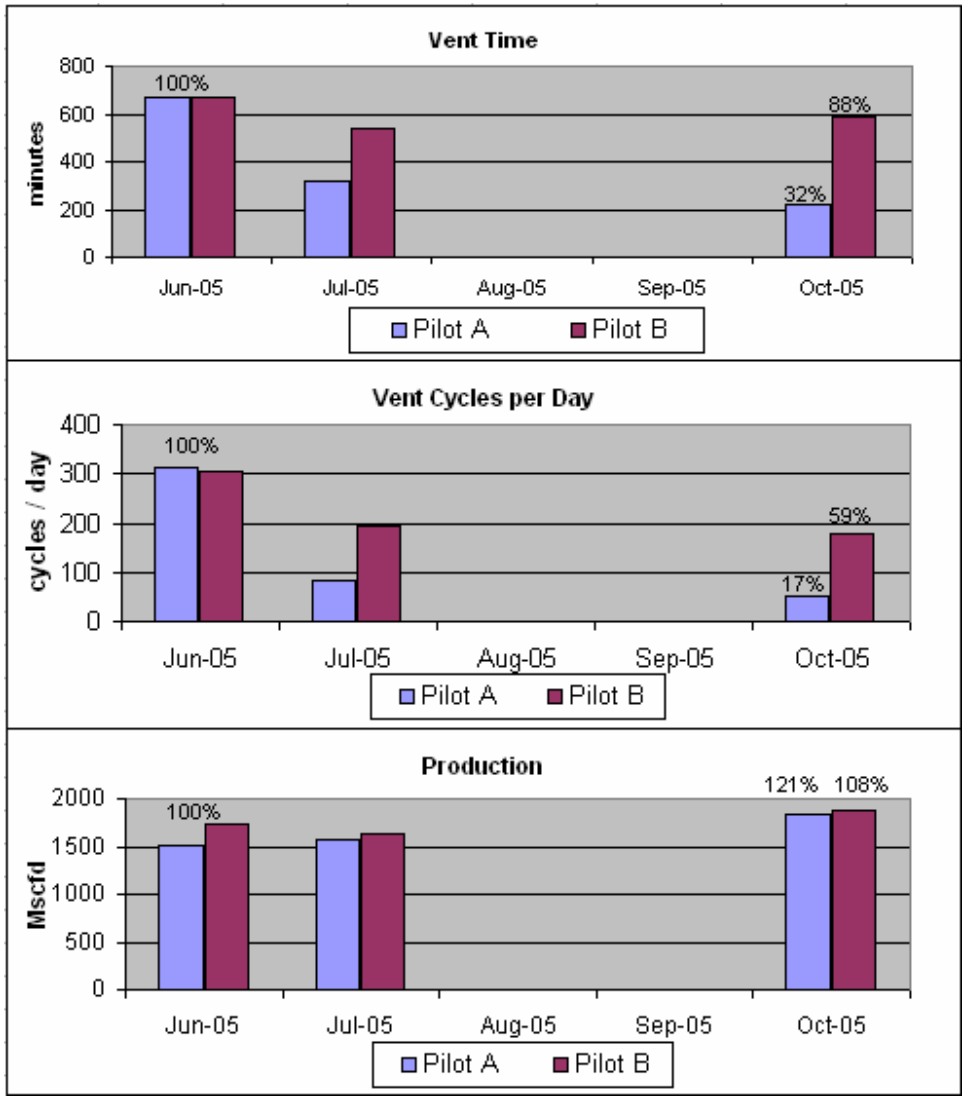
Performance



Next Steps

"New" Code

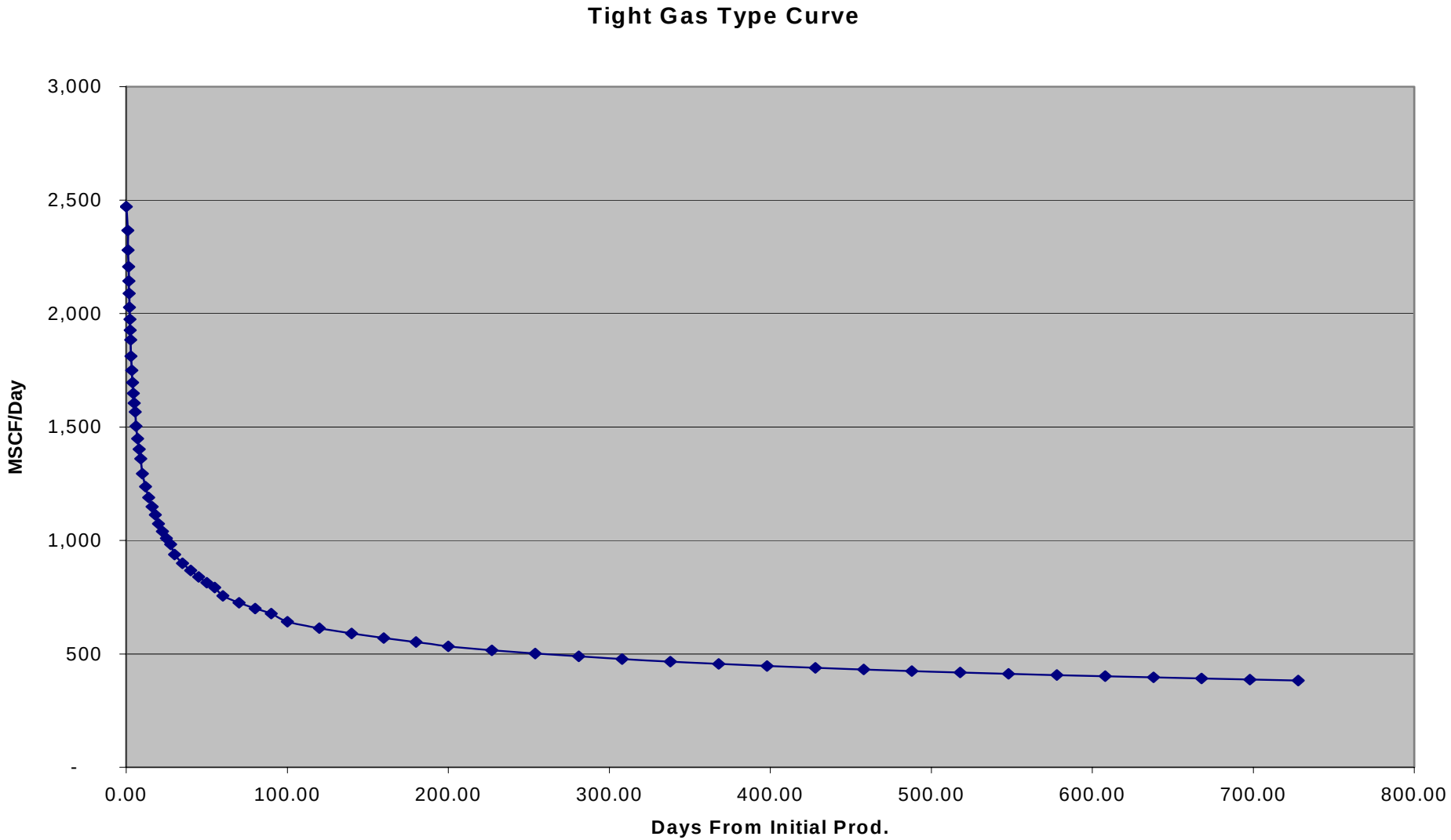
- **Optimize Performance**
  - **Improve Production**
  - **Reduce Venting**
- **Automate Further**
  - **"Better Learning"**
  - **Less Intervention**
- **40 Well Pilot**
  - **20 Control**
  - **20 Test**
- **More to Come**



Tight Gas Reservoir

- **Most Wells Not Plunger Equipped**
- **Condensate and Water Production = Fluid Loading**
- **Venting to Atmosphere – Historical Approach**
- **Automated Shut-in Cycles – New Approach**
- **PLC; RTU; Host; and Automated Flow Valve**
- **40 Well Pilot ~ 12 Months**
- **~$5 K/Well for Automated Valve + RTU**

Tight Gas Production



Results to Date

- **Venting Virtually Eliminated**
- **Production Up ~ 17 MCF/Well/Day**
- **Overall Better Well Control**
- **Reduced Operator Trips**
- **~200 Well Expansion Planned for 06**
- **~Production Enhancement of ~1167 MMSCF/Yr Expected**
- **Vent Reduction of ? Expected**