

Public Briefing

October 23, 2012

Pierre Part, LA

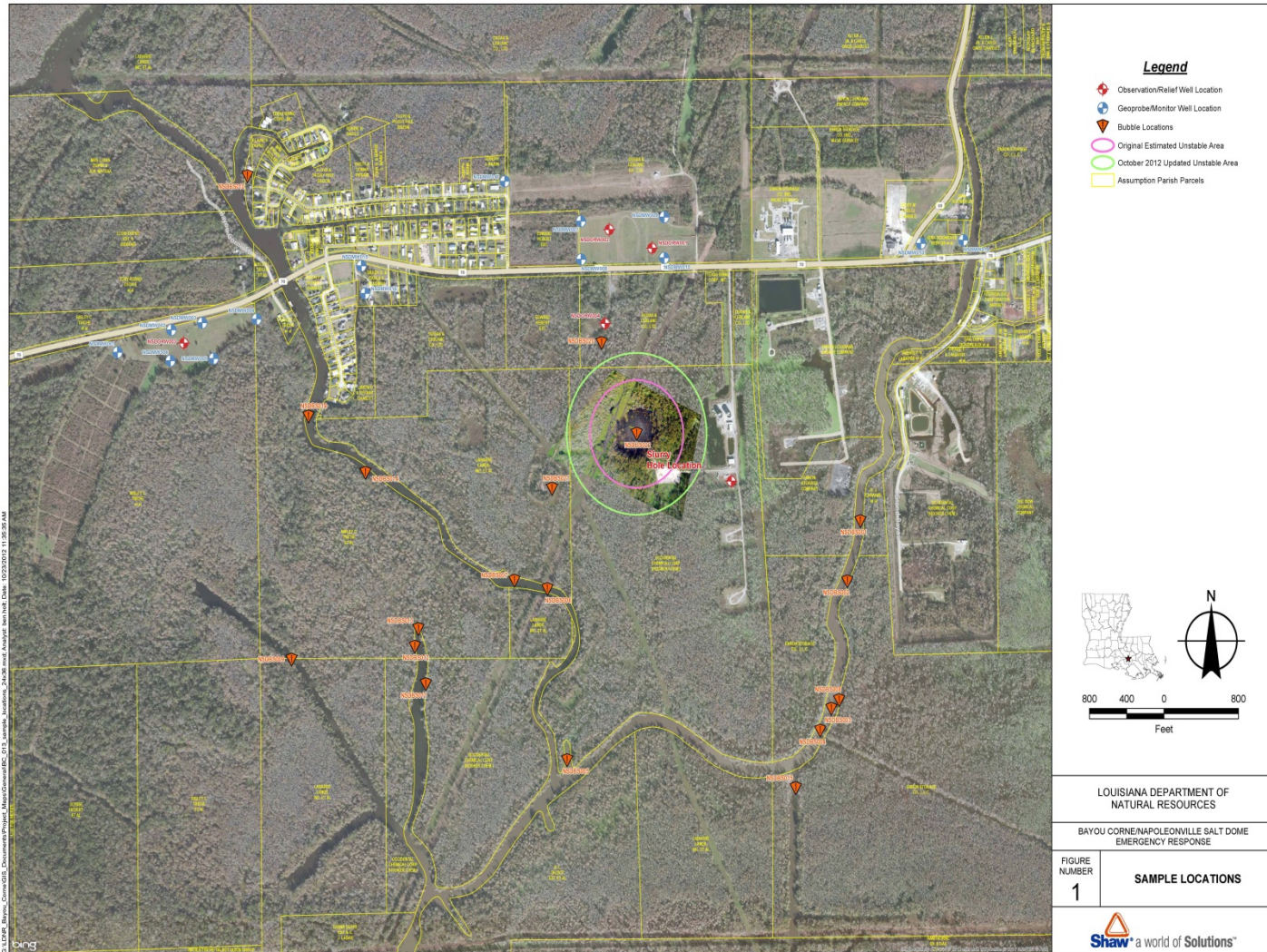
Agenda

- Progress
- Status of observation/relief wells
- Current status of cavern and sinkhole
- Gas migration and pressure monitoring
- Stability monitoring
- Conceptual understanding of current situation
- Path forward

Progress in Past 2 Weeks

- Routine monitoring of water wells and bubbles
- 18 Geoprobe wells installed & sampled
- Monitored pressures in Geoprobe wells and ORW wells
- Confirmed perforations on ORW-01, -02, & -03 are clogged
- Site preparation for ORW-04
- Major progress on data analysis and situational understanding

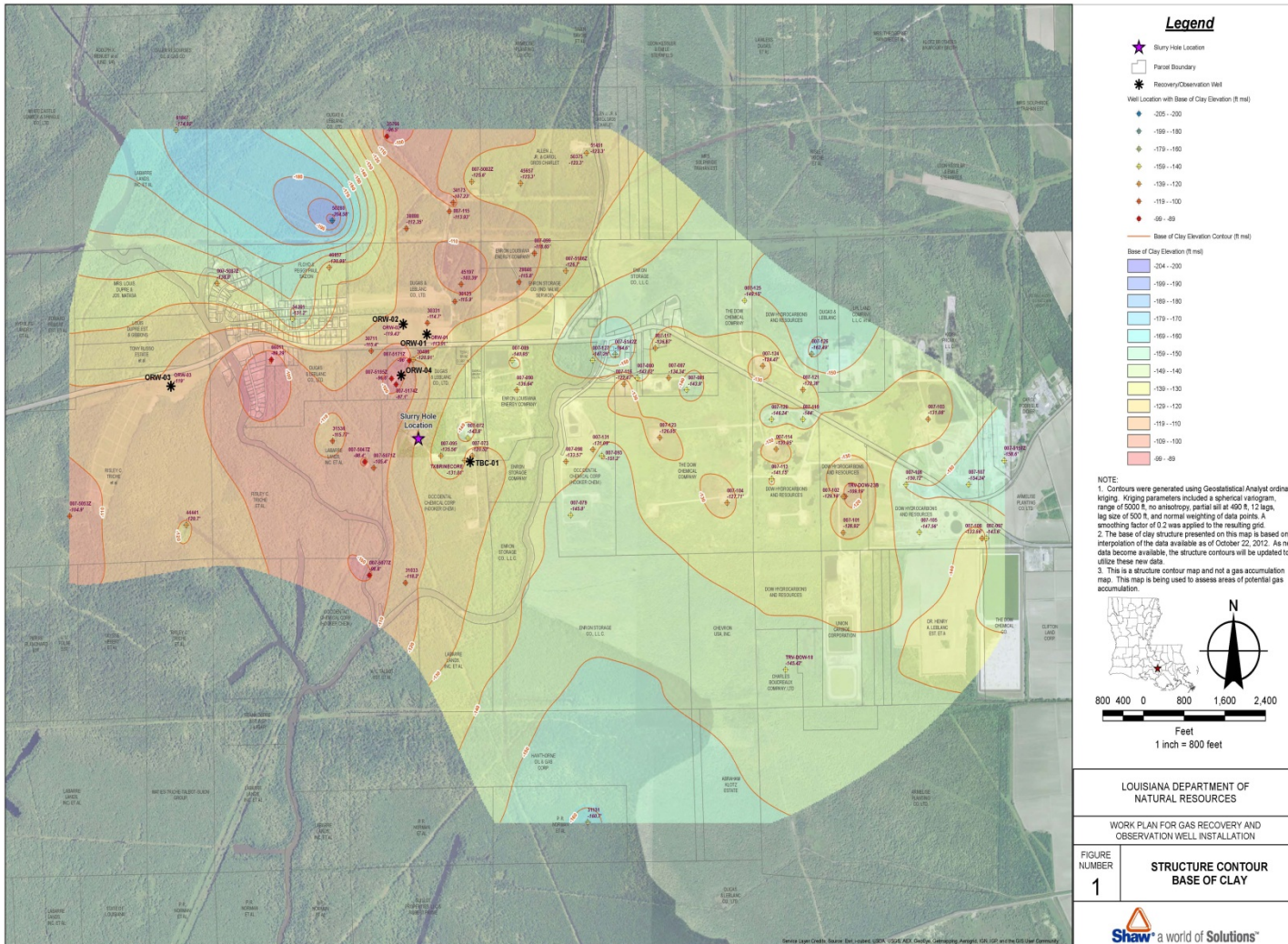
Sample Locations



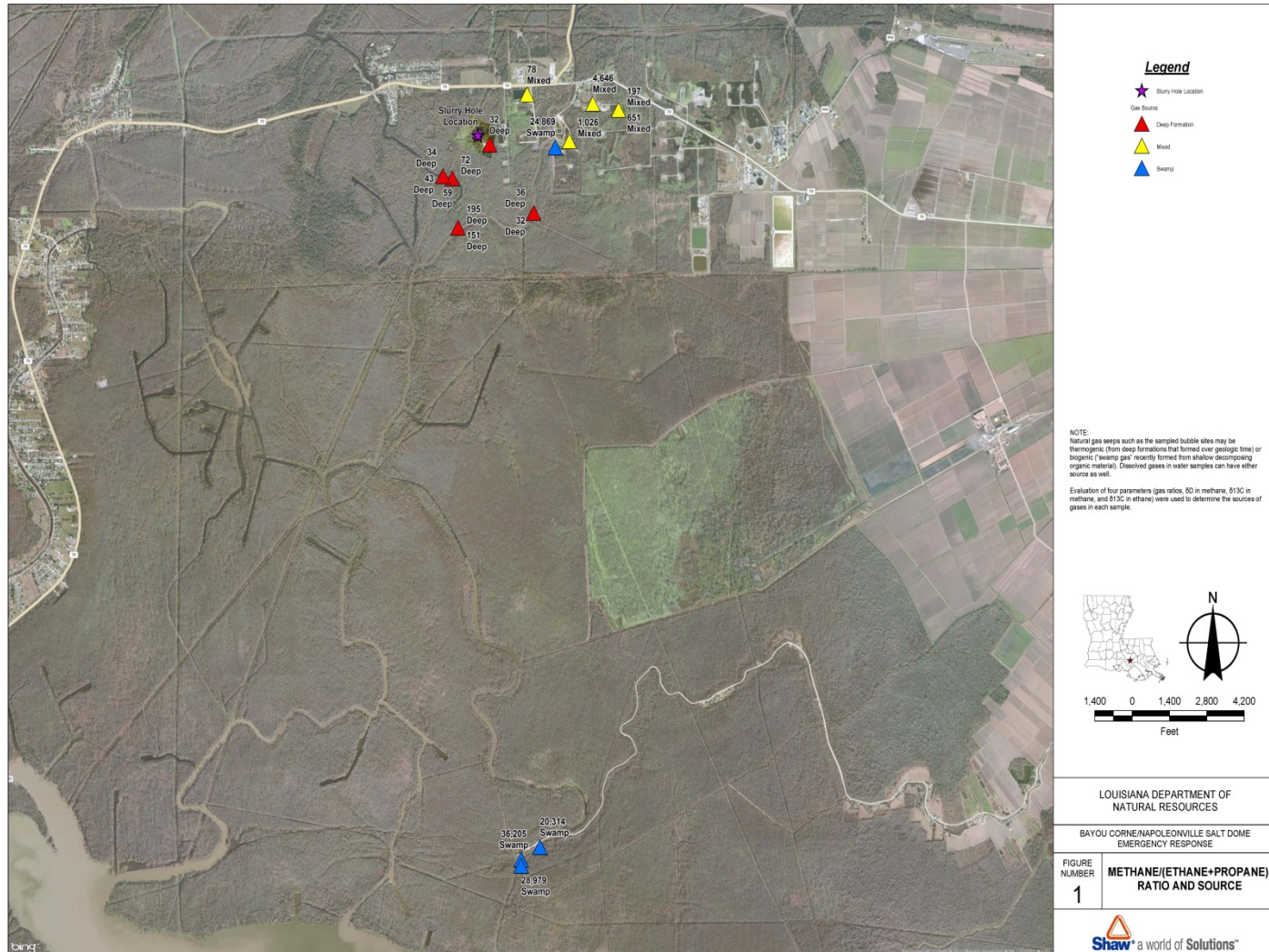
Gas Migration and Pressure Monitoring

- Geoprobe and aquifer pressure monitoring wells being installed in community to assess gas migration from aquifer into shallow clay unit
- Subsidence monitoring at Geoprobe locations
- Weekly monitoring of bubble sites with video
- Mapping all bubble locations
- Assessing utility of PDK logging in large water wells

Base of Clay Map

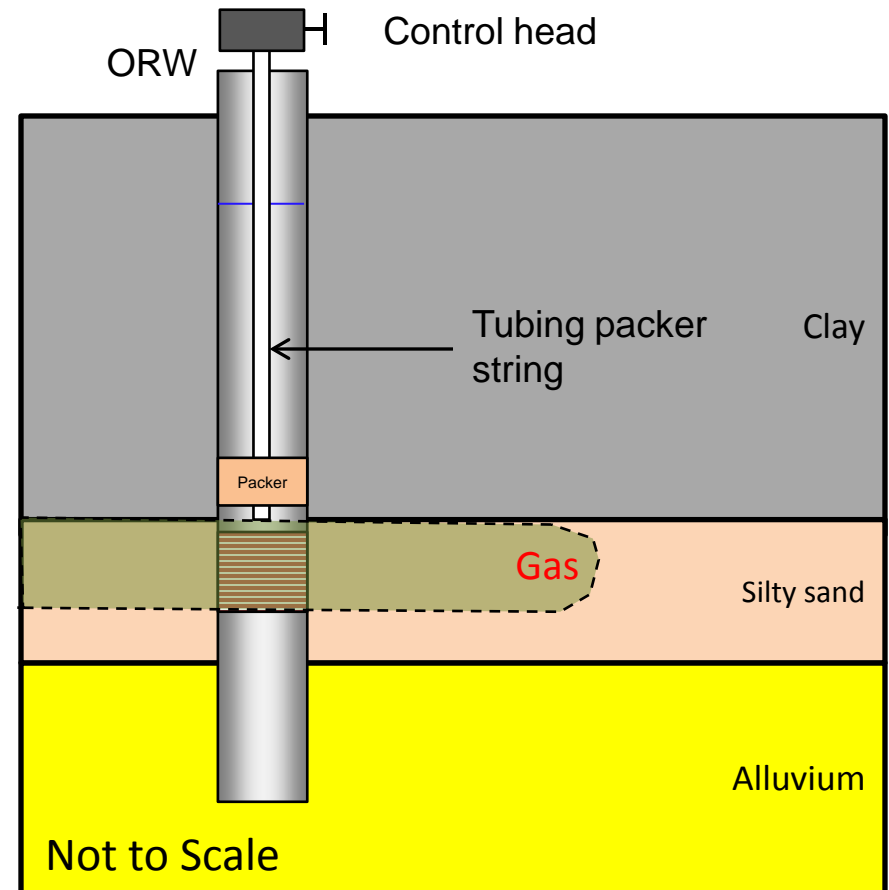


Gas Isotope Results



Packer Swab ORW Development

- Drill/wash out material in casing
- Lower packer assembly with control head
- Swab perfs to open them up
- Gas flow at all times will be controlled at wellhead

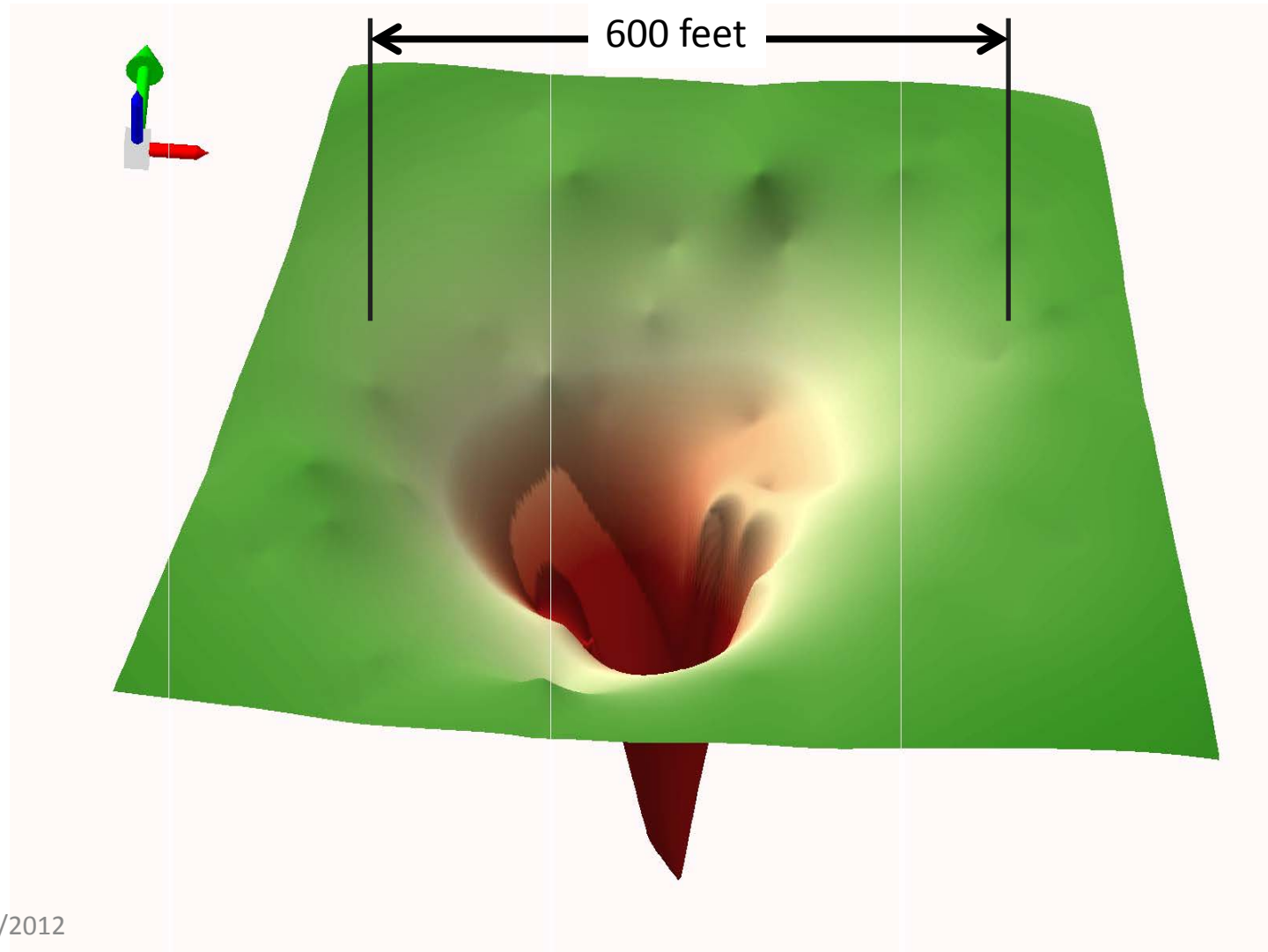


Baski Well Development Packer



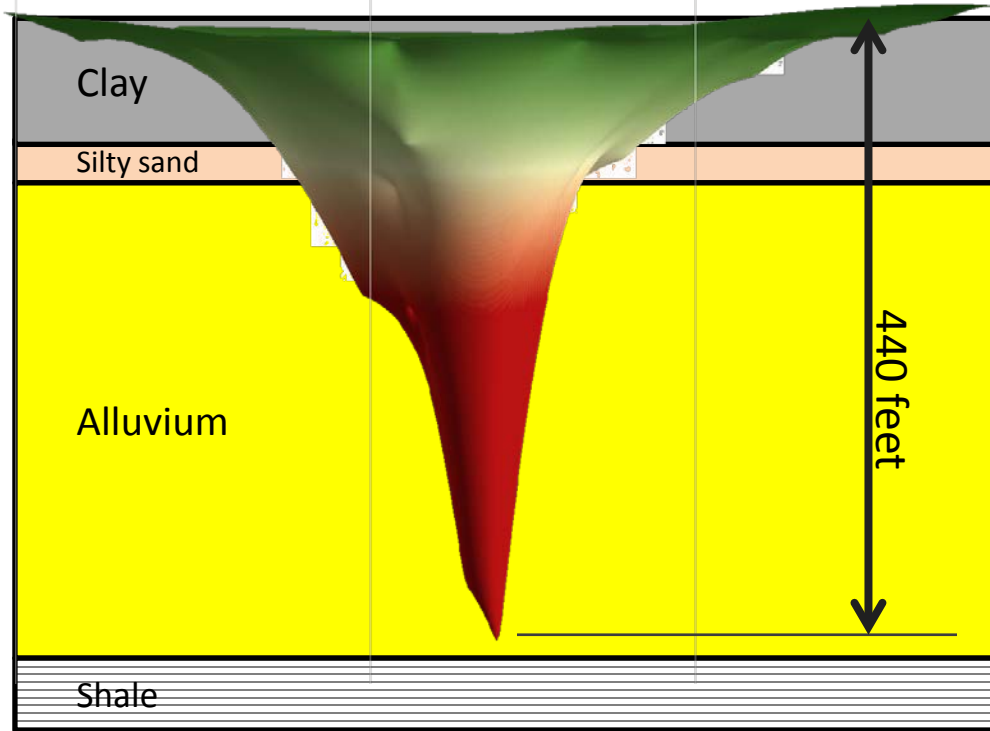
Sinkhole from Above

Looking North



Sinkhole Section and Data

Looking North



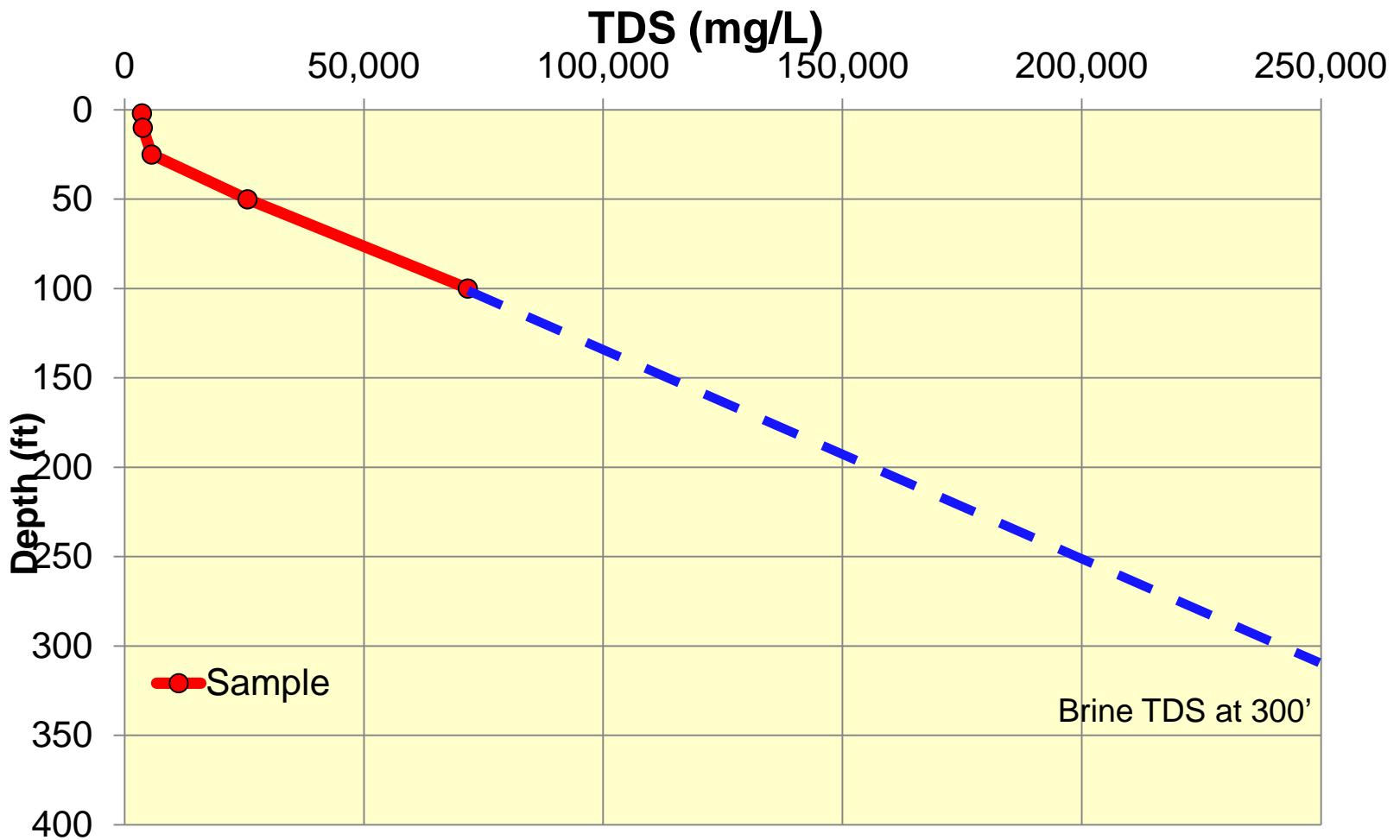
Cross-Section

- Oct. 4, 2012 Data
- Expanding to the west
- Total dissolved solids (TDS) at surface approximately 4,000 mg/L
- TDS at 100 feet 72,000 mg/L
- Increase in TDS related to brine release during cavern collapse

Data collected by Miller Engineers & Associates, Inc., Franklin, LA

10/25/2012

Sinkhole Total Dissolved Solids in Water



Basic Data

- Current volume of sinkhole—550,000 yd³ (2.6 million bbls)
- Volume of fill in cavern—3.3 million yd³ (16 million bbls, based on 2007 sonar volumes)
- Volume of brine in cavern—0.7 million yd³ (3.3 million bbls)
- Un-accounted for volume of voids (Fill minus sinkhole volumes)—~2.8 million yd³ (13 million bbls), large uncertainty

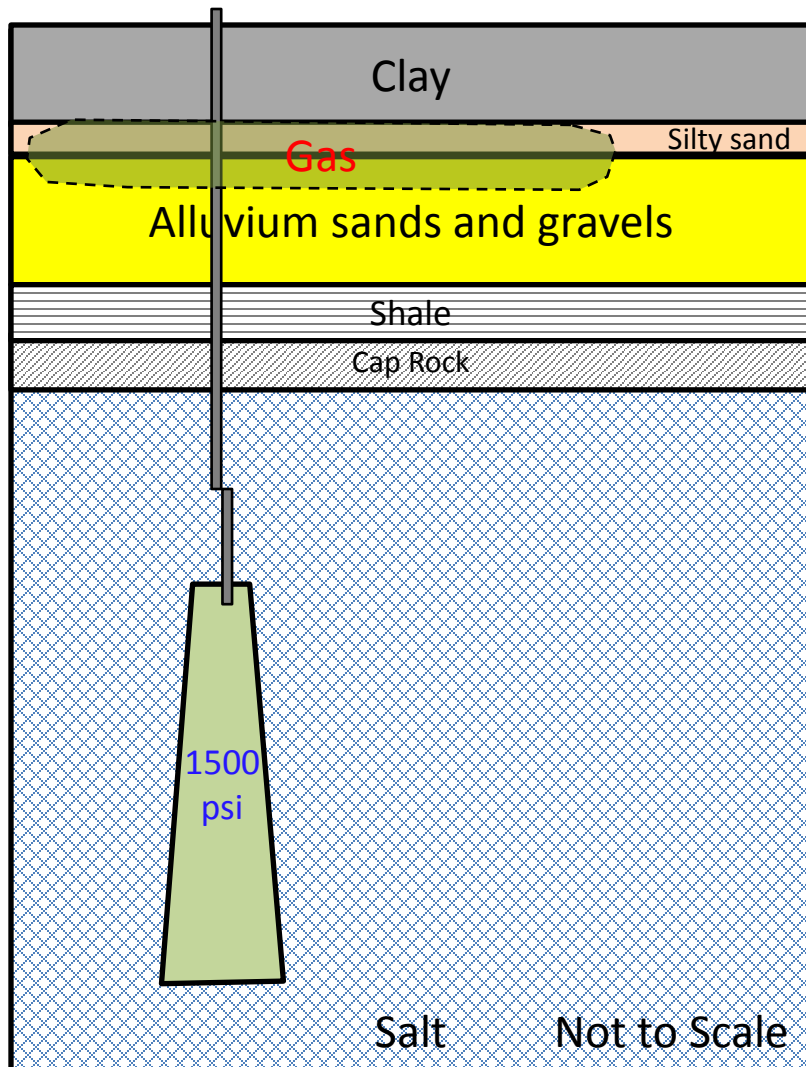
Basic Data

- Area of sinkhole—5.5 acres as of first October
- Gradual subsidence noted outside of sinkhole to the west
- Bubbles observed in swamp as well as where they are observed in bayous
- New bubbles in sinkhole may indicate better pressure release from below

Stability Monitoring

- Maintain Oxy #3 cavern pressure
- Continuous recording of cavern tubing and casing pressure tied into alert system
- Continuous sinkhole water level monitoring
- Seismic monitoring system with real-time data analysis tied into alert system
- Obtaining elevation data in immediate vicinity of sinkhole to determine subsidence

Why is 2012 Situation Different than 2003 Gas Release?



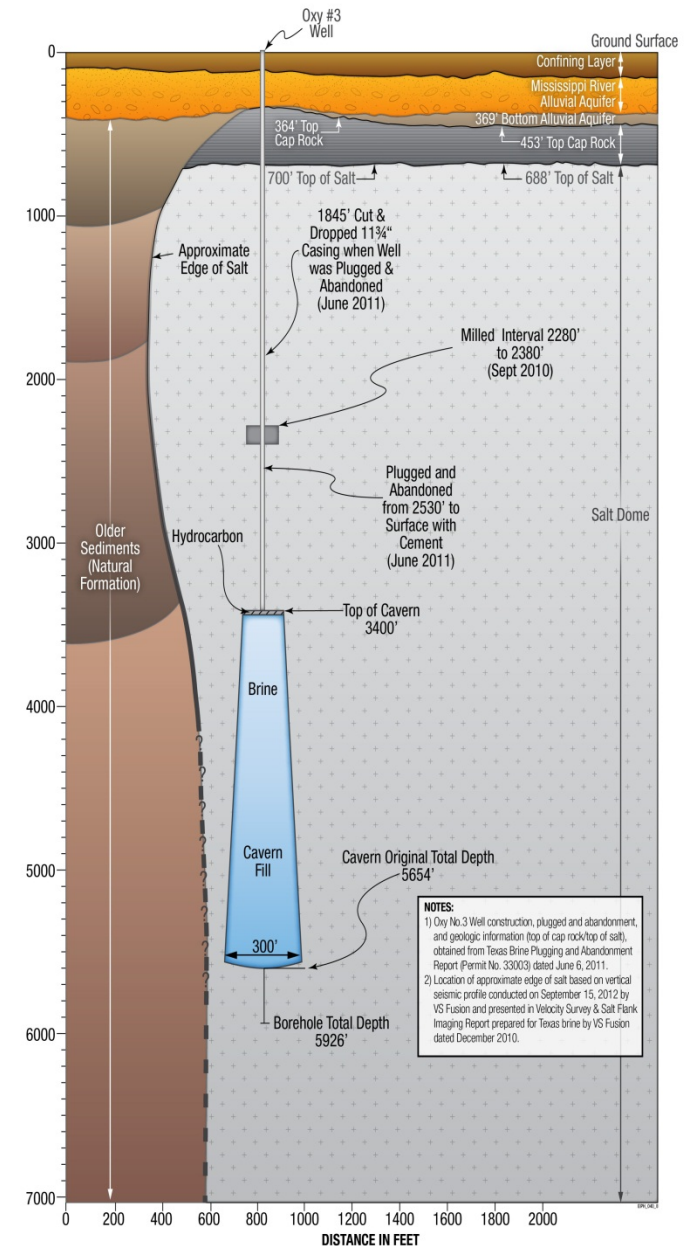
2003

- Cavern pressure ~1,500 psi
- Conduit to surface was open pipe/borehole
- Pressure from cavern flowed up open casing to the alluvial sands and gravels with minimal pressure loss
- Pressures in aquifer 75 psi—clay frac pressure
- Cavern intact—Finite source of gas in cavern
- After 2-3 months gas release was largely mitigated and controlled

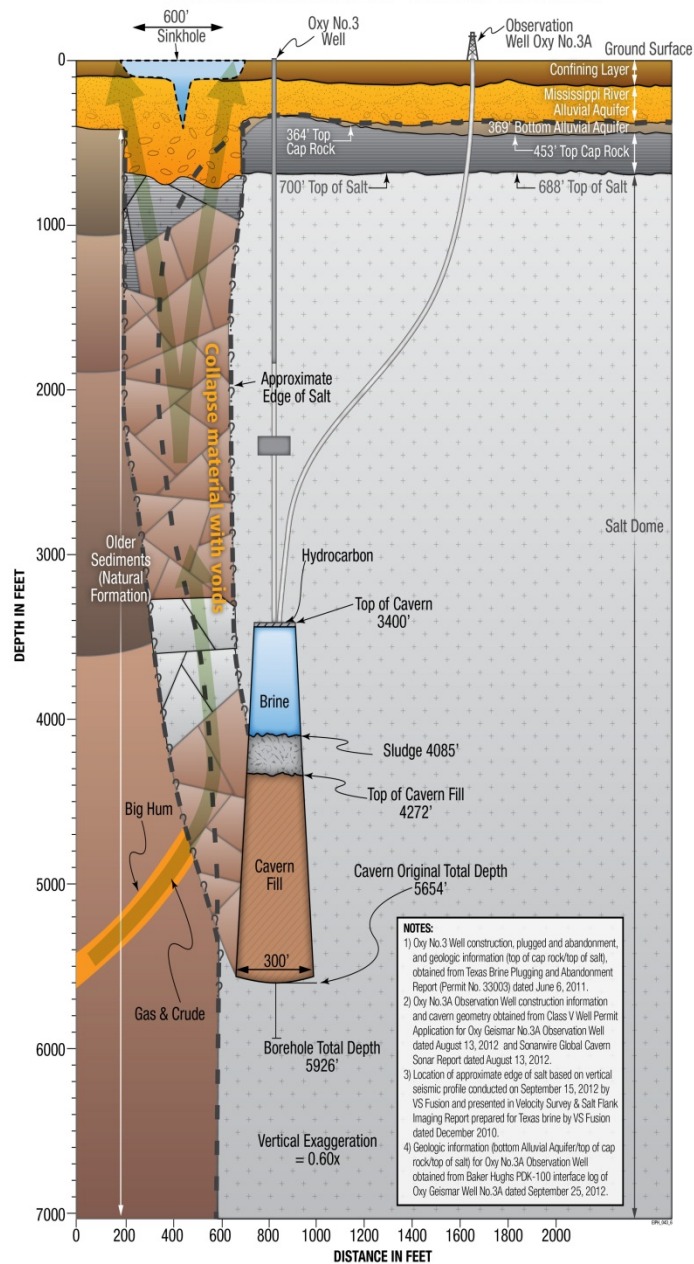
2012 Situation

- Unique in history of subsidence, cavern collapse, and hydrocarbon release
- Careful with situation because of unknowns
- Urgent but measured approach to all activities

CONCEPTUAL MODEL PRIOR TO 08/02/2012



CONCEPTUAL MODEL OF CURRENT SITUATION



Path Forward

- Continue to assess stability and gas migration to provide information to the parish about returning people to their homes
- Dr. William Pettitt, Itasca, micro-seismologist on-board to evaluate stability of collapse zone
- Get OWR-4 observation/relief wells online
- Redevelop OWR-01 thru -03 wells
- Seismic investigation of collapse zone