ADEQ and The Buffalo River Alliance

July 8, 2016
OVERVIEW

• Introductions & Opening Comments
• Purpose/Goal
• Resistivity Overview
• Plan Overview
  • Location
  • Proposed Measurements
  • Plan Components
  • Contractor
  • Transparency
Fact about Resistivity and Conductivity

- Lower Resistivity = Higher Conductivity
- Wet clay has lower resistivity, thus higher conductivity than dry clay
- Pore water has higher conductivity than solids and air

Recommendation from OSU Professor Halihan:
- Drilling to investigate potential fracture
- Location of interest is W/SW of the ponds
- **Below 50 Ohm-meters** represent fine soils, microbial mass, and/or electrically conductive fluids and referred to as very electrically conductive.

### Resistivity Scale

- **Highly Resistive**
  - Unweathered bedrock with fresh groundwater
  - Resistivity (Ohm-m): 10,000

- **Very Resistive**
  - Weathered bedrock with fresh groundwater
  - Resistivity (Ohm-m): 1,000

- **Resistive**
  - Significantly weathered bedrock with fresh groundwater
  - Resistivity (Ohm-m): 500

- **Electrically Conductive**
  - Soil and/or possible conductive fluids
  - Resistivity (Ohm-m): 150

- **Very Electrically Conductive**
  - Soil and/or possible conductive fluids and/or potential biofilms
  - Resistivity (Ohm-m): 50

Figure 9 - Resistivity scale for Manu Ituka BRI dataset. Cool colors are used to indicate more electrically conductive subsurface locations and warm colors are used to indicate more resistive locations.
Holding Ponds  | Transect MTJ108  | This transect has a 3.0 meter spacing between the electrodes (1.5 meter resolution).  | Figure A108
PLAN OVERVIEW

• Location
  • ~75 m NE from SW corner of the west transect
• Proposed measurements of hollow stem, split-spoon core and groundwater samples
  • Nitrates-N
  • Fecal Coliform Bacteria or E-Coli
  • pH
  • Conductivity
  • Mineral Ions
  • Ammonia-N
  • Total Organic Carbon
PLAN COMPONENTS

• Scope of Work
• Drilling Work Plan
• Quality Assurance Project Plan
• Sampling and Analysis Plan
• Health and Safety Plan
• Conduct the Exploration
• Findings Report
POTENTIAL CHALLENGES

• Timing of contractor vs. lagoon management
• Chances of hitting a vertical fracture at >30m with surface approximation of borehole location
• Encounter competent rock above target depth
• Inclement weather
REPORT

• Executive Summary
• Methods and Materials
• Results
• Discussion
• Conclusions
• Appendices
  ▪ Analytical data
  ▪ Subsurface profile from retrieved core
• ADEQ will contract with an outside contractor from the list that Office of Land Resources will be provided to do the study

• Anticipated schedule
  • 30 days to notice to proceed
  • 30 days to mobilize field work
TRANSPARENCY

- Scoping discussions
- ADEQ will post documents on a presentation and material website. Review time due to constraints of project timeline
- Field study observation and oversight
- Split samples