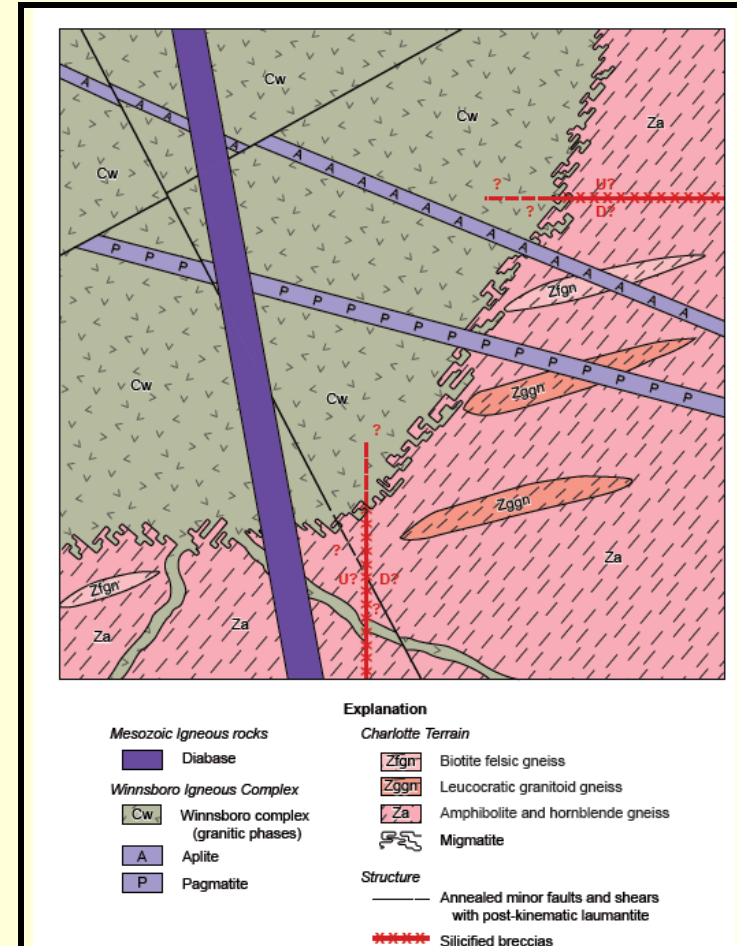


## R. J. Cumbest

[illegible]

# Anticipated Geology Schematic

- Relative ages based on Unit 1 investigations and more recent literature
- Silicified breccias (Wateree Creek Fault) older than Winnsboro pluton (Secor, Personal communication, 2010)
- Basic stratigraphy represented by Charlotte terrane (Late Proterozoic) intruded by Winnsboro igneous complex with late pegmatite and aplite dikes (309 Ma).



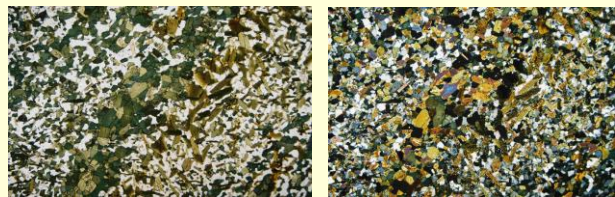
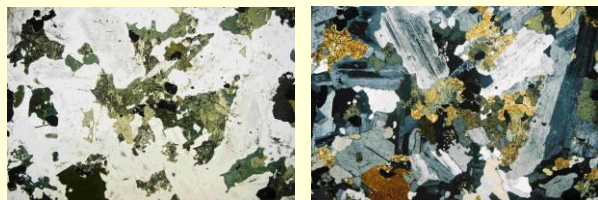
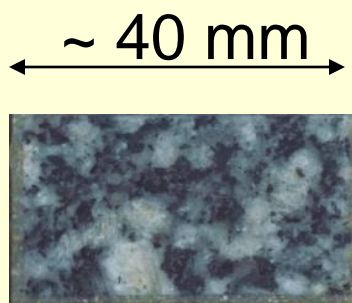
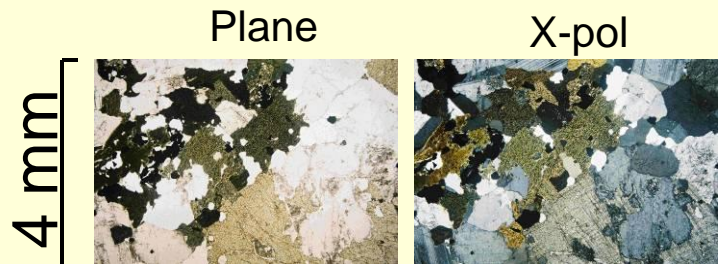
## Thin Section

## Section chip

## Winnsboro Igneous Complex

Late Phase: **Quartz Monzonite**

Early Phase: **Diorite**



**Charlotte Terrane:** Primarily  
Fine grained amphibolite (Za) with  
subconcordant to discordant bodies  
of felsic gneiss (Zggn and Zfgn)



# Intrusive Relationships

Winnsboro **Late Phase**  
(Quartz Monzonite)



Winnsboro **Early Phase**  
(Diorite)

Charlotte Terrane

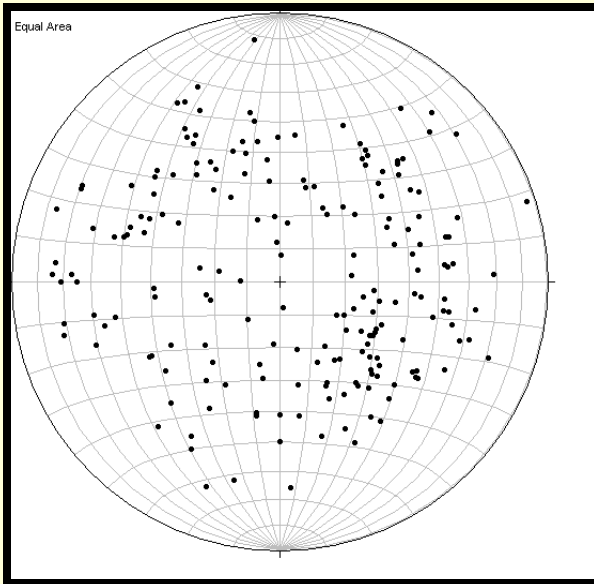
# Weathering Profile at top of Excavation

NW Wall – relatively featureless residual soil

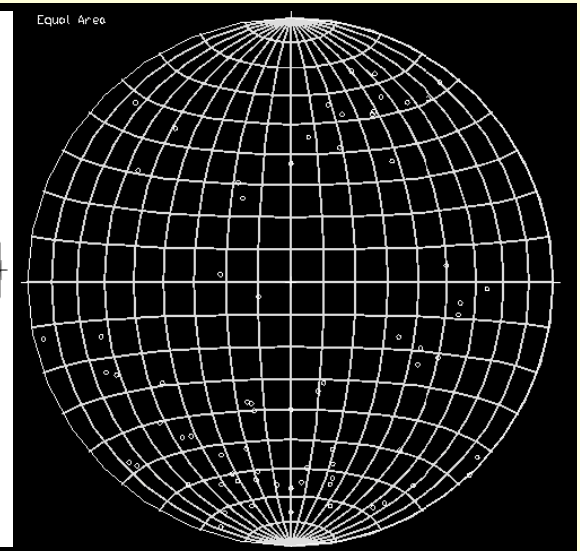
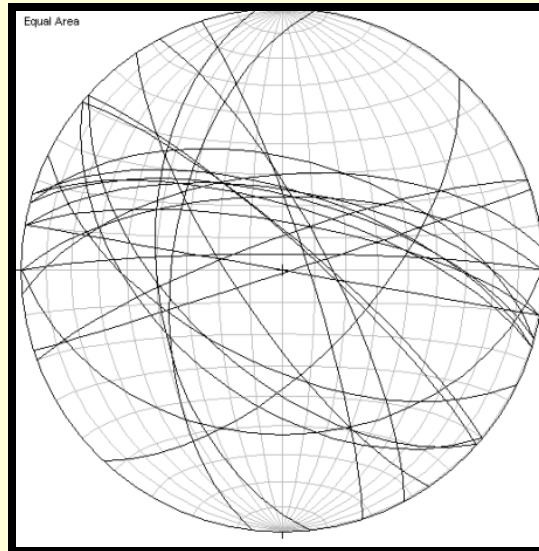


Away from NW top of excavation is deeper into the weathering and structures are preserved in the saprolite

## Recon



## Unit 2 Excavation



Wide range in  
orientations

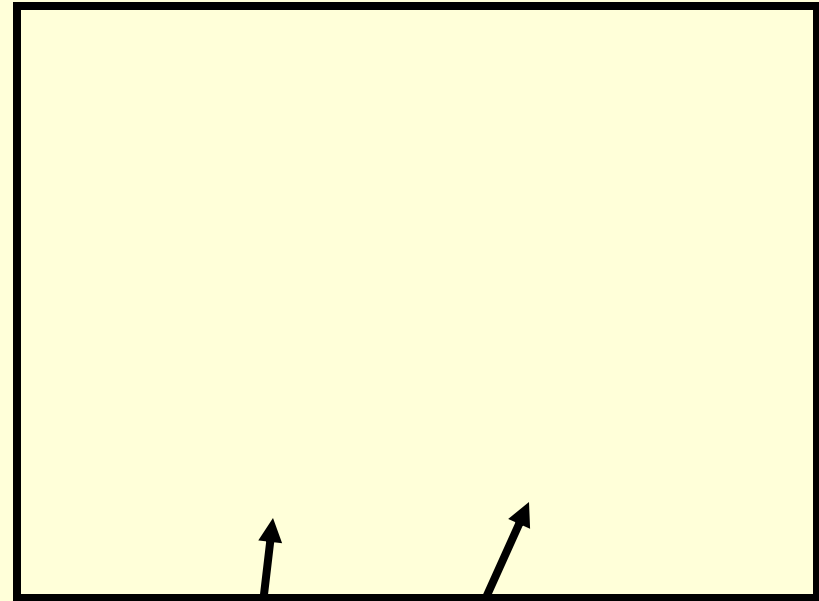
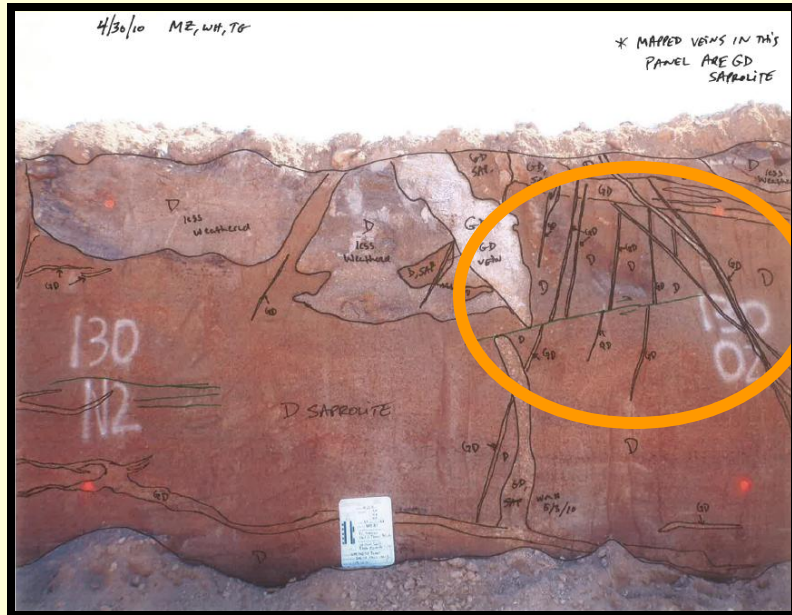
Covered with black amorphous  
material / probably Mn and Fe oxides



## Relative ages with Winnsboro Complex intrusions



# Additional Examples



Pegmatite



# Preliminary Conclusions

- Winnsboro complex intruded in multiple pulses of diorite followed by quartz monzonite with pegmatite and aplite of multiple generations
- Most of the fracturing and small scale faulting produced by and concurrent with the intrusive process
- Youngest structures are recorded in quartz monzonite

# Nuclear Island Exposure



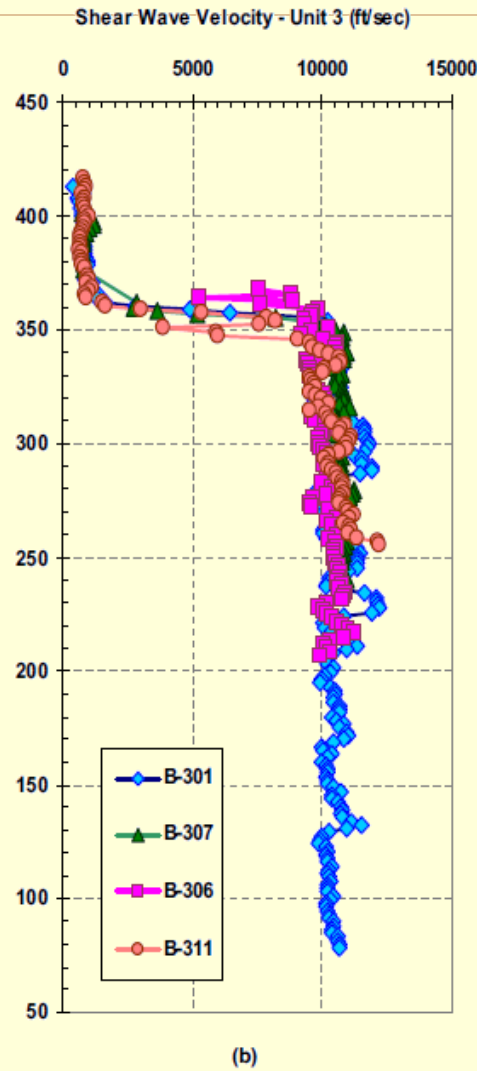
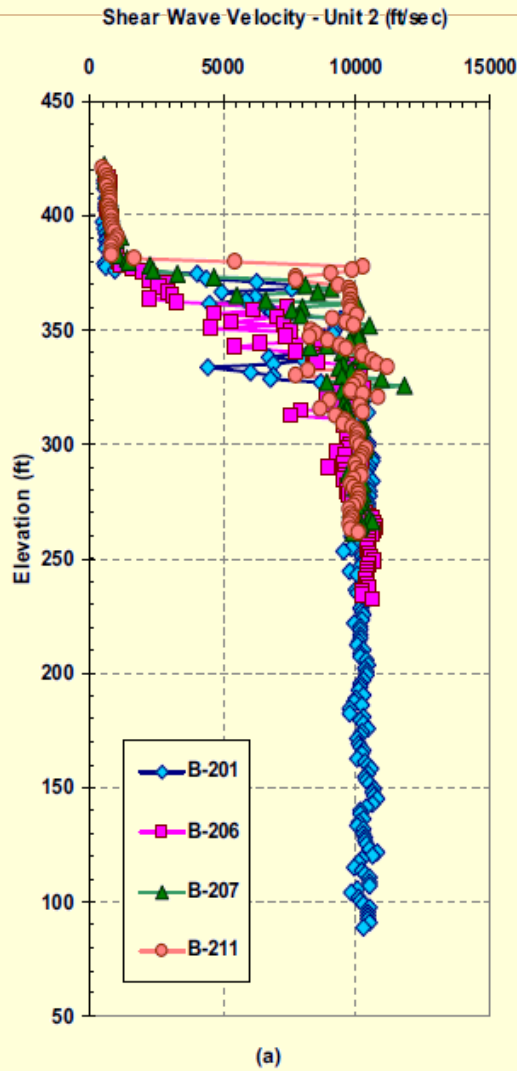
# Structures in Quartz Monzonite



Fracture filled with undeformed epidote and chlorite (indicates relatively high temperature formation)

Late pegmatite

# Other Issues



Lithologic control  
on difference in  
shear wave  
response  
between Units 2  
and 3 ?



- Unit 2 and 3 Excavation Wall and Top of Rock Maps
- ArcScene 3D representation of excavation sequence, retaining wall and geologic surfaces
- Geologic map of surrounding areas based on reconnaissance mapping
- Photo database