# Geomorphology and Archaeology: Case Studies from Western New York

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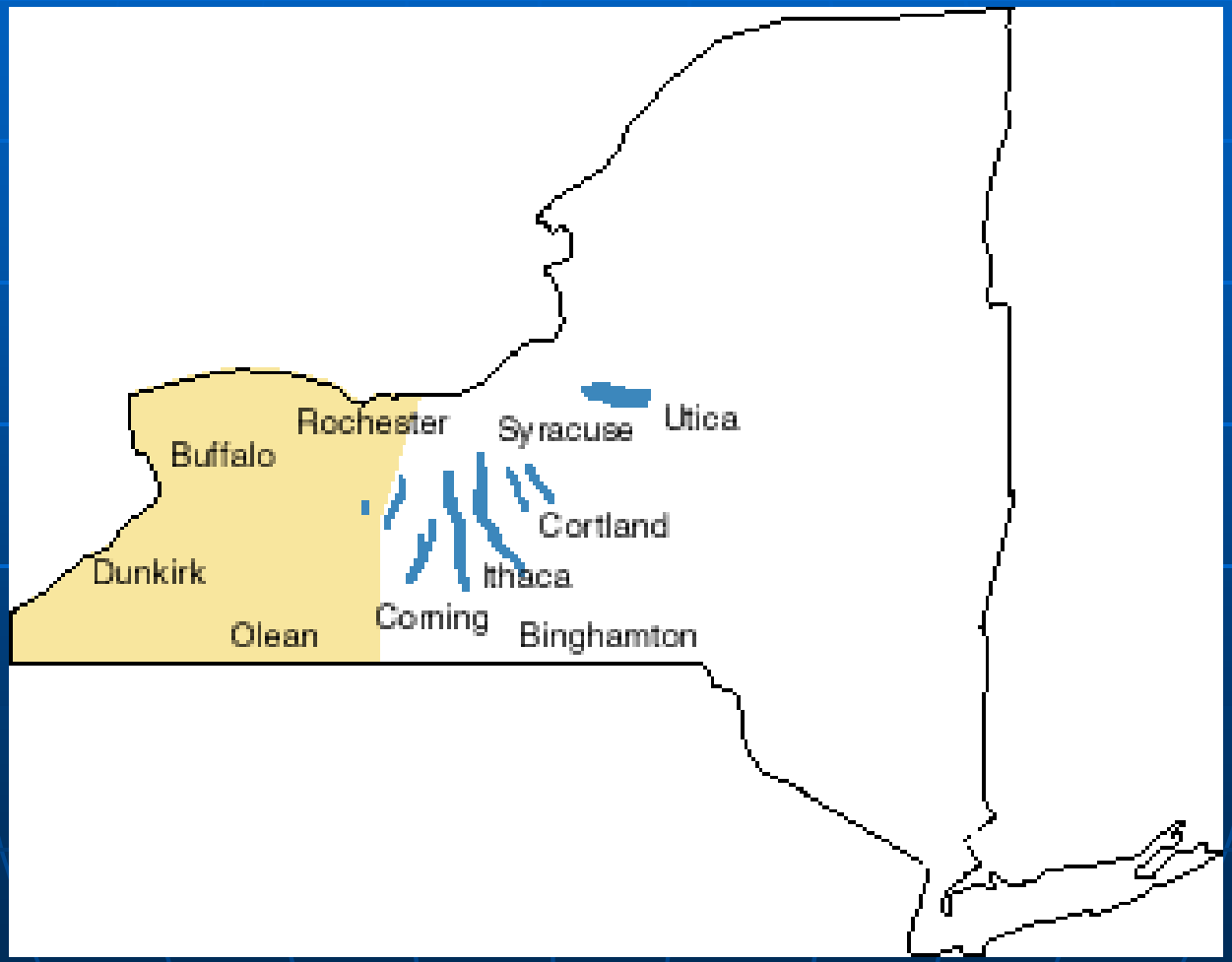
# Geomorphology and Archaeology: Case Studies from Western New York



# Closely Related Considerations:

1) Wetlands Testing
2) Geomorphology
    a) lowland, alluvial
    b) Upland
3) Deep Testing

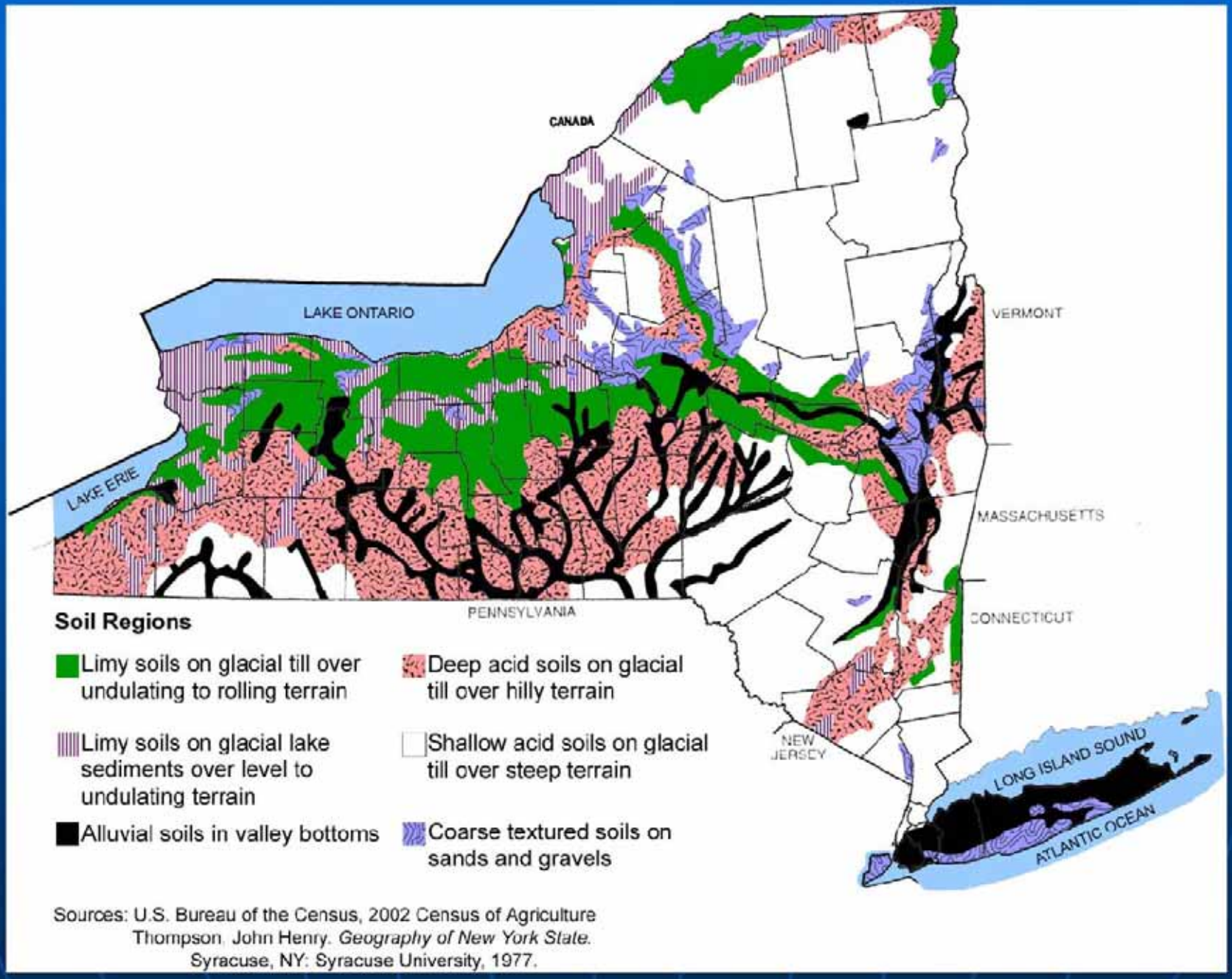
Definitions:

NYAC, SHPO, NYSM, DEC, USDA

# Deep Testing Standards: Adopted in 1996 and revised in 1997 for incorporation into the May 1994 NYAC Standards

# A Definition for Geomorphology: The branch of geology that studies characteristics, origins and development of landforms

A Definition for Wetlands:
Land areas with permanent or seasonal saturation that dominates the nature of
1) soil development
2) plant types
3) animal types
that reside there




# Problems and Potential: Diversity of the Landscape


15 Mile Post
Schichtels
Nursery
D. Scott 1
Obenauer 1-5
Ninemile Road
0
50 KM 50 Miles

For Each Case Study:

1) Location
2) Setting
3) Project type/stage
4) Field Methods
5) Results
6) Relevance/Lessons for…
    a) Wetlands testing
    b) Geomorphology
    c) Deep Testing
    d) Developing ‘Standards’

Case Study 1: Deep Testing

Dorothy Scott 1 Site (UB 3640)

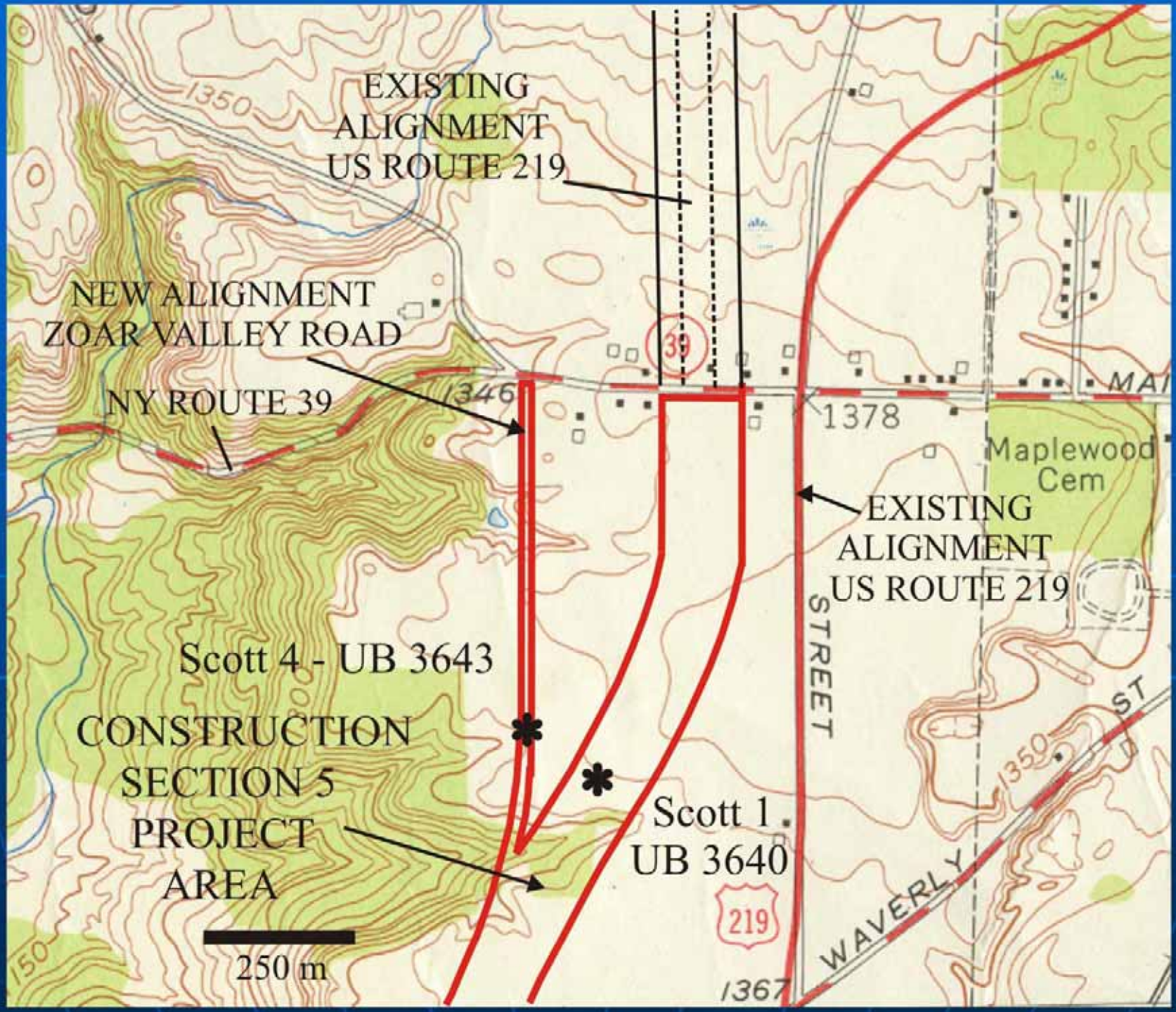
1) Town of Concord, Erie County
2) Upland Setting
3) Phase 3 Data Recovery
4) 63 square meters excavated

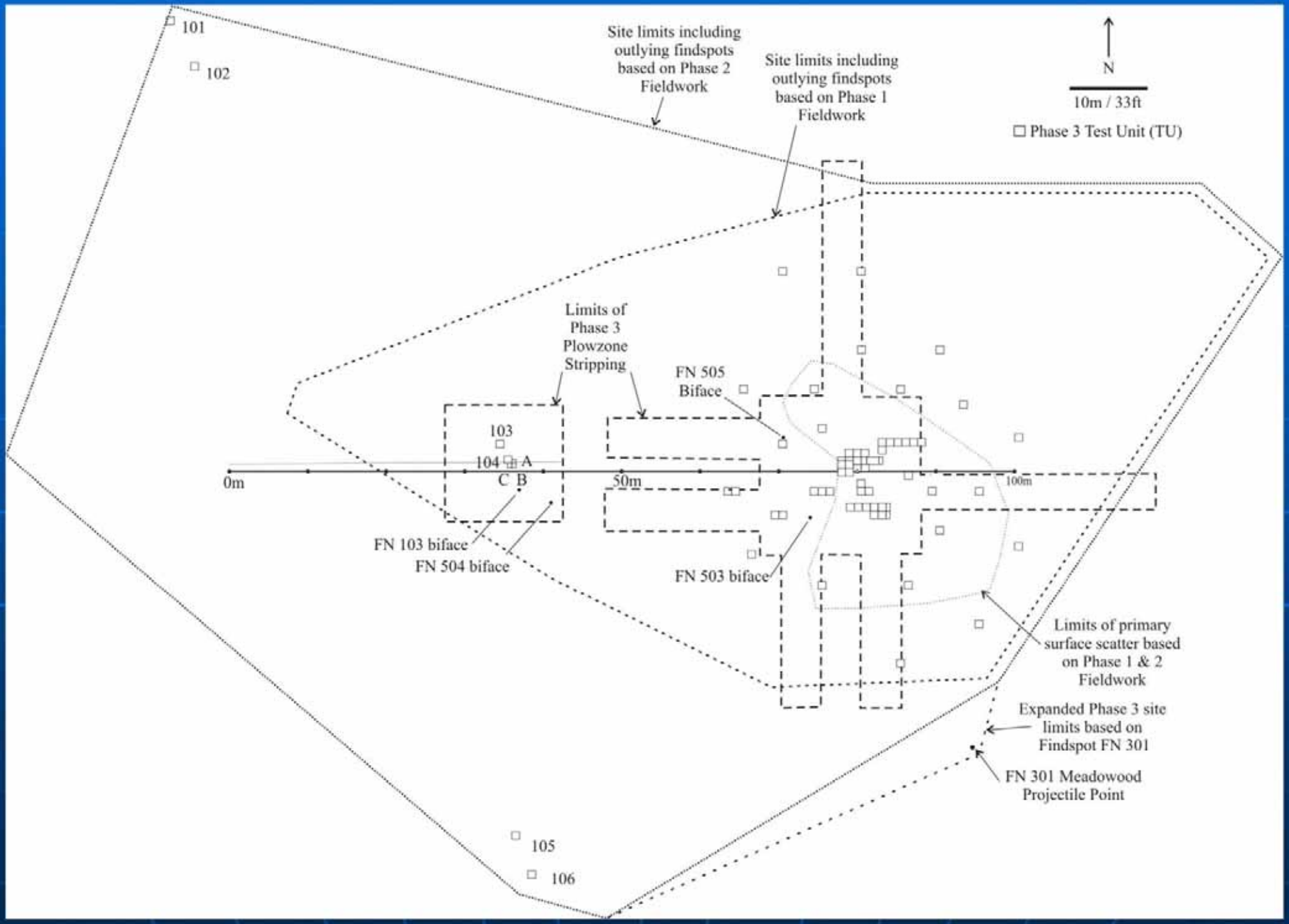
-TU dug 80-120 cm bgs

Questions: Is this deep testing?

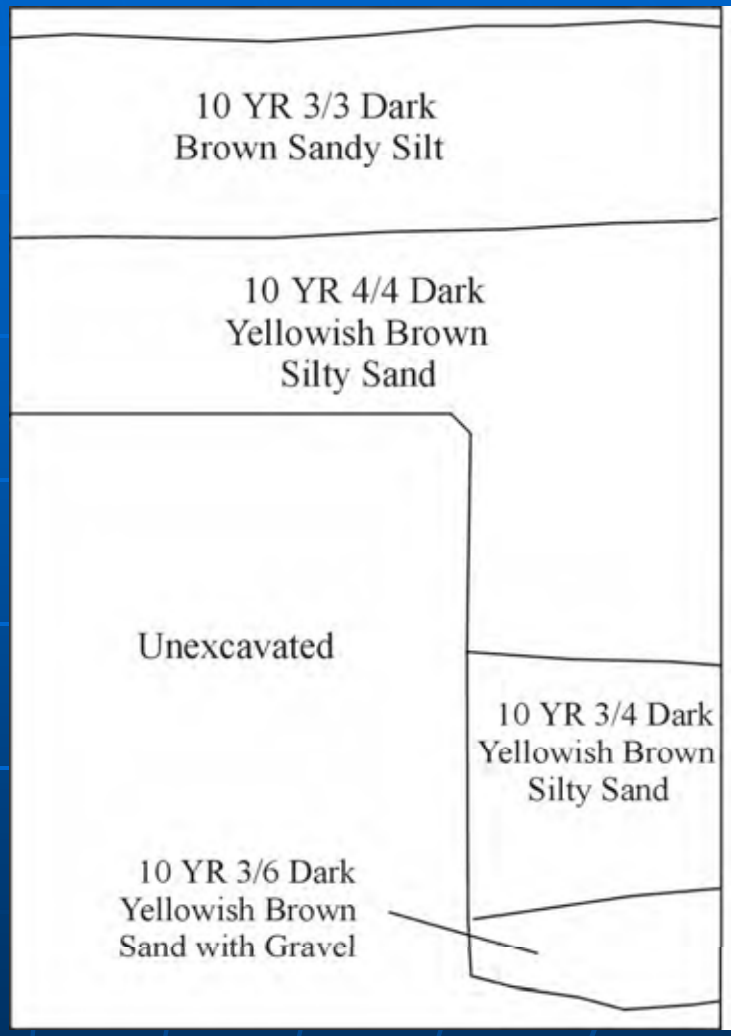
Should there be Geomorph?

In this setting…yes! and yes?


EXISTING
ALIGNMENT
US ROUTE 219
NEW ALIGNMENT
ZOAR VALLEY ROAD
NY ROUTE 39
1350
1346
1378
39
Maplewood
Cem
EXISTING
ALIGNMENT
US ROUTE 219
STREET
Scott 4 - UB 3643
CONSTRUCTION
SECTION 5
PROJECT
AREA
Scott 1
UB 3640
219
1367
WAVERLY
ST
250 m


101
102
Site limits including outlying findspots based on Phase 2 Fieldwork
Site limits including outlying findspots based on Phase 1 Fieldwork
N
10m / 33ft
Phase 3 Test Unit (TU)
Limits of Phase 3 Plowzone Stripping
FN 505 Biface
103
104
A
C
B
0m
50m
100m
FN 103 biface
FN 504 biface
FN 503 biface
Limits of primary surface scatter based on Phase 1 & 2 Fieldwork
Expanded Phase 3 site limits based on Findspot FN 301
FN 301 Meadowood Projectile Point
105
106

Scott 1 site (A02910.000065, NYSM 11338, UB 3640), facing northwest at site's location on a well-drained knoll.  Photo taken during Phase 2 excavations in 2003




Scott 1 site (A02910.000065, NYSM 11338, UB 3640) typical test unit wall profile

Scott 1 site (NYSM 11338, UB 3640) View of Feature 1 taken when first identified during the Phase 2 (left) and again during Phase 3 (right)

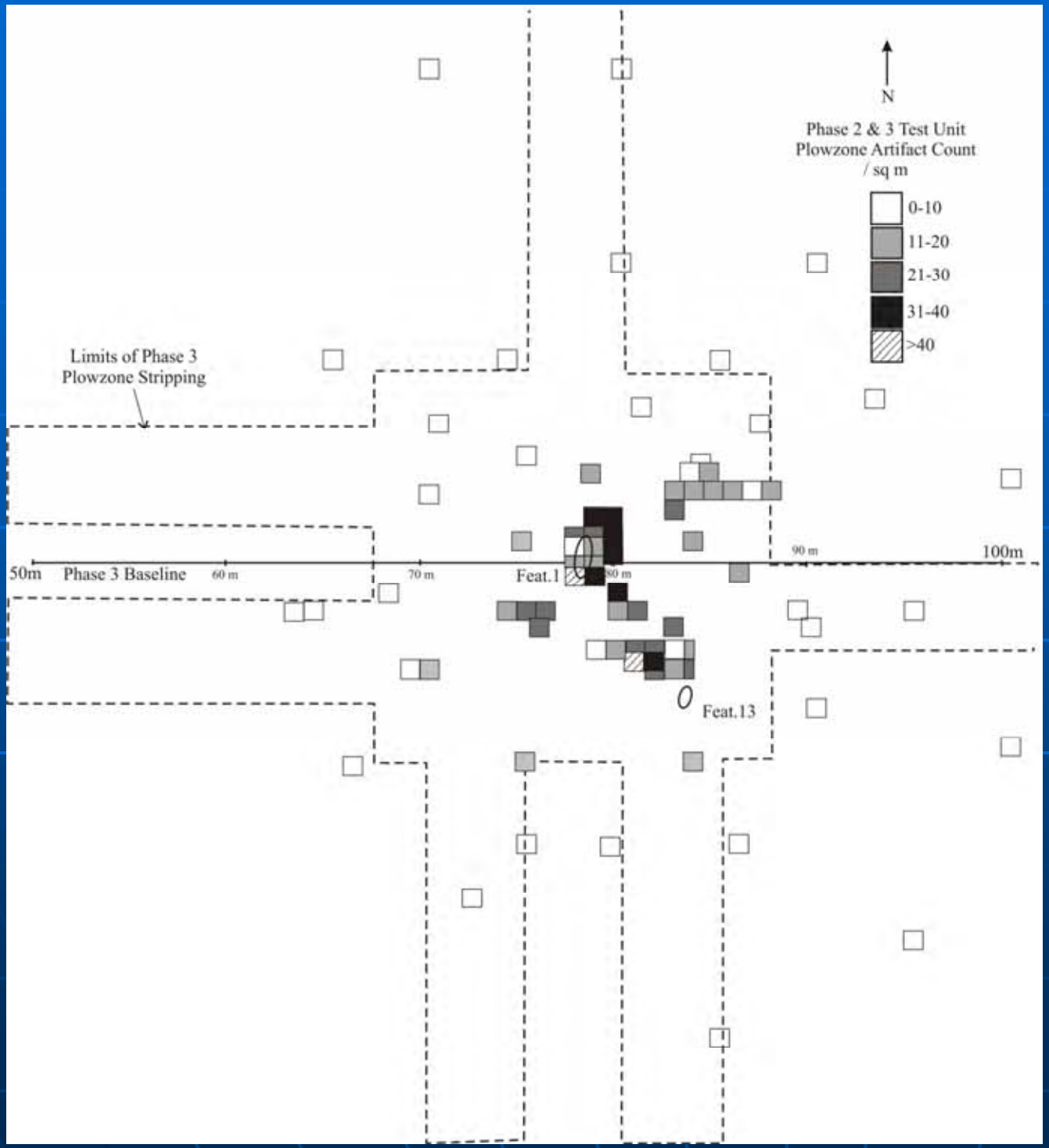
Scott 1 site (NYSM 11338, UB 3640) View facing north at Feature 1 showing profile

Scott 1 site (NYSM 11338, UB 3640) View facing northeast at Feature 1 showing profile

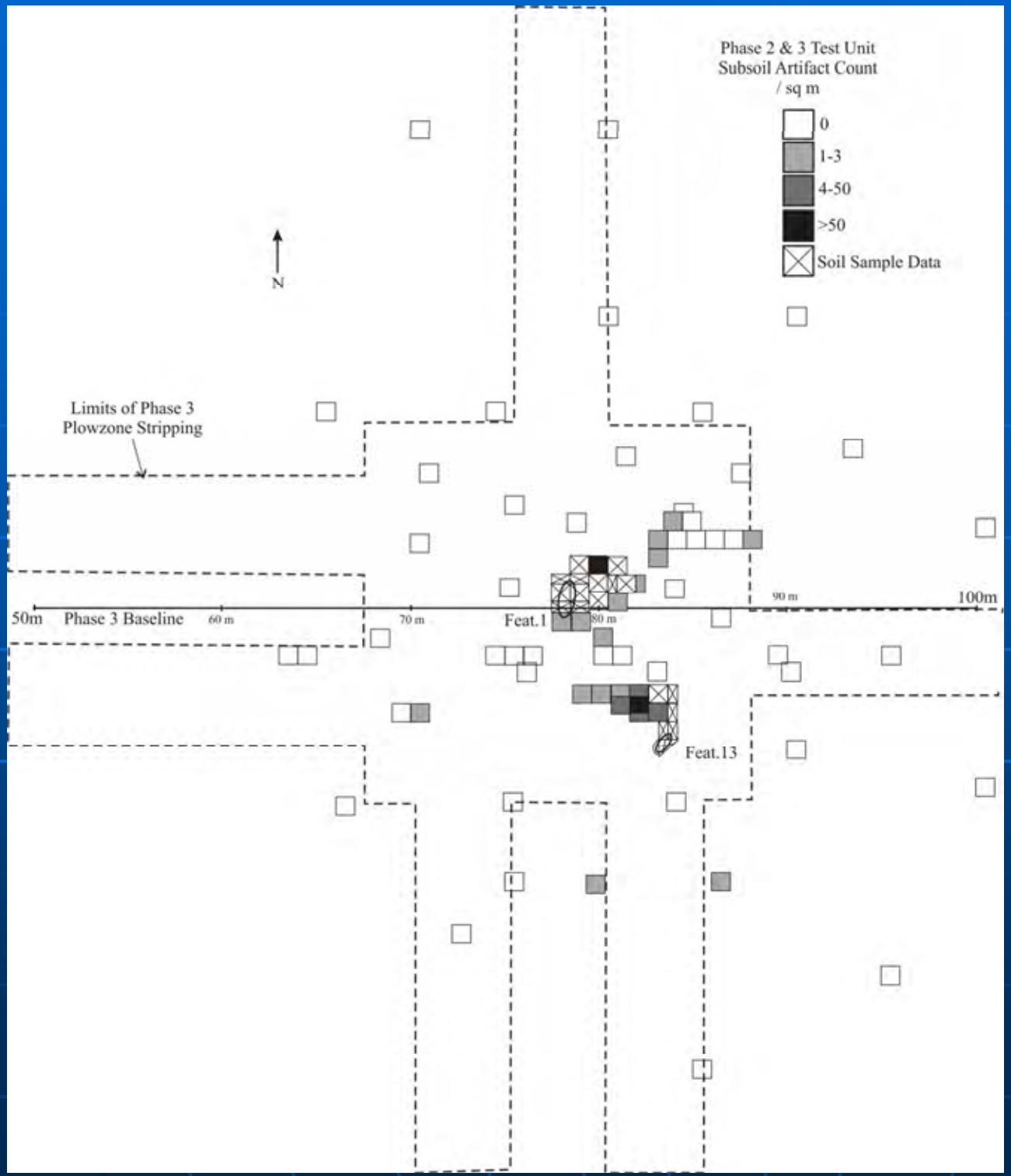
Scott 1 site (NYSM 11338, UB 3640), facing north at Feature 13 in north wall

Scott 1 site (NYSM 11338, UB 3640), facing west at Feature 13 in north wall of TU 169

Dorothy Scott 1 site projectile points, bifaces and selected utilized flakes




Distribution of plowzone artifacts from Phase 2 and 3 test unit excavations




Distribution of subsoil artifacts from Phase 2 and 3 test unit excavations

5) Results:

-Artifacts in plowzone as expected

-Also upper B-horizon as expected

*Artifacts clustered 50-60 cm bgs deeper in B-horizon subsoil (Not in features)

6) Relevance/Lessons for…

a) Geomorphology- NO formal study conducted!

b) Deep Testing- necessary here!

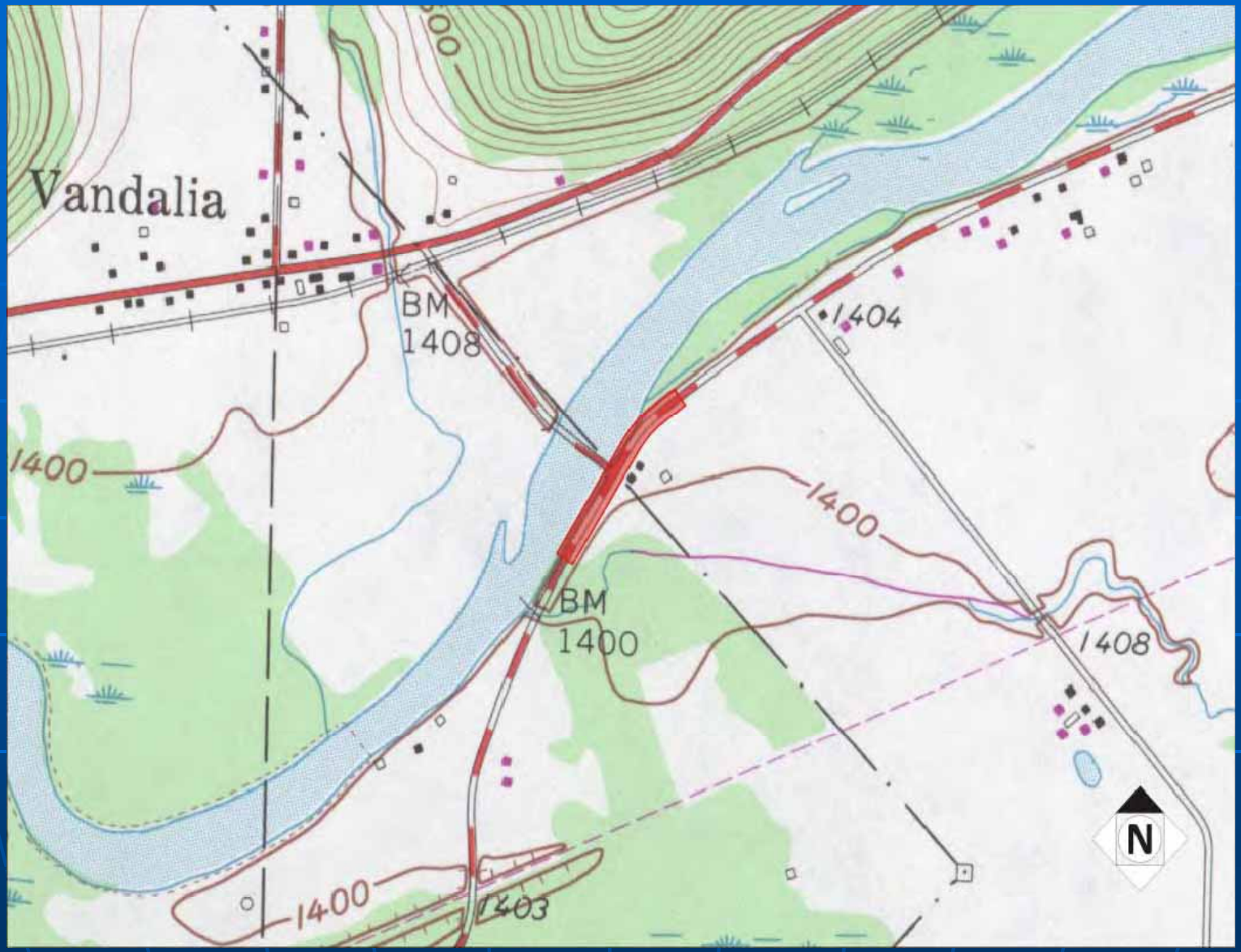
c) Developing 'Standards'- Lessons Learned!

# Case Study 2: Deep Testing/Geomorphology

## Nine Mile Road Site (UB 2993)

1) Town of Allegany, Cattaraugus County
2) Lowland Setting- Allegheny River Bank
3) Phase 3 Data Recovery
4) ?? square meters excavated, Trenches

-TU dug 200-250 cm bgs

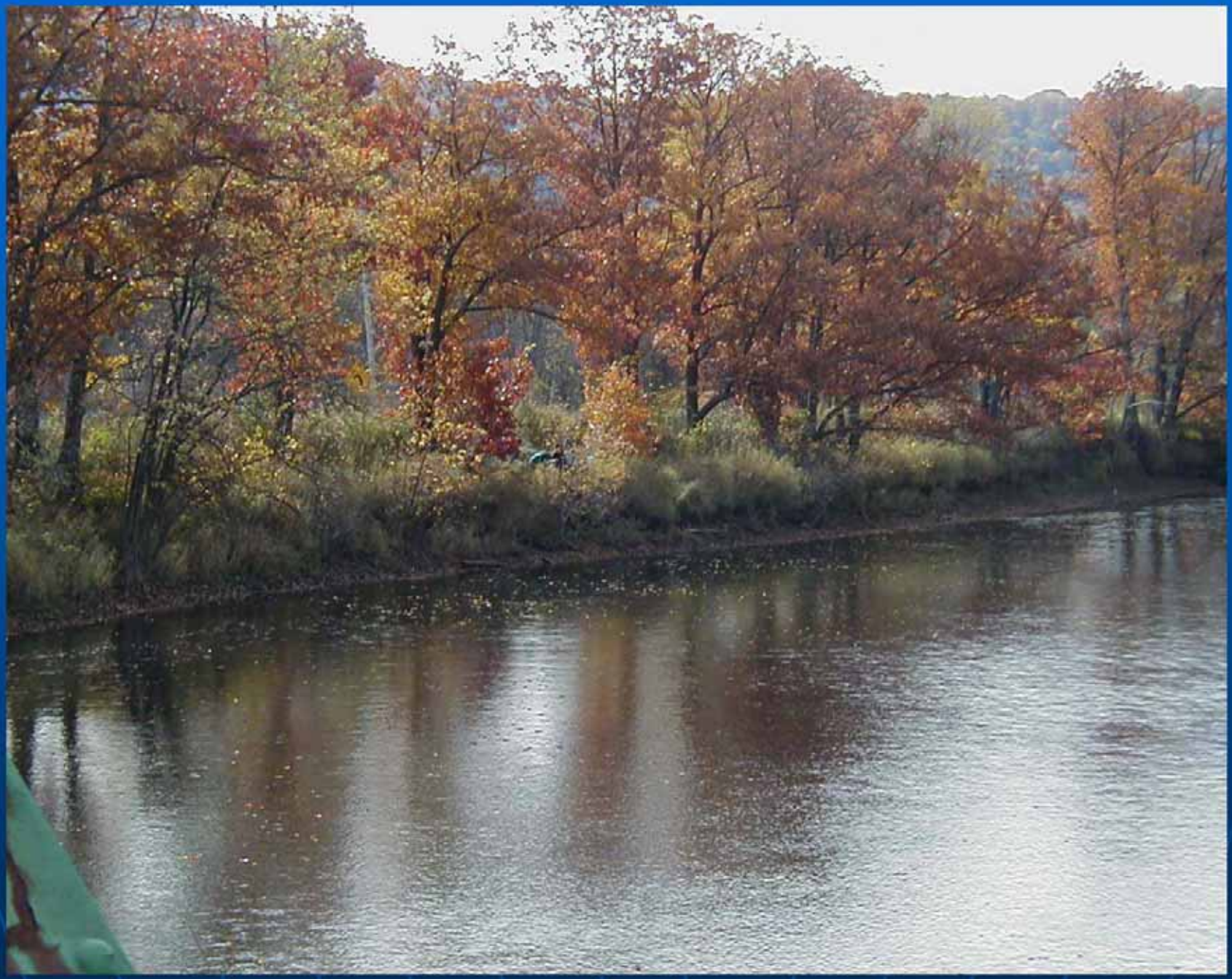



Location of the Ninemile Road site (A00934.000044, NYSM 10722, UB 2993) on 1961 Knapp Creek, NY USGS 7.5 Minute Series Quadrangle. Note the locations of Birch Run to the south of the site and Ninemile Creek on the opposite side of the river


N

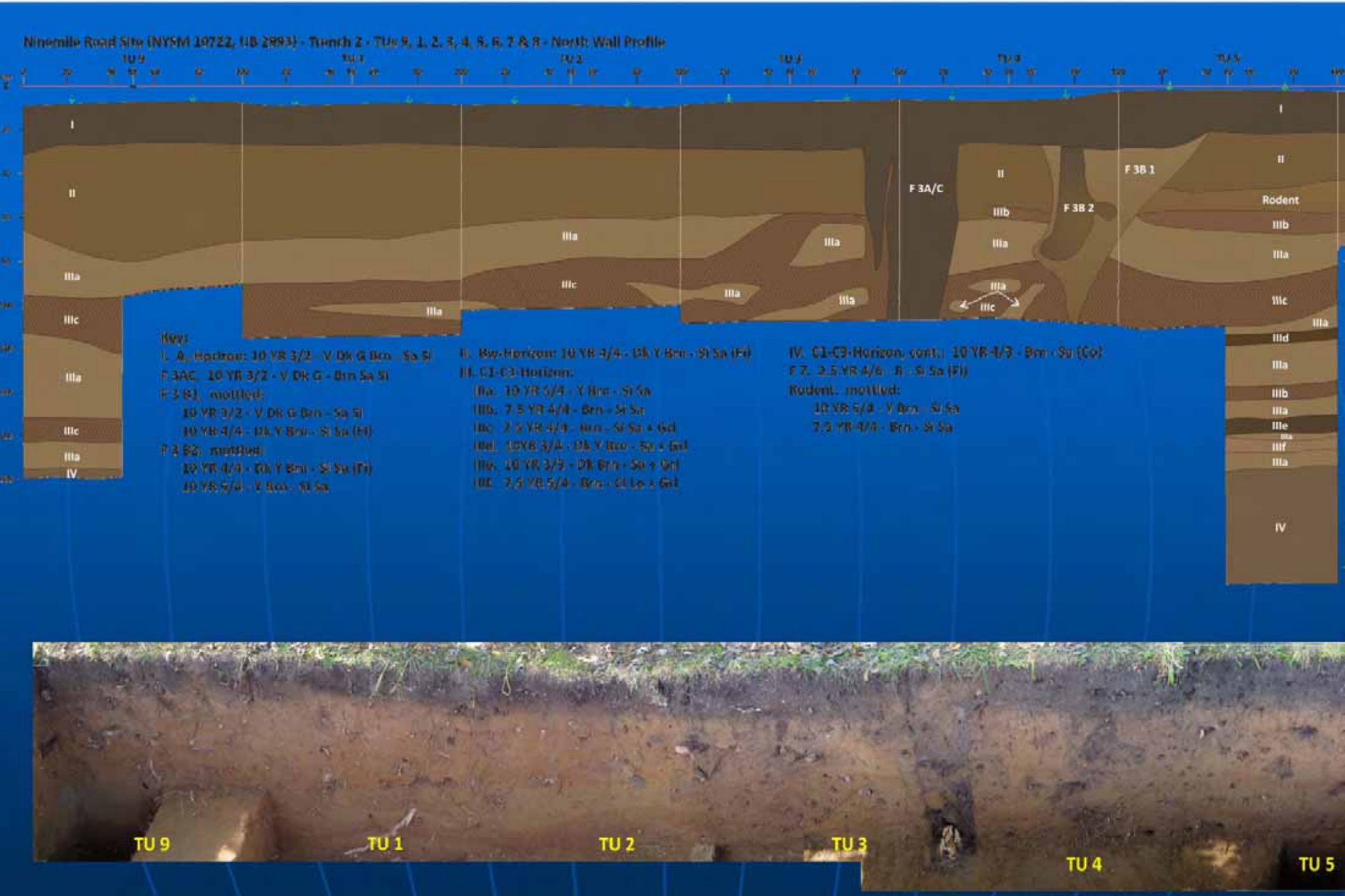
General view of Trench 2 during Phase 3 excavations of Ninemile Road site, facing northeast

General view of Trench 3 during Phase 3 excavations

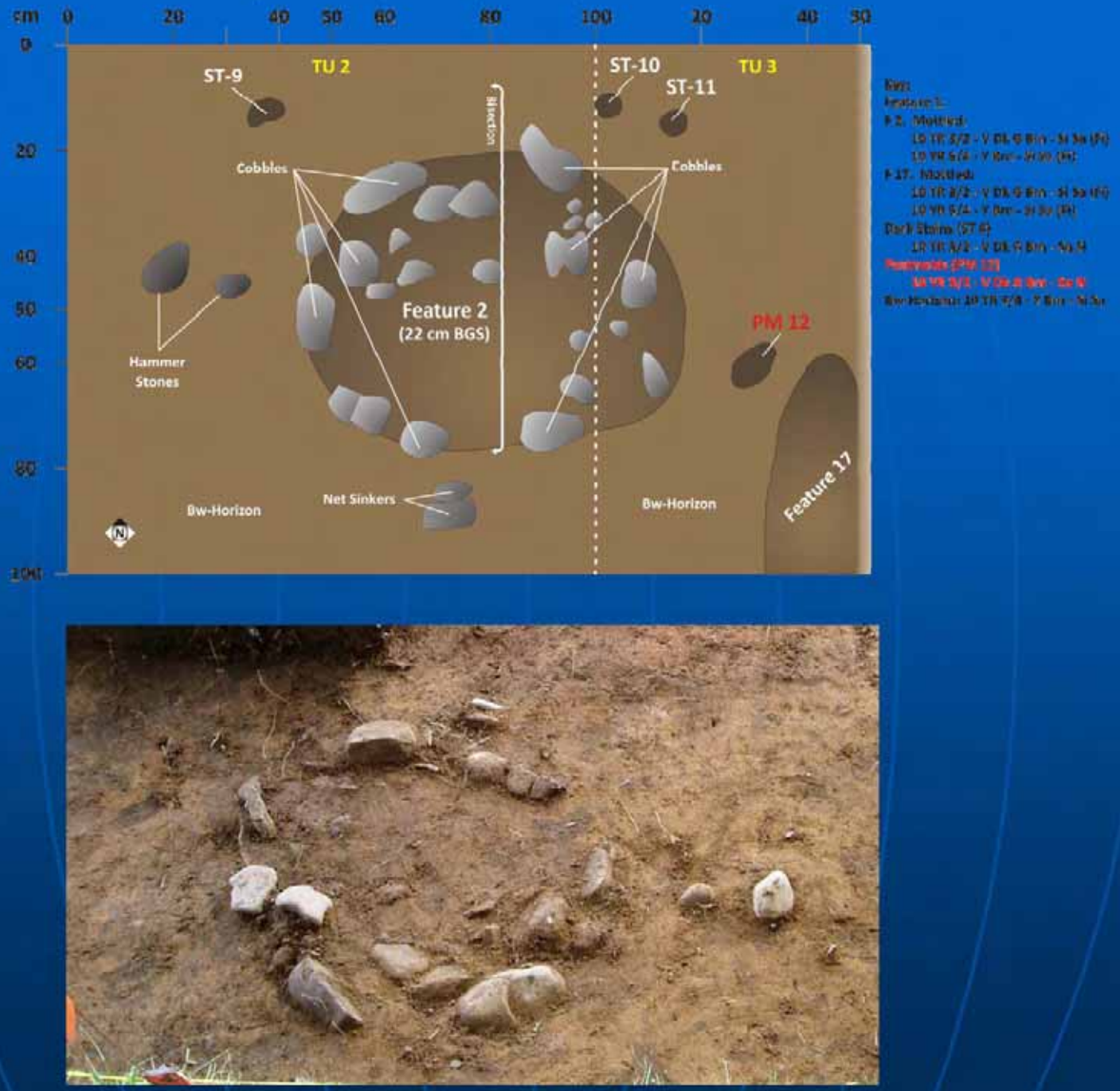


General view of the location of Trench 4, facing southwest from the Cotton Road bridge over the Allegheny River

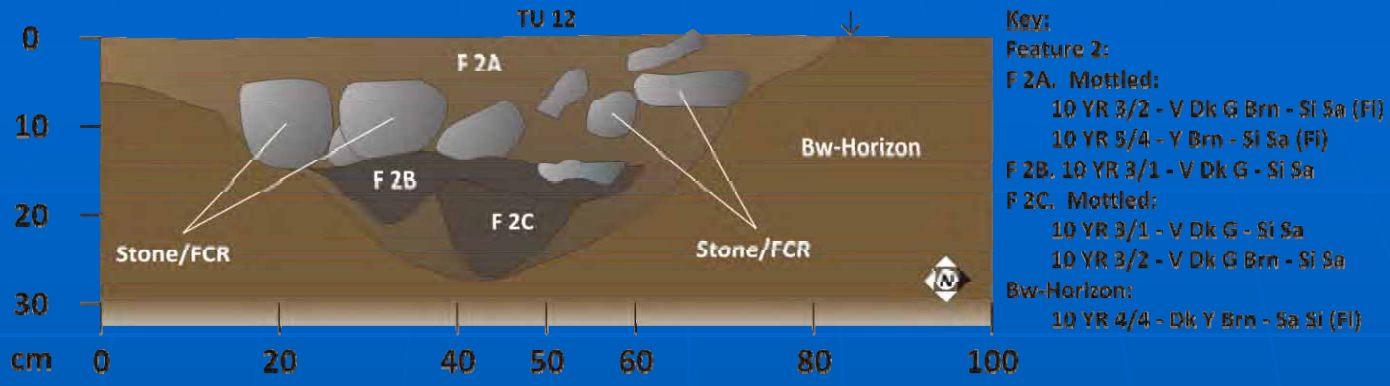
Ninemile Road site, Phase 3, Trench 2, TUs 1-12, plan view



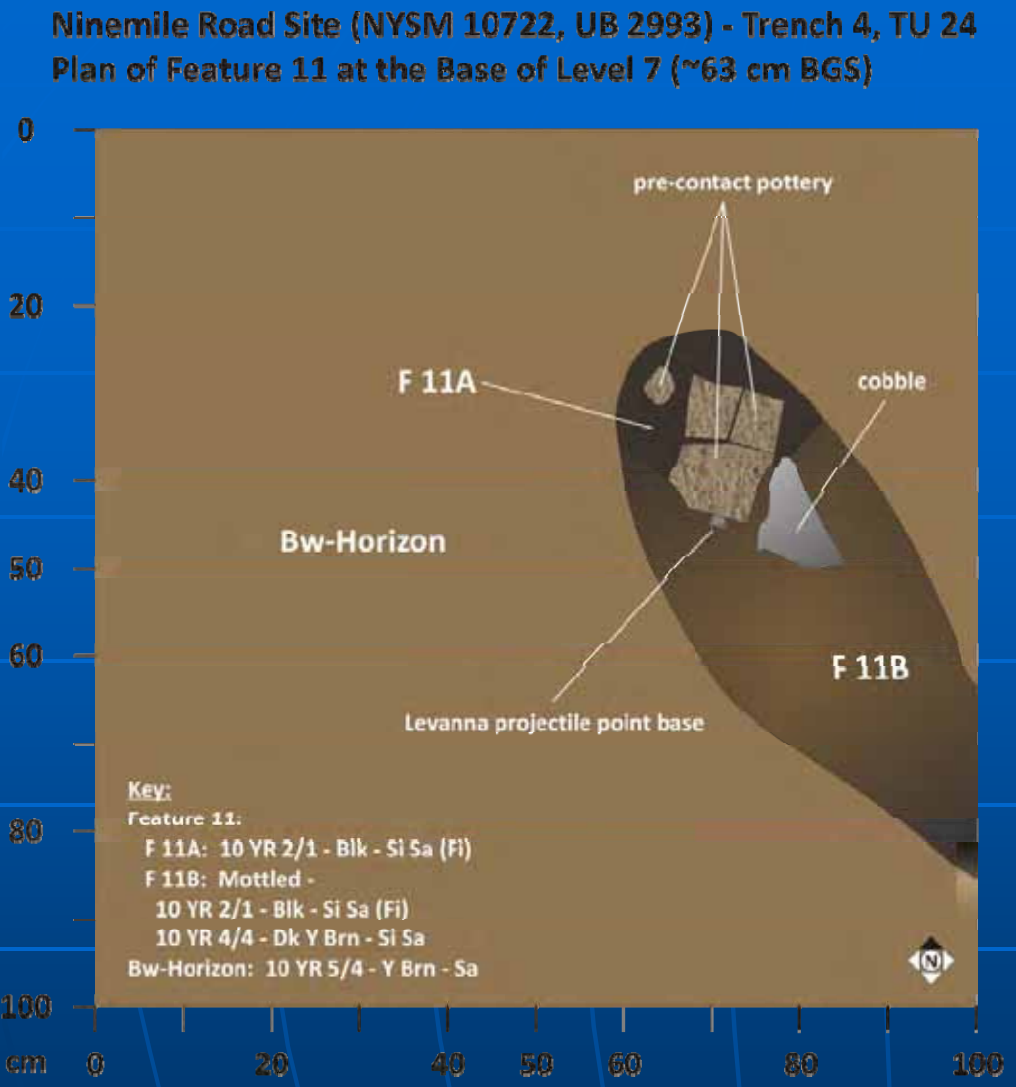

Ninemile Road site, Phase 3, Trench 2, TUs 1-9 north wall profile




Ninemile Road site, Phase 3, Trench 2, TUs 2 and 3, Feature 2 plan view, facing south




Ninemile Road site, Phase 3, Trench 2, TUs 2 and 3, Feature 2 profile, facing west showing fire cracked rock cobbles in feature fill




Ninemile Road site, Phase 3, Trench 4, TU 24, Features 11A and 11B plan view, facing north. Note the ceramic sherds and the base of an early Late Woodland period Levanna projectile point

5) Results:

-Artifacts in plowzone as expected

-Features in upper B-horizon on stable landform

*Artifacts and features stratified in A/B-horizon soil column to great depth, with C-horizon stream gravel/sand beneath

6) Relevance/Lessons for…

a) Geomorphology- Formal study conducted!

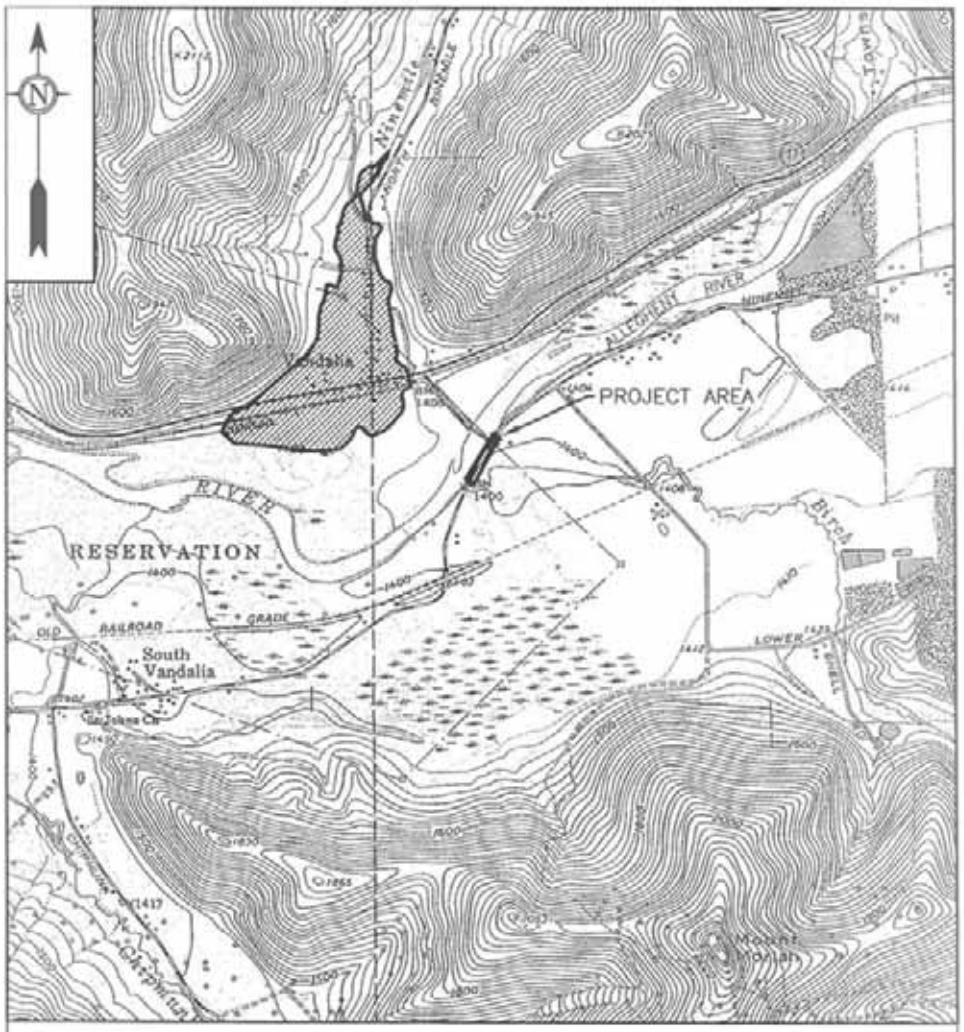
b) Deep Testing- necessary here!

c) Developing 'Standards'- Lessons Learned!

PLOTTER FILE: ENVIRONMENTAL.CTB

GAI CAD FILE: 2004-509-10-00-E-A001.DWG 12/29/04






ALLUVIAL FAN

MAP REFERENCE:
USGS 7.5 SERIES QUADRANGLE
KNAPP CREEK, N.Y. 1961
PHOTOREVISED 1979

gai consultants

SCALE 1"=2000'

2000 0 2000

FIGURE 1

| | | | |
|---|---|---|---|
| PROJECT LOCATION–NINEMILE ROAD SITE<br>SOIL GEOMORPHOLOGY INVESTIGATION<br>ALLEGANY INDIAN RESERVATION/<br>CATTARAUGUS COUNTY, NEW YORK | DWN. JCN | DATE 12/29/04 | |
| | APPD. DLC | CHKD. DLC | 00<br>TASK NO. |
| UNIVERSITY OF BUFFALO<br>DEPARTMENT OF ANTHROPOLOGY<br>BUFFALO, NEW YORK | 2004–509–10<br>PROJECT NO./DASH NO. | | |
| | SCALE: AS NOTED | E–A001<br>DRAWING NO. | REV |

# Case Study 3: Deep Testing/Geomorphology

15 Mile Post Site (UB 309)

1) Town of Wheatfield, Niagara County
2) Lowland Setting- Niagara River tributary
3) Phase 3 Data Recovery
4) 20+ square meters excavated, Trenches

-TU dug 100-150 cm bgs

Question: Is this deep enough? In this setting, Geomorphology says yes!


Black
Creek
CHANNEL
NIAGARA
RIVER
Edgewater
Creek
ISLAND


Topsoil Cap / Fill
Clay Cap / Fill
1st Buried A-horizon / Historic Surface
Buried B-horizon
2nd Buried A-horizon / Meadowood c. 500 BC

5) Results:

-Artifacts in 2 buried A-horizons

- No Features in A or B-horizons
- Unstable landform ?

*Artifacts in buried A-horizon at great depth, with C-horizon clay/cobble washed surface at base = dramatic erosion event

6) Relevance/Lessons for…

a) Geomorphology- Formal study conducted!
b) Deep Testing- necessary here with clear base
c) Developing 'Standards'- Lessons Learned?

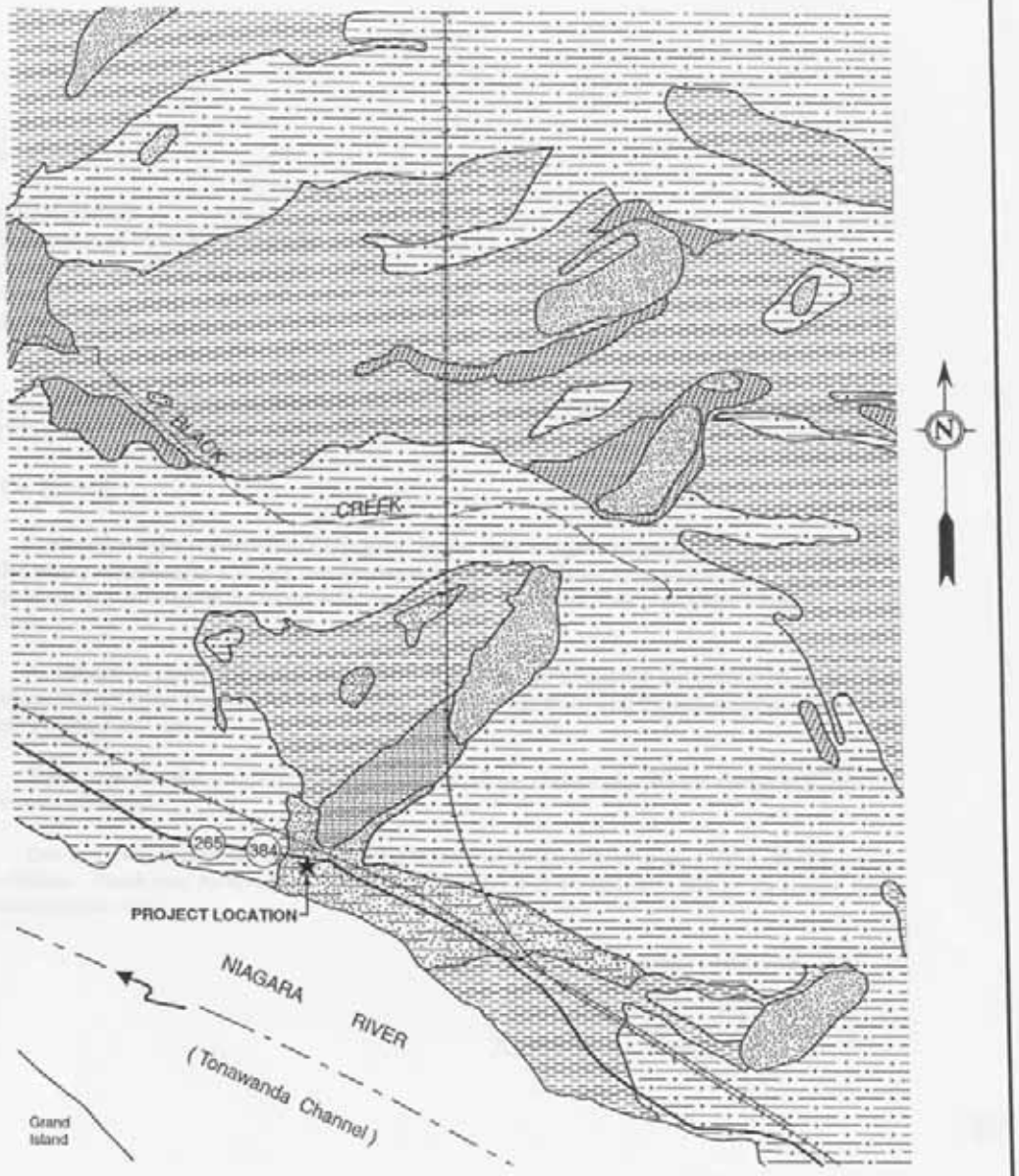



Figure 1

gai

**GEOMORPHOLOGY AND PROJECT LOCATION FOR THE 15 MILE POST SITE, NIAGARA COUNTY, NEW YORK**

# Case Study 4: Wetlands Margin Testing
# US 219 Obenauer Site Cluster

1) Town of Ellicottville, Cattaraugus County
2) Lowland Setting- Mansfield/Great Valley Creek Headwatersara River tributary
3) Phase 1-2, Recon. and Site Exam
4) Few square meters excavated, TU only

-TU dug 50-60 cm bgs = hard clay sub

Question: Is this deep enough? Not sure

No Geomorphology

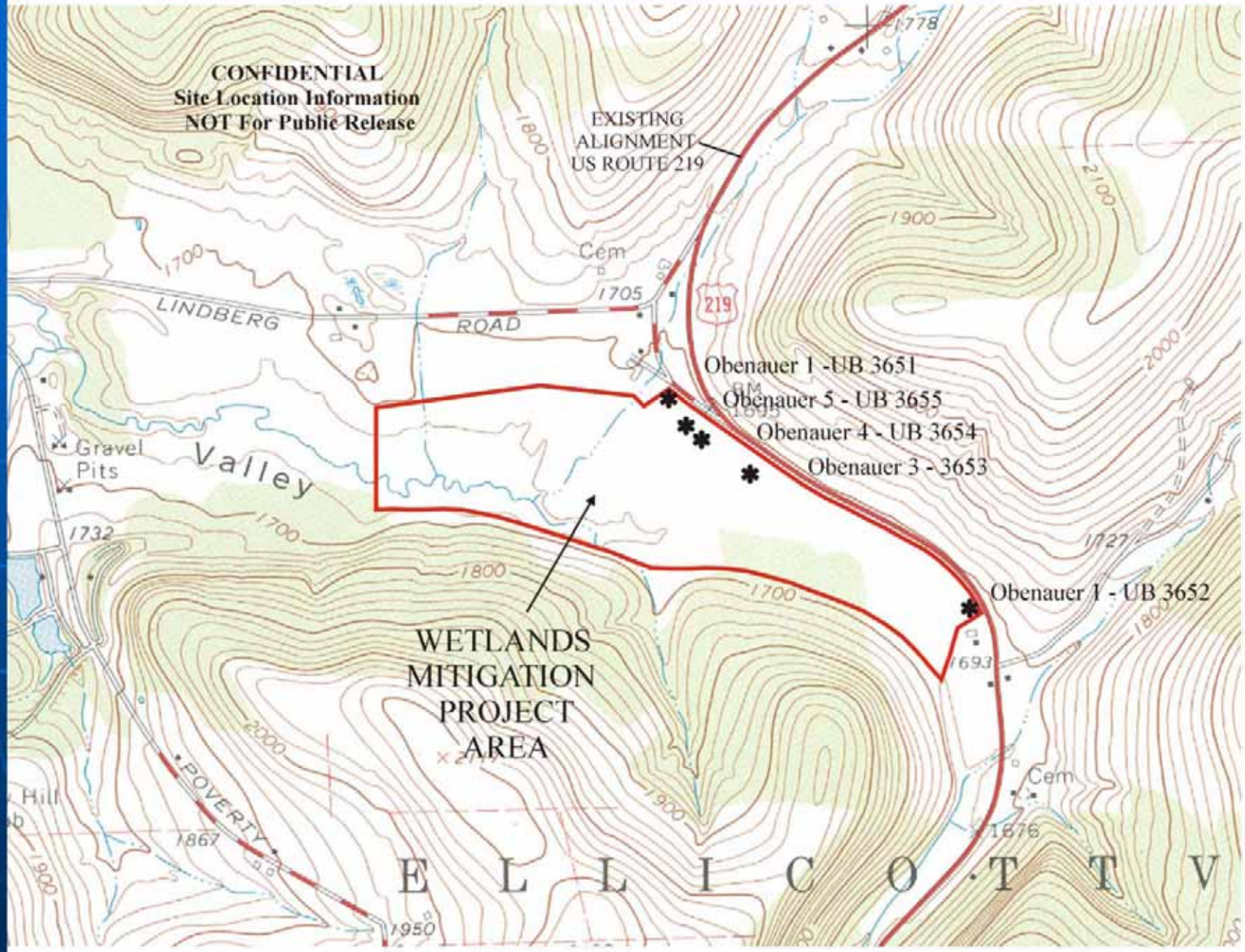



**Figure 5.** Location of Phase 2 Site Examinations in PIN 5101.53.121 Wetlands Mitigation Project Area shown on 1964 Ellicottville, New York USGS 7.5 Minute Series Quadrangle.

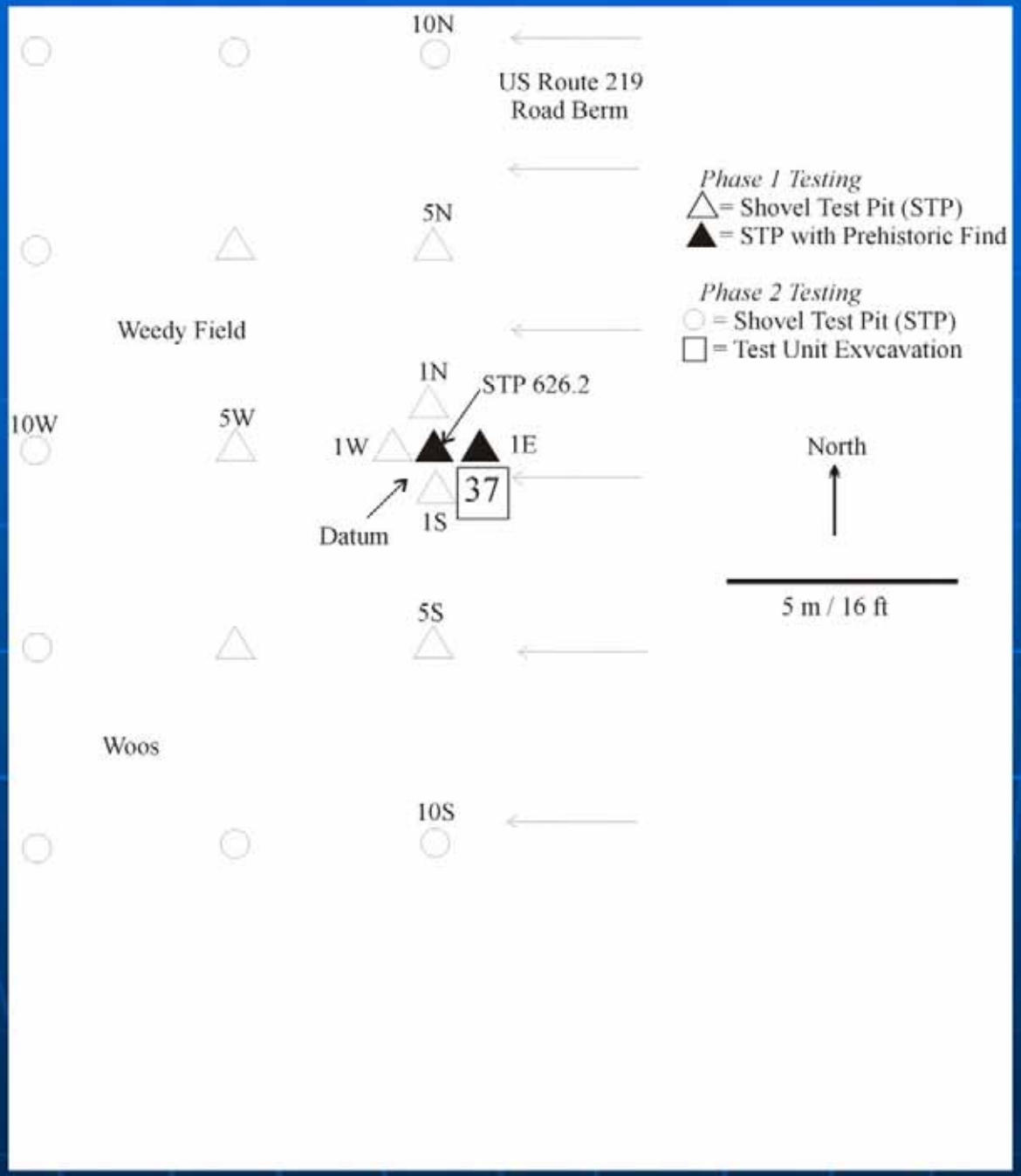

10N
US Route 219
Road Berm
Phase 1 Testing
= Shovel Test Pit (STP)
= STP with Prehistoric Find
5N
Phase 2 Testing
= Shovel Test Pit (STP)
= Test Unit Exvcavation
Weedy Field
1N
STP 626.2
10W
5W
1W
1E
North
37
Datum
1S
5 m / 16 ft
5S
Woos
10S

**Photo 33.** Obenauer 3 site (NYSM 11351, UB 3653), Phase 2, Test Unit 35 east wall profile.

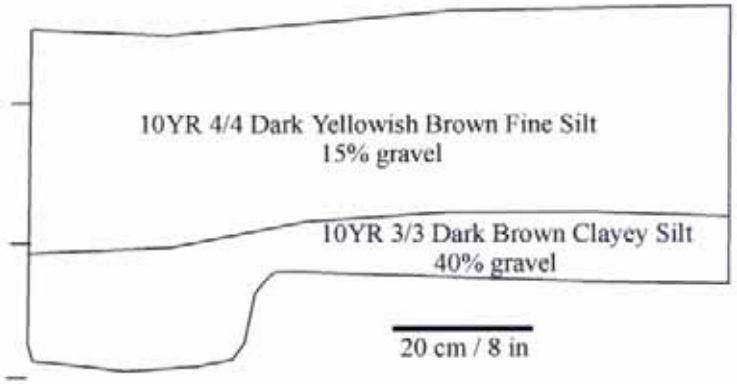
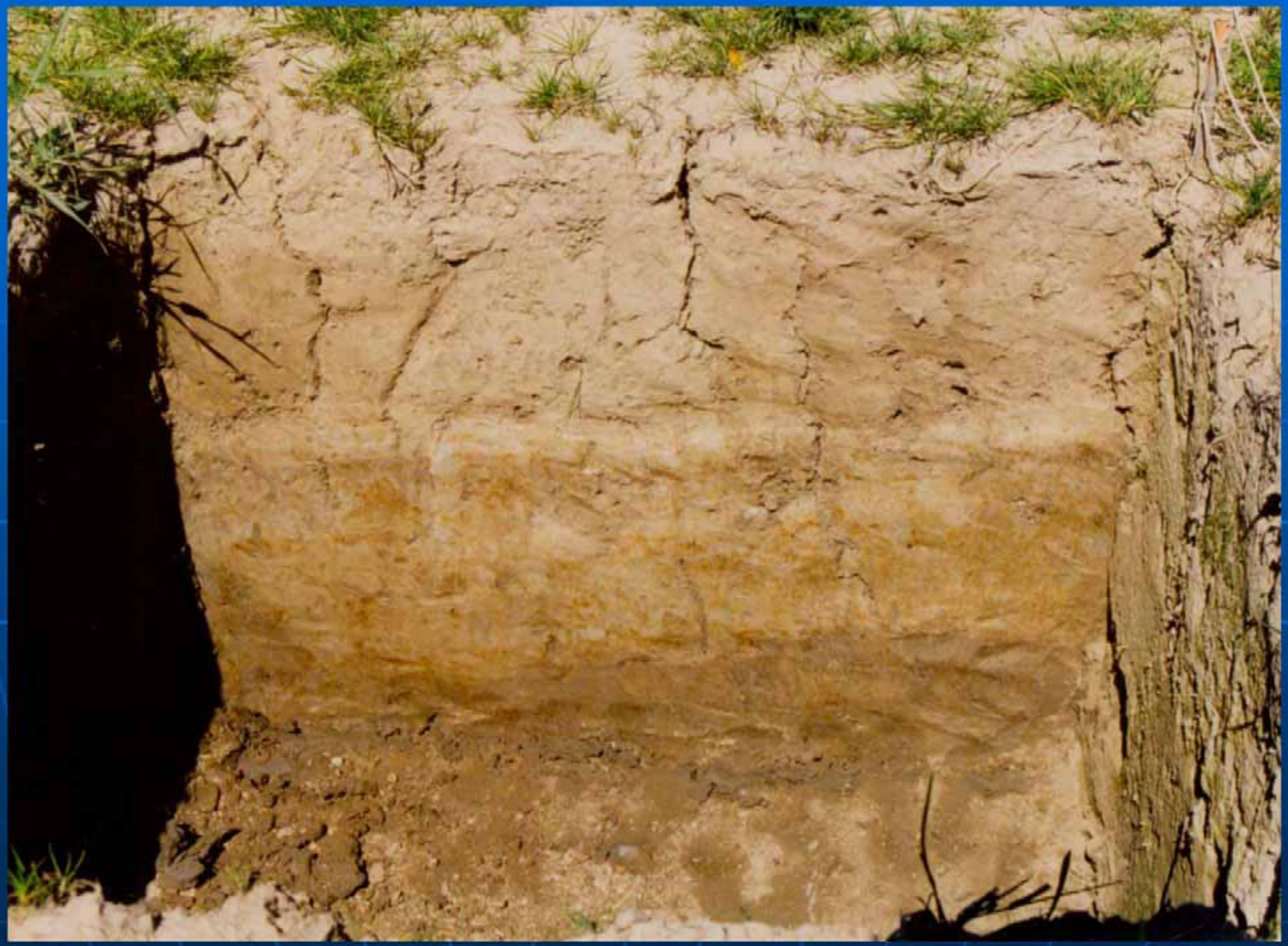



**Figure 40.** Obenauer 3 site (NYSM 11351, UB 3653) Phase 2, Test Unit 35 east wall profile.

5) Results:

6) Relevance/Lessons for…
   a) Geomorphology- No Formal study conducted!
   b) Deep Testing- Difficult here!
   c) Developing 'Standards'- Lessons Learned =
      Wetland margins are sensitive for small sites


1300
1200
CREEK
240
Bigelow
Bridge
1200 STREET
ELK
X1322
BEECH
TREE
Gravel
Pit
ERIE CO
ATTARAUGUS CO
Stony
1200
1200
ROAD



# Questions for Consideration:

1) What is the role of Geomorph. in CRM
   a) Phase 1-3
   b) Project size/scope
   c) Qualifications

2) Is there a need for a Geomorp. Policy?
   a) Based on data, not assumptions
   b) Criteria that can be met

Needs:

1) More case studies/info from across NY
2) Examples of productive wetlands testing
   a) NYAC membership
   b) NYSOPRHP
   c) Universities and CRM companies
3) Examples of productive Geomorphology
   a) b) c)
4) Deep Testing

5) Case Studies of *Unproductive* Testing ?