Archaeology Guidelines

Section: Fieldwork

State Historic Preservation Office

Ohio History Connection
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Fieldwork

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Archaeology Fieldwork

Introduction

The following guidelines are set forth to ensure a consistent and uniform approach to the treatment of archaeological resources. The State Historic Preservation Office (SHPO) has consulted with non-SHPO archaeologists, the Ohio Archaeological Council, and has referred to the archaeological literature, federal guidelines, and other states' standards in developing these guidelines.

Reports generated must meet the requirements outlined in Archaeology Report Formats of these *Archaeology Guidelines*.

Phases of Archaeological Investigation

Regulation 36 CFR Part 800.4 (b) *Identification of historic properties* under Section 106 of the National Historic Preservation Act of 1966 calls for the agency official to identify historic properties within the area of potential effects (APE). Identification is to be done in consultation with (prior to, during, and after the investigation) SHPO, the undertaking's consulting parties, tribes, other organizations, and individuals likely to have knowledge of or concerns with historic properties in the APE, and the undertaking's effects on them. Identification of historic properties, especially those archaeological in nature, often involves a two-step process; typically referred to as Phase I identification and Phase II evaluation. Phase I involves the development and implementation of a testing strategy focused on identifying archaeological properties within the APE. The archaeological properties identified by the survey are documented and evaluated for eligibility against the National Register of Historic Places (NRHP) criteria for evaluation. However, for some properties the information gathered during the Phase I identification is insufficient and more intensive investigation is required. The properties requiring additional investigation are subjected to Phase II evaluation. Phase II evaluation usually focuses on documenting the range of archaeological data sets at specific archaeological resources, their spatial distribution, and their physical integrity to adequately evaluate the resource's archaeological significance, i.e., its ability to yield important information in prehistory and/or history. Each property is different and SHPO encourages the development of a testing strategy in consultation with SHPO and other consulting parties, including tribes as necessary, that ensures the information obtained through the Phase II evaluation is sufficient to demonstrate the property's NRHP eligibility.

Phases I and II are not exclusive and can be combined to save time and effort, usually on sites suspected to contain few archaeological features and/or appear to lack integrity of design, materials, workmanship, and association, provided the sampling strategy recovers sufficient evidence to document their information and/or lack of integrity for NRHP eligibility.

No identification efforts or testing should be conducted on historic properties that are listed or determined eligible for listing in the NRHP without consultation with SHPO.

Archaeological resources that are listed in or eligible for listing in the NRHP and are adversely impacted by the undertaking most likely require Phase III archaeological data recovery. Exceptions to data recovery depends upon the nature of the archaeological resource and the result of consultation between the lead agency, tribes, SHPO, and other consulting parties. The scope of work necessary to mitigate the adverse effect is determined through consultation with the federal agency, SHPO, all other consulting parties including tribes, and possibly the Advisory Council on Historic Preservation, and outlined in a data recovery plan. Implementation of the data recovery plan, among other stipulations, is formalized by the federal agency in a Memorandum of Agreement (MOA).

There is no formal process for consulting with SHPO under Ohio Revised Code (ORC) 149.53. However, the phased approach indicated above is typically followed.

Evaluating Archaeological Resource Eligibility

Archaeological investigations conducted under federal and state regulatory requirements seek to identify NRHP eligible archaeological resources. For Section 106 compliance, the regulations require the federal agency to apply the NRHP eligibility criteria in consultation with the SHPO, American Indian tribes, and other consulting parties [36 CFR § 800.4 (c)(1)]. The federal agency may use in-house professionals or rely on recommendations provided by archaeological consultants. The federal agency, however, is legally responsible for decisions on NRHP eligibility. Consultation under ORC 149.53, essentially follows the same procedures as set forth under section 106.

A. National Register of Historic Places Criteria

To be eligible for listing in the NRHP, archaeological resources must be evaluated according to its historic context and ability to meet at least one of the four National Register criteria (A through D) established by the National Park Service and possess integrity.

Criterion A: Archaeological resources associated with events that have made a significant contribution to the broad patterns of our history.

Criterion B: Archaeological resources associated with the lives of persons significant in our past.

Criterion C: Archaeological resources that represent the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or embodying, representing, and possessing high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

Criterion D: Archaeological resources yielding, or likely to yield information important in prehistory or history.

The United States Department of the Interior's National Register program has published several bulletins to help guide archaeologists, agencies, managers, and others in evaluating archaeological resource significance:

- How to Apply the National Register Criteria for Evaluation (1997)
- Guidelines for Evaluating and Registering Archeological Properties (2000)
- Guidelines for Evaluating and Documenting Traditional Cultural Properties (rev. 1998)
- Defining Boundaries for National Register Properties with Appendix, Definition of National Register Boundaries for Archeological Properties (rev. 1997)

Assessing NRHP eligibility is usually a cumulative process in which more and more data is collected to reach a level of information sufficient to establish significance. Although eligibility is usually determined after Phase II testing, sometimes a Phase I investigation provides sufficient information for an NRHP eligibility evaluation.

B. Integrity

An archaeological resource cannot be determined eligible for listing in the NRHP unless it possesses integrity. Integrity is the ability of the property to convey significance through physical features and context. The NRHP criteria require that an eligible archaeological resource must possess several aspects of integrity: location, design, setting, materials, workmanship, feeling, and/or association.

Integrity of location, design, materials, and association are of primary importance for archaeological resources being considered under Criteria A and B. Integrity of design, materials, and workmanship are especially important under Criterion C. Under Criteria C and D, integrity of setting adds to the overall integrity of an archaeological site and/or district. Integrity of association is especially relevant under Criterion D. Integrity of association measures the strength of the relationship between the site's data or information and the important research questions.

Typically, archaeological resources with excellent integrity will have intact features/deposits that are temporally and spatially distinct.

Criteria for Qualified Professional Archaeologists

Any archaeological investigation conducted pursuant to federal or state laws as well as undertakings funded with grants administered by SHPO must be conducted or overseen by qualified archaeological professionals who meet or exceed the minimum standards for archaeology as outlined in the Department of the Interior's Standards and Guidelines for Archeology and Historic Preservation.

SHPO maintains a directory of qualified archaeological consultants, and a list of those with specific expertise in disciplines such as submerged and geophysical archaeological survey, geomorphology, and paleoethnobotany. Placement on the directory does not mean that SHPO recommends or endorses these individuals or organizations to the exclusion of others. Work by individuals or organizations appearing on the directory does not receive any special consideration by SHPO. Qualified archaeologists and related disciplines should provide SHPO with updated resumes on an annual basis. If an individual's resume is not on file and/or the individual does not meet the minimum standards as set forth by the Department of Interior, SHPO retains the right to reject deficient submissions.

Curation Guidance

Artifacts are the property of the landowner; however, securing written permission from the landowner to curate a collection from private property in a facility which meets federal curation standards is highly encouraged. If the artifacts are recovered on State land, under ORC 149.53, the Director of the Ohio History Connection (Director) shall determine the disposition of artifacts. In most cases, the Director determines that the artifacts are curated at the Ohio History Connection (OHC). The curation of artifacts from federal property is determined by the agency with jurisdictional control. Every effort should be made to curate a collection from any

archaeological resource determined eligible for listing or is listed in the NRHP with a facility meeting federal curation standards.

Collections and original primary documents must be curated in accordance with the receiving institution's curation standards and guidelines. For further information, see OHC Archaeology Collections Acquisition Procedures.

The handling, processing, and disposition of human remains must follow the Human Remains Treatment Plan (see **Cemeteries, Burial Mounds, and Other Burial Places I**: Human Remains Treatment Plan) developed by the agency in consultation with the appropriate consulting parties and tribes.

Phase I Identification

Phase I identification is intended to discover unrecorded archaeological resources and confirm previously identified archaeological resources within the APE. The methodology of a Phase I identification should be adequate to sample the full range of archaeological resources that may be present within the APE. The results of the Phase I identification are documented and summarized in a report reviewed by the agency, SHPO, tribes, and other consulting parties, as applicable. A statement as to the author's opinion of the resources' eligibility must be included in the report.

A. Field Visit

Although a great deal of topographic and environmental information is available electronically, a field visit, when practicable, is recommended. Minor physiographic features (slight rises, depressions, slopes), modern agricultural practices, the presence of significant environmental features (rock outcrops, springs, etc.), and prior ground disturbance should be noted. The results of the field visit should be combined with background documentary research to develop a sampling strategy.

An important category of information available from a field visit is that of prior ground disturbance. An attempt should be made to ascertain and document the nature and extent of previous disturbance(s). Documentation should take the form of photographs, maps, representative soil profiles, and/or construction records.

> **Urban.** A field visit is necessary to evaluate the possibility of prior destruction of archaeological resources, the visual evidence for potential archaeological deposits and to document existing conditions. In the urban environment, visual evidence for archaeological deposits is often lacking, especially in an open situation such as a large parking lot or modern highway. In such cases no amount of surface inspection will detect the presence or absence of archaeological deposits, but certain geophysical survey instruments, such as ground penetrating radar and magnetic gradiometry, can be used to identify archaeological properties buried beneath modern infrastructure. If the APE currently contains buildings, structures, and/or objects, it is sometimes possible to predict the likelihood of the survival of archaeological resources by an assessment of basement depths, or other intrusions into the original ground surface for example.

If disturbance seriously affects the preservation of archaeological resources that may be present within the APE or influences the extent or the nature of archaeological investigations, SHPO must be provided with sufficient

documentation to allow concurrence with the investigator's conclusions; see section entitled General Report Outlines for Disturbance Assessment and Phase I Identification Short Reports within the Archaeology Report Formats of the *Archaeology Guidelines*.

In evaluating the effect of disturbance and small-scale environmental conditions, the nature of the archaeological record and site formation processes must be considered. Archaeological resources, for example, may be preserved beneath modern disturbance. Likewise, wet or marshy areas may be of contemporary origin.

B. Background Research

This segment of the identification survey is an essential precondition for effective field work, interpretation, and NRHP evaluation. Background research should include, but not be limited to tracing the local environment and culture history using historical maps, documents and photographs, Light Detection and Ranging (LiDAR) data, historical and modern aerial photographs, previous archaeological survey results, local, regional, state, or national syntheses (historic contexts), and interviews with persons knowledgeable about archaeological resources in the APE.

It is the responsibility of the investigator to develop expectations of the probable archaeological resources occurring within the APE, their distribution, and potential significance. If the undertaking occurs in a part of the state where survey data are available and provides a cultural chronology and settlement patterns, the expectations will be derived from extrapolating the known regional settlement patterns to the local conditions and note where gaps occur in the current knowledge. In the Phase I report, the investigator is responsible for summarizing the pertinent and missing information from the regional studies as they apply to the local conditions.

To place the Phase I identification within a fuller context for examining the ecological and cultural historical parameters affecting the location of archaeological resource, background information from various sorts must be considered. Background information should address and critically evaluate environmental characteristics important for defining cultural chronology, establishing settlement patterns, identifying relevant cultural ecologies, and devising predictive models for the location of archaeological resources.

The Phase I identification should also assemble relevant information on the following aspects of the APE:

- Geomorphology
- Soils

- Hydrology
- Geology
- Flora

The Phase I report should integrate and interpret these data and use them to identify areas in which archaeological resources are likely to be present and less likely to be present. These expectations should be explicitly stated and defended by reference to the above categories of information and to local or regional models of settlement. If any of this information is not useful for the development of the sampling strategy, then the Phase I report can exclude them.

The Phase I report must consider the potential for buried archaeological resources in shoreline, streambank, and other environments, as applicable. In doing so it is imperative to conduct background research in past environmental, climatic, geological, pedological, archaeological, and geomorphological studies. Recommended sources of information include historic USGS topographic maps, historical aerial photographs, soil surveys, and LiDAR data. These resources can help document impacts to the APE, such as erosion, sediment deposition, and land-altering activities that may impact archaeological resource preservation potential. Investigators need to identify the potential impacts of a given undertaking on the APE and identify how the landscape has changed over time (e.g., has the APE always been underwater, or was it dry land at a previous point in time).

C. Disturbance Assessment

Reclaimed strip mines, clear cut forests, transportation/utility rights-of-way, and industrial/commercial/residential development areas where documentary research suggest extensive disturbance may require some level of field verification to document the prior disturbance destroyed or at least significantly impacted the integrity of archaeological deposits that may have been present within the APE. Soil coring (push tube device, typically ¾ inches in diameter) and/or shovel probes (non-standard sized units excavated with a shovel solely to document stratigraphic integrity) spaced at the discretion of the investigator are appropriate alternatives to standard survey techniques in areas thought to be disturbed. Photographs and verbal descriptions of soil profiles are typically sufficient to document the extent of disturbance.

D. Developing the Sampling Strategy

Because every undertaking offers a different setting, the sampling strategy for Phase I identification should tailor the investigator's approach to the local conditions. The sampling strategy needs to integrate the locally pertinent environmental, archival and culture history background information. It should

reference the specific environmental setting of the APE and should specify probable survey results. Finally, the sampling strategy needs to provide the appropriate instrumentation and field methods to fulfill its objectives. Consider the following guidelines as a flexible baseline for the design and implementation of the Phase I identification sampling strategy.

Urban. In addition to the information sources outlined above (beginning in Background Research), the following considerations apply to urban situations where documentary research is extremely important in the identification of urban archaeological resources. Documentary research must be performed prior to conducting the field survey and should focus on the development of the APE over time, from its pre-urban horizons through to its urban florescence, typically during the twentieth century. The scope of the Phase I research should incorporate discussions of broad social, economic, architectural, technological, ethnic, and other historical and cultural trends in the APE, specifically as these relate to the possibility that significant subsurface archaeological resources are or are not likely to be preserved. For example, the effect of municipal services such as water, sewer, and trash disposal should be considered. The Phase I research should also focus on the effects of the urbanization process on the APE. This phase of investigation should assess the possibility that earlier construction destroyed or has disturbed archaeological resources through grading, blasting, excavation for cellars, subways, sewers, etc. The information should discuss the extent to which earlier construction techniques and projects affected the potential preservation of buried archaeological resources. The result of the documentary research should justify the need for archaeological investigations by outlining expectations that the archaeological deposits are potentially NRHP eligible and substantially intact.

E. Geographic Information System Modeling

For large-scale undertakings involving hundreds or thousands of acres it is common practice to develop a predictive model summarizing the relative probability of encountering certain types of archaeological resources across broad terrain. In the absence of an established set of predictive models covering the State of Ohio, investigators create their own models for APEs and/or undertaking types. Almost all rely upon comparing existing archaeological resource location datasets to environmental datasets (e.g., general soil types, distance to permanent water sources, degree of slope) to identify probability zones (e.g. high and low). The models go further to either implicitly or explicitly link archaeological resource types to NRHP eligibility determinations. Predicted locations of archaeological resource types considered most likely to be determined eligible are intensively sampled; while those locations of less likely eligible archaeological resource types are less intensively sampled or excluded from the survey. Differential survey strategies connected to probability zones are

allowable but complete exclusion of parts of the landscape introduce bias and compromises the testing of the predictive model.

Geographic information system (GIS) modeling must always be evaluated and refined as to its utility (or lack thereof) in identifying archaeological resources. The goal of these models are not to simply eliminate areas from Phase I identification, but rather to use the results of a tested model to effectively identify where archaeological resources are likely to occur so that the most appropriate survey method(s) can be utilized in the most effective way now and in the future. Models also need to demonstrate what kind of information is most helpful in determining the potential for archaeological resources, and they must also consider what kinds of NRHP eligible archaeological resources are most likely to exist at a given location. **All large-scale undertakings (100 acres or larger) that utilize GIS modeling to exclude areas from survey must therefore be reviewed by SHPO prior to the start of any Phase I field investigations.**

F. Phase I Identification- Field Investigation

Field investigation will be done after the development of an appropriate sampling strategy that includes the nature and extent of the undertaking, current and historic land use, background research and proposes adequate survey methodologies and instruments to identify archaeological resources in the APE. There are no standard techniques that can be rotely applied in all situations. All methodologies should be derived from and justified by the situation and the background information. The procedures outlined here are a suggested baseline. Procedures that fall below this baseline are acceptable if justified by the sampling strategy and agreed to via consultation with SHPO and other consulting parties.

All field investigations should start with a thorough walkover of the entire APE, including a thorough examination of areas where the ground moderately to severely slopes for the presence of rockshelters, rock ledges, or caves, as well as for trash disposal areas and eroded artifacts/features at or from the top of the slope. The walkover should be documented with photographs. The use of Global Positioning Systems (GPS) with sub-meter accuracy is encouraged for all archaeological surveys. GPS should be used to record the boundaries of all individual surveyed areas and the location of shovel/deep test units, artifact locations and/or artifact distributions, and above-ground buildings, structures, objects, or prominent landscape features within the surveyed area. Cultural features and anomalies of archaeological interest must be recorded using a GPS receiver with sub-decimeter accuracy

1. Surface Collection

a) An important consideration is the widespread use of "no-till" farm practices in Ohio. No-till farming (also called zero tillage or direct drilling) is an agricultural technique for growing crops or pasture without disturbing the soil through tillage. In some cases, low-till methods combine till and no-till methods. For example, some approaches may use a limited amount of shallow disc harrowing but no plowing. The visibility and nature of surficial cultural materials present at an archaeological resource will be directly affected by the method of farming employed. All ground conditions should be thoroughly documented and considered when evaluating the nature, extent, and density of archaeological materials during ground surface inspections.

b) All open and undeveloped areas with sufficient ground surface visibility (greater than 50 percent) can be systematically inspected at intervals of 5 to 10 meters. If archaeological materials are visible at the ground surface, a controlled surface collection of these materials should be made. Use of a grid or piece-plotting may be employed to define provenience for each object to the level of the sampling framework, i.e., 3-4 meters along a transect.

c) Plowing and disking of fallow and/or no-till fields may be used to improve ground surface visibility. Sufficient time must be allotted to allow the newly plowed ground to be rain washed.

d) A single shovel test unit (0.5-m x 0.5-m) to determine depth of topsoil/plowzone should be excavated within the boundaries of an archaeological resource that is recommended for Phase II evaluation. Additional shovel tests, at the investigator's discretion, may be necessary if the archaeological resource extends across different topographic features.

e) Archaeological resource boundaries must be based on cultural material proximity and landform. Cultural materials found at distances greater than 20 meters apart generally require treatment as a separate archaeological resource unless it occupies the same landform.

2. Shovel Testing

a) Hand excavation of 0.5-m x 0.5-m (square) shovel test units may be employed where plowing, disking, and weathering are not feasible and must be employed in areas with an undisturbed topsoil.

b) Shovel test unit interval (the distance that separates two adjacent units) should not exceed 15 meters. All shovel test units should be excavated in natural stratigraphic levels or 10 cm levels within natural levels to depths reaching bedrock or parent glacial material, or in

which no archaeological materials are discovered. In the case of deep soil profiles, shovel test units should be excavated to at least 50 cm depth below ground surface. If culturally sterile soil or bedrock has not been reached at a depth of 50 cm, procedures for deep testing should be followed.

c) Close-interval shovel testing, less than 15-meter intervals on a block grid, may be appropriate to further investigate soil conditions and/or to better assess the distribution and density of archaeological materials.

d) All soil from each natural or 10 cm level in each shovel test unit should be screened through ¼ inch mesh hardware cloth to test for the presence of archaeological materials. Troweling through the removed soil may be employed as an alternative to screening in areas of high clay content soils with low potential for archaeological materials. This alternative approach must be discussed and justified in the sampling strategy.

e) Notes must be kept on each shovel test unit documenting its location, soil stratigraphy, Munsell color codes, depth, and the presence or absence of artifacts. A representative sample of shovel tests should be documented with photographs and profile drawings.

f) Archaeological resource boundaries must be based on cultural material proximity and landform. Cultural materials found at distances greater than 20 meters apart generally require treatment as a separate archaeological resource unless it occupies the same landform.

3. Deep Testing

a) Deep testing and/or geophysical survey is required in areas where cultural bearing strata may be deeply buried, i.e., below 50 cm.

b) The interval for testing in deeply stratified contexts is a 1 m x 1 m unit (screened) at 30 m intervals on a block grid. Deep testing should continue to a depth indicated by a geomorphologist as not likely to contain archaeological resources or 50 cm below the vertical APE. Deep testing can use hand or power augurs with 160 three-and-a-half-inch diameter, or 127 four-inch diameter, or 32 eight-inch diameter auger holes per 30 m as the equivalent of one 1 m x 1 m unit. When the vertical APE exceeds 1.5 meter in depth, larger hand excavated test units or backhoe trenches will be necessary.

c) Additional geomorphological or soil studies may be appropriate where particularly complex or unusual conditions of soil deposition exist. If in doubt SHPO should be consulted.

d) Regardless of the investigative method employed, a geomorphologist should be consulted for the identification of buried soil horizons.

e) Archaeological resource boundaries must be based on cultural feature and/or material proximity and landform. The horizontal and vertical boundary must be clearly documented. Estimates as to the full horizontal extent of the boundaries should also be provided within the report.

f) All deep tests must be conducted in a manner consistent with the U.S. Department of Labor's Occupational Safety and Health Administration's Standards for Excavating Trenches.

Urban Settings. Archaeological investigation in urban situations can pose unique accessibility and safety challenges. Where the APE is accessible, testing is expected. Background research should determine whether protective safety equipment is required. If field investigations to verify the presence and integrity of archaeological resources as identified by the background research cannot be accomplished at this stage of the survey the Phase I report should state the justification for the decision and suggest an appropriate alternative. Further consultation with SHPO will be necessary. Guidance on subsurface testing in urban areas is contained in Field Investigation in the following section on Phase II survey.

4. Geophysical Survey

The standard site identification methods presented above are conventionally employed; however, the use of geophysical instruments for the identification of subsurface features and deposits has proven efficient and effective. In cases where an American Indian burial mound, earthwork complex, or cemetery is known or thought to be within the APE then geophysical survey is SHPO's preferred method of investigation. **Justification for use of geophysical instruments for Phase I identification as an alternative to conventional identification methods must be built into the sampling strategy and coordinated with SHPO prior to implementation.**

Resistivity, magnetometer, and other remote sensing techniques have been refined and used with considerable success in identifying potential sub-surface cultural features under certain conditions. The success of these techniques is highly dependent on bedrock and soil conditions, feature size and composition, depth of features, as well as the skill and sophistication of the user. Certain conditions (i.e., bedrock at or near the ground surface, consistently or periodically high-water tables, soils with hard pans,

fragipans, gravel concentrations, and high iron contents) may preclude the use of some of these techniques.

Although remote sensing techniques are, under certain conditions, an effective and efficient means to obtain information on the number and range of anomalies that may be features and their distribution, they do not allow for the full characterization of anomalies without coring or selective excavation, i.e., ground-truthing. That said, alone systematic surface collection and subsurface testing are poor sampling techniques for identifying anomalies that may be archaeological features and their distribution. Yet the techniques complement each other and can provide a more robust Phase I identification.

The geophysical instruments tabled below represent "best practice" for identifying the targeted archaeological resources. They are subject to change as the technology improves and new applications are discovered. The magnetic gradiometer is the recommended instrument for survey when and where practicable. The magnetic gradiometer can be pared with the electromagnetic conductivity meter for better results. For geophysical survey focused on historic-era resources (e.g., stone foundations, privies, wells, and cisterns) and cemeteries, ground penetrating radar and/or electrical resistivity can be used to either compliment or replace the magnetic gradiometer. The minimal acceptable standards for these instruments are provided in the table below.

INSTRUMENT	DATA DENSITY	TRANSECT SPACING	DEPTH	PREFERRED TARGETS
Magnetic Gradiometer	10 samples per meter	50 cm	Base of plowzone/ 1+ meter	Burned Soil Prehistoric features Iron objects Magnetic rocks
Ground Penetrating Radar	20-50 Traces per meter	25-50 cm	Varies w/ soil type 0.70- 3+ meters	Graves* Foundations Rock-filled pits
Electrical Resistance	2 samples per meter	50-100 cm	0 – 70cm	Soil moisture Earthworks Roads Foundations
Electromagnetic Conductivity Meter	8-10 per meter	50 cm		Earthworks Foundations Roads Prehistoric features Middens

* See the Cemeteries, Burial Mounds, and Other Burial Places chapter of *Archaeology Guidelines* for further discussion

Additional expectations for any geophysical survey include:

a) Vegetation within the survey area must be removed or cut to a height of 2 to 4 inches prior to survey.

b) If the survey is done on a grid, semi-permanent datum points recorded using a GPS receiver with sub-decimeter accuracy must mark the geophysical grid corners.

c) Geophysical anomalies of archaeological interest must be ground-truthed via soil coring and/or hand excavation. The presence of burnt soil, microdebitage, ceramic, dark organic soil, and/or charcoal/ash may be used as indicators of a pre-contact feature, with brick, mortar, glass, refined ceramic, and corroded metal for a historic-era feature.

d) If field conditions allow the area where geophysical anomalies of archaeological interest are identified should be surface collected.

e) Geophysical anomalies verified as cultural features in isolation or clusters must be recorded on an Ohio Archaeological Inventory (OAI) form.

f) Archaeological resource boundaries must be based on cultural anomaly proximity and landform.

g) Detailed discussion of the instruments used, how the data was collected, and field conditions must be included in the Phase I identification report.

h) Field notes and when possible unprocessed sensor data must be provided with the Phase I identification report.

i) Inconclusive and/or negative soil cores may be an indication of leaching and organic decomposition due to the extreme age of a cultural feature. Stone preventing core penetration may represent fire-cracked rock. Verification of the soil coring may be necessary (e.g., hand excavation to expose the anomaly in plan view) when the geophysical data and soil coring suggests incongruent results.

j) Interpretation of the data and classification of geophysical anomalies must be done by or under the direct supervision of a qualified professional with proven experience for applying this technique to archaeological resource identification in the eastern United States.

For more detailed discussion see the supplement entitled, Geophysical Survey.

Ohio's American Indian earthworks are among the most significant prehistoric features on the landscape. However, their surface expressions have been lost to agricultural practices and modern development. That does not mean they are destroyed, or they have lost the integrity to yield important information. Current and historic aerial photography, LiDAR, and 19th century illustrations are all useful tools in locating earthworks, but recent use of geophysical instruments has shown that these resources are often much larger, more complex, and occur more frequently than archaeologists have previously understood. Outside of the footprint of the earthen structure, pits, posts, and other important features likely occur. If an earthwork is within the APE, SHPO will likely recommend a magnetometer survey and/or other geophysical survey be conducted.

5. Metal Detector Survey

Metal detector survey play an important role in the identification and understanding of early historic frontier sites, historic-era village sites, forts, and battlefields. Use of metal detectors should supplement conventional site identification and/or testing methods, as determined by the sampling strategy.

Metal detector coverage should be based on research objectives, but at a minimum, should be conducted systematically along 2-meter lanes, within

20-meter blocks. Vegetation and leaf litter may need to be removed within the survey blocks to allow for adequate coverage. Plastic shaft pin flags are used to mark "target" locations. Targets must be investigated (typically with trowel and pinpointer) with verified artifacts cataloged and their proveniences recorded via GPS with sub-meter accuracy.

Reported results of a metal detector survey must include overall methodology, survey coverage, and a discussion of how metal detection aids and enhances the survey. The methodology description must include the survey equipment type, personnel/qualifications, operation mode and time spent in detection. If sampling is used, the type of sampling (e.g., every third transect swept or only iron targets excavated) must be justified and discussed. Mapping graphics should illustrate the width and orientation of detection lanes, pin flag locations, and any excavations placed for ground truthing.

Although no specific make or model detector is recommended, the equipment used for survey should at a minimum comprise the following:

a) Ability to discriminate between metal types

b) Ground balance capabilities

c) A search coil measuring greater than or equal to 20 cm in diameter

d) Ability to pinpoint

In addition, the use of good quality noise canceling headphones is highly recommended.

The metal detecting operators must be qualified professionals with proven experience applying this technique to archaeological site survey. Inexperienced operators may be used but the ratio of novices to qualified professional should not exceed 4 to 1.

6. Rockshelters

Unique depositional environments such as rockshelters must be visually inspected for evidence of artifacts, petroglyphs, polissoirs, cupstones, etc. If no cultural materials are observed on the shelter's interior surface or talus slope, at least one shovel test (0.5-m x 0.5-m) should be excavated inside the shelter. If the interior shovel test cannot be excavated due to excessive rock fall, then a shovel test beyond the drip line or on the talus slope will suffice.

The height of the ceiling and the depth of the shelter should be recorded, and a photograph of the rockshelter taken. GPS should be used to record

the location of the rockshelter and/ or shovel test units.

7. Submerged Resources

Ohio's northern border includes over 310 miles of shoreline along Lake Erie and the coastal islands, with approximately 600 shipwrecks estimated to have been lost within Ohio waters. While shipwrecks are the most recognized type of submerged archaeological resource, they are not the only resource anticipated from submerged contexts, nor is Lake Erie the only location with the potential to contain submerged archaeological resources. Navigable waterways, including streams, rivers, lakes, and reservoirs may all contain evidence of past human activity. Archaeological resources may also be identified within streambanks and along eroding shorelines. Background research should address the potential for shipwrecks as well as the potential for early industrial structures/remnants or inundated (formerly terrestrial) archaeological resources.

When the APE includes the potential for submerged archaeological resources that cannot be readily seen through visual inspection of the seafloor, lakebed, or riverbed, a remote-sensing survey may be necessary. The methods described below represent "best practice" using commonly available tools and techniques as applied to the identification of Ohio's submerged resources. If archaeological resources are identified and occur within Lake Erie, consultation with ODNR and SHPO is required to determine the most appropriate course of action.

a) General requirements for all submerged resource surveys, include:

   (1) A differentially-corrected global positioning system receiver or system of equal or greater accuracy to continuously log the surface position of the vessel.

   (2) Surveys for linear undertakings, such as submerged transmission cables or pipelines, should include a centerline based on the projected path of the infrastructure to be installed, and offsets to either side. The use of a centerline is intended to allow for collection of data directly along the area to be impacted by operations.

   (3) The report must identify all project personnel and their role(s), equipment specifications and settings used in the survey, field and operating conditions, survey procedures, data quality, discussion of any data acquisition issues/problems that impact quality or interpretation, and post-processing procedures (including software used and workflows followed).

(4) Operation of equipment and data interpretation must be done by or under the direct supervision of a qualified maritime archaeologists.

The selection of remote sensing instruments for the inspection of the submerged portion of the APE is dependent upon the goals of the survey. Marine magnetometers are capable of penetrating multiple sediment layers and locating ferrous objects. The side scan sonar, commonly used to locate shipwrecks, provides imagery across large areas that discerns different features on the seafloor, lakebed, or riverbed. The minimal acceptable standards for these instruments are:

a) Marine Magnetometer

(1) For towed devices, magnetometer towfish should be pulled behind the vessel at a distance of at least three times the length of the vessel, or as appropriate based on hull material to eliminate vessel interference.

(2) The towfish altitude must not exceed 6 meters from the seafloor, lakebed, or riverbed.

(3) The data sampling interval must record at 1-second intervals or less.

(4) Magnetometer sensitivity should not exceed one gamma (γ) or one nanoTesla (nT).

(5) Parallel survey lanes should be 15 m apart, but never more than 30 m.

b) Side Scan Sonar

(1) Side scan sonar must be a dual-frequency system that records data digitally.

(2) Side scan sonar frequency must be a minimum of 300–500 kHz.

(3) Line spacing should be selected to ensure 100% overlap (200% coverage) of survey area.

(4) Towfish height should be between 10 and 20 percent of the range of the instrument.

G. Phase I Identification- No-Collection and In-Field Analysis

The use of no-collection and in-field analysis strategies may be preferred for a given undertaking. Justification for employing this technique must be made

clear in the report and can include agency/landowner requirements, the outcome of tribal consultation, resources that are 20th century refuse dumps, or work conducted on an NRHP listed archaeological property.

Expectations for use of this strategy will typically include:

1. Artifacts provenienced to shovel test unit, transect, or piece-plotted via sub-meter GPS.
2. Artifacts cleaned before analysis and photography.
3. Use of standardized artifact analysis forms for the recordation of material and artifact types as well as physical metric and nonmetric attributes such as shape, size, and decoration.
4. In-field photography of all diagnostic artifacts done on a neutral background with appropriate provenience labeling and scale.
5. Return of artifacts to location where found.
6. In-field analysis must be done by a qualified archaeologist familiar with the classification and analysis of artifacts typically encountered in Ohio.
7. Artifact analysis forms, artifact photographs, and other associated documentation must be included as an attachment to the Phase I Identification report.

H. Archaeological Monitoring

Monitoring is an acceptable practice in cases where the built environment impedes identification and evaluation efforts of archaeological resources or human remains are thought to be present but cannot be reasonably identified prior to construction. Decision and justification to utilize archaeological monitoring will be based upon consultation between the agency, SHPO and other consulting parties. Generally, SHPO will request that an archaeology monitoring plan or an agreement document/letter stipulating the protocols for monitoring be prepared for review prior to construction activities. The plan/protocols should include, but not be limited to:

1. A discussion on the objectives of the archaeological monitoring include types of resources expected.
2. The number of qualified archaeologists required during the monitoring.
3. If lineal descendants and/or Tribal representatives will work alongside the archaeologists, their responsibilities and authority.
4. The area of archaeological monitoring must be included on project plans along with a construction plan note summarizing the stipulations

of the archaeological monitoring plan. It is imperative that the construction contractor knows exactly what is expected of them.

5. Details as to who is responsible for notifying the monitoring personnel and others as appropriate and the time required to mobilize before start of construction activities within the specified monitoring area.
6. A clear statement by the agency or applicant empowering the monitoring archaeologists to halt construction excavations in order to assess and document archaeological resources discovered.
7. Specifications as to actions required by the monitoring archaeologist when archaeological resources are encountered.
8. Protocols for consultation and decision making.
9. Requirements to maintain a daily journal by the monitoring archaeologist(s). The journal describes the areas and activities monitored, what was encountered, any issues or concerns that were encountered, and how the issues or concerns (if any) were resolved.
10. Discussion regarding the preparation and dissemination of monitoring report.
11. Specific measures to ensure the safety of the monitoring personnel including specialized safety-related training requirements.

It is important to understand that monitoring alone does not meet an agency's responsibility to make a reasonable and good faith effort to identify NRHP eligible archaeological properties prior to construction activities, consider the effect of the undertaking on them, or to provide SHPO, tribes, other consulting parties, and Advisory Council on Historic Preservation an opportunity to comment.

I. Tribal Monitor

The inclusion of a tribal monitor during any phase of archaeological activity and/or construction activities results from consultation between the agency and the tribe(s), especially when an undertaking involves a historic property of religious and cultural significance to the tribe(s) and/or the protection of their ancestral remains. To ensure good communication and relationships, protocols should be in place prior to any archaeological or construction activities that require the presence of a tribal monitor. These protocols must be established by the agency in consultation with the tribe(s) and shared with all other pertinent consulting parties. Protocols include:

1. Establish the role of the tribal monitor
2. Type of recordation and activities allowed

3. Consultation and decision-making requirements
4. The treatment of ancestral remains and artifacts (if applicable)
5. The tribal monitor must be made aware of all safety rules and participate in safety training required.
6. The tribal monitor must abide by all safety rules and wear the required protective equipment.

Guidance regarding documentation of all American Indian ancestral remains and associated funerary objects:

- All American Indian ancestral remains and associated funerary objects must be treated with care, dignity, and respect.
- All American Indian ancestral remains and associated funerary objects must not be publicly displayed or photographed without written consent from the consulting tribes.
- No destructive analysis of human remains and associated funerary objects can be conducted without the written permission from the consulting tribes.
- Reports documenting the location of American Indian ancestral remains must be marked "Contains Sensitive Material" on the cover of the report.

J. Human Remains

A human burial treatment plan will be developed through consultation and coordination with lineal descendants, tribes, SHPO, the lead agency, and relevant consulting parties when human remains are encountered during Phase I identifications. Principles concerning the treatment of human remains are found in the chapter entitled, **Cemeteries, Burial Mounds, and Other Burial Places** within the *Archaeology Guidelines.*

K. Phase I Analysis

Artifacts recovered during Phase I testing should be treated according to current standards of archaeological documentation. A summary of metric and non-metric attributes should be provided, as appropriate. Identification and tabulation of artifacts as well as distribution patterns should be the primary concerns of analysis.

In general, artifacts should be classified by material (lithic, ceramic, metal, etc.) and functional type (e.g., projectile point, nail, and flake) and tabulated by count and percentage. Whenever possible, cultural/chronological types (e.g., Brewerton corner-notched point, Fayette Thick, Levanna Cord-On-Cord, etc.) and raw material types for lithic artifacts (Upper Mercer flint, Flint Ridge chalcedony) and pre-contact ceramic tempering should be specified. Identifiable faunal or floral

remains should be tabulated by taxon and number. When in doubt, under specify, for an unambiguous general label is preferable to an unsupported or questionable specific label.

For historic-era archaeological materials, in addition to above classes of items, analysis should specify and tabulate ceramics by type (paste, ware, manufacturer, if known); metal by type and manufacturing technique, if known; date if known, or by mean date or chronological parameter, and what techniques and artifacts were used to establish the date; and glass by color and type. Other materials should be tabulated by type and number. Abundant and generally non-diagnostic materials (e.g., slag) may be indicated as present or absent. Identifiable faunal or floral remains should be tabulated by taxon and number.

Phase II. Evaluation

A Phase II evaluation is designed to sample more intensely the archaeological resources recommended for further investigations by the agency and SHPO and provide informed decisions as to their significance. A Phase II evaluation may involve efforts designed to reveal more detailed information on stratification, the presence of features, paleo environment, artifact assemblage, chronology, and spatial boundaries, site integrity, among others. The objective of the investigation is to provide sufficient evidence of the resource's likelihood to yield important information and document its aspects of integrity when compared to other similar types of archaeological resources in the local area, region, state, or nation. The results of the Phase II evaluation are documented and summarized in a report reviewed by the agency, SHPO, and other consulting parties. A statement concerning how each archaeological resource meets or does not meet the NRHP criteria for eligibility must be included in the report.

A. Phase II Background Research

The purpose of background research in Phase II evaluation is to build upon the Phase I results by providing specific contextual framework(s) for determining the NRHP significance of each archaeological resource. This will normally involve:

1. A summary of the results of previous investigations and those resources recommended for additional Phase II survey. This should include tabulation of Phase I resource types, their artifact assemblages and their spatial and temporal distributions.
2. The local and/or regional settlement patterns within which the archaeological resources occur. Regional surveys, cultural resource management surveys, previous archaeological investigations in the

region or of similar resources may be relevant to this task. The investigator should demonstrate a thorough grasp of the relevant literature.

3. If historic-era archaeological resources apply, documentation of significant persons (related to NRHP criterion B) or events (related to NRHP criterion A) associated with the APE or resources in the APE should be undertaken. This will allow a more informed evaluation of the APE considering the NRHP criteria. The minimum level of documentary research for a Phase II evaluation includes primary and secondary documents not previously consulted. They should be examined and assessed for the relevant information they contain. Typical classes of documents that should be consulted include but are not limited to: original land surveys, deeds, tax assessments, insurance surveys, census data, road dockets, city directories, maps and atlases, city plots, building permits, lithographs, photographs, LiDAR imagery, and other public and private records as may be available for achieving the goals of the Phase II evaluation. National Register Bulletin 39 *Researching a Historic Property*, provides further guidance.

4. A discussion of geomorphology, soils, local climate, and biota as they relate to archaeological resource formation and preservation processes, as well as to the local or regional settlement systems through time.

5. A summary of the types of data that the archaeological resource is expected to yield, based on a consideration of similar archaeological resources and previous information from the archaeological resource under study.

Urban. Additional and intensive background research will usually be necessary to define the significance, extent, and distribution of features identified in the Phase I survey. Since Phase I field testing in urban situations will normally be limited, background research is a particularly crucial component of urban Phase II evaluation in defining the resource's nature and significance. In unban situations it is particularly important that a major portion of the documentary research be completed prior to fieldwork, since the results of this research will guide Phase II methodology and determine the appropriate techniques and testing locations.

- Particular attention should be given to the history of city services such as water, sewer, and trash collection as they affect the nature of archaeological resources. These activities affect the nature of the archaeological record and must be included in the report, as appropriate.
- Investigators should consult the reports of earlier archaeological investigations, ordinances and resolutions, health department records, utility company records, and other municipal records and maps.
- The differences between public policy and actual practice, and how they may have affected the archaeological record should be discussed.

B. Phase II Evaluation. Field Investigation

Field investigation in Phase II evaluation should be oriented toward the recovery of information critical to the determination of NRHP eligibility. Evaluation of significance and integrity is the goal of Phase II evaluations, keeping the following objectives in mind:

1. Horizontal and vertical boundary definition or re-definition in order to determine the undertaking's effects.

2. Determining the nature, location, and extent of archaeological features. The presence of features alone may not be sufficient to establish NRHP eligibility. It must demonstrate that features may be likely to yield important information to be considered NRHP eligible. In considering the importance of features, the nature of the feature's contents and its state of preservation must be established.

3. Phase II evaluations may establish surface artifact distributions and their relationship to subsurface features and deposits. This can best be done by a more intensive and/or repeated applications of the systematic surface collection method used in Phase I identification. This can also be applied to more intensive subsurface testing and include intensive soil coring for the recovery of microdebitage distribution patterns.

4. Phase II evaluation can focus on the recovery of diagnostic artifacts, the recovery of radiocarbon samples, and the recording of geomorphological data that may provide approximate chronological limits to resource's occupation. SHPO encourages the collection and dating of carbon samples in Phase II, both for the purpose of determining the NRHP eligibility and building regional chronologies.

5. Because of the importance of stratified archaeological resources in defining regional or local chronologies, culture histories, and cultural system interrelationships, the identification of stratified deposits should be a goal of Phase II evaluation.

6. Botanical and faunal material can yield important information on environment, diet, and subsistence practices. The potential of the archaeological resource to yield such samples should be evaluated by the systematic collection and examination of soil samples from sealed features and/or cultural deposits and strata. The development of a valid sampling design should be part of all Phase II methodologies.

C. Boundary Definition

Boundaries developed after Phase II evaluation should at a minimum encompass all elements (i.e., artifacts, features, deposits, and above or below-ground buildings, objects, and structures) that comprise the archaeological resource. Boundaries should be recorded with a sub-meter GPS and geo-reference plotted on appropriate scaled maps to show the resource's location and the undertaking's impacts to the resource's elements. For undertakings that only impact a portion of an archaeological resource (e.g., pipeline or sewer line rights-of-way) the extent of the resource elements within the right-of-way must be clearly established. When possible, archaeologists should seek to extend investigations outside the APE to allow better delineation of the resource's boundary and to provide a more complete characterization of the resource's elements. For undertakings impacting multiple archaeological resources, the boundaries of each resource within the APE must be determined. Determining the horizontal and vertical extent of the archaeological resource may involve:

1. The observed surface distribution of artifacts, keeping in mind that the pattern of durable items (lithics, fire-cracked rock, ceramic sherds, etc.) on the surface does not necessarily correlate with the location of features and other deposits and is rarely indicative of the full range of activities.

2. Shovel test units excavated at close intervals and/or larger excavation blocks or trenches to establish the maximum extent of artifacts, features, and deposits. A suggested strategy for an archaeological resource initially determined solely through surface collection is to place shovel test units at 5-10 m in a grid arrangement expanding outward until artifacts are consistently (2 or 3 contiguous units) not encountered.

3. The use of geophysical instruments across the entire landform or at least 10 m beyond the horizontal distribution of artifacts combined with ground-truthing methods.

D. Artifact Distribution

The choice of methods to define artifact distribution will, in part, depend on local conditions and the character of the resource. While alternative methods are welcomed, if justified, the techniques and standards include one or more of the following:

1. Intensive surface collection usually involves a combination of a walkover of the site area at small intervals (5 m or less) and intensive collection of a systematic sample. Intensive surface collection must also include plotting the artifacts found. These procedures rely on adequate surface visibility. Re-plowing is appropriate only if it can be ascertained that the topsoil has been disturbed by plowing or other action. Where the potential for undisturbed topsoil exists, other sampling procedures should be used (see Stratified Random Sampling and Systematic or Intentional Sampling).

2. Piece-plotting (exact provenience) is one surface collection technique that records each artifact location using sub-meter GPS units, a total station, or transit and tape (tied to a permanent datum and grid system). The artifacts are collected and curated by their provenience.

3. Another surface collection technique is the systematic-grid collection of artifacts from provenience block units no smaller than 2 m x 2m. This technique is particularly appropriate for large artifact-dense sites.

4. On certain historic-era and urban sites, a systematic use of metal detectors can be an effective means of defining the distribution of certain types of metal artifacts. The proposed metal detection plan for a specific archaeological site should be coordinated with SHPO prior the initiation of field work.

E. Feature Identification

The importance of cultural features determining NRHP eligibility cannot be understated. As part of the NRHP evaluation process, the investigator must determine whether the features are likely to yield important information. This evaluation will guide the choice of methods and techniques to discover and characterize features. The use of one or more of these techniques will depend on several considerations: size of resource, stratification topography, environmental features, Phase I identification results, and other sources of information (e.g., collector information, natural exposures of features, etc.).

Neither Phase I nor II work should disturb the archaeological resource any more than necessary to determine NRHP eligibility. The testing strategy should focus on obtaining a representative sample of features and their horizontal and vertical distribution. The advice of SHPO staff should be sought if questions arise.

1. Geophysical Survey Techniques

The highly effective application of archaeological geophysics with limited "ground-truthing" significantly reduces ground disturbance, can often be accomplished in a fraction of the time of test excavations, and can allow for a larger area to be investigated for less cost. Geophysics can be used as a substitute for other testing strategies but does not necessarily negate the need for test unit excavations or mechanical stripping of the plow zone or topsoil. The appropriate instrumentation and data processing will depend on geological conditions and type of data sought. Thus, investigators are to consult with specialists in developing their testing strategies.

If geophysics has not already done at the Phase I, SHPO highly recommends integrating geophysics with test unit excavations and/or mechanical stripping during Phase II to determine the density and horizontal extent of subsurface features. Geophysics can often be used on any size and shape of an APE. In general, isolated geophysical anomalies of archaeological interest should be verified via at least 1 m x 1 m test units and clustered groups of geophysical anomalies can be exposed by using test units or mechanical stripping. If all geophysical

anomalies cannot be exposed, at least in plan view, then the investigator should develop a sampling strategy applied to the geophysical anomalies. Negative areas or geophysical anomalies of marginal archaeological interest should also be investigated.

Further discussion about the use of geophysical survey is found under Phase I Identification- Geophysical Survey and in the supplement, Geophysical Survey.

2. Mechanical Topsoil Removal

Where it can be demonstrated that ground disturbance of the natural soil stratigraphy is limited to the topsoil (by plowing or other means), the mechanical removal of topsoil to expose features may be appropriate. This technique should only be used following the systematic collection of an artifacts, and where the information derived from material contained in the disturbed topsoil is insufficient to establish a resource's NRHP eligibility.

This, like the procedures described above, is a sampling procedure and should be explicitly justified in terms of the available data. A systematic or random sampling design may be used, but the chosen design must justify he number, size, and placement of mechanically stripped units. Mechanical stripping of the topsoil must be followed by hand-excavation with shovel, hoe, trowel, etc., to clean the subsoil surface and expose features. Mechanical stripping should stop when sufficient information is obtained to warrant a determination that an archaeological resource is NRHP eligible.

3. Test Units

For sites with stratified archaeological deposits, inadequate artifact sample, and/or where mechanical topsoil removal is not practical it may be necessary to hand excavate test units. Test unit size must be large enough to permit positive identification of features (and no less than 1 m x 1 m). Test unit placement must follow an explicit testing design which adequately samples all areas and yield quantifiable information on feature type occurrences and distribution.

F. Feature Characterization

To ensure comparability of results, certain procedures are to be applied in the treatment of archaeological features encountered in Phase I and II testing:

1. Prior to excavation, features are to be troweled and cleaned to expose them completely in plan view, them mapped and photographed.

2. Features are to be sectioned and profiled by hand excavation to reveal contours and stratigraphy with profiles recorded by drawings and photographs.

3. If stratified feature fill/matrix is apparent or suspected, the feature is to be excavated in natural stratigraphic levels or appropriate arbitrary levels (10 cm or less), with plan drawings and photographs, as appropriate.

4. A sample of fill not less than 3 liters in volume is to be recovered for floatation analysis (see below) from each feature or from each discrete level within a feature, as feasible. SHPO recommends sampling 25-50% of the fill from each feature or discrete level or 100%, if less than 3 liters are available.

5. All features are to be assigned unique and consistent feature numbers.

6. All artifacts recovered from features are to be bagged and labeled by provenience unit and feature number.

G. Stratigraphy

Stratified archaeological deposits are crucial to the definition of regional chronologies and cultural relationships. Documenting the potential for stratified deposits will be a primary concern in Phase II evaluation. This will frequently occur in conjunction with other procedures (e.g., those designed primarily to sample artifact distribution or locate features). In many cases, the potential for stratified deposits will have been established during Phase I testing, in which case Phase II procedures will simply confirm that potential and document the extent of such deposits. Regardless of the details, Phase II evaluation must enable the investigator to make definitive statements regarding the presence and extent of stratified deposits and to discuss the relationship of stratification to NRHP eligibility.

Documentation of stratigraphy should involve a consideration of both the potential for stratified deposits from the background information and the field results from the sampling strategy. Supplemental geomorphological investigations may be warranted during the Phase II evaluation, especially where there are indications of alluvial, colluvial, or eolian soil deposition, or in rockshelters with substantial soil deposition.

In any case, the Phase II evaluation should include test units that reveal the soil stratigraphy through Holocene levels to determine the presence or absence of stratified deposits throughout the resource. The number and placement of such tests will depend on the pedological characterization of the resource (i.e., the pattern of soil deposition, erosion, and development). Stratigraphic information may be obtained from test units for the identification and characterization of features and/or boundary determination but must convincingly document the presence or absence of stratified deposits and their distribution across the resource.

H. Dating

The dating of archaeological components is an essential condition for NRHP evaluation. In most cases, the artifact assemblage resulting from surface collection and test excavations will contain some temporally or culturally diagnostic artifacts and permit at least a preliminary dating of the archaeological resource or some of its components.

Dating based on diagnostic artifacts is often not precise. There is considerable uncertainty regarding the precise dates of many artifact styles commonly considered time markers. Certain artifact types considered diagnostic of a particular period may, in fact, have been made and used through several culture historical periods. Artifacts may be assigned to a certain class incorrectly. Diagnostic artifacts may be found in general surface collections or in questionable association with cultural features.

These problems and others beset the use of artifacts as time markers. Perhaps the most glaring problem is the absence of diagnostic artifacts from resources considered NRHP eligible. Archaeological resources with abundant features, faunal and botanical remains, or human skeletal remains may have few or no diagnostic remains.

SHPO recommends that diagnostic artifact dating and stratigraphic relationships be confirmed or cross-checked with absolute dating technique. Where diagnostic artifacts are absent, but the resource is thought to be NRHP eligible, it is essential that an effort be made to secure absolute dates.

The most common, most reliable, and least expensive absolute dating technique, and the one most appropriate to the environmental and archaeological conditions of Ohio, is radiocarbon dating. Phase II evaluations should include plans for the collection of carbon samples from features or objects (i.e. burnt nutshell, charred residue from inside ceramic sherds, etc.) that most closely date the feature or

object encountered. SHPO encourages radiocarbon dating for the purpose of evaluating archaeological resources and for establishing regional chronologies. Experimentation with alternative absolute dating techniques, such as thermoluminescence, hydration of glasses or cherts, and archaeomagnetism techniques is encouraged.

I. Botanical/Faunal Specimens

The potential of an archaeological resource to offer data on environment, subsistence, and diet is largely dependent on recovery and analysis of samples of animal and plant species contemporary with and used by its human occupants. The identification of this potential will, therefore, be one of the primary concerns of Phase II evaluation. Unless the resource is stratified, the collection of samples from general contexts (i.e., not from definable features) will not be productive. Therefore, attention should be focused on the retrieval of faunal and botanical remains from features through screening (¼ inch mesh or finer) and flotation.

At stratified archaeological resources, important information may be gained from the analysis of carefully excavated and provenienced stratigraphic columns. Flotation samples from such columns should be planned in addition to the flotation of feature contents. In general, such columns should be at least 30 cm x 30 cm in cross-section to provide sufficient volumes of soil for flotation and may be taken with soil samples for pedological or geomorphological analysis.

Analysis of flotation samples during Phase II evaluations is oriented toward the demonstration of research potential as a condition for NRHP eligibility. The analysis, therefore, will be preliminary and limited to the extent necessary to define research questions which might be addressed by data set. Sorting and counting specimens to their generic or specific level and by their distribution amongst the sampled feature types should permit the development of research questions. Such analysis may require the services of a specialist or the careful use of an adequate type collection.

J. Phase II Evaluation. Submerged Resources within Lake Erie

A survey design must be submitted to SHPO and ODNR, prior to the start of fieldwork, when submerged archaeological resource may be affected by the proposed undertaking. The research design must be developed by or with the help of an experienced maritime archaeologist and in consultation with SHPO, ODNR, and the agency. The survey design must be appropriate for the type of resource expected and the conditions in which survey will be undertaken.

K. Human Remains

A burial treatment plan will be developed through consultation and coordination with lineal descendants, tribes, SHPO, the lead agency, and all interested parties, when human remains are encountered during Phase II evaluations. The principles concerning human remains are found in the chapter entitled, **Cemeteries, Burial Mounds, and Other Burial Places** within the *Archaeology Guidelines.*

L. Phase II Evaluation. Urban Environments

Phase II evaluations in urban environments can pose some of the most complex and hazardous environments for safety and health concerns. As required, all personal protective equipment requirements and OSHA safety regulations must be strictly adhered to. Constraints imposed by urban conditions and the results of documentary research will be important factors in the development of the archaeological investigation. The minimum level of fieldwork necessary for a Phase II evaluation in the urban environment includes the following:

1. An adequate testing strategy that accounts for the full nature and extent of the anticipated resources must be developed in consultation with SHPO.

2. The testing design will be primarily non- random with test unit locations and sizes based on available documentary evidence and current conditions.

3. The testing should be designed to delineate the presence and distribution of architectural evidence, site stratification and features, in a sufficient amount and manner of information to determine the resource's NRHP eligibility in conjunction with the documentary evidence.

4. Sealed features that may contain large quantities of artifacts, such as privy or well shafts, do not require complete excavation at the Phase II level. The emphasis in this phase should be on recording and evaluating the potential information yield of such features. The assumption is that many such features will contain large quantities of artifacts in numerous strata, some of which may provide important information, while others may not. As there is no practical way to test the entire depth of a well or privy shaft, at the Phase II level it may be appropriate to excavate to the beginning of (but not through) an archaeologically important level.

5. The use of mechanized equipment such as backhoes, graders, front-end loaders, pneumatic drills and the like, may be desirable for exposure of archaeological resources, where extensive fill can be documented. The importance of the fill itself must be determined as

part of the Phase II evaluation. Emphasis should be placed upon the reasonable and effective limited use of mechanized equipment as a practical tool in conducting timely and cost-effective testing in the urban environment. This equipment serves as a complement to, not a substitute for, more conventional archaeological field methodologies.

6. The choice of when to employ mechanical or hand excavation techniques in urban archaeological settings must be carefully considered and justified in the testing strategy to optimize the achievement of the overall goals and objectives.

7. Careful examination of hand or machine-excavated soil matrices should always be undertaken.

8. Plan and profile drawings and photographs should document each step of the excavation procedure with representative images selected for use in the final report.

9. Safety precautions should be taken at all times. Nothing in these guidelines is intended to require unsafe working conditions.

Phase III. Treatment of Adverse Effect

When an NRHP listed or eligible archaeological resource is adversely affected by an undertaking, mitigation of the adverse effects through data recovery may be the treatment resolution agreed to by the parties involved. In general, data recovery involves relatively large-scale excavations, detailed laboratory analysis, and the production of reports containing the results of the archaeological investigation. Phase I and II studies will direct some of the important information to be sought, but consulting parties may want the recovery of other categories of information as well. It is essential that Phase III research designs be developed in consultation with SHPO and consulting parties.

A sample outline for a Phase III data recovery:

Goal: Recover the important data through archaeological excavation prior to the total or partial destruction of an archaeological resource by the undertaking.

Procedures to Achieve Goal

1. Maximize data retrieval through the use of an explicit research design.
2. Determine intra-site and inter-site variability in artifact content, feature types, settlement patterns, etc.
3. Disseminate recovered information through technical and popular reports and publications, professional and public presentations and exhibits, social media videos and podcasts, and/or tours during the data recovery for the public, professional, and descendant communities.

Background Research Activities

1. Formulate hypotheses to be tested.
2. Define suitable excavation strategies with assistance from pertinent participating agencies, such as SHPO, Tribal Historic Preservation Offices (THPO), National Park Service, Advisory Council on Historic Preservation, and regional or local archaeological organizations and societies, etc.
3. Summarize previous work.
4. Analyze collections from the resource.
5. Cite appropriate resources from the literature and documentary resources enumerated under Background Research for Phase I and Phase II.

A. Field Procedures

1. Adhere to all personal protective equipment requirements and document how all applicable OSHA and OHIO811 safety regulations were followed.

2. Conduct systematic excavation resulting in recovery of a representative and comprehensive samples from the archaeological resource. For most undertakings, excavation of less than 100% of the resource's area may be acceptable, based on artifact and feature distribution analysis.

3. Excavation may be limited to the undertaking's construction footprint. For certain undertakings, inclusion of an excavated sample outside of the directly impacted area may be recommended.

4. Some of the methods described under Field Investigation (for Phase I and for Phase II) may also be applicable.

5. Use state-of-the-art methods necessary to maximize data collection regarding stratigraphy, features, artifacts, ecofacts, etc., developed in consultation with SHPO and other consulting parties.

B. Artifact Analysis

1. The procedures described under Analysis for Phase I and for Phase II are applicable.

2. Employ appropriate procedures under the direction of recognized specialists for specialized artifact analyses and dating techniques, such as radiocarbon and thermoluminescence, residue analysis, artifact composition analysis, microwear, pollen, etc.

3. Test hypotheses and report results in an appropriate scientific manner. Describe the importance of the information to Ohio archaeology.

Report Standards (as outlined in the chapter entitled, Archaeology Report Formats within the *Archaeology Guidelines*).

G. **Report Standards** to the public through popular publications, presentations, video, audio, web-based media, exhibits, etc.