I. INTRODUCTION

This work is dedicated to an understanding of prehistoric Native American technology, settlement patterns, and subsistence practices. The research centers on survey, testing, and excavation of an archaeological site (7-NC-F-18; N-3778) located on Lums Pond State Park, in New Castle County, Delaware (Figure 1). We attempt to show that the Lums Pond investigation contributes to an understanding of the adaptations of Native American inhabitants in the Upper Coastal Plain of Delaware during the last 6,000 years, a period which saw significant changes in societal complexity, with populations changing from small, highly mobile groups of hunter-gathers to larger groups of semi-sedentary horticulturists. Throughout the course of the 6,000 year use span of the Lums Pond site, the various occupations were relatively brief, as indicated by non-overlapping, low density spreads of artifacts and features over a wide area. The Lums Pond site research design, the field and laboratory methods, and the interpretations may be viewed as a case study in the investigation of such temporary locales, and the relationship of such sites in the context of a regional environment and settlement system.

The Delaware Route 896 Improvement Project

The archaeological investigations at Lums Pond State Park resulted from needed improvements and widening of the Delaware Route 896. As part of an continuing commitment to the transportation needs of the state of Delaware, the Delaware Department of Transportation (DelDOT), in conjunction with the Federal Highway Administration, has undertaken the improvement of a 6.3 mile segment of Delaware Route 896 south of Newark, in the western portion of New Castle County. The improvements were aimed at providing relief of current traffic congestion and safety deficiencies along the corridor, as well as accommodating significant increases projected in future traffic loads. Plans were made to expand the existing two-lane highway to a four-lane divided highway and to make improvements to intersections along the way. As originally planned, the project extended from Delaware Route 4, southward across I-95 and US Route 40, and on to the approach to the four-lane Summit Bridge over the Chesapeake and Delaware Canal.

Planning for the SR896 project was conducted in accordance with best land management practices as required on the federal, state, and local level. Assessments were conducted to examine alternatives that had the least adverse impact on socioeconomic patterns and the environment, including air quality, noise, water resources, wildlife, and cultural resources. The cultural resources investigations were conducted in

compliance with federal and state regulations and guidelines, which have been formulated to protect significant historical resources. The investigations were carried out in accordance with Section 106 of the National Historic Preservation Act, as amended, the standards of the Advisory Council on Historic Preservation (36CFR800), Section 138 of the Federal Highway Act, and the Delaware State Historic Preservation Office (SHPO) guidelines. The cultural resources investigations were therefore mandated by federal regulations and public revenues were used to benefit a wide audience. The current report is thereby tailored to satisfy both public and professional interests.

DelDOT began preliminary consultation and coordination with the Delaware State Historic Preservation Officer and the Delaware Bureau of Archaeology and Historic Preservation in 1981. As project limits lengthened, coordination expanded and included the New Castle County Historic Preservation Planner. To ensure the protection of significant cultural resources, initial work was to include a review of available state inventoried information on the history and prehistory of the area and field inspection of known resources and areas with potential to contain resources. An important source of information was a multi-resource architectural survey of Pencader Hundred previously conducted by the County in conjunction with the Delaware SHPO staff. Properties and districts that were listed on or potentially eligible for listing on the National Register of Historic Places were identified. This resulted in additional architectural and archaeological investigations that were initiated in 1986 under DelDOT contract.

Cultural resource survey and testing was conducted along portions of the corridor in 1985 and 1986 by archaeologists at the Center for Archaeological Research at the University of Delaware. The findings and results of these investigations are included in the reports entitled, *Phase I & II Archaeological Investigations of the Route 896 Corridor* (Lothrop et al. 1987) and *Architectural Investigations of the Route 896 Corridor* (Bowers 1987). The combined archaeological and architectural investigation efforts resulted in 49 locations being initially identified as either archaeological sites or structures, and these were subsequently evaluated within the broad area of potential environmental impacts. The individual sites and their significance will be discussed in some detail later in this report.

Following the initial investigations, several parts of the corridor remained unsurveyed, including a short section of the road adjacent to Iron Hill, two areas near the intersection with Old Cooches Bridge Road (RD 408) that were planned for the installation of stormwater management facilities, and a wetland mitigation area proposed in a portion of Lums Pond State Park adjacent to the highway. The Lums Pond Mitigation Area was selected through an agency agreement to replace wetlands disturbed as a result of the partial infilling of Muddy Run. Archaeological survey and testing of these areas was conducted by archaeologists from the Cultural Resources Department of Parsons Engineering Science, Inc., in May of 1994 and January of 1995. The results of the survey of the road segment and the proposed stormwater management facilities are reported in a separate volume, *Phase II Archaeological Investigations at Iron Hill East (7NC-D-108), and Phase I Archaeological Investigations at two Stormwater Management Areas, State Route 896, New Castle County, Delaware* (Petraglia and Knepper 1995). The current volume presents the details of the archaeological investigations at Lums Pond.

Lums Pond State Park

Lums Pond State Park is a 1200-acre reserve located at the headwaters of St. Georges Creek, a tributary of the Delaware River (Figure 2). The park lies east of Delaware Route 896, adjacent to the highway right-of-way and immediately north of the Chesapeake and Delaware Canal. The area generally consists of poorly drained woodlands lying on the drainage divide between the Delaware River and the Chesapeake Bay (Wise 1983). At the center of the park is Lums Pond, an artificial impoundment of St. Georges Creek. Lums Pond was originally constructed as a millpond in the mid-eighteenth century, and has been enlarged several times in the nineteenth and twentieth centuries for use in association with the Chesapeake and Delaware Canal lock at Summit. It currently serves as a recreational facility.

A cultural resources survey of the park was carried out in 1983 by Cara Wise, Division of Parks and Recreation Archaeologist (Wise 1983). Ten historic period sites

and eleven prehistoric sites were documented within the boundaries of the park. One of the prehistoric sites (7NC-F-18; N-3778), had previously been discovered in an active agricultural field near the intersection of Delaware Route 896 and Howell School Road. Thereafter, the field lay fallow and became densely overgrown with vines, briars, and ivies until it was subject to the current archaeological investigation. At the time of this survey, the precise location and nature of the previously recorded site was unknown, and thus resurvey and testing of the field were required prior to development of the area for the wetland mitigation.

Report Organization

This report begins with an initial review of the history of archaeological research in the region, passing into presentation of information derived from the Lums Pond field and laboratory investigations, and concluding with interpretations and issues raised from the study. To satisfy both public and professional interests, the report is necessarily divided into two volumes. Volume I, the present volume, is an overview and synthesis of all the technical data, whereas Volume II provides the technical background details from which the interpretations are derived. Chapter I of the present volume introduces the SR 896 project and the Lums Pond investigations, describing the general approach of the cultural resources investigations. The following chapter, Chapter II, reviews the environmental and cultural background for the project area, presenting information about the physical environment, aspects of the environment to which human groups adapted, and data concerning the cultural development of the region, from earliest Native American settlement to European occupation. Chapter III covers the history of archaeological research conducted in the project area vicinity, and provides a summary of the kinds of archaeological resources present in the area. Chapter IV provides a description of the initial field investigations, including the goals of the survey and evaluative testing program. Chapter V is the Lums Pond research design, presenting major questions about prehistoric chronology, environment, settlement, subsistence, and technology. Chapter VI presents the goals of the excavations and the methods used to effectively mitigate the site. Procedures for the handling, processing, and cataloguing of the artifacts are presented. Chapter VII, the heart of the Lums Pond findings, covers all aspects of field findings and artifact analyses, including descriptions of stratigraphy, dating, features, stone and ceramic artifacts, and spatial distributions. Finally, Chapter VIII synthesizes the results of the investigations, indicating how the Lums Pond site contributed to various research topics and issues. The chapter addresses questions concerning Native American occupation at Lums Pond, the context of occupations in the surrounding environment, and the role of the site in a regional settlement system. Chapter VIII ends with an examination of what was learned from the special studies

employed for the project. The pros and cons of the specific technical studies are reviewed, and recommendations for future research on similar sites are discussed. Volume I concludes with a list of references used in the text, a glossary of key archaeological terms and a list of all project personnel.

Volume II is of limited distribution, and covers all pertinent details of data analysis used as the basis for the conclusions presented in the current volume. Volume II is mainly of use for researchers from the archaeological community who wish to examine details concerning the Lums Pond site. The chapters that form Volume II are significant in that they provide the analytical data and justification for the conclusions reached in the current study. Chapter IX summarizes the site setting, describing the geomorphological background and stratigraphy. The chapter establishes the overall environmental framework and puts archaeological assemblages in depositional context. The results of the geochemical testing of features are also presented in this chapter. Chapter X contains the results of analysis of radiocarbon data from the site, providing the temporal framework of the natural stratigraphy and the archaeological deposits. Chapter XI summarizes all recovered features, describing their morphology and contents for information concerning their functional significance. Chapter XII presents the results of the macrobotanical analysis on samples taken from features and archaeological deposits. Chapter XIII is a detailed description of the artifact assemblages recovered from the site. Analysis includes typology and technological analysis of the stone and ceramic data sets. Chapter XIV is an analysis of the distribution of different types of artifacts across the site, recovered from both plow zone and buried contexts. The following two chapters, Chapters XV and XVI, present the results of specialized studies of the Delaware jasper. Chapter XV summarizes the results of the source analysis, and Chapter XVI summarizes the results of tool making experiments and their relevance to the Lums Pond artifacts. The results of the refitting of chipped stone artifacts and fire-cracked rock are presented in Chapter XVII. The reassembly data provides the basis for a better understanding of stone tool reduction and how horizontal and vertical artifact distribution patterns are formed by cultural and natural processes. The final chapter of Volume II, Chapter XVIII, presents the findings of the organic residue analysis conducted on the stone artifact data set, investigating the potential of the stone tools to provide functional information. Lastly, Appendix A furnishes points of contact where the artifact inventory may be requested. The artifact inventory is a complete dBase III+ compendium of the 13,000 artifacts recovered from the Lums Pond site.