INTRODUCTION

In consideration for submerged cultural resources of potential archeological or historical significance that could be impacted by construction of bridges along the Delaware Route 1 Corridor, an underwater archeological investigation was conducted at the direction of the Delaware Department of Transportation (DelDOT). This report documents the findings of that work, which consisted of underwater archeological survey and site evaluation investigations at three proposed highway bridge crossings in Kent County, Delaware (see Figure 1).

The construction of the Delaware Route 1 Corridor Project affected portions of three navigable waterways. In north to south order, they were Smyrna River, Mill Creek, and Leipsic River (Figures 1 and 2). These bridge crossings traversed tidal waterways that were in the vicinity of historic settlements and commercial facilities. Each of the three waterways was potentially an avenue of waterborne transport between the interior of Kent County and Delaware Bay.

This investigation was performed in order to comply with the applicable Federal laws and regulations concerning the protection of archeological and historical cultural resources that might be affected by construction activities involving Federal permits and regulatory control. These laws and regulations include the National Historic Preservation Act of 1966 as amended, National Environmental Policy Act of 1969, Federal Abandoned Shipwreck Act of 1989, and Advisory Council on Historic Preservation Regulations (36 CFR 800). The Federal agency required to comply with these cited laws and regulations was the Federal Highway Administration, U.S. Department of Transportation.

The work was conducted on behalf of the Delaware Department of Transportation and was supervised by the DelDOT Archeologist, Location Studies Division. Review oversight was exercised by the State Historic Preservation Officer, Bureau of Archeology and Historic Preservation, Division of Historical and Cultural Affairs, Delaware Department of State. This investigation was performed by Karell Archeological Services.

Three major tasks were accomplished during this study. The first was background research to compile environmental, archeological, and historical information relating to the bridge crossing areas. The second was an underwater remote sensing field survey employing a marine proton magnetometer and bathymetric recording sonar. That work collected data on cultural materials in the project area and located sites having the potential to be considered historically significant. The third task was an evaluation of underwater archeological sites to assess their eligibility for nomination to the National Register of Historic Places. Attention was directed to locations where the remote sensing survey indicated there were cultural materials of potential historical significance.

Field investigations were conducted between November 1988 and April 1990. Ancillary work included artifact conservation, interpretation and analysis of the collected data, and preparation of the technical report.

Summary of the Findings

A detailed description of this underwater archeological investigation and its results are provided in the following report. The following is a brief overview and summary.

The physiography of the three project areas was created as a direct consequence of changes in sea level during the late Pleistocene and early Holocene geological epochs. The onset of worldwide cooling around 40,000 years ago caused much of the water evaporated from the oceans to become solidified as ice in vast glaciers and ice caps. This caused sea level to fall worldwide by as much as 300 feet below its present elevation. At the time of the glacial maximum, the project area and what is now Delaware Bay were uplands with free flowing streams and river valleys subject to erosional down cutting.

Around 15,000 years ago, the Earth entered a long term warming trend. The melting of glacial ice that resulted returned formerly frozen waters to the seas causing eustatic sea level rise. This process led to the drowning of the ancient subaerial lower Delaware River drainage. As the valley of the ancient Delaware River was inundated, it became tidal and expanded in width forming Delaware Bay. Many tributaries of the ancestral Delaware River also became tidal watercourses. The bridge crossing areas began to be inundated around 6,000 years ago (circa 4000 B.C.) when sea level rose to about 30 to 40 feet below its present elevation.

It is generally thought that prehistoric aboriginal peoples first began to inhabit Delaware around 12,000 years ago near the end of the final Pleistocene Ice Age. The distribution of the earliest human settlements has been only partially identified. Much of the territory that was potentially inhabited in those times has been inundated by rising sea level.

Delaware's prehistoric period lasted for about twelve millennia following the initial aboriginal settlement. The science of Archeology has been and remains the main source of information for documenting and interpreting the cultures and lifeways of the prehistoric American Indians.

The end of Delaware's prehistory occurred at the commencement of the historic period. This came about during the early 17th century when European explorers and settlers arrived and initiated the keeping of documentary records. The first historic period settlement in Delaware was established in 1631 at "Swanendael" near present day Lewes. While that settlement was short-lived, others established subsequently were more successful.

Maritime activity in Delaware began with exploratory voyages during the early 1600's and subsequently expanded and intensified as settlements were

established. Throughout the historic period, the use of watercraft has been a major element of cultural activity in the Delaware Bay region. Surviving archeological evidence of ships and shipping-related activity includes material from a substantial number of shipping losses and abandonments in and around the state (Berman 1972; Lonsdale and Kaplan 1964; Seibold and Adams 1989). The distribution of underwater cultural resources is largely associated with maritime shipping routes and related geographic features such as anchorages, harbors, landings, navigation channels, and natural hazards such as shoals and capes.

One finding of the background research effort was evidence that each bridge project area had the potential to contain materials of archeological interest. During prehistoric times the lands adjoining Smyrna River, Mill Creek, and Leipsic River had been foci of cultural activity including resource exploitation and settlement. During the historic period those waterways were used by vessels engaged in commerce from the 17th century until the middle of the 20th century. Other cultural activity related to maritime traffic also took place in Delaware's interior navigable waterways, often being associated with landing places along rivers.

During this investigation's field work the first task accomplished was a remote sensing survey of the project area employing a marine proton magnetometer and bathymetric recording sonar. These instruments were used to collect data on the presence of submerged cultural materials. Several individual and clustered cultural targets were located. They included twenty-three isolated objects containing small masses of iron and fourteen larger magnetic anomaly clusters.

Analysis of the magnitude, distribution, and interrelationships between the recorded targets resulted in the identification of eight underwater archeological sites. Two of these were in Smyrna River, three in Mill Creek, and three in Leipsic River. Seven of these sites were interpreted as having the potential to be considered historically significant. The remaining one (Leipsic River Magnetic Anomaly Site 7K-C-378) contained 20th century material that lacked potential significance. Another of the Leipsic River sites (7K-C-376) was situated outside the area impacted by the bridge crossing and was not evaluated as part of the Phase II study.

Evaluation investigations of six underwater archeological sites were conducted to assess their historical significance and eligibility for nomination to the National Register of Historic Places (NRHP). None of the sites in Smyrna River or Leipsic River were found to contain cultural materials of archeological interest. The Smyrna River sites (7K-A-110 and 7K-A-111) consisted of artifact concentrations dating to the 20th century along with a small number of scattered objects dating prior to 1900. The site evaluated in Leipsic River (7K-C-377) was found to be of 20th century vintage and lacking in historical significance.

There were three sites in the Mill Creek project area. Two of these (Sites 7K-A-113 and 7K-A-114) contained remains of watercraft and one (Site 7K-A-112)

consisted of a concentration of 20th century refuse. Site 7K-A-113 contained 20th century material but also included the articulated wreck of a small wooden boat of vernacular construction dating to the first half of the 20th century.

A substantial amount of late 19th century to recent vintage artifacts were found at Mill Creek Site 7K-A-114. However, the most interesting find there was an articulated hull fragment of an early 20th century commercial vessel. It was part of a wooden Work Boat that was originally about 50 feet in length.

The remains of the two watercraft encountered in Mill Creek were recovered for further analysis. None of the other cultural materials in that bridge crossing were of sufficient significance to merit nomination to the NRHP. Subsequent study of the watercraft remains identified their vintage and provided data documenting their construction. Since both were of 20th century vintage and represented common types, they were found not to be eligible for nomination to the National Register of Historic Places.

This investigation determined that the six underwater archeological sites examined were not of sufficient significance to merit nomination to the National Register. While all three project areas contained a substantial amount of cultural material, nearly all of it was of 20th century vintage and lacking in archeological or historical interest. Artifacts predating 1900 were limited to scattered objects not associated with significant cultural properties. Based on those findings, no further investigation of the bridge crossing areas prior to the project's construction was recommended.

Organization of the Report

This report is divided into eleven sections. Following this introduction a description of the investigation's research design is presented. The next section is a description of the general environmental setting of the vicinity, including its evolutionary development. That is followed by an overview of Kent County's prehistory and a discussion concerning the potential preservation of submerged prehistoric cultural remains. A summary of historic period cultural development is presented in the next part. The following section provides a description of the investigation's field methodology.

Each of the three bridge crossings is discussed in its own separate section. The Smyrna River bridge crossing area is covered first, followed by the Mill Creek bridge crossing, and thirdly by the Leipsic River area. Each project area section contains three subsections. The first discusses the natural setting and sediment stratigraphy. That is followed by a review of local historical cultural development and listing of recorded shipwrecks in the vicinity. The findings of the remote sensing survey and site evaluation work are then provided.

A concluding summary and review of the recommendations is presented next. The final section of this report is a discussion of possible directions for future research.

Six appendixes are included to present important supplemental information. These contain copies of the archeological site report forms for the eight underwater sites documented in this study, an artifact catalog, a glossary, a public information article, a section on the investigation's personnel, and a bibliography.