INTRODUCTION

The purpose of this report is to describe the results of Phase II excavations at the Dairy Queen site (7NC-D-129, N-10895) which is located within the Ogletown Interchange Project Area in White Clay Creek Hundred, north-central New Castle County, Delaware (Figure 1). The Ogletown Project Area right-of-way (ROW) encompasses approximately 100 acres and 3.5 miles of linear ROW. The Dairy Queen site was identified during a Phase I survey of the area in 1985 and 1986 (Coleman, Hoseth, and Custer 1987). The Phase II field work and report preparation took place between August 1986 and July 1987. Excavations were undertaken by the University of Delaware Center for Archaeological Research (UDCAR) for the Delaware Department of Transportation (DelDOT) and the Federal Highway Administration (FHWA) under Section 106 of the National Historic Preservation Act to evaluate the effects of the proposed relocation and reconstruction of Delaware Routes 4 and 273 on significant, or potentially significant, cultural resources as defined by the National Register of Historic Places (36CFR60).

ENVIRONMENTAL SETTING

The Ogletown Interchange Project Area and the Dairy Queen site are located in the east-central portion of New Castle County (Figure 1). The entire project area is in an area transitional between the Fall Line and High Coastal Plain physiographic zones of Delaware. The summary of the local environmental setting presented below is abstracted from the work

of Custer (1984:23-25) and Custer and DeSantis (1986).

The Fall Line/High Coastal Plain transition zone of Delaware represents a northeast-southwest trending zone through the northern portion of the Delmarva Peninsula and is characterized by a combination of features common to both the Fall Line and High Coastal Plain (Spoljaric 1967:3). The Fall Line Zone is itself a transitional zone from the Piedmont Uplands to the flatter Coastal Plain areas to the south. It marks a shift in the role of streams in the Piedmont as primarily erosive agents to a depositional function on the Coastal Plain (Spoljaric 1967). Streams with steep gradients flowing from the Piedmont reach the Fall Line Zone, which is less steep, and drop their bed loads. At present, the bed loads of the Piedmont streams are quite small, but at various times in the past these streams carried tremendous loads and dropped gravels, cobbles, boulders, and various sorted sands that make up the Columbia Formation described by Jordan (1964). Sands, which form the primary component of these sediments, consist mostly of quartz and feldspar while gravels are dominated by sandstone, vein quartz, and chert (Jordan 1964). The deposition of the Columbia Formation created a series of well-drained soils and interspersed cobble beds in the vicinity of the Fall Line Zone. These cobble beds are of special interest because they provide good sources of raw material for the manufacture of stone tools. Water resources are abundant and are comprised of variously sized tributaries of the White Clay Creek, which flows parallel to the Fall Line.

Custer (1984) follows Jordan (1964) in distinguishing between the Higher (Upper) Coastal Plain and lower portions of

Delaware's Coastal Plain based primarily on textural differences in the Columbia sediments of these two areas. Located between the Fall Line and the Smyrna River, the High Coastal Plain represents the southeastern extension of the very coarse glacial deposits of the Columbia sediments (Jordan 1964:40). In many areas these coarse deposits resisted erosion, creating a rolling topography with up to 16 meters (50 feet) of elevation difference between the headlands bordering the larger streams and the adjacent floodplain marshes. Elevation differences surrounding the project area range up to 52 meters (170 feet) from the floodplains of White Clay Creek to the edge of the Fall Line. Even though these Upper Coastal Plain elevation differences are considerably less than those noted for the Piedmont and Fall Line, they are great enough to significantly influence seasonal differences in plant communities (Braun 1967:246-247). Water courses tend to be deeply incised and are lined by a veneer of relatively recent sediments that is thin along the upper reaches of drainages and thickens toward their mouths (Kraft et. al. 1976:13). Most streams are tidal and the saltwater/freshwater mix allows for a wide range of resources. Soil types present include a variety of well-drained to poorly drained series that are distributed in a mosaic pattern across the region.

The Dairy Queen site is located on a low knoll in an interior area characterized by extensive poorly drained woodlands (Figure 2, Plate 1). Numerous spring-fed ephemeral streams and bay/basin features are present near the site and provide ample sources of surface water and favorable hunting and gathering

locales. Soil profiles recorded throughout the Ogletown Project Area during the Phase I/II survey (Coleman, Hoseth, and Custer 1987) indicate that most of the poorly-drained wooded areas have remained poorly-drained for the past 10,000 years throughout the Holocene. However, it is likely that the size of the poorly-drained woodlands waxed and waned in response to both seasonal and long-term fluctuations in local climates. Vegetation on the knoll at 7NC-D-129 probably changed through time as did regional vegetation (Custer 1984). Prior to 3000 B.C., the knoll probably was wooded with stands of first spruce and pine, and then hemlock and oak. From 3000 B.C. to 800 B.C., it is likely that the site environs may have consisted of an oak-hickory woodland which at times gave way to an open woodland or even grasslands. After 800 B.C., the knoll at 7NC-D-129 would have been covered by a mixed hardwood woodland. Throughout the prehistoric period of human occupation, the surrounding environments of 7NC-D-129 would have provided an interface of well-drained and poorly drained woodlands which would have been a productive setting for prehistoric hunters and gatherers. At present the site's local environment is characterized by fallow agricultural fields and scrub woodlands.

REGIONAL PREHISTORY

The prehistoric archaeological record of the northern New Castle County area can be divided into four blocks of time: The Paleo-Indian Period (ca. 12,000 B.C. - 6500 B.C.), the Archaic Period (6500 B.C. - 3000 B.C.), the Woodland I Period (3000 B.C. - A.D. 1000), and the Woodland II Period (A.D. 1000 - A.D. 1650).

A fifth time period, the Contact Period, may also be considered and includes the time period from A.D. 1650 to A.D. 1750, the approximate date of the final Indian habitation of northern Delaware in anything resembling their pre-European Contact form. Each of these periods is described below and the descriptions are summarized from Custer (1984) and Custer and De Santis (1986).

Paleo-Indian Period (12,000 B.C. - 6500 B.C.) - The Paleo-Indian Period encompasses the time period of the final disappearance of Pleistocene glacial conditions from Eastern North America and the establishment of more modern Holocene environments. The distinctive feature of the Paleo-Indian Period is an adaptation to the cold, and alternately wet and dry conditions at the end of the Pleistocene and the beginning of the Holocene. This adaptation was primarily based on hunting and gathering, with hunting providing a large portion of the diet. Hunted animals may have included now extinct megafauna and moose. A mosaic of deciduous, boreal, and grassland environments would have provided a large number of productive habitats for these game animals throughout northern Delaware, and watering areas in the study area would have been particularly good hunting settings.

Tool kits of Paleo-Indian groups were oriented toward the procurement and processing of hunted animal resources. A preference for high quality lithic materials has been noted and careful resharpening and maintenance of tools was common. A lifestyle of movement among the game attractive environments has been hypothesized with the social organizations being based upon single and multiple family bands. Throughout the 5500 year time

span of the period, the basic settlement structure remained relatively constant with some modifications being seen as Holocene environments appeared at the end of the Paleo-Indian Period.

Numerous Paleo-Indian sites are noted for northern Delaware including hunting and processing sites near Hockessin (Custer and De Santis 1986) and adjacent to the Wilmington Medical Center (Custer, Catts and Bachman 1982), possible quarry sites near Iron Hill, and isolated point finds.

Archaic Period (6500 B.C. - 3000 B.C.) - The Archaic Period is characterized by a series of adaptations to the newly emerged full Holocene environments. These environments differed from earlier ones and were dominated by mesic forests of oak and hemlock. A reduction in open grasslands in the face of warm and wet conditions caused the extinction of many of the grazing animals hunted during Paleo-Indian times; however, browsing species such as deer flourished. Sea level rise was also associated with the beginning of the Holocene Period in northern Delaware. The major effect of the sea level rise was to raise the local water table, which helped to create a number of large swamps, such as Churchmans Marsh, which is located approximately 6 km northeast of the study area. Adaptations changed from the hunting focus of the Paleo-Indians to a more generalized foraging pattern in which plant food resources would have played a more important role. Large swamp settings such as Churchmans Marsh supported large base camps as indicated by the remains at the Clyde Farm site. A number of small procurement sites at

favorable hunting and gathering locales are also known in northern Delaware.

Tool kits were more generalized than earlier Paleo-Indian tool kits and showed a wider array of plant processing tools such as grinding stones, mortars, and pestles. A mobile lifestyle was probably common with a wide range of resources and environmental settings utilized on a seasonal basis. A shifting band-level organization which saw the waxing and waning of group size in relation to resource availability is evident.

Woodland I Period (3000 B.C. - A.D. 1000) - The Woodland I Period can be correlated with a dramatic change in local climates and environments that seem to have been a part of events occurring throughout the Middle Atlantic region. A pronounced warm and dry period set in and lasted from ca. 3000 B.C. to 1000 B.C. Mesic forests were replaced by xeric forests of oak and hickory, and grasslands again became common. Some interior streams dried up, but the overall effect of the environmental changes was an alteration of the environment, not a degradation. Continued sea level rise also made many areas of the Delaware River and Bay shore the sites of large brackish water marshes which were especially high in productivity.

The major changes in environment and resource distributions caused a radical shift in adaptations for prehistoric groups. Important areas for settlements included the major river floodplains and estuarine swamp/marsh areas. Large base camps with fairly large numbers of people are evident in many areas of northern New Castle County such as the Delaware

Park site, the Clyde Farm site, the Crane Hook site, and the Naamans Creek site. These sites supported many more people than previous base camp sites and may have been occupied on nearly a year-round basis. The overall tendency was toward a more sedentary lifestyle.

Woodland I tool kits show some minor variations as well as some major additions from previous Archaic tool kits. Plant processing tools became increasingly common and seem to indicate an intensive harvesting of wild plant foods that may have approached the efficiency of horticulture by the end of the Woodland I Period. Chipped stone tools changed little from the preceding Archaic Period; however, more broad-bladed knife-like processing tools became prevalent. Also, the presence of a number of non-local lithic raw materials indicates that trade and exchange systems with other groups were beginning to develop. The addition of stone, and then ceramic containers is also seen. These items allowed more efficient cooking of certain types of food and may also have functioned as storage for surplus food resources. Storage pits and house features during this period are also known from the Delaware Park site and the Clyde Farm site. Social organization also seems to have undergone radical changes during this period. With the onset of relatively sedentary lifestyles and intensified food production, which might have produced occasional surpluses, incipient ranked societies may have begun to develop, as indicated by the presence of extensive trade and exchange and some caching of special artifact forms. By the end of the Woodland I Period a relatively

sedentary lifestyle existed in northern Delaware.

Woodland II Period (A.D. 1000 - A.D. 1650) - In many areas of the Middle Atlantic, the Woodland II Period is marked by the appearance of agricultural food production systems; however, settlements of the Woodland I Period, especially the large base camps, were also occupied during the Woodland II Period and very few changes in basic lifestyles and artifact assemblages are evident (Stewart, Hummer, and Custer 1986). Intensive plant utilization and hunting remained the major subsistence activities up to European Contact. Similarly, no major changes are seen in social organization for the Woodland II Period of northern Delaware.

Contact Period (A.D. 1650 - A.D. 1750) - The Contact Period is an enigmatic period of the archaeological record of northern Delaware which began with the arrival of the first substantial numbers of Europeans in Delaware. The time period is enigmatic because few Native American archaeological sites that clearly date to this period have yet been discovered in Delaware, although numerous Contact Period sites are evident in southeastern Pennsylvania. It seems clear that Native American groups of Delaware did not participate in much interaction with Europeans and were under the virtual domination of the Susquehannock Indians of southern Lancaster County, Pennsylvania. The Contact Period ended with the virtual extinction of Native American lifeways in the Middle Atlantic area except for a few remnant groups.

PREVIOUS INVESTIGATIONS

The Dairy Queen site was identified by Thomas (1980) through information supplied to him by local informants. A limited testing program which employed five shovel test excavations provided no indication of prehistoric occupation. The 1985 Phase I excavation of 11 1m test units at 10m intervals on an east-west transect across the previously identified site area produced a substantial collection of both historic and prehistoric artifacts from the plowzone horizon with two of the Units (Nos. 5 and 7) containing prehistoric artifacts from a yellow-brown sandy loam soil horizon (22-36cm below ground surface [bgs]) and an orange-brown sandy loam with orange sandy clay pockets (36-46cm bgs) soil horizon (Coleman, Hoseth, and Custer 1987). No features were encountered below the plowzone. The lithic materials included: quartz, quartzite, chert, and jasper debitage and a limited amount of fire-cracked rock. The location of the buried materials within the indirect impact zone of the proposed ROW made Phase II investigations necessary.

The distribution of prehistoric and historic artifacts exhibited opposite frequency trends based on the initial east-west transect. The frequency of prehistoric artifacts increased from west to east while the frequency of historic artifacts increased from east to west (as one moved further outside of the proposed ROW). The historic materials, particularly late 18th and early 19th century artifacts, were especially concentrated in units excavated along the W70 and W80 grid lines (Figure 3). The source for this earlier material was most likely the main house site of the "Red House Plantation," originally thought to

be represented by the A. Temple House site (Coleman, Hoseth and Custer 1987). Further research has noted that the 18th century Red House Plantation site was located at least 300' from the present A. Temple site. It is very probable that the majority of artifacts located by the Phase I excavation are associated with surface middens originally at the Red House Plantation site. The much smaller frequencies of later 19th and 20th century are of unknown origin but probably also represent field scatter from surrounding historic sites and roadways.

In order to better define the site limits and integrity of the site and the limits of the buried deposits an additional 37 1m test units were excavated employing a 10m interval grid system as part of a preliminary Phase II testing program (Figure 3). Again a substantial collection of 18th, 19th, and 20th century historic materials and prehistoric lithic materials were derived from plowzone contexts. The relatively small size of the site and the limited range of tool types recovered suggested that the site was an ephemerally utilized procurement/hunting station. A single stemmed projectile point, probably dating to the Woodland I time period (3000 B.C.- A.D. 1000) was recovered. While no subsurface features were encountered, six of these units recovered prehistoric materials from apparently undisturbed soils beneath the plowzone (Table 1). Four of these units were located during testing at a five meter interval at the four cardinal directions from Unit 7. From these four units a total of 37 prehistoric artifacts were recovered from Level 2 (0-10cm below plowzone), a yellow-brown sandy loam and two from Level 3 (10-20cm below plowzone, 50-70 bgs), an orange-brown silty clay.

TABLE 1

DISTRIBUTION OF ARTIFACTS WITH DEPTH FROM PHASE I AND PRELIMINARY PHASE II TEST EXCAVATIONS

	Level 1(PZ)	2	3	4	5	6	7	8	Total
n	29	92	96	26	11	3	7	0	264
%	11	35	36	20	4	1	3	0	

KEY: n = number
% = percent

Preliminary geomorphological and pedological analysis of the site indicated that within a restricted area, approximately 30m X 30m in size, the prehistoric artifacts were present in fairly good stratigraphic context, buried by low energy colluvial deposition (Table 1). However, based on the limited testing, intra-site artifact concentrations/activity areas were not identified. Further testing was therefore recommended to identify the distribution of artifacts across the site.

RESEARCH DESIGN AND FIELD METHODS

The main goal of additional Phase II testing at the Dairy Queen site was to gather additional information which would clarify the eligibility of the site for listing on the National Register of Historic Places. Specifically, the additional Phase II excavations sought to determine if a majority of the artifacts were to be found in good stratigraphic context at the site. Also, the excavations sought to identify the distribution of artifacts and related activity areas across the site. Finally, the excavations sought to collect a larger sample of artifacts from the site which could aid in determination of the age of the

site and determination of its role in regional settlement systems.

In order to accomplish the research goals noted above, a series of 2m squares were excavated in the area around Test Unit 7 (Figure 3), which had produced the greatest number of artifacts from subsurface contexts. Four 2m squares (Figure 4) were excavated and determined that some of the artifacts recovered from deep subsoil contexts in Test Unit 7 were located in a hitherto unrecognized feature, which will be described later. An additional eight 2m squares were excavated in order to look for more subsurface features (Figure 4). A final investigation of the site consisted of six 2m squares which were stripped of their plowzones and then skim-shovelled to a depth of 10cm below the plowzone to look for artifacts or features associated with outlying site areas (Figure 4). While excavating these additional squares, it became clear that the artifact concentration at 7NC-D-129 was small and that the additional Phase II excavations had completely excavated the site.

In all of these 2m excavation units, the plowzone was removed as a single stratigraphic unit. Subsoil sections of the units were excavated in 50cm blocks and 5cm levels. In each 2m unit, a single 50cm block was retained as a flotation sample. All excavated soils were screened through 1/4" mesh screens. All gravels and pebbles which did not pass through the 1/4" screens were retained for one 50cm block in each 2m square. The distribution of these pebble samples was analyzed in order to understand the depositional processes at the site. Standard soil column samples were also collected.

All artifacts were washed and marked using the standard accession system developed by the staff of the Island Field Museum. Lithic artifacts were analyzed for blood residues and were sorted by raw materials and functional categories including projectile point/knives, bifaces, retouched flake tools, ground stone tools and debitage. Presence or absence of cortex was noted to study cobble utilization, and bifaces were sorted into discards and rejects, following the work of Callahan (1979) to study tool manufacturing activities.