

# MINING DATA AT MARSHALLS CREEK



**A Phase III Archaeological Investigation of  
Three Native American Chert Quarries  
in the Upper Delaware Valley**

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SMITHFIELD TOWNSHIP,  
MONROE COUNTY, PENNSYLVANIA

ARCHAEOLOGICAL investigations were conducted as part of the environmental impact studies for the Marshalls Creek Traffic Relief Project in Monroe County, Pennsylvania. The archaeological studies were performed on behalf of the project sponsors, the Federal Highway Administration (FHWA) and the Pennsylvania Department of Transportation (PennDOT), in accordance with the requirements of federal and state historic preservation regulations.

The Marshalls Creek Traffic Relief Project is located in the Marshalls Creek watershed on the southeastern fringe of the Pocono Mountains, approximately three miles northwest of the Delaware River. Archaeological surveys performed elsewhere in upland areas of the Upper Delaware Valley had characterized the region as one where Native Americans hunted, foraged, and camped, but rarely, if ever, established villages. This characterization was based on numerous surveys of widely scattered sites containing stone tools and weapons, but few hearths, post-holes, or burials. Based on the results of these previous surveys, archaeologists assumed they would find only minimal evidence of a Native American presence in the Marshalls Creek valley.

***Unfold this brochure  
to learn more about the  
archaeology of the  
Marshalls Creek Traffic  
Relief Project Area***

The initial archaeological survey for the Marshalls Creek Traffic Relief Project, referred to as a Phase I survey, was performed in 1995. The Phase I survey involved the examination of the landscape and the excavation of scores of test pits across the Marshalls Creek watershed. Archaeologists discovered that Native Americans had been more active here than earlier surveys had indicated. Terraces, slopes, and ridges bordering the creek were littered with “lithic scatters” (small archaeological sites consisting of stone fragments, often resulting from tool manufacture), and no fewer than ten stone outcroppings showed signs of having been quarried in the distant past. Exposed layers and nodules of a material prized by the ancient quarriers—a dense, siliceous rock known as chert—could still be found encased in limestone and sandstone. Not surprisingly, most of the nearby lithic scatters comprised at least fifty percent chert, all of it black or darkly colored. Clearly, this section of the Marshalls Creek corridor was a locus of Native American quarrying.

The archaeologists and sponsoring agencies learned enough through the Phase I survey to delineate a 900-acre “Marshalls Creek Chert Quarry Archaeological District,” and determine the District eligible for listing in the National Register of Historic Places, a listing of historic properties deemed significant to understanding the historical and cultural foundations of the Nation. Contributing to this District were 65 Native American sites: 51 lithic scatters, 10 quarries, 3 base camps, and a single rock shelter. No archaeological sites that date to the period of European Contact (1550-1779) were identified within the Marshalls Creek Chert Quarry



*The Tattoo II Site blankets a slope and ridge bordering Marshalls Creek.*



*ABOVE: The Marshalls Creek Chert Quarry Archaeological District is illuminated on a detail of adjoining East Stroudsburg and Bushkill USGS topographic quadrangles.*

Archaeological District. Stone tools and weapons recovered from the base camps suggested that native peoples had occupied these sites during the Late Archaic period (3000-500 BC) and the Late Woodland period (800-1550 AD). As the Marshalls Creek Traffic Relief Project progressed—and before any of the sites could be disturbed by construction activities—the significance of the Archaeological District would have to be more fully explored.

In 2003, a second phase of archaeological testing was completed to assess additional areas of potential project impact and to further characterize some of the previously identified sites. The project’s limits had been refined to the point where it was now clear which sites within the Marshalls Creek Chert Quarry Archaeological District would be impacted by construction activities. Representatives of the FHWA, PennDOT, the Pennsylvania Historical and Museum Commission, and Native American Tribes that might attach religious and cultural significance to the affected sites collaborated in developing a strategy for a third and final phase of archaeological investigation. Sometimes referred to as “Data Recovery,” a Phase III Archaeological Survey has two principal goals: to extract and record a comprehensive set of data from a threatened National Register-eligible site, and to thoroughly analyze those data in the light cast by previous archaeological surveys and cultural studies. Because prior testing strongly suggested that none of the many threatened sites within the Marshalls Creek Chert Quarry Archaeological District could be expected to yield a significantly distinctive dataset, a novel approach was adopted for the Marshalls Creek Phase III Survey.



FIELD WORK for the Phase III Survey would focus on the three largest quarry sites within the project limits: “The Place 2 Site,” “the Sunnydale Quarry,” and “Tattoo II Site.” Data collected at these locations would be analyzed on their own merits, and then tested against a predictive model of Native American quarrying recently developed by archaeologists investigating several chert quarry sites in east-central New York State. Evidence gathered in New York suggested that native peoples had not only mined chert there, but had also processed or refined the chert in “workshop” zones around the quarry face.

Beginning in July, 2003 and proceeding through several field seasons, archaeologists and geological specialists conducted extensive additional research and field-testing intended to address an array of questions concerning the Marshalls Creek quarries. What was the full range of activities conducted in and around the quarries? Were certain activities concentrated in particular areas? Did activities change over time? What raw materials and implements were employed in these activities? What light did the data shed on Native American lifeways in this vicinity and the wider region? Answering such questions would also reveal if the Marshalls Creek quarries fit the pattern of Native American chert quarrying discerned by archaeologists in upstate New York.

Months of Phase III investigating at the three quarry sites yielded a wealth of artifacts and raw data. The analysis of the data revealed that the Marshalls Creek quarries did not fit the “zone” model of Native American chert quarrying hypothesized from quarries in upstate New York. Evidence unearthed at the Place 2, Sunnydale Quarry, and Tattoo II Sites indicated that quarrying was conducted there in non-systematic fashion. No location was identified as a zone or workshop devoted to a particular stage of tool-making. Quarriers had collected chert from the rock face or the quarry floor, then performed all of the refining steps on the spot or somewhere nearby.

Data compiled through the Phase III survey provided important insights into Native American use of chert quarries in the Marshalls Creek corridor. The archaeologists discovered that, although this corridor was rich in chert, the material was not well suited for manufacturing shaped tools. High-quality chert is relatively uniform, with few mineral inclusions and frost fractures. It responds predictably to blows from a hammerstone, breaking into workable slivers, and shedding flakes evenly, according to the force and angle of the tool-maker’s strikes. For Native American tool-makers, this meant greater control in reducing chert cores to workable preforms, then shaping those preforms into weapons and tools such as arrowheads, spear-tips, knives, scrapers, and drills. Poor quality chert, like that at the Marshalls Creek quarries, shatters and flakes unpredictably, and is thus difficult to shape precisely. It was valued by native peoples primarily as the raw material for expedient tools—sharp-edged stone flakes created quickly and easily for slicing and scraping. These implements dulled quickly, and were soon discarded.

Two photographs of a quarried rock face at the Tattoo II Site document the archaeologists’ removal of about a foot of overburden in order to re-expose the chert seams. Native American quarriers had dislodged chert by pounding on the seams with hammerstones, one of which archaeologists found buried downslope from the rock face. Conspicuous in the bottom image is a dark cavity indicating where a thin layer of chert had been removed, leaving a flat sandstone surface.



HAMMERSTONE

PARENT ROCK (sandstone)



CLEAVAGES  
CAVITIES RESULTING FROM CHERT REMOVAL

The bedrock or “parent rock” encasing the Marshalls Creek chert was laid down 354-417 million years ago, during the Devonian period of the Paleozoic Era. Three bedrock formations are present in the Marshalls Creek corridor. The Sunnydale and Place 2 quarries are part of the Buttermilk Falls Formation, comprising medium-gray limestone and “argillaceous” (clayey) limestone with nodules and beds of dark-gray chert. Archaeologists found no evidence in either of these sites that native peoples had forcibly removed chert from the parent rock. Removal had not been necessary, as freeze-and-thaw cycles dislodged so much chert from the rock face that quarriers could collect what they wanted from the quarry floor. Numerous lithic scatters in the immediate vicinity indicated that tools—mostly of the expedient variety—were fashioned on-site.

The Tattoo II Site is part of the Ridgeley Formation, a much sturdier matrix of sandstone, limestone, and chert. While frost damage created cracks in the bedrock, the chert remained trapped

until knocked loose by a precontact quarrier with his preferred tool: a fist-sized hammerstone, composed of either sandstone, quartzite, diabase, or mudstone. Archaeologists uncovered evidence of this quarrying when they dug through a foot or more of accumulated soil and forest litter to reveal formerly exposed chert layers and lenses or nodules. Some of the deposits were almost entirely depleted. Others showed cavities where blocks of chert had been removed. In a few instances, hammerstones used in chert removal were discovered just below the outcrops. The chert at Tattoo II had fewer inclusions than the chert at Place 2 and Sunnydale, and was more extensively used. Although Tattoo II covered a much smaller area than the other two quarries, the number of artifacts found there was ten times greater.

From their findings at the three quarry sites, and conclusions drawn from earlier investigations in the region, archaeologists were able to piece together a distinctive portrait of the Marshalls Creek Chert Quarry Archaeological District. While a handful of



HAMMERSTONES (quartzite)

ANVIL STONE (quartzite)

CHERT FLAKES

EXPEDIENT CUTTING TOOLS

EXPEDIENT SCRAPING TOOLS

PREFORMS

ABOVE: The few projectile points (“arrowheads”) recovered from the Marshalls Creek Chert Quarry Archaeological District had been manufactured of higher quality materials quarried elsewhere. They included (from left): a Pequea point (Middle Archaic through Middle Woodland, 6500 BC-1000 AD, siltstone); a Levanna point (Woodland, 1000 BC-1550 AD, chert); another Pequea point (chert); and a Jacks Reef corner notched point (Middle Woodland, 0-1000 A.D., jasper). All artifacts are shown approximately one-third actual size.

unearthed arrowheads pointed to a Native American presence in the Late Archaic period (3000-500 BC), the data strongly suggested that most of the quarrying occurred during the Woodland period (500 BC-1550 AD), with intensity peaking in the Late Woodland period (800-1550 AD). There was certainly much more activity here than had been predicted for the Pocono uplands, based on previous archaeological surveys. The quarries appear to have been part of a package of features that made the Marshalls Creek valley a destination for hunter-gatherers. The visitations may have been seasonal, tied to game hunting, foraging for wild edibles (such as chestnuts and acorns), and trapping fish during annual migrations. The quarries were a ready source of tools for working hides, wood, bone, and meat used by Native Americans to clothe, feed, defend, and entertain themselves. The archaeological investigations performed for the Marshalls Creek Traffic Relief Project have contributed significantly to our understanding of the settlement patterns and lifeways of the Native Americans who formerly occupied the Marshalls Creek valley.



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DEPARTMENT OF TRANSPORTATION



U.S. Department of Transportation  
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