National Register of Historic Places Multiple Property Documentation Form

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This form is used for documenting multiple property groups relating to one or several historic contexts. See instructions in *How to Complete the Multiple Property Documentation Form* (National Register Bulletin 16B). Complete each item by entering the requested information. For additional space, use continuation sheets (Form 10-900-a). Use a typewriter, word processor, or computer to complete all items.

Х	New Submission	Amended Submission

A. Name of Multiple Property Listing

Lime Industry of Houston County, Tennessee

B. Associated Historic Contexts

Lime Industry of Houston County, Tennessee circa 1870 - circa 1950

C. Form Prepared by			
name/titleJeffrey A. Plunkett			
organizationLandmark Archaeological and Environm	nental Se	rvices, Inc.	date <u>December 15, 2003</u>
street & number518 South Main St.	:		
city or town <u>Sheridan</u>	state _	Indiana	zip code <u>46069</u>
D. Certification		······	
As the designated authority under the National Historic Press documentation form meets the National Register documenta properties consistent with the National Register criteria. This forth in 36 CFR Part 60 and the Secretary of the Interior's Sta See continuation sheet for additional comments.)	ation stanc s submissi	dards and sets forth on meets the proce	requirements for the listing of related edural and professional requirements set
Signature and title of certifying official			Date
DSHPO- THC State or Federal Agency or Tribal government			

I hereby certify that this multiple property douthentation form has been an	oproved by the National Register as a basis for
evaluating related properties for insting in the National Register.	Λ
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Signature of the Keeper	Date of Action

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E. Statement of Historic Contexts

The importance of the limekiln industry to the development of Houston County economics was a direct result of the landscape and how different industries operated in the county before the lime industry emerged. A brief description of early settlement and industries in the region is necessary to explain how the industrial villages that sprang up around the kilns came to dominate the settlement and economics of the area.

The Settlement of the Early Houston County Area

The geology of Middle Tennessee is comprised of limestone, chert, and significant amounts of high quality iron ore characteristic of Mississippian formations. As a result, the region was an excellent source of high quality iron and limestone. Abundant forests were found throughout this part of the state. Forests were essential to the production of lumber, charcoal, and wood products, and later in the burning of limestone. The Houston County area was generally not suitable for large-scale agriculture due to the topography.

While the Central Basin area of Middle Tennessee, a major population center during the Mississippian time period of the 1400s native people did live in the Houston County region in small groups throughout prehistoric times. The Tennessee Division of Archaeology site files show a total of thirty-eight prehistoric sites recorded in Houston County by professional archaeologists. Of these thirty-eight sites, thirteen are associated with the Paleo Indian time period while twenty-one sites relate to the Archaic period.

The western Houston County area was one of the last areas of Middle Tennessee to be settled by Europeans, as the Native American groups still had rights to the central Tennessee hunting grounds. Native and European American clashes were common. The Tennessee Ridge, located between White Oak and Wells Creek, became the dividing line between the Indians and the government in the early 1800s, with a treaty line (visible as late as 1886) blazed out of the forest between the two creeks to show the boundary between the hunting areas of the two (Finley Volume XXI:9). This boundary line discouraged settlement of western Houston County, but also pointed out the undesirability of the Erin area for agriculture.

The Iron Industry

The first important large-scale industry in what would become Houston County was the iron industry. The iron industry in Tennessee started in the late 1700s and reached its zenith before the Civil War. The destruction of many of the furnaces and forges during the war, and the shifting of the iron industry to larger-scale operations in the north, led to the decline of the industry. Iron forges and furnaces were constructed in the northern part of the county along the Stewart County line with three furnaces, Union, Byron, and Ashland built in Houston County. All the iron works in Houston County were not

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reopened after the war (Smith 1988:56). Sources of iron could be found on or near the surface throughout the Wells Creek Basin in the region.

The iron industry is important for the history of the Houston County lime industry because the construction of forges and furnaces required a great deal of intricate stone masonry and engineering. The skilled masons and engineers who worked in the iron industry could use those same skills to erect the large masonry limekilns constructed in the late 1860s and 1870s. In fact, the Stewart Kiln in Stewart, Tennessee, shows similar architectural features to the earlier iron furnaces.

The iron industry helped to establish the early settlement patterns of the Houston County area, with industrial villages or iron plantations being located around forge and furnace sites. The lack of a strong agricultural base strengthened the industrial village settlement pattern. The iron industry employed slave labor as well as non-slave, but the form of the industrial village was similar to other industrial mining, extraction, and processing sites. This resulted in the primary settlement pattern in Houston County being villages and towns centered on industrial extracting and processing sites.

The lime industry emerged from the iron furnace industry since limestone was an essential ingredient in the production of iron ore. Limestone was mined and crushed at the first iron furnaces in Houston County. A different link between the limekilns and the iron furnaces is seen from oral history, which mentions that newly freed African-American slaves worked the limekilns as skilled labor (Wayne Richardson Interview). Slave labor was the primary labor resource for the antebellum iron industry of the area. Another important factor in the emergence of the lime industry in Houston County was the decision to construct the Memphis, Clarksville and Louisville Railroad from Paris in Henry County to Clarksville in adjacent Montgomery County. The route chosen went from east to west through the center of what would become Houston County and was constructed by Irish laborers prior to the Civil War.

Houston County and the Towns of Erin and Arlington after the Civil War

Houston County was formed from Stewart, Montgomery, Humphreys, and Dickson counties in 1871. The largest town in the county is the county seat of Erin (population 1,490), although when the county was formed the nearby industrial village of Arlington was larger and served as the county seat. The arrival of the railroad changed that. Arlington was on the eastern part of the Tennessee Ridge grade where trains could not stop so the regional depot was constructed in nearby Erin.

Reference to a community named "Erin" dates back to the time of the construction of the railroad in Houston County. There is a reference to the Irish railroad worker's camp being called "Erin" with a few buildings and camp stores servicing the camp. The area was abandoned by the Irish laborers at the commencement of the Civil War and then reoccupied by local citizens after the war. The Irish named the place that would become Erin, Tennessee, after their homeland because of similarities in the landscapes (Bell n,d.:2, Finley Volume 7:1-13). The 1863 Federal map drawn after the battle of

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Ft. Donelson in 1862 also mentions a community called "Erin."

The town of Erin was formed in the same general area as the original "Erin" camp. The railroad also constructed "Erin Station" about a half a mile west of where the town of Erin stood in 1863. This "Erin Station" probably stood on the outskirts of the Erin town proper. Since the Memphis, Clarksville, and Louisville Railroad was investing in a hotel, station, and railroad support buildings at "Erin Station", they may have wanted to set apart the station community from the older town of "Erin." The idea that there was more than one town of Erin was echoed in a volume edited by Joyce and Charles Lovelady (1989). The Irish who worked on the railroad commonly settled in small groups along the path of the transportation system. The Irish immigrants were often discouraged to settle in areas, and were thought of as a lower class of people. It was usually difficult for Irish to gain employment in established communities. "No Irish Need Apply" signs were often hung in tandem with signs seeking workers.

As the economy of Houston County improved a fight ensued over where the county seat would be located. Both Arlington, which was the home of the two major lime works that employed a good portion of Houston County's citizens, and Erin, which was located a few miles to the east and had the rail line, wanted to be the county seat. As Arlington had a major local road that connected it to the Stewart and Dickson County seats (Lovelady 1989:33), it became the county seat in 1871. Erin began as a small railroad station in 1859 or 1860, but boasted over 700 citizens in 1886 (Goodspeed, 1886; Finley XXI:24). The choice by the Memphis, Clarksville and Louisville Railroad Company to locate a passenger service in Erin (not Arlington), with offices, a hotel, a water tower, and all other necessary train-related structures helped Erin grow and prosper. In 1878 Erin became the county seat and by 1886 Arlington had completely lost its identity as a town (Goodspeed 1886; Finley XXI:26).

This amazing growth of Erin was due to railroad investment in the town, and the influx of money and the migration of a few people from Beaver County, Pennsylvania and New York, who would come to dominate politics and economics in Houston County. Erin was surveyed and platted in 1871 by H. H. Buquo, who also co-owned one of the large Arlington lime works. Buquo's father, Jacob Buquo, M. Hollister, and T.J. Reynolds owned the land that would become Erin. George E. Rauscher, who owned a number of limekilns, became the first Mayor of Erin. V.R. Harris, who also co-owned limekilns became Mayor of Erin in 1881 (Goodspeed 1886; Finley XXI:24). These men acquired the land that would become Erin from the descendants of Isaac Nichols. Many of the people who held positions of authority and had a crucial and pervasive role in the development of Houston County were the limekiln owners. Therefore, it can be argued that without the lime industry Houston County would have developed much differently.

Initially, the limekiln owners used Erin as a mercantile town, without heavy industry or processing. Arlington was the industrial center, with no mercantile businesses (Goodspeed 1886, Finley Volume XXI:26). The men who owned the limekilns set up this division between the two towns in order to create a social distance between their work and home environments. As Iris Hopkins-McClain

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(1966:17) wrote, "Feelings were bitter at one time about the removal of the county seat. The people around Arlington were descendants and representatives of the old and early settlers of the county. The wave of Northern people who settled in the county after the Civil War tended to settle in Erin proper... These men, however, did much for the economy of the county..."

The Lime Industry

Immediately following the Civil War, the owners of the Memphis, Clarksville and Louisville Railroad reestablished the railroad line for commercial use through Houston County. The iron forges that once were expected to utilize the railroad were, for the most part, destroyed during the war and were not rebuilt (Lovelady 1989:24). As the railroad was revitalized, new industries developed. The largest of and most important was the lime industry, centered on the town of Arlington.

Processing limestone to produce marketable material, such as quicklime, involves burning, roasting, or calcinating natural limestone cobbles or blocks. Lime production in the nineteenth century needed several natural features to facilitate production of such materials. A limestone ridge or vein of the appropriate stone type for quarrying first had to be located, as well as large quantities of wood for fuel. Later, coal was introduced to the lime firing process and access to coal sources then became a necessity.

Judge Joe Spencer gave a brief account of the process in Metcalf's Manuscript (1989:3):

A kiln is round on the inside. It comes down to a bosch (narrower neck) just above the firebox at the bottom of the chimney. The cooling zone is down below the firebox. The firebox comes in from two sides. You stack wood as close as you can and as high as you can reach. Then you dump the rock in at the top. Next, you light the fire. In about 36 hours you should be able to make your first draw of lime. You take out the ashes and drop the lime into the cooling basin. From then on the lime sticks and you have to trim it with a cutting bar around the edges. The lime sits in there like a cone. You trim the edges and drop it straight down. It has to cool six hours below the firebox before you can pull it out. Even at that time it will be so hot that it will be transparent.

Hugh Metcalf (1989:4) noted:

"When you get ready to draw the lime you let the fire die down. Then when you get ready to cut the kiln you draw the lime. You take a couple of big sticks of wood in there and pry just over the edge. Then you take your bar and trim it."

Eldred Knight (Metcalf 1989:4) continued:

"Firing a kiln is a very technical job. Really it takes an expert to fire a kiln. If they goofed

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up and rested their eyes too much the kiln would tell on them and go to "rocking". We had the best people you could ever assemble, they could do anything. We had nothing to work with except our hands for the most part."

The most common product of burning lime was quicklime, which was used to make plaster and mortar for building construction. Higher quantities of calcium carbonate in the limestone resulted in higher quality plaster and mortar material. Because burned lime absorbs water over time, it is labeled as a perishable product that must be used within a set period of time or it becomes useless for construction purposes. By adding sand to the mix, bonding between the sand and the lime results in a hardened product (either mortar or cement) that keeps its shape over time (Blatchley 1903: 211-214).

Another lime-based nineteenth century product was whitewash, which was quicklime that had been saturated with water and then mixed with glue. Lime was also processed into similar whiting materials, such as "bleaching powder", and was used in the paper industry to break down rag pulp. Other uses for lime included hair removal in the tanning industry, as an ingredient in soap making, and as a fluxing agent in glass making and iron ore smelting. Another common use for lime was as a fertilizer for agriculture (Blatchley 1903: 214-217).

The placement of a masonry limekiln took into account the distance from the stone quarry site to the kiln processing area, and the distance from the kiln to the nearest transportation source. If the kiln served local needs, a road network sufficed for transportation. If the kiln served regional or national markets, then a more advanced form of transportation was necessary, such as a railroad or canal. Since most lime products were of the bulk variety, profits from operating a lime industry rested on the movement of large shipments of raw lime products on a regular schedule. The perishable and sometimes flammable (volatile) nature of most lime products also limited production to available shipping resource types. Railroads could transport lime faster than wagons, which opened up more markets for limekiln operations. The number of kilns on a site reflects the company owners desire to increase the efficiency of the human labor force as well as increase production output in a shorter amount of time. Two kilns would allow the operators to stagger the firings, which would produce more lime with fewer workers and less man-hours.

The perishable nature of the processed lime necessitated a quick, reliable and protected means of transport to consumer. The presence of the Memphis, Clarksville and Louisville Railroad within walking distance of a number of excellent sources of limestone provided Houston County with the ideal combination of high quality raw materials and transportation routes to larger markets. The limekilns that were constructed to exploit this combination of transportation and natural resources led to Houston County's economic heyday.

The lime industry in turn led to commercial expansion throughout Houston County. Erin became the political, industrial, and commercial center of the county with a number of businesses and professionals. By 1886, Houston County lime was being sold to twelve to fifteen states outside

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Tennessee (Goodspeed, 1866: Finley Volume XXI:13). In 1900, most of the limekiln labor was African-American (Lovelady 1989:60). To the west, Stewart became a large village on the railroad, and also had a limekiln, shops, and manufacturers linked to the lime industry. Each of the limekilns also had an associated railroad spur or station except for Stewart, which was located on the railroad line. The spurs underscore the inter-dependence of the lime industry with the route of the railroads.

A side industry that developed to serve the limekilns was timber harvesting. Timber was available in abundance at the time of the first European settlers, but decreased dramatically as the timber was harvested. Although renewable, there was a period of time during the peak of the limekiln industry when large areas of Houston County were deforested. This led to the use of coal as the major fuel source. The transition from using wood to coal is common knowledge but not documented by surviving records.

By 1886, there were seven limekilns operating in Arlington, Stewart Station, and Erin. Their combined capacity was 750 barrels of processed lime per day employing 300 men. The lime manufactured at these kilns was a superior quality and was regularly sold in between twelve and fifteen different states in the Union (Goodspeed 1886).

Around the turn of the century the lime industry in Houston County began to decline, as substitutes for lime products were developed and larger commercial factories established. This in turn led to a decline in Houston County's economic base as faster, easier, and cheaper methods for generating higher quality lime replaced the older kiln technology. While some lime production continued into the 1930s, primarily for insecticide sprays and water purification, the majority of the quarries that once provided limestone for the lime industry began instead to provide crushed stone to be used primarily for road surfacing.

In the early 1940s lime production in the county ceased and the limekilns were abandoned. For the next two decades, the quarries that had once provided limestone for the various kilns in the county instead provided crushed stone and rip-rap for construction projects in the region, including the large Tennessee Valley Authority projects. By the late 1960s even these small local quarries stopped being used as they were gradually forced out of business by the larger regional commercial quarry operations.

In 1972 passenger service on the railroad ended, with freight service discontinuing in 1978, and local service ending in 1982. The taking up of the railroad tracks in 1985, removed the last part of the regional economic system linked with the limekilns that began in the 1860s (Lovelady 1989:32).

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Property Type – Limekiln

Description

Kilns

The earliest form of limekiln was a "ground hog" intermittent kiln, which was usually located on the side of a hill for ease of loading quarried lime cobbles through the top. These kilns were allowed to go out between firings, but were more susceptible to having stones collapse in the interior, extinguishing the fire. "Ground hog" kilns are easy to identify as they usually have only one bottom opening and are located next to a hill or ridge with an opening in the top for loading (Blatchley 1903: 225).

"Pot kilns" allowed for more control of the lime burning operation, with openings at the bottom used for continuous firing. These types of kilns were usually freestanding, with two side openings at the base for fueling the fire in the chamber, and a central opening at the base for removing the lime. The Cook's Hollow Limekiln was an intermittent "pot kiln", a type commonly used from the 1840s up through the early twentieth century. An excellent description of this type of kiln comes from W. S. Blatchley (1903: 226-227), who writes:

On the inside (the kilns) were usually circular in horizontal section, tapering slightly, by a curve both up and down from the circle of largest diameter, which was from four or six feet above the bottom. A kiln 10 to 11 feet in greatest diameter, was 25 to 28 feet high, five to six feet in diameter at the top and seven to eight feet at the bottom. There was an arched opening on one side at the bottom, five to six feet high, through which the wood was introduced and the burnt lime removed. A horizontal grating on which the fire was built was usually placed one or two feet above the bottom. In all these intermittent kilns there was an enormous loss of heat at each burning, for the quantity of fuel, necessary to raise the contents of the kiln and the thick stone and brick walls to the degree of heat necessary to form the lime, had to be repeated each time the kiln was liable to become injured by over-burning before the top portions were thoroughly calcined.

Blatchly goes on to note that these types of kilns usually held 1000 to 1200 bushels of lime, were filled in one day, used exclusively wood as a fuel source, and took about three days to burn before being emptied in a day or two.

The "pot kilns" were in turn replaced by perpetual burning kilns, which utilized coal as well as wood to fire the limestone. Perpetual burning kilns were also freestanding, with two side

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openings at the base and a central opening for removing the lime. Perpetual burning kilns had more complicated fire control and stone loading features for facilitating the continuous production of lime. All three types of masonry limekilns were in use up to the early 1900s. After masonry perpetual burning kilns came steel-chambered kilns, which were commonly used throughout the twentieth century (Blatchley 1903:227).

An intermediate step between "pot kilns" and perpetual burning kilns was the practice of constructing several "pot kilns" at the same location. The construction of additional kilns allowed for a simulated perpetual burning of limestone. As one kiln was stocked with fuel and stone, another kiln was burning both to process lime. In this fashion, a more dependable lime processing system was constructed, without the idle cooling down time found with a single operating kiln. A single mid-nineteenth century lime production industry in Delphi, Indiana, had six "pot kilns" operating, each in a different stage of the lime production process.

Associated Features

Several nearby landscape features may also be associated with the limekilns. The primary quarry site for the limekiln was always located nearby. The quarry itself involved breaking limestone cobbles or blocks off of the ridge face, or recovering natural blocks that had been sheared off the ridge face through natural freezing and thawing.

Historic roadbeds or rail beds that served the quarry and kilns may still be extant. A larger road network probably served as the link between the kiln and quarry. The road-based transportation network acted as a route for the people who worked at the site to get to the kiln or the quarry.

A shallow levee associated with the limekilns may also be extant. It could be made from earth and stone along both banks of the dry creek bed. This levee would have protected the road and the kiln site during heavy rains or flash floods when the creek would have been filled with water.

Many limekilns had adjacent buildings or structures, none of which are standing in Houston County. There may be extant stone foundations of these resources.

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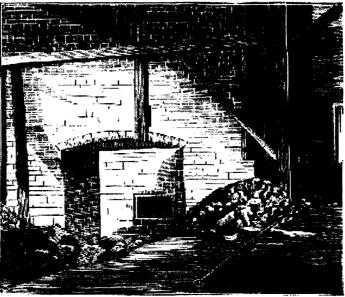
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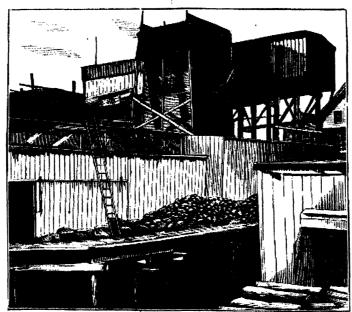
Examples of typical limekilns that were operating in the late nineteenth century:

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Circa 1876 limekiln in Maryland from *The Manufacturer and Builder*. Showing exterior of a working limekiln operation and interior of a limekiln. From Cornell University's Making of America <u>http://library5.cornell.edu/moa</u>.



Lig. 3. -- Fist of Interspe of Patont Louis-Koise



Ng. 4.- Flew of Exterior Surroundings of Lime-Kiln.

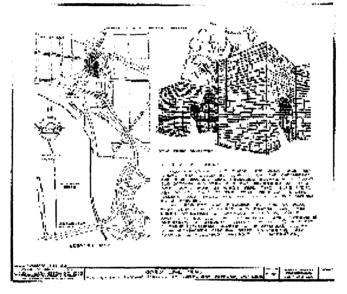
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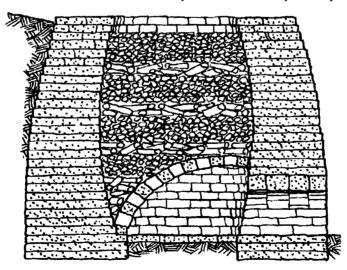
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Circa 1864 Godey Limekilns, Washington DC. From the Library of Congress, American Memory, http://memory.loc.gov



Hillside limekiln. From Introduction to Early American Masonry , Harley J. McKee.



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Significance

Limekilns can be eligible for listing in the National Register under criterion A in the area of industry. The limekilns and associated features are a tangible reminder of the importance of the lime industry to the history of Houston County and to the Middle Tennessee region during the late nineteenth and early twentieth centuries. The lime industry was the primary economic industry in Houston County when it began around 1871 and it continued to dominate both the commercial and industrial activities and settlement patterns in the county until the decline of the industry in the twentieth century.

The families who owned the limekilns of Houston County dominated politics, land ownership, and determined where towns and businesses were located in the county until the 1900s. At their height, the few families who owned the limekilns owned over 25% of Houston County. Since lime was sold throughout the southeast during the heyday of the lime industry, the importance of the Houston County business on a regional economic scale is also evident. The kilns are reminders of the influence of the lime industry in the settlement of Houston County and Middle Tennessee.

After the decline of the lime industry, the Houston County limestone companies and their associated quarries turned to crushed limestone as their principle product, with lime as a less economically important product. In this capacity, the lime quarries still provided a regional economic role, providing stone to several surrounding counties and to Tennessee Valley Authority projects. Lime was still produced, and sent as far away as New Orleans, but the dominance the industry once held over Houston County economics never returned.

Registration requirements

Limekilns can meet registration requirements if they have a strong integrity of association with the development of the lime industry in Houston County, Tennessee. They can be important to the industrial or commercial development of a single community or to a wider area. These resources should have been in operation during the period of significance of this nomination

Limekilns that are significant under Criterion A must be directly associated with the lime industry of Houston County, Tennessee. This association should be supported by written accounts or substantial oral tradition showing the limekiln's use during the period of significance. The limekiln must retain a strong integrity of its original appearance. This includes the retention of the majority of its materials, design, form, plan, setting, location, and association.

Archaeology

The limekilns have not been assessed for their potential archaeological significance. Nonetheless, there appears to be a potential for subsurface remains. Properties of this type typically were a

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complex of the principal industrial building(s) and associated secondary resources. Subsurface remains may contain important information useful for interpreting site patterning or general interpretation of the history of the property. An industrial archaeological approach to the site(s) also has the potential to reveal details of individual limekiln operations that may differentiate from expected patterns. Investigations could yield important information about innovative techniques of extraction or processing in the lime industry.

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Houston County Library Photographic Collections.

Houston County Library Scrapbooks.

Metcalf Business Records, 1940s.

Oral Histories from Local Historians – Taken by Dr. Wayne Bischoff and Rich Green

Mr. Wayne Richardson (former limekiln and quarry worker) Ms. Nina Finley Ms. Lorene Powers Mr. Roland Roby Mr. Webb Mitchum Mr. Tom D. Spencer

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Survey Methodology

This project was conducted as part of a grant from the Tennessee Historical Commission. The Greater Nashville Regional Council and the City of Erin, Tennessee administered the grant. All properties discussed in this document were visually inspected and documented in the field on two separate occasions by Dr. Wayne Bischoff and Rich Green of Landmark Archaeological and Environmental Services, Inc. Archival photographs of all structures were taken and will be submitted with the appropriate forms. Dr. Wayne Bischoff did archival research and oral histories.