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64501194

Cover

National Register of Historic Places Multiple Property Documentation Form

This form is used for documenting property groups relating to one or several historic contexts. See instructions in National Register Bulletin *How to Complete the Multiple Property Documentation Form* (formerly 16B). Complete each item by entering the requested information.

New Submission Amended Submission



A. Name of Multiple Property Listing

Lime Manufacturing Resources of Utica, Indiana

B. Associated Historic Contexts

(Name each associated historic context, identifying theme, geographical area, and chronological period for each.)

1. Indiana Lime Industry, 1818-1953
2. Lime Manufacturers of Indiana, 1818-1953
3. Clark County and Utica Township Lime Industry, 1818-1953

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D. Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this documentation form meets the National Register documentation standards and sets forth requirements for the listing of related properties consistent with the National Register criteria. This submission meets the procedural and professional requirements set forth in 36 CFR 60 and the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation.

MAKzoll Deputy SUPO 11/5/2013

 Signature of Certifying official Title Date

INDIANA DNR - Division of Historic Preservation & Archaeology

 State or Federal Agency or Tribal government

I hereby certify that this multiple property documentation form has been approved by the National Register as a basis for evaluating related properties for listing in the National Register.

Patrice Andrus 12/30/2013

 Signature of the Keeper Date of Action

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Provide the following information on continuation sheets. Cite the letter and title before each section of the narrative. Assign page numbers according to the instructions for continuation sheets in National Register Bulletin *How to Complete the Multiple Property Documentation Form* (formerly 16B). Fill in page numbers for each section in the space below.

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Paperwork Reduction Act Statement: This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C.460 et seq.).

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E. Statement of Historic Contexts

Introduction

This nomination addresses resources associated with the historically significant lime industry in Clark County, Indiana. Clark County lies in southeastern Indiana and is bounded by Jefferson, Scott, Washington, and Floyd counties, as well as the Ohio River. Initial Euro-American settlement in the county occurred in the late 1790s, with Springville rising to early prominence. The county's earliest settlers came from Kentucky, Maryland, New York, North Carolina, Ohio, Pennsylvania, and Virginia, as well as from England and Germany. Located across the Ohio River from Louisville, Kentucky, Clark County profited from its proximity to the city as early as 1795. During this time, a ferry service began operating across the Ohio River from Utica Township (Baird 1909:47). The ferry facilitated the movement of farm produce and other goods between Clark County and urban markets at Louisville.

Agriculture dominated the economy of Clark County during the initial period of settlement, but the timber industry also proved a significant economic force. Farmers cleared land during winter months when they were not as busy in the fields, and often employed professional lumberjacks. Timber was sold as building material and as fuel for steamboats and industry (Baird 1909). By the 1830s, shipbuilding and lime production had eclipsed lumbering and become the most significant industries in Clark County. Following the Civil War, the lime industry expanded considerably, with Utica as its center. Lime production flourished during the 1870s and 1880s, and then rapidly declined in the 1890s. During the first decade of the twentieth century, cement manufacturing replaced lime burning as a major industry in Clark County (Kramer 2007:92, 185, 133–134). Shipbuilding has remained significant until the present day.

The Significance of Lime

Historically, lime, also known as "quicklime," has seen a wide variety of applications. During the first half of the nineteenth century, lime was used primarily by farmers to condition their fields. It was also a key ingredient in natural cement and plaster, making it an important building material. Lime also was used by manufacturing and chemical industries for the production of bricks, dyes, rubber, gelatin, medicines, explosives, petroleum, glass, abrasives, polishes, ceramics, water purification, soda ash, caustic soda, bleaching powder, calcium carbide, illuminating gas, ammonia, calcium cyanamide, calcium nitrate, insecticides, sugar, distillation of wood, paper, paints, glycerin, lubricants, candles, and leather tanning. It also saw use in the food and textile industries (Hockensmith 2009:16). The various forms of lime included air slaked lime, caustic lime, chalk lime (gray and white), chemical lime, clot lime, cob lime, dolomitic lime, fat lime, greystone lime, ground lime, hydrated lime, hydraulic lime, lean lime, lime putty, lump lime, magnesian lime, meagre lime, plaster lime, poor lime, pot lime, quick lime, run of kiln lime, screened lime, selected lime, shell lime, slaked lime, and Vienna lime (Hockensmith 2009:16).

By 1906, 86 percent of lime was used for building purposes, while 8 percent was used for chemical and manufacturing processes, and 6 percent was used for agriculture (Ault et al. 1974:3). By 1934, only 27 percent of lime was used in building materials, with 64 percent used in chemical and manufacturing, and 10 percent in agriculture. In 1970, a mere 8 percent of lime was used for building, with 91 percent going into chemical and manufacturing, and only 1 percent into agriculture (Ault et al. 1974:4).

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Sources of Lime in Indiana

Extensive beds of limestone and dolomitic lime are found throughout the Midwest. The chemical composition and quality of the stone, however, varies significantly from region to region. Such variations stem from the nature of geologic processes and the availability of limestone and dolomite outcroppings. Regardless of their composition, both limestone and dolomitic lime were used for many of the same applications. Consequently, due to the wide range in uses, purity requirements varied considerably. Lime is a low-cost bulk commodity, thus it was imperative that a limemaker locate a source of high-quality lime that could satisfy as many requirements as possible with one product (Ault et al. 1974:2, 34).

Lime producers in Indiana relied on two main types of source material: high-calcium limestone and high-purity or high-magnesium dolomite. Mississippian-age Salem and Harrodsburg limestones and Paoli and Ste. Genevieve limestones are the best sources for high-calcium limestone in the state. Near the south-central region of Indiana, in Owen, Monroe, and Lawrence Counties, deposits of Salem and Harrodsburg limestone can contain as much as 97 percent calcium carbonate. Layers of this material can measure 50 feet in thickness. Layers of high-calcium Paoli and Ste. Genevieve limestones typically are less thick than those of the Salem limestones. Although not as thick, the purest limestone in Indiana comes from the oolitic facies of the Ste. Genevieve limestones. Purity levels averaging 98 percent calcium carbonate have been found in layers of Ste. Genevieve limestone measuring 28 feet thick (Ault et al. 1974:34-35).

In Indiana, high-purity dolomite is located in the northeastern and north-central regions of the state. The largest and purest deposits of dolomite are located in the Wabash Formation of north-central Indiana. However, much of the material is buried under hundreds of feet of glacial drift, making recovery unfeasible. In a few areas, however, the overburden is shallow enough to permit mining of the material (Ault et al. 1974:35).

The Manufacture of Lime

Lime is obtained by heating natural limestone or dolomite in a process known as calcining. To calcine limestone or dolomite the raw material must be heated to temperatures ranging from about 725°C to 900° C, depending on the composition of the stone. During this process, the heat drives off carbon dioxide (CO₂), leaving calcium oxide (CaO) and small amounts of various impurities, such as silica, alumina, and magnesium. When pure, quicklime is a fine, white powder. Impurities in the stone, however, often give quicklime a yellow or blue tint. To produce mass quantities of lime suitable for a variety of applications, it is necessary to hold impurities to as little as 2 percent or less of the total. It is imperative, therefore, to use only the purest limestone or dolomite (Heath 1915:2-3, 24; Lazell 1915:14-15; Eckel 1922: 97).

Small-scale lime operations often relied on available outcrops, but as the industry grew, it became necessary to locate large deposits. Lime quarries were exposed by stripping away overburden and low-grade stone. Upon reaching bedrock, workers drilled holes in the limestone at regular intervals, inserted blasting powder, and then detonated the explosives. The blast produced boulders and large rocks that required additional reduction, sometimes performed with jaw crushers. After sorting the material by size, it was hauled to a kiln with wheelbarrows, horse-drawn wagons, or carts. Larger operations sometimes employed trams, much like those used in coal and hard rock mines (Hockensmith 2009:12-13).

The most common technique for calcining lime during the period of early settlement was the "log heap" method.

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Log heaps consisted of nothing more than a bed of fresh-cut logs upon which a pyramid-shaped heap of brush was piled. A pyramid of limestone spalls was added to the top of the log heap, which was left to dry for as long as six months. Once the lime-makers deemed the logs and brush thoroughly dry, they soaked the entire pyramid with kerosene and set it afire. The heap burned for approximately 48 hours, reducing the limestone to quicklime, which was recovered after the heap cooled (Ault et al. 1974:7-8). This method commonly was employed throughout Indiana from the late eighteenth century until at least the 1820s. Log heaps likely were used well into the nineteenth century by farmers who required limited quantities of lime for soil conditioning.

By the 1830s, most lime producers used "ground hog" kilns. These devices required construction of a square or cylindrical-shaped, stone-lined chamber in the side of a hill. Lime makers made an arch of limestone near the lower section of the kiln then stacked additional limestone atop the arch until stone protruded from the top of the kiln. Combustible material was placed under the arch of stone and set afire. The process required three to four days of burning to produce quicklime. Once the quicklime was removed from the cooled kiln, the kiln was reloaded with limestone and fuel and the process repeated. Such kilns were common during the early 1800s (Ault et al. 1974:9).

These primitive, "intermittent" kilns, as they are known, required a complete cycle of charging, burning, cooling, extraction of the burned lime, and then charging with new lime. By the 1870s, inefficient intermittent kilns had been largely replaced by "perpetual" or "continuous" kilns. The improved kilns could burn uninterrupted for extended periods of time. Workers added lime and fuel at regular intervals without waiting for the kiln to cool. Burnt lime was drawn regularly from the bottom of the kiln, enabling a lime operation to continually load new lime into the top of the kiln. By eliminating the need to cool and reload the kiln, continuous kilns allowed lime manufacturers to greatly increase production while simultaneously reducing fuel costs (Kramer 2007:13).

The most common examples of continuous-burning kilns were of the vertical or rotary types. As its name implies, the vertical or shaft kiln, as they are sometimes called contain a vertical, cylindrical shaft, typically 6 to 10 feet in diameter and between 40 and 50 feet in height. Limestone and fuel, such as wood or coal, are loaded into the cylinder in alternating layers. The finished product is removed from the bottom of the kiln and new stone and fuel are loaded from the top. Because the lime and fuel are loaded in alternating layers, the quicklime is contaminated by fuel ash, which must be sifted from the lime. The process, however, proved more economical than earlier methods. Some vertical kilns included a steel-lined shaft. Known as flame kilns, these devices eliminated the problem of ash contamination by locating the firebox around the outside of the shaft (Ault et al. 1974:10-11).

Experiments with rotary kilns started in 1885, but the design was not considered commercially viable until 1890. These kilns include a large, nearly horizontal, revolving steel cylinder in which the lime is cooked. A gas or coal-fired flame is blown in through the lower end of the cylinder, while lime is fed through the opposite end. As the cylinder rotates, the lime slowly gravitates toward the lower end of the kiln, where it eventually falls through an opening and lands in a cooler (Heath 1915:30; Eckel 1922:109). These kilns were developed toward the end of quicklime production in Indiana and probably played a larger role in the production of Portland cement, which by ca. 1905 had largely replaced lime cement as a building material.

Indiana Lime Industry, 1816-1953

Early settlers took advantage of the abundant supplies of limestone and dolomite located throughout Indiana for domestic use. Vast beds of Mississippian limestone extend from the northwest corner of the state toward the Ohio border and south to the Ohio River. From Putnam County, in south-central Indiana, immense beds of Silurian and

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Devonian dolomites and limestone extend south to Crawford and Harrison Counties on the Ohio River (Ault et al. 1974:12).

As early as the late eighteenth century, settlers in Indiana made quicklime from local stone. As trees were cleared from fields, the logs were assembled into cribs for the purpose of burning limestone spalls. The calcined material was used to condition newly cleared fields, as well as to make whitewash and mortar. Most of the material was used on the farms on which it was made (Ault et al. 1974:12).

As the state's population grew, so too did the demand for lime. Enterprising industrialists recognized the potential for profit that the state's limestone supplies offered, and began forming lime-manufacturing companies. The abundance of good-quality Indiana limestone, combined with an ever-improving transportation network, made lime burning a popular business. By the 1850s, lime production had developed into a significant industry (Ault et al. 1974:6-7). So common was the practice of making lime that by 1850, at least 40 counties in Indiana contained kilns. The majority of commercial production occurred in the Wabash River valley in northern Indiana and in south-central Indiana (Ault et al. 1974:7).

Prior to 1874, much of Indiana's limestone was shipped to market on the Wabash & Erie Canal, which paralleled the Wabash River valley between Huntington and Terre Haute, Indiana. For a brief period of time during the mid-nineteenth century, the canal provided outlets for quicklime from Toledo, Ohio, to Evansville, Indiana. After abandonment of the canal in 1874, the state's burgeoning rail network monopolized lime shipments (Ault et al. 1974:12). By the late 1800s, most of the state's lime producers were concentrated in a few towns and cities. Good quality limestone, access to efficient transportation, and open markets determined the success or failure of the various lime-producing centers (Ault et al. 1974:12).

The heyday of commercial quicklime production in Indiana lasted from roughly 1850 to ca. 1900. During that period, the commercial production of lime evolved from a small-scale process, aimed at local consumption, into a significant industry capable of meeting large-scale demand. In 1889, Indiana ranked seventh in the nation in terms of lime production (Day 1890:641). By 1900, the Indiana lime industry had shrunk to a handful of plants. Consolidation of competing companies contributed significantly to the decline in the number of manufacturers, but decreasing demand also played a major role. By 1905, the demand for Portland cement was surpassing that for natural cement, which represented the most common commercial use for Indiana quicklime. Lime, however, remained a component of Portland cement mortar and concrete until about 1930, when advances in Portland cement negated the need for lime. During the Great Depression, surviving lime producers found it difficult to renovate existing plants, making it increasingly unprofitable to manufacture. By 1940, only two plants remained active in the state. Demand slowly increased during the 1940s, but Indiana's lime producers made little effort to compete with those in Ohio, who had access to cheaper transportation and nearby markets. The last Indiana lime plant, using native stone, ceased operation in 1953 (Ault et al. 1974:39-40).

Comparative Figures of Neighboring States

Pre-1900 production figures for Indiana's lime industry are limited. Two estimates, however, suggest that lime production was on the rise in the late 1870s and early 1880s. Roughly 20,000 tons of lime were manufactured in 1879, and approximately 30,000 tons were produced in 1882 (Ault et al. 1974:34). How these figures compare to the output of other states at that time is not clear, but Federal census records for 1889 indicate that of the forty states producing limestone, Indiana ranked third in overall extraction of the material, which included building stone. It also ranked third in the number of limestone quarries (172), behind only Pennsylvania and Ohio.

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The 1889 census data indicates that the North Central region, defined as Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, Ohio, South Dakota, and Wisconsin, led the nation in the production of limestone. The limestone output for this region was valued at more than \$10 million, nearly \$4 million more than the next largest producing region, the North Atlantic (Day 1890:631). Indiana accounted for 18 percent (nearly \$2 million) of the region's output. However, while the state was the nation's third largest producer of limestone, it ranked seventh in the production of quicklime, producing 1,074,517 barrels in 1889. These numbers suggest that Indiana's limestone industry focused on the production of dimension stone for architectural use. This concentration is scarcely surprising, given the history of the Salem dimension stone belt in Monroe and Lawrence Counties, the source for a significant portion of the nation's building stone (Day 1890:632).

Pennsylvania remained the nation's leading producer of quicklime until 1922. After that date, Ohio has reigned as the nation's leader. Indiana ranked as high as ninth place as late as 1920, but slowly declined thereafter (Ault et al. 1974:33-34).

Lime Manufacturers of Indiana, 1818-1953

In south-central Indiana, a narrow band of Mississippian-age limestone extends from the north end of Putman County to the Ohio River. The purity of certain layers of this stone, combined with the easily accessible outcrops, made southern Indiana's Mississippian-age limestone attractive to lime producers. The majority of lime kilns processing this material were clustered in Putnam and Lawrence Counties. In southeastern Indiana, lime manufacturers utilized Silurian and Devonian dolomites and limestones. A few scattered operations processed lime in Shelby, Decatur, Bartholomew, Ripley, and Jefferson Counties, but the largest concentration of lime producers working with these deposits was located near the Ohio River in Clark County, where production began as early as 1818. Although production figures for individual lime plants are limited, the number of known lime producers in Clark County suggests that the county's industry was rivaled only by those in Lawrence, Carroll, and Huntington counties (Ault et al. 1874:29).

Of those counties rivaling Clark County, Lawrence County eventually came to dominate the industry statewide. Although better known for its dimension stone, known commercially as "Indiana Limestone," Lawrence County produced quicklime since before the Civil War. The Salem and St. Genevieve limestones found along the Blue River provided lime burners, like Asa Erwin, an excellent source of high quality lime. Located about 2 miles north of Mitchell, Lawrence County, Erwin's operation included a pair of pot kilns. Production figures for Lawrence County are few, but one from 1873 reveals that Erwin's facility produced 17,500 bushels by year's end (Ault et al. 1974:19). Compared to 1860 lime production figures for Clark County, Erwin's output was higher than many of the independent manufacturers at Utica, but much lower than some of the larger manufacturers, who could produce as much as 50,000 barrels a year (United States Federal Census 1860).

In 1895, Erwin sold out to the Mitchell Lime Company, which quickly increased their own capacity by adding Erwin's kilns to their own. Just as Clark County's lime industry was nearing its end in 1900, the expanding Mitchell Lime Company spawned its own company town called Rabbitville. Operations at Rabbitville continued into the 1930s, when the expense of removing overburden from the limestone beds finally exceeded practical limits, forcing the company to stop its lime-manufacturing activities (Ault et al. 1974:20).

Unlike the Mitchell Lime Company, the Horseshoe Lime Company, of Bedford, Lawrence County, circumvented the need to quarry their own limestone. Relying on dimension stone companies to perform the heavy work, the Horseshoe Lime Company simply calcined waste stone from dimension stone operations. Using this technique, the company could produce 12,000 to 13,000 bushels of lime per month, far exceeding the capacity of Clark

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County's manufacturers. Shipped over the Monon Railroad, Horseshoe Lime Company lime sold at markets throughout the Midwest. Rail connections such as this gave Lawrence County lime manufacturers a distinct advantage over those located at Clark County's river-bound lime-burning community of Utica. Despite better transportation facilities, however, the rise of Portland cement eventually decreased demand for Bedford quicklime. Production at the Horseshoe Lime Company facility, which was acquired by the Ohio & Western Lime Company in 1907, and the Indiana Lime Company by 1915, came to an end during the early 1930s (Ault et al. 1974:22).

At least three other companies burned lime from the Bedford-Mitchell district during the nineteenth and early twentieth century. These companies operated at or near Salem, Lawrence County, where certain layers of limestone exceed 98 percent total carbonate. This exceptionally good limestone was acquired from both open-pit quarries and underground mines. Using both stone and steel kilns, local lime manufacturers produced a high-quality product (Ault et al. 1974:28). However, slow production, high overhead, and a lack of capital to invest in more efficient equipment eventually proved fatal to the Salem quicklime business. Nevertheless, like many of Lawrence County's lime manufacturers, those of the Salem area survived into the early 1930s (Ault et al. 1974:29).

The only lime manufacturer to remain in operation through the Great Depression was James B. Speed. His Louisville Cement Company came to dominate the industry by 1900, and by the early 1950s, he was the only lime manufacturer remaining in the state. Speed began his lime-burning activities at Utica, Clark County, Indiana, around 1871. His James B. Speed & Company contributed significantly to the growth of the lime industry in that town. However, following his 1885 discovery of a higher quality limestone near Milltown, Lawrence County, Speed shifted the bulk of his lime operations to that community (Hockensmith 2009:56). In 1887 he erected a pair of stone kilns and a pair of steel kilns near the west bank of the Blue River. The stone kilns had a capacity of 375 bushels per day, slightly less than that of the steel kilns. As of 1903, Speed's plant was the only operation in the state producing hydrated lime, which, among other applications, was used to condition soil and make mortar (Ault et al. 1974:24-25). His operations at Utica, which declined significantly during the 1890s, came to an end in 1907 (Hockensmith 2009:54).

Across the river from the Louisville Cement Company's Milltown plant, the Eichel Lime & Stone Company built three steel kilns in 1903. The company remained independent until 1913, when the ever-growing Louisville Cement Company brought Eichel Lime & Stone into its fold. The Louisville Cement Company added a rotary kiln to this facility in 1921. The company's Milltown operation survived until 1953, making it the last lime-manufacturing plant in the state (Ault et al. 1974:26).

Although the state's lime industry had been decreasing since 1900, production of lime briefly increased as manufacturers, like the Louisville Cement Company, consolidated and increased efficiency with high capacity plants. As with many American industries, lime production came to a near standstill during the Great Depression and World War II. Between 1930 and 1943, five of the state's six remaining lime producers stopped making quicklime. It appears that these manufacturers shifted their output to the production of crushed limestone, rather than modernizing their kilns to make quicklime production more profitable (Ault et al. 1974:36).

The general indifference toward lime production likely resulted from a decreased demand for building lime. Lime, however, remained a useful commodity for a variety of applications, including steel and chemical manufacturing. Indeed, demand for industrial and chemical lime increased from approximately 3 million tons in 1950 to nearly 17 million tons by 1970 (Ault et al. 1974:4). In the post-war years, lime manufacturers in Ohio continued to supply markets that were easily accessible via Lake Erie. In markets that had historically purchased Indiana quicklime, such as Illinois, Pennsylvania, Michigan, and Kentucky, new manufacturers arose to meet local demand. After

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World War II, it became standard practice to build lime processing plants just outside the limits of major cities. These plants relied on locally quarried lime or imported it from outside sources. Although a number of large markets remained available to Indiana lime producers after 1945, the state's manufacturers failed to capture these opportunities (Ault et al. 1974:38).

No single explanation accounts for the end of Indiana's lime industry. Certainly, declining demand for building lime, high overhead, and competition from manufacturers in neighboring states played major roles in the industry's demise. Nevertheless, it would appear that with an abundance of high-calcium limestones available within the state, and readily available markets in Kentucky, Illinois, and Michigan, Indiana lime plants could have continued processing native stone at a profit. Ultimately, the leading cause of the industry's extinction may have been nothing more than a pervasive lack of enthusiasm for lime production. As one lime expert put it, Indiana lime production ended largely as a result of "apathy, and unaggressiveness undoubtedly stimulated by the decline of building lime" (Ault et al. 1974:40).

Clark County and Utica Township Lime Industry, 1818-1921

Prior to the Civil War, agricultural processing constituted a significant percentage of Clark County's overall industrial output. Nonagricultural processing, however, grew significantly between 1820 and 1840. According to Carl E. Kramer, only 389 people in the county were employed in manufacturing in 1820. By 1840, manufacturing jobs in Clark County had increased by 168 percent, employing 1,045 workers, or about 13 percent of the county's total workforce. Among Indiana's 87 counties, Clark ranked fifth in value of manufacturing. Much of the county's industrial growth was directly related to lime burning and ship building (Kramer 2007:92).

Commercial lime burning in Clark County began as early as 1818, when settlers in the Utica area first exploited the extensive Niagara limestone deposit that lay along the falls region of the Ohio River. During these early years, calcination was achieved by placing locally mined limestone in bonfires made of logs and brush. Despite these primitive methods, capacity proved sufficient to export barrels of quicklime to river ports as far south as New Orleans. During the early years of production, however, lime shipments were probably nothing more than cargo-filler aboard flatboats loaded with pork, flour, and whiskey (Baird 1909:399; Kramer 2007:92).

Motivated by increasing profits, local lime manufacturers experimented with more efficient production methods. By 1826, a man named Starkweather had built an intermittent pot kiln about 0.5 miles upriver from Utica. Located on property later owned by Nicholas Lentz, the kiln used Pittsburgh coal for fuel. According to a contemporary account, lime production was the town's primary source of income at this date. As Allen Lapham noted in his journal on July 6, 1828, the village of Utica contained about 40 or 50 houses and the business done here "is very little being principally what arises from the manufactory of Quicklime, and brick, and of supplying Steam Boats with wood." Upon inspection of the rock formations along the bluffs of the Ohio, Lapham "passed along on top of the ledge in a direction leading up the river and came to the place where the quarry of stone for the lime kiln is" (Thomas and Conner 1973:52-53).

Around this period, Robert G. Wood, James Sweeney, and William Brendel went into business shipping lime to Louisville, where it was packaged in large quantities and re-shipped to more distant markets. During the 1840s, Sweeney entered the lime-burning business with partners Allen Somers and, later, James Hogg. They were followed by Henry C. Emmerke and Mechac James, who also shipped lime to Louisville. Other principal Clark County lime manufacturers of the Antebellum Period included Jack Howard, Floyd Ogden, Redford Perry, Jacob Robinson, and Lyman Parks (Baird 1909:399; Kramer 2007:92).

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By the 1840s, lime had become the county's most important extractive industry and further efforts were made to improve production. Utica native Napoleon Bonaparte Wood made significant strides in this area when around 1850 he improved the ground hog kiln by building a temporary wall in front of the furnace. Wood's modified ground hog kilns improved fuel efficiency, making quicklime production more profitable. Perhaps as a result of these efforts, the first large shipment of lime left Utica for New Orleans about 1850. Consisting of 5,000 barrels, the shipment marked a significant increase in the direct exportation of lime from Clark County (Baird 1909:400; Kramer 2007:92).

In 1850, a total of seven companies manufactured lime in Clark County. Two of these companies, Keller & Morgan and George James, were located in Jeffersonville Township. The Keller & Morgan operation was capitalized at \$1,000 and employed an average of six hands. The company's kilns consumed 400 cords of wood and produced 33,000 barrels of lime, worth a total of \$5,833. The George James outfit, capitalized at \$500, employed an average of four hands. The kilns burned 140 cords of wood and produced 4,900 barrels of lime valued at \$697 (Hockensmith 2009:75; United States Federal Census 1850). Because these figures do not include the costs of limestone, which lime burners acquired by the perch or square rod, it is impossible to determine the profitability of the operations.

Annual production rates for the remaining five Clark County lime producers, all located in Utica Township, do include the costs of stone. The producers included E.J. Higrat, Allen Summers, James Morrow, Napoleon Wood, and Robinson & Pang. The Higrat operation used 270 perches of rock, burned 140 cords of wood, employed one hand, and produced 2,000 barrels of lime valued at \$1,250 per year. Allen Summers had \$350 invested in his company, which used 480 perches of rock worth \$225 and burned 250 cords of wood costing \$310. He employed two male hands at a combined total of \$40 per month and produced 3,600 barrels of lime valued at \$2,160. James Morrow's company included \$110 of capital invested. He used 800 perches of rock worth \$100 and burned 430 cords of wood costing \$645. He employed three male hands costing a total of \$60 per month. Lime production totaled 6,500 barrels of lime valued at \$3,900. Napoleon Wood had only \$20 invested in capital. He used 189 perches of rock worth \$15 and burned 70 cords of wood costing \$105. He employed no workers other than himself and managed to produce 900 barrels of lime valued at \$403. Finally, Robinson & Pang had \$700 invested in a company that produced 6,000 barrels valued at \$1,560. They used 680 perches of rock at a cost of \$329 and burned 340 cords of wood at \$510. They employed three male hands at a total of \$54 per month. These figures are likely rough estimates but they nevertheless provide some indication as to the size of the companies in operation during the time of the 1850 census (Hockensmith 2009:75; United States Federal Census 1850).

The 1850 U.S. Population Census for Utica Township probably does not include all of the lime burners and quarry men employed in the county, but the 17 residents who listed their occupation as "lime burner" indicates the significance of the industry. One individual listed his occupation as "rock quarry," indicating that he might have either quarried dimension stone or limestone for burning, or possibly both. All these men likely worked at quarries in the immediate vicinity of their residences, regardless of whether they produced dimension stone or quicklime (Hockensmith 2009:77; United States Federal Census 1850). Wages for quarrymen in 1850 are not readily available, but the manufacturing census indicates that lime burners earned about \$20 per month (Hockensmith 2009:75; United States Federal Census 1850).

By 1860, only six Utica Township residents listed their occupation as lime burners, with another five identifying themselves as quarrymen (Hockensmith 2009:77; United States Federal Census 1860). Nevertheless, annual lime production was measured in the tens of thousands of barrels. As Richard Owen noted in his 1862, *Report of a Geological Reconnaissance of Indiana*, at Utica, "large quantities of lime are burned from Devonian rock, in beds about twenty feet thick, with fossils only in the lower layers; surmounted by ten to fifteen feet of chert and reddish

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clay. As nearly as we could ascertain they ship annually from this place 100,000 barrels of excellent white lime, chiefly burnt in fire kilns, some of which hold 350 barrels and are charged fifty or sixty times a year" (Owen 1862:106).

The 1860 U.S. Census of Manufacturing for Clark County suggests that Owens' estimates were reasonably accurate. In Utica Township the census records include M.M. James, and Moses H. Tyler & Harrod. The James outfit had \$1,000 of capital invested in the business. He burned 1,500 cords of wood valued at \$3,800 and processed 3,300 perches of stone worth \$1,500. James employed five male hands that received a combined total of \$123 per month in wages. Altogether he produced 50,000 bushels of lime valued at \$7,500. With \$2,000 of capital invested, the Tyler & Harrod operation produced only 18,000 valued at 3,600. They burned 3,700 bushels of coal costing \$800 and used 1,000 perches of stone worth \$600. Three mail hands worked at the Tyler & Harrod Company making a combined total of \$75 per month in wages. The only other Clark County lime manufacturer listed in 1860 was T.J. Howard of Jeffersonville Township. He invested \$2,300 in his business, which yielded 50,000 bushels of lime valued at \$10,000. Expenses included 1,500 cords of wood costing \$3,300; 3,300 perches of stone worth \$1,500; wages for seven male hands at 168 per month; and \$200 for other articles (Hockensmith 2009; United States Federal Census 1860).

Census figures suggest that profits varied considerably among firms. Factors contributing to these discrepancies may include the various types of kilns employed by manufacturers, the quality of stone burned, and the efficiency with which it was quarried and transported to the kiln. Regardless, the industry remained relatively limited in size and capacity until the late 1860s. After that period lime production expanded significantly. Manufacturing and population census records of the 1870s and 1880s indicate that Charlestown and Jeffersonville Townships also contributed to the county's lime industry, but Utica Township clearly arose as the county's primary lime-manufacturing community.

Among the leaders responsible for the rise of Utica's lime industry in the late 1860s was Moses H. Tyler, owner of M.H. Tyler & Company (Hockensmith 2009:57-58; Baird 1909:400; Kramer 2007:184). Significant to Tyler's operation was his pair of continuous-burning "patent kilns," capable of producing 200 barrels of quicklime per day. Achieving production rates previously unrealized by local lime manufacturers, Tyler became the first large-scale lime company in Utica. Built at a cost of \$10,000, the Utica Lime Company kilns employed between ten and twenty hands at a time (Baird 1909:400; Kramer 2007:184).

Like most lime manufacturers, Tyler & Company leased land for the purpose of quarrying lime. His lease with Mitchell P. Howes, signed on July 31, 1868, reveals how such arrangements transpired. The lease states precisely what the lime company could use:

All or so much ground as may be required, by such M.H. Tyler & Company for the erection as of as many patent lime kilns as they may build for their benefit, the lime of said lands and lime quarries commencing at the terminus of the quarry known and designated as the bridge Company Quarries, on Coal Kilns point. All the cliff south of said quarry to his south line adjoining the town of Utica. Also, the quarries that extend up the ravine in the orchard in front of said cliff as far as quarries extend (Clark County 1868b:547).

The lease also stipulated that Howes was entitled to 1 cent per bushel for all lime burned. It further stated that Howes was to secure enough ground for the storage of wood, coal or lime, as well as to build a lime house on the bank of the river or in the meadow fronting the river (Clark County 1868b: Hockensmith 2009:68).

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Tyler eventually sold his businesses to James B. Speed's ever-growing Louisville Cement Company. Agreements from March 22 and April 24, 1871, state that Tyler agreed to sell the following:

Patent kilns at Utica, Indiana, with all their patent privileges for lime kilns now held by them, also the lime boat, two horses & wagons, drag, carts & all tools, sheds & personal property or fixtures now held, owned or used by them, in & about the business of burning, barreling, or shipping & transporting lime from said kilns to markets; all of the said articles to be delivered as herein provided in as good condition as the same were on the 22 of March 1871 (Clark County 1871:138).

Despite the sale, Tyler remained employed at the facility for the next 25 years. At the time of his death in 1896, an obituary stated that he had been "superintendent of the Louisville Lime Company for at least 40 years" (*The Evening News* 1896:4). The obituary seems to have blurred the distinction between Tyler's own business and that of the Louisville Cement Company, which purchased the M.H. Tyler & Company in 1871.

About the same time that Tyler organized his company, the Utica Lime Company also began lime production at Utica. Incorporated, in Clark County, Indiana, on May 26, 1868, the Utica Lime Company included company directors Dexter Belknap, Benjamin Hyatt, and company president John T. Cooper. With a capital stock of \$15,000, the Utica Lime Company was organized for the "manufacture and sale of lime, and the purchase or lease of ground for that purpose, and the manufacture of barrels to hold said lime, and the purchase of boats to ship the same in." Operations were carried out in Utica Township, with the main office located across the river in Louisville (Hockensmith 2009; Clark County 1868b:547).

Like M.H. Tyler & Company, the Utica Lime Company leased land from Mitchell P. Howes. On June 16, 1868, Howes and wife Eliza J. signed an agreement with the Utica Lime Company to "occupy and use the same [land] for all purposes connected with the business of lime burning and dealing in lime," as well as to "mine and quarry stone upon said land for the purpose of burning the stone into lime" (Clark County 1868b:10). The lease also gave the company permission to transport products across Howes' property, with the stipulation that the company maintain the roads in good repair. In compensation for use of the land the Howes would receive 2 ½ cents per barrel of lime, paid semiannually (Hockensmith 2009:68).

The company renewed the lease on May 23, 1871. The renewed lease contained the same language as the previous agreement, but with the additional stipulation that the company would pay the Howes in royalties equivalent to 10,000 barrels of lime, regardless of whether or not that amount was manufactured (Clark County 1871:229-230; Hockensmith 2009:68). The Utica Lime Company transferred this lease to the Union Lime & Cement Company on February 4, 1873 (Clark County 1873:229-230; Hockensmith 2009:68). On February 4, 1887, the Utica Lime Company again signed a lease with the Howes, but the landowner received only 1 ½ cents per barrel (Clark County 1887:292; Hockensmith 2009:69). By the late 1890s, the Howes property was in the hands of Elizabeth Hyatt. Hyatt continued to renew leases with the Utica Lime Company, which reorganized in 1900 and again in 1921 (Hockensmith 2009:71).

In 1873, the Utica Lime Company transferred its lease with the Howes couple to the Union Lime & Cement Company. Incorporated in Louisville on November 25, 1872, the Union Lime & Cement Company included stock holders R.A. Robinson, William A. Robinson, J.W.E. Bayly, and John T. Cooper of the Utica Lime Company. The articles of incorporation stated that the business of the firm was "the manufacture and dealing in hydraulic cement, lime and barrels, and all other articles usually manufactured and dealt in, in connection with cement and

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lime; also the quarrying, mining and dealing in building and other stone..." (Blatchley 1904:242; Hockensmith 2009:58).

The company acquired the Utica Lime Company's lease agreement at a cost of \$21,000. Signed on February 4, 1873, the lease continued the terms established between the Utica Lime Company and the Howes. The agreement, which terminated on June 16, 1889, stated that Utica Lime Company sold to the Union Lime and Cement Company "all the improvements, machinery, and attachments owned and used by it in the manufacture of Lime and cement on the land hereinbefore described and the land adjacent thereto" (Clark County 1873:229; Hockensmith 2009:68).

Despite the transfer of assets, the Utica Lime Company continued to operate under its original name. The company ceased operating in 1892, but was reincorporated in 1900 by the same shareholders. The reorganization appears to have been short lived, but the company was again resurrected in 1921 (Hockensmith 2009:60-62).

Another notable lime producer at Utica was Prussian-born Henry C. Emmerke. At the time of Emmerke's death in July 1899, his obituary in Jeffersonville's *The Evening News* stated that he was known as "a pioneer lime burner of Utica," who "lived to see a small industry grow to large proportions and then gradually drop back to almost a standstill." The obituary noted that the lime business flourished prior to the advent of the cement mill, which antiquated the "old-fashioned kiln dug in the side of some steep bank along the river." Emmerke was reported to also have been engaged in the lime business across the river at Harrods Creek, Kentucky, where he ran a general store and saloon (*The Evening News* 1899).

When Emmerke began his lime-burning business remains uncertain, but by 1857 he and business partner Mechac James were shipping lime to Louisville (Baird 1909:399; Kramer 2007:133). On August 31, 1868, Emmerke signed a lease agreement with Nicholas Lentz for "quarrying rock and building kilns for burning lime." The agreement further stated that "should H.C. Emmerke & Co. use all of the rock on the above described premises, the said H.C. Emmerke & Co. can go to the north side of said premises on the hill near the house of Robert G. Woods, senior, and get rock and have the right of way along the line on the southwest side of my farm running to the Ohio River." Emmerke agreed to pay Lentz one half cent per bushel for all lime burned in his kilns (Clark County 1868b:15).

Emmerke eventually sold his company to the Louisville Cement Company, who on July 7, 1871, signed an agreement with Emmerke to assume ownership of the entire works. The agreement included:

the patented lime kiln now used by him [Emmerke] in Utica Township, Clark County, Indiana together with patented right for the same for said County of Clark now held by him to be assigned by proper writing of assignment together with all of his tools & utensils of every kind used in and about the business of lime & also his boats & their tackling used in transportation of lime & used to assign and set over to said first party all of his contracts for furnishing lime (Clark County 1868a:142).

Incorporated in Louisville in 1869, the Louisville Cement Company was the latest manifestation of a business whose roots extended to 1830. Initially organized by John Hulme and Francis McHarry, the company exploited beds of natural cement stone discovered during construction of the Louisville & Portland Canal. Hulme and McHarry processed the material at the former Tarascon gristmill at Shippingport, Kentucky. In 1866, a group of Louisville businessmen purchased the Hulme and McHarry operation and renamed it the Louisville Cement &

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Waterpower Company. Three years later the company was reorganized as the Louisville Cement Company, with Dr. William B. Caldwell serving as president and James Breckenridge Speed as general manager (Kramer 2007:185).

By the mid-1870s, James Breckenridge Speed had become the biggest name in the local lime industry. Born near Booneville, Missouri, on January 4, 1844, Speed went to work for the Louisville Hydraulic Cement & Water Power Company shortly after the Civil War (French 2001:842–843; Hockensmith 2009:54). At age 25, he assumed the general management position at the newly organized Louisville Cement Company. Within a few years, Speed ascended to the role of company president. In 1871, he organized J.B. Speed & Company, which burned lime at Utica (Ault et al. 1974:31; Hockensmith 2009:54). Speed's lime operation at Utica was merely one component of a large-scale hydraulic cement operation that operated numerous plants located between Louisville and Crawford County, Indiana.

The main arm of Speed's business, the Louisville Cement Company, extended its reach into Clark County, Indiana, soon after incorporating at Louisville in 1869. That same year the company purchased the Sable and Gilmore mill and a large tract of land on Muddy Fork at Petersburg in Clark County. Two years later, on April 11, 1871, the company incorporated in Clark County. The corporate documents stated that the purpose of the company was the "manufacture of lime & hydraulic cement commonly called Water Lime" (Clark County 1871:114). The well-financed company had a capital stock of \$100,000 and included directors James W. Henning, James B. Speed, James H. Rhorer, and Milton M. Rhorer (Kramer 2007:185). Although the company office was located in Louisville, its Clark County operations were directed from Jeffersonville (Hockensmith 2009:56). During this period, the company built a large cement processing plant at Petersburg. The facility employed about 60 hands and operated eight kilns with a combined capacity of 1,000 barrels of cement per day. Annual production was rated at 100,000 barrels. Located along the tracks of the Jeffersonville, Madison & Indianapolis Railroad, the plant was well situated for the exportation of cement (Kramer 2007:185).

Although the Louisville Cement Company was involved primarily with the manufacture of hydraulic cement, it also "took up the collateral line of the manufacture of lime, beginning in a small way at Utica" (Hockensmith 2009:56). Through Speed's J.B. Speed & Company, the enterprise operated a pair of coal-fired and a pair of wood-fired kilns with a combined capacity of 520 barrels per day. As of December 1881, the Louisville Cement Company's lime operation was valued at \$25,000 and employed about 35 hands (Baird 1909:400; Kramer 2007:184).

The Louisville Cement Company acquired a foothold at Utica through the purchase of the M.H. Tyler & Company and the H.C. Emmerke & Company. On March 22, 1871, Mitchell and Eliza Howes signed a 30-year lease with the Louisville Cement Company. The lease was identical to that signed by Tyler in 1868. The agreement stated that the Louisville Cement Company "shall have use of all that part of the river front & flat ground from the river to the cliffs extending from the south inside line of the cliffs lease to the Utica Lime Company down river as they may require for the manufacture, storage, and shipment of lime, fuel & rock for roads & tracks for moving same" (Clark County 1871:135). The company could quarry "...all the rock from the face of the cliffs or ledges of rock as far back into the ledges or layers of limestone as said second party may choose to quarry" (Clark County 1871:135). The lease further stated that the company had the right to erect kilns and lay tracks between the quarry and the kilns for the purpose of moving limestone. The company agreed to pay the Howes semiannual royalties "for all lime burned from the land belonging to said first party up to 30,000 barrels per annum said second party shall pay one cent per bushel, for all excess over thirty thousand barrels per annum said second party shall pay one half cent per bushel" (Clark County 1871:136; Hockensmith 2009:65). The lease also noted that the Utica Lime Company had, through verbal agreement with Mitchell Howes, erected a

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frame warehouse near the property line for the Louisville Cement Company, and that the Louisville Cement Company should not interfere with it. The company continued to renew leases with the Howes and their heirs through the 1890s (Clark County 1871:136-137; Hockensmith 2009:65).

The Louisville Cement Company's activities, as well as those of the Utica Lime Company and other smaller producers, greatly contributed to the growth of the industry in post-Civil War era. As one journalist noted in June 1872, "[t]he limeries are running at full force at this place now. The Louisville Cement Company is making three hundred and twenty barrels per day, and working twenty-six hands. The Utica Lime Company, Messrs Bellknap & Co., are also working a large force of hands" (*National Democrat* 1872a:5; Hockensmith 2009:947). In August of that same year another article noted that "[t]he principal feature of this place [Utica] is the burning of lime just above the river bank. This gives work to a large number of the inhabitants" (*National Democrat* 1872b; Hockensmith 2009:47). In his 1874, *Report of Geological Survey of Clarke and Floyd Counties, Indiana*, William W. Borden noted that:

J. Speed Esq. (Louisville Cement Co.), has erected at Utica two of Page's patent kilns, each producing one hundred and twenty barrels of lime per day. At Robinson's landing, a few miles above Utica, Mr. Jacob Robinson burns of the same stone ten thousand barrels per year. The fuel employed is wood and requires four cords to burn one kiln. The Utica Lime Co., use a mixture of wood and coal, have two kilns, each producing ninety barrels of well burned lime per day. The Louisville Cement and Lime Co., and the Utica Lime Co., and Mr. J. Robinson burn one hundred and twenty five thousand barrels of lime per year employing in the business a large number of hands (Borden 1874:145).

Census data for Utica Township in 1870 and 1880 reveals the extent of the industry's expansion. A total of ten men were employed as lime burners in 1870, but by 1880 the number had climbed to at least forty-one. Sixteen quarry workers were employed in 1880, including Moses Tyler, who at age 66 was employed as "Superintendent of stone quarry" (Hockensmith 2009:80; United States Federal Census 1870, 1880). Clearly, the quarry and lime industries were interdependent, as the limeries required spalls from the quarry to make quicklime (Hockensmith 2009:77). Those listed as quarry workers likely were employed by the lime companies.

The industry continued to boom through the early 1880s, but in 1885 Speed's Louisville Cement Company relocated its main lime operations to Crawford County, Indiana, following the discovery of a high quality limestone near Milltown (Hockensmith 2009:56; Ault et al. 1974:26). Speed continued to burn lime at Utica, but the operation there appears to have dwindled. Concurrently, all lime operations at Utica declined. On March 31, 1892, *The Evening News* reported that "[t]he Utica Lime Company has shut down their kilns indefinitely" (*The Evening News* 1892; Hockensmith 2009:61).

As noted in Henry Emmerke's 1899 obituary, Emmerke had seen Utica's lime industry "grow to large proportions and then gradually drop back to almost a standstill" (*The Evening News* 1899). In 1903, W.S. Blatchley stated in his annual report to the Indiana Department of Geology that for the past seven years annual lime production at Utica had totaled no more than 8,000 barrels per year. He stated that as of 1903, there was but one kiln under fire at Utica. Owned by J.B. Speed & Company, this structure was located "about a quarter of a mile northeast of Utica," and was processing "a very fine magnesium which burns into a lime of high repute for mortar and plaster." This product was marketed at Louisville and points along the Ohio River north of Utica. Following a complete conversion to Portland cement in 1906, Speed abandoned the Utica works entirely (Rooney and Carr 1971:19). Blatchley wrote that the Union Lime & Cement Company continued to burn lime near Utica until ca. 1900, when the company abandoned its works for lack of transportation facilities (Blatchley 1904:242).

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Immediate access to cheap transportation was, in fact, a chief determinate of the viability of large-scale commercial quicklime production, wherever it occurred. Utica's close proximity to the Ohio River clearly had much to do with the prosperity of its quicklime plants. However, the river that had proved a boon to Utica's lime industry became a limiting factor, as railroads came to dominate the transportation industry during the 1870s and 1880s. According to Blatchley, the lack of transportation facilities was the primary impediment to the industry at Utica, "where shipment is possible only by boat on the Ohio River" (Blatchley 1904:222). Given the extreme bulk of lime, in combination with its relatively low value per barrel, wagon shipments were cost-prohibitive. Limeries with ready access to rail transportation would have had a clear advantage over those located at isolated river landings.

Another factor reported to have played a role in the decline of Utica's lime industry was competition between independent lime manufacturers and their much larger, high-capacity counterparts (Baird 1909:401; Ault et al. 1974:31). It is possible that competition among smaller producers exacerbated this problem. The formation of the Utica Lime Manufacturing Company on March 11, 1867, supports this theory. The organization was created to better regulate lime production, shipments, and sales. Founding members included Henry Emmerke, James Morrow, James A. Hobson, T.J. & George Brindle, W.L. Daily, N.R. Hogg & brother, and B.J. Hogg. The articles of the company were as follows:

1. This company shall be known by the name of Utica Lime Manufacturing Company.
2. There shall be an agent appointed for a term of one year to sell and attend to the business of the Company, at Louisville and vicinity, who shall furnish boats to boat lime manufactured by said Company, the said agent furnishing a hand to superintend the loading of lime and running the boats. The said agent being responsible to the proper manufacture of the lime so soon, as loaded in the boats.
3. The said agent shall sell all lime at Louisville and vicinity, and collect all moneys, and pay the same over to the proper manufacture on the seventh day after the lime is delivered in the boat, deducting ten cents per bushel for his own services, all lime to be sold at forty cents per bushel.
4. Lime to be manufactured in the following order, Henry Emerke 1 kiln each week, other parties as follows: 1. James Morrow, 2. Summers & Hobson [James A. Hobson], 3. T. J. & George Brindle, 4. N. R. & D. Hogg, 5. N. B. Wood, and 6. W. L. Daily.
5. Said agent shall keep the Louisville market a sufficient quantity of lime to supply the demand, and shall notify the manufacturers in regular order, when to burn their kilns in order that he may have a supply, if any manufacture should fail to be ready to burn, next in order shall take his turn, then in regular order.
6. Said agent shall cause all lime to be weighed according to the lawful standard, the agent returning duplicate of weight with account sales, the agent to pay all expenses incurred in running boats to and from place of manufacture.
7. The said Company, at their discretion may increase or diminish the price of lime when the interest of the Company requires it.

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8. No member of this Company owning boat or boats shall be allowed to hire the same to parties other than members of this Company, for boating lime under a penalty of fifty dollars to be collected as other debts by the Company.

9. These articles of agreement shall be in full force and effect for one year, and until dissolved by consent of the Company (Clark County 1868a:506-507; Hockensmith 2009:62-63).

Articles 4 and 5 indicate that there was a need to control production in order to avoid glutting the market at Louisville. With so many companies producing lime, prices were likely too low to make a significant profit. Given these conditions, the participating companies likely wanted to discourage additional lime burners from entering the market. This is evidenced by Article 8, which implies that the consortium aimed to hinder the operations of non-member companies by denying them access to transportation. How effective these articles were, or how long the organization existed, remains unclear, but under the conditions that must have prompted its formation, no individual company could hope to make a serious enterprise out of Utica lime. The next step in the industry's evolution was consolidation. The Louisville Cement Company was the one organization with enough capital to reduce or eliminate its competition. By July 1871, former Utica Lime Manufacturing Company member Henry Emmerke had sold out to the ever-growing cement conglomerate, as did Moses H. Tyler. Any remaining independent companies were left to compete with a well-financed corporation whose primary purpose was the large-scale production of natural and hydraulic cements.

The rise of natural and Portland cements proved perhaps even more detrimental to Utica's lime industry than the lack of good transportation. As Henry Emmerke's obituary noted, the lime business flourished prior to the advent of the cement mill, which antiquated the "old-fashioned kiln dug in the side of some steep bank along the river" (*The Evening News* 1899). While lime was a component to the Louisville Cement Company's operation, their main goal was the production of natural and hydraulic cement. The company operated large cement plants at Petersburg and later the company-founded community of Watson, located near the Mississippi & Ohio Railroad in Utica Township (Kramer 2007:185). Once a better, more accessible source of lime was located at Milltown in Crawford County, the Utica operation became an ancillary operation. Those independent lime manufacturers surviving after 1885 were left to compete in a market with a modern cement manufacturer who could produce and ship a superior product at a lower cost.

Although Utica's lime industry nearly was finished by the late 1890s, numerous quarrymen and lime manufacturers initiated businesses at Utica well into the 1920s and 1930s. The first of these was the Union Lime & Cement Company, which reincorporated the defunct Utica Lime Company in 1900. John T. Cooper, John L. Wheat, William A. Robinson, and R.A. Robinson started the company with \$50,000 in capital stock. Blatchley noted that the Utica Lime Company "uses a mixture of wood and coal, and has two kilns, each producing 90 barrels of well burned lime per day" (Blatchley 1904:222). Their operation, however, proved short-lived. A company report dated March 15, 1910, stated: "No manufacturing done in Indiana for last six years. Property in that state consists of dilapidated shed and abandoned lime-kiln of practically no value." The company's corporate standing was revoked by the Indiana Secretary of State on June 16, 1945 (Hockensmith 2009:61).

The next company to incorporate was the Utica Stone, Lime, & Cement Supply Company. Formed on September 9, 1911, the company's aim was to "manufacture lime and cement; to quarry and sell stone; to buy and sell lime, stone and cement; to buy and hold all necessary real estate; [and] to carry on and maintain said business" (Clark County 1911:441). The company incorporated with 100 shares of capital stock valued at \$100 per share. Directors included Louis H. Meyer, Joseph Keehner, and Charles W. Kelly. The articles of incorporation stated that the principle place of business "is to be located in the town of Utica, in the County of Clark and in the State of

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Indiana (Clark County 1911:441; Hockensmith 2009:57). On September 11, 1911, Joseph Keehner signed a lease agreement with Mitchell Howes' daughter and heir Elizabeth P. Hyatt. It made reference to the "appurtenances thereon belonging necessary to the manufacture of lime and the sale of lime and stone providing however said appurtenances shall be used exclusively for manufacturing of lime from rock obtained from said premises" (Clark County 1911:144-145; Hockensmith 2009:70). It further granted "the right to use the Ohio River banks fronting said lands . . . for the purpose of maintaining, tying, loading and unloading boats, barges or other water craft" (Clark County 1911:144; Hockensmith 2009:70). In compensation, Mrs. Hyatt was to receive a royalty of "one and one half cents per barrel for all lime sold by said lessee from said premises, a royalty of ten cents per cubic yard for such dimension stone and three cents per cubic yard for such broken stone as is not made into lime, and is sold by this lessee settlements to be made quarterly" (Clark County 1911:144; Hockensmith 2009:70). It is not known if this company ever burned lime at Utica, nor is it known how long the company remained in business. However, the company failed to file annual reports between 1935 and 1955, which resulted in termination of their corporate status (Hockensmith 2009:57).

In 1921, a third manifestation of the Utica Lime Company appeared on the scene. Walter E. Hyatt, Benjamin L. Hyatt, and Mary Gertrude Hyatt signed a "Certificate of Agreement" at Clark County on April 19, 1921, and filed articles of incorporation for the Utica Lime Company on May 9, 1921. According to the articles of incorporation, the object of the company was to "burn and dry lime to sell at retail and wholesale" (Clark County 1921:107; Hockensmith 2009:71). On June 3, 1921, Elizabeth P. Hyatt conveyed 6.83 acres of land to the Utica Lime Company for "the purpose of burning lime and quarrying rock and erecting buildings needed for same only" (Clark County 1921:216-217; Hockensmith 2009:71). The agreement stipulated that Hyatt was entitled to five cents for each barrel of lime produced and three cents for every cubic yard of limestone removed. The lease further stated "that rock must be quarried and either burned into lime or sold by the cubic yard at least six months each and every year or this lease becomes null and void" (Clark County 1921:216-217; Hockensmith 2009:71). It is not clear if the company actually burned lime on the property, but Hyatt signed another lease with the Utica Lime Company on July 13, 1925. Set for a period of ten years, the lease described the property as "a certain quarry which is now being operated by Joseph Hall, the face of which is not to exceed three hundred fifty feet and the depth of which is not to exceed seven hundred feet (Clark County 1921:531; Hockensmith 2009:71). It states that the second party understood that it "agrees to use said party only for the purpose of quarrying rock and burning lime, and for such purposes to take from said real estate such rock as it may desire an in consideration therefore does hereby agree to pay to said first party and first party agrees to accept the minimum sum of not less than thirty five dollars per month for each and every month from the date this lease takes effect" (Clark County 1921:531; Hockensmith 2009:71). The company also agreed to pay Hyatt 7 cents per cubic yard "for all crushed stone and seven cents per barrel for all lime burnt and credit for the monthly payment of \$35.00 is to be given on rock crushed and lime burnt" (Clark County 1921:531; Hockensmith 2009:71). It is not certain how long this operation remained active, nor is it known whether the company actually burned lime or simply sold crushed rock.

Elizabeth Hyatt signed a ten year lease agreement with Charles Long in 1926 for access to 37 acres of her land. The agreement stated that "[i]t is understood and said lessee hereby agrees to use said property for the purpose of quarrying rock and erecting lime kilns and tramways, railroad switches, ware-houses, machinery and for any other purpose necessary to the quarrying, crushing, burning or otherwise preparing rock or stone for the market" (Clark County 1926:54; Hockensmith 2009:70). Compensation to Hyatt included \$35 per month plus seven cents per yard for all stone quarried (Clark County 1911:54; Hockensmith 2009:70). The lease was assigned to the Utica Stone Company on January 20, 1927 (Clark County 1926:54; Hockensmith 2009:71).

The following year Hyatt signed a ten-year lease agreement with Fred Kilgus. The agreement essentially mirrored

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that signed by Charles Long. It included 37 acres and provided for the "quarrying of rock and erecting of lime kilns and tramways, railroad switches, ware-houses, machinery and for any other purpose necessary to the quarrying, crushing, burning or otherwise preparing rock or stone for the market" (Clark County 1926:102; Hockensmith 2009:70). Compensation to Hyatt included \$35 per month plus seven cents per yard for all stone quarried (Clark County 1927:102; Hockensmith 2009:70). Given the identical parameters of the agreement, the Kilgus lease might have been associated with the Utica Lime Company operation.

The last available lease agreement for the former Mitchell Howes property dates from 1932. This was a 99-year lease agreement made between Louis Ewald and Elizabeth Hyatt's heir, Gertrude Hyatt. Signed on January 11, 1932, the lease was for "quarrying stone there from and placing thereon such machinery, appliances, and appurtenances as may be necessary for the purpose of transporting said stone before or after the same is crushed" (Clark County 1932:133; Hockensmith 2009:72). Gertrude Hyatt was to receive \$180 in advance, and \$25 per month rent and 3 cents per cubic yard of stone during the first year (Clark County 1932:133; Hockensmith 2009:72). This lease agreement makes no mention of lime, but appears focused on rock crushing.

The lack of additional lease agreements suggests that the lime industry at Utica was largely played out by the 1930s, if not earlier. Whether any of the later companies actually produced quicklime remains uncertain. As of 1909, when Baird wrote his *History of Clark County*, James Speed was the last to manufacture lime at Utica. This was further substantiated by Blatchley, who stated in 1903 that there was "but one kiln under fire at Utica," owned by J.B. Speed & Company (Blatchley 1904:242). Population census records for 1900 reveal that at least eight men in Utica Township gave their occupation as lime burners, with an additional 19 men identifying themselves as "Stone quarryman" or "Stone Cutter" (United States Federal Census 1900; Hockensmith 2009:81-82). One of the eight men listed as a lime burner in 1900 was Napoleon Wood, who had improved the old pot kiln around 1850. It is not known if Wood gave his occupation out of habit or if he was actually employed in the production of lime at that date.

Clearly, the quarries remained active at Utica, as evidenced by the number of quarrymen in the township. The number actually jumped to 27 in 1910, indicating that quarry activities at Utica remained significant. However, in 1910, for the first time since the 1850 census, no one identified themselves as a lime burner (United States Federal Census 1910; Hockensmith 2009:82-82). By 1930, the number of quarrymen in Utica Township had dwindled to seven. These men identified themselves as "Labor," "Contractor," "Engineer," or "Crusher." Again, no one identified themselves as a lime burner (United States Federal Census 1930; Hockensmith 2009:82). Due to the poor quality of the 1920 census for Utica Township, it is not known how many men were listed as quarrymen or lime burners at that date.

The lack of lime burners in the post-1900 population census records remains consistent with Baird's observations ca. 1909. However, it is possible that the Utica Stone, Lime, & Cement Supply Company, formed in 1911, manufactured lime. It also is possible that the Utica Lime Company of 1921 made lime. Given the predominance of Portland cement, however, any lime production at Utica after ca. 1910 probably was limited in scale. As evidenced by the census records, much of the activity at Utica's quarries appears to have been related to stone crushing. Lease agreements with Elizabeth Hyatt indicate that crushed stone was a component, if not the main objective, of these later companies. The option of burning lime may have been left open in the event that such a product became marketable. Regardless, the heyday of Utica lime clearly was over by 1907, and was probably in decline as early as 1885. The transition from lime to natural cement and Portland cement, in combination with poor transportation facilities, and stiff competition, proved fatal to Utica's once-prominent industry. After ca. 1910, crushed stone and dimension stone appear to have replaced lime as the primary focus at the Utica quarries. Four kilns and a series of extensive quarries now provide the only reminder of this once-significant enterprise.

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F. Associated Property Types

1. *Quarries*

Description

A quarry is an open pit mine from which stone, gravel, clay, or other types of minerals are removed. The method by which workers excavate the quarry depends upon the type of resource being mined. In the case of limestone mines, wherein the limestone was used largely for burning, the object was merely to break the rock from its matrix. Due to the low cost of the final product, lime burning operations sought to remove the largest amount of stone from the quarry with the least amount of effort. During much of the nineteenth century, this work was performed by hand using basic tools, such as hand drills, hammers, picks, shovels, wedges, and prybars. Explosives, such as black powder and dynamite, helped reduce large sections of limestone to manageable sizes. The quarrying process was similar to other types of underground mining, whereby workers drilled holes to set explosive charges, ignited their charges, and then removed or "mucked" the resulting rubble. Once workers removed the rubble, they started the process over again by drilling a new set of holes (Orton and Peppel 1906:261–263).

Despite the widespread use of steam and air-powered rock drills during the late-nineteenth century, many older and smaller lime-manufacturing operations continued to rely upon hand drills for quarrying. Drilling typically was accomplished by either the "single jack" or "double jack" method. Single jack drilling involved a single worker who held a steel drill bit against the rock face with one hand while wielding a 3 or 4-pound hammer with the other. Double jack drilling required one worker to hold the bit and one or two additional workers to strike the bit with long-handled sledge hammers. By methodically turning the bit while striking the head of the bit with a hammer, workers drilled a ¾ to roughly 1-½ inch diameter hole into the rock face to a depth of 1 to 3 feet or more. Upon completing a desired pattern of holes, workers packed the holes with explosives. In this manner, quarry workers blasted away at the quarry face, creating manageable piles of rubble that were then further reduced in size by additional charges or with sledge hammers and steel wedges. By the late-nineteenth century, the more modern, larger lime quarries typically employed steam or compressed air drills. Mechanical drills significantly reduced the amount of time required to drill a pattern of blast holes (Orton and Peppel 1906:261; Gillette 1904:141; Lockhart 1913:78–79).

The extent of any given quarry operation depends upon the quantity of available mineral resources as well as the length of time and the method by which workers excavated the quarry. Consequently, the size and shape of quarries varies dramatically. Typical features of most quarries include a quarry face, which marks the perimeter of the mine, and the quarry bench, which marks the depth to which workers excavated. Drill holes measuring roughly 1 to 2 inches in diameter generally are located in the vertical rock face of the quarry, providing evidence of blasting and prying. During operation, quarries of the late nineteenth and early twentieth century often included narrow gauge railroad tracks, which were used to haul small cars of rock from the quarry face to assorted rock crushing machinery. These tracks were temporary in nature, as workers relocated the rails to reach the ever-changing work site locations within the quarry. Like any other mining operation or construction project, portable machinery typically was removed following abandonment of the quarry. Often, all that remains within a quarry is the excavation itself and assorted piles of stone and aggregate.

The quarries of Utica remain largely consistent with the size and configuration that they assumed during their last days of operation. These excavations are located along the western side of Upper River Road from the north end of the village of Utica to approximately 1 mile north of Utica. These mines were excavated from the bluffs that

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parallel the Ohio River, north of Utica. The quarries were conveniently located adjacent to the river, where workers could easily load barrels of limestone aboard river boats and barges. Limestone mining occurred at these quarries from as early as 1818 to as late as the 1930s. However, the quarries were associated with lime burning from about 1818 to perhaps no later than 1907, although it is possible that lime burning occurred here on a limited basis into the 1920s.

Quarry - Significance

Like all lime-manufacturing enterprises, the lime industry of Utica entirely was dependent upon access to high-quality limestone and dolomite. Just as a gold mining operation does not exist without the presence of gold, a lime-burning business cannot exist without lime. Due to the immovable nature of quarries, and the weight and bulk of the mined materials, the location of lime quarries had much to do with the placement of kilns, their ancillary components, and the transportation networks that moved raw and finished products. In effect, the quarries anchored the entire operation and all subsequent stages of the lime-making process radiated from these open pit mines. Consequently, the story of Utica's lime industry begins and ends with the development of its lime quarries. Any structures contributing to the local lime industry relate directly to the location of the quarries.

Utica lime quarries are eligible for inclusion in the National Register of Historic Places under Criterion A for their local association with the history of Utica lime manufacturing, and under Criterion D for their potential to reveal information important to the history of the lime-manufacturing industry. Lime manufacturing was a significant industry in Utica from ca. 1818 to ca. 1907. Lime burning provided employment for many of the local residents and made Utica a well-known name from Pittsburgh to New Orleans.

Although quicklime quarries do not follow any specific plan or embody characteristics specific to the lime burning industry, they do provide evidence of mining techniques. Drill holes in the quarry face illustrate the results of the drilling and blasting process, and the general shape of the quarry reveals how lime-burning operations utilized existing lime resources. The outline of a quarry also indicates where workers concentrated their efforts, as well as where they entered and exited the excavation site. These clues help provide information as to how local lime-burning operations developed existing deposits.

Quarry – Registration Requirements

As a large excavation within the landscape, a quarry is not subject to changes in the integrity of location. However, any equipment used in the quarry, such as drilling machinery, excavators, or tramways typically were removed from the site at the time of abandonment. The quarry itself, therefore, often provides the only evidence of a mining operation. The quarry site offers unmistakable evidence of the mining operation's center of activity, as well as the extent of the operation.

The precarious nature of quarries, their tendency to flood, and the impracticality of building on the bedrock of a quarry bench, often precludes any type of residential or commercial development within the quarry itself. Changes to the interiors of quarries generally involve the accumulation of rain and ground water, assorted refuse, and vegetation that might find a foothold on the quarry bench. Surrounding development, however, can drastically alter the overall setting within which a quarry exists. Residential and commercial development can obliterate original transportation routes between the quarry and outlying machinery or ancillary structures, as well as alter the surrounding setting. To qualify for listing in the National Register of Historic Places, a quarry should retain the shape it attained at the time of its abandonment. It should also retain any corridors between the quarry and former processing facilities, such as kilns or rock crushers, as these pathways are integral components to the overall quarrying process. The presence of groundwater and rainwater should not affect those aspects that qualify

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the quarry for inclusion on the National Register of Historic Places; however, conversion of a quarry to a landfill can alter the shape and depth of the excavation site. Consequently, any quarry that has been converted to a landfill site does not qualify for inclusion on the National Register of Historic Places. Also, any quarry that no longer conveys a sense of connection to its former processing sites, as a result of residential, commercial, or industrial development, does not qualify for inclusion on the National Register of Historic Places.

2. *Pot Kilns*

Description

Early settlers often calcined lime by burning spalls in log heaps, but as demand for quicklime increased it became necessary to improve the efficiency of the lime-burning process. The intermittent "pot" kiln, sometimes called a "groundhog" kiln, met this need, and by the 1830s lime burners around the country used this kiln design to calcine limestone. As the name suggests, groundhog kilns are recognizable by their partial enclosure within an embankment or earthen mound. Built from local stone, these kilns exhibit design characteristics unique to the builder and the surrounding topography. Consequently, no two pot kilns look exactly alike. Common features, however, include a rounded or square-shaped stone structure that houses the pot-shaped combustion chamber; an arched firebox and draw-off entrance at the bottom of the kiln; and an earthen embankment into which the kiln was built. The hill or embankment facilitated the loading or "charging" of limestone into the top of the kiln, which might extend from several feet to one or more stories above the foundation of the structure. Pot kilns operated intermittently, meaning that each batch of lime required a cool-down phase prior to removal of the product. Depending on the size of the kiln, a batch might require three or four days to complete (Ault et al. 1974:9).

Pot Kilns – Significance

The intermittent pot kiln marked a significant step forward in the evolution of lime burning technology. More efficient than the previous method of burning lime in log heaps, the pot kiln enabled lime manufacturers to increase production while reducing the amount of time and fuel required to process limestone spalls. Due to their relatively small size and the need for a cool-down phase between batches, pot kilns remained unsuitable for production on an industrial scale. Nevertheless, pot kilns afforded lime burners the opportunity to manufacture enough lime to supply markets beyond the immediate area. As a result, these kilns provided local lime manufacturers the experience needed to produce lime on a larger scale. In this manner, the pot kiln became an indispensable component in the evolution of the lime industry.

Pot kilns that meet National Register of Historic Places guidelines and those guidelines specified in this document will be eligible under Criterion A. These kilns played a significant role in the early development of Utica's lime industry, which extended from ca. 1818 to the Civil War. During this period, pot kilns helped Utica lime burners transition from production for local markets to production on an industrial scale.

Due to the fact that lime burners built these structures according to their own inclinations, as well as taking advantage of locally available building materials and the existing site topography, pot kilns vary from site to site. Consequently, each kiln offers unique insights into traditional building trades and vernacular construction. Because lime burners built kilns to meet anticipated demand and potential burning capacity, they provide evidence of the size of individual lime-burning operations. The location of these kilns also indicates how the local lime industry developed over time, as pot kilns tend to mark the locations of older quarries and corridors within a quarry complex.

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Pot Kilns – Registration Requirements

To qualify for the National Register of Historic Places, a pot kiln should convey a sense of the appearance of the original structure; that is, it should retain the arched firebox and draw-off chamber at the bottom of the kiln as well as the limestone stack that extends above the firebox and draw-off chamber. The embankment within which the kiln was built should remain intact, as this is a character-defining feature of pot kilns, which relied upon the embankment to support the stone structure and to enable workers to charge the combustion chamber from atop the kiln. The shape of the embankment also had much to do with the final, exterior appearance of the kiln, as the builder erected the stone structure to conform to existing topography. Because the original location of the kiln provides important information about how the kiln related to nearby quarries as well as transportation routes, it should remain upon its original site of construction. Collapsed pot kilns that remain at their original location remain significant under Criterion D, for their ability to yield important information about the lime industry.

3. *Vertical Kilns*

Description

Pot kilns remained common throughout the Midwest and South for much of the nineteenth century. Their simple construction made them ideal for small-scale lime production, such as that associated with local agriculture and construction. For large-scale commercial production, however, increased capacity was required and the “vertical” or “shaft” draw kiln met this demand. Developed during the mid-to-late nineteenth century, vertical kilns were built according to either the “mixed feed” or “separate feed” design. In a mixed feed kiln, limestone spalls and fuel were loaded into the chamber in alternating layers. This allowed for continuous burning, but the calcined lime that emerged at the bottom of the kiln was mixed with the ashes of spent fuel. This problem was eliminated with the separate feed kiln, also known as a “flame” kiln, in which combustion occurred around the outside of a steel cylinder. As limestone within the cylinder calcined, it dropped to the bottom of the kiln, where it was extracted free of contaminants. Despite the contamination issue associated with mixed feed kilns, they proved economical, and consequently saw wide use throughout the country. Such kilns commonly were employed at lime-manufacturing sites by the mid-1870s (Emely and Porter 1927:9–10; Ault et al. 1974:9). Surviving vertical kilns of Utica consist of the double-chambered mixed feed type. These kilns are recognizable by their three, massive, battered stone walls. Built of limestone blocks, these kilns are built into an embankment, which helps facilitate charging the kiln. Double-chambered kilns have a pair of arched draw-off chambers at the bottom of the structure’s primary façade. The chambers are just tall enough and wide enough to permit one or two workers to extract burned lime, cinders, and ash from the rear of the draw-off chamber. A pair of circular or elliptical openings, which correlate to the pair of draw-off chambers at the bottom of the kiln, is visible on top of the kiln. Workers accessed these chambers via an earthen ramp at the rear of the structure.

Vertical Kilns – Significance

Introduction of large, vertical draw kilns at Utica signaled the beginning of lime burning on an industrial scale. This phase of the industry’s history considerably was different than that of the antebellum period, when numerous small-scale manufacturers burned lime using pot kilns. Better financed and organized, lime burners of the late 1860s and 1870s erected large double-chambered, continuous kilns capable of burning lime around the clock for days or weeks at a time. The large vertical kilns of Utica represent the apex of the area’s lime-burning industry. These kilns helped transform the Utica lime industry into a significant enterprise, paralleled by only a handful of lime-burning districts in the state. They were used by the last lime-manufacturing companies of Utica, who finally ceased production during the first or second decade of the twentieth century. These kilns, in combination with

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neighboring quarries, provide the most telling evidence of the extent of this once-vital industry. Vertical kilns that meet National Register of Historic Places guidelines and those guidelines specified in this document will be eligible for inclusion under Criterion A. Built during the late 1860s and 1870s, continuous-burning vertical or shaft kilns greatly increased lime production at Utica following the Civil War. During the height of lime production in the 1870s and 1880s, Utica lime manufacturers shipped their products to riverfront communities up and down the Ohio River. These structures provide important information about mid-to-late nineteenth lime-burning technology, as well as visual evidence of the extent of lime-burning activities at Utica.

Vertical Kilns – Registration Requirements

Defining features of a vertical kiln include its battered stone walls, which comprise the exterior shape of the kiln; entrances to the draw-off chambers, at the bottom of the kiln; and the means by which workers charged the combustion chambers. In the case of the latter, many vertical kilns conformed to the pattern established by pot kilns, whereby a hill or embankment provided ready access to the top of the kiln. In this case, a vertical kiln generally includes only three stone walls, with the embankment comprising the fourth, or rear, wall of the kiln. Other features might include a shed covering, or at least evidence of a former shed covering atop the entrances to the draw-off chambers.

To qualify for the National Register of Historic Places, a vertical kiln should convey a sense of what the original structure looked like; that is, it should retain its stone walls, draw-off chambers at the bottom of the kiln, and the means by which workers charged the kiln's combustion chambers. Because the original location of the kiln provides important information about how the kiln related to nearby quarries, as well as to transportation routes, it should remain upon its original site of construction. If the kiln was built into an embankment, the embankment should also remain intact, as this was the means by which lime burners accessed the top of the kiln. Vertical kilns that remain at their original location, whether intact or collapsed, remain significant under Criterion D, for their ability to yield important information about the lime industry.

4. *Archaeological Properties*

Description

The National Register of Historic Places guidance defines an archaeological property as: “the place or places where remnants of a past culture survive in a physical context that allows for the interpretation of these remains” (Little et al. 2000:7). The guidance notes that “physical evidence, or archeological remains, usually takes the form of artifacts (e.g., fragments of tool or ceramic vessels), features (e.g., remnants of walls, cooking hearths, or trash middens), and ecological evidence...It is not only the locations of artifacts themselves that are important but the locations of artifacts relative to one another, which is referred to as archeological context” (Little et al. 2000:7–8). In addition to artifacts buried in the ground, archeological features may include ruins, and “standing or intact buildings that have a direct historical association with below ground archeological remains” (Little et al. 2000:9).

Archaeological properties associated with the lime-manufacturing industry of Utica Township may include any of the properties defined above (i.e., quarries, kilns, etc.), regardless of whether they possess sufficient integrity to convey their historical significance as a physical example of their property type. Furthermore, archaeological properties may include other physical remnants of activities associated with lime-manufacturing, including but not limited to: artifacts, quarry material, ruins, foundations and foundation remnants, builders' trenches, spoil heaps, push piles, road beds, rail spurs, and barge moorings. These properties may be above ground, or wholly or partially below ground.

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Archaeological Properties - Significance

By their nature, archeological properties generally lack the ability to convey significance under Criterion A, B, or C without being first researched and interpreted by a trained professional. For this reason, archeological properties generally are evaluated and determined significant under Criterion D (although, some properties, buildings for example, may be eligible as both other property types *and* as archeological properties). Significance under Criterion D is linked to information that may be obtained from the property in question. The potential archaeological properties listed above may no longer be extant as recognizable buildings, structures, and objects, but their archaeological remains can provide important information regarding how the industry functioned; how lime was moved, stored, and manipulated within the landscape; and the human behaviors associated with these activities that cannot be learned through historical research or from studying the extant built environment.

Archeological Properties – Registration Requirements

In order for a specific archaeological property to be considered eligible for inclusion in the National Register of Historic Places, it must have sufficient integrity to convey important information to a trained archeologist. Archaeological integrity may be demonstrated by the presence of spatial patterning of artifacts or features that represent differential uses or activities, and the lack of serious disturbance of the property's archeological deposits (Little et al. 2000:37). Even without intensive archaeological investigation, the spatial relationships between archaeological properties and extant structures and objects can provide information concerning the lime industry, provided that the function of the archaeological property is known.

Archaeological properties that meet National Register of Historic Places eligibility criteria will date to the period of significance, must be demonstrated to be related to the manufacture of lime in Utica Township, and must retain sufficient archaeological integrity to convey significant archaeological information.

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G. Geographical Data

The geographical area extends along the western side of Upper River Road from the northern end of the village of Utica, Utica Township, Clark County, Indiana, to approximately 0.5 miles north of the northern end of the village of Utica.

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H. Summary of Identification and Evaluation Methods

Utica lime industry research was conducted as a joint effort between Gray & Pape, Inc., architectural historians and Archaeological Consultant Charles D. Hockensmith. Much of the context and resource descriptions were created with the aid of Hockensmith's research and field measurements. Hockensmith (2009) compiled his notes in the report entitled *An Archaeological and Archival Study of the Lime Industry at Utica, Clark County, Indiana*. This report was indispensable in the preparation of the Multiple Property Document Form and accompanying individual resource nominations. Hockensmith's research methods and field investigations were conducted as follows:

Metric measurements were taken for the lime kilns and associated resources. An attempt was made to record the remains as precisely as possible. Tapes and folding rules were used when possible for shorter distances. Even kiln measurements were sometimes approximate because they were covered and surrounded with trees, tree falls, bushes, vines, briars, etc. These obstacles made it difficult to tightly stretch a tape across the tops of the kilns and sometimes the sides. Side measurements sometimes had to be taken a couple meters above the base since the lower courses of stones were covered by soil. The upper courses of stones were sometimes missing along the tops of the kilns. Because of the potential danger in falling several meters, a tree limb was sometimes used to extend the tape out to the approximate edge of the wall. When possible, tapes were dropped over the tops of kiln walls to obtain heights. The foundations were precisely measured. Linear and oval dump piles were paced to determine their approximate dimensions. Most of the dump piles were even more over grown than the kilns. It was often difficult to pace in a straight line due to tree falls resulting from storms, numerous trees, bushes, vines, briars, and steep slopes. Since the dump piles were often very irregular in width and height, these dimensions were approximate guesses. Initially, an effort was made to estimate the sizes of quarries. However, dense vegetation, tree falls, and rock piles made it difficult to obtain accurate dimensions. It was later decided that this information could be more precisely obtained from U.S.G.S. topographic maps (Hockensmith 2009:8687).

In discussions with Gray & Pape, Inc. personnel, it was decided to not conduct shoveling testing in the areas surrounding the four kilns or collect artifacts during the fieldwork. The exception to this strategy was to collect brick samples from all four kilns and to include an analysis of the bricks in the report. The fieldwork was conducted by the author on March 12-13, 16-21, 2009. Perry Harrell assisted the author on March 12-13 and 20, 2009. Gray & Pape, Inc. staff, Michael Striker and Donald Burden were in the field with the author on March 16, 2009 to take some GPS readings and determine the heights of some kilns and quarries. If time was available, the author was given the flexibility to visit and collect limited information on other lime kilns in Clark County (Hockensmith 2009:86-87).

Archival research was conducted at many libraries and some other locations. Kentucky libraries included the Filson Club Historical Society (Louisville), the

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Louisville Free Library, the University of Kentucky (Lexington), and the Kentucky Historical Society (Frankfort). Indiana libraries visited included the Jeffersonville Public Library, the Charlestown Public Library, the Sellersburg Public Library, the New Albany Public Library, the Madison Public Library, the Indiana State Historical Society, the Indiana State Archives, etc. Other facilities visited included the Clark County Courthouse in Jeffersonville and the Indiana Geological Survey (Indianapolis). Research in these facilities discovered a wide range of documents that contained information on the historic lime industry in Utica and Clark County, Indiana. These sources included the Indiana Geological Survey reports, histories of Clark and other Indiana counties, available schedules for the U.S. Population censuses and the U.S. Manufacturing censuses, deeds, leases, corporate records, Indiana Gazetteers and Business directories, newspapers, etc. The author went through the early Indiana Geological Survey reports at the University of Kentucky Geology Library in Lexington. The indexes or table of contents (when indexes were absent) of the geological reports were scanned for information on the lime industry and copies were made of those pages. To complete the archival research, a trip was made to Indianapolis where the Indiana Historical Society Library, the Indiana State Library, and the Indiana State Archives were visited. Resources found in these libraries included corporate records, census records, Indiana State Business Directories and Gazetteers, published census summaries, and other sources (Hockensmith 2009:86-87).

Deed research was conducted at the Clark County Courthouse. The most recent deeds are located on a computer data base. Some of the twentieth century deeds are available on microfilm (Deed Drawer No. and Instrument No.), while the earliest deeds are in the large traditional deed books (Deed Book No. and Page No.). Many of the earlier deed books were damaged by the 1937 flood and sometimes the pages are very faded and difficult to read. Unlike neighboring Kentucky, there was no legal requirement for those preparing deeds to provide a reference to the previous deed book and page number. While this information is occasionally included, it is more often absent. Thus, considerable time can be expended trying to locate the previous deed by searching large index books for Grantees. Often many index books have to be searched for the name of the person who last sold the land. There is no way to know how many years the land had been in their possession of the previous owner before it was sold again. For example, they may have purchased the land one year before or 50 years before. Thus, the researcher must search many index books for most tracts every time they were sold in order to establish the history of ownership. The search is further complicated by the fact that some property owners bought and sold multiple tracts (Hockensmith 2009:86-87).

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UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
EVALUATION/RETURN SHEET

REQUESTED ACTION: COVER DOCUMENTATION

MULTIPLE Lime Manufacturing Resources of Utica, Indiana MPS
NAME:

STATE & COUNTY: INDIANA, Clark

DATE RECEIVED: 11/15/13 DATE OF PENDING LIST:
DATE OF 16TH DAY: DATE OF 45TH DAY: 01/01/14
DATE OF WEEKLY LIST:

REFERENCE NUMBER: 64501194

REASONS FOR REVIEW:

APPEAL: N DATA PROBLEM: N LANDSCAPE: N LESS THAN 50 YEARS: N
OTHER: N PDIL: N PERIOD: N PROGRAM UNAPPROVED: N
REQUEST: N SAMPLE: N SLR DRAFT: N NATIONAL: N
NEW MPS: Y

COMMENT WAIVER: N

ACCEPT RETURN REJECT 12/30/2013 DATE

ABSTRACT/SUMMARY COMMENTS:

RECOM./CRITERIA Accept cover

REVIEWER Patricia Andrews DISCIPLINE Historian

Phone _____ Date 12/30/2013

DOCUMENTATION see attached comments Y/N see attached SLR Y/N

If a nomination is returned to the nominating authority, the nomination is no longer under consideration by the National Park Service.

DNR Indiana Department of Natural Resources



Division of Historic Preservation & Archaeology • 402 W. Washington Street, W274 • Indianapolis, IN 46204-2739
Phone 317-232-1646 • Fax 317-232-0693 • dhpa@dnr.IN.gov • www.IN.gov/dnr/historic



November 5, 2013

Carol D. Shull
Interim Keeper of the National Register
National Park Service 2280
National Register of Historic Places
1201 "I" (Eye) Street, N.W.
Washington D.C. 20005

Re: Lime Manufacturing Resources of Utica, Indiana Multiple Property Documentation Form

Dear Ms. Shull,

Enclosed is a Multiple Property Documentation Form for Lime Manufacturing Resources of Utica, Indiana. All procedural requirements have been met in the processing of this application. I believe the application to be adequately documented, technically and professionally correct and sufficient.

In my opinion, this MPDF and the four accompanying individual nominations meet all applicable standards for evaluation, and the four properties are eligible for listing in the National Register of Historic Places. The Indiana Historic Preservation Review Board reviewed the application and voted to recommend its approval to the National Register of Historic Places.

Please address any questions you or your staff may have about this nomination to my National Register staff, Paul Diebold, Frank Hurdis, or Holly Tate.

Sincerely,

Cameron F. Clark
State Historic Preservation Officer

CFC:PCD:pcd

enclosure: nomination package