BURNS McDONNELL

CITY OF KANSAS CITY, MISSOURI

CULTURAL RESOURCES INVESTIGATION REPORT FOR THE TODD CREEK WASTEWATER TREATMENT PLANT

TODD CREEK WASTEWATER TREATMENT PLANT

PROJECT NO. 125460

MAY 8, 2024

CONTENTS

TABLES

List of Abbreviations

Abbreviation	Term/Phrase/Name
APE	Area of Potential Effects
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
FCR	fire-cracked rock
ft	feet
GIS	Geographic Information System
GPS	Global Positioning Satellite
GSV	Ground Surface Visibility
ha	hectares
HHPA	historical high probability area
KCMO	Kansas City, Missouri
m	meter
MoDNR	Missouri Department of Natural Resources
NETR Online	Nationwide Environmental Title Research Online
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
ONHPO	Osage Nation Historic Preservation Office
Project	Todd Creek Wastewater Treatment Plant
ROW	right-of-way
SHPO	State Historic Preservation Office
SOI	Secretary of the Interior
SRF	State Revolving Fund
Study Area	1-mile buffer around APE
USGS	U.S. Geological Survey
USACE	U.S. Army Corps of Engineers

Executive Summary

Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) was retained by the City of Kansas City, Missouri (KCMO) to conduct cultural resources investigations for the proposed Todd Creek Wastewater Treatment Plant Project (Project) in Platte County, Missouri. The Project's proposed 22.16-acre Area of Potential Effect (APE) is the area where all construction-related activities are anticipated as well as an access road to the Project site.

KCMO is applying for a State Revolving Fund (SRF) loan for the Project through the Missouri Department of Natural Resources (MoDNR). The SRF loan is provided through a program that is capitalized by federal grants, state appropriations and dedicated revenues. Congress established the SRF program to provide states with a way to offer financial assistance to local communities. The program is a federal-state partnership, with the state being responsible for operating their program. Correspondence received from the SHPO dated March 8, 2024, recommended that an archaeological survey should be conducted. The use of SRF Loan Program triggers the implementation of review and consultation under Section 106 of the National Historic Preservation Act of 1966 as amended (NHPA) (54 U.S.C. § 300101). Burns & McDonnell conducted cultural resources investigations to professional standards and guidelines in accordance with the *Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation* (48 FR 44716-44742), and in accordance with the *Secretary's Standard for Identification* (48 FR 44720-44723). Additionally, the archaeological surveys were conducted in accordance with the Osage Nation Historic Preservation Office Archaeological Survey Standards as well as those outlined by the Missouri State Historic Preservation Office.

A review of the Missouri Department of Natural Resources (MoDNR) Archaeology Viewer database identified no previously recorded archaeological sites or historic properties within the APE. Three isolated finds were documented within the Project APE and are determined to be ineligible for listing in the National Register of Historic Places. Burns & McDonnell finds that the Project will have no effect to historic properties and is recommended to proceed as planned with the following stipulations:

1. If the Project configuration is changed, additional archaeological investigations and National Register of Historic Places evaluations may be necessary.
2. If inadvertent discovery of cultural resources occurs during Project construction, land-disturbing activities in the immediate area must be halted, and lead federal agency and the State Historic Preservation Office of Missouri must be notified to determine the best course of action.

1.0 Introduction

Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) was retained by the City of Kansas City, Missouri (KCMO) to conduct cultural resources investigations for the proposed Todd Creek Wastewater Treatment Plant Project (Project) located in Platte County, Missouri (Appendix A: Figure 1). A previous survey for this Project was conducted in 2022, however, alterations to the Project required that additional survey be conducted in a previously unsurveyed parcel (Reynolds 2022). This report addresses the cultural resources investigation of this previously unsurveyed parcel. The proposed Area of Potential Effect (APE) for the Project is 22.16-acres (8.96 hectares) and includes the proposed construction footprint as identified by KCMO and encompasses the proposed location of an access road and all associated construction activities.

The Project includes a water outfall that enters Todd Creek requiring KCMO to apply for a State Revolving Fund (SRF) loan, creating a federal nexus for the Project through the Missouri Department of Natural Resources (MoDNR). The SRF loan is provided through a program that is capitalized by federal grants, state appropriations and dedicated revenues. Congress established the SRF program to provide states with a way to offer financial assistance to local communities. The program is a federal-state partnership, with the state being responsible for operating their program. This federal nexus triggers the implementation of review and consultation under Section 106 of the National Historic Preservation Act of 1966 as amended (NHPA) (54 U.S.C. § 300101). Correspondence received from the SHPO dated March 8, 2024, recommended that an archaeological survey should be conducted for the Project. Burns & McDonnell conducted cultural resources investigations to professional standards and guidelines in accordance with the *Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation* (48 FR44716-44742), and in accordance with the *Secretary's Standard for Identification* (48 FR 44720-44723). Additionally, the archaeological surveys were conducted in accordance with the Osage Nation Historic Preservation Office (ONHPO) Archaeological Survey Standards (ONHPO 2023).

1.1 Objectives of the Investigation

Burns & McDonnell conducted the cultural resources investigation for the Project to identify archaeological sites and historic-age non-archaeological resources (historic resources), including historic-age structures, buildings, objects, sites, and districts, and provide a preliminary evaluation of National Register of Historic Places (NRHP) eligibility for any resources identified that may be impacted by the Project. This was accomplished through a desktop background review of the APE and within a 1-mile buffer around the APE (Study Area) to identify any previously recorded cultural resources and cultural resource surveys. Knowledge and understanding of the cultural resources in the regional setting provides a context in which to evaluate any newly identified resources. An intensive field survey including systematic shovel-testing was conducted within the Project APE. Preliminary evaluations for NRHP were performed for all cultural resources identified during the evaluations for management recommendations for are provided.

1.2 Description of the APE

The Project APE is comprised of a 22.16-acre (8.96 ha) area that encompasses the proposed footprint for the wastewater treatment plant and associated construction zone, including an access road to the Project site (Appendix A: Figure 1). The APE is positioned within the valley of Todd Creek, located near the center of Section 1, Township 52N Range 34W. The APE is located west of an active quarry and is approximately 2.27 miles north of Ferrelview, Missouri.

1.3 Personnel

Brandon Reynolds, MA, RPA, is the Secretary of the Interior (SOI)-qualified Principal Investigator for the cultural resources investigation of this Project and was the lead for field surveys. The field survey crew included Bruce Darnell, MA, RPA. Mr. Reynolds led the report writing efforts completed the Geographic Information System (GIS) analyses of field data and created the figures.

1.4 Report Format

The report format, after the Introduction, includes background chapters on the Environmental Setting, Cultural History Overview, Research Design and Methods, Previous Investigations of the Study Area, Results of Investigations, and Recommendations. A References Cited chapter and four appendices are also included in the report. Appendix A contains figures including maps showing the Project layout, areas surveyed, and sites recorded. Appendix B contains Project Area and site photographs, while Appendix C contains shovel test and auger results. Appendix D is the SHPO correspondence requesting the survey.

2.0 Environmental Setting

This chapter gives an overview of the environmental setting of the Study Area, including discussion of some of the natural resources available to pre-contact and historic populations. The area's climate is classified as seasonal humid subtropical with warm summers and cool winters.

2.1 Physiography and Geology

The Study Area is located in the Dissected Till Plains Section of the Central Lowlands Province in the Interior Plains Division (Fenneman 1931). The Dissected Till Plains formed from Pre-Illinoian (more than 600,000 years ago) glacial advances that modified the landscape and deposited an expansive till substrate. This till overlies Pennsylvanian shale, limestone, and delta sandstone bedrock (Spencer 2011). In the uplands, the till is mantled by loess. The river valleys have been filled with late Quaternary alluvium and colluvium, which overlie eroded Pennsylvanian bedrock. Typically, high terraces in river valleys are mantled by loess (Spencer 2011).

In the Dissected Till Plains, the primary source for most of the late Quaternary loess is glacial. In Missouri, glaciogenic loess is concentrated in areas along the Missouri and Mississippi rivers. This loess derives from glacial flour that was transported by the rivers, deposited in their floodplains, and subsequently blown into the uplands by the wind. Glacial flour is a very fine-grained silty byproduct of glaciers grinding along and eroding bedrock (Bettis et al. 2003).

Three late Quaternary loess units occur in northern Missouri, listed as follows from oldest to youngest: the Gilman Canyon Formation, Peoria, and Bignell. In general, the Gilman Canyon Formation ranges from approximately 40,000 years old at its base to 24,000 years old at its top (Mandel 2006). Peoria Loess overlies the Gilman Canyon Formation and dates from approximately 27,000 to 17,000 years old (Muhs et al. 2013). Bignell Loess overlies Peoria Loess and accumulated episodically throughout the Holocene (Mason et al. 2006). A paleosol, referred to as the Brady Soil, has been documented in the sections where the Peoria Loess is buried by Bignell Loess (Feng et al. 1994). The Brady soils developed approximately 10,500 to 9,000 years ago (Johnson and Willey 2000). Combined, these units form the thickest known loess deposits in the world (Muhs et al. 2008). For example, in the Loess Hills on the western side of the Missouri River Valley, loess deposits range in thickness from 60 to 150 ft. These deposits reduce in thickness to fewer than 25 ft, and in some areas the loess has been eroded away and till or bedrock are exposed on the surface (Chapman et al. 2001).

2.2 Hydrology

The Project Area lies within watershed of the Little Platte River. Todd Creek is a tributary of the Little Platte River that flows into the Platte and Missouri Rivers. Streams within the Little Platte River basin are typical prairie-type streams, turbid and possessing homogeneous substrates of silt and sand (Missouri Department of Conservation 2024).

2.3 Soils

Soils occur in recognizable patterns across landscapes. This patterning is greatly influenced by parent material and landscape position. Parent material is the mineral or organic material in which soil has formed, and it includes the kinds of rock from which the regolith is derived (Soil Survey Staff 1993; Wysocki et al. 2005:168). Soils can form in an extensive array of surficial geologic deposits, including unconsolidated sediments (alluvial, glacial, marine, and eolian), saprolite, and bedrock (weathered and unweathered) (Wysocki et al. 2005:167).

As soils occur in recognizable patterns across landscapes, soil distributions provide a first approximation of landform distribution at a countywide scale. In the APE, Higginsvilles soils have formed on hillslopes, while Kennebec soils formed on floodplains. In stream valleys, the distribution of the different mapped soil units provides an indication of the type of landform that is present in the river valley. However, soils formed in recently deposited alluvium can bury older surfaces, obscuring view of older alluvium that lay beneath the modern alluvium (Table 2-2).

Table 2-1: Soil Associations in the Project

Soil Parent Material	Soil Series	Acres	% of Project
Loess	Higginsville, Sharpsburg	52.6	63.1%
Alluvium	Kennebec	19.9	22.9%
Residuum	Snead-Rock	9.9	11.8%

Source: Soil Survey Staff 2024

Table 2-2: Landscape Position, Landforms, and Soil Series

Landscape Position	Landform	Soils Series
Uplands	Backslopes, shoulders, summits	Higginsville
Stream valleys	Low terraces, floodplains, and alluvial fans	Kennebec
Slopes	Hillslopes, backslope, side slope	Snead-Rock outcrop complex

Source: Soil Survey Staff 2024

2.4 Vegetation

Current vegetation cover across much of the Study Area has been substantially altered from its historical condition. Nearly all former prairie land has been tilled and is being actively cultivated for the production of row crops, especially corn and soybeans. Some farm fields are maintained as pastures. Fallow fields, fence rows, and rural roadsides contain remnants of native prairie plants along with Eurasian invasive grasses, forbs, shrubs, and trees. Some former savannas are uncultivated and are maintained as livestock pasturage. Elsewhere, savanna and woodland remnants persist, especially on steep bluff slopes and in riparian settings, but these are often overrun by invasive shrubs and trees.

Aerial photograph imagery indicates that the Project APE has been extensively cultivated since at least 1957, with little native vegetation remaining (Nationwide Environmental Title Research [NETR] Online 2024). Current vegetation mainly consists of pasture grasses and forbs grown for hay. Deciduous woodland and scrub vegetation has grown up around streams, ponds, in some gullies, and along field edges. Today, the Project APE consists primarily of agricultural fields with a narrow bands of riparian vegetation in the stream valley to the west.

2.5 Fauna

A variety of animal species have been found in Missouri throughout the history of human occupation. Many of these species were important food sources for prehistoric and historic groups. Some species have been extirpated from the State, and some are now completely extinct. Missouri's diverse indigenous faunal community includes mammals such as the plains bison *(Bison bison)*, elk (*Cervus canadenis*), white-tailed deer *(Odocoileus virginianus)*, gray wolf *(Canis lupus)*, coyote *(Canis latrans)*, red wolf *(Canis rufus),* gray fox *(Urocyon cinereoargenteus)*, black bear (*Ursus americanus*)*,* eastern cottontail *(Sylvilagus floridanus)*, black-tailed jack rabbit *(Lepus californicus)*, beaver *(Castor canadensis)*, American badger *(Taxidea taxus)*, mountain lion *(Felis concolor),* and mink *(Mustela vison)* (Nelson 2005 [1985]; O'Brien and Wood 1998). Birds include wild turkey *(Meleagris gallapavo)*, greater prairie chicken *(Tympanuchus cupido)*, mourning dove *(Zenaidura micoura),* red-tailed hawk *(Buteo jamalensis)*, bob-white quail *(Colinus virgianius)*, common raven *(Corvus corax)*, several raptor species, and a wide variety of migratory waterfowl. Numerous kinds of reptiles and amphibians are indigenous to the State, including a long list of nonvenomous and venomous snakes, aquatic and terrestrial turtles, skinks, toads, many kinds of frogs, and several species of salamanders. Rivers, tributary streams, lakes, and ponds were sources of pan fish, game fish, and shellfish for both prehistoric and historic peoples. Some of the now-extinct Pleistocene megafauna that roamed the prairies, and that were important to prehistoric people in the region, included wooly mammoth (*Mammuthus primigenius*), Columbian mammoth (*Mammuthus Columbi*), mastodon (*Mammut americanum*), forms of bison (e.g., *Bison bison occidentalis* and *B. antiquus*), and horse (*Equus caballus mexicanus*) (O'Brien and Wood 1998).

2.6 Previous Disturbances

The Project APE is adjacent to Todd Creek, which runs along the southern boundary of the APE. Much of the Project area slopes either southward toward Todd Creek or around intermittent streams draining into Todd Creek. Soils throughout the entire APE have been disturbed by plowing and cultivation. At the time of survey, the Project area was tilled and planted with soybeans. Erosion on steeper slopes has caused gullying and truncated the topsoil in some areas. The Project area lies adjacent to the Martin Marietta Stamper Mine, which began operation at this locale between 1997 and 2003 (NETR Online 2024).

Review of online resources, historical plats, and topographic maps indicates that the APE has not been previously developed for use other than agricultural purposes. The 1914 Smithville Quadrangle (USGS 1914) shows a residence at the intersection of Todd Creek Road and NW 144 Street adjacent to the APE. The residence is also depicted on the 1961 Ferrelview MO Quadrangle (USGS 1961) but is no longer shown on later Ferrelview maps (USGS 2012). The 1961 Ferrelview quadrangle (USGS 1961) indicates an unnamed quarry adjacent to the Project

APE in the west. This quarry is not shown on subsequent historic quadrangles. Google Earth's aerial imagery from 1997 and 2005 shows evidence that this quarry was still in use, and appears to have been incorporated as part of the current Stamper Mine and Quarry.

3.0 Cultural History Overview

In Missouri, the State has been divided into six archaeological regions, and the Project APE is found within the Northwest Prairie Region of the Glaciated Plains of northern Missouri (Chapman 1980). The following discussion is a general overview of the Study Area's cultural history with some distinct characterizations of the archaeology and history of the region.

Archaeologists generally divide the prehistoric cultural sequence of the Midwest into two pre-ceramic stages and two ceramic stages. The stages of cultural development in the Midwest are defined by changes in technology, settlement, and subsistence. The Paleoindian period has been designated as the earliest pre-ceramic stage and dates from ca. 11,500 to 9900 BP, although there is significant evidence of a human occupation in North America prior to 12,000 years ago. Following the Paleoindian is the Archaic, which dates from approximately 9900 to 3000 BP. The ceramic stages include the Woodland stage, dating from 3000 to 1000 BP, and the Mississippian stage, dating from AD 900 to the period of contact between European explorers and local native groups (O'Brien and Wood 1998).

Following the prehistoric stage in the Midwest is the historic stage, defined as the beginning of written accounts and often marked by the identification of European trade items in site assemblages. The following summary briefly traces the region's cultural development from the Paleoindian period through the recent past and is intended to provide a context within which to evaluate the significance of documented archaeological resources within the APE.

3.1 Paleoindian

There have been discoveries in the last several decades that suggest human occupation of the Americas perhaps as early as 30,000 years ago. Major archaeological sites across the Americas that may contain evidence of early occupations up to 30,000 years old include Monte Verde, Chile (Dillehay 1984:100-109; Quivira and Dillehay 1988:177-191); Meadowcroft Rockshelter, Pennsylvania (Adovasio et al. 1983: 163-189); Pendejo Cave, New Mexico (Chrisman et al. 1996:357-376); and Selby/Dutton and Lamb Springs, Colorado (Stanford 1979; Stanford et al. 1981). Locally in Missouri, the Big Eddy Site (Ray 1998) and the Shriver site (Reagan et al. 1978) contain possible evidence of very early human occupations.

The Shriver site is in Daviess County and was first excavated in the 1970s as part of a highway relocation project. Potential chert debitage and utilized flakes inconsistent with Clovis (12,000 to 9000 BP) lithic technology were found below a Clovis point at the site and below the loess soil deposits (O'Brien and Wood 1998; Environmental Research Center 1999:11). Rowlett and Garrison (1984) analyzed a number of thermoluminescence dates from the site and concluded the artifacts found below the Clovis layer date to around 14,000 BP. Critics question whether the chert pieces are actually artifacts or just the result of natural erosional and depositional processes (O'Brien and Wood 1998).

The Paleoindian stage is best defined by the presence of extinct megafaunal remains in ecofact assemblages of archaeological sites found in North America. This stage, dating from approximately 12,000 to 9000 BP is generally thought of as a period dominated by highly mobile hunting and gathering bands living a nomadic lifestyle and exploiting, by choice, a

limited number of resources. However, many archaeologists have reconsidered the mobility scenario, suggesting that base camps were established and that small groups fanned out over the landscape to harvest or obtain local resources.

Though poorly defined throughout the Study Area and the State in general (Environmental Research Center of Missouri 1999:11), sites assigned to the Paleoindian period are best known by the presence of particular styles of projectile points, with the most recognized being the fluted varieties. The Paleoindian projectile points recovered in Missouri include fluted varieties and lanceolate varieties. The lanceolate varieties are usually associated with later Paleoindian occupations.

Other Paleoindian tools include spurred end scrapers, side scrapers, drills, burins, flake knives, gravers, perforators, bone points, foreshafts, shaft straighteners, and atlatls (Baker and Kidder 1937; Blackmar and Hofman 2006; Frison and Zeimens 1980; Harrington 1971; Hofman and Graham 1998; Lahren and Bonnichsen 1974; Wormington 1957). Archaeologists have traditionally described the settlement patterns of these people as highly mobile with groups focusing on hunting and gathering subsistence strategies. Burlington chert was a favored raw material for Early Paleoindian peoples of the upper Midwest, as Clovis points made from this material were found hundreds of miles from the sources in southeast Iowa, western Illinois, and central and northeastern Missouri (O'Brien and Wood 1998). A number of perishable items, such as textiles, wood, and bone have been identified at sites with optimal preservation in dry caves on the margin of the Plains, including the Ozarks (Harrington 1971; O'Brien and Wood 1998; Blackmar and Hofman 2006). Textile artifacts identified at these early sites include such items as netting and sandals (Blackmar and Hofman 2006:58; Chapman 1975:158-163; O'Brien and Wood 1998:12, 78). Wood artifacts include digging sticks, hunting clubs or throwing sticks, pegs, stakes, and tarp elements (Blackmar and Hofman 2006: 58). Bone artifacts identified at these sites include bone awls, weaving tools, a variety of flint working tools, tubes, beads, fishhooks, scraping and cutting tools, and needles (Lahren and Bonnichsen 1974; Frison and Zeimens 1980; Blackmar and Hofman 2006; Frison 1991).

The minimal representation of Paleoindian peoples in the archaeological record may be due to their form of subsistence, which produced few material remains, and/or to climactic and geomorphological changes that "may have resulted in deeply buried and eroded sites," making evidence of Paleo-Indian occupation "difficult to recover" (Environmental Research Center of Missouri 1999:11; Angelbeck et al. 1996:8). The Paleoindian period spans the Pleistocene-Holocene transition. This was a period of major environmental change in North America (Mandel 2006). Glacial conditions that had greatly influenced climate were subsiding, resulting in increased seasonality and insulation during the summers (Kutzbach and Webb 1993). This transition period reflected a general warming trend that followed the last glacial maximum with episodic cooling (e.g. the Younger Dryas). It is likely that these climatic and environmental changes contributed to the way humans interacted with their surroundings. Differing behaviors and activities during that time may have contributed to the variability of the archaeological record.

Archaeologists have divided the Paleoindian period into several complexes that do not represent a single homogenous adaptation. Some groups appear to have been more focused on hunting and processing large mammals such as mammoths and bison while others had a more generalized, seasonally based economic approach (Blackmar and Hofman 2006).

Regardless of which complex they belonged to, it appears that people throughout the Paleoindian period used both resource-specific and generalized subsistence strategies to varying degrees.

3.1.1 Clovis Complex

The first generally accepted widespread cultural adaptation to be observed in North America is the Clovis complex which is believed to date from 12,000 to 11,000 BP when the Ice Age climate of the Pleistocene was transitioning to the more modern climate of the Holocene (McMillan and Klippel 1981). It was originally applied to a complex of artifacts found in direct association with extinct megafauna, especially mammoth. The origins of Clovis are unknown. The most diagnostic artifact of the complex is the distinctive Clovis fluted projectile point, which is the earliest known projectile point in North America and is typically recorded as an isolated surface find in Missouri. Important exceptions to Clovis-era artifacts recorded as surface finds in Missouri exist, including the most important, the Kimmswick site "south of St. Louis, where Clovis points were associated with the remains of mammoth and other now-extinct megafauna" (Roper et al. 1991:9). Most of the information known about the Clovis complex comes from excavations from surrounding states; however, it is "the best represented of the Paleoindian traditions in Missouri" (Roper et al. 1991:9).

3.1.2 Folsom Complex

In western Missouri and onto the Plains, Folsom sites postdate Clovis sites. Subsistence strategies of these people still concentrated primarily on hunting large, now-extinct mammals; however, the focus changed from mammoth to bison (*Bison antiquus*). The Folsom culture was also nomadic, roaming the high plains from about 11,000 to 10,500 BP. The diagnostic artifacts associated with this complex include the Folsom projectile point. The manufacturing technique creating the fluted projectile point often produced a fragmented channel flake, and consequently, a second diagnostic feature is this channel flake. Folsom points have been found throughout western Missouri, though rarely in eastern Missouri, which may represent the dominance of Dalton Phase occupations in those areas (O'Brien and Wood 1998).

3.1.3 Dalton

By the end of the Paleoindian period, the environment had changed dramatically. The withdrawal of the Wisconsin ice shield caused the gradual shift in the distribution of floral communities across the landscape. At the beginning of the Paleoindian period, the vegetation in the APE was dominated by mixed boreal-deciduous forests. At the end of the period, this vegetation community had retreated to the north and was replaced by prairie. The dynamics of the environment were reflected in the cultural adaptations of the Paleoindian peoples. These dynamic adaptations were reflected in technological and social changes in the Paleoindian period (Koldehoff and Walthall 2009).

Dalton is a transitional period at the end of the Paleoindian stage. Many archaeologists interpret the Dalton period as an example of cultural adaptation to the changing environment, the transition from the late Pleistocene to the early Holocene (Goodyear 1982). Local artifact density increased, suggesting changes in settlement patterns as people became more sedentary (Angelbeck et al. 1996:9).

The most diagnostic artifact associated with this transition is the Dalton projectile point or knife. Studies in Missouri indicate that this unique artifact endured into the early Archaic period in southwestern Missouri (Chapman 1975). Little evidence of this broad temporal distribution is found in surrounding areas, suggesting that the Dalton point/knife is temporally distinct (Goodyear 1974, 1982). Sites containing Dalton components have been reported throughout Missouri (O'Brien and Wood 1998); however, most Dalton points found in northwestern Missouri "are surface finds that provide little information regarding lifeways during this period" (Angelbeck et al. 1996:9).

3.2 Archaic

The Archaic period roughly coincides with the beginning of the Holocene Epoch and terminates around 4,000 BP (Carr 1998; Dent 1995). In comparison to the climate at the Pleistocene-Holocene transition, the early Holocene, at about 9000 BP, marks the onset of a warmer and drier climate. Researchers have alternately referred to this warm and dry period as the Altithermal (Antevs 1955), Hypsithermal (Deevey and Flint 1957), or Atlantic climate episode (Baerreis and Bryson 1965); in this report, this period is referred to as the Altithermal. This climatic period led to gradual changes in the environment and landscape. For example, the warming global climate accelerated the melting of polar ice caps and continental glaciers to the north, resulting in sea level rise. At the onset of the Archaic period, the sea level was 90 ft lower than it is today. By the end of the Archaic period, sea level had roughly stabilized and was close to sea levels of modern times (Bense 1994).

In the Great Plains, the warmer and drier climate led to an expansion of grasslands into previously forested areas and the disappearance of much of the wetland vegetation (Wyckoff et al. 1983). Forested areas persisted in the moist bottomlands near rivers and streams. These riparian forests attracted game species. The concentration of faunal resources in bottomland and forested areas combined with an increased reliance on riparian forest foods such as nuts, berries, and starchy roots, led to increased sedentism. The changes in subsistence practices led to technological changes in lithic tool production. Although use of lanceolate points continued, stemmed (expanding and contracting) and notched (corner and basal) projectile points began to be used and hafting technologies changed (Musil 1988; O'Brien 1996). The toolkit expanded to include ground stone tools. The use of manos, metates, and pestles was implemented in conjunction with increased reliance on plant foods (Sabo and Early 1990). These changes appear to have begun about 9000 BP and continued until 1500 BP (Hughes 1984:109).

3.2.1 Early Archaic

The Early Archaic in the Midwest is generally viewed as a continuation of the lifestyle traditions established during the Dalton period. As the climate continued to shift, a broader range of ecological niches were exploited (Chapman 1975). Many of the same projectile point styles of previous stages continued to be used in the Early Archaic, but with the introduction of stemmed forms and corner-notched forms, Early Archaic tools became progressively more complex (Chapman 1975). The Early Archaic is not well-defined in the Project locality, as is the case for much of Missouri (Wood et al. 1995; O' Brien and Wood 1998).

Archaeologists are divided as to the reason for such a poor representation of human occupation in the region during this stage. Some archaeologists consider the lack of Early

Archaic sites is a result of the limited number of systematic archaeological surveys conducted in the area and believe sites may be deeply buried in floodplain alluvium (Schmits 1991:9). Other archaeologists have interpreted the lack of Early Archaic sites as an indication that the local populations relocated in response to the changing environment. In particular, people may have migrated to the southeast to take advantage of the deciduous forest environment (Roper et al 1991:10). The few potential Early Archaic occupations identified in the northwest Missouri "have been located in upland locations near major streams," areas that have not been subject to intensive archaeological investigations (Schmits 1991:9).

3.2.2 Middle Archaic

The climate continued to shift throughout the Middle Archaic, resulting in continued changes in the vegetation. The climate became drier, causing forests to concentrate in the bottomlands and stream valleys while grasses spread across the uplands. This shift is represented by the increased exploitation of prairie species, with the best evidence coming from excavations at Rodgers Shelter in Benton County, Missouri (Kay 1982; McMillan 1971). Additional studies in the Illinois River valley and southern Indiana also demonstrate that prairie resources were very important in the subsistence strategies of the Middle Archaic peoples (Munson 1980).

As with most periods, many of the previous tool types or forms continued to be used in the Middle Archaic. New tool types used by the Middle Archaic peoples include ungrooved ground stone celts and full-grooved ground stone axes. Other stone artifacts such as bannerstones and pendants represent new developments during this period. Bone tools were also important during the Middle Archaic, including antler projectile points, awls, fishhooks, and tortoise shell cups (Griffin 1967). The most diagnostic artifacts associated with the Middle Archaic period are the side-notched projectile points or knives (Chapman 1975).

Little is known about the Middle Archaic in northwestern Missouri (Chapman 1975; O'Brien and Wood 1998; Wood et al. 1995). Investigations in the Salt River valley in northeastern Missouri revealed that Middle Archaic occupations were significantly denser than those of the Early Archaic, but that subsistence was still based on foraging. Investigations at a residential site (Pigeon Roost Creek) indicated that the occupants were heavily involved in collecting and processing hickory nuts, a common theme in Middle Archaic sites of the Midwest (O'Brien and Wood 1998).

3.2.3 Late Archaic

Population increased dramatically during the Late Archaic in the southeast and Midwest. Most archaeologists attribute this population boom to the end of the Altithermal, which resulted in a milder climate (O'Brien and Wood 1998). This period, which is one of the better represented in the vicinity of Study Area, is marked by what Caldwell (1958) refers to as "primary forest efficiency." This is a reflection of the more intensive exploitation of local resources, including extensive use of shellfish in settings near streams or other water sources and nut collection and processing. Hickory nuts were the most prominent mast used during this period throughout much of Missouri. Deer hunting was also an important activity and food source. According to Reid (1983), "[a]ssemblages associated with the Late Archaic include the Sedalia Complex and Nebo Hill in the northwest region." Diagnostics from the period include "a variety of stemmed points such as Stone Square and Sedalia, basal notched Smith and

Afton Corner Notched, digging implements such as Clear Fork gouge and Sedalia diggers, and three-quarter grooved axes" (Sturdevant 1991a:17).

Many Late Archaic sites functioned as residential sites or specialized limited activity sites associated with procurement and processing of locally available resources. Many of the activity sites are found in upland settings and are defined by a low artifact density and few, if any, features (Hoard 1992; O'Brien and Wood 1998). Archaeologists date the Nebo Hill phase, which received its name from the phase type site in the Missouri River valley north of Kansas City, to between 4000 and 2600 BP. Evidence of Nebo Hill phase occupations is primarily located in the lower Missouri River valley, especially between St. Joseph and Kansas City, Missouri (O'Brien and Wood 1998). The eastern boundary is generally considered the Bethany Falls and Burlington escarpments, while the western boundary follows the Oread escarpment and the Flint Hills. The southern border coincides with the upper reaches of the Osage River, and the northern border extends into southwestern Iowa. Characteristic artifacts include the lanceolate Nebo Hill projectile point and large bifaces consisting of hoes, gouges, and rectangular celts. Ground and pecked stone tools include rectangular and ovate manos and grooved axes. The earliest recognized pottery in Kansas is associated with the Nebo Hill phase. The pottery is a fiber-tempered ware (Phillips and Brown 2009).

The economy of the Nebo Hill phase consisted of hunting and harvesting the deciduous forest and forest edge resources. The population may also have cultivated gardens containing tropical cultigens, such as squash and bottle gourd (Logan 1996). The origin of the phase may have been associated with the drier climate of the post-Altithermal, and the disappearance of the phase may have occurred with the development of larger, sedentary villages based upon stored surpluses (Reid 1984). Several Late Archaic sites "have been identified in the region, particularly along the major stream valleys" (Chapman 1975). Reid (1983) recognized at least three site types associated with this phase, including "base camps, small cold-weather camps, and quarry sites/hunting camps."

3.3 Woodland

The Woodland Period (2600 to 1100 BP) is typically characterized by increased sedentism (permanent residences), intensified horticultural activity, expanding regional exchange networks, and the elaboration of ceremonial activities and mortuary practices (Griffin 1967; O'Brien and Wood 1998). The origin of these trends can be traced to the Late Archaic, but the elaboration of cultural elements became the hallmark of the time. These developmental trends form the basis for distinguishing the Early, Middle, and Late Woodland sub-stages. Regional variations in the timing and extent to which these traditions were expressed, however, make this subdivision difficult to employ in certain areas. Unlike the Late Archaic settlement system, the Early Woodland occupations in the Midwest are typified by relatively small, short-duration camps situated adjacent to specific environmental locales. This pattern suggests that small social groups using seasonally occupied, specialized, extraction camps were exploiting resources within defined territories.

3.3.1 Early Woodland

The numbers of Early Woodland sites recorded in Missouri are considerably less than those dating to the preceding Late Archaic and the following Middle to Late Woodland periods, particularly in northwestern Missouri where there is little evidence of occupation from this

period in the known archaeological record (Roper et al. 1991:11). In Missouri, as in much of the Midwest, ceramic manufacture is generally associated with the development of the Early Woodland, though the timing of its appearance seems to vary spatially across the landscape. In fact, fiber-tempered pottery has been found at Late Archaic Nebo Hill sites (4000 to 2600 BP) in the greater Kansas City area (O'Brien and Wood 1998).

The Black Sand culture is the best known from this period. The group is defined by its distinctive pottery, as well as lithics such as contracting-stemmed dart points, triangular-stemmed knives, humpback scrapers, and nutting stones. In Missouri, sites of the Black Sand culture are found within the main valley of the Missouri River and its immediate tributaries, as well as throughout the northeastern corner of the State and extending into other large river valleys, including the Illinois, Mississippi, and Missouri (Roper et al. 1991:11). In the Northwestern Prairie Region, recorded Black Sand sites are primarily known in the Kansas City and Fishing River localities (Martin 1997).

3.3.2 Middle Woodland

In the Midwest, the Middle Woodland period is characterized by widespread acceptance of pottery and mound building with the appearance of more permanent villages. This period is also associated with the Hopewellian Interaction Sphere, which is marked by specific design motifs on pottery vessels, "elite" burial mounds, and the exchange of exotic materials (Caldwell and Hall 1964). The Hopewellian Interaction Sphere connected distant Middle Woodland groups by a highly developed socio-religious organization (Struever 1964). Large regional centers, which exhibit groups of conical shaped burial mounds, were the focal points for Hopewellian activities during this period.

The pottery from the Middle Woodland period is quite varied in decorative technique. The pottery may be plain (i.e. undecorated), incised, punctated, or stamped, and the decorations may occur in specific areas defined by incised lines (zoned), or may be restricted to the rim or lip (O'Brien and Wood 1998; Hoard 1992). Sites in the northern greater Kansas City area that share ceramic characteristics with Illinoisan Hopewell sites have been called Kansas City Hopewell since the late 1930s. A major concentration of these sites "lies along both sides of the Missouri River in Platte, Jackson, and Clay Counties" (O'Brien and Wood 1998:192). The Kelley site in Doniphan County, Kansas, was excavated in 1969 and represents the northernmost of the sites attributed to this period (O'Brien and Wood 1998).

As the period progressed, pottery styles evolved from dentate-stamped and punch-and-boss to incised cross-hatching and punctates to the undecorated ceramics characteristic of the Late Woodland period (Johnson 1979). The similarities in the pottery design elements seen in Kansas City Hopewell sites seem to lag behind the designs at Illinois Hopewell sites. More Kansas City Hopewell dates fall into what in western Illinois would be considered the early Late Woodland period (ca. 1600 to 1250 BP) (O'Brien and Wood 1998).

3.3.3 Late Woodland

The beginning of the Late Woodland period, traditionally identified as ca. 1600 BP, was marked by a reduction in interregional trade, a decrease in the complexity of ceremonial/mortuary practices, and a reduction in the elaborateness of ceramic decoration (O'Brien and Wood 1998). Subsistence was still based on hunting, gathering, and horticulture.

Around 1250 to 1150 BP, corn, in addition to squash and beans, became important cultigens. Continuity with the preceding Middle Woodland period is reflected in a subsistence base that involved the use of terrestrial and riverine species, nuts, and cultivated plants. Settlements tended to be small, nucleated villages located in a variety of ecological zones (Conner 1985; O'Brien and Wood 1998). Base camps were now not only found in bluff-base and river bottomland locations, such as documented examples in the American Bottom and Illinois River valley, but also in the valleys of smaller streams and uplands.

3.4 Mississippian and Plains Village

The Mississippian period in Missouri is traditionally divided into Early Mississippian (AD 900 to 1200), Middle Mississippian (AD 1200 to 1400) and Late Mississippian (AD 1400 to 1541). However, these divisions are problematic because there is a great amount of variation in the archaeological record in Missouri during this period, more so than in earlier periods. In some parts of Missouri, many of the characteristics of Mississippian culture were adopted late or not at all. For example, for much of the Mississippian period, the material culture of the people living in the Ozark highlands was almost identical to that of Late Woodland times. As another example, in northwestern Missouri, "Mississippian" lifestyles were never adopted; for example, shell-tempered ceramics appear, but not until ca. AD 1150 and only at a few sites (O'Brien and Wood 1998). Cultures in this region might properly be considered part of the Plains tradition, as they maintain more similarities to Central Plains tradition cultures than to eastern Woodlands cultures. During this period there is evidence that groups became more sedentary and people relied more on horticulture, although hunting and gathering remained important subsistence activities.

In Missouri, archaeologists have documented evidence of three "interrelated and, to a degree, spatially segregated cultural complexes" associated with the Late Woodland/Early Mississippian and Middle Mississippian period. These include the Steed-Kisker phase, the Nebraska phase, and the Pomona variant, which "occur both in western and northwestern Missouri and in adjoining parts of Kansas" (O'Brien and Wood 1998:274).

The Steed-Kisker phase, a unit identified through excavations at a site of the same name in Platte County, Missouri, represents a semi-sedentary horticultural complex exhibiting Mississippian influences such as shell-tempered pottery. Sites associated with this phase have also been documented "in tributary valleys of the Missouri, Platte, and Little Platte Rivers along the east side of the Missouri beginning near St. Joseph and extending downriver to the Fishing River" (O'Brien and Wood 1998:274).

The vicinity around St. Joseph generally "marks a rough boundary between sites provisionally assigned to Steed-Kisker and those assigned to the Nebraska phase" (O'Brien and Wood 1998:276). Though little is known about the Nebraska phase in Missouri, excavations at other sites suggest Nebraska-phase people lived in "small, nucleated villages…principally along the Missouri River bluffs and those of its tributaries" (O'Brien and Wood 1998:276). Though similar in many ways to sites associated with the Steed-Kisker phase, differences in architecture, village layout, and pottery decoration distinguish the two phases. The Amazonia Mound site in Andrew County was radiocarbon dated to this period and appears to have been associated with a Nebraska-phase occupation (O'Brien and Wood 1998:276).

Also found in the eastern Kansas River region are the remains of the Pomona variant. This cultural complex extended throughout much of the eastern third of Kansas and part of western Missouri, where it is also referred to as May Brook (Brown 1985). The Pomona variant, while contemporaneous with the Nebraska and Steed-Kisker phases, appears to be a continuing Late Woodland adaptation influenced by neighboring Plains Village cultures (Witty 1967, 1978:59-62, 1981; Blakeslee and Rohn 1986:1292; Brown 1985). The primary differences between this group and their contemporary counterparts were in house architecture and pottery production techniques (O'Brien and Wood 1998:276). They were also semi-sedentary and dependent upon corn horticulture to supplement hunting and gathering techniques.

3.5 Protohistoric Contact Period

European explorers identified four major historic Indian tribes (Missouri, Osage, Iowa, and Kansa) living within the boundaries of modern Missouri at the time of initial contact. The Osage were primarily located south of the Missouri River, and the Iowa tribes were located north. The Missouri were closely related to the Iowa, and at initial contact, lived along the river that now bears their name. The Kansa also lived along the Missouri River as they moved west into present day Kansas (Blaine 1995; Burns 2004; Wood et al. 1995). The Osage and Kansa were likely later settlers to the region as there are "no known antecedents" to these groups in the archaeological record (O'Brien and Wood 1998:356). They adapted to the traditions of their new home as sites known to be affiliated with these groups contain artifacts reminiscent of the Oneota culture identified at prehistoric sites throughout the State (O'Brien and Wood 1998:356).

Though little ethnographic information is available about the protohistoric occupants of the region, contact period sites dating to before European exploration of the area contain "a wide variety of European trade goods, especially glass beads, and native-made items fabricated from iron, copper, and brass trade objects" (O'Brien and Wood 1998:352). Most were received from trade with other Native American groups; however, there is evidence that the Spanish may have made contact with local groups via the Southwest (O'Brien and Wood 1998:352).

The Osage and Missouri were descendants of "peoples responsible for leaving what may have been termed Oneota artifacts," and though Oneota materials "are found over much of northern and western Missouri" there is little known about this group excepting data gathered during investigations in three areas, namely the lower Chariton River area in north-central Missouri, the St. Joseph area of northwestern Missouri, and western Missouri (O'Brien and Wood 1998:353). Of particular importance are the Utz and Guthrey sites, which were occupied contemporaneously. Occupation at the Utz site began as early as the mid-fifteenth century, and it was occupied over an extended period by a variety of groups. Occupation extended through the contact period, as European trade goods were found there. Some scholars hypothesize that the settlement represented an exchange center similar to the Leary site in eastern Nebraska because of the "significant quantities of 'exotic' materials and finished artifacts" recovered there, including many objects made of non-locally available resources (O'Brien and Wood 1998:353). The site was abandoned by 1712 according to the accounts of Étienne Véniard, sieur de Bourgmont, "a French officer who lived and worked among the Missouri between 1712 and 1719" (O'Brien and Wood 1998:353). The Missouri, who were the last occupants of the site, then relocated to the Gumbo Point site a few miles up the

Missouri River "where they lived in a terrace-edged village from about 1727 to 1789." They left the area altogether by 1794 (O'Brien and Wood 1998:354).

The Kansa, sometimes referred to as the Wind People, lived "in several small villages along the Kansas River west of present-day Kansas City when they entered recorded history"; however, their "prehistoric and protohistoric sites…are further north along the Missouri River" (O'Brien and Wood 1998:355). The best known are the Fanning and Doniphan sites in Doniphan County, Kansas and the King Hill site in St. Joseph, Missouri. The Doniphan site was likely the village visited by Bourgmont in 1724 and may have been the Kansa's "principal village" (O'Brien and Wood 1998:355).

During the historic period, the Osage were divided into two distinct bands known as the Big Osage and Little Osage. They are known to have occupied "hilltop villages along the Osage River in Vernon County" in southwestern Missouri but often traveled into the Ozarks for hunting expeditions (O'Brien and Wood 1998:356). The best known Big Osage village sites include the Carrington and Brown sites dating from ca. 1675 to 1825. The Hayes site represents a Little Osage village dating from 1675 to after 1806. This village was described by Zebulon Pike who passed through the area in 1806 on his way to the southwest (O'Brien and Wood 1998:356). All of the locations contain large amounts of European trade goods. In general, Osage villages "consisted of 60 to 300 houses, some of which are described as mat-covered, oblong structures." The dwellings were typically erected without a planned arrangement around a central plaza or open space (O'Brien and Wood 1998:356).

After 1806, the Little Osage left the Hayes site and established a village on the Missouri River a few miles west of the Utz site. This village, known as the Plattner site, was "contemporaneous with the Missouri Indian village at Gumbo Point, and their cultural inventories are similar except that Plattner contains far more European trade goods" (O'Brien and Wood 1998:356). Later, some Missouri joined the Osage while "others joined the Oto [or Iowa] on the lower Platte River" (O'Brien and Wood 1998:356). Later in the nineteenth century, a number of displaced eastern tribes passed through the area as they were eventually forced on toward the Indian Territory (Kansas and Oklahoma). Very few sites associated with the historic tribes are known, and many may have been destroyed by the adjoining major rivers (Wood et al. 1995).

3.6 European Exploration and Colonial Development

Western Missouri and the Project vicinity in particular were "intimately associated with the early era of European exploration" (Schmits 1991:19). Spanish explorers Hernando de Soto and Francisco Coronado were the first Europeans to approach present-day Missouri, though neither traveled through the Project vicinity. De Soto discovered the Mississippi River and crossed it somewhere near present-day Memphis, Tennessee. At almost the same time, Coronado, in search of the fabled "seven cities of Cibola," traveled as far as the Kansas River. It would be almost 130 years before additional European explorers reached the region (March 1967:1; Schmits 1991:19).

3.6.1 French Exploration and Sovereignty

In 1673, Father Jacques Marquette and Louis Joliet initiated an expedition that reached the Missouri River. The French were interested in the waterway as a potential route to California,

but their initial expedition ended due to the fear of Spanish reprisals when the men reached Arkansas (March 1967:2). Joilet's reports were "heard with interest" by Robert Cavelier, Sieur de La Salle, who "dreamed of building a chain of posts" extending from Canada to the Gulf of Mexico (Schmits 1991:19). In 1682, he initiated an expedition that reached the Mississippi River and traveled to the Gulf. Upon his arrival, he claimed all the areas drained by the river for the King of France (Schmits 1991:19). On his return voyage, La Salle established Fort St. Louis at Starved Rock on the Illinois River (March 1967:3-4).

Political turmoil and international conflicts prevented additional expeditions to the region for the next decade, after which time "missionary and trading efforts by the French in the Mississippi Valley resumed" (March 1967:4). The first European settlement in Missouri was at Mission St. Francis Xavier and included 100 Frenchmen and approximately 2,400 Native Americans from Cohokia. The settlement was only temporary and soon moved to the east side of the Mississippi River. The new location became known as Kaskaskia and "overshadowed all other French settlements in the region in population and economic importance throughout the period of French control and beyond." Many explorers and traders reached Missouri from this post during the period (March 1967:7).

At the same time, Frenchmen from across the Mississippi River began to exploit the lead mines in southeastern Missouri. An expedition of note in 1714 by Sieur Antoine de la Mothe Cadillac, the new governor of the Louisiana Territory, lasted 8 months, during which he searched for silver and other precious metals in the areas in Missouri where lead was being mined. He visited the area now "comprising Iron, Madison, Ste. Genevieve, St. Francois, and Washington Counties" (March 1967:10).

False hopes of mineral riches in the region prompted additional exploration of Missouri in search of viable mines and in attempts to gain Native American allies. The first incursion into the interior of Missouri occurred in 1718 when Claude Charles du Tisne was tasked with contacting Indian tribes west of the Missouri River, "particularly the Pawnees and the Comanches [sic]" (March 1967:12-13). The expedition was halted by the Missouri Indians, though du Tisne led another expedition across the State shortly thereafter when he established a relationship with the Osage and Pawnee, who, he discovered, had already been engaged in trade with the Spanish. His expedition has been described as the "first recorded journey by land into the interior of Missouri" and was "a factor in awakening the French to the desirability of taking stronger measures in the Missouri River region" (March 1967:12-13).

During the same period, the Spanish were becoming increasingly concerned about French incursions into the Missouri region, an area they considered "a buffer between their interests and French holdings." In response, the Spanish attempted an expedition from the west. Though the expedition was unsuccessful, the attempt alarmed the French enough to authorize the construction of a fort on the Missouri River (March 1967:17; Schmits 1991: 19). Étienne Véniard de Bourgmond was selected by the French government to spearhead the effort because he already had relationships with local Indian groups (March 1967:17). He left France in June 1722 and started his trek up the Mississippi River in February 1723. Bourgmond established Fort Orleans in what is now southeastern Carroll County, and though it was initially successful, it was shut down in 1727. The exact location of the fort remains unknown (March 1967: 20; Bray 1978, Wood et al. 1995).

Subsequent inroads into the area during the French exploration period were generally made by fur traders and explorers who concentrated their expeditions along the major rivers. Trading posts were placed along these streams, often at the confluences of two rivers. Most of these early posts were situated near Indian villages to access the trading market, and the traders and trappers would return to homes in Illinois rather than establish permanent settlements in Missouri.

In the mid- to late 1700s, permanent European communities were being established within Missouri, starting with St. Genevieve (ca. 1735) along the Mississippi River in the southeastern portion of the State. In 1763, Spain officially acquired the Louisiana Territory, which included what would become Missouri, from the French through the Treaty of Fontainebleau. Spain did not assume control of the territory until 1770. Shortly after the treaty, the communities of St. Louis (1764) and St. Charles (1769) were established (Foley 2000), and Spain's liberal land grant policies "introduced waves of American settlers into Missouri" (Schmits 1991:20). Though banned later, another incentive to early American settlement was Spain's policies towards slavery, which they permitted in the region during this period. As a result, slavery and Southern cultural traditions were entrenched in Missouri long before it became part of the United States (Schmits 1991:21), setting the stage for future conflict.

3.6.2 American Territorial Period

In 1800, Spain returned the territory to France via the secret Treaty of San Ildefonso. Three years later, the United States purchased the Louisiana Territory, and American expeditions began to explore the region even before the sale was finalized. The most famous expedition was that of Meriwether Lewis and William Clark, who traveled up the Missouri River. Part of their mission was to "trace the Missouri to its source" in their search for the most efficient means to reach the Pacific Ocean (Schmits 1991: 21). They began their journey up the Missouri River in 1804 and passed through what would become Jackson County, Missouri, in June of that year "camping at the mouth of the Kansas river for three days." They found abundant food sources along this portion of the journey, and Clark "noted in his journal that a high limestone bluff" in the area "offered an ideal location for a potential government-fortified trading post." Four years later, under the direction of William Clark, Fort Osage was constructed at that location (Schmits 1991:21; Lissandrello 1975).

As part of the fort's establishment, the U.S. Government concluded a treaty with the Osage through which the Indians ceded to the U.S. Government approximately 30 million acres between the Missouri and Arkansas rivers as well as a 6-square-mile area surrounding the fort. This smaller area eventually became the town of Sibley. In exchange for the land, the government "offered the Indians protection from other tribes and access to the post." Under the leadership of Major George C. Sibley, from whom the future town of Sibley received its name, the fort served as "the last protection to travelers headed farther west." It did not retain this position for long, however, as American settlement extended further west. By 1825, Fort Osage was abandoned, and "the gateway to the West" shifted to the area around Independence in present-day Jackson County, Missouri (Schmits 1991:21). One significant impact of the fort's presence was its influence on early American settlement patterns as its location on a major route west meant many people passed through and some eventually settled in the area (March 1967:278-279).

In 1812, the Territorial Act converted a portion of the Louisiana Territory into the Missouri Territory, and much of the Project vicinity was within Howard County, Missouri. At that time, the population of Missouri was approximately 21,000 (Schmits 1991:21). The early territorial period was characterized by conflict over earlier land claims issued by the French and Spanish governments. The difficulty of confirming land grants "served to impede the sale of public lands and was an obstacle to early settlement" (March 1967:236). Early settlement in the Project vicinity was generally by fur traders, many of them French. For example, French fur traders established the earliest permanent European settlement in Jackson County in 1821 near Randolph Bluffs (Schmits 1991:21).

Despite early impediments, the Euro-American population in Missouri continued to grow as the frontier movement in the United States gained momentum. Most immigrants from the United States to the Missouri territory tended not to change latitude "and to settle in areas where the topography, soils, and climate were similar to those in the places from which they migrated" (March 1967:266). As a result, many of the initial settlers during the early nineteenth century were from Virginia, North Carolina, and Maryland by way of Kentucky and Tennessee. Most were subsistence farmers, though slaveholders made the trek as well, and they tended to settle in areas similar to those they occupied in other frontier areas. These areas were not always the most fertile as the farmers did not initially consider the vast plains of the Missouri territory to be fit for settlement or cultivation.

In addition to disputes over land claims, several other factors impacted the rate of settlement during the early territorial period, including malaria outbreaks, an economic depression in the United States preceding the War of 1812, and a major earthquake in Missouri's New Madrid region. The most important factor, however, was "the Indian danger, both real and imagined, that existed" in the West prior to the War of 1812. The danger was not necessarily from tribes in Missouri, but rather from "those tribes lying east of the Mississippi River, who had been forced by devious means to relinquish 110,000,000 acres of choice hunting grounds in a series of treaties concluded between 1802 and 1810" with the U.S. Government. This animosity was used by the British, who recruited many Indian allies during the War of 1812, and was the greatest deterrent to frontier expansion during the period (March 1967:266).

By this period, the principal tribes occupying the Missouri Territory included the Osage, the Shawnee, the Delaware, and the Sac and Fox. The major Osage settlements were south of the Missouri River along the Osage River. French missionaries brought the Delaware and Shawnee to the region in the eighteenth century by French missionaries. They lived in the vicinity of Cape Giradeau along tributaries of the Mississippi River in southwestern Missouri. The Sac and Fox roamed "a large area extending from the Missouri River north to the headwaters of the Des Moines and Iowa Rivers." Other tribes also came into the area to hunt or camp during this period, including the Missouri, who had been decimated by disease and conflict with other tribes, particularly the Sac and Fox, the Iowa, and the Kansa (March 1967:272).

3.7 Early American and Antebellum Period

Following the War of 1812, migration to western territories increased at a dramatic pace. Many factors encouraged increased settlement in the area, including "economic dislocations in the East…the great demand for farm products, and the reduction of the Indian danger" (March 1967: 309). The scale of the great migration was specifically "reflected in the creation of new

territories and the admission of new states" including Indiana in 1816, Alabama in 1817, Illinois in 1818, and Mississippi in 1819 (March 1967:309). The Missouri Territory applied for statehood during this same period. Immigration to the area had been so rapid that by 1819, the territory's population was 66,586 including 10,200 enslaved persons. The number represented an increase of more than 45,000 residents within a 10-year period (March 1967: 309). Though settlement did occur in some portions of the Project vicinity during this period, particularly in Ray and Jackson Counties, most of the area remained part of Indian Territory during the late territorial and early statehood period.

At the eve of statehood in 1820, Missouri was characterized principally by scattered settlements along the Mississippi and Missouri rivers. The rivers offered the primary means of transport, both for settlement and for goods to get to market. Keelboats were the main vessel used for transport of large cargoes until the advent of steam travel, which began on the Mississippi River in 1811 and on the Missouri River in 1819 (March 1967:368). Other means of transportation included primitive trails, many of which were based on historic Indian trails or on those created by fur traders.

3.7.1 Early Statehood Period

When applying for statehood, the Missouri Territory applied for admittance as a slave state, inducing "a national crisis over slavery" (Schmits 1991:23). Missouri was eventually established as a slave state, but the associated Missouri Compromise prohibited slaveholding in the remaining portions of the Louisiana Territory "north of 36 degrees and 30 minutes north latitude" (Foley 2000; Schmits 1991:23). During the first decade of statehood, Missouri's population almost doubled, followed by an increase of more than 270 percent between 1830 and 1840. The State had 682,044 inhabitants by 1850, and more than 1 million inhabitants, including 114,931 enslaved persons, by 1860 (March 1967:499).

In 1830, Clay County, which included present-day Clay, De Kalb, Clinton, Gentry, and Worth counties, achieved a population of approximately 5,000, with most of the new settlers coming from the Upper South. Settlement in this region was encouraged by the advent of steamboat travel, though during this period, present-day Clinton and Clay counties represented the western extent of American settlement. West of this area and east of the Missouri River included a triangle of land that was part of Indian Territory and contains most of the current APE. Though settlement was forbidden in this area, many tried to cross the line despite being ordered out by American troops. An example from the Project vicinity is John Monzingo, who reportedly settled with his family in present Nodaway County prior to the Platte Purchase in 1837, which officially opened the region for settlement (March 1967:500).

The Platte Purchase included what became Atchison, Holt, Nodaway, Andre, Buchanan, and Platte counties and was part of a larger American pattern of pushing Native American groups further west as the country expanded (March 1967:502). The treaty was made with members of the Sac and Fox, the Iowa, and other tribes, including the Sioux, Otoe, and Missouri (Sturdevant 1991b:15). The agreement negated the previous Treaty of Prairie du Chien that had granted the territory to the tribes. In return, the Indians received $7,500, and the government agreed to help them relocate to present Doniphan County, Kansas. By August of 1837, all of the Indians had been removed from the area, and American settlers immediately began to arrive (March 1967:509-510).

Many early settlers in the region came from Clay and Clinton counties, and though "no survey had been made and no way existed to get title to the land until 1838…an estimated 4,500 immigrants settled there within two years" (March 1967:510). As in other portions of the western frontier, most of the settlers were subsistence farmers and tended to settle in the wooded river bottoms rather than on the prairies. In addition to the typical perils of frontier life, inhabitants of this area were subject to a bitter conflict over the boundary between Iowa and Missouri that became known as the Honey War. The conflict, which resulted in armed skirmishes and property damage to those living in the disputed area, was a conflict between both citizens and officials in Iowa and Missouri over jurisdiction and property rights (March 1967:511).

Over the next 20 years, the "development of roads, rivers, transportation, and to some extent railroads…helped to increase the density of population in the older settled areas…[and] encouraged the expansion of the population beyond the frontier line after 1840." Despite continued development in the Project vicinity, the State's largest population centers remained along the Mississippi River prior to the Civil War, and the Project vicinity remained an isolated frontier region (March 1967:520).

3.7.2 Antebellum Development

New immigrants continued steadily to arrive from the East. Settlers were enticed to the area for a variety of reasons, including the "almost two thousand miles of navigable rivers" that "made possible the relatively rapid development of farms and villages" (March 1967:578). During this period, Missouri was known as the Gateway to the West, and the western counties served to supply the "fur trade, the Santa Fe trade, and provisions for troops at Leavenworth" (March 1967:587). The 1840s saw traffic on the Missouri River and activity in the Project vicinity increase "prodigiously as population and industry in Western Missouri and Iowa grew, the Oregon fever raged, and the war with Mexico necessitated the movement of troops and supplies to transfer points on the Missouri River" (March 1967:587).

Though the volatile and at times unpredictable Missouri River served to facilitate settlement and commerce during the early nineteenth century, the lack of road infrastructure was an impediment during this period (Snider and Sheals 2003). At this time, the responsibility for construction and maintenance of roads was considered a local matter, and "little to no pressure existed for the state to assume an active role in road and bridge construction." This tradition of reliance on local government entities to construct and maintain roads resulted in decades of "poor planning, waste of public funds, [and] an inadequate tax base for financing road construction." As a result, citizens became interested in the possibilities of railroad construction as early as the 1830s (March 1967:593); however, it would be the 1850s before governmental backing allowed the construction to begin (March 1967:612) and after the Civil War before construction began in earnest in the Project vicinity.

In general, life in the Project vicinity and Missouri itself during the antebellum period was based on a system of subsistence agriculture. Some cash crops, namely hemp and tobacco, were grown in areas where plantation agriculture existed; however, the leading counties in this industry were outside of the Project vicinity (March 1967:633). Instead, corn, which was the principal crop cultivated in Missouri since the inception of American settlement there (March 1967:627), was the dominant crop grown by the mainly sustenance-oriented farmers

in the Project vicinity before and after the Civil War. At the advent of the Civil War, only two states produced more than Missouri's nearly 73 million bushels (March 1967:628).

Due to a lack of dependence on cotton cultivation, Missouri's enslaved population constituted less than 3 percent of the population, a number much lower than in most other slave states. Additionally, only 10 percent of residents could be classified as slaveowners, and most owned very few slaves. Despite the fact that most Missourians were not slaveowners (March 1967:810), most came from Southern states and supported the system's existence and the philosophy that a person could be considered property. As a result, though Missouri would remain within the Union, anti-Union guerilla activity plagued the State from the inception of the Civil War.

3.8 Civil War

The decades leading up to the Civil War were wrought with heated disagreements, threats, and violent skirmishes in the Kansas-Missouri border counties. Both pro-slavery and anti-slavery groups formed and rallied their members to take action (Trexler 1914). Martial law, established by Major General Fremont in 1861, resulted in confiscation or destruction of property belonging to Southern sympathizers. Groups of Union Missouri State Militia, such as "Penick's thieves" took advantage of the martial law and stole or destroyed private property. At the same time, groups such as "Quantrill's raiders" murdered, burned, and looted in the name of the Confederacy. William Quantrill used Jackson County as his headquarters for a time during 1862, living under the protection of local Confederate sympathizers (March 1967:930).

Though Missouri remained a part of the Union, public opinion in western Missouri was strongly anti-Union. Governor Hamilton Rowan Gamble created the Enrolled Missouri Militia in 1862 to provide more local protection against anti-Union factions. However, "disloyal" men unwilling to join the militia were required to enroll as "disloyal" or risk prison. Many joined the Confederate army or guerrilla groups instead (Green 2018).

3.9 Postbellum and Late Nineteenth Century Development

Missouri and the Project vicinity recovered quickly from the Civil War and grew rapidly in the intervening years. The State's population increased by approximately 40 percent during the 1860s, while the State's overall wealth increased by more than 70 percent (March 1967:1029). Related to this growth, railroad mileage in the State more than doubled between 1865 and 1870 with most of the new construction serving rural areas that were formerly economically isolated. Railroad construction was widely supported by local residents, and though railroads did "provide farmers with better market access, lower transport costs, encourage immigration, and increase land values" in some areas, many counties incurred debts they were unable to repay to support railroad construction in their area (March 1967:1037).

In general, railroad and infrastructure improvements during the immediate postbellum period supported the expansion of commercial agriculture and influenced community development patterns as many towns were established along the new lines, existing towns along the lines expanded, and those bypassed by railroad construction ultimately declined or disappeared altogether. By 1900, the State had more than 6,887 miles of track (March 1967:1041).

This same period witnessed the transition of local agriculture from subsistence-based to large scale commercial cultivation in many areas. Infrastructure improvements supported this transition, including the initiation of land reclamation programs in many areas. For example, Holt County instituted a program to make thousands of acres of marshlands arable. A survey in 1864 identified 25,702 acres of marshland in the county, and by 1874, an extensive system of levees and ditches was under construction (Sturdevant 1991b:15).

Between 1860 and 1890, the number of improved acres in the State increased from more than 6 million to nearly 20 million. This increase meant that 64 percent of land in the State was improved in 1890 as opposed to 31 percent at the end of the Civil War. The increased amount of improved acreage was accompanied by an increase in the number of individual farm units from approximately 93,000 in 1860 to over 238,000 by 1880, and a reduction in average farm size from 215 acres at the end of the Civil War to 125 acres by the turn of the twentieth century (March 1967:1043).

In addition to the physical changes, farms began to produce a variety of different crops during the postbellum period. The principal commercial crops prior to the Civil War were either no longer produced, as was the case with hemp, or produced in significantly reduced quantities, as was the case with tobacco production, which was reduced by almost half. Instead, farmers began producing wheat and oats in commercial quantities using new labor-saving machinery and the increased ease of transporting crops to market. Nevertheless, as in the years before the Civil War, corn remained the State's staple crop, though now farmers did not just grow it for themselves and their livestock but also for sale at market. In 1880, Missouri farmers produced more than 200 million bushels of corn (March 1967:1043).

3.10 Early Twentieth Century Development

The early decades of the twentieth century in Missouri were characterized by continuing technological and infrastructure-related improvements that dramatically changed the State's physical and economic landscapes. For example, the replacement of horses and mules with automobiles precipitated a period of intensive roadway construction and improvement, while the use of the tractor encouraged increased agricultural production and efficiency. Other widespread improvements during the period, including electric lights and the installation of water and sewer systems, were concentrated in urban areas but impacted many aspects of everyday life even for those without direct access to the new luxuries (March 1967:1305).

The movement was also influenced by an agricultural decline due in large part to the increased technological efficiencies available to farmers at the time. With access to better plants, improved pest control methods, and new farm machinery that "increased output 26 percent between 1920 and 1930," farmers produced more crops than they could sell. As a result, a "protracted and withering depression" began in the agricultural sector from which many would never recover (March 1967:1308). This depression preceded the larger nationwide depression of the 1930s, and as the situation became increasingly desperate, over 1 million rural farmers had abandoned their homes by the end of the 1920s. Farm foreclosures were commonplace throughout the State causing "absentee ownership and tenancy" to increase while the number of farms declined, and their sizes increased as large commercial interests bought up foreclosed properties (March 1967:1309).

For residents in the Project vicinity who lived in rural areas dependent upon agriculture, the Great Depression resulted in extreme hardships. In particular, “a devastating drought in the early thirties greatly impacted farmers in the western portion of the state leading to migrations out west in search of work.” They resided in or near America’s great Dust Bowl and faced continuous declines in the values of their farms and a general inability to support their families (University of Missouri-St. Louis n.d.).

Despite the strains put on the industry during the early twentieth century, as late as 1940, agriculture remained the “principal employer of labor and the chief source of wealth in Missouri” and the Project Area. This economic dependence on agricultural pursuits continued through World War II, when increased wartime manufacturing shifted the State’s economic profile (March 1967:1512).

4.0 Research Design and Methods

The following chapter outlines the methods and approaches used during this investigation. The primary objective of the field surveys were to identify archaeological sites and historic resources, including historic-age structures, buildings, objects, sites, and districts, and provide a preliminary evaluation of National Register of Historic Places (NRHP) eligibility. The level of effort involved for this Project is typically referred to as an intensive cultural resource survey. A desktop cultural resources records review and a field survey were conducted to locate cultural resources within or adjacent to the Project APE and evaluate their eligibility for inclusion in the NRHP.

4.1 Desktop Background Review

Prior to the field survey, Burns & McDonnell conducted a review of archaeological and historical literature relevant to the Study Area. Information on previously recorded sites, cultural resource surveys, and historic properties within the Study Area was obtained using the MoDNR Archaeology Viewer database (Viewer).

Additional sources reviewed include an online search of historic period maps, historic period aerial photographs, and the NRHP database maintained by the National Park Service. The following websites were utilized for background research:

- U.S. Geological Survey (USGS) Map Locator and Downloader (https://ngmdb.usgs.gov/topoview/)
- National Register of Historic Places (http://nrhp.focus.nps.gov/natreghome.do?searchtype=natreghome)
- MoDNR Viewer (https://modnr.maps.arcgis.com/apps/webappviewer/index.html?id=9a91136c6340497b96fd7a198a0b886e)
- USGS Historical Topographic Map Explorer (http://historicalmaps.arcgis.com/usgs/)
- Nationwide Environmental Title Research (NETR) Online Database (www.netronline.com)

The results of this research are discussed in Chapter 5: Background Review.

4.2 Field Survey

The design and methods of the field survey used for this Project are a combination of methodology outlined by the Missouri State Historic Preservation Office (SHPO) and the ONHPO Archaeological Survey Standards (ONHPO 2023). The primary method of field investigation was the use of systematic shovel testing throughout the entirety of the APE and additional deep testing via auger at at the lead archaeologist's discretion on pertinent high points within the landscape. Shovel testing was conducted in intervals no further than 30 m (98 ft) along each transect, and each transect spaced no wider than 30 m apart. Shovel tests were not excavated in areas of slope greater than 20 percent, where surface water was present, or where buried utilities were present.

All shovel tests were recorded using Esri Field Maps software and their locations recorded using a global positioning satellite (GPS) receiver. All excavated sediments were screened through 1/4-inch hardware cloth mesh and soils from each shovel test were recorded for color, texture, disturbances, and inclusions. Each test was a minimum of 30 cm (12 inches) in diameter and excavated in 10 cm (4 inches) levels to a depth of 20 cm (8 inches) into a sterile subsoil or into culturally sterile deposits. At locations where no topsoil was present, shovel tests were excavated to a minimum of 20 cm below the surface. Deep testing was done at select locations using a bucket auger to depths of 2 m (6.6 ft) below surface.

A visual examination of the ground surface was conducted by the field crew in transects spaced no more than 5m (16.4 ft) apart. Visual inspection included examination of stream cut banks, gullies, animal burrows, trails, road cuts, eroded ridge slopes, two-track roads, push piles, and borrow pits. This approach not only helps identify and define cultural resources, but it also allows the investigators insight into depositional settings, environmental characteristics, and landform integrity within the APE.

4.3 NRHP Evaluation

Under Section 106 of the NHPA federal undertakings are required to assess the effects of their projects on cultural resources that are listed, or determined eligible to be listed, in the National Register of Historic Places (NRHP). Criteria for evaluating resources for inclusion in the NRHP were established by the Secretary of the Interior and are outlined in the NHPA (36 CFR 60.4). A resource eligible for the NRHP must meet one or more of the established significance criteria:

A. are associated with the events that have made a significant contribution to the broad patterns of our history; or
B. are associated with the lives of persons significant in our past; or
C. embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic value, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
D. yield, or may be likely to yield, information important in prehistory or history.

With limited exceptions, historic-age buildings and structures must be at least 50 years old to be considered significant. Significant cultural resources (i.e. historic properties) must also retain sufficient integrity to convey their significance. The degree of integrity is assessed based on the property's location, design, setting, materials, workmanship, feeling, or association. Significant properties that also retain integrity to convey their historical context are considered eligible for inclusion in the NRHP.

Archaeological sites are evaluated under all four of the significance criteria (A-D) listed above. The most commonly applied criterion for evaluating an archaeological property is Criterion D. In general, sites that are viewed as likely to contain intact subsurface deposits are determined by occupation intensity, function or type, and the extent of disturbance. Site integrity and condition are key factors in evaluating NRHP eligibility.

5.0 Background Review

Previous cultural resources investigations and findings are reviewed in this chapter to provide additional historical context for cultural resources identified within the Project APE. The Study Area, defined as the APE and the land in a 1-mile radius around it, was reviewed for previously recorded archaeolgoical sites, cultural resource surveys, NRHP-listed properties, and high probability areas for the presence of historic-age sites (HHPA).

5.1 Previous Archaeological Surveys

A total of four previous archaeological surveys have been completed within the Study Area (Table 5-1; Appendix A: Figure 2). These surveys varied in approach and intensity. Two of the surveys overlap each other, as PL233 encompassed the survey area of PL173. Survey PL141 is more linear in nature, and PL10 is located along the northeast boundary of the Study Area (Appendix A: Figure 2). Survey PL233 outlines a previous survey for the Todd Creek Wastewater Plant conducted by Burns & McDonnell in 2022 located north of the current APE.

Table 5-1: Previous Cultural Resource Surveys within the Study Area

Survey ID	Author(s)	Project Title	Report Year	Intersects APE
PL10	Logan, Brad	Cultural Resources of Kansas City International Airport and Its Environs: A Preliminary Reconnaissance	1979	No
PL141	Francis, Ike	Cultural Resources Investigation for Proposed 2nd Creek Pump Station, Pump Station and Force Main (COE) Platte County, Missouri	2008	No
PL173	Hawkins, Rebecca A.	Cultural Resources Survey of the Proposed Basswood Telecommunications Facility, Platte County, Missouri	2014	No
PL233	Reynolds, Brandon	Cultural Resources Report for Todd Creek Wastewater Treatment Plan Replacement Project	2022	No

Source: Missouri Department of Natural Resources

5.2 Previously Recorded Archaeological and Historic Sites

A review of MoDNR records revealed no previously recorded archaeological sites within the Study Area (Appendix A: Figure 2). No historic properties are recorded in the Study Area on the SHPO Interactive Map of NRHP listed sites. The nearest NRHP-listed property is the Platte County Courthouse, located in Platte City 6.9 miles northwest of the Project APE.

5.3 Historic Period Map and Aerial Imagery

A review of historic period topographic maps and aerial imagery was conducted to determine if historic-age resources are or were once present in or near the Project APE. A topographic map dated to 1894 does not show any structures or buildings within the APE, but one structure is present on a topographic map dated to 1914 (USGS 1894, 1914). This structure is also present on a 1961 topographic map, but is no longer present on a 2012 map (USGS 1961, 2012). The earliest available aerial image dates to 196 and reveals two outbuildings on the

north side of the APE, adjacent to the quarry operations west of the Project (NETR Online 2024). These buildings are absent in 1970, suggesting they were demolished by that time.

6.0 Results of Investigations

Burns & McDonnell archaeologists completed the field survey of the APE between April 15 and 19, 2024. Fieldwork consisted of pedestrian survey which was confined to the APE involving examination of the ground surface at 5-m transect spaceing along with systematic shovel testing at 30-m interval shovel testing as prescribed in the ONHPO guidelines . Additionally field crews excavated judgmentally placed augers to test for presence of deeply buried deposits with potential to contain cultural resources.

At the time of survey, the APE consisted of a plowed soybean field with winter ground cover which afforded between 35 and 80 percent ground surface visibility (GSV) (Appendix B: Photographs 1-3). The APE gently sloped downward to the east toward lower alluvial terraces of Todd Creek. Along the eastern periphery of the APE, an existing sewer line was observed (Appendix B: Photographs 4-5) where shovel testing was not attempted. The northeast corner of the APE has a steep slope that drains into Todd Creek (Appendix B: Photograph 6). An unmapped intermittent stream cuts through the APE where a proposed access road is planned, and shovel testing was conducted around this sloped area (Appendix B: Photograph 7).

A total of 105 shovel tests and 4 augers were excavated in the APE none of which contained cultural material (Appendix A: Figure 3; Appendix B: Photograph 8; Appendix C). Soils throughout the APE consisted mainly of a silty or clayey loam A-horizon colored 10YR 4/2 mottled with 10YR 5/8 over a clay or sandy clay subsoil colored the same which was very compact. In some areas erosion has reduced the topsoil so that the subsoil was at or very near the surface.

Three surface artifacts were found during pedestrian survey in the southwest corner of the APE at the field edge. One piece of probable fire-cracked rock (FCR) was found within the bounds of the agricultural field. One broken biface (non-diagnostic) and one non-diagnostic broken flake were found in close proximity to each other in road wash bordering the agricultural field and were recorded with a single point in the southwest corner of the Project (Appendix A: Figure 3; Appendix B: Photographs 9-12). Per Osage guidelines, a total of 16 radial shovel tests were placed around these isolated surface finds, with all of the tests negative for cultural material.

Two additional shovel tests were excavated outside of the APE on a subtle rise on the terrace adjacent to the finds to investigate the possibility that the isolated finds were displaced from a site. These were placed to the west instead of south, as the landscape slopes sharply to the south towards part of Todd Creek. Both of the western external shovel tests were were negative (Appendix A: Figure 3). The surface finds are 35 m apart, and no other surface artifacts were observed during the 5-m pedestrian transects. The finds are in an area that has been extensively disturbed by agricultural activity, the impact of the nearby mine and quarry, and erosion due to its proximity of Todd Creek. Due to these disturbances, and considering the results of the shovel and auger testing, the APE is unlikely to contain intact subsurface cultural deposits. No other cultural features were identified during the field surveys in the APE.

7.0 Conclusions and Recommendations

This document provides a summary of archival research, pedestrian survey with shovel testing within the 22.16-acre (8.96-hectare) APE for the Todd Creek Wastewater Treatment Plant Project in Platte County, Missouri. Based on our research, the APE has been subject to extensive prior disturbance likely associated with quarrying activities that took place during the mid-twentiety century and into the early years of the twenty-first century. Three isolated prehistoric artifacts were discovered on the surface in the southwest of an agricultural field in the southern portion of the APE, and no archaeological sites were found in the area. No additional cultural resources were found within the APE during these investigations. Based on the results of the survey, Burns & McDonnell recommends no further consideration of Project impacts under Section 106 at this location with the following stipulations:

1. If the proposed Project configuration changes and the APE is updated, additional archaeological investigations and significance and integrity evaluations may be necessary.

2. If any unrecorded cultural resources are encountered during Project construction, land-disturbing activities in the immediate area must be halted, and the federal agency (USACE) must be notified so they can provide guidance on next steps. Any exposed cultural resources will be evaluated for their significance.

8.0 References

Adovasio, J.M., J. Donahue, K. Cushman, R.C. Carlisle, R. Stuckenrath, J.D. Gunn, and W.C. Johnson
1983 Evidence from Meadowcroft Rockshelter. *Early Man in the New World* edited by R. Shutler, Jr., pp. 163-189, Sage Publications, Beverly Hills, California.

Angelbeck, William, David C. Austin, Robert L. Beardsley, Julie Knight, and Daniel Warren
1996 *Phase I Cultural Resources Survey of Route 136, Nodaway County, Missouri.* Cultural Resources Section, Missouri Highway and Transportation Department, Jefferson City, Missouri.

Antevs, Ernst
1955 Geologic-Climatic Dating in the West. In American Antiquity 20:317-335.

Baerreis, D.A. and R. A. Bryson
1965 Climatic Episodes and the Dating of the Mississippian Cultures, In *Wisconsin Archaeology* 46(4), 203-220. CCR #77

Baker, William and A. V. Kidder
1937 A Spear Thrower from Oklahoma. *American Antiquity* 3:51-52.

Bense, Judith
1994 *Archaeology of the Southeastern United States: Paleoindian to World War I.* Academic Press, San Diego, California

Bettis, E.A., III, D.R. Muhs, H.M. Roberts, A.G. Wintle
2003 Last Glacial Loess in the Conterminous USA. *Quaternary Science Reviews*, 22(18-19): 1907-1946.

Blackmar, Jeanette M., and Jack L. Hofman
2006 The Paleoarchaic of Kansas. In *Kansas Archaeology*, edited by R.J. Hoard and W.E. Banks, pp. 46-75. Kansas State Historical Society and University Press of Kansas, Lawrence, Kansas.

Blaine, Martha Royce
1995 *The Ioway Indians*. University of Oklahoma Press, Norman

Blakeslee, Donald J. and Arthur H. Rohn
1986 *Man and Environment in Northeastern Kansas: The Hillsdale Lake Project.* In 5 Volumes. Contract No. DACW41-76-C-0162. Prepared for the U.S. Army Corps of Engineers Kansas City District by Wichita State University Department of Anthropology, Wichita, Kansas.

Bray, Robert T.
1978 European Trade Goods From the Utz Site and the Search for Fort Orleans. Missing Journal Name 00769576: CNPO. 39: 1-75. 1978.

Brown, Kenneth L.
1985 *Pomona: A Plains Village Variant in Eastern Kansas and Western Missouri.* Unpublished Ph.D. Dissertation, Department of Anthropology, University of Kansas, Lawrence.

Burns, Louis F.
2004 *A History of Osage People.* University of Alabama Press, Tuscaloosa.

Caldwell, Joseph R.
1958 Trend and Tradition in the Prehistory of the Eastern United States. *American Anthropology Association Memoir 88.* Scientific Papers Volume X. Illinois State Museum, Springfield.

Caldwell, Joseph R. and Robert L. Hall
1964 *Hopewellian Studies.* Illinois State Museum Scientific Papers Volume 12. Illinois State Museum, Springfield.

Carr, Kurt W.
1998 The Early Archaic Period in Pennsylvania. In *Pennsylvania Archaeologist* 69(2):42-69.

Chapman, Carl H.
1975 *The Archaeology of Missouri, I.* University of Missouri Press, Columbia.

1980 *The Archaeology of Missouri II.* University of Missouri Press, Columbia.

Chapman, S.S., Omernik, J.M., Freeouf, J.A., Huggins, D.G., McCauley, J.R., Freeman, C.C., Schlepp, R.L.
2001 Summary Table: Characteristics of Ecoregions of Nebraska and Kansas. Electronic document, https://gaftp.epa.gov/EPADataCommons/ORD/Ecoregions/ks/ksne_back.pdf, accessed April 2024.

Chrisman, D., R. S. MacNeish, J. Mayalwala, and H. Savage
1996 Late Pleistocene Human Friction Skin Prints from Pendejo Cave, New Mexico. *American Antiquity* 61:357-376.

Conner, Michael
1985 Site Structure and Function. *The Hill Creek Homestead and the Late Mississippian Settlement in the Lower Illinois Valley.* Edited by M. Conner, pp. 198-221. Center for American Archaeology, Kampsville, Illinois.

Deevey, E. S. and R. F. Flint
1957 Postglacial Hypsithermal Interval. In *Science*, 125:182-184

Dent, Richard J. Jr.
1995 *Chesapeake Prehistory: Old Traditions New Directions.* Plenum Press, New York.

Dillehay, Tom D.
1984 A Late Ice-Age Settlement in Southern Chile. *Scientific American* 251:106-117.

Environmental Research Center of Missouri, Inc.
1999 *Cultural Resource Investigations Phase I Survey, DeKalb County PWSD No. 1 Waterline Project, DeKalb County, Missouri,* USDA RD Project, Prepared for DeKalb County P.W.S.D No. 1 and Crowley, Wade, Milstead, Inc.

Feng, Z.D., Johnson, W.C., Sprowl, D.R. and Lu, Y.C.
1994 Loess Accumulation and Soil Formation in Central Kansas, United States, During the Past 400,000 Years. *Earth Surface Processes and Landforms* 19(1):55-67.

Fenneman, Nevin M.
1931 Physiography of Western United States. McGraw-Hill, New York.

Foley, William E.
2000 *A History of Missouri: Volume I, 1673 to 1820.* University of Missouri Press, Columbia.

Frison, George C.
1991 *Prehistoric Hunters of the High Plains (*2nd Edition). Academic Press, San Diego, California

Frison, George C. and G. Zeimens
1980 Bone Projectile Points: An Addition to the Folsom Cultural Complex. *American Antiquity* 45:231-237.

Goodyear, A. C.
1974 The Brand Site: A Technofunctional Study of a Dalton Site in Northeast Arkansas. *Arkansas Archaeological Survey Research Series No. 7.*

1982 The Chronological Position of the Dalton Horizon in the Southeastern United States. *American Antiquity* 47:382-395.

Green, Rod
2018 The Civil War in the Upper Counties of Northwest Missouri. Daviess County in Northwest Missouri. https://daviesscountyhistoricalsociety.com/2023/02/08/upper/, accessed April 2024.

Griffin, James B.
1967 Eastern North American Archaeology: A Summary. *Science* 156:175-91.

Harrington, Mark R.
1971 *The Ozark Bluff Dwellers.* Indian Notes and Monographs No. 12. Museum of the American Indian, Heye Foundation, New York.

Hoard, Robert J.
1992 *Woodland-Period Cooking Vessels from Missouri.* Ph.D. Dissertation, Department of Anthropology, University of Missouri-Columbia.

Hofman, Jack L. and Russell W. Graham
1998 The Paleo-Indian Cultures of the Great Plains. *Archaeology of the Great Plains,* edited by W.R. Wood, pp. 87-139. University Press of Kansas, Lawrence.

Hughes, David T.
1984 The Foragers: Western Oklahoma. *Prehistory of Oklahoma,* edited by Robert E. Bell, pp. 109-117. Academic Press, New York.

Johnson, Alfred E.
1979 Kansas City Hopewell. *Hopewell Archaeology: The Chillicothe Conference,* edited by D.S. Brose and N. Greber, pp. 86-93. Kent State Press, Kent, Ohio.

Johnson, W.C. and Willey, K.L.
2000 Isotopic and Rock Magnetic Expression of Environmental Change at the Pleistocene-Holocene Transition in the Central Great Plains, *Quaternary International* 67:89-106.

Kay, Marvin
1982 Stylistic Study of Chipped Stone Points from Rodgers Shelter. In *Holocene Adaptations with the Lower Pomme de Terre River Valley, Missouri, Vol. 3*, edited by Marvin Kay, pp. 379-551. Illinois State Museum, Springfield.

Koldehoff, Brad, and John A. Walthall
2009 Dalton and Early Holocene Midcontinent: Setting the Stage. In *Archaic Societies: Diversity and Complexity across the Midcontinent* edited by Dale L. McElrath, Andrew C. Fortier, and Thomas E. Enerson, pp. 137-151. State University of New York Press, Albany

Kutzbach, J.E. and T. Webb III
1993 Conceptual Basis for Understanding Late-Quaternary Climates. In *Global Climates Since the Last Glacial Maximum*, edited by H. E. Wright, Jr., J. E. Kutzbach, T. Webb III, W. F. Ruddiman, F. A. Street-Perrott, and P. J. Bartlein, pp. 5-11. University of Minnesota Press, Minneapolis.

Lahren, L.A. and R. Bonnichsen
1974 Bone Foreshafts from a Clovis Burial in Southwestern Montana. *Science* 186:147-150.

Lissandrello, Stephen
1975 National Register of Historic Places Inventory—Nomination Form, *Fort Osage,* Prepared by Historic Sites Survey, National Park Service.

Logan, Brad
1996 The Protohistoric Period on the Central Plains. *Archeology and Paleoecology of the Central Plains,* edited by Jack Hofman, pp. 134-139. Arkansas Archeological Survey Research Series No. 48.

McMillan, R.B.
1971 *Biophysical Change and Cultural Adaptation at Rodger Shelter, Missouri.* Unpublished Ph.D. Dissertation, University of Colorado, Boulder.

McMillian, R. Bruce and Walter E. Klippel
1981 Post-Glacial Environmental Change and Hunting-Gathering Societies of the Southern Prairie Peninsula. *Journal of Archaeological Science* 8:215-245.

Mandel, Rolfe D.
2006 *Geomorphology, Quaternary Stratigraphy, and Geoarchaeology of Fox Creek Valley, Tallgrass Prairie National Preserve, Northeast Kansas*. Kansas Geological Survey.

March, David D.
1967 *The History of Missouri, Volume I,* Lewis Historical Publishing Company, New York.

Martin, Terrel L.
1997 The Early Woodland Period in Missouri. *Missouri Archaeologist* 58.

Mason, J.A., E.A. Bettis III, H.M. Roberts, D.R. Muhs, and R.M. Joeckel
2006 AMQUA Pre-meeting Field Trip No. 1: Last Glacial Loess Sedimentary System of Eastern Nebraska and Western Iowa, in Guidebook for Field Trips, 18th Biennial Meeting of the American Quaternary Association, edited by R.D. Mandel, R.D. Kansas Geological Survey Technical Series 21: 1-1–1-22.

Missouri Department of Conservation
2024 Platte River. Electronic document, https://mdc.mo.gov/your-property/watershed-inventory/platte-river, accessed April 2024.

Muhs, Daniel R., E. Arthur Bettis III, Helen M. Roberts, Stephen S. Harlan, James B. Paces, L. Reynolds
2013 Chronology and Provenance of Last-Glacial (Peoria) Loess in Western Iowa and Paleoclimatic Implications. *Quaternary Research* 80:468–481.

Muhs, Daniel R., E. Arthur Bettis III, J. Aleinikoff, J.P. McGeehin, J. Beann, G. Skipp, B.D. Marshall, H.M. Roberts, W.C. Johnson, R. Benton
2008 Origin and Paleoclimatic Significance of Late Quaternary Loess in Nebraska: Evidence from Stratigraphy, Chronology, Sedimentology, and Geochemistry. *Geological Society of America Bulletin* 120:1378–1407.

Munson, C.A. (editor)
1980 Archaeological Salvage Excavation at Patoka Lake, Indiana: Prehistoric Occupations of the Upper Patoka River Valley. *Research Reports, No. 6*, Glenn A. Black Laboratory of Archaeology, Indiana University, Bloomington.

Musil, R.R.
1988 Functional Efficiency and Technological Change: A Hafting Tradition Model for Prehistoric North Americirca *Early Human Occupation in Far Western North America: The Clovis-Archaic Interface,* edited by J.A. Willig, C.M. Aikens, and J.L. Fagan, 373-87. Nevada State Museum, Anthropological Papers No. 21.

Nationwide Environmental Title Research (NETR) Online
2024 Historic Aerials by NetrOnline. https://www.historicaerials.com, accessed April 2024.

Nelson, Paul W.
2005 [1985] *The Terrestrial Natural Communities of Missouri*. Missouri Natural Areas Committee.

O'Brien, Michael J.
1996 Middle and Late Woodland Subsistence and Ceramic Technology in the Central Mississippi River Valley: Selected Studies from the Burkemper Site, Lincoln County, Missouri. *Illinois State Museum Reports of Investigations* 52. Springfield, Illinois.

O'Brien, M. J., and W. R. Wood
1998 *The Prehistory of Missouri*. University of Missouri Press, Columbia, Missouri.

Osage Nation Historic Preservation Office (ONHPO)
2023 Archaeological Survey Standards. Electronic document, https://www.osageculture.com/culture/historic-preservation-office/survey-standards, accessed April, 2024.

Phillips, James L. and A. Brown (editor)
2009 *Archaic Hunters and Gatherers in the American Midwest.* Left Coast Press, Walnut Creek, CA.

Quivira, Mario Pino and Tom D. Dillehay
1988 Monte Verde, South-Central Chile: Stratigraphy, Climate Change, and Human Settlement. *Geoarchaeology* 3:177-191.

Ray, Jack H.
1998 Cultural Components. *The 1997 Excavations at the Big Eddy Site (23CE3426) in Southwest Missouri.* Edited by Neal H. Lopinot, Jack H. Ray, and Michael D. Conner. Special Publication No. 2, Center for Archaeological Research, Southwest Missouri State University, Springfield.

Reagan, M. S., R. M. Rowlett, E. G. Garrison. W. Dort, V. Bryant, and C. Johnson
1978 Flake Tools Stratified Below Paleo-Indian Artifacts. *Science* 200:1272-1275.

Reid, Kenneth C.
1983 The Nebo Hill Phase: Late Archaic Prehistory in the Lower Missouri Valley. In *Archaic Hunters and Gatherers in the American Midwest,* edited by James L. Phillips and James A Brown, pp. 11-40. Academic Press, New York.

1984 *Nebo Hill and Late Archaic Prehistory on the Southern Plains Peninsula.* Publications in Anthropology No. 15. University of Kansas, Lawrence.

Reynolds, Brandon
2022 Cultural Resources Report for Todd Creek Wastewater Treatment Plan Replacement Project. Submitted to Todd Creek Wastewater Treatment Plan Replacement Project, LLC, Burns & McDonnell, Kansas City, Missouri.

Roper, D.C., M.F. Hawley, L.R. Sage, K.C. Taylor, C.S. Demeter, and T. Weston
1991 *An Intensive Archaeological Survey of the Maitland Loop on ANR's Southwest Gathering System, Nodaway County, Missouri.* Commonwealth Cultural Resources Group, Jackson, Michigan.

Rowlett, R.M. and E.G. Garrison
1984 Analysis of Shriver Site Artifacts by Thermoluminescence. *Missouri Archaeological Society Quarterly,* 1:20-22.

Sabo, George III, and Ann M. Early
1990 Prehistoric Culture History. *Human Adaptation in the Ozark and Ouachita Mountains,* by G. Sabo III, A.M. Early, J.C. Rose, B.A Burnett, L. Voegele, Jr., and J.P. Harcourt, 34-120. Arkansas Archeological Survey Research Series No. 31, Fayetteville.

Schmits, Larry J.
1991 *Phase I Cultural Resources Survey of The Proposed Sibley Power Plant Railroad Connection,* Prepared for the Interstate Commerce Commission, Black and Veatch Engineers, and the Sibley Railroad Company by Environmental Systems Analysis, Inc.

Snider, Becky L. and Debbie Sheals
2003 *Route 66 in Missouri, Survey and National Register Project.* Electronic document chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://mostateparks.com/sites/mostateparks/files/REPORT_Route66-Survey-P2.pdf, , accessed April2024.

Soil Survey Staff
1993 *Soil Survey Manual*. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. U.S. Government Printing Office, Washington, D.C.

2024 *Web Soil Survey.* Electronic document, http://soils.usda.gov/technical/classification/osd/index.html, accessed April 11, 2024.

Spencer, Charles G.
2011 *Roadside Geology of Missouri.* Mountain Press, Missoula, Montana.

Stanford, Dennis J.
1979 Plains. *Pre-Llano Cultures of the Americas: Paradoxes and Possibilities*, edited by R.L. Humphreys and D.J. Stanford, pp. 101-123, Anthropological Society of Washington, Washington, D.C.

Stanford, Dennis J., W. R. Wedel, and G. Scott
1981 Archaeological Investigations of the Lamb Springs Site. *Southwestern Lore* 47:14-27.

Struever, S.
1964 Hopewellian Interaction Sphere in Riverine-Western Great Lakes Culture History. *Hopewellian Studies,* edited by J.R. Caldwell and R.L. Hall, pp. 87-106. Scientific Papers No. 12. Illinois State Museum, Springfield.

Sturdevant, Craig
1991a *Cultural Resource Investigations Phase I Survey Happy Holler Wildlife Area, Andrew County, Missouri,* Fish and Wildlife Project, Prepared for Missouri Department of Conservation by Environmental Research Center of Missouri, Inc., Jefferson City.

1991b *Phase I Survey, Proposed Gas Pipeline Project (2), Platte and Buchanan Counties, Missouri.* Prepared for Williams Natural Gas Company, Tulsa, Oklahoma by Environmental Research Center of Missouri, Inc., Jefferson City (Report #BN-022).

Trexler, Harrison, A.
1914 *Slavery in Missouri 1804-1865.* Johns Hopkins Press, Baltimore, Maryland.

University of Missouri-St. Louis
n.d. *Missouri Life, The Great Depression*. Electronic document, www.umsl.edu/library, accessed April 2024.

U.S. Geological Survey (USGS)
1894 Kansas City, Kansas. 1:125,000 Topographic Quadrangle. U.S. Geological Survey Historical File Topographic Archive, Reston, Virginia.

1914 Smithville, Missouri. 1:62,500 Topographic Quadrangle. U.S. Geological Survey Historical File Topographic Archive, Reston, Virginia.

1961 Ferrelview, Missouri. 1:24,000 Topographic Quadrangle. U.S. Geological Survey Historical File Topographic Archive, Reston, Virginia.

2012 Ferrelview, Missouri. 1: 24,000 Topographic Quadrangle. U.S. Geological Survey Historical File Topographic Archive, Reston, Virginia.

Witty, Thomas A., Jr.
1967 The Pomona Focus. *Kansas Anthropological Association Newsletter* 12(9): 1-5. Topeka.

1978 Along the Southern Edge: The Central Plains Tradition in Kansas. In *The Central Plains Tradition: Internal Development and External Relationships.* Edited by Donald J. Blakeslee. Pages 56-66. Report No. 11. Office of the State Archaeologist, University of Iowa, Iowa City.

1981 The Pomona Focus, Known and Unknown. In *The Missouri Archaeologist.* 42: 77-83.

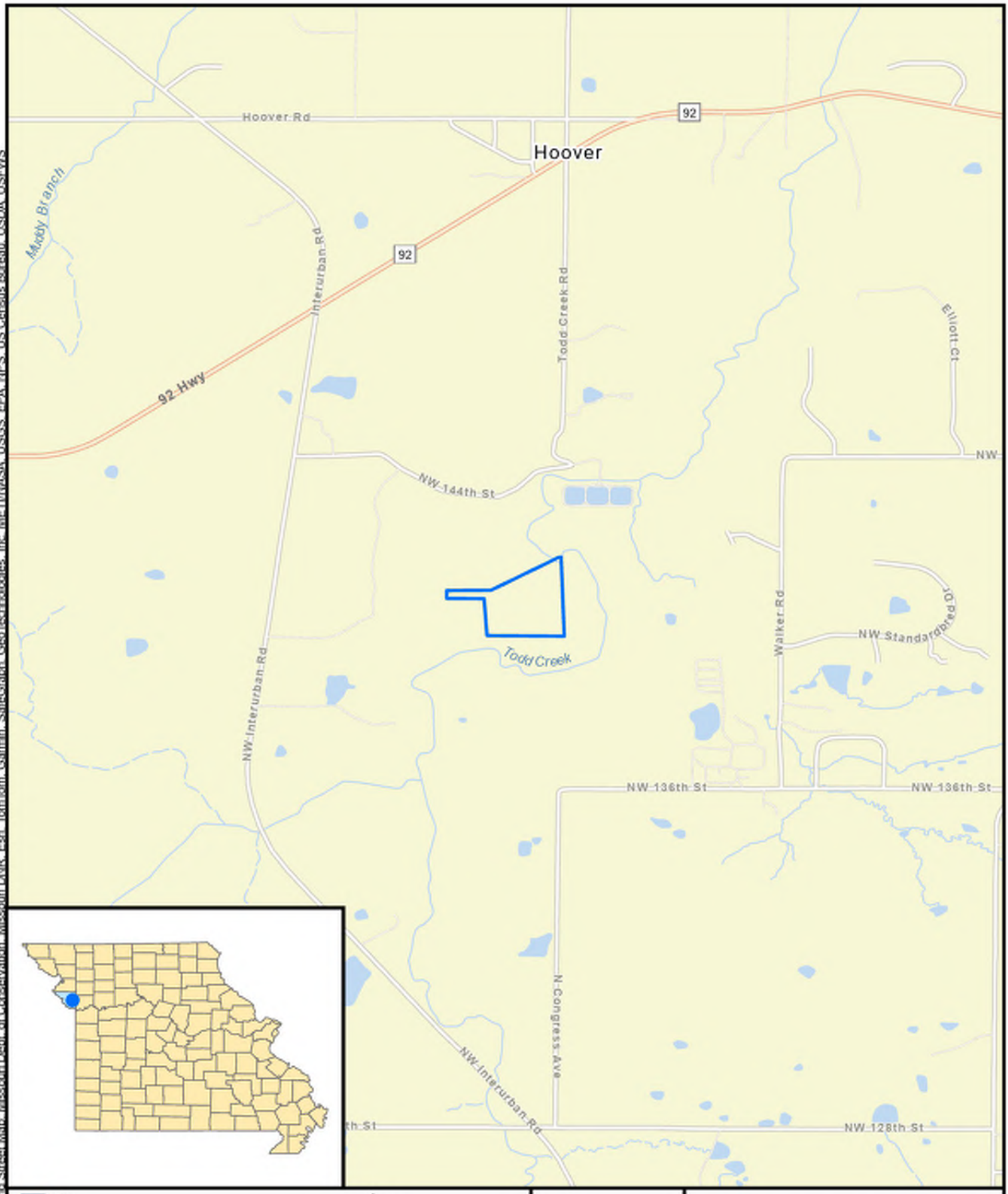
Wood, W. Raymond, Michael J. O'Brien, Katherine A. Murray, and Jerome C. Rose
1995 *Holocene Human Adaptations in the Missouri Prairie-Timberlands.* Arkansas Archaeological Survey Research Series No. 45. Arkansas Archaeological Survey, Fayetteville.

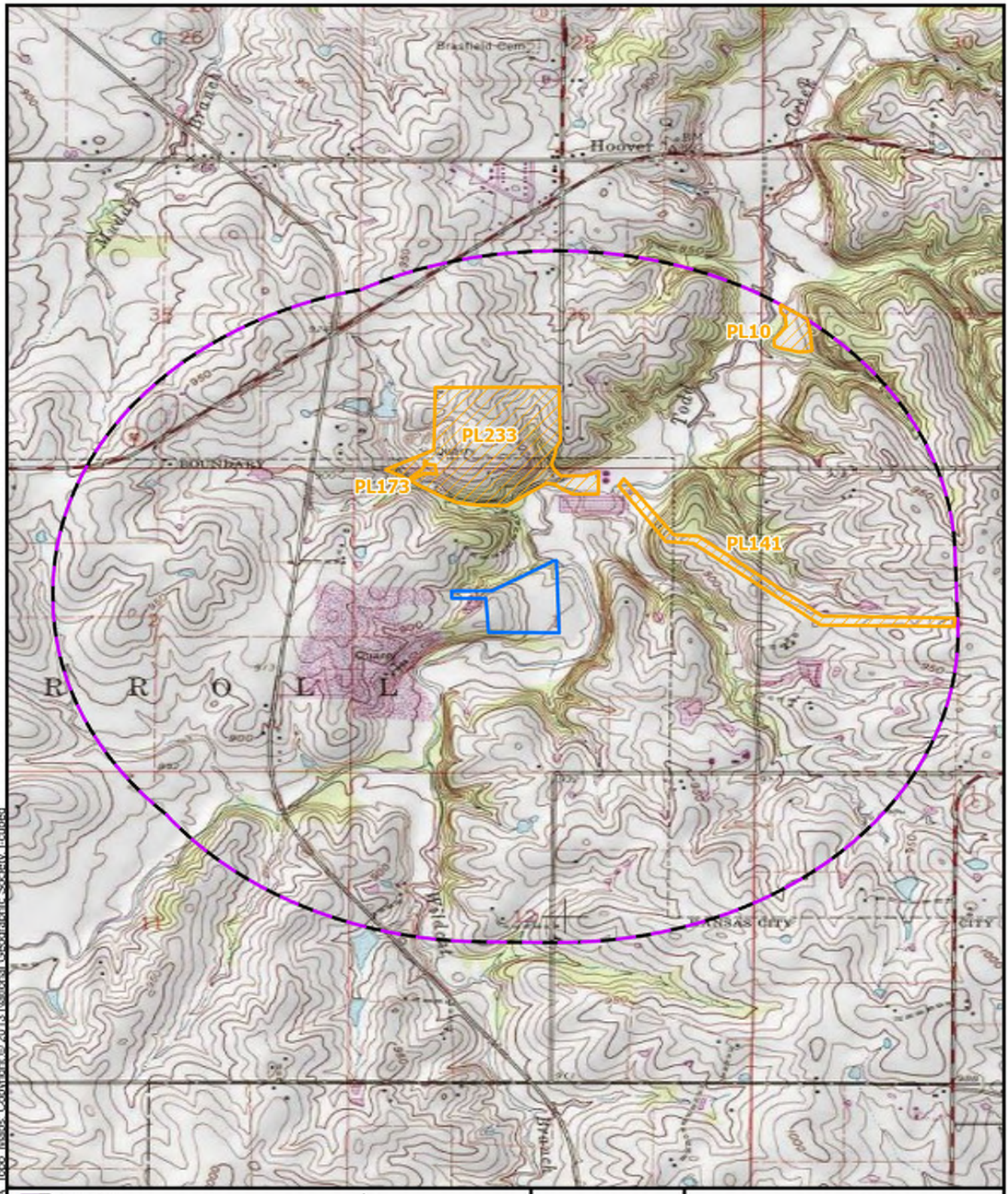
Wormington, H. M.
1957 *Ancient Man in North America.* Denver Museum of Natural History, Popular Series No. 4.

Wyckoff, Don G., Robert L. Brooks, Timothy G. Baugh, Richard R. Drass, Larry Neal, and Lois Albert
1983 *Oklahoma Archeology: A 1981 Perspective of the State's Archeological Resources, Their Significance, Their Problems and Some Proposed Solutions.* Archeological Resource Survey Report Number 16, Oklahoma Archaeological Survey, University of Oklahoma, Norman.

Wysocki, D. A., P. J. Schoeneberger, H. E. LaGarry
2005 Soil Surveys: A Window to the Subsurface, *Geoderma* 126: 167-180.

APPENDIX A – MAP FIGURES


Hoover Rd
92
Hoover
Mosby Branch
Interurban Rd
92 Hwy
Todd Creek Rd
Elliott Ct
NW
NW 144th St
Walker Rd
NW Standardbred Ct
Todd Creek
NW Interurban Rd
NW 136th St
NW 136th St
N Congress Ave
NW Interurban Rd
NW 128th St
APE
NORTH
2,000 1,000 0 2,000
Scale in Feet
BURNS McDONNELL
Figure 1
Project Location
Todd Creek Wastewater
Treatment Plant
Platte County, MO
Path: C:\Users\bsreynolds\OneDrive - Burns & McDonnell\Desktop\WFH\Missouri\Todd Creek_125460\2024\Todd Creek 2024\Todd Creek 2024.aprx bsreynolds 5/19/2024
Service Layer Credits: World Street Map: Missouri Dept. of Conservation, Missouri DNR, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS
Source: ESRI, KCMO, Burns & McDonnell
Issued: 5/19/2024



BURNS McDONNELL

Figure 2
Background Review
Todd Creek Wastewater Treatment Plant
Platte County, MO

Path: C:\Users\bsreynolds\OneDrive - Burns & McDonnell\Desktop\WFH\Missouri\Todd Creek_125460\2024\Todd Creek 2024\Todd Creek 2024 aprx bsreynolds 5/19/2024
Service Layer Credits: USA_Topo_Maps: Copyright © 2013 National Geographic Society, i-cubed

Source: ESRI, KCMO, MODNR, Burns & McDonnell

Issued: 5/19/2024

Figure 3a
Field Results
Todd Creek Wastewater Treatment Plant
Platte County, MO

BURNS McDONNELL

Source: ESRI, KCMO, Burns & McDonnell

Issued: 5/19/2024

Path: C:\Users\bsreynolds\OneDrive - Burns & McDonnell\Desktop\WFH\Missouri\Todd Creek_125460\2024\Todd Creek 2024\Todd Creek 2024.aprx bsreynolds 5/19/2024
Service Layer Credits: Bing Maps Aerial: © 2024 Microsoft Corporation © 2024 Maxar ©CNES (2024) Distribution Airbus DS

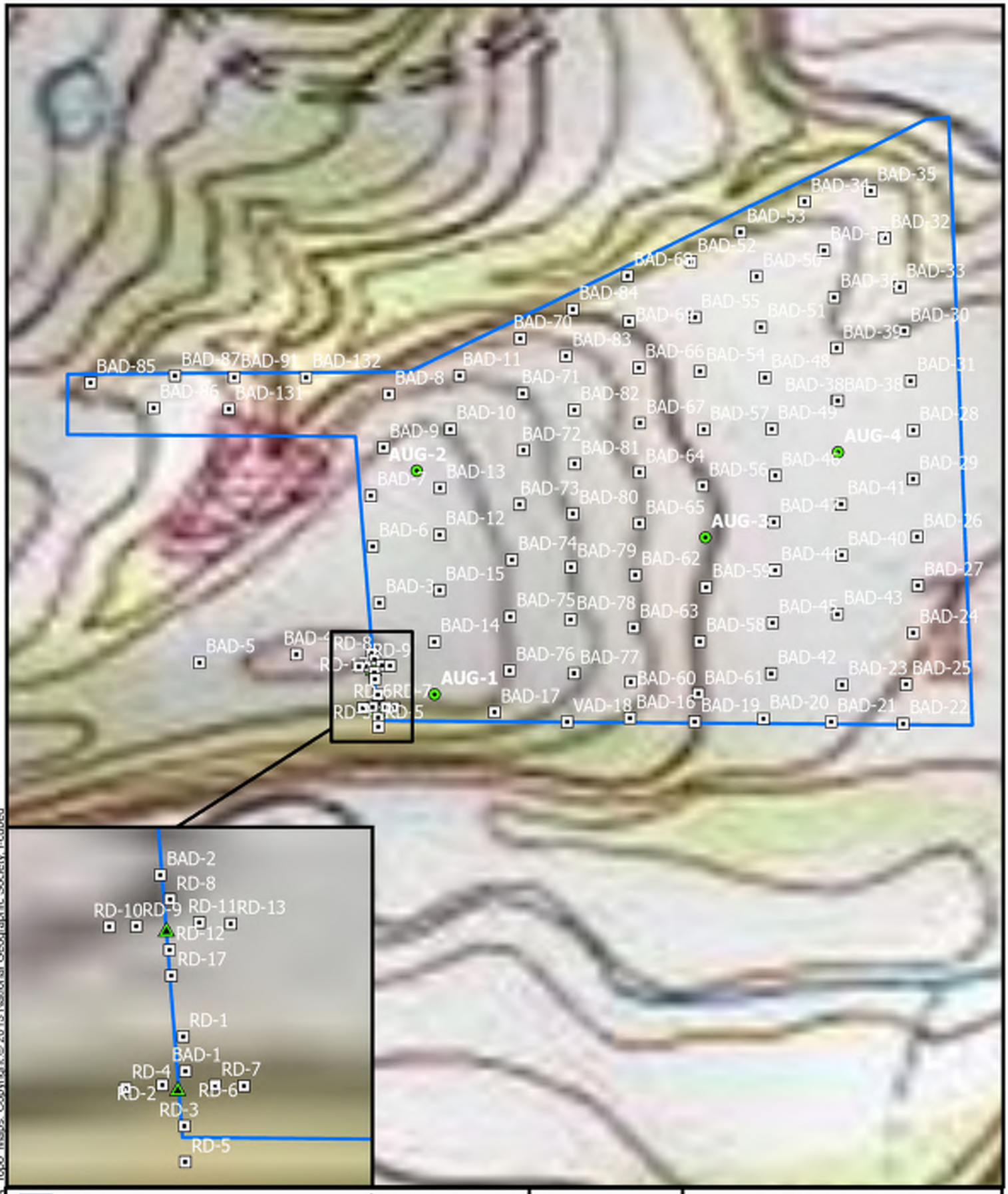


Figure 3b
Field Results
Todd Creek Wastewater Treatment Plant
Platte County, MO

BURNS McDONNELL

Source: ESRI, KCMO, Burns & McDonnell

Issued: 5/19/2024

Path: C:\Users\bsreynolds\OneDrive - Burns & McDonnell\Desktop\WFH\Missouri\Todd Creek_125460\2024\Todd Creek 2024\Todd Creek 2024.aprx bsreynolds 5/19/2024
Service Layer Credits: USA_Topo_Maps: Copyright © 2013 National Geographic Society, i-cubed

APPENDIX B – FIELD PHOTOGRAPHS

Photograph 1: APE overview. Camera facing north.

Photograph 2: APE overview showing gradual slope east towards Todd Creek. Camera facing east.

Photograph 3: APE overview showing gradual slope of APE. Camera facing west.

Photograph 4: Sewer utility at eastern APE edge. Camera facing north.

Photograph 5: Berm along eastern edge of APE where sewer line is located. Camera facing south.

Photograph 6: Overview of Todd Creek from northeast corner of APE. Modern architectural debris/trash present in photograph. Camera facing northeast.

Photograph 7: Sloped surface with intermittent stream along proposed access road. Camera facing west/southwest.

Photograph 8: Auger test example taken from the field.

Photograph 9:Field edge where two isolated finds were found and grouped as a single point. Camera facing north/northwest.

Photograph 10: Broken biface isolated find.

Photograph 11:Broken flake isolated find.

Photograph 12: Possible FCR isolated find.

APPENDIX C – SHOVEL TEST AND AUGER TABLE

Shovel Test Number	Level 1	Munsell	Texture	Level 2	Munsell	Texture	Shovel Test Results	Comments
BAD-1	0-10	10YR3/6	Si Cl Lo	10-40	10YR3/6 and 10YR5/2	Si Cl	Neg	Mottled, compact
BAD-2	0-35	10YR 4/2, 5/8	Cl	n/a	n/a	n/a	Neg	Mottled, compact
BAD-3	0-10	10YR3/6 and 10YR5/2	Si Cl	10-40	10YR3/6, 10YR5/2 and 5YR4/4	Si Cl	Neg	Mottled, compact
BAD-4	0-25	10YR 4/3	Cl	25-45	10YR 5/5	Cl	Neg	
BAD-5	0-13	10YR3/4	Si Cl	13-40	10YR3/6 and 5YR4/4	Si Cl	Neg	Mottled, compact
BAD-6	0-30	10YR 4/3, 5/6	Si Cl Lo	n/a	n/a	n/a	Neg	Mottled, compact
BAD-7	0-8	10YR3/2	Si Cl Lo	8-40	10YR4/4 and 5YR4/4	Si Cl	Neg	Mottled, compact
BAD-8	0-30	10YR 4/3, 5/6	Si Cl Lo	n/a	n/a	n/a	Neg	Mottled, compact
BAD-9	0-10	10YR3/2	Si Cl Lo	10-40	10YR4/4 and 5YR4/4	Si Cl	Neg	Mottled, compact
BAD-10	0-20	10YR 5/2	Cl	20-35	10YR 5/6	Cl	Neg	Extreme compaction in ST
BAD-11	0-10	10YR3/4	Si Cl Lo	10-40	10YR5/4	Si Cl	Neg	Compact
BAD-12	0-30	10YR 5/2	Cl	30-50	10YR 5/6	Cl	Neg	
BAD-13	0-10	10YR3/4	Si Cl Lo	10-40	10YR5/4	Si Cl	Neg	Compact
BAD-14	0-25	10YR 4/3, 5/6	Cl	n/a	n/a	n/a	Neg	Mottled, compact
BAD-15	0-10	10YR2/2	Si Cl	10-40	10YR3/4	Si Cl	Neg	Compact
BAD-16	0-20	10YR 4/3, 5/6	Cl	n/a	n/a	n/a	Neg	Mottled, compact
BAD-17	0-10	10YR2/2	Si Cl	10-40	10YR3/4	Si Cl	Neg	Compact
BAD-18	n/a	n/a	n/a	n/a	n/a	n/a	Neg	No Dig-Slope
BAD-19	0-10	10YR3/4	Si Cl Lo	10-35	10YR3/4 and 5YR4/4	Si Cl	Neg	Mottled, compact

Shovel Test Number	Level 1	Munsell	Texture	Level 2	Munsell	Texture	Shovel Test Results	Comments
BAD-21	0-30	10YR3/4, 10YR5/6, and 5YR4/4	Si Cl	-	-	-	Neg	Mottled, compact
BAD-22	0-20	10YR 4/3	Si Cl Lo	20-40	10YR 5/4	Cl	Neg	
BAD-23	0-13	10YR3/4	Si Cl	13-40	10YR3/4 and 5YR4/4	Si Cl	Neg	Mottled, compact
BAD-24	0-20	10YR 4/3	Si Cl Lo	20-40	10YR 5/4	Cl	Neg	
BAD-25	0-10	10YR3/4	Si Cl	10-40	10YR2/2	Si Cl	Neg	Compact
BAD-26	0-25	10YR 4/2, 5/8	Cl Lo	n/a	n/a	n/a	Neg	Mottled, compact
BAD-27	0-10	10YR3/4	Si Cl Lo	10-40	5YR4/4	Si Cl	Neg	Compact
BAD-28	0-25	10YR 4/2	Si Cl Lo	25-40	10YR 5/3	Si Cl Lo	Neg	
BAD-29	0-10	10YR3/4	Si Cl Lo	10-40	5YR4/4	Si Cl	Neg	Compact
BAD-30	0-20	10YR 4/3	Si Cl Lo	20-40	10YR 5/6	Cl Lo	Neg	
BAD-31	0-10	10YR3/4	Si Cl Lo	10-40	5YR4/4	Si Cl	Neg	Compact
BAD-32	0-15	10YR 4/2, 5/8	Cl	n/a	n/a	n/a	Neg	Mottled, compact
BAD-33	0-10	10YR3/4	Si Cl Lo	10-35	10YR2/2	Si Cl	Neg	Compact
BAD-34	0-15	10YR 4/2, 5/8	Cl	n/a	n/a	n/a	Neg	Mottled, compact
BAD-35	0-8	10YR3/4	Si Cl Lo	8-30	10YR2/2	Si Cl	Neg	Compact
BAD-36	0-20	10YR 4/3	Cl Lo	20-40	10YR 5/6	Cl Lo	Neg	
BAD-37	0-30	10YR3/4	Si Cl Lo	30-50	10YR4/6	Si Cl	Neg	Compact
BAD-38	0-15	10YR 5/5	Cl	n/a	n/a	n/a	Neg	Compact
BAD-39	0-11	10YR3/4	Si Cl	11-40	10YR2/2	Si Cl	Neg	Compact
BAD-40	0-20	10YR 4/2, 5/4	Cl	n/a	n/a	n/a	Neg	Mottled, compact
BAD-41	0-10	10YR3/4	Si Cl	10-40	10YR2/2	Si Cl	Neg	Compact
BAD-42	0-20	10YR 4/3	Cl	20-40	10YR 5/5	Cl	Neg	
BAD-43	0-10	10YR3/4	Si Cl	10-40	10YR2/2	Si Cl	Neg	Compact
BAD-44	0-20	10YR 4/3	Cl	20-40	10YR 5/5	Cl	Neg	

Shovel Test Number	Level 1	Munsell	Texture	Level 2	Munsell	Texture	Shovel Test Results	Comments
BAD-45	0-10	10YR3/4	Si Cl	10-40	10YR2/2	Si Cl	Neg	Compact
BAD-46	0-20	10YR 3/3, 4/3	Cl Lo	n/a	n/a	n/a	Neg	Mottled, compact
BAD-47	0-15	10YR2/2	Si Cl Lo	15-35	5YR4/4	Si Cl	Neg	Compact
BAD-48	0-8	10YR 4/3	Cl Lo	8-28	10YR 5/8	Cl	Neg	
BAD-49	0-10	10YR2/2	Si Cl Lo	10-30	5YR4/4	Si Cl	Neg	Compact
BAD-50	0-20	10YR 4/3, 5/8	Cl Lo	n/a	n/a	n/a	Neg	Mottled, compact
BAD-51	0-12	10YR3/4	Si Cl Lo	12-40	10YR2/2	Si Cl	Neg	Compact
BAD-52	0-10	10YR 4/4	Cl Lo	10-30	10YR 5/6	Cl	Neg	
BAD-53	0-30	10YR2/2 and 5YR4/4	Si Cl	-	-	-	Neg	Mottled, compact
BAD-54	0-25	10YR 3/2, 4/4	Cl	n/a	n/a	n/a	Neg	Mottled, compact
BAD-55	0-30	10YR2/2 and 5YR4/4	Si Cl	-	-	-	Neg	Mottled, compact
BAD-56	0-25	10YR 3/2, 4/4	Cl	n/a	n/a	n/a	Neg	Mottled, compact
BAD-57	0-20	10YR2/2 and 5YR4/4	Si Cl	-	-	-	Neg	Mottled, compact
BAD-58	0-25	10YR 3/2, 4/4	Cl	n/a	n/a	n/a	Neg	Mottled, compact
BAD-59	0-20	10YR2/2 and 5YR4/4	Si Cl	-	-	-	Neg	Mottled, compact
BAD-60	0-30	10YR 3/2, 4/4	Cl	n/a	n/a	n/a	Neg	Mottled, compact
BAD-61	0-25	10YR2/2 and 5YR4/4	Si Cl	-	-	-	Neg	Mottled, compact

Shovel Test Number	Level 1	Munsell	Texture	Level 2	Munsell	Texture	Shovel Test Results	Comments
BAD-62	0-25	10YR 3/2, 4/4	Cl	n/a	n/a	n/a	Neg	Mottled, compact
BAD-63	0-25	10YR2/2 and 5YR4/4	Si Cl	-	-	-	Neg	Mottled, compact
BAD-64	0-20	10YR 3/2, 4/4	Cl	n/a	n/a	n/a	Neg	Mottled, compact
BAD-65	0-25	10YR2/2 and 5YR4/4	Si Cl	-	-	-	Neg	Mottled, compact
BAD-66	0-20	10YR 3/2, 4/4	Cl	n/a	n/a	n/a	Neg	Mottled, compact
BAD-67	-	-	-	-	-	-	-	No Dig- Drainage
BAD-68	0-25	10YR 3/2, 4/4	Cl	n/a	n/a	n/a	Neg	Mottled, compact
BAD-69	0-20	10YR2/2 and 5YR4/4	Si Cl	-	-	-	Neg	Mottled, compact
BAD-70	0-10	10YR 4/3	Cl	10-30	10YR 5/3	Cl	Neg	
BAD-71	0-20	10YR2/2 and 5YR4/4	Si Cl	-	-	-	Neg	Mottled, compact
BAD-72	0-25	10YR4/2, 5/8	Cl	n/a	n/a	n/a	Neg	Mottled, compact
BAD-73	0-20	10YR2/2 and 5YR4/4	Si Cl	-	-	-	Neg	Mottled, compact
BAD-74	0-20	10YR4/2, 5/8	Cl	n/a	n/a	n/a	Neg	Mottled, compact
BAD-75	0-20	10YR2/2 and 5YR4/4	Si Cl	-	-	-	Neg	Mottled, compact

Shovel Test Number	Level 1	Munsell	Texture	Level 2	Munsell	Texture	Shovel Test Results	Comments
BAD-76	0-25	10YR4/2, 5/8	Cl	n/a	n/a	n/a	Neg	Mottled, compact
BAD-77	0-20	10YR2/2 and 5YR4/4	Si Cl	-	-	-	Neg	Mottled, compact
BAD-78	0-30	10YR4/2, 5/8	Cl	n/a	n/a	n/a	Neg	Mottled, compact
BAD-79	0-20	10YR2/2 and 5YR4/4	Si Cl	-	-	-	Neg	Mottled, compact
BAD-80	0-25	10YR4/2, 5/8	Cl	n/a	n/a	n/a	Neg	Mottled, compact
BAD-81	0-20	10YR2/2 and 5YR4/4	Si Cl	-	-	-	Neg	Mottled, compact
BAD-82	0-25	10YR4/2, 5/8	Cl	n/a	n/a	n/a	Neg	Mottled, compact
BAD-83	0-20	10YR2/2 and 5YR4/4	Si Cl	-	-	-	Neg	Mottled, compact
BAD-84	0-35	10YR4/2, 5/8	Cl	n/a	n/a	n/a	Neg	Mottled, compact
BAD-85	0-15	10YR 4/1, 5/8, 6/1	Cl	n/a	n/a	n/a	Neg	Disturbed, mottled
BAD-86	0-15	10YR 4/1, 5/8, 6/1	Cl	n/a	n/a	n/a	Neg	Disturbed, mottled
BAD-87	0-15	10YR 4/1, 5/8, 6/1	Cl	n/a	n/a	n/a	Neg	Disturbed, mottled
BAD-91	0-15	10YR 4/1, 5/8, 6/1	Cl	n/a	n/a	n/a	Neg	Disturbed, mottled
BAD-130	0-20	10YR 4/2, 5/8	Cl	n/a	n/a	n/a	Neg	Disturbed, mottled

Shovel Test Number	Level 1	Munsell	Texture	Level 2	Munsell	Texture	Shovel Test Results	Comments
BAD-131	0-20	10YR 4/2, 5/8	Cl	n/a	n/a	n/a	Neg	Disturbed, mottled
RD-1	0-25	10YR 4/2, 5/6	Cl	n/a	n/a	n/a	Neg	Mottled, compact
RD-2	0-20	10YR 4/2, 5/6	Cl	n/a	n/a	n/a	Neg	Mottled, compact
RD-3	0-30	10YR 4/2, 5/6	Cl	n/a	n/a	n/a	Neg	Mottled, compact
RD-4	0-30	10YR 4/2, 5/6	Cl	n/a	n/a	n/a	Neg	Mottled, compact
RD-5	0-25	10YR 4/2, 5/6	Cl	n/a	n/a	n/a	Neg	Mottled, compact
RD-6	0-25	10YR 4/2, 5/6	Cl	n/a	n/a	n/a	Neg	Mottled, compact
RD-7	0-30	10YR 4/2, 5/6	Cl	n/a	n/a	n/a	Neg	Mottled, compact
RD-8	0-25	10YR 4/2, 5/6	Cl	n/a	n/a	n/a	Neg	Mottled, compact
RD-9	0-25	10YR 4/2, 5/6	Cl	n/a	n/a	n/a	Neg	Mottled, compact
RD-10	0-20	10YR 4/2, 5/6	Cl	n/a	n/a	n/a	Neg	Mottled, compact
RD-11	0-25	10YR 4/2, 5/6	Cl	n/a	n/a	n/a	Neg	Mottled, compact
RD-12	0-10	10YR 4/2	Cl	10-30	10YR 5/6	Cl	Neg	
RD-13	0-25	10YR 4/2, 5/6	Cl	n/a	n/a	n/a	Neg	Mottled, compact
RD-17	0-30	10YR 4/2, 5/6	Cl	n/a	n/a	n/a	Neg	Mottled, compact

Auger Test Number	Level 1	Munsell	Texture	Level 2	Munsell	Texture	Level 3	Munsell
AUG-1	0-65	10YR 4/3, 5/8	Cl Lo	65-110	10YR 4/3, 5/8	Cl	65-110	10YR 5/8, 6/8
	Texture	**Level 4**	**Munsell**	**Texture**	**Level 5**	**Munsell**	**Texture**	**Shovel Test Results**
	Cl	110-175	10YR 5/8, 6/1	Cl	175-210	10YR 6/1	Cl	Neg
	Comments							
	mottled throughout							

Auger Test Number	Level 1	Munsell	Texture	Level 2	Munsell	Texture	Level 3	Munsell
AUG-2	0-65	10YR 4/2, 5/8, 6/1	Cl Lo	65-85	10YR 5/8, 6/1	Cl Lo	85-150	10YR 5/8, 6/1 (more 6/1 present here than 5/8)
	Texture	**Level 4**	**Munsell**	**Texture**	**Level 5**	**Munsell**	**Texture**	**Shovel Test Results**
	Cl Lo	150-210	10YR 6/1 (some 5/8 present)	Cl	n/a	n/a	n/a	Neg
	Comments							
	mottled throughout							

Auger Test Number	Level 1	Munsell	Texture	Level 2	Munsell	Texture	Level 3	Munsell
AUG-3	0-55	10YR 3/2, 4/2	Cl Lo	55-90	10YR 4/2, 5/8	Cl Lo	90-190	10YR 4/2, 5/8, 6/1
	Texture	**Level 4**	**Munsell**	**Texture**	**Level 5**	**Munsell**	**Texture**	**Shovel Test Results**
	Cl Lo	190-215	10YR 5/8, 6/1	Cl	n/a	n/a	n/a	Neg
	Comments							
	mottled throughout							

Auger Test Number	Level 1	Munsell	Texture	Level 2	Munsell	Texture	Level 3	Munsell
AUG-4	0-30	10YR 4/3, 5/8	Cl Lo	30-60	10YR 4/3, 5/8, 6/1	Cl Lo	60-120	10YR 4/3, 5/8, 6/1
	Texture	**Level 4**	**Munsell**	**Texture**	**Level 5**	**Munsell**	**Texture**	**Shovel Test Results**
	Cl	120-180	10YR 5/8, 6/1	Cl	n/a	n/a	n/a	Neg
	Comments							
	mottled throughout, redox evident in lowe levels							

APPENDIX D – SHPO CORRESPONDENCE

BURNS McDONNELL