

APPENDIX E

SHPO Consultation, Cultural Resources Desktop Assessment, Phase IA Cultural Resources Survey, and Historic Structures Report

November 7, 2019



Des Moines Industrial LLC.
512 1/2 East Grand Avenue
Des Moines, Iowa 50309

Attn: Paul Cownie
P: (303) 710-9985
E: PaulCownie@DesMoinesIndustrial.com

Re: Cultural Resources Desktop Assessment
200 Southeast 15th Street
Des Moines, Iowa 50317
Terracon Project Number: 08197038

Dear Mr. Cownie,

Terracon Consultants, Inc. (Terracon) conducted a cultural resources desktop assessment of a proposed railroad industrial development in Des Moines, Iowa. This letter report details the findings of the desktop assessment, which included the examination of historic maps and aerial photographs, examination of the soils and geomorphology of the site, and a Site File Search conducted with the Iowa Office of the State Archaeologist (OSA) for information on previously recorded cultural resources within or near the proposed project area.

1.0 PROJECT INFORMATION

The proposed development consists of an approximately 40-acre parcel located near Southeast 15th Street in Des Moines, Iowa. East Market Street runs along the northern boundary of the project area and Southeast Connector Trail runs along its southern boundary. The proposed project area is depicted on the United States Geological Survey 7.5' Des Moines SE (1956, photorevised 1967, 1971, and 1976) in Exhibit 1. The legal location of the project area is the S1/2 of Section 2 and the SE1/4 of Section 3 in Township 78 North, Range 24 West, in Polk County, Iowa. An aerial photograph of the proposed project area can be seen in Exhibit 2. The proposed project involves the construction of a railroad transload facility.

2.0 RECORDS SEARCH AND BACKGROUND RESEARCH

2.1 Iowa Site File Search

A records search request was submitted to the Iowa Office of the State Archaeologist (OSA) for information regarding previously identified archaeological sites within or near the proposed project area. Colleen Randolph, OSA Records Manager, conducted the search of the Iowa Cultural Resources

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Site File and returned the results via email. The records search reported that no archaeological sites have been previously recorded within the project area or within 328 feet (100 meters) of the project area. The site file search did note that 45 archaeological sites have been identified within one mile of the project area. These sites are summarized in Table 1. A total of 21 locations were also identified in the Historic Indian Location Database (HILD) or as Notable Locations, which are sites identified in historic records that have not been definitively located through fieldwork. These locations are summarized in Table 2. One of these locations, HILD 1108, is depicted as including the western portion of the project area, though this location has not been verified within the project area through archaeological survey. The Site File search shows that two cultural resources surveys have previously been conducted within portions of the project area, and did not record cultural resources within the surveyed areas.

Given the archaeological sensitivity of the project area, it was recommended by Ms. Randolph that John Doershuk, the Iowa State Archaeologist, and Lara Noldner, Director of the OSA Bioarchaeology Program, be consulted regarding concerns they had regarding the project location. Terracon’s Principal Investigator, Suzanne Reece, had a conference call with Mr. Doershuk and Ms. Noldner on August 16, 2019. This call addressed the fact there are known disturbances within the project area, but the project area retains heightened archaeological potential given its location between numerous, prehistoric and historic sites near the East Village neighborhood of Des Moines. It was also noted that the project area is located in between the reported locations of several Meskwaki settlements, and at the very least, portions of the project area likely would have seen some utilization while traveling between these locations.

Table 1. Archaeology Sites Previously Recorded Within One Mile of the Project Area.

Site Number	Description	Approx. Distance from Project Area
13PK61	Multi-component prehistoric and historic site	0.75 mile
13PK349	Late Prehistoric and Woodland mounds	1 mile
13PK350	Late Prehistoric and Woodland mounds	1 mile
13PK372	Archaic isolated find; historic Euro-American structural remains; historic recreational	0.75 mile
13PK373	Historic Euro-American structural remains; historic recreational	0.75 mile
13PK375	Historic Euro-American industrial and military	1 mile
13PK534	Historic Euro-American industrial	1 mile
13PK622	Historic Euro-American scatter	0.3 mile
13PK623	Historic Euro-American scatter	0.4 mile
13PK624	Historic Euro-American scatter	0.4 mile
13PK625	Historic Euro-American scatter	1 mile
13PK657	Historic Euro-American school	0.8 mile
13PK658	Historic Euro-American farm/residence	0.7 mile

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Site Number	Description	Approx. Distance from Project Area
13PK674	Historic Euro-American structural remains	0.75 mile
13PK839	Prehistoric isolated finds; historic Euro-American structural remains; railroad related; industrial	1 mile
13PK840	Isolated burials; historic Euro-American structure/building remains	0.2 mile
13PK856	Late Prehistoric artifact scatter; Late Woodland artifact scatter; historic farm/residence	1 mile
13PK860	Historic dump	0.6 mile
13PK861	Historic industrial	0.6 mile
13PK862	Historic cemetery	0.8 mile
13PK875	Historic Euro-American structure/building remains; historic Indian structure/building remains	0.25 mile
13PK876	Historic Euro-American structure/building remains; historic Indian structure/building remains	0.3 mile
13PK878	Historic Euro-American structure/building remains	0.75 mile
13PK879	Historic Euro-American structure/building remains	0.75 mile
13PK880	Historic Euro-American structure/building remains	0.8 mile
13PK881	Historic Euro-American military	0.75 mile
13PK884	Historic Euro-American railroad related	0.8 mile
13PK885	Woodland mounds; Late Prehistoric mounds	0.9 mile
13PK917	Historic farm/residence	0.75 mile
13PK918	Historic industrial	0.75 mile
13PK928	Historic Euro-American farm/residence	0.4 mile
13PK929	Historic Euro-American farm/residence	0.7 mile
13PK943	Historic dump	0.5 mile
13PK944	Historic Euro-American railroad related	0.75 mile
13PK951	Historic Euro-American cemetery	0.2 mile
13PK954	Historic Euro-American cemetery	0.75 mile
13PK958	Historic Euro-American cemetery	0.7 mile
13PK959	Historic Euro-American cemetery	0.3 mile
13PK966	Middle Archaic open habitation, village, prehistoric scatter, and isolated burials	1 mile
13PK972	Prehistoric isolated find	0.8 mile
13PK983	Historic Euro-American farm/residence	0.85 mile
13PK990	Historic dump; historic artifact scatter	0.5 mile
13PK1051	Historic Euro-American scatter	0.5 mile
13PK1073	Historic Euro-American scatter	0.2 mile
13PK1077	Historic Euro-American farm/residence; historic scatter	0.6 mile

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Table 2. HILD and Notable Location Database Results Within One Mile of the Project Area.

Number	Description	Approx. Distance from Project Area
XX2	Des Moines Mound Terrace	1 mile
XX52	Fort Des Moines No.2 Buildings	1 mile
XX53	Fort Des Moines No. 2 Buildings	1 mile
XX139	Homeless camp	0.75 mile
XX140	Homeless camp	0.75 mile
XX677	Fort Des Moines Historical Site/Marker	1 mile
XX727	Handcart Trail – Des Moines River crossing	0.7 mile
XX6661	Lower Agency Cemetery/Agency Bottoms Cemetery/Old Eastside Cemetery	0.2 mile
XX6682	Location of an isolated pioneer burial discovered in the 1870s	0.5 mile
XX6562	Civil War Rendezvous Camp	0.25 mile
HILD 154	Sauk and Meskwaki Racetrack	1 mile
HILD 162	1834-5 Dragoon Camp; 1841 Sauk Meskwaki Camp	0.3 mile
HILD 159	Dirt Lodge trading post	0.75 mile
HILD 702	Trading post? 1841	0.6 mile
HILD 157	Fort Des Moines 2	1 mile
HILD 164	Phelps trading post T17	0.3 mile
HILD 155	Sauk and Meskwaki Games	0.9 mile
HILD 163	Raccoon Agency	0.25 mile
HILD 158	Ewing Post, Scott House	0.6 mile
HILD 1077	AIM Takeover, 1973	0.4 mile
HILD 1108	Huge Sauk and Meskwaki Camp 1841	0 mile

A search of the historical structural inventory maintained by the Iowa State Historic Preservation Office (SHPO) was conducted with records manager Berry Bennett. This inventory reported information on hundreds of previously recorded structures within one mile of the project area, but did not identify historical-age structures recorded within the project area. None of the National Register of Historic Places (NRHP) eligible or listed districts that currently exist within downtown Des Moines cross through the proposed project area.

2.2 Investigation of Historic Maps, Atlases, and Aerial Photographs

A series of historic plat maps and atlases were examined via the Historic Map Works (2019) website for information on possible historic site locations. A total of seven such maps were examined (Andreas 1875, Hixson 1930, Huebinger 1904, Kenyon 1914, McVicker 1872, Stacy 1947, and Warner and Foote 1885). These atlases and plat maps depict the development of much of the project area as a railroad corridor beginning in 1872 and continuing to the present day. One General Land Office (GLO) survey

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map accessed through the Bureau of Land Management's online GLO database depicts the project area as primarily consisting of wetlands in 1848. One United States Geological Survey 7.5' Topographic quadrangle was also examined for possible historic site locations. The Des Moines SE (1956, photorevised 1967, 1971, and 1976) quadrangle depicts seven structures along the southern boundary of the project area. Aerial photographs show these structures were no longer extant by 1990. Aerial photographs also depict a junkyard within the eastern half of the project area from 1990 to 2011. Portions of the project area also saw industrial and infrastructure development during this time, including the creation of seepage basins along Highway 69.

2.3 Environmental and Geomorphological Review

The Natural Resources Conservation Service's (NRCS) Web Soil Survey depicts two soils within the proposed project area: Urban land and Nodaway silt loam with 0 to 2 percent slopes that is occasionally flooded. The NRCS assigns "Urban land" to areas that have been heavily developed to the extent that the natural soils are no longer readily identifiable, and this classification makes up most (approximately 92 percent) of the project area. Nodaway silt loam with 0 to 2 percent slopes that is occasionally flooded is found in approximately 5 percent of the project area. This soil can create prime farmland, and is typically found on talfs of flood plains. It is occasionally prone to flooding, and its profile typically presents as a silt loam Ap horizon from 0 to 7 inches below ground surface overlying a silt loam C horizon, which can reach depths as great as 80 inches (NRCS 2019). The NRCS identified the remainder of the project area (3 percent) as consisting of standing water.

The United States Geological Survey 7.5' Des Moines SE (1956, photorevised 1967, 1971, and 1976) quadrangle depicts the project area within a mostly flat urban environment, with evidence that portions of the project area are located in a former channel of the Des Moines River. The current channel of the Des Moines River is located approximately 0.6 mile to the west of the project area, and approximately 0.7 mile to the south of the project area. This location places the project area within the northern edge of the Southern Iowa Drift Plain (Prior 1991). This physiographic region is the largest of those identified in Iowa, and is characterized by well-developed drainage systems that have eroded and shaped upland areas, leaving a landscape bisected by rills and ravines. Steeply rolling hills are also a common topographic feature of the Southern Iowa Drift Plain (Prior 1991).

3.0 SUMMARY

No cultural resources have been previously recorded within the proposed project area, though the western portion of the project area does potentially contain resources related to a Sauk and Meskwaki Camp from 1841 (HILD 1108). Numerous archaeological sites are, however, known to be in the vicinity of the project area, suggesting there is a high level of archaeological potential within the subject property. This combined with the complex depositional conditions expected within a former river channel of the Des Moines River suggested early on to Terracon that a desktop assessment alone would not be sufficient to make a recommendation on the possibility of cultural resources being present

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within the project area. As a result, Terracon recommended to Des Moines Industrial, LLC. that a geoarchaeological survey be conducted of the proposed project area, and said study was carried out in September 2019. The results of the geoarchaeological survey were used to guide a targeted Phase IA archaeological survey of the proposed project area.

Thank you for the opportunity to conduct this desktop archaeological assessment.

Sincerely,



Suzanne Reece, MSc, RPA

Principal Investigator - Archaeology

for

Ann M. Scott, PhD, RPA

Cultural Resources Dept. Manager

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4.0 REFERENCES

Andreas, A.T.

1875 *Illustrated Historical Atlas of the State of Iowa*. A.T. Andreas, Chicago.

Bureau of Land Management

2019 *General Land Office Records*. Bureau of Land Management, United States Department of the Interior. Washington, D.C. <https://glorerecords.blm.gov/>.

Historic Map Works

2019 *Historic Map Works*, Historic Map Works, LLC., South Portland, Maine. www.historicmapworks.com/.

Hixson, W.W., and Company

1930 *Plat Book of the State of Iowa*. W.W. Hixson and Company, Rockford, Illinois.

Huebinger, M., and Company

1904 *Atlas of the State of Iowa*. M. Huebinger and Company, Davenport, Iowa.

Kenyon Company

1914 *Atlas and Plat Book of Polk County, Iowa*. The Kenyon Company, Des Moines, Iowa.

McVicker, Geo A.

1872 *Map of Polk County, Iowa*. Geo A. McVicker, Chicago.

Natural Resources Conservation Service (NRCS)

2019 *Web Soil Survey*. Natural Resources Conservation Service, Washington, D.C. <https://websoilsurvey.sc.egov.usda.gov/>

Prior, Jean C.

1991 *Landforms of Iowa*. University of Iowa Press, Iowa City, Iowa.

Stacy Map Publishers

1947 *Stacy's Farm Plat Book of Polk County, Iowa*. Stacy Map Publishers, Rockford, Illinois.

United States Geological Survey (USGS)

1956 *Des Moines SE, Iowa. Quadrangle. 7.5 Minute Topographic*. Photorevised 1967, 1971, and 1976. United States Geological Survey, Washington, D.C.

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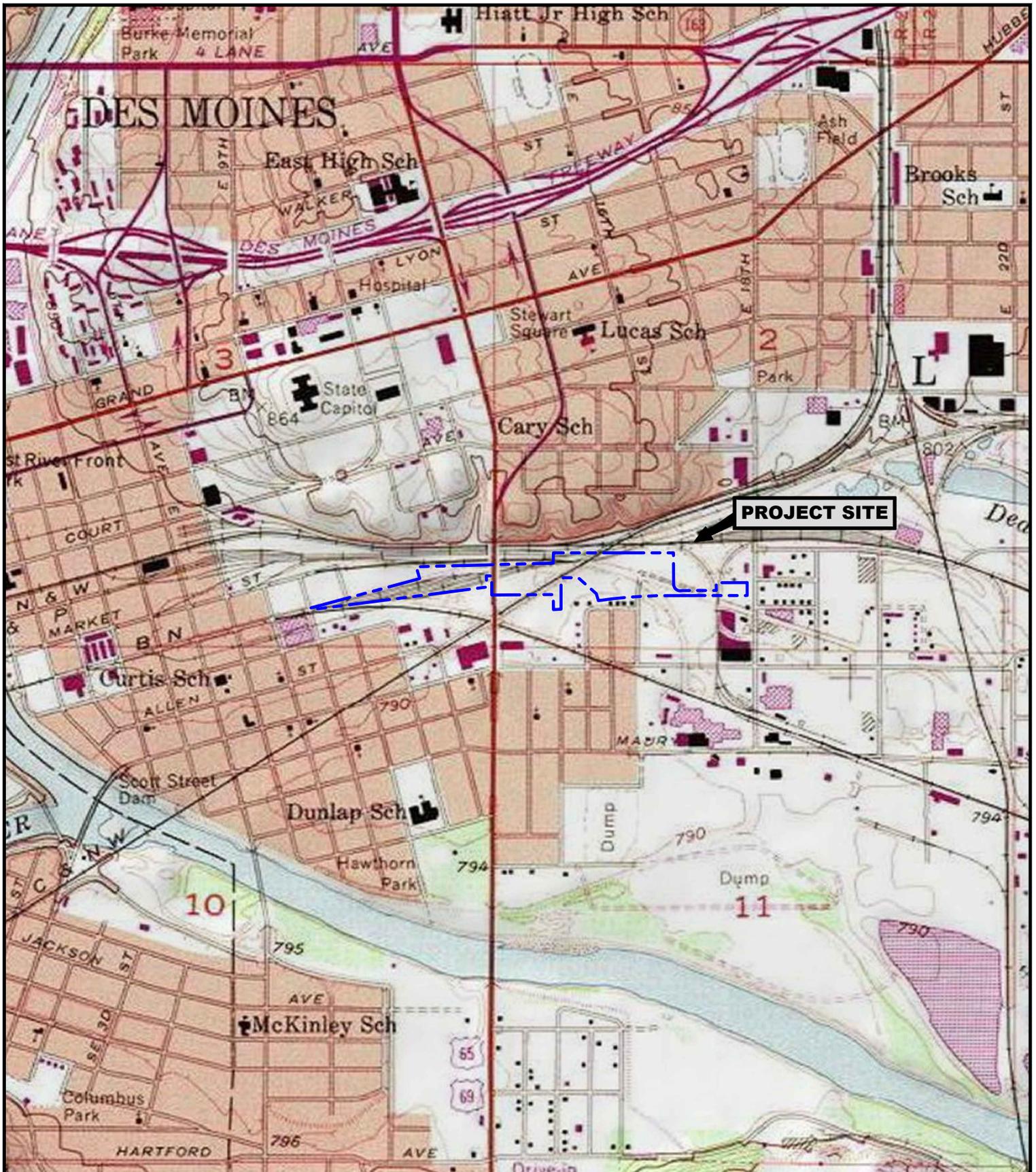
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Warner, Geo. E., and C.M. Foote

1885

Plat Book of Polk County, Iowa. Warner & Foote, Minneapolis, Minnesota.

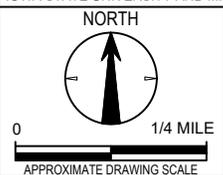


PROJECT SITE

TOPOGRAPHIC IMAGE FROM IOWA GEOGRAPHIC MAP SERVER MAINTAINED BY IOWA STATE UNIVERSITY AND MIT - <http://cairo.gis.iastate.edu/map.html>

LEGEND

 - BOUNDARY OF ASSESSED AREA



Project No:	Date:
08197038-T1	11/4/2019
Project Mngr:	Drawn By:
JAH	JAL
File Name:	
08197038-T1.dwg	
Layout Name:	
E2	

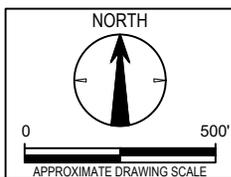
Terracon
Consulting Engineers and Scientists

600 SW 7TH STREET DES MOINES, IOWA 50309
PH. (515) 244-3184 FAX. (515) 244-5249

TOPOGRAPHIC SITE MAP	EXHIBIT 1
DES MOINES INDUSTRIAL - TRANSLOAD CENTER 200 SE 15TH STREET DES MOINES, IOWA	



AERIAL PHOTO FROM GOOGLE EARTH



Project No:	Date:
08197038-T1	11/4/2019
Project Mngn:	Drawn By:
JAH	JAL
File Name:	
08197038-T1.dwg	
Layout Name:	
E3	

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600 SW 7TH STREET DES MOINES, IOWA 50309
PH. (515) 244-3184 FAX. (515) 244-5249

LEGEND

--- - BOUNDARY OF ASSESSED AREA

SITE DIAGRAM	EXHIBIT
DES MOINES INDUSTRIAL - TRANSLOAD CENTER 200 SE 15TH STREET DES MOINES, IOWA	2

Phase IA Cultural Resources Survey

Proposed Railroad Transload Facility
Federal Railroad Administration, Project Sponsor
Section 2 and 3, T78N, R24W
Des Moines, Polk County, Iowa

Terracon Project No. 08197038
Issued: November 8, 2019



Information contained in this report relating to the nature and location of archaeological sites is considered private and confidential and not for public disclosure in accordance with Section 304 of the National Historic Preservation Act (54 U.S.C. § 307103); 36 CFR Part 800.6 (a)(5) of the Advisory Council on Historic Preservation's rules implementing Sections 106 and 110 of the Act; Section 9(a) of the Archaeological Resource Protection Act (54 U.S.C. § 100707) and, Chapter 22.7, subsection 20 of the Iowa Code.

Prepared for:

Des Moines Industrial LLC.
Des Moines, Iowa

Prepared by:

Suzanne Reece, MSc, RPA, Principal Investigator
Terracon Consultants, Inc.

terracon.com

Terracon

Environmental



Facilities



Geotechnical



Materials

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APPENDIX A – Project Maps

APPENDIX B – Historical Atlases and Plat Maps

APPENDIX C – Project Photographs

APPENDIX D – National Archaeological Database (NADB) Form

APPENDIX E – Resumes

APPENDIX F – Geoarchaeological Survey Report

ABSTRACT

A Phase IA Cultural Resources Survey was conducted in Des Moines, Polk County, Iowa for Des Moines Industrial LLC. of Des Moines, Iowa for a proposed railroad transload facility within an industrial area of Des Moines. The proposed project is funded by the Federal Railroad Administration (FRA). Because the project involves federal funding, the Phase IA Cultural Resources Survey was conducted to comply with Section 106 of the National Historic Preservation Act of 1966, as amended (54 U.S.C. § 300101 et seq.); the investigation was conducted utilizing the Association of Iowa Archaeologists Guidelines (2018). Prior to conducting the Phase IA investigation, a desktop assessment and geoarchaeological survey were conducted. These prior studies were used to guide the Phase IA survey.

The proposed undertaking consists of an approximately 40-acre parcel located near Southeast 15th Street in Des Moines, Iowa. East Market Street runs along the northern boundary of the project area and Martin Luther King Jr. Parkway runs along its southern boundary. This report details the Phase IA Cultural Resources Survey performed by Terracon Consultants, Inc. (Terracon) of the proposed project area and summarizes the geoarchaeological survey of the project area that was previously conducted by Impact 7G for Terracon. Suzanne Reece, MSc, RPA, served as Principal Investigator, and the project was conducted with the assistance of Archaeological Crew Chief Samantha Hunt. The Phase IA survey was conducted on October 23 and 24, 2019.

The fieldwork involved a pedestrian survey of the project area and documentation of structural remains within the project area. No shovel tests were excavated within the project area based on the findings and recommendations from the geoarchaeological survey, the presence of extensive modern surface debris, and existing, active infrastructure. This fieldwork did not identify previously unrecorded cultural resources within the project area. Given the extensive ground disturbances within the project area, as well as the geomorphological findings, it is unlikely that intact cultural resources are present within the accessible portions of the project area. A determination of *no historic properties affected* is recommended.

1.0 INTRODUCTION

Information contained in this report relating to the nature and location of archaeological sites is considered private and confidential and not for public disclosure in accordance with Section 304 of the National Historic Preservation Act (54 U.S.C. § 307103); 36 CFR Part 800.6 (a)(5) of the Advisory Council on Historic Preservation's rules implementing Sections 106 and 110 of the Act; Section 9(a) of the Archaeological Resource Protection Act (54 U.S.C. § 100707) and, Chapter 22.7, subsection 20 of the Iowa Code.

Des Moines Industrial LLC. is planning to construct a railroad transload facility within an industrial corridor of Des Moines, Polk County, Iowa. The project is being funded through the Federal Railroad Administration (FRA). The property currently contains several rail lines, seepage basins, and undeveloped land. The Phase IA Cultural Resources Survey was conducted to comply with Section 106 of the National Historic Preservation Act of 1966, as amended (54 U.S.C. § 300101 et seq.) and utilized the Association of Iowa Archaeologists Guidelines (2018). Terracon's Suzanne Reece, MSc, RPA, served as the Principal Investigator for the Phase IA Cultural Resources Survey. Fieldwork was carried out with the assistance of Archaeological Crew Chief Samantha Hunt. The survey was conducted on October 23 and 24, 2019. Data, field notes, and photographs and other records generated by the project will be curated in the Terracon office in Des Moines.

1.1 Project Description

The proposed development consists of an approximately 40-acre parcel located near Southeast 15th Street in Des Moines, Iowa. It is located between East Market Street to the north and East Martin Luther King Jr. Parkway to the south. The proposed project area and the anticipated area of potential effect (APE) is depicted on the United States Geological Survey 7.5' Des Moines SE (1956, photorevised 1967, 1971, and 1976) in Appendix A, Exhibit 1. The legal location of the project area is the S1/2 of Section 2 and the SE1/4 of Section 3 in Township 78 North, Range 24 West, in Polk County, Iowa. An aerial photograph of the proposed project area can be seen in Appendix A, Exhibit 2. The proposed project involves the construction of a railroad transload facility, which includes an office/warehouse, a transloading pad, proposed salt building, a wetland restoration and stormwater pond, and an aggregate storage pile (Appendix A, Exhibit 3). The lead federal agency for the proposed project is the Federal Railroad Administration (FRA).

1.2 Environmental Context

The project area is located within a former river valley formed by the Des Moines River. The changing course of the river over time has left the topography of the project area mostly flat, though the former river terrace and floodplain can be discerned in areas that have not been fully developed. The project area is in a largely industrial area of Des Moines, and has had railroad tracks crossing through it since at least 1872. It has historically been an area filled with wetlands

and been undesirable for further development, save for a few structures along the southern edge and a junkyard that was previously located on the eastern half of the property. Aside from the rail lines and junkyard, the project area has seen disturbances from the installation of stormwater retention infrastructure, utilities, and road projects.

At the time of the Phase IA survey, vegetation within the project area primarily consisted of short grasses, forbs, and deciduous trees. The ground surface visibility ranged from 25 to 100 percent, with an average ground surface visibility of 70 percent. Evidence of extensive amount of ground disturbances were present within the project area, including push piles of soil and debris, as well as man-made berms. The elevation of the project area averages approximately 800 feet above mean sea level (AMSL). The nearest permanent body of water is the Des Moines River, which is located approximately 0.7 miles to the west of the project area.

1.3 Geomorphological Context

Prior (1991) depicts the project area as being located along the northern edge of the Southern Iowa Drift Plain, and just south of the Bemis Moraine. The Southern Iowa Drift Plain is the largest of Iowa's landform regions, and it is characterized by rolling hills, complex and interconnected drainage networks, and Pre-Illinoian glacial drift that has seen drastic modification through erosional processes. In some portions of the Southern Iowa Drift Plain, the Pre-Illinoian glacial drift has been overlain with up to 30 feet of windblown Wisconsin-age loess, while other portions of the drift plain have been worn away to the bedrock by moving water. As a result, there is great variability in the appearance of the landforms within this landform region, but all have been created through a series of depositional and erosional events over time, even if said landforms may not be immediately apparent in the developed areas of Des Moines.

The location of the project area within a former channel of the Des Moines River suggests that the natural processes of the river have caused both erosion and deposition of alluvium within and adjacent to the project area. Given the age of the drainage system associated with the Des Moines River, this process has been occurring for approximately 10,000 years (OSA 2019). The Iowa Geological Survey has separated the alluvium found in Iowa river and stream valleys into four lithostratigraphic units of the Deforest Formation, including: the Camp Creek Member, the Roberts Creek Member, the Gunder Member, and the Corrington Member (Bettis 1990; Bettis et al. 1992; OSA 2019). The Deforest Formation consists of silty, clayey, loamy, and sandy valley fill alluvial sediments from the Holocene, and these soils can be found across Iowa and surrounding Midwestern states (Bettis 1990; Bettis et al. 1992). Deforest Formation soils have been identified as possessing high archaeological potential, and the Deforest Formation is the oldest stratigraphic unit that archaeological deposits have been identified in Iowa (Bettis 1990). The four lithostratigraphic units that the Deforest Formation has been separated are in part defined by the timing of their deposition, and as such there is a variability in the archaeological potential of the four soils (OSA 2019). The Corrington Member soils were deposited between 9,000 to 2,500 years before the present, while the Gunder Member soils were deposited between 10,500 and 3,000 years before the present. Roberts Creek soils were deposited between 4,000 and 500 years

before the present, and the Camp Creek Member soils were deposited between 400 years ago to today. As a result, Roberts Creek and Camp Creek Member soils have a high possibility of containing archaeological deposits ranging from the Late Archaic to the historic age.

The Natural Resource Conservation Service's (NRCS) Web Soil Survey (2019) identified two soils within the proposed project area. Urban land is identified within approximately 92 percent of the project area. The NRCS defines this classification as "areas that are covered by buildings, roads, streets, parking lots, mobile home parks, auto salvage yards, and railroad yards. The original soils can no longer be identified" (NRCS 2000: 121). The second soil identified within the project area is Nodaway silt loam with 0 to 2 percent slopes that is occasionally flooded. This soil is found in approximately five percent of the project area, with the remaining three percent of being considered identified as containing standing water. Nodaway silt loam is associated with the Camp Creek Member of the Deforest Formation, and is typically located on talfs of flood plains. This soil can create prime farmland, but it is occasionally prone to flooding. Its profile typically presents as a silt loam Ap horizon from 0 to 7 inches below ground surface overlying a silt loam C horizon which can reach depths as great as 80 inches (NRCS 2019).

Given that most of the project area has been identified as urban land, it should be noted that considerable effort has been made to reconstruct the natural geomorphology of Des Moines and the Des Moines River Valley by both geomorphologists and geoarchaeologists. In addition to Wisconsinan terraces identified around Des Moines, these studies have identified three main Holocene terraces within the Des Moines River valley. These three terraces consist of a Low Terrace that is historic in age, a late Holocene Intermediate Terrace, and a High Terrace that has been identified as early to middle Holocene in age. Geomorphological and geoarchaeological studies that have been conducted in downtown Des Moines have found that complex depositional conditions are present, with overlapping Intermediate and Low Terraces and variable deposits of urban fill (Brice, Petrides, and Associates 1985).

Geomorphological and archaeological work carried out for the CBD Loop Arterial Construction Project also examined the conditions found in the Des Moines and Racoon River valleys, and came to several important conclusions (Mandel 1982; Brice, Petrides, and Associates 1985). Among their findings, it was determined that in the flood plains of the Des Moines and Racoon Rivers, there is significant potential for the existence of prehistoric deposits located below historic era-alluvial deposits. Mandel (1982) and Brice, Petrides, and Associates (1985) also found that there is low potential for buried prehistoric sites on the bluffs surrounding the river valleys, but there is high potential for prehistoric sites at the ground surface in areas where river bluffs have not been disturbed.

1.4 Geoarchaeological Survey of the Project Area

Given the complex geomorphological conditions that have been previously identified within the vicinity of the project area, a geoarchaeological study was conducted by Brandon Scott of Impact 7G prior to the Phase IA survey. This study also was limited to the approximately 40 acres of the

project area where landowner access agreements were able to be obtained. A copy of this report is be included with the submission of this Phase IA survey report to the Iowa State Historic Preservation Office (SHPO) for review (see Appendix F).

A total of 12 cores were extracted and examined by the geoarchaeological survey, and found that the project area primarily consists of alluvial landforms that have been covered by dense historic fill. Each of the 12 cores identified fill episodes within the examined cores, with some cores identifying one major fill deposit while other cores identified up to five different significant episodes of fill deposition with the deepest fill deposition extending to 383 cm below the ground surface in Core 7. The soils identified by the geoarchaeological investigation suggest much of the project area would have been “perennially wet and inhospitable for extended human settlement” (Scott 2019). Other soils identified by the geoarchaeological study were found to be too young to be likely to contain significant archaeological deposits. In summary, the geoarchaeological survey found that the geomorphological conditions and landforms identified within the site would not be conducive to long term human settlement or occupation of the project area.

Based on these findings, historical research, and known modern disturbances to the project area, Scott recommended that no further archaeological work was necessary in areas where geoarchaeological testing was able to be conducted. Restrictions on property access and standing water prevented testing of some portions of the project area from being examined by Scott, and these same restrictions impacted the Phase IA survey as well.

1.5 Project Purpose and Scope of Work

The Phase IA investigation was conducted for the purpose of determining if cultural resources are present within the proposed project area and, if so, identify the boundaries, integrity, and the temporal or cultural context of the encountered resource. Identified resources will also be evaluated for possible inclusion on the National Register of Historic Places (NRHP).

The Scope of Work for this project included conducting historic and environmental background research of the project area. This was done through conducting records searches, examining historic atlases, plat maps, and historic aerial photographs, as well as reviewing previous archaeological and geomorphological studies conducted within and adjacent to the project area. Following the review of these records, a focused Phase IA strategy was developed based on the recent geoarchaeological study of the project area (Scott 2019). As the areas recommended by this report for further subsurface investigations are no longer included within the project area, the Phase IA survey primarily consisted of a pedestrian survey and documentation of surface level conditions to assess the likelihood of cultural resources being present at the surface or near surface of the project area. This collected data will be reviewed and a recommendation on the effect the proposed project will have on cultural resources will be made and presented in this technical report.

2.0 HISTORICAL AND CULTURAL CONTEXT

The general cultural sequence of Iowa follows the statewide cultural context delineations described by the Office of the State Archaeologist, which include the Paleoindian, Archaic, Woodland, and Late Prehistoric, and Historic periods.

Paleoindian Period (11500 – 8500 BCE)

The Paleoindian Period in Iowa presented a series of significant geomorphological, environmental, and climatic changes that drastically altered the lifeways of the people living in the region. Many of these changes were preceded by the retreat of glaciers across the Upper Midwest. The receding glaciers deposited moraines, soils, and water across the state, and the shifting landscape combined with the environmental changes allowed for the emergence of a taiga ecosystem (Schermer et al. 1995). Over time, the taiga gave way to woodlands, which were the most common environment found within Iowa during the Paleoindian Period. Paleoindian sites that have been investigated suggests that human occupation at this time primarily consisted of hunter gatherers societies, who had the capabilities and technology to effectively hunt large game animals such as bison, mastodon, and mammoth (Schermer et al. 1995). The artifact type most commonly associated with this period is fluted, lanceolate points, such as Clovis and Folsom points, though a variety of stone tools made of a wide variety of materials have also been identified from this period in Iowa.

Archaic Period (8500 – 800 BCE)

The Paleoindian Period gave way to the Archaic Period, where communities of hunters and foragers became more common. The end of the last glacial period led to changes in the environment including changes in the plant and animal life. This allowed the Archaic inhabitants of the area to establish less nomadic lifestyles and access resources that were previously unavailable. Due to the longer habitation of locations by Archaic peoples, there is greater archaeological evidence of their lifestyles than previous inhabitants. During the Middle Archaic (5500 to 2500 BCE) in Iowa, these settlements tended to be near sources of fresh water; however, the shifting environment caused large deposits of silt to fill river valleys and streams (Schermer et al. 1995). As a result, the archaeological evidence for the lifeways of the people of the Middle Archaic is minimal. Human populations continued to grow throughout the Archaic Period, and by the Late Archaic (2500 BCE – 500 BC), larger, more permanent settlements begin to develop. These settlements allowed for the creation of more complex social interactions and trade networks, as well as new cultural institutions such as communal cemeteries (Schermer et al. 1995).

Woodland Period (800 BCE – 1250)

The Woodland Period is defined by the emergence of pottery containers, burial mounds, and agriculture. Hunter-gatherer lifestyles were still predominating, with expanded exploitation of

riverine resources such as fish and clams as sources of protein (Schermer et al. 1995). The rapid climate and topographic changes experienced in earlier periods began to slow, and the area that would one day be Iowa became covered in a blend of prairies and forests. Changes in artifact typologies and settlement patterns occurred throughout this period, and these social and cultural changes resulted eventually created social and cultural contexts that would lead to the emergence of distinct tribal groups.

Late Prehistoric Period (1250 – 1673)

The Late Prehistoric Period is marked by the emergence of the Plains Village cultural context. The hallmarks of this cultural context included expanded agricultural practices, including crop diversification. Bison remained a key component of the diets and lifeways of people of the Late Prehistoric. Despite these commonalities, distinctive cultural groups continued to emerge, such as the Great Oasis, Mill Creek, and Oneota cultures. Each of these groups developed distinct pottery, lithics, lodgings, and cultural practices that can be used by modern archaeologists to link the populations of the past with modern descendant communities.

Historic (1673 – Present)

The initial contact between Native Americans and Europeans in Iowa first began through tribal trade networks. European trade goods arrived in the area before European traders and settlers, and quickly began to change the lives of the original inhabitants of the region. However, trade goods were not the only things exchanged at these meetings, as the European intrusion into the area also introduced new cultural practices as well as disease. Tribal communities were decimated by diseases, and the expansion westward of European traders, fur trappers, and settlers from the eastern coasts also forced relocations of tribal groups. Tribes originally from the Great Lakes region such as the Winnebago, Sauk, and Mesquakie (Fox) began to settle in Iowa in the 1700s, until the continued expansion of European and European-American settlers continued to push them westward (Schermer et al. 1995).

The land that would become Iowa was obtained by the United States in 1762. The establishment of military forts, fur trade posts, and the accessibility of the area by river travel intensified the European-American occupation of what would become Iowa. Iowa became a state in 1846, and portions of the state were opened to settlers shortly after. Small towns began to emerge throughout the state by 1850; these towns were connected through railroad networks that not only hastened settlement, but also exploitation of natural resources found within Iowa, such as coal. These changes further disenfranchised the Native American population of the state, pushing tribal groups out of their traditional homelands into other parts of the country and, over time, into reservations. The archaeological sites related to the historic period are distinctly different from earlier phases of human occupation in this part of the country, especially as manufactured goods became prevalent. Written histories and maps of the area also become more common, which allow for easier identification of historic site locations.

At the time of Euro-American expansion into Iowa, the lands around the confluence of the Raccoon and Des Moines Rivers were under the control of the Sauk and Mesquakie (Fox). This and other tribal lands in central Iowa were ceded to the United States in a treaty in 1842. In 1843, construction began on a military fort that would come to be known as Fort Des Moines, despite a previous fort bearing the same name. Settlers could claim land in central Iowa beginning in 1845, and the fort became the epicenter for settlers and traders. As Des Moines expanded outwards, the Des Moines River Valley, which had been an epicenter of human settlement since the retreat of the glacial ice sheets, continued to be developed commercially, residentially, and industrially.

2.1 Site File Search and Historic Inventory Search

A records search request was submitted to the Iowa Office of the State Archaeologist (OSA) for information regarding previously identified archaeological sites within or near the proposed project area. Colleen Randolph, OSA Records Manager, conducted the search of the Iowa Cultural Resources Site File and returned the results via email. The records search reported that no archaeological sites have been previously recorded within the project area or within 328 feet (100 meters) of the project area. The site file search did note that 45 archaeological sites have been identified within one mile of the project area. These sites are summarized in Table 1. A total of 21 locations were also identified in the Historic Indian Location Database (HILD) or as Notable Locations, which are sites identified in historic records that have not been definitively located through fieldwork. These locations are summarized in Table 2. One of these locations, HILD 1108, is depicted as including the western portion of the project area, though this location has not been verified within the project area through survey. The Site File search shows that two cultural resources surveys have previously been conducted within portions of the project area, and did not record cultural resources within the surveyed areas.

A Historic Inventory Search was conducted by Berry Bennett, SHPO Preservation Program Manager, for information regarding previously recorded historic-age structures recorded within or near the project area. This inventory reported information on hundreds of previously recorded structures within one mile of the project area, but did not identify historical-age structures recorded within the project area. None of the National Register of Historic Places (NRHP) eligible or listed districts that currently exist within downtown Des Moines cross through the proposed project area.

Table 1. Archaeology Sites Previously Recorded Within One Mile of the Project Area.

Site Number	Description	Approx. Distance from Project Area
13PK61	Multi-component prehistoric and historic site	0.75 mile
13PK349	Late Prehistoric and Woodland mounds	1 mile
13PK350	Late Prehistoric and Woodland mounds	1 mile
13PK372	Archaic isolated find; historic Euro-American structural remains; historic recreational	0.75 mile
13PK373	Historic Euro-American structural remains; historic recreational	0.75 mile
13PK375	Historic Euro-American industrial and military	1 mile

Phase IA Cultural Resources Survey

Des Moines Industrial ■ Des Moines, Iowa
 November 8, 2019 ■ Terracon Project No. 08197038



Site Number	Description	Approx. Distance from Project Area
13PK534	Historic Euro-American industrial	1 mile
13PK622	Historic Euro-American scatter	0.3 mile
13PK623	Historic Euro-American scatter	0.4 mile
13PK624	Historic Euro-American scatter	0.4 mile
13PK625	Historic Euro-American scatter	1 mile
13PK657	Historic Euro-American school	0.8 mile
13PK658	Historic Euro-American farm/residence	0.7 mile
13PK674	Historic Euro-American structural remains	0.75 mile
13PK839	Prehistoric isolated finds; historic Euro-American structural remains; railroad related; industrial	1 mile
13PK840	Isolated burials; historic Euro-American structure/building remains	0.2 mile
13PK856	Late Prehistoric artifact scatter; Late Woodland artifact scatter; historic farm/residence	1 mile
13PK860	Historic dump	0.6 mile
13PK861	Historic industrial	0.6 mile
13PK862	Historic cemetery	0.8 mile
13PK875	Historic Euro-American structure/building remains; historic Indian structure/building remains	0.25 mile
13PK876	Historic Euro-American structure/building remains; historic Indian structure/building remains	0.3 mile
13PK878	Historic Euro-American structure/building remains	0.75 mile
13PK879	Historic Euro-American structure/building remains	0.75 mile
13PK880	Historic Euro-American structure/building remains	0.8 mile
13PK881	Historic Euro-American military	0.75 mile
13PK884	Historic Euro-American railroad related	0.8 mile
13PK885	Woodland mounds; Late Prehistoric mounds	0.9 mile
13PK917	Historic farm/residence	0.75 mile
13PK918	Historic industrial	0.75 mile
13PK928	Historic Euro-American farm/residence	0.4 mile
13PK929	Historic Euro-American farm/residence	0.7 mile
13PK943	Historic dump	0.5 mile
13PK944	Historic Euro-American railroad related	0.75 mile
13PK951	Historic Euro-American cemetery	0.2 mile
13PK954	Historic Euro-American cemetery	0.75 mile
13PK958	Historic Euro-American cemetery	0.7 mile
13PK959	Historic Euro-American cemetery	0.3 mile
13PK966	Middle Archaic open habitation, village, prehistoric scatter, and isolated burials	1 mile
13PK972	Prehistoric isolated find	0.8 mile
13PK983	Historic Euro-American farm/residence	0.85 mile
13PK990	Historic dump; historic artifact scatter	0.5 mile
13PK1051	Historic Euro-American scatter	0.5 mile
13PK1073	Historic Euro-American scatter	0.2 mile
13PK1077	Historic Euro-American farm/residence; historic scatter	0.6 mile

Table 2. HILD and Notable Location Database Results Within One Mile of the Project Area.

Number	Description	Approx. Distance from Project Area
XX2	Des Moines Mound Terrace	1 mile
XX52	Fort Des Moines No.2 Buildings	1 mile
XX53	Fort Des Moines No. 2 Buildings	1 mile
XX139	Homeless camp	0.75 mile
XX140	Homeless camp	0.75 mile
XX677	Fort Des Moines Historical Site/Marker	1 mile
XX727	Handcart Trail – Des Moines River crossing	0.7 mile
XX6661	Lower Agency Cemetery/Agency Bottoms Cemetery/Old Eastside Cemetery	0.2 mile
XX6682	Location of an isolated pioneer burial discovered in the 1870s	0.5 mile
XX6562	Civil War Rendezvous Camp	0.25 mile
HILD 154	Sauk and Meskwaki Racetrack	1 mile
HILD 162	1834-5 Dragoon Camp; 1841 Sauk Meskwaki Camp	0.3 mile
HILD 159	Dirt Lodge trading post	0.75 mile
HILD 702	Trading post? 1841	0.6 mile
HILD 157	Fort Des Moines 2	1 mile
HILD 164	Phelps trading post T17	0.3 mile
HILD 155	Sauk and Meskwaki Games	0.9 mile
HILD 163	Raccoon Agency	0.25 mile
HILD 158	Ewing Post, Scott House	0.6 mile
HILD 1077	AIM Takeover, 1973	0.4 mile
HILD 1108	Huge Sauk and Meskwaki Camp 1841	0 mile

A series of historic plat maps and atlases were examined via the Historic Map Works (2019) website for information on possible historic site locations. A total of seven such maps were examined (Andreas 1875, Hixson 1930, Huebinger 1904, Kenyon 1914, McVicker 1872, Stacy 1947, and Warner and Foote 1885). These atlases and plat maps depict the development of much of the project area as a railroad corridor beginning in 1872 and continuing to the present day. One General Land Office (GLO) survey map accessed through the Bureau of Land Management's online GLO database depicts the project area as primarily consisting of wetlands in 1848. Several attempts were made to locate Sanborn Fire Insurance maps, which included the proposed project area, but none were able to be identified. Copies of the examined atlases and plat maps are included in Appendix B, Figures 1 through 8.

A series of United States Geological Survey 7.5' Topographic quadrangles dating from 1905 to 2018 were also examined for possible historic site locations. Like the historical atlases and plat maps, the topographic maps depict the project area as primarily containing wetlands, undeveloped land, and a series of railroad lines. The Des Moines SE (1956, photorevised 1967, 1971, and 1976) quadrangle depicts seven structures along the southern boundary of the project area. Aerial photographs show these structures were no longer extant by 1990.

A series of historic aerial photographs dating from the 1930s to the present were also examined. From 1930 to 1960, the project area primarily consists of undeveloped land that is bisected by railroad lines, Highway 69, and some smaller streets. In 1950, the remnants of some sort of development can be seen in the western portion of the project area, and the disturbances caused by this development are seen until aerial photographs from the 1980s. In aerial photographs from 1970, tree clearing is evident within the eastern portion of the project area, and the seepage basins within the central portion of the project area are evident. These excavations continue and expand into the 1980s. Aerial photographs from the 1980s also depict the eastern half of the project area beginning to be used as a junk yard. This business was active until 2011, and remnants of it are still evident within the project area. From the 1980s, a tree line was developed along the northern portion of the project area, and aerial photographs show several episodes of tree removal and regrowth are evident.

3.0 FIELDWORK METHODS

Given the findings and recommendations of the geoarchaeological survey, a Phase IA pedestrian survey was conducted of the project area. Parallel pedestrian transects were conducted throughout the project area. Interval widths of 5 meters or smaller were used to investigate areas with low ground surface visibility and within wooded areas. A larger interval of 15 meters was used in the portions of the project area with high ground surface visibility and in areas where pedestrian surveys have been previously conducted. Suzanne Reece, MSc, RPA, served as Principal Investigator, and fieldwork was conducted with the assistance of Samantha Hunt, Archaeological Crew Chief. The pedestrian survey was conducted on October 23 and 24, 2019.

Photographs were taken of notable ground surface disturbances, structural remains, and significant debris piles. Field notes were also taken, which noted areas of ground disturbances, active infrastructure, and general field conditions. Locations of active utilities were marked prior to the pedestrian survey. Overview photographs of the proposed project area can be seen in Appendix C, Figures 1 through 8.

4.0 RESULTS

The pedestrian survey found evidence of extensive ground disturbances throughout the project area. While some of these ground disturbances—such as the initial construction and utilization of the railroad line running through the property—occurred during the historical period, more modern disturbances are prevalent. Such disturbances include the continued utilization of the project area by modern railroads, prior construction and demolition of structures, utility and rainwater control infrastructure construction and expansion, and a large junkyard, which occupied the eastern half of the project area. The junkyard was not cleaned up entirely when it went out of business, and evidence of buried scrap metal and other trash was evident. Push piles of debris and soil were also noted throughout the project area.

The lack of integrity seen at the ground surface was established to extend into subsurface conditions by the geoarchaeological report, which found extensive fill deposits overlying the natural soils within the project area. This report also found that conditions within the project area both in the prehistoric and historical periods would have not been conducive to human occupation, as the landscape was primarily wetlands or marsh. The disturbances documented in both the Phase IA and geoarchaeological examination of the project area suggest that it is unlikely for intact cultural deposits to be present which can be encountered or identified through standard survey methodologies. If extant archaeological resources are present, they are deeply buried and only accessible through extensive mechanical excavation of the fill soils within the project area.

5.0 MANAGEMENT RECOMMENDATIONS

A total of 40 acres were surveyed in Des Moines, Polk County, Iowa ahead of the construction of a proposed railroad transfer station. No historic properties have been identified within the project area either through a records search, geoarchaeological survey, or the current Phase IA cultural resources survey. The geoarchaeological work conducted for the proposed project found that extensive fill soils are present within the project area. Given this, it is unlikely that the proposed project will encounter natural soil deposits during the planned construction, and as a result, there is little chance of encountering intact cultural deposits within the available portions of the project area. As such, a determination of *no historic properties affected* is recommended for the proposed project area. Terracon recommends no further cultural resources work and that the project be allowed to proceed as planned.

Prepared by:



Suzanne Reece, MSc, RPA
Principal Investigator – Archaeology

Authorized Project Reviewer:

for

Ann M. Scott, PhD, RPA
Cultural Resources Group Manager

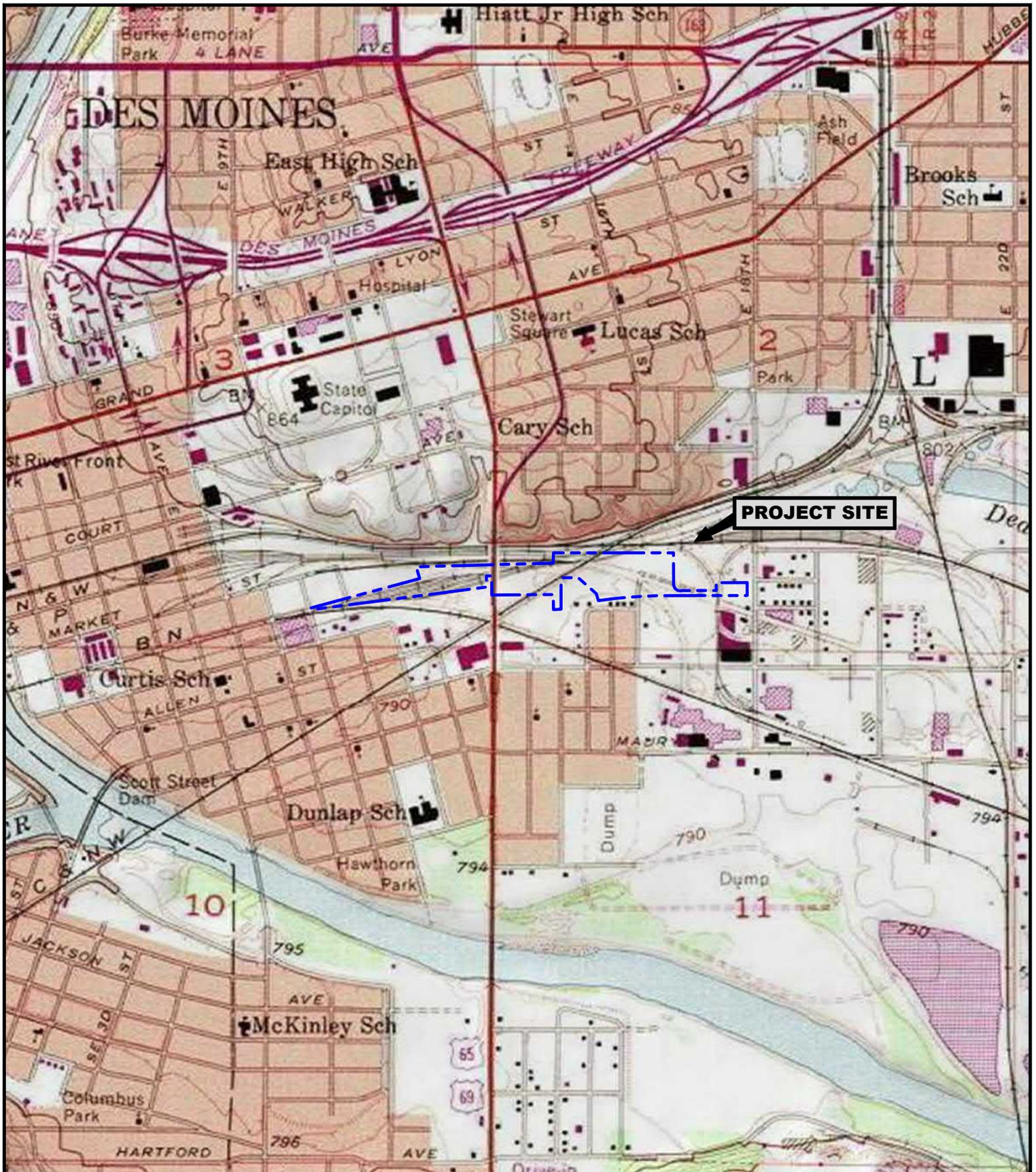
6.0 REFERENCES

- Andreas, A.T.
1875 *Illustrated Historical Atlas of the State of Iowa*. A.T. Andreas, Chicago.
- Association of Iowa Archaeologists (AIA)
2018 *Association of Iowa Archaeologists Guidelines*. Association of Iowa Archaeologists, Iowa City, Iowa.
- Bettis, E. Arthur, III
1990 *The Deforest Formation of Western Iowa: Lithologic Properties, Stratigraphy, and Chronology*. Iowa Department of Natural Resources, Des Moines, Iowa.
- Bettis, E. Arthur, III, and Richard G. Baker, William R. Green, Mary K. Whelan, and David W. Benn
1992 *Late Wisconsinan Holocene Alluvial Stratigraphy, Paleocology, and Archaeological Geology of East-Central Iowa*. Iowa Quaternary Studies Group for the Iowa Department of Natural Resources, Des Moines, Iowa.
- Bettis, E. Arthur III, and David W. Benn
1984 *An Archaeological and Geomorphological Survey in the Central Des Moines River Valley, Iowa*. *Plains Anthropologist* 29: 211-227.
- Bettis, E. Arthur III, and Bernard E. Hoyer
1986 *Late Wisconsinan and Holocene Landscape Evolution and Alluvial Stratigraphy in the Saylorville Lake Area, Central Des Moines River Valley, Iowa*. Iowa Geological Survey, Iowa City, Iowa.
- Bureau of Land Management
2019 *General Land Office Records*. Bureau of Land Management, United States Department of the Interior. Washington, D.C. <https://gloreCORDS.blm.gov/>.
- Huebinger, M., and Company
1904 *Atlas of the State of Iowa*. M. Huebinger and Company, Davenport, Iowa.
- Kenyon Company
1914 *Atlas and Plat Book of Polk County, Iowa*. The Kenyon Company, Des Moines, Iowa.
- Mandel, Rolfe D.
1982 *Geomorphic Investigations of the CBD Loop Arterial Project Area. Phase I Cultural Resources Investigation of the CBD Loop Arterial Project Area*. Brice, Petrides, and Associates, Waterloo, Iowa.

- McVicker, Geo A.
1872 *Map of Polk County, Iowa.* Geo A. McVicker, Chicago.
- Natural Resources Conservation Service (NRCS)
2000 *Soil Survey of Polk County, Iowa.* Natural Resources Conservation Service, Washington, D.C.
- 2019 Web Soil Survey. Natural Resources Conservation Service, Washington, D.C. <https://websoilsurvey.sc.egov.usda.gov/>
- Office of the State Archaeologist (OSA)
2019 *The Geoarchaeology of Iowa's Stream Valleys.* Office of the State Archaeologist, Iowa City, Iowa.
<http://archaeology.uiowa.edu/geoarchaeology-iowas-stream-valleys>
- Prior, Jean C.
1991 *Landforms of Iowa.* University of Iowa Press, Iowa City, Iowa.
- Schermer, Shirley J., William Green, and James M. Collins
1995 *A Brief Cultural History of Iowa.* University of Iowa, Iowa City, Iowa.
- Scott, Brandon K.
2019 *Geoarchaeological Investigations for the Proposed Des Moines Transload Facility along Martin Luther King Jr. Parkway, Sections 2 and 3, T78N, R24W, Lee Township, City of Des Moines, Polk County, Iowa.* Impact7G for Terracon, Clive, Iowa.
- Stacy Map Publishers
1947 *Stacy's Farm Plat Book of Polk County, Iowa.* Stacy Map Publishers, Rockford, Illinois.
- United States Geological Survey (USGS)
1956 *Des Moines SE, Iowa. 7.5 Minute Topographic.* Photorevised 1967, 1971, and 1976. United States Geological Survey, Washington, D.C.
- Warner, Geo. E., and C.M. Foote
1885 *Plat Book of Polk County, Iowa.* Warner & Foote, Minneapolis,

APPENDIX A

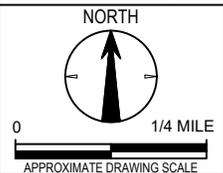
Project Maps



TOPOGRAPHIC IMAGE FROM IOWA GEOGRAPHIC MAP SERVER MAINTAINED BY IOWA STATE UNIVERSITY AND MIT - <http://cairo.gis.iastate.edu/map.html>

LEGEND

 - BOUNDARY OF ASSESSED AREA



Project No:	Date:
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Project Mng:	Drawn By:
JAH	JAL
File Name:	
08197038-T1.dwg	
Layout Name:	
E2	

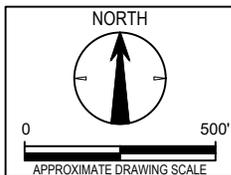
Terracon
Consulting Engineers and Scientists

600 SW 7TH STREET DES MOINES, IOWA 50309
PH. (515) 244-3184 FAX. (515) 244-5249

TOPOGRAPHIC SITE MAP	EXHIBIT
DES MOINES INDUSTRIAL - TRANSLOAD CENTER 200 SE 15TH STREET DES MOINES, IOWA	1



AERIAL PHOTO FROM GOOGLE EARTH



Project No:	Date:
08197038-T1	11/4/2019
Project Mng'r:	Drawn By:
JAH	JAL
File Name:	
08197038-T1.dwg	
Layout Name:	
E3	

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LEGEND

— — — — — BOUNDARY OF ASSESSED AREA

SITE DIAGRAM	EXHIBIT 2
DES MOINES INDUSTRIAL - TRANSLOAD CENTER 200 SE 15TH STREET DES MOINES, IOWA	

LEGEND

-  EXISTING PROPERTY LINE
-  EXISTING LOT LINES
-  PROPOSED DMI PROPERTY LINE
-  EXISTING NS AND UP TRACK
-  EXISTING BNSF TRACK
-  EXISTING IAISRR TRACK
-  PROPOSED INDUSTRY TRACK
-  PROPOSED PAVEMENT
-  EXISTING CONCRETE PAVEMENT
-  PROPOSED DRAINAGE BASIN

RAIL

- 12,650 FEET OF PROPOSED TRACK
- 13 INTRA-TERMINAL SWITCHES
- DIRECT INTERCONNECTS NSRR & IAISRR

SALT BLDG

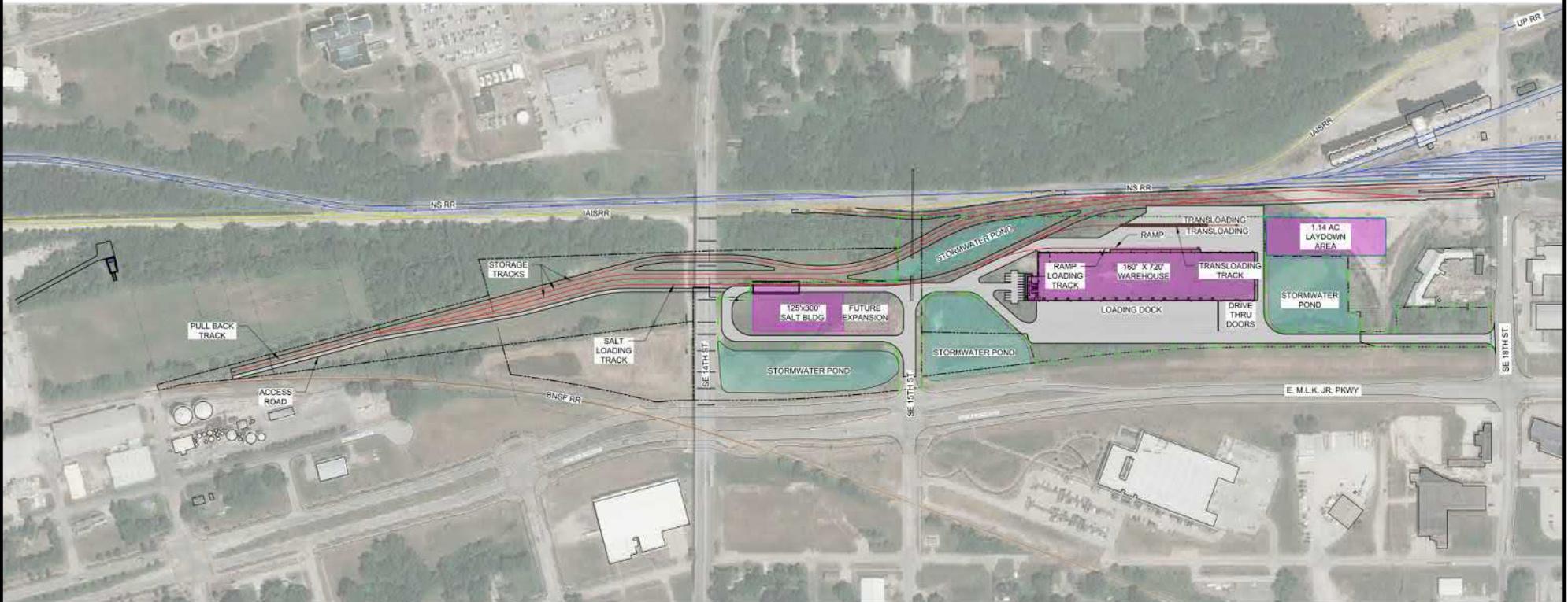
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- 37,500 SF
- EAVE = 12", PEAK= 50'
- STORAGE=15,120 TON

SALT BLDG ADDITION

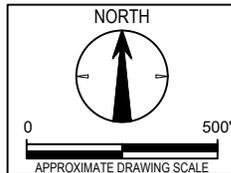
- STEEL FRAME. = 125'x150'
- 18,750 SF
- EAVE = 12", PEAK= 50'
- STORAGE=9,360 TON

WAREHOUSE/OFFICE

- PRECAST CONC. = 160'x720'
- 115,200 SF
- EAVE = 38'



BASE DRAWING BY VAA



Project No: 08197038-T1	Date: 11/4/2019
Project Mngr: JAH	Drawn By: JAL
File Name: 08197038-T1.dwg	
Layout Name: E5	

Terracon
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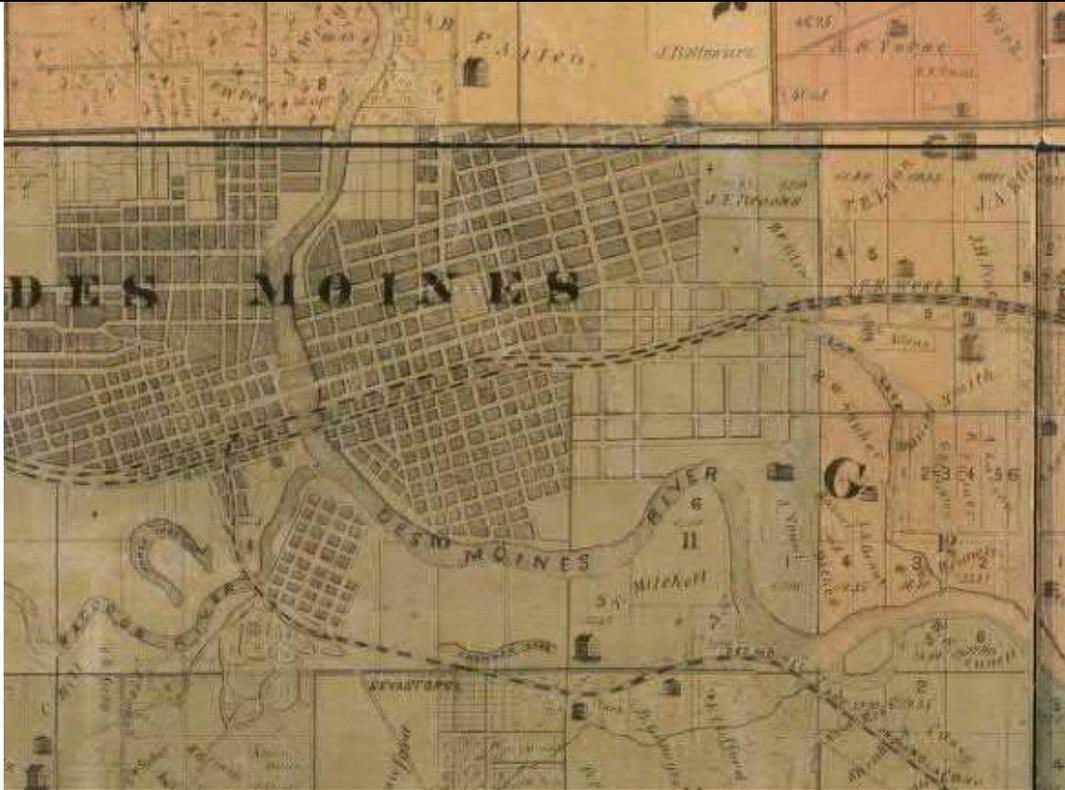
600 SW 7TH STREET DES MOINES, IOWA 50309
PH. (515) 244-3184 FAX. (515) 244-5249

OVERALL PRELIMINARY SITE LAYOUT
DES MOINES INDUSTRIAL - TRANSLOAD CENTER 200 SE 15TH STREET DES MOINES, IOWA

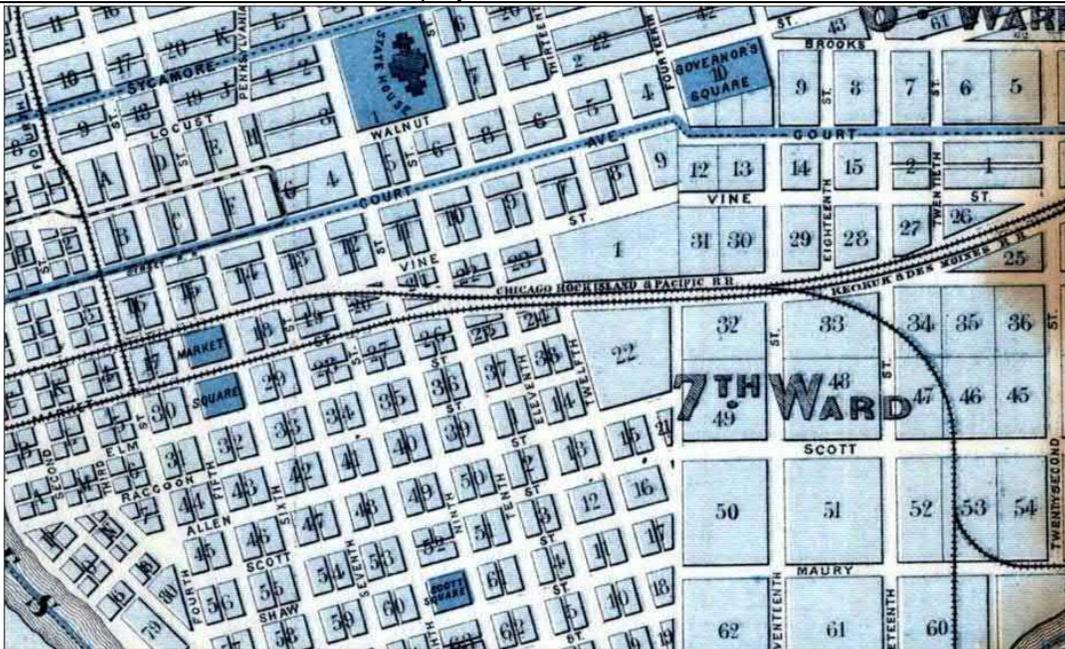
EXHIBIT
3

APPENDIX B

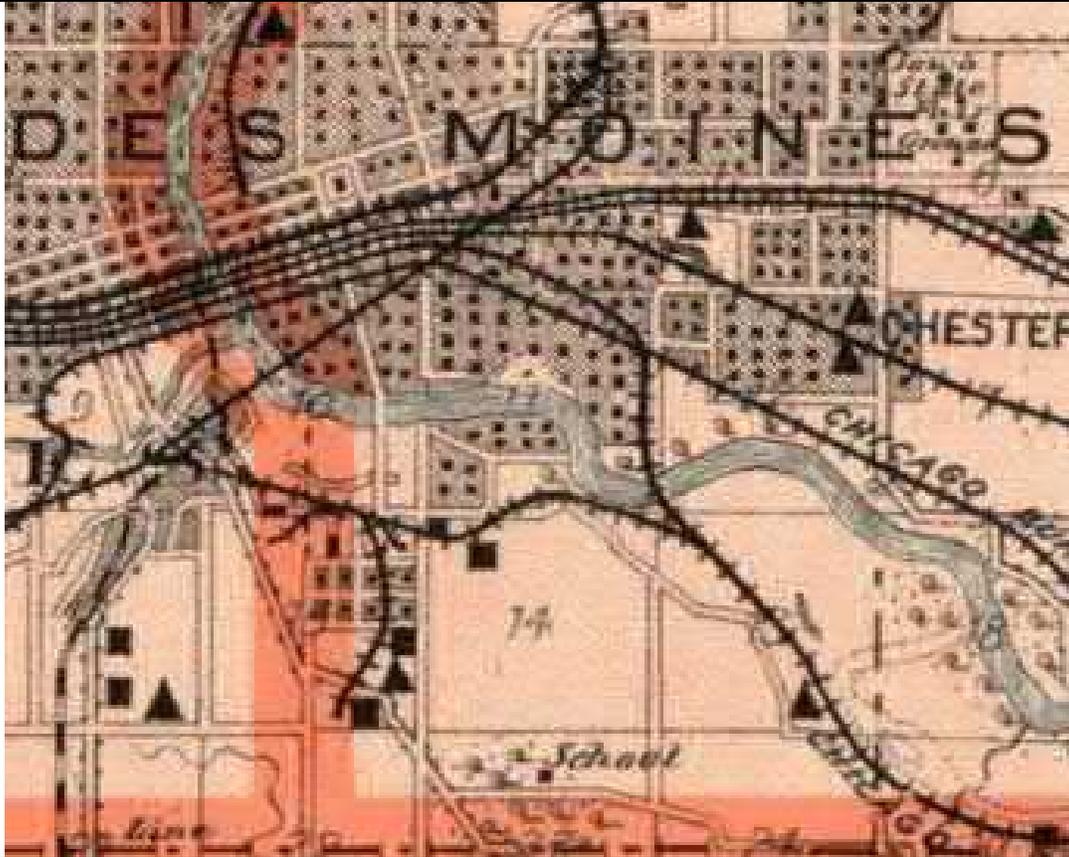
Historical Atlases and Plat Maps



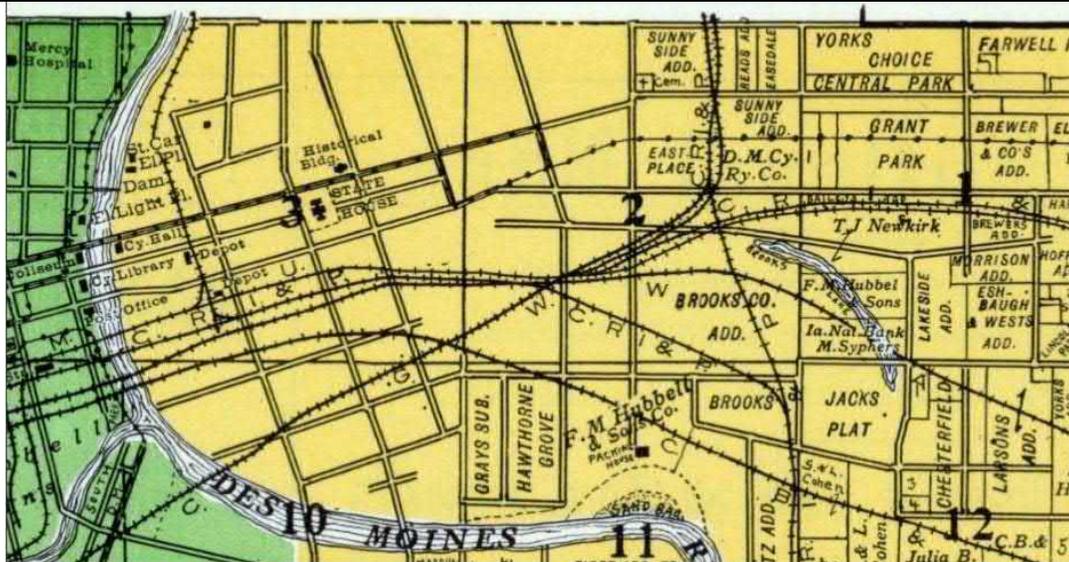
3. Detail of the project area as shown on McVicker 1872.



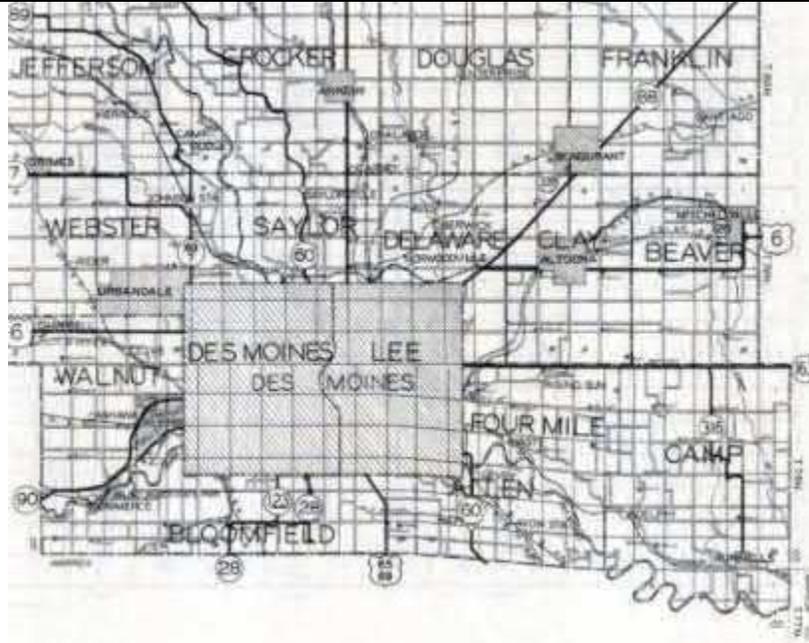
4. Detail of the project area as shown on Andreas 1875.



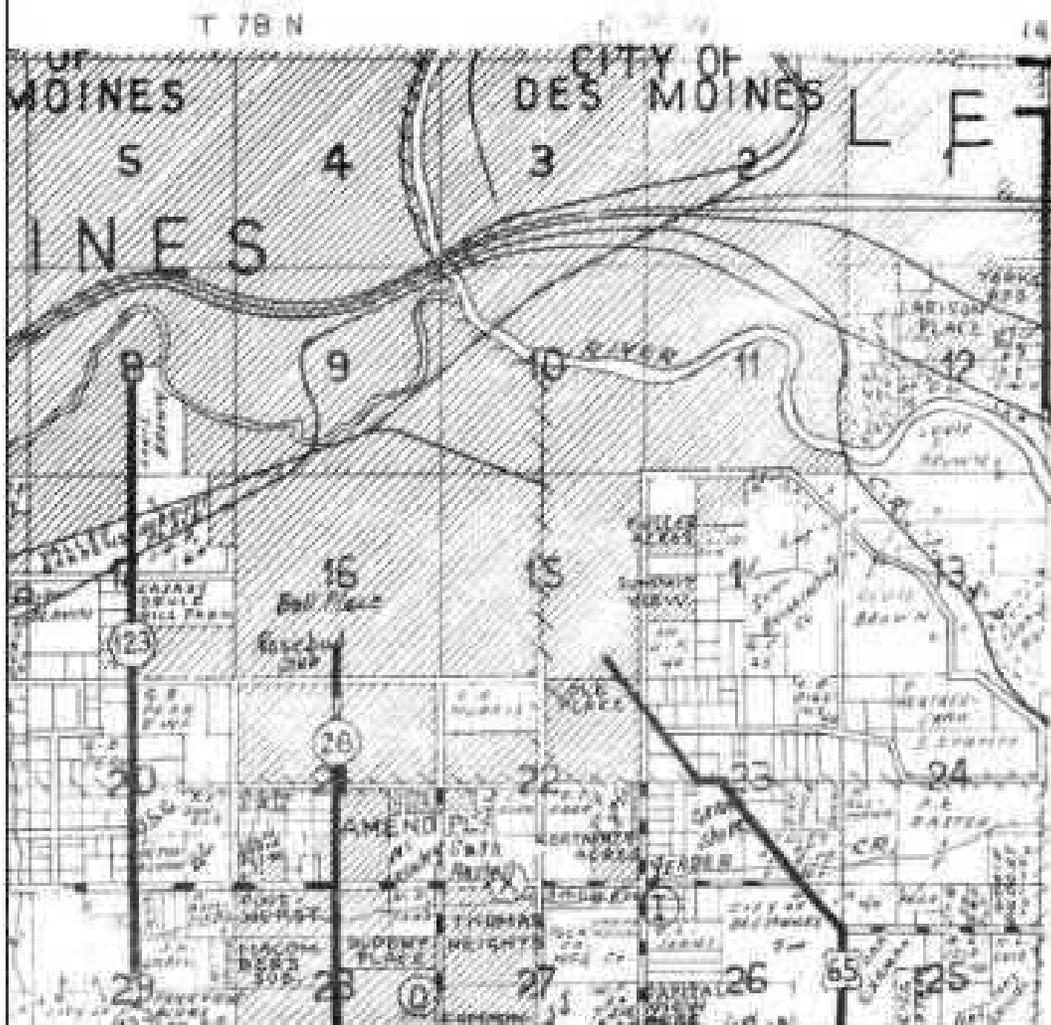
5. Detail of the project area as shown on Huebinger 1904.



6. Detail of the project area as shown on Kenyon 1914.



7. Detail of the project area as shown on Hixson 1930.



8. Detail of the project area as shown on Stacy 1947.

APPENDIX C

Project Photographs



1. Overview of the project area showing modern and historic debris, facing southeast.



2. Overview of the project area including railroad, facing north.



3. Overview of a wetland/seepage basin, view to the west.



4. Overview of a wetland/seepage basin, view to the west.



4. Overview of a wetland/seepage basin, view to the south.



5. Overview of an existing borrow area, view to the south.



6. Push pile of debris and rubble, view to the west.



7. Drainage channel that has been filled with debris, view to the west.



8. Cement and brick debris pile, view to the north.

APPENDIX D

National Archaeological Database (NADB) Form

NADB – REPORTS CITATION FORM

Complete items 3 and 5-14. The State Historic Preservation Office will record information for items 1 through 4.

1. DOCUMENT NO. _____

2. SOURCE _____ AND SHPO – ID _____

3. FILED AT

4. UTM COORDINATES

Zone _____	Easting _____	Northing _____
Zone _____	Easting _____	Northing _____
Zone _____	Easting _____	Northing _____
Zone _____	Easting _____	Northing _____
Zone _____	Easting _____	Northing _____
Zone _____	Easting _____	Northing _____

Continuation, see 14.

5. AUTHORS Reece, Suzanne

6. YEAR 2019 _____

Year published.

7. TITLE Phase I Cultural Resources Survey of a Proposed Railroad Transload Facility, Sections 2 and 3, T78N, R24W, Des Moines, Polk County, Iowa

7. PUBLICATION TYPE (circle one)

1. Monograph or Book
2. Chapter in a Book or Report Series
3. Journal Article
4. Report Series
5. Dissertation or Thesis
6. Paper presented at a Meeting
7. **Unpublished or Limited Distribution Report**

8. Other

9. INFORMATION ABOUT PUBLISHER/PUBLICATOIN

Follow the American Antiquity style guide for the type of publication circled.

10. STATE/COUNTY (Referenced by report. Enter as many states, counties, or towns, as necessary. Enter all, if appropriate. Only enter Town if the resources considered are within the town boundaries.)

STATE 1 Iowa COUNTY Polk TOWN Des Moines

STATE 2 _____ COUNTY _____ TOWN _____

STATE 3 _____ COUNTY _____ TOWN _____

Continuation, see 14.

11. WORKTYPE (circle all code numbers that are appropriate)

- 0 General Management Plan/Environmental Document
- 1 Cultural Resources Research Plan
- 2 Statement for Management
- 3 Outline of Planning Requirements
- 4 Cultural Resources Preservation Guide
- 5 Development Concept Plan
- 6 New Area Study/Reconnaissance Study
- 7 Boundary Study
- 8 Interpretive Prospectus
- 9 Special Planning/Management Study
- 10 Historical Study
- 11 Primary Document – Original
- 12 Primary Document – Translation
- 13 Advertisement
- 14 Popular Culture/History Document
- 15 Journal/Periodical
- 20 Historical Resource Study
- 21 Historical Base Map

- 22 Historical Handbook Text
- 23 Park Administrative History
- 24 Special History Study
- 30 Archeological General Considerations
- 31 Archeological Overview and Assessment
- 32 Archeological Identification Study (Phase I)**
- 33 Archeological Evaluation Study (Phase II)
- 34 Archeological Data Recovery (Phase III)
- 35 Archeological Collections and Non-Field Studies
- 36 Socio-Cultural Anthropology Study
- 37 Social Impact Statement
- 38 Ethnohistory Study
- 39 Special Archeology/Anthropology Study
- 40 Field Reconnaissance, Sampling**
- 41 Field Reconnaissance, Intensive
- 42 Paleo-environmental Research
- 43 Archeometrics
- 44 Archeoastronomical Study
- 46 Remote Sensing
- 47 Archeozoological Study
- 48 Archeobotanical Study
- 49 Bioarcheological Study
- 50 Historic Buildings Report-Beginning February 1956
- 51 Historic Buildings Report After February 1957-Part I
- 52 Historic Buildings Report-Part II
- 54 Historic Buildings Report-After March 1960-Part III
- 56 HSR-Administrative Data-After December 1971
- 57 HSR-Historical Data
- 58 HSR-Archeological Data
- 59 HSR-Architectural Data
- 61 Historic Structures Preservation Guide-After December 1971
- 62 Historic Structures Report-After October 1980
- 63 Cultural Landscape Report (Historic Grounds Report)
- 64 Ruins Stabilization and Maintenance Report
- 70 Scope of Collection Statement
- 71 Historic Furnishings Report-After October 1980
- 72 Collection Condition Survey
- 73 Collection Storage Plan
- 82 Collection Management Plan (Collection Preservation Guide)
- 83 Special Curatorial Study
- 84 Archeological Field Work, Indeterminant
- 85 Archeological Survey, Indeterminant
- 86 Field Reconnaissance, Minimal
- 87 Underwater Survey
- 88 Resource/Site Based Work, Indeterminant
- 89 Minimal/Informal Site Visitation
- 90 Oral History
- 91 Subsurface Activity, Indeterminant

- 92 Testing/Limited Excavation
- 93 Major Excavation
- 94 Underwater Resource/Site Based Work
- 95 Artifact/Collection Based Study/Report
- 96 Literature Synthesis/Review/Research Design
- 97 Intensive Determination of Surface Characteristics
- 98 Environmental Research
- 99 Geomorphological Study
- 100 Geological Study
- 101 Paleontological Study
- 102 Population Reconstruction
- 103 Rock Art Study
- 104 Architectural Photography
- 105 Architecture Site Plan
- 106 Architectural Floor Plan
- 107 HABS Drawing
- 108 Physical Anthropology Study
- 109 Boat Survey
- 110 Other (Furnish a Keyword in Keyword Category 1 to identify the nature of this study.)

12. KEYWORDS and KEYWORD CATEGORIES

- 0 Types of Resources (or “no resources”)
- 1 Generic Terms/Research Questions/Specialized Studies
- 2 Archeological Taxonomic Names
- 3 Defined Artifact Types/Material Classes
- 4 Geographic Names or Locations
- 5 Time
- 6 Project Name/Project Area
- 7 Other keywords

Enter as many keywords (with the appropriate keyword category number) as you think will help a person (1) who is trying to understand what the report contains or (2) who is searching the database for specific information. Whenever appropriate, record the number of acres studied in a document.

Des Moines	[4]	Iowa	[4]		[]
Des Moines River	[4]		[]		[]
Railroad	[0]		[]		[]
	[]		[]		[]
	[]		[]		[]
	[]		[]		[]
	[]		[]		[]
	[]		[]		[]

Continuation, see 14.

13. FEDERAL AGENCY FRA

14. CONTINUATION/COMMENTS (include item no.) _____

FORM COMPLETED BY

Name Suzanne Reece, MSc, RPA Date 11/8/2019

Address 955 Wells Street, Suite 100

City St. Paul State Minnesota

Zip 55106

Telephone Number 651-225-5298

APPENDIX E

Resumes

SUZANNE REECE, MSC, RPA

PRINCIPAL INVESTIGATOR - ARCHAEOLOGY

PROFESSIONAL EXPERIENCE

Ms. Reece is an Archaeologist and Principal Investigator with Terracon's Minneapolis-St. Paul office. Ms. Reece has worked as a Secretary of the Interior-qualified Archaeological Principal Investigator throughout the Midwest for the past five years. She has planned, managed, and conducted numerous cultural resources surveys for both public and private clients ranging from individual landowners to federal agencies. Ms. Reece has expertise in the areas of historical research, pedestrian and subsurface archaeological investigations, human and animal skeletal analysis, artifact identification and curation, as well as mitigation of disturbances to archaeological sites. She also has extensive experience in evaluation of historic structures and archaeological sites for National Register of Historic Places (NRHP) eligibility.

PROPERTY DEVELOPMENT

Ms. Reece has done extensive work with both private and public sector clients assessing proposed site locations for cultural resources. Her work has helped clients avoid costly delays by identifying archaeological sites and historic properties prior to land purchases and the start of construction. She has conducted literature searches (desktop reviews), intensive Phase I and Phase II surveys, and archaeological monitoring of construction activities in support of site selection and property development projects. Some of the property development and site selection projects Ms. Reece has worked on include: residential developments, municipal and state land purchases, industrial park developments, and wetland mitigation banks.

INFRASTRUCTURE DEVELOPMENT

Ms. Reece has planned and conducted numerous cultural resources surveys related to the repair, replacement, and creation of modern infrastructure. She has conducted literature searches (desktop reviews) for utility installations within road rights-of-way, as well as intensive Phase II surveys and Phase III treatment plans for waterline, sewer line, telecommunication, and flood mitigation projects. While conducting these surveys, Ms. Reece has also gained experience in identifying and documenting historic structures and historic districts.

MUNICIPAL, STATE, AND FEDERAL PROPERTY

Ms. Reece has conducted many cultural resources studies on public lands owned by a government entity. In conducting these projects, she has played a role in obtaining the necessary state and federal archaeological permits, overseen compliance with permit stipulations, and conducted and documented the resulting fieldwork. She has conducted archival research, Phase I reconnaissance surveys and intensive Phase II surveys, mortuary feature relocation surveys, Phase III treatment plans and investigations, and archaeological monitoring for projects on public land.

TRANSPORTATION IMPROVEMENTS

Ms. Reece has lead cultural resources planning efforts and fieldwork for numerous transportation improvement projects which require compliance with state or federal historic preservation laws. These projects have included improvements to railways, road construction and expansion, highway erosion and floodwater mitigation studies, as well as cultural resources oversight of soil borrow project areas. She has conducted research and prepared reports on the historic significance of structures such as bridges and culverts and how to mitigate their loss of historic integrity during repairs or replacements.

PROJECT EXPERIENCE

Ms. Reece has conducted extensive archaeological work for the South Dakota Department of Game, Fish, and Parks, including work at Lake Herman State Park, Oakwood Lakes State Park, and Good Earth State Park. Particularly of note, she has served as the osteologist on-site or on-call for numerous construction projects conducted within the Blood Run National Historic Landmark Site located within Good Earth State Park. Ms. Reece was also the Principal Investigator for all stages of the investigation of a prehistoric, Split Rock Creek chert quarry site (39MH98) in South Dakota. Investigation and documentation of this site spanned a total of three years, and included hundreds of hours of fieldwork, report preparation, and curation of recovered artifacts.

EDUCATION

Master of Science,
Osteoarchaeology, University of
Edinburgh, 2013.

Bachelor of Arts, Honors
Anthropology, University of
Minnesota, 2011.

AFFILIATIONS

American Association of Physical
Anthropologists (AAPA)

International Council for
Archaeozoology (ICAZ)

Register of Professional
Archaeologists (RPA)

WORK HISTORY

Terracon Consultants, Inc.,
Minneapolis-St. Paul, Minnesota.
Principal Investigator –
Archaeologist, 2018-Present.

Kogel Archaeological Consulting
Services, Sioux Falls, South Dakota.
Principal Investigator, 2013-2018.

University of Edinburgh, Edinburgh,
Scotland. Osteoarchaeologist, 2013.

University of Minnesota, Minneapolis,
Minnesota. Laboratory Intern, 2010;
Excavator, 2008.

PRESENTATIONS

"Introduction to Cultural Resources
Management for Professionals"
American Institute of Architects
approved Continuing Education
Seminar, 2018.

"Introduction to Cultural Resources
Management" presented at Riverland
Community College, 2016.

"Actualistic Studies in Bone
Breakage: A Comparative Analysis of
Fracture Angle Measurement
Techniques" presented at the
University of Oxford Graduate
Archaeology Conference, 2013.

"Examining Bone Breakage in Faunal
Remains" presented at the University
of Minnesota Undergraduate
Anthropology Conference, 2011,

Samantha Hunt

**ARCHAEOLOGICAL CREW CHIEF,
NATURAL AND CULTURAL RESOURCES**

PROFESSIONAL EXPERIENCE

Ms. Hunt is a Crew Chief with the Cultural Resources Department at Terracon's Des Moines, IA office, formally of the Columbia, SC office. She has been working in the Cultural Resource field since 2014 and graduated with her Bachelor of Art degree from the University of Northern Iowa in 2015. Her job responsibilities include conducting archaeological field surveys, lab management, artifact analysis, GIS, report preparation, and equipment management. Ms. Hunt has worked in the eastern and mid-western United States as well as Colorado and Arizona conducting archaeological monitoring, Phase I Surveys, Phase II Evaluative Testing, and Phase III Data Recovery Projects. Additionally, Ms. Hunt is currently pursuing a master's degree in Cultural Resource Management at Adam's State University in Alamosa, Colorado.

PROJECT EXPERIENCE

ARCHAEOLOGICAL DATA RECOVERY PROJECTS

Smith Mountain Lake Data – Bedford and Pittsylvania Counties, Virginia

Artifact analyst, field technician, and GIS data collaborator for data recovery and Phase II excavations at seven prehistoric sites ranging from Paleoindian to Woodland periods in Bedford and Pittsylvania counties, Virginia.

59LBR Logistics Data Recovery - Phoenix, Arizona

Field technician for an archaeological data recovery at site 59LBR, a Hohokam occupation site, in Phoenix, Arizona.

Yellow House Creek - Berkeley County, South Carolina

Laboratory technician for an archaeological data recovery of sites 38BK1800/1801/1803/1804 located in Berkeley County, SC. These multicomponent sites range from Late Archaic to 18th- 19th century.

***University of Northern Iowa Field School - Cedar Falls, Iowa**

Participant in the field school of a prehistoric Woodland site at Hartman Reserve Nature Center in Cedar Falls, Iowa. This site was used to fulfill requirements for a Bachelor of Arts degree.

***Plum Grove Field School - Iowa City, Iowa**

Participant in the Plum Grove Field School of the historic 19th century house site 13JH31, the home of first territorial governor of Iowa Robert Lucas.

CULTURAL RESOURCE SURVEY AND TESTING PROJECTS

Trolley Road Apartments Phase I – Dorchester, South Carolina

Crew Chief for a phase I cultural resource investigation of approximately 14 acres for proposed apartment site in Dorchester, South Carolina.



EDUCATION

Master of Art, Cultural Resource Management, Adam's State University, currently pursuing

Archaeology and GIS Certificate, Sanisera Institute of Archaeology, 2015

Bachelor of Art, Anthropology-Archaeology, University of Northern Iowa, 2015

AFFILIATIONS

Archaeological Society of South Carolina

PROFESSIONAL TRAINING

OSHA 10-hr. Construction Awareness Training, 2017

CPR, AED, and Basic First Aid, 2017

WORK HISTORY

Terracon Consultants, Inc., Crew Chief, 2016-Present

Rivanna Archaeological Services, LLC, Archaeological Field Technician, 2015-2016

TRC Environmental, Archaeological Field Technician, 2014-2015

Environment and Archaeology LLC, Archaeological Field Technician, 2015

HRA Gray & Pape, Junior Archaeological Field Technician, 2015

GAI Consultants, Archaeological Field Technician, 2014

University of Iowa Natural History Department, Volunteer, 2012

Living History Farms in Des Moines, IA, Volunteer, 2007

** Work performed prior to joining Terracon.*

Samantha Hunt (continued)

Sunflower County Solar Reconnaissance – Sunflower County, Mississippi

Crew Chief for a reconnaissance-level cultural resource investigation of approximately 1,970 acres at the proposed Sunflower County Solar site in Sunflower County, Mississippi.

Garden of the Gods Monitoring – Colorado Springs, Colorado

Cultural resource monitor for the Garden of the Gods flood mitigation project in Colorado Springs, Colorado.

Finklea Mine Reconnaissance – Effingham, South Carolina

Crew Chief and artifact analyst for a reconnaissance-level cultural resource investigation of approximately 65 acres for a proposed mine expansion in Florence County, South Carolina.

Greensville Solar Phase I & II - Emporia, Virginia

Crew Chief and artifact analyst for a Phase I cultural resource investigation of approximately 1,330 Acres and Phase II of multicomponent sites 44GV177/179 at the proposed Greensville County Solar Project in Greensville County, Virginia.

Middle Tennessee Megasite Phase I - Adams, Tennessee

Field Technician for a Phase I cultural resource investigation of approximately 1,700 Acres at the proposed Middle Tennessee Megasite in Montgomery and Robertson Counties, Tennessee.

Willow Oak Reconnaissance - Kershaw, South Carolina

Field Technician for a reconnaissance-level cultural resource investigation of approximately 170 acres for a proposed quarry expansion in Kershaw County, South Carolina.

Salisbury Site Phase II - Summerville, South Carolina

Field Technician and artifact analyst for a Phase II evaluative testing at site 38BK1911 in Berkeley County, South Carolina.

Williamsburg Replacement Hospital Reconnaissance - Williamsburg County, South Carolina

Crew Chief for a reconnaissance-level cultural resource investigation of approximately 40 acres at the proposed Williamsburg Replacement Hospital in Williamsburg County, South Carolina.

59LBR Logistics Archaeological Testing Phase II - Phoenix, Arizona

Field Technician for a Phase II cultural resource investigation at site 59LBR, a Hohokam occupation site, in Phoenix, Arizona.

LG&E Penile-Preston Pipeline Phase I - Louisville, Kentucky

Field technician for a Phase I cultural resource investigation of approximately seven miles for a proposed pipeline replacement
in Jefferson County, Kentucky.

Midland-Wiregrass Solar Phase I - Midland City, Alabama

Field technician and artifact analyst for a Phase I cultural resource investigation of approximately 648 acres for a proposed solar farm located
in Dale County, Alabama.

Brunswick Forest Subdivision Phase I - Leland, South Carolina

Field Technician and artifact analyst for Phase I cultural resource investigation of approximately 813 acres of Brunswick Forest in Leland, North Carolina.

LG&E Preston-Piccadilly Pipeline Phase I - Louisville, Kentucky

Field Technician for Phase I cultural resource investigation of approximately six miles for a proposed pipeline replacement in Jefferson County, Kentucky.

Samantha Hunt (continued)

Cambridge Oaks Apartments Phase I - Cleveland County, North Carolina

Crew Chief for a Phase I cultural resource investigation of approximately 12 acres at the proposed Cambridge Oaks Apartments in Cleveland County, North Carolina.

Locust Grove Apartments Phase I - Stanly County, North Carolina

Crew Chief for a Phase I cultural resource investigation of approximately 10 acres at the proposed Locust Grove Apartments in Stanly County, North Carolina.

Seabrook Solar Reconnaissance - Lobecco, South Carolina

Field Technician for a reconnaissance-level cultural resource investigation of approximately 410 acres for a proposed solar farm in Beaufort County, South Carolina.

Chesapeake Solar Phase I - Chesapeake, Virginia

Field Technician for a Phase I cultural resource investigation of approximately 168 acres for a proposed solar farm in Chesapeake, Virginia.

Centerville Solar Phase I - Suffolk, Virginia

Field Technician for a Phase I cultural resource investigation of approximately 248 acres for a proposed solar farm in Suffolk, Virginia.

Dillon Inland Port Phase I - Dillon, South Carolina

Field Technician for a Phase I cultural resource investigation of approximately 173 acres for a proposed inland port located in Dillon County, South Carolina.

Mogul Wastewater Phase I - Laurens, South Carolina

Field technician for a Phase I cultural resource investigation of approximately three miles for a proposed wastewater line located in Laurens County, South Carolina.

Limestone County Waterline Phase I - Athens, Alabama

Field Technician for the Phase I cultural resource investigation of approximately 57,000 feet of proposed waterline improvements in Limestone County, Alabama.

***Nexus Pipeline Phase I - Wadsworth, Ohio and surrounding areas**

Field Technician for a Phase I and II cultural resource investigations of a proposed pipeline corridor in Ohio.

***Allegheny National Forest Reconnaissance - Allegheny National Forest, Bradford, Pennsylvania**

Field Technician for a reconnaissance-level cultural resource investigation in advance of seismic survey throughout the Allegheny National Forest, Pennsylvania.

***James Monroe's Highland Phase II - Charlottesville, VA**

Field Technician for Phase II cultural resource investigation of President James Monroe's Highland residence near Charlottesville, Virginia.

***Rover Pipeline Phase I - St. Clairsville, Ohio and surrounding areas**

Field Technician for a Phase I cultural resource investigation of a proposed pipeline corridor extending from Ohio through West Virginia.

Samantha Hunt (continued)

TECHNICAL REPORTS

- 2019 Samantha Hunt, Mills Dorn, and William Green. Phase I Cultural Resources Survey of Approximately 14 Acres at the Trolley Road Apartments in Dorchester County, South Carolina. Report Prepared for Atlantic Housing Foundation.
- 2019 Samantha Hunt, Mills Dorn, Kelly Higgins, Shelby Linck, and William Green. Preliminary Cultural Resources Investigations of Approximately 1,970 Acres at the Sunflower County Solar Project Sunflower County, Mississippi. Report Prepared for Recurrent Energy.
- 2019 Samantha Hunt and William Green. Cultural Resources Reconnaissance Survey of Approximately 65 Acres at the Proposed Finklea Mine in Florence, South Carolina. Report Prepared for Venture Engineering.
- 2017 William Green, Shelby Linck, and Samantha Hunt. Cultural Resources Reconnaissance Survey of Approximately 40 Acres at the Proposed Lake City Hospital-Brown Site Williamsburg County, South Carolina. Report prepared for GMK Associates.
- 2017 William Green, Shelby Linck, and Samantha Hunt. Phase I Cultural Resources Survey of Approximately 10 Acres at the Proposed Locust Grove Apartments Stanly County, North Carolina. Report prepared for Greenway Residential Development, LLC.
- 2017 William Green, Shelby Linck, and Samantha Hunt. Phase I Cultural Resources Survey of Approximately 12 Acres at the Proposed Cambridge Oaks Apartments Phase II Cleveland County, North Carolina. Report prepared for Greenway Residential Development, LLC.

Ann M. Scott, PhD, RPA

NATURAL|CULTURAL RESOURCES MANAGER AND PRINCIPAL INVESTIGATOR

PROFESSIONAL EXPERIENCE

Ann Scott serves as Group Manager and Principal Investigator in the Natural and Cultural Resources Group of Environmental Services. Dr. Scott has over 25 years of archaeological and environmental compliance experience and has worked for the National Park Service, the State of Wisconsin, the State of Illinois, and various public and private entities in the Midwest and Texas. This work has involved Phase I archeological surveys, Phase II testing, and Phase III data recovery at both prehistoric and historic-period sites. The work has been performed in compliance with State level regulations, municipal regulations, Section 106 of the National Historic Preservation Act (NHPA), the National Environmental Policy Act (NEPA), and Department of Transportation (DOT) NEPA assignment standards. Additionally, she has held permits as a Principal Investigator for the Bureau of Land Management for the Texas Gulf Coast and Great Plains and the US Forest Service for National Forests and Grasslands in Texas. Dr. Scott has served as Project Manager on several multi-disciplinary projects (Categorical Exclusions and Environmental Assessments) involving work with wetlands, waters, endangered species and habitats, karst surveys, and historic resources surveys. Dr. Scott meets or exceeds all qualifications for the Secretary of the Interior's *Standards and Guidelines for Prehistoric and Historic Archaeology* under 36 CFR 61.

SELECT PROJECT EXPERIENCE

Utility Infrastructure (Water/Wastewater)

South Belton Sewer Service – City of Belton, Bell County, Texas

As Principal Investigator and Project Manager for the 18,900-linear-foot sewer line project, Dr. Scott supervised the survey, prepared the report, and coordinated with the Texas Historical Commission (THC) for compliance with the Antiquities Code of Texas. The THC agreed with our findings of no historic properties affected and the project was approved for construction.

Bunton Creek Interceptor – City of Kyle, Hays County, Texas

The proposed 7,000-linear-foot sewer line project was receiving funding with federal monies and required Section 106 compliance. One historic archeological site was recorded and, after archival and deed research, was assessed as ineligible for inclusion on the National Register of Historic Places (NRHP). The report was coordinated with the Texas State Historic Preservation Office (SHPO) (THC). The SHPO/THC agreed with our findings of no historic properties affected and the project was approved for construction. Dr. Scott served as Project Manager and Principal Investigator.

Cottonwood Creek Wastewater Line – City of Cedar Park, Texas*

Dr. Scott served as Principal Investigator and supervised the pedestrian survey for the 1,200-linear-foot wastewater alignment under an Antiquities Code of Texas permit. The project received THC concurrence for the report that included the assessment of cultural resources in an area of high probability for archeological sites as well as avoidance of a site eligible for designation as a State Antiquities Landmark (SAL).

Transportation

Loop 375 Border Highway, West Extension – El Paso County, Texas*

As Project Archeologist of the Loop 375 Border Highway West Extension, Dr. Scott performed mechanical scraping of Smelter Cemetery, archeological survey for work on federal land (US International Boundary and Water Commission [USIBWC]), and responded to discoveries. Work was within/adjacent to BNSF and Union Pacific railroad rights-of-way. Coordination with TX SHPO, USIBWC, TxDOT and the tollway developer was ongoing throughout the project. The SHPO concurred with our findings of no historic properties affected by the project.

EDUCATION

Doctor of Philosophy, Latin American Studies, The University of Texas at Austin, 2009

Master of Arts, Anthropology, Northern Illinois University, 1993

Bachelor of Science, Anthropology, Central Michigan University, 1988 (honors)

REGISTRATIONS

Register of Professional Archeologists

QUALIFICATIONS

Exceeds all qualifications for the Secretary of the Interior's *Standards and Guidelines for Prehistoric and Historic Archaeology* under 36 CFR 61

AFFILIATIONS

Society for American Archeology
Council of Texas Archeologists
Texas Archeological Society
Colorado Council of Professional Archeologists
American Cultural Resources Association (Board member: 2010-2015)

WORK HISTORY

Terracon, Natural & Cultural Resources Group Manager, 2016-present

J & L Consulting, Senior Principal Investigator; Environmental Specialist, 2015-2016

aci consulting, Director of Cultural Resources, Denver and Austin 2010-2015

HRA Gray and Pape, Archeologist, 2009

The University of Texas at Austin, Graduate Student/Research Assistant, 1999-2009

Prewitt and Associates, Staff Archeologist, 1996-2001

PRESENTATIONS/PUBLISHED ARTICLES

Co-editor of book entitled *The National Historic Preservation Act, Past, Present, and Future* with co-editor Kimball Banks, Routledge Press, 2016

*Experience prior to Terracon



NEPA

On-Call Professional Environmental (NEPA) Services – City of San Antonio, Texas*

Dr. Scott served as sub-contractor Project Manager for the City of San Antonio (COSA) contract primed by AECOM in San Antonio. Dr. Scott managed proposals, budgets, contracts, projects, and personnel for each of the work authorizations. Examples of projects included NEPA categorical exclusions, desktop reviews, and Section 106 compliance for US Army Corps of Engineers (USACE) for trail, roadway, and federal housing projects.

Utility Infrastructure (NEPA compliance)

Texas Water Development Board Projects, Hillside Terrace Wastewater Line – City of Buda, Texas and Brazosport Water Authority Treatment Plant Improvements, – Lake Jackson, Texas*

Serving as Project Manager, Dr. Scott oversaw the completion of the Environmental Information Document (EID), which is a combination of compliance for state and federal laws (NEPA). All aspects of the project were managed by Dr. Scott including multi-disciplinary field investigations, document quality control, agency coordination, assistance in public meetings, and delivery of final documentation. Both projects received Finding of No Significant Impact (FONSI) and were approved.

Transportation (Trail)

Helotes Creek Pedestrian and Bicycle Trail – City of Helotes, Texas*

As part of a Statewide Transportation Improvement Program (STIP) grant received by the City of Helotes, environmental specialists were needed to complete the NEPA environmental compliance requirements for the Categorical Exclusion per TxDOT federal standards. In addition to field work, Dr. Scott assisted in the environmental review process and completion of the Categorical Exclusion forms as well as review of technical reports and compilation of the Summary of Findings report.

Huesta Creek Pedestrian Trail – City of San Antonio, Texas*

Dr. Scott served as Principal Investigator for this project for the City of San Antonio. Dr. Scott supervised pedestrian survey of the approximately 4,400 feet of the 9,144-foot paved pedestrian trail alignment under a Texas Antiquities Code permit. The project results received COSA Office of Historic Preservation as well as Texas Historical Commission concurrence, which allowed the project to proceed.

Sabine Street Promenade – City of Austin, Texas*

Serving as Project Manager, Dr. Scott oversaw the completion of the NEPA Categorical Exclusion checklist. Because the trail improvement project crossed the 6th Street National Register Historic District, a Historic Resources Survey and Report was required by TxDOT. In addition to the cultural resources, a Hazardous Material Initial Site Assessment (ISA) and Biological Assessment were performed along the alignment. The project was approved.

Energy (Solar)

Chimney Hill Solar Project – Pontotoc County, OK

As Principal Investigator and Project Manager for the solar project, Dr. Scott supervised the survey, prepared the report, and coordinated with the OK SHPO and Oklahoma Archeological Survey.

Transportation (Tollway)

Testing and Data Recovery at 41TR203, The Mercado Site, North Tarrant Express, Segment 3A – Fort Worth, TX*

As Principal Investigator for Segment 3A of the North Tarrant Express Project, Dr. Scott supervised testing-level and data recovery fieldwork at site 41TR203 along the North Trinity River. Dr. Scott coordinated data recovery efforts with TxDOT and the THC staff managing research design, field efforts, and agency staff visits.

Residential Housing Development

Reassessment of Site Boundary and Current Site Conditions for Site 41EP155/157 – Horizon City, Texas*

Under the supervision of Dr. Scott as Principal Investigator, archeologists revisited this SAL and NRHP-eligible prehistoric site near Horizon City in El Paso County. The site had been originally determined to be eligible for listing as a SAL and inclusion on the NRHP in 2003, and work confirmed the eligibility of the site and minimally revised the site boundaries.

APPENDIX F

Geoarchaeological Survey Report

Geoarchaeological Investigations for the Proposed Des Moines Transload Facility along Martin Luther King Jr. Parkway, Sections 2 and 3, T78N, R24W, Lee Township, City of Des Moines, Polk County, Iowa

CRM Report 88 – September 26, 2019

Prepared For:

Terracon Consultants, Inc.
600 Southwest 7th Street
Des Moines, Iowa 50309

Prepared By:

Branden K. Scott
(Principal Investigator)

Information contained in this report relating to the nature and location of archaeological sites is considered private and confidential and not for public disclosure in accordance with Section 304 of the National Historic Preservation Act (54 U.S.C. § 307103); 36 CFR Part 800.6 (a)(5) of the Advisory Council on Historic Preservation's rules implementing Sections 106 and 110 of the Act; Section 9(a) of the Archaeological Resource Protection Act (54 U.S.C. § 100707), and Chapter 22.7, subsection 20 of the Iowa Code.



9550 Hickman Road,
Suite 105
Clive, Iowa 50325

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Abstract

This report presents the results of a geoarchaeological investigation conducted for Terracon Consultants, Inc. of Des Moines, Iowa by Impact7G, Inc. of Clive, Iowa. The purpose of this investigation was to document the subsurface and archaeological potential of a proposed railroad transload facility along Martin Luther King Jr. Parkway in Des Moines, Iowa. The project area encompasses approximately 14.5 ha (35.9 ac) in Sections 2 and 3, T78N, R24W, Lee Township, Polk County, Iowa. The project area occurs on infilled alluvial landforms below the Bemis glacial moraine in the Southern Iowa Drift Plain physiographic region. The project area is positioned within the Des Moines River valley.

A couple of past archaeological surveys have been conducted through the project area, but no previous investigation tested the subsurface of the property. Instead, past researchers mentioned either dense fill that they could not get under or indicated that the area was disturbed. Historic maps indicate that much of the project area existed in low, wet areas possibly associated with historic channel movements of the Des Moines River. No known archaeological sites are recorded within the project area. One known historic Native American location in the Historic Indian Location Database is recorded in the western portion of the project area, but this incredibly large area represents a trading post where the location is not precisely known. Historic maps indicate that there might have been some minor historic development in the western and southern portions of the project area. Overall, though, the project area appears to be a location of historic borrowing and filling along railroad corridors.

The geoarchaeological survey was conducted by Branden K. Scott (principal investigator) on September 13 and 16, 2019. Mr. Scott was assisted by a drill rig crew from Terracon Consultants, Inc. Sampling consisted of using a drill rig with 3" split spoon recovery at 12 selected locations within the project area. These locations were selected to gain a representative sample of alluvial landforms below historic fill levels. Some locations in the project area could not be sampled because 1) existing, deep water retention ponds, 2) deciduous tree vegetation that prevented machine access, 3) utility corridors with dense concentrations of buried utilities/infrastructure, 4) surficial wetlands/fens that prevented machine access, and 5) inability to gain access permission from lands not owned by the City of Des Moines. Cores were extracted with the intent of reaching buried Des Moines River channel deposits so that the entire Holocene alluvial sequence could be documented. Cores were described in the field as they were extracted by Branden K. Scott. The resulting cores identified two major landform types below historic fills. The northern portion of the project area appears to be a historic-aged, abandoned channel of the Des Moines River. This was documented by thin Camp Creek Member sediments overlying channel sands. The southern portion of the project area encountered deposits associated with slackwater/wetland deposits that likely formed during the Late Prehistoric/early historic periods (late Roberts Creek/early Camp Creek). Both landform types are interpreted to be inhospitable for extended human settlement during the Late Prehistoric/early Historic periods. No sediments of older age (such as Gunder Member-associated alluvial deposits) were encountered in the project area. The western portion of the project area occurs in a former borrow area that has stripped the Holocene alluvial sequence to Des Moines River channel deposits. Based on the nature of historic fills, Impact7G, Inc. believes that it would be very difficult to differentiate potential historic building sites from the surrounding brick and concrete fill matrix.

Impact7G, Inc. believes that the portion of the project area where geoarchaeological testing occurred has low potential for significant archaeological sites. The area represents a historic Des Moines River channel backed by a low floodplain/wetland that would have been an unattractive location for extended human settlement.

Introduction

This report presents the results of a geoarchaeological investigation conducted for Terracon Consultants, Inc. of Des Moines, Iowa by Impact7G, Inc. (Impact7G) of Clive, Iowa. The purpose of this investigation was to determine the subsurface conditions of alluvial landforms within the Des Moines River valley that have been capped with historic fill prior to the placement of a proposed transload facility atop the project area. This investigation sought to 1) describe historic fills, 2) describe soils below fill layers, 3) determine the type of landscape represented below historic fills, 4) determine the approximate age of alluvial sediments, and 5) determine if/where there are locations within the project area that should be the focus of intensive archaeological investigations to identify buried archaeological sites. The project area encompasses approximately 14.5 ha (35.9 ac) in Sections 2 and 3, T78N, R24W, Lee Township, Polk County, Iowa. The project area is found surrounding Southeast 14th Street in Des Moines, Iowa north of Martin Luther King Jr. Parkway in the Des Moines River valley. The project area occurs on alluvial landforms in the Southern Iowa Drift Plain physiographic region (Prior 1991; Figure 1). Methods employed during this investigation are consistent with guidelines for geoarchaeological investigations in Iowa (Association of Iowa Archaeologists 2018). Notes, photographs, and all other records associated with this project are housed at Impact7G.

Two previous archaeological surveys have been conducted through the project area, but neither investigation probed the subsurface in this area. Historic maps indicate that much of the project area existed in low, wet areas possibly associated with historic channel movements of the Des Moines River, which follows with past researchers' assessments of the area (Pope et al. 2014; Whittaker et al. 2007). No known archaeological sites are recorded within the project area. One known historic Native American location in the Historic Indian Location Database (HILD) is recorded in the western portion of the project area, but this incredibly large area represents a trading post where the location is not precisely known. Historic maps indicate that there might have been some minor historic development in the western and southern portions of the project area. Most historic uses of this area appear to be associated with borrow/dumping/filling and railroad activities.

The geoarchaeological investigation was conducted by Branden K. Scott (principal investigator) on September 13 and 16, 2019. The principal investigator was assisted by a drill rig crew from Terracon Consultants, Inc. Sampling consisted of using a drill rig with 3" split spoon recovery at 12 selected locations within the project area. These locations were chosen to gain a representative sample of alluvial landforms below historic fill levels. Some locations in the project area could not be sampled because 1) existing, deep water retention ponds, 2) deciduous tree vegetation that prevented machine access, 3) utility corridors with dense concentrations of buried utilities/infrastructure, 4) surficial wetlands/fens that prevented machine access, and 5) inability to gain access permission from lands not owned by the City of Des Moines. Cores were extracted with the intent of reaching buried Des Moines River channel deposits so that the entire Holocene alluvial sequence could be assessed and documented. Cores were described in the field as they were extracted by Branden K. Scott. The resulting cores identified two major landform types below historic fills. The northern portion of the project area appears to be a historic-aged, abandoned channel of the Des Moines River. This was documented by thin Camp Creek Member sediments overlying channel sands. The southern portion of the project area encountered deposits associated with slackwater/wetland deposits that likely formed during the Late Prehistoric/early historic periods (late Roberts Creek/early Camp Creek). Both landform types are interpreted to be inhospitable for extended human settlement during the Late Prehistoric/early Historic periods. No sediments of older age (such as Gunder Member-associated alluvial deposits) were encountered in the project area. The western portion of the project area occurs in a former borrow area that has stripped the Holocene alluvial sequence to Des Moines River channel deposits. Based on the nature of historic fills, Impact7G believes that it would be very difficult to differentiate potential historic building sites from the surrounding brick and concrete fill matrix.

Impact7G believes that the portion of the project area where geoarchaeological testing occurred has low potential for significant archaeological sites. The area represents a historic Des Moines River channel backed by a low floodplain/wetland that would have been an unattractive location for extended human settlement.

Information contained in this report relating to the nature and location of archaeological sites is considered private, confidential, and not for public disclosure in accordance with Section 304 of the National Historic Preservation Act (54 U.S.C. § 307103); 36 CFR Part 800.6 (a)(5) of the Advisory Council on Historic Preservation's rules implementing Sections 106 and 110 of the Act; Section 9(a) of the Archaeological Resource Protection Act (54 U.S.C. § 100707), and Chapter 22.7, subsection 20 of the Iowa Code.

Project Area Location

The project area occurs in Polk County in the Southern Iowa Drift Plain physiographic region (Prior 1991; Figure 1). The project area is further located in the S ½, SW ¼, Section 2 and the S ½, SE ¼, Section 3, T78N, R24W, Lee Township, Polk County, Iowa (Figure 2). The project area is bounded by Martin Luther King Jr. Parkway to the south and East 18th Street to the east in Des Moines (Figure 3). The project area goes under Southeast 14th Street/US Highway 69. The project area occupies approximately 14.5 ha (35.9 ac) of alluvial landforms in the Des Moines River valley. Project plans indicate that the proposed development on this property will be a railroad transload facility. The western portion of the project area will be comprised of mostly elevated railroad tracks. The eastern portion of the facility will house buildings/structures associated with the facility. Depths of disturbances are unknown at this time, but most earthmoving/excavation is likely to occur in the eastern portion of the project area where buildings will be located. Use of fill material will likely be higher in the western portion of the project area to elevate railroad beds.

Geoarchaeological Research Design

The purpose of a geoarchaeological investigation is to provide information on landscapes, landforms, potential for buried archaeological sites, and to direct future archaeological investigations. Impact7G focuses on the geologic environment containing archaeological resources to locate and evaluate archaeological properties and we cater field investigations to local geomorphological conditions. Local geomorphology and site formation processes are responsible for burial, preservation, and destruction of archaeological resources and these same processes affect our ability to locate sites. Geologic environments also weigh heavily on human settlement decisions and they affect locations/types of plant and animal communities. Utilizing geomorphological data can aid in predicting site locations in relation to area landforms, as has been demonstrated throughout Iowa alluvial environments (e.g., Bettis and Benn 1984; Bettis et al. 1992; Bettis and Thompson 1981; Bettis et al. 1996) and upland landscapes (e.g., LANDMASS site suitability model). Focusing on local geologic conditions can lead to identification of post-settlement alluvium (PSA), disturbances, manipulated landscapes, and buried surfaces. An understanding of local geology also provides an archaeologist the ability to make informed decisions regarding where and how deep to conduct subsurface testing. Geological data greatly weigh on a site's context/artifact associations. To conduct this research, geologic cores are extracted, documented, and interpreted as a means of determining how and where to conduct archaeological testing.

Environmental and Geomorphological Context

Physiographic Region

The project area is positioned within the Des Moines River valley in Prior's (1991) Southern Iowa Drift Plain physiographic region (Figure 1). The Southern Iowa Drift Plain is Iowa's largest physiographic region. Most regional landforms are comprised of Pre-Illinoian tills that date to greater than 300,000 years old overlaying Pennsylvanian bedrock. However, the last known significant glacial advance into this region occurred approximately 500,000 years ago, with the Yarmouthian Interglacial occurring between ~300,000 and 500,000 years ago. There are four general surfaces associated with this region. The highest landforms (upland summits) are composed of Pre-Illinoian till that was exposed to weathering during the Yarmouth, Illinoian (~130,000–300,000 years ago), and Sangamon (~130,000–30,000 years ago) stages. Below the upland summits is the Late Sangamon Surface, followed on lower portions of hillslopes by a Wisconsinan erosional surface (~30,000–10,500 years ago). These three Pleistocene surfaces are often covered with loess, particularly Peoria Loess, which fell between ~12,000–25,000 years ago. Holocene (~10,500 years ago–present) alluvial landforms are positioned below Pleistocene surfaces and they represent current stream valleys (Prior 1991).

The Southern Iowa Drift Plain is characterized by dissected landscapes that have created a well-connected network of drainage systems and streams incising into surrounding uplands. This region has steeply rolling hills, narrow interfluves, and uplands with rills and ravines (Bettis and Littke 1987; Prior 1991). Upland summits in the region have similar elevations, revealing the glacial origins of this dissected landscape.

Brief History of the Des Moines River Valley

The project area is positioned within the Des Moines River valley at the base of the Bemis terminal moraine of the Des Moines Lobe. The history of the Des Moines River valley is directly tied to glacial advances and retreats that existed north of the project area. The Des Moines Lobe of the Laurentide Ice Sheet advanced into Iowa approximately 15,000 years ago, reaching its southern terminus approximately 14,000 years ago. When glacial ice retreated from the Des Moines area, it left large piles of glacial till and outwash along the terminal and lateral edges; deposits that are now known as the "Bemis Moraine". This moraine forms the northern edge of the Des Moines River valley at the project location. As the glacier retreated northward, meltwaters accumulated in streams, rivers, ponds, and lakes. Rivers and streams were the main carriers of glacial meltwater, which carved much of the present river valleys. There are three distinct streams/rivers in the vicinity of the project area that helped shape the valley (Pope et al. 2014). The Raccoon River was likely the first major stream to form in this area. The Raccoon River follows the south and southwest margins of the Des Moines Lobe. This river carried significant quantities of meltwater as well as water from other streams that were cutoff by the Des Moines Lobe and diverted to the Raccoon River valley (Artz and Bettis 2013). The Beaver Creek channel is the next oldest stream in the vicinity of the project area. Beaver Creek cuts through the Bemis Moraine, therefore, it formed less than 14,000 years ago. This stream acted as a path for water discharge associated with the Altamont Moraine—a terminal glacial moraine that runs through central Iowa. The Des Moines River is younger than both the aforementioned waterways. The present Des Moines River valley formed approximately 12,300 years ago and carried meltwaters from the Algona Moraine, which occurs in north-central Iowa. These meltwaters cut a deep gorge into glacial tills, Wisconsinan loess, and Pennsylvanian bedrock. The Des Moines River cut through Beaver Creek, and portions of Beaver Creek's former channel are still visible in southeastern Des Moines. By 11,500 years ago, the glacial retreat from Iowa was complete and ushered in the Holocene epoch. The Des Moines and Raccoon River valley experienced slower waters, which led to finer-grained sediment aggregation followed by periods of channel incision. These aggregation and incision cycles formed terraces throughout the valley.

Iowa's Holocene Alluvial Landscape

Iowa's river and stream valleys consist of numerous terraces, alluvial fans, colluvial slopes, and wetlands. The Holocene alluvial environment is referred to as the "DeForest Formation" (Bettis 1990). DeForest Formation members are defined based on composition, age, and degree of soil development (Bettis and Littke 1987; Bettis et al. 1992; Bettis et al. 1996). Alluvial members of interest to this investigation are the Camp Creek, Roberts Creek, Gunder, and Corrington Members, which are detailed below using descriptions from Bettis (1990), Bettis et al. (1992), and Bettis et al. (1996).

The Camp Creek Member represents low landforms immediately adjacent to streams and/or historic sediment that mask older buried surfaces. This member is characterized by a lack of developed soils and brief periods of deposit stability. This member has weakly developed A horizons with an A-C soil profile, often with alluvial stratification evident in profiles. The Camp Creek Member dates to roughly less than 500 BP (late Holocene and Historic). The most recent sediments associated with this member are termed "post-settlement alluvium" or "PSA". The next oldest alluvial fill is the Roberts Creek Member, which dates to approximately 500–3000 BP (middle–late Holocene). This member has A horizons underlain by weakly developed B horizons. Sediments associated with this member tend to be dark in color, including underlying B horizons. Where downcutting has occurred, Roberts Creek Member landforms can be positioned above Camp Creek Member landforms. Lower Roberts Creek landforms are often covered with Camp Creek Member sediments. The Gunder Member represents the oldest alluvial fills of the Holocene and it dates from 3000–10,500 BP (early–middle Holocene). These alluvial fills have had much longer periods of stability, resulting in formation of deep, strongly developed, and oxidized Bt horizons. This alluvial member typically represents the highest Holocene-age landform in a valley, although some lower Gunder Member landforms can be covered with younger sediments. The Corrington Member represents alluvial fans that have splayed out at the mouths of tributary streams and upland drainages. These fans typically date from 2500–9000 BP (early–middle Holocene). Alluvial fans deposit significant amounts of sediment along valley walls and buried soils are common. Also common are voided areas where small channels/rills have developed that removed older fan deposits.

Archaeological sites can occur on any DeForest Formation landforms, but ages of sites are limited by the age of alluvial fills. Historic Euro-American and Native American sites can be found in Camp Creek Member deposits. Context and artifact associations are often problematic in these landforms because the Camp Creek Member has limited stability. Roberts Creek Member sediments can contain historic sites, but they also have potential for *buried* Late Prehistoric, Woodland, and Late Archaic sites. Gunder Member landforms can contain archaeological sites though all of prehistory, but they also have potential for *buried* Early to Late Archaic and Paleoindian sites. Corrington Member fans can contain archaeological sites of any age, but fan sediments can contain *buried* Paleoindian–Late Archaic sites with limited potential for buried Woodland and Late Prehistoric sites. The DeForest Formation works well for modeling most of Iowa's stream and river valleys, but larger river valleys have local histories and landforms that often require individual classification (e.g., Bettis et al. 1996; Bettis and Benn 1984).

Past Geoarchaeological Work in the Des Moines River Valley

Bettis and Benn (1984) conducted one of the earliest geoarchaeological investigations of the central Des Moines River valley in the downstream corridor below the dam at Saylorville Reservoir. Bettis and Benn (1984) identified three distinct Holocene valley surfaces within the downstream corridor and related those surfaces to the types of archaeological sites that might be encountered. The High Terrace consists of silty, loamy, and silty clay loam overbank deposits atop sand and fine gravel. Soil horizons were well differentiated, and no stratification were evident. High Terrace soil stratigraphy typically consists of dark silt loam to silty clay loam A horizons underlain by silt loam and silty clay loam Bt horizons which are typically much browner than the A horizons. Oxidation is also present. These horizons are non-effervescent. High Terrace landforms can contain buried Early and Middle Archaic sites, with later

occupations occurring nearer the surface of the terrace. The High Terrace is comparable to the Gunder Member of the DeForest Formation. The Intermediate Terrace began forming at around 4000 B.P to 1000 BP. The Intermediate Terrace consists of a complex sequence of alluvial landforms, with several distinct levels indicated within the valley. These soils are typically entisols or inceptisols. Intermediate Terraces typically have darker A horizons comprised of loam and sandy loam with Bw horizons that are usually slightly browner in color. Soil horizons in the Intermediate Terrace tend to be non-effervescent and carbonates have had time to leach from the soil. Buried soils are common. This landform can contain buried archaeological components typically dating from the Late Archaic period (3000–800 BC) through the Oneota period (1050–1400 AD in central Iowa). The Intermediate Terrace is comparable to the Roberts Creek Member of the DeForest Formation. The Low Terrace was formed after 1000 BP and it contained the modern floodplain of the Des Moines River. This floodplain was covered with forest and it was regularly flooded. All soils associated with the low terrace are entisols with some organic accumulation and weak structural development. These deposits typically lack B horizons. These surfaces are Late Prehistoric to modern in age (post 1000 AD). Low Terrace sediments can bury Intermediate Terraces, as is the case at the Christianson Oneota site (Benn 1991; Benn et al. 2003). The Low Terrace is comparable to the Camp Creek Member of the DeForest Formation.

Lawrence and Hotopp (1978) completed a survey for a road improvement project in the floodplain south of the current project area. It doesn't appear that much pedestrian survey or subsurface testing was conducted during this survey. Instead, the authors state, "The land in the vicinity of the project has been disturbed in the past by road construction and the building of various businesses and residences. It is doubtful that any archaeological materials could be found undisturbed or in context due to the fast [sic] amount of construction activities which have previously taken place in the project area."

Brice, Petrides and Associates, Inc. (1985; Figure 2) conducted an investigation through the center of the project area. However, this past investigation was unable to penetrate historic fills, but they mention that there is potential for buried archaeological deposits in river alluvium and below some historic fills; a fairly astute observation in 1985.

Winham and Mandel (1991) conducted geomorphological investigations in the Saylorville downstream corridor for a sewer project using backhoe trenches. Low Terraces in the area typically had an A-C (or Ap-C) profile with a stratified C horizon. Although low in topographic position, profiles of the Low Terrace were relatively well drained and lacked colors/redoximorphic features associated with wetland environments. Trench "Phase 7, Segment 5, Area C" produced a profile consisting of A-C-2Ab-C with red brick occurring in the lower levels indicating that some Low Terraces have buried, weakly developed entisols/inceptisols. Intermediate Terraces typically had a A-Bw-BC profile with occasional buried soils with loamy to silty clay loam textures with some landforms having a sandy texture. Colors ranged from grayish browns to brown and wetland soils were not encountered in most locations. Redoximorphic features were absent from the profiles and some effervescence was noted in buried soils. The trench placed on the Low Terrace at Phase 7, Segment 4, Area B produced a profile of historic alluvium (A-AC) atop a buried wetland deposit (2Ab1-2Ab2-2Bg-2BCg1-2BCg2). The wetland deposit consisted of dark colored silty clay loam to silty clay over an olive (5Y 5/3) basal unit. Redoximorphic features were common in the B and BC horizons. Subsequent investigations of this unit (Johnson and Winham 1992) encountered no archaeological materials. The landform was interpreted to be an area of "limited stability and a slack-water environment, thus limiting the likelihood of sustained occupation of the area" (Johnson and Winham 1992:20). Encountered High Terraces yielded Ap-A-Bw-C1-C2-2C profiles and sediments were mostly brown and comprised of sandy loams.

Peterson et al. (1993) also conducted a survey in the floodplain near the project area. Peterson et al. (1993) placed 30 bucket auger tests in her project area where surface visibility was reduced. Most of these tests were excavated to at least 100 cm below surface. While formal profiles were not recorded, most augers

encountered layers of historic fill over sands and occasional silt loams. Only historic-era artifacts were encountered.

Whittaker et al (2007) surveyed the southern portion of the project area for part of the southeast connector project (Figure 2). Using historic map research, Whittaker et al. (2007) mapped likely historic channel and wetland locations within the project area (Figures 4 and 5). This background research was accomplished by superimposing historic maps atop the current topographic map. According to this map, most of the project area occurred in a wetland and/or within a stream channel (Figure 4). Whittaker et al. (2007) also identified the current project area as a probable historic meander bend (Figure 5). Such meander bends probably account for Dean's Lake, which is an oxbow lake located east of the project area. While numerous maps were made of the area that outline potential geomorphological conditions, Whittaker et al. (2007) conducted no subsurface testing or coring within the current project area because they interpreted the area as "disturbed".

Investigations in downtown Des Moines on the west bank have also added to our understanding of alluvial processes in the Des Moines River valley (Artz 2019a; Artz et al. 2003; Nagel et al. 2005). Investigations in the downtown area consisted of a series of mechanical backhoe trenches and 20 geotechnical cores positioned on built-over, alluvial landforms adjacent to the Des Moines River. Trenches placed in 2005 encountered urban fill over oxidized, loamy alluvial sediments associated with the Gunder Member/High Terrace. Low Terraces were also encountered, and they consisted of typically brown to black loams with stratification evident. The Unit 4 trench encountered stratified black and greenish gray alluvium with occasional thin sandy interbeds. This alluvial package was also encountered in nearly all the other trenches. This was interpreted to be a slackwater deposit associated with an oxbow. This type of deposit was common in cores extracted from the current project area. Low Terrace deposits were interpreted to be historic-aged alluvium based on the types of artifacts recovered. Artz (2019a) conducted coring near the backhoe trenches from 2005 and identified mostly historic-era alluvial deposits (Camp Creek) adjacent to a higher, mixed Roberts Creek/Gunder Member landform. Gunder Member deposits typically had distinct clay skins on ped surfaces. Roberts Creek Member overlaid the Gunder Member deposits. Roberts Creek deposits consisted of thick units of dark silty clay to silty clay loam with weak to medium structure, common redoximorphic features, and occasional very dark gray clay coats. These sediments were non-effervescent, suggesting that carbonates had time to leach from the profiles. Camp Creek sediments were typically very dark silty clay to silty clay loam with some green coloration, common wood and plant macrofossils, thin bedding, and a weak structure parting across bedding planes. Redoximorphic features were also common. Camp Creek sediments from these cores were non-effervescent.

Pope et al. (2014) identified a Middle Archaic site in the Des Moines River floodplain approximately 1.5 km (0.9 mi) southeast of the project area. The Pope et al. (2014) report provides by far the most comprehensive analysis of geomorphological conditions in this section of the Des Moines River valley. The Palace Site is buried in Gunder Member sediments beneath the surface of the High Terrace. The site was bounded to the west and south by a Low-Intermediate Terrace complex, of which the current project area resides (Figure 6). Profiles at the Palace Site identified four lithofacies units. Unit I, the basal layer, consisted of sandy to gravelly fluvial and glaciofluvial deposits associated with river channels and glacial outwash. Unit II consisted of lateral accretion, point bar facies. This unit contained stratified alluvium comprised of silt loam, loamy sand, and thin beds of silty clay loam and fine sands. Lamination was evident. Unit III consisted of vertical accretion deposits that contained the earliest cultural deposits. Unit III covered the Unit II facies. Unit III had a well-developed soil of predominantly clay to silt loam and it lacks stratification. The cultural deposits were often capped by sand-rich sediments. This unit was interpreted to be Gunder Member in age. Unit IV consisted of silt loam and silty clay loam with typical A-C and A-Bw horizonation. At least one prehistoric component was identified in this unit. The unit had alternating beds of light brown and dark colored soils, with the darker layers interpreted as buried A horizons. This unit was interpreted to be associated with the late Gunder Member. Unit V consisted of loamy-textured

vertical accretion deposits with a high percentage of sand. These deposits were interpreted as levee or splay deposits. This unit was interpreted to be a late Holocene deposit.

Artz (2019b, 2019c) recently undertook a geoarchaeological investigation upstream from the project area for a proposed pump station. Profiles recorded on this section of the river (immediately adjacent to the river) consisted of stacked A-C horizons of sandy loam, loam, and sand. Colors ranged from black to brown within the same profile. Most sediments effervesced with hydrochloric acid, which led Artz (2019b, 2019c) to conclude that the sediments were Camp Creek in age because Roberts Creek and Gunder sediments are almost always leached of carbonates.

Soil Survey Data

Soil survey data were obtained from the web application provided by the Natural Resources Conservation Service (2018), the paper soil survey compiled by Dideriksen and Radatz (2000), and information provided by Artz (2005). Described soils within the project area are detailed below and on Figure 7. Older soil survey maps from 1921 and 1960 were not available.

Symbol	Soil Series	Member/Landform	Description
220	Nodaway silt loam, 0–2% slopes	Camp Creek	This is a nearly level, moderately well drained soil that occurs in floodplains. This soil formed in silty alluvium under mixed prairie and deciduous forest. The typical profile is Ap-C1-C2-C3.
4000	Urban land	Disturbed/Fill	This map unit consists of areas that are covered with buildings, roads, streets, parking lots, mobile home parks, auto salvage yards, and railroad yards. The original soils can no longer be identified. No typical profile exists for this map unit.

Nearly the entire project area is mapped as “Urban Land”. This mapping unit is generally associated with disturbed locations where the natural soil is no longer intact. This unit is unhelpful when detailing the geoarchaeological potential of floodplain environments because these “disturbances” could be infilling of alluvial landforms that would mask the natural surface that occurs below fill zones. The Nodaway soil is present in the far western portion of the project area. This soil type is typically associated with low stream terraces that were deposited less than 500 years ago. The position and shape of this soil unit suggests that prior to “urban land”, the Nodaway soil extended further into the project area. It is very likely that a similar soil could be present below historic fill levels. Additional areas surrounding the project area consist of “Nodaway-Urban Land Complex”. This suggests that nearly all areas below historic fills could be associated with the Nodaway soil, and by extension, the Camp Creek Member of the DeForest Formation. Nearly all previously recorded archaeological sites on this floodplain in proximity to the project area are from the historic period, which adds a little bit of data concerning the potential historic nature of the floodplain. However, archaeological site 13PK966 (Palace site) is located 1.5 km (0.9 mi) southeast of the project area in the Nodaway soil, suggesting that there are positions within the Des Moines River floodplain that contain buried, older alluvial surfaces.

Use of soil survey data requires geomorphological field investigations for corroboration. While useful at a pre-field stage to identify landforms that might contain significant archaeological sites, soil types can be plotted incorrectly, or local conditions can create profiles that deviate from the “typical profile” outlined by the soil survey.

Buried Site Potential

Iowa's alluvial environment is complex. Pre-field data acquired concerning potential geomorphological conditions suggests need for on-site field investigations to determine prehistoric archaeological site potential at this location.

Historic Maps and Aerial Photographs

Historic maps and aerial photographs were used to track potential channel movements and land use in the project area. There are no Sanborn Fire Insurance maps of this area. The General Land Office map (1848; Figure 8) shows much of the project area in a wetland. In fact, approximately 7.5 ha (18.5 ac) of this large wetland occurs within the project area. This wetland likely represents a river oxbow. A channel is shown in the eastern portion of the project area. This location has an approximate area of 2.5 ha (6.2 ac). Terraces might exist around the wetland and channel features. A farm field is depicted in the far eastern portion of the project area. The Andreas (1875) map shows the project area in an "urban" environment, but there are no notable streams or wetlands depicted in this area. (Figure 9). The Tate and Tate map from 1899 shows the project area with multiple rail lines and platted additions (Figure 10). These additions do not appear to have taken off and there is little additional evidence that anything was built on these parcels, except possibly in the west and south-central sides where topographic maps show some houses. No information pertaining to the geology of the area or past stream movements are depicted on this map. The Hovey map from 1902 shows no buildings occupying the project area (Figure 11). Instead, the area has multiple rail lines crossing property owned by the City of Des Moines and Brook and Company. The Des Moines River is depicted to the south near its present location. Similar land use is depicted on the maps from 1914 and 1930 (Kenyon Company 1914; Hixson 1930; Figures 12 and 13).

The topographic maps from 1905 and 1907 depict the project area on the floodplain at the base of the Bemis terminal moraine (Figures 14 and 15). These 1:62,500 maps do not provide much significant topographic information (like would be shown on a 1:24,000 map), but they do outline some interesting elements. First, there are small upland drainages flowing south from the moraine toward the project area/floodplain. These small drainages can often produce alluvial fan deposits along the valley wall. Second, the project area is shown at the same elevation as Dean Lake which is east of the project area. The elevational similarity might indicate that the oxbow to the east is topographically related to lands within the project area. Third, there appears to be housing and street development in the western portion of the project area. This suggests that a portion of the project area might have existed on higher landforms prior to historic infilling.

The topographic map from 1956 provides the most detailed mapping of the project area prior to historic infilling (Figure 16). According to this map, most of the project area occurred in depressional areas that mark former channel locations. These areas are redrawn on Figure 17. The depressional areas encompass 9.0 ha (22.3 ac) of the project area, or 62.1%. Slightly elevated areas are positioned in the western portion of the project area and within the southern portion of the project area. The 1956 map does not depict houses in the western portion of the project area. Instead, houses are placed in the southern portion of the project area on this map.

The aerial photograph from 1938 shows the project area on an industrial parcel with numerous railroad tracks (Figure 18). A few, small buildings might be present in the southern portion of the project area. Additionally, there is some evidence of potential residential development in the western portion of the parcel. No data concerning the geomorphological history are shown on this aerial photograph. The aerial photograph from 1955 shows the project area on a railyard with numerous disturbances (Figure 19). Similar disturbances are noted on the aerial photograph from 1961 and 1974 (Figures 20 and 21). From 1983 to 2013, borrow areas are clearly shown on the aerial photograph and portions of the project area were being used for an auto salvage yard (Figures 22 and 23). After cleanup, the land was left idle.

Based on historic maps, nearly the entire project area occurred within a depression/wetland or within a channel belt during the historic period (Figure 17). Exceptions occur in small localized areas in the far western, central, and far eastern portions of the project area. According to Whittaker et al. (2007), most of these exceptions occur within historic meander belts (Figure 5).

The LiDAR image depicts the project area on areas of disturbance, fill, and made retention basins (Figure 24). It is difficult to decipher the geologic landscape at this location, but a few general trends can be observed. First, the project area appears to be slightly lower than areas to the south and east (at the location of the Palace site). Second, oxbow lakes and streams have a natural curvature back toward the project area, suggesting that portions of the project area were once the active channel in the recent past. And third, there has been significant manipulation of the terrace surface and this has likely masked the shapes and distributions of naturally occurring alluvial landforms. The railroad tracks north of the project area do not appear to cross alluvial fans, or if they do, the alluvial fans are not distinguishable from the manmade landscape. It is possible that the former course of the Des Moines River abutted the valley wall at this location, which could account for the lack of visible alluvial fans and the very steep, nearly straight-sided sideslope of the Bemis Moraine.

Geoarchaeological Field Methods and Results

Geomorphological Methods

The geoarchaeological investigation sought to identify the subsurface landscape within the project area. The project was initiated on August 22, 2019 when maps first came to Impact7G. Branden Scott visited the site with a handheld soil probe to determine if there was potential to explore the subsurface with a 3/4" soil probe. It was quickly realized that historic fills were too dense to penetrate by hand. After multiple utility locate requests, Impact7G began explorations using a drill rig operated by Terracon Consultants, Inc. The method of core extraction consisted on using a 3" split-spoon bit with lengths of 0.8 m (2.5 ft) and 1.5 m (5 ft). The bit was hammered into the ground. In locations with dense fill, a drilling bit was used to remove concrete and brick rubble that could not be extracted in the core. Drilling of dense fill resulted in the lack of core recovery in some portions of the historic fill layers. Cores were then placed on split PVC pipes for recordation. Core recording was consisted with Natural Resources Conservation Service nomenclature and methods (Shoeneberger et al. 2012). Carbonates were tested with 36% hydrochloric acid concentrate cut to 10% with distilled water. Cores were split in half and wood marker blocks were placed at 50 cm intervals along the cores. The cores were then individually photographed, then described.

At the outset of this project, Impact7G outlined where they would prefer to place cores, and located 16 potential core locations (Figure 25). Three of these locations could not be extracted because we were unable to secure landowner access. These proposed core locations occurred near the valley wall and were hoped to be retrieved to determine if potential alluvial fan deposits occur along the valley wall. Most cores were to be placed in the eastern portion of the project area where 1) there was more land available for subsurface exploration, 2) there would be higher likelihood of encountering mixed landform types, 3) there was better access for the drill rig (i.e., not within an excavated, man-made wetland), and 4) this location will be the focus of most construction excavation activities. The eastern area was examined in an almost systematic fashion, with cores extracted near Martin Luther King Jr. Parkway, through the center of the project area, and along the valley wall where there could be alluvial fan deposits. Another reason for choosing core locations was that these areas presented the best chances for finding sub-fill terraces based on historic map analysis. Additional cores were placed around large man-made wetlands to better round out descriptions in the project area. A notable borrow area was present in the western portion of the project area on the LiDAR image. Impact7G placed a core in this area to determine depths of past borrowing activity and to

determine if there was potential for intact deposits associated with HILD 159, A.K.A. Dirt Lodge Trading Post. The location of this trading post is unknown, but it is described as being near the mouth of the Raccoon River between 1824 and 1831.

Field conditions limited the ability to place cores in all proposed positions. Portions of the project area have surface wetlands/fens that prevented the drill rig from entering and coring. Impact7G had to shift core locations to better accommodate the equipment. Also, tree cover prevented access to a few locations and cores had to be shifted to a new position. Impact7G was able to place 12 cores within the project area on September 13 and September 16, 2019 (Figure 26).

Geomorphological Results

Impact7G was able to extract twelve cores from the project area on September 13 and 16, 2019. The results of these cores are presented below. Core locations and associated alluvial landform type are presented on Figure 26. Core logs are presented in Appendix A. The project area occurred on alluvial landforms covered with dense fill. The project area was covered with grasses and deciduous trees with limited surface visibility (Figures 27–36).

Profile Designation: Core 1

Method: Drill rig, 2–5’ split spoon

Slope: 0-2%

Vegetation: Mixed tall grasses

Recorder: B. Scott, 9/13/2019

Location: NAD83; Zone 15; 450,778.582 East; 4,603,949.252 North

Photographs: Figures 37–41

Depth (cm)	Soil Horizon	Description
0–178	Fill 1	Brownish yellow (10YR 6/6), light gray (10YR 7/1), dark greenish gray (5GY 3/1), black (10YR 2/1), and greenish gray (10GY 5/1) silty clay, clay, and brick; massive structure; loose; some cinders; abrupt boundary.
178–211	Fill 2	Very dark grayish brown (10YR 3/2) silt loam; massive structure; firm; frequent wood, cinders, and brick; non-effervescent.
211–236	Abg	Very dark brown (10YR 2/2) silty clay loam; moderate, medium blocky structure; firm; non-effervescent; clear boundary.
236–274	ABgb	Grayish brown (10YR 5/2) sandy clay loam; moderate, medium subangular blocky structure; friable; faint strong brown (7.5YR 4/6) and brown (7.5YR 4/4) redoximorphic features; slightly effervescent; clear boundary.
274–318	Bgb	Dark gray (10YR 4/1) medium sand; weak, medium subangular blocky structure; friable; diffuse strong brown (7.5YR 4/6) mottles/redoximorphic features; non-effervescent; abrupt boundary.
318–402	2Cgb1	Brown (10YR 5/3) medium sand; massive structure; single grain sand; loose; wet; non-effervescent.
402–450	2Cgb2	Brown (10YR 4/3) medium-coarse sand; massive structure; loose; non-effervescent; wet; End.

The presence of an ABg and Bgb horizon in Core 1 suggests that this core sampled late Roberts Creek member alluvium. This alluvial deposit is thin for a Roberts Creek deposit (107 cm thick). The ABgb horizon showed effervescence, which suggests that this soil has not been in place long enough to have carbonates leach from the profile. Redoximorphic features, organic material and reduced colors are quickly encountered. The poorly drained nature of this profile suggests that the soil formed in a perennially wet environment that would be inhospitable to extended human habitation throughout much of the year. Archaeological sites are not anticipated at this location.

Profile Designation: Core 2**Method:** Drill rig, 2–5’ split spoon**Slope:** 0-2%**Vegetation:** Mixed tall grasses**Recorder:** B. Scott, 9/13/2019**Location:** NAD83; Zone 15; 450,808.364; East; 4,603,986.888 North**Photographs:** Figures 42–45

Depth (cm)	Soil Horizon	Description
0–19	A	Brown (10YR 4/2) loamy sand with some fill material; weak, fine subangular blocky structure; friable; slightly effervescent; clear boundary.
19–96	Fill 1	Light yellowish brown (10YR 6/4), yellow (2.5YR 7/6), reddish yellow (7.5YR 7/6), and greenish gray (5GY 6/1) clay loam and sand; massive structure; loose; violently effervescent; abrupt boundary.
96–140	Fill 2	Greenish gray (N 5/1), dusky red (10R 3/3), and strong brown (7.5YR 4/6) silty clay; massive structure; firm; less rock than above; non-effervescent; abrupt boundary.
140–250	Fill 3	Very dark grayish brown (10YR 3/2) sandy loam; weak, fine subangular blocky structure; friable; some rock, brick, and cinders; slightly effervescent; unclear boundary.
250–282	Ab	Very dark brown (10YR 2/2) silty clay; moderate, coarse blocky structure; firm/compacted; common roots; strong marsh gas odor; non-effervescent; clear boundary.
282–305	Cgb	Dark gray (10YR 4/1) silty clay; weak, fine subangular blocky structure; friable; black (10YR 2/1) stratification evident; finely laminated; roots common; common brown (7.5YR 5/4) redoximorphic features; breaks on laminations; slightly effervescent; abrupt boundary.
305–419	2Cgb	Light gray (10YR 7/1 and 10YR 7/2) grading to yellowish brown (10YR 5/4) medium-coarse sand; massive structure; loose. End.

Core 2 represents a thin (56 cm thick) deposit of stratified alluvium with an Ab-Cgb sequence. The soil horizons show evidence of stratification, redoximorphic features, carbonates, and organic material. This core appears to represent late Holocene alluvium that settled onto historic-age channel deposits. Significant archaeological sites are unlikely to occur at this location.

Profile Designation: Core 3**Method:** Drill rig, 2–5’ split spoon**Slope:** 0-2%**Vegetation:** Mixed tall grasses**Recorder:** B. Scott, 9/13/2019**Location:** NAD83; Zone 15; 450,792.835 East; 4,604,043.388 North**Photographs:** Figures 46–51

Depth (cm)	Soil Horizon	Description
0–20	A	Very dark brown (10YR 2/2) loamy sand; weak, fine subangular blocky structure; friable; non-effervescent; abrupt boundary.
20–183	Fill 1	Brown (10YR 4/2) sand, silt, clay and rocks; massive structure; firm/compacted; some brick; breaks along planes in shale/clay; slightly effervescent; unknown boundary.
183–232	Fill 2	Reddish brown (2.5YR 4/4), dark reddish brown (2.5YR 2.5/3), and light greenish gray (5GY 7/1) clay; massive structure; plastic; frequent concrete and rock; strongly effervescent; abrupt boundary.

Depth (cm)	Soil Horizon	Description
232–260	Ab	Very dark grayish brown (10YR 3/2) silty clay; moderate, medium subangular blocky structure; firm/compacted; significant quantities of organic/root matter; strong marsh gas odor; historic glass at 250 cm; non-effervescent; unclear boundary.
260–480	Unknown	No recovery.
480–533	Cgb	Dark gray (10YR 4/1) silty clay; no structure information available (poor recovery); black (10YR 2/1) stratification evident; roots common; common brown (7.5YR 5/4) redoximorphic features appear to have been present; appears to have dark grayish brown (10YR 4/2) and very dark brown (10YR 2/2) coarse sand lenses; unclear boundary. Incomplete, poorly recovered cores.
533–586	2Cgb	Light gray (10YR 7/1 and 10YR 7/2) grading to yellowish brown (10YR 5/4) medium-coarse sand; massive structure; loose. End.

Core 3 has a relatively deep profile (~3 m thick) below fill levels. The Ab horizon shows signs of being formed under a perennially wet environment, which typically adds to the thickness of soil cores. Below the Ab horizon, the drill rig had difficulty obtaining a core and keeping it in the spoon. The Camp Creek member designation for this core derives from the Cgb horizon, which was very similar to the sample extracted from Core 2. The C horizon also had recognizable stratification and interbedded sand lenses. This type of deposit is likely slackwater silts and clays that settled out atop channel deposits. This location is too young to contain significant archaeological sites.

Profile Designation: Core 4

Method: Drill rig, 2–5' split spoon

Slope: 0-2%

Vegetation: Mixed tall grasses

Recorder: B. Scott, 9/13/2019

Location: NAD83; Zone 15; 450,710.503 East; 4,604,046.328 North

Photographs: Figures 52–57

Depth (cm)	Soil Horizon	Description
0–13	A	Yellowish brown (10YR 5/4) silty clay; weak, fine subangular blocky structure; friable; slightly effervescent; abrupt boundary.
13–57	Fill 1	Gray (10YR 6/1), dark reddish brown (2.5YR 3/3), and olive yellow (2.5Y 6/6) silt, clay, and rock; massive structure; friable; slightly effervescent; clear boundary.
57–83	Fill 2	Very dark grayish brown (10YR 3/2), black (10YR 2/1), and yellowish brown (10YR 5/4) sandy clay loam; massive structure; firm; frequent brick; strongly effervescent; abrupt smooth boundary
83–196	Fill 3	Very dark grayish brown (10YR 3/2) and greenish gray (5G 6/1) loamy sand; massive structure; friable; large pieces of wood, some brick; strong sewer gas odor; non-effervescent; abrupt boundary.
196–259	Ab	Very dark gray (10YR 3/1) silty clay; moderate, medium subangular blocky structure; firm; frequent roots/organics; compacted; some gray (10YR 6/1) silt inclusions; strong marsh gas odor; non-effervescent; unknown boundary.
259–286	ACb	Dark gray (10YR 4/1) loamy sand; weak, very fine subangular blocky structure; friable; stratification evident; common grayish brown (10YR 5/2) sand lenses; non-effervescent; clear smooth boundary.
286–316	Cb1/PSA	Very dark gray (10YR 3/1) and dark gray (10YR 4/1) silty clay; weak, fine subangular blocky structure; friable; non-effervescent; abrupt boundary.
316–350	Cb2/PSA	Very dark grayish brown (10YR 3/1) silt to silty clay; massive structure; friable with plasticity; breaks across lamination planes; non-effervescent; abrupt boundary.

Depth (cm)	Soil Horizon	Description
350–390	2Cgb	Gray (10YR 6/1) medium-coarse sand; massive structure; loose; single grain sand; wet. End.

Core 4 is comprised of Camp Creek member alluvium. The A horizon is fairly thick at this location (63 cm), but the ACb and Cb1 horizons are composed of stratified PSA atop channel sands. This landform likely represents a historic course of the Des Moines River and it is too young to contain significant archaeological sites.

Profile Designation: Core 5

Method: Drill rig, 2–5' split spoon

Slope: 0-2%

Vegetation: Mixed tall grasses

Recorder: B. Scott, 9/13/2019

Location: NAD83; Zone 15; 450,717.417 East; 4,604,003.528 North

Photographs: Figures 58–62

Depth (cm)	Soil Horizon	Description
0–17	A	Grayish brown (10YR 5/2) sandy clay; weak, fine subangular blocky structure; plastic; some historic materials; non-effervescent; clear boundary.
17–153	Fill 1	Greenish gray (10Y 6/1), dark reddish brown (2.5YR 3/3), light gray (10YR 7/1), brownish yellow (10YR 6/6), and brown (10YR 5/3) clay, rock, and mettle; massive structure; firm; slightly effervescent; abrupt boundary.
153–186	Fill 2	Brown (10YR 5/3) and light gray (10YR 7/1) coarse brick and concrete and some silt loam; massive structure; loose; violently effervescent; abrupt boundary.
186–259	Fill 3	Very dark grayish brown (10YR 3/2) and olive yellow (5Y 6/6) sandy loam; weak, fine subangular blocky structure; friable; frequent cinders, tar paper at 209 cm; non-effervescent; abrupt boundary.
259–280	Ab	Dark gray (10YR 4/1) and very dark grayish brown (10YR 3/2) silty clay; weak, fine subangular blocky structure; friable; some brown (7.5YR 4/4) redoximorphic features; bedding planes evident; non-effervescent; clear boundary.
280–333	2Cgb	Yellowish brown (10YR 5/4) medium-fine sand; massive structure; loose; single grain sand; strong brown (7.5YR 4/6) and light gray (10YR 7/1) thin sand lenses; stratified; non-effervescent. End.

Core 5 represents the historic course of the Des Moines River. Below fill deposits is a very thin A horizon (21 cm) atop channel sands. This location is too young and unstable to contain significant archaeological sites.

Profile Designation: Core 6

Method: Drill rig, 2–5' split spoon

Slope: 0-2%

Vegetation: Mixed tall grasses

Recorder: B. Scott, 9/13/2019

Location: NAD83; Zone 15; 450,718.123 East; 4,603,960.959 North

Photographs: Figures 63–67

Depth (cm)	Soil Horizon	Description
0–10	A	Dark grayish brown (10YR 4/2) loamy sand; weak, fine subangular blocky structure; friable; some historic material; non-effervescent; gradual boundary.
10–124	Fill 1	Brown (10YR 5/3), greenish gray (5GY 6/1), dark reddish brown (2.5YR 3/3), and yellowish brown (10YR 5/6) clay and sand; massive structure; firm; rock frequent; compacted; violently effervescent; abrupt boundary.

Depth (cm)	Soil Horizon	Description
124–174	Fill 2	Dark gray (10YR 4/1), yellowish brown (10YR 5/4), and strong brown (7.5YR 5/6) sandy clay loam; massive structure; friable; frequent wood and cinders; violently effervescent; clear boundary.
174–380	Fill 3	Very dark brown (10YR 2/2) silty clay loam; massive structure; friable; rocks and wood frequent; tin at 240 cm; strong hydrocarbon odor; violently effervescent; unclear boundary.
380–500	2Cgb	Gray (10YR 5/1) and yellowish brown (10YR 5/6) medium-fine sand; massive structure; loose; excessively wet; tin at 422 cm (possibly pushed down by core). End.

This profile produced fill materials over channel deposits. The top of the profile has a modern, developing A horizon (current vegetative surface). There was difficulty in obtaining a solid core for 224 to 380 cm below surface because wood kept compressing the soil in the core. However, no sediment that could be interpreted as an A or B horizon was encountered above the channel sands.

Profile Designation: Core 7

Method: Drill rig, 2–5' split spoon

Slope: 0-2%

Vegetation: Mixed tall grasses

Recorder: B. Scott, 9/16/2019

Location: NAD83; Zone 15; 450,647.342 East; 4,603,969.038 North

Photographs: Figures 68–75

Depth (cm)	Soil Horizon	Description
0–183	Fill 1	Dark yellowish brown (10YR 4/4) greenish gray (5GY 6/1), dusky red (10R 3/3), and very dark brown (10YR 2/2) sandy clay; weak, medium subangular blocky structure; firm; some rock; concrete rubble; non-effervescent; unclear boundary.
183–284	Fill 2	Very dark gray (10YR 3/1) sandy loam; weak, fine subangular blocky structure; friable; cinders, brick, and wood present; plastic at 182 cm; strong odor of creosote; slightly effervescent; unclear boundary.
284–299	Fill 3	Dark greenish gray (5GY 4/1) silty clay with faint olive (5Y 4/4) mottles; weak, fine subangular blocky structure; plastic; some wood with creosote odor (possibly from above); slightly effervescent; abrupt boundary.
299–356	Fill 4	Black (10YR 2/1) sandy loam; massive structure; loose; common cinders, glass, and brick; violently effervescent; abrupt boundary.
356–383	Fill 5	Dark greenish gray (10GY 4/1), dark yellowish brown (10YR 4/4), and very dark grayish brown (10YR 3/2) sandy clay; massive structure; friable with plasticity; some brick and rock; slightly effervescent; abrupt boundary.
383–401	Ab1	Very dark gray (10YR 3/1) silt loam; weak, fine subangular blocky structure; friable; frequent crushed aquatic gastropod shell; decaying wood common; non-effervescent; clear boundary.
401–406	Ab2	Very dark gray (10YR 3/1) silt loam; weak, fine subangular blocky structure; plastic; aquatic gastropod shell common; slightly effervescent; unknown boundary.
406–558	Bgb	Dark greenish gray (5GY 3/1 and 10Y 3/1) silty clay; weak, medium subangular blocky structure; friable with plasticity; aquatic gastropod shell common; slightly effervescent; abrupt boundary.
558–562	2Cgb	Dark greenish gray (10Y 3/1) medium-coarse sand; massive structure; loose; slightly effervescent; single-grain sand. End.

Core 7 is interpreted to be an early Camp Creek member deposit. The entire Holocene sequence at this location is confined to 1.75 m of silty to silty clay alluvium. The soil is weakly developed, has an

effervescence reaction, has reduced colors, and decaying organics and aquatic gastropod shells are common. This profile is consistent with slackwater deposits formed in oxbow lakes. This location would have been perennially wet and inhospitable throughout much of the Late Prehistoric and early Historic period. Archaeological sites are unlikely to occur at this location.

Profile Designation: Core 8

Method: Drill rig, 2–5’ split spoon

Slope: 0-2%

Vegetation: Mixed tall grasses

Recorder: B. Scott, 9/16/2019

Location: NAD83; Zone 15; 450,619.66 East; 4,603,995.269 North

Photographs: Figures 76–83

Depth (cm)	Soil Horizon	Description
0–113	Fill 1	Very pale brown (10YR 7/4), dark brown (10YR 3/3), very dark grayish brown (10YR 3/2), dark olive brown (2.5YR 3/3), olive (5Y 5/4), yellow (5Y 7/6), and greenish gray (5G 6/1) clay, silt, sand, and rock; massive structure; firm; brick common; interbedded with black (10YR 2/1) cinders; strongly effervescent; abrupt boundary.
113–180	Fill 2	Yellowish brown (10YR 5/4) clay with black (10YR 2/1) beds of cinders; massive structure; firm/compacted; brick common; some greenish gray (5GY 6/1) silts/clays; violently effervescent; abrupt boundary.
180–332	Fill 3	Black (10YR 2/1) silt loam; massive structure; loose; cinders, brick, and wood common; violently effervescent; unclear boundary
332–400	Fill 4	Black (10YR 2/1) silt and cinders; massive structure; friable; some brick; abrupt boundary.
400–408	Fill 5	Black (10YR 2/1) and dark yellowish brown (10YR 4/6) sand and cinders; massive structure; loose; wet; glass common; abrupt boundary.
408–448	Abg	Greenish black (10Y 2.5/1) silt loam; weak, fine subangular blocky structure; friable with plasticity; dense small aquatic gastropod shell; coarse sand lenses; slightly effervescent; clear boundary.
448–650	Bgb	Greenish black (10Y 2.5/1) sandy clay loam; weak, fine subangular blocky structure; plastic; common aquatic gastropod shell; common organic material; sand lenses common; slightly effervescent. End. Wetness and slumping made deeper coring difficult.

Core 8 is very similar to Cores 10 and 11. This location is interpreted to be an early Camp Creek or late Roberts Creek member deposit. The Bgb horizon is very thick (like Core 10). Colors are reduced, redoximorphic features are common, and aquatic gastropod shells occur throughout the profile. Both the Abg and Bgb horizons had carbonates present, indicating that the landform has not had enough time for carbonates to leach out. This landform is interpreted to be a late Holocene/early historic slackwater deposit associated with an oxbow. This type of location would have been perennially wet and inhospitable for extended human settlement.

Profile Designation: Core 9

Method: Drill rig, 2–5’ split spoon

Slope: 0-2%

Vegetation: Mixed tall grasses

Recorder: B. Scott, 9/16/2019

Location: NAD83; Zone 15; 450,605.516 East; 4,604,023.807 North

Photographs: Figures 84–88

Depth (cm)	Soil Horizon	Description
0–179	Fill 1	Very dark gray (10YR 3/1), dark yellowish brown (10YR 4/6), light gray (10YR 7/2), light olive brown (2.5Y 5/6), dark reddish brown (2.5YR 3/3), and greenish gray (5GY 5/1) silt, clay, and sand; massive structure; firm; common cinders, brick, and concrete; hydrocarbon odor; abrupt boundary.
179–233	Ab	Very dark grayish brown (10YR 3/2) and brown (10YR 4/3) silt loam; weak, fine subangular blocky structure; friable; slight bedding/lamination; hydrocarbon odor; slightly effervescent; clear boundary.
233–279	ACb	Gray (10YR 5/1) and dark grayish brown (10YR 4/2) fine sand; weak, very fine subangular blocky structure; friable; parts on laminations; slightly effervescent; clear boundary.
279–371	2Cb	Light gray (10YR 7/1) and white (10YR 8/1) medium-coarse sand; massive structure; loose; single grain sand; non-effervescent; gradual boundary
371–422	2Cgb	Light gray (10YR 7/2) and light yellowish brown (10YR 6/4) coarse sand; massive structure; loose; single grain sand; non-effervescent; wet. End.

Core 9 encountered an Ab-ACb-2Cb soil sequence consistent with the Camp Creek member. The sediments have weak structure and laminations are clearly distinguishable. The alluvial package is thin (approximately 1 m of Holocene alluvium), indicating that this location was likely part of the historic floodplain and it represented very low alluvial landforms at the time of European settlement. This core likely represents a small, historic-age terrace. Archaeological sites are unlikely to occur at this location due to position on the landscape and youthful age.

Profile Designation: Core 10

Method: Drill rig, 2–5' split spoon

Slope: 0-2%

Vegetation: Mixed tall grasses

Recorder: B. Scott, 9/16/2019

Location: NAD83; Zone 15; 450,486.741 East; 4,603,952.78 North

Photographs: Figures 89–95

Depth (cm)	Soil Horizon	Description
0–380	Fill 1	Greenish gray (10Y 6/1), dark gray (N 4/), red (2.5YR 5/6), and strong brown (7.5YR 4/6) silt, clay, sand, and rock; massive structure; firm; cinders, concrete, and brick common; wood and glass present; creosote odor; unknown boundary.
380–402	Ab	Very dark grayish brown (10YR 3/2) silt loam; weak, fine subangular blocky structure; friable with plasticity; frequent aquatic gastropod shells; strong marsh gas odor; slightly effervescent; gradual boundary.
402–495	Bgb1	Very dark grayish brown (10YR 3/2) and black (10YR 2/1) silty clay loam; weak, fine subangular blocky structure; friable with plasticity; common strong brown (7.5YR 4/6) redoximorphic features; frequent organic material; slightly effervescent; clear boundary.
495–580	Bgb2	Very dark grayish brown (10YR 3/2) silty clay loam; massive structure; plastic; common strong brown (7.5YR 4/6) redoximorphic features; slight gray (10YR 6/1) laminations/bedding; non-effervescent; abrupt boundary.
580–610	2Cgb	Dark gray (N 4/) medium-coarse sand; massive structure; non-effervescent; loose. End.

Core 10 represents a late Roberts Creek member deposit. The interpretation of this member is based on the thickness of the Bgb horizon and the slight effervescence of carbonates that have not leached from the profile. The Ab horizon is very thin (22 cm) and it has frequent aquatic gastropod shells and a strong odor of marsh gas. The Bgb and BCgb horizons have strong redoximorphic features and a high organic content that is consistent with slackwater deposits formed in oxbow lakes. This type of landform would have been

perennially wet during the Late Prehistoric and early historic periods, making in an unsuitable location for extended human settlement.

Profile Designation: Core 11

Method: Drill rig, 2–5’ split spoon

Slope: 0-2%

Vegetation: Mixed tall grasses

Recorder: B. Scott, 9/16/2019

Location: NAD83; Zone 15; 450,517.211 East; 4,603,994.687 North

Photographs: Figures 96–100

Depth (cm)	Soil Horizon	Description
0–213	Fill 1	Brick and concrete rubble; could not get description because of no recovery.
213–460	Fill 2	Yellowish brown (10YR 5/4) and light gray (10YR 7/1) sand, concrete, and brick; no structure data available; some wood; minimal recovery.
460–500	Bgb	Dark gray (N 4/) silty clay; massive structure; plastic; common, coarse strong brown (7.5YR 4/6) redoximorphic features; common aquatic gastropod shells; slightly effervescent; abrupt boundary.
500–520	2Cgb	Gray (10YR 5/1) medium sand; massive structure; loose; wet; non-effervescent. End.

Core 11 consisted of fills atop a truncated Bgb horizon which is interpreted to be associated with the late Roberts Creek member. It is unclear if truncation occurred because of past borrowing/earthmoving activities or fluvial action. The Bgb horizon is very similar to Core 10, and this soil formed in an excessively wet environment as noted by color reduction, redoximorphic features, and aquatic gastropods. The “late Roberts Creek” designation derives from carbonates in the horizon that have not had time to leach from the profile. This location likely represented a slackwater deposit associated with an oxbow during the Late Prehistoric and early historic period. This type of environment is unlikely to yield archaeological deposits because it would have been perennially wet and difficult to settle on for extended periods.

Profile Designation: Core 12

Method: Drill rig, 2–5’ split spoon

Slope: 0-2%

Vegetation: Mixed tall grasses

Recorder: B. Scott, 9/16/2019

Location: NAD83; Zone 15; 449,875.556 East; 4,603,981.127 North

Photographs: Figures 101–104

Depth (cm)	Soil Horizon	Description
0–12	A	Very dark grayish brown (10YR 3/2) and yellowish brown (10YR 5/4) silt loam; weak, fine subangular blocky structure; friable; clear boundary.
12–76	Fill 1	No description available; no recovery; abrupt boundary.
76–98	Cg1/PSA	Grayish brown (10YR 5/2) silt with light gray (10YR 7/1) stratification; massive structure; friable with plasticity; stratified alluvial deposit; brown (7.5YR 4/4) redoximorphic features; slightly effervescent; clear boundary.
98–134	Cg2/PSA	Grayish brown (10YR 5/2) fine sand; massive structure; friable; wet; non-effervescent; abrupt boundary.
134–220	2Cgb	Brown (10YR 5/3) medium sand; massive structure; single grain sand; loose; wet; lenses of strong brown (7.5YR 4/6) medium sand; non-effervescent. End.

Core 12 was placed in the western portion of the project area to determine if borrowing activities removed the Holocene alluvial sequence. A small section of fill was encountered and drilled through. Below fill

layers were modern flood deposits (PSA) atop channel sands. Past borrowing activities in this area removed sediments above channel deposits and significant archaeological sites will not be found in this area.

Discussion

Correlating profiles across space produces a predictable pattern to alluvial deposits (Figure 26). In the northern parts of the project area, Camp Creek member sediments over channel sand dominate. This suggests that the historic river course backed up against the valley wall and cut a channel through the project area. Only Core 9 produced a profile that could be a slightly elevated, better drained Camp Creek Member terrace landform. The remainder of the cores appear to be slackwater deposits atop channel sands and the soils developed in a wet, marshy environment. The southern portion of the project area produced cores consistent with the late Roberts Creek/early Camp Creek members. Profiles in the southern portion of the project area were highly reduced, contained significant quantities of organic material, had common aquatic gastropods, and redoximorphic features were common. These sticky clays and silts are indicative of low-lying wetlands that formed in depressional areas. This area was likely an oxbow/wetland during the Late Prehistoric/early historic periods. Older alluvium (i.e., Gunder Member or High Terrace) was not encountered within the project area. The types of landforms represented below historic fills would have been swampy, wet, and inhospitable for extended human settlement.

The historic fills were likely placed atop this location to elevate the ground surface out of these swampy conditions for modern development or just as a general dumping area. Historic topographic maps indicate the presence of some potential buildings/structures in the western and southern portions of the project area. The western portion of the project area (where geoarchaeological investigations were able to be conducted) consisted of a borrow area that stripped Holocene sediments to the underlying channel sands. Historic archaeological resources are unlikely to be found in these areas. The southern portion of the project area has been disturbed by large utility trenches and man-made water retention basins. Significant historic-era sites are unlikely to be preserved in this area. The remainder of the project area has little to no historic development outside of railroad tracks. If there were small structures in the project area, their archaeological deposits would be masked by the dense historic fills (much of which is building materials from other properties around Des Moines), making it nearly impossible to differentiate a historic building component from the surrounding concrete and brick fill.

Constraints to Investigation and Deviations from Best-Practice Guidelines

The entire project area has been manipulated by past activities and there are significant quantities of historic infilling atop the original alluvial surface. This has masked potential subsurface landscape features. Impact7G attempted to locate cores to best sample the subsurface environment. The surface conditions did not allow for cores to be extracted in all proposed locations. Portions of the project area have standing wetlands/fens and equipment was not able to access these areas. Furthermore, tree vegetation prevented a core being placed in one location. Impact7G focused testing on areas where there will be the greatest amount of proposed subsurface work. A section of the project area is not owned by the City of Des Moines, and we could not get access for this area prior to initiation to this project. Concrete and brick fill material also limited the ability to extract complete cores because these locations in profile had to be drilled out with no recovery.

Recommendations

Impact7G encountered only slackwater deposits associated with wetland/oxbow lake environments (late Roberts Creek and Camp Creek member deposits) and Camp Creek member alluvium over channel sands in the portion of the project area where site access was granted. These locations have low potential for significant archaeological sites. Impact7G recommends no additional archaeological investigations for the portion of the project area where geoarchaeological testing could be conducted. Additional investigations might be warranted for areas where landowner access was not obtained prior to the completion of this report. It is anticipated, however, that profiles consisting of Camp Creek Member alluvium over channel sands will be encountered in this non-sampled area because it appears the Des Moines River was positioned against the valley wall at this location.

Despite our best efforts, archaeologists have not devised survey and testing methods that can guarantee all archaeological sites will be identified within a project area all the time. If unanticipated archaeological sites are encountered during earthmoving/development, activities should cease, and the overseeing Federal/State agency should be contacted as well as the SHPO at (515) 281-5111. The developer is responsible for protecting cultural resources from additional disturbance until a professional examination is made and permission to proceed with development is granted by the overseeing Federal/State agency and SHPO. Human burials are protected by Iowa law (Chapter 716.5, Iowa Code). If human remains are encountered, take measures to secure the find(s) and contact the State Medical Examiner at (515) 725-1400 or city, county, or state law enforcement agencies. If human remains are suspected to be 150 years old or older, also contact the Bioarchaeology Program at the Office of the State Archaeologist at (319) 384-0740.

References Cited

Andreas, Alfred T.

1875 *Illustrated Historical Atlas of the State of Iowa*. Andreas Atlas Company, Chicago.

Artz, Joe A.

2005 Ackmore to Zwingle; Soil Series of Iowa. Electronic document, www.iowaisites.com/soil-series/, accessed September 21, 2019. Office of the State Archaeologist, University of Iowa, Iowa City.

2019a *Geoarchaeological Assessment for the Proposed Federal Courthouse Building, Des Moines, Polk County, Iowa*. CRM Report 80. Impact7G, Inc., Clive, Iowa.

2019b *Phase I Geoarchaeological Assessment for the SE 9th Street Pump Station, City of Des Moines, Polk County, Iowa*. CRM Report 67. Impact7G, Inc., Clive, Iowa.

2109c Letter Report: Supplement to CRM Report 67: Phase I Geoarchaeological Assessment for the SE 9th Street Pump Station, City of Des Moines, Polk County, Iowa. Impact7G, Inc., Clive, Iowa.

Artz, Joe A., and E. Arthur Bettis III

2013 *Pennsylvanian, Cretaceous, and Quaternary Geology of the Whiterock Conservancy, on the Middle Raccoon River, Guthrie and Carroll Counties, Iowa*. Contract Completion Report 1969. Office of the State Archaeologist, University of Iowa, Iowa City.

Artz, Joe A., William E. Whittaker, and Jan Olive Nash

2003 *Phase IA Geomorphological, Archaeological, and Architectural/Historical Reconnaissance for the Proposed Des Moines River Outfall and Overflow Sewer, Sections 4, 9, and 10, T78N-R24W, Polk County, Iowa*. Contract Completion Report 1083. Office of the State Archaeologist, University of Iowa, Iowa City.

Association of Iowa Archaeologists

2018 *Association of Iowa Archaeologists Guidelines*. Association of Iowa Archaeologists, Iowa City.

Benn, David W.

1991 The Christenson Oneota Site, 13PK407. *Journal of the Iowa Archeological Society* 38:16–55.

Benn, David W., Lowell Blikre, Lucretia S. Kelly, Derek V. Lee, Gina S. Powell, and Jeffrey R. Straka

2003 *Data Recovery Excavations at the Christenson Oneota Site (13PK407), Polk County, Iowa*. BCA 959/1029. Bear Creek Archeology, Inc., Cresco, Iowa.

Bettis, E. Arthur III

1990 *Holocene Alluvial Stratigraphy and Selected Aspects of the Quaternary History of Western Iowa*. Guidebook for the 37th Midwest Friends of the Pleistocene Field Conference.

Bettis, E. Arthur III, Jeffrey D. Anderson, J. S. Oliver, David W. Benn, and Michael D. Wiant

1996 *Landform Sediment Assemblage (LSA) Units in the Upper Mississippi River Valley, United States Army Corps of Engineers, Rock Island District, Vol. 1 & 2*. Illinois State Museum Research and Collections Center. Quaternary Studies Program, Technical Report No. 95-1004-11b, Springfield, Illinois.

Bettis, E. Arthur III, Richard G. Baker, William R. Green, Mark K. Whelan, and David W. Benn

- 1992 *Late Wisconsin and Holocene Alluvial Stratigraphy, Paleoecology, and Archaeological Geology of East-Central Iowa*. Guidebook Series No. 12, Quaternary Studies Group Contribution No. 51.
- Bettis, E. Arthur III, and David W. Benn
1984 An Archaeological and Geomorphological Survey in the Central Des Moines River Valley, Iowa. *Plains Anthropologist* 29:211–227.
- Bettis, E. Arthur III, and John P. Littke
1987 *Holocene Alluvial Stratigraphy and Landscape Development in Soap Creek Watershed Appanoose, Davis, Monroe, and Wapello County, Iowa*. Contribution No. 14, Iowa Quaternary Studies Group, Geological Survey Bureau, Iowa City.
- Bettis, E. Arthur III, Deborah J. Quade, and Timothy J. Kemmis
1996 *Hogs, Bogs, and Logs: Quaternary Deposits and Environmental Geology of the Des Moines Lobe*. Guidebook Series 18. Iowa Geological Survey, Iowa City.
- Bettis, E. Arthur III, and Dean M. Thompson
1981 Holocene Landscape Evolution in Western Iowa: Concepts, Methods, and Implications for Archeology. In *Current Directions in Midwestern Archeology: Selected Papers from the Mankato Conference*, edited by Scott Anfinson, pp. 1–14. Occasional Publications in Minnesota Anthropology No. 9. Minnesota Archeological Society, St. Paul.
- Brice, Petrides and Associates
1985 *Cultural Resources of the CBD Loop Arterial Project Area: Phase II Investigations: Project No. M-2787(1)-81-77*. Brice, Petrides and Associates, Waterloo, Iowa.
- Dideriksen, Robert O., and Caryl A. Radatz
2000 *Soil Survey of Polk County, Iowa*. U.S. Department of Agriculture Natural Resources Conservation Service. U.S. Government Printing Office, Washington, D.C.
- General Land Office
1848 *Secretary of State Land Survey Records: Description of the Lands on the Interior Sectional Lines*. On file, State Historical Library, Iowa City.
- Hixson, W. W.
1930 *Plat Book of Polk County, Iowa*. W. W. Hixson and Company, Rockford, Illinois.
- Hovey, Arthur M.
1902 *Atlas of Polk County, Iowa*. Arthur M. Hovey, Knoxville, Iowa.
- Johnson, Mark, and R. Peter Winham
1992 *Archeological and Geomorphological Evaluation of the Des Moines Sewer Reroutes, Phase 2, Supplement A*. Archeology Laboratory, Augustana College, Sioux Falls, South Dakota.
- Kenyon Company
1914 *Atlas and Plat Book of Polk County, Iowa*. Kenyon Company, Des Moines, Iowa.
- Lawrence, Emilie, and John Hotopp
1978 *F-65-4 Reconstruction Polk County*. Project Completion Report 2(9). Office of the State Archaeologist, University of Iowa, Iowa City.

Nagel, Cindy L., Cynthia L. Peterson, and Joe. A. Artz

2005 *Phase I Geomorphological and Archaeological Investigation for the Proposed Des Moines River Outfall and Overflow Sewer Project, Stage 1, South of Court Avenue, City of Des Moines, Polk County, Iowa.* Contract Completion Report 1161. Office of the State Archaeologist, University of Iowa, Iowa City.

Natural Resources Conservation Service

2018 Soil Survey of Polk County, Iowa. United States Department of Agriculture, Washington, D.C. Electronic document, <https://websoilsurvey.sc.egov.usda.gov/Home Page.htm>.

Peterson, Cynthia L., Fred A. Finney, and Stephen C. Lensink

1993 *Phase I Archaeological Survey of the CBD Loop Alternative and Fifteenth Street Extension, City of Des Moines, Polk County, Iowa.* Contract Completion Report 374. Office of the State Archaeologist, University of Iowa, Iowa City.

Pope, Melody, William E. Whittaker, and Angela R. Collins (editors)

2014 *The Palace Site (13PK966): A Middle Archaic Habitation and Burial Site in Des Moines.* Contract Completion Report 2000. Office of the State Archaeologist, University of Iowa, Iowa City.

Prior, Jean C.

1991 *Landforms of Iowa.* University of Iowa Press, Iowa City.

Schoeneberger, P. J., D. A. Wysocki, E. C. Benham, and Soil Survey Staff

2012 *Field Book for Describing and Sampling Soils.* Version 3.0. Natural Resources Conservation Service, National Soil Survey Center, Lincoln, Nebraska.

Tate, J. C., and F. C. Tate

1899 *Tate's Atlas of Des Moines and Plat Directory to Additions, Subdivisions and Official Plats in Des Moines, Iowa.* J. C. and F. C. Tate, Des Moines, Iowa.

Whittaker, William E., Melody Pope, John Doershuk, and Stephen C. Lensink

2007 *Phase I Intensive Archaeological Investigation of the Proposed Des Moines Southeast Connector Project, SE 12th Street to U.S. 65, Polk County, Iowa.* Contract Completion Report 1550. Office of the State Archaeologist, University of Iowa, Iowa City.

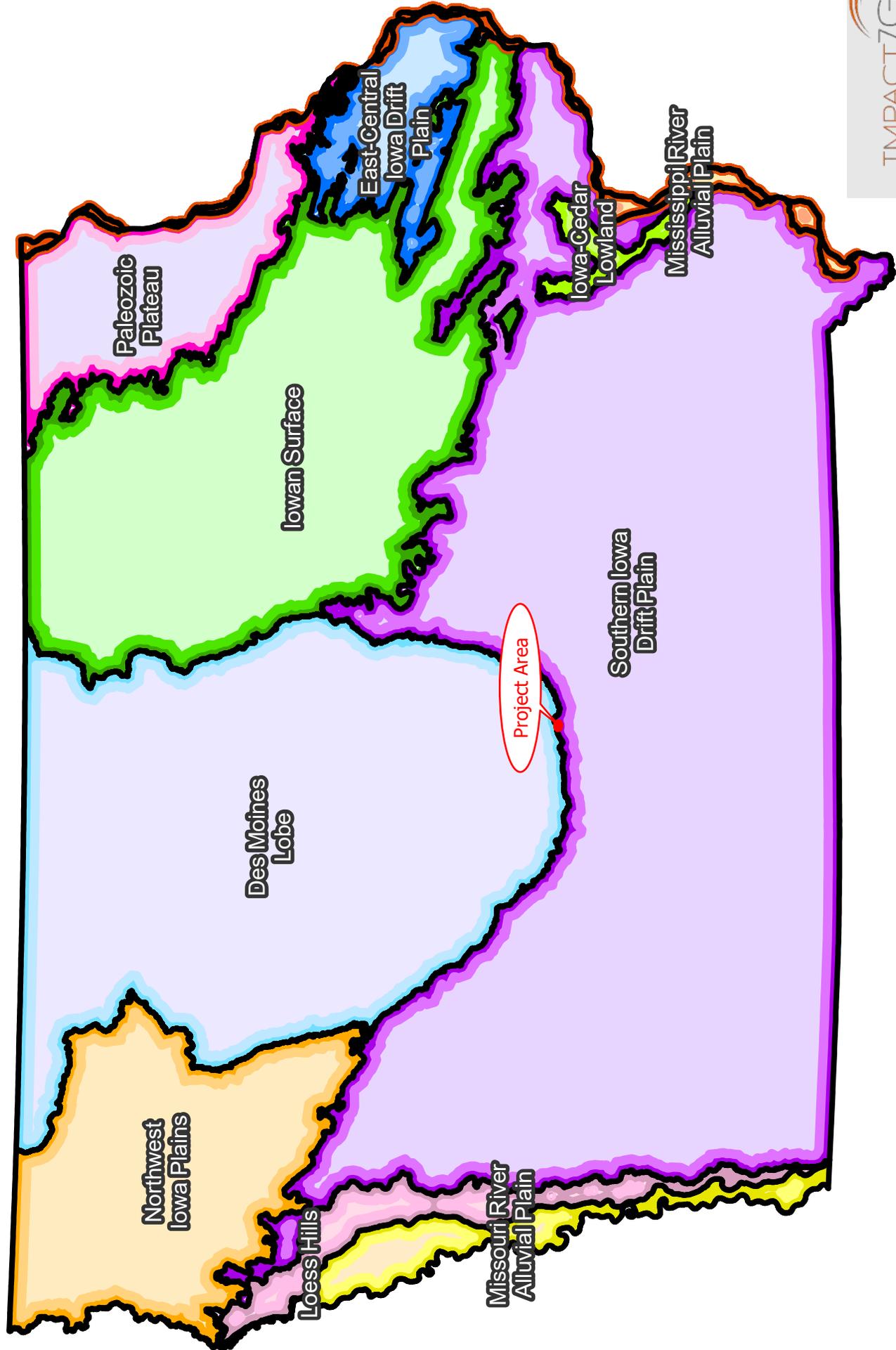
Winham, R. Peter, and Rolfe Mandel

1991 *Archeological and Geomorphological Evaluation of the Des Moines Sewer Reroutes, Phase 2.* Archeology Laboratory, Augustana College, Sioux Falls, South Dakota.

Figures

Figure 1. Physiographic location of the project area

Project Area



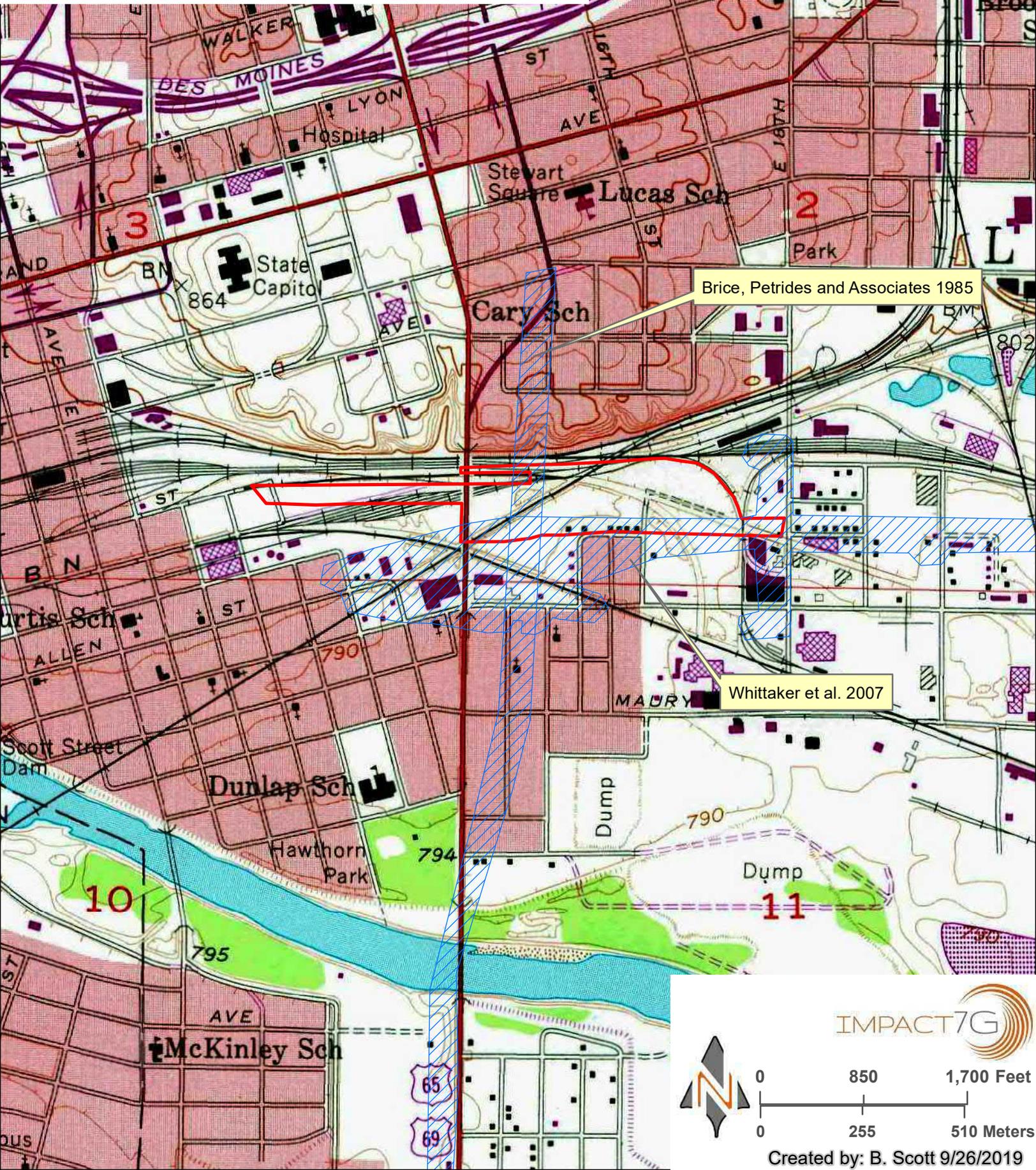
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0 20 40 Kilometers
Created by: K. Kettler 9/26/2019

Figure 2. Topographic location of the project area

Legend

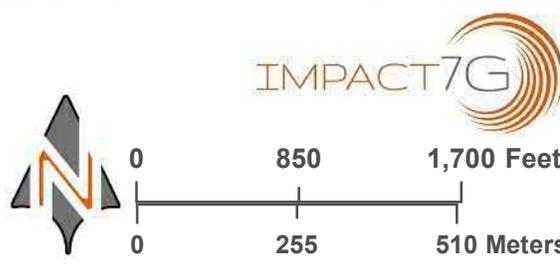
-  Project Area
-  Previous Survey



Brice, Petrides and Associates 1985

Whittaker et al. 2007

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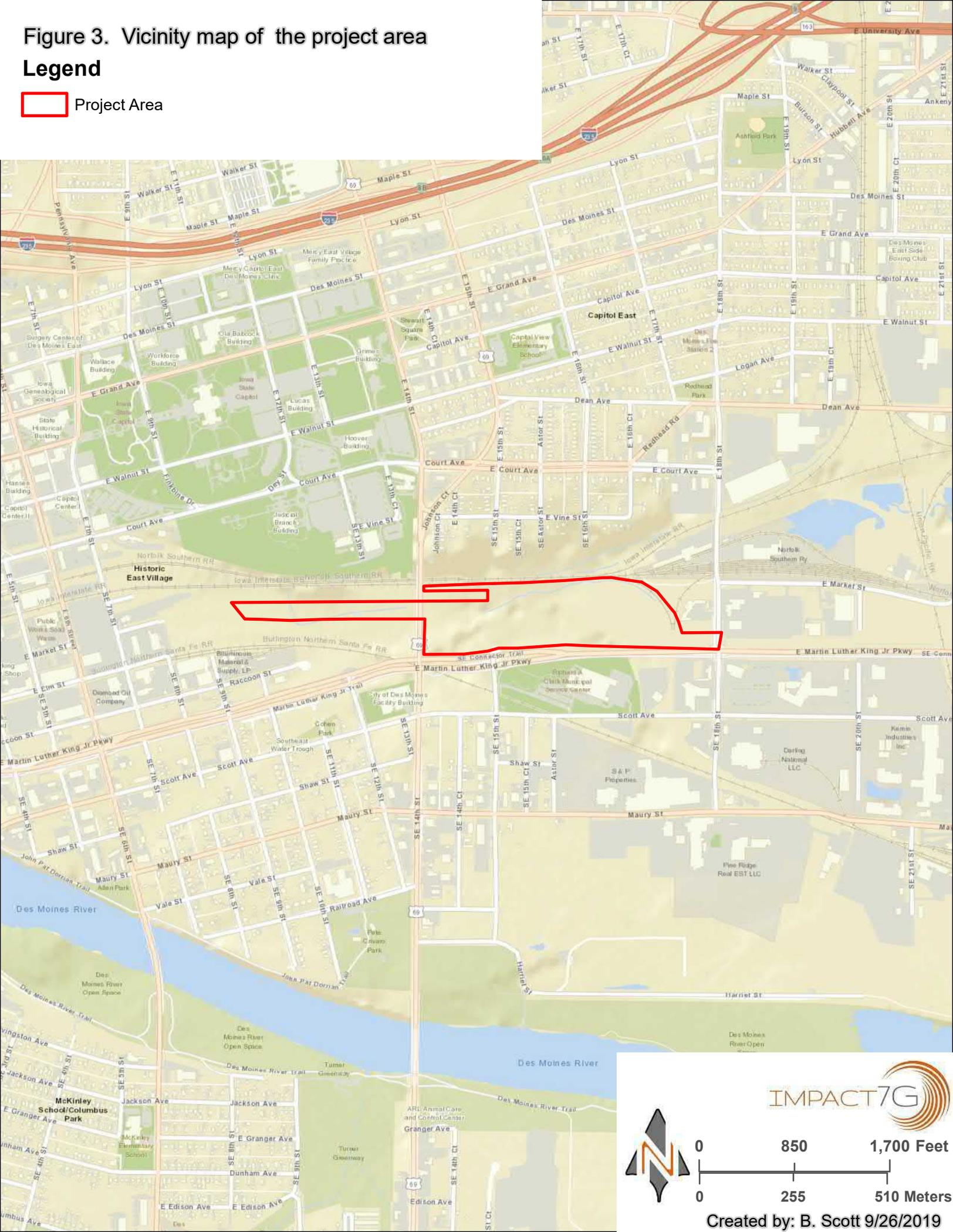
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Created by: B. Scott 9/26/2019

Figure 3. Vicinity map of the project area

Legend

 Project Area



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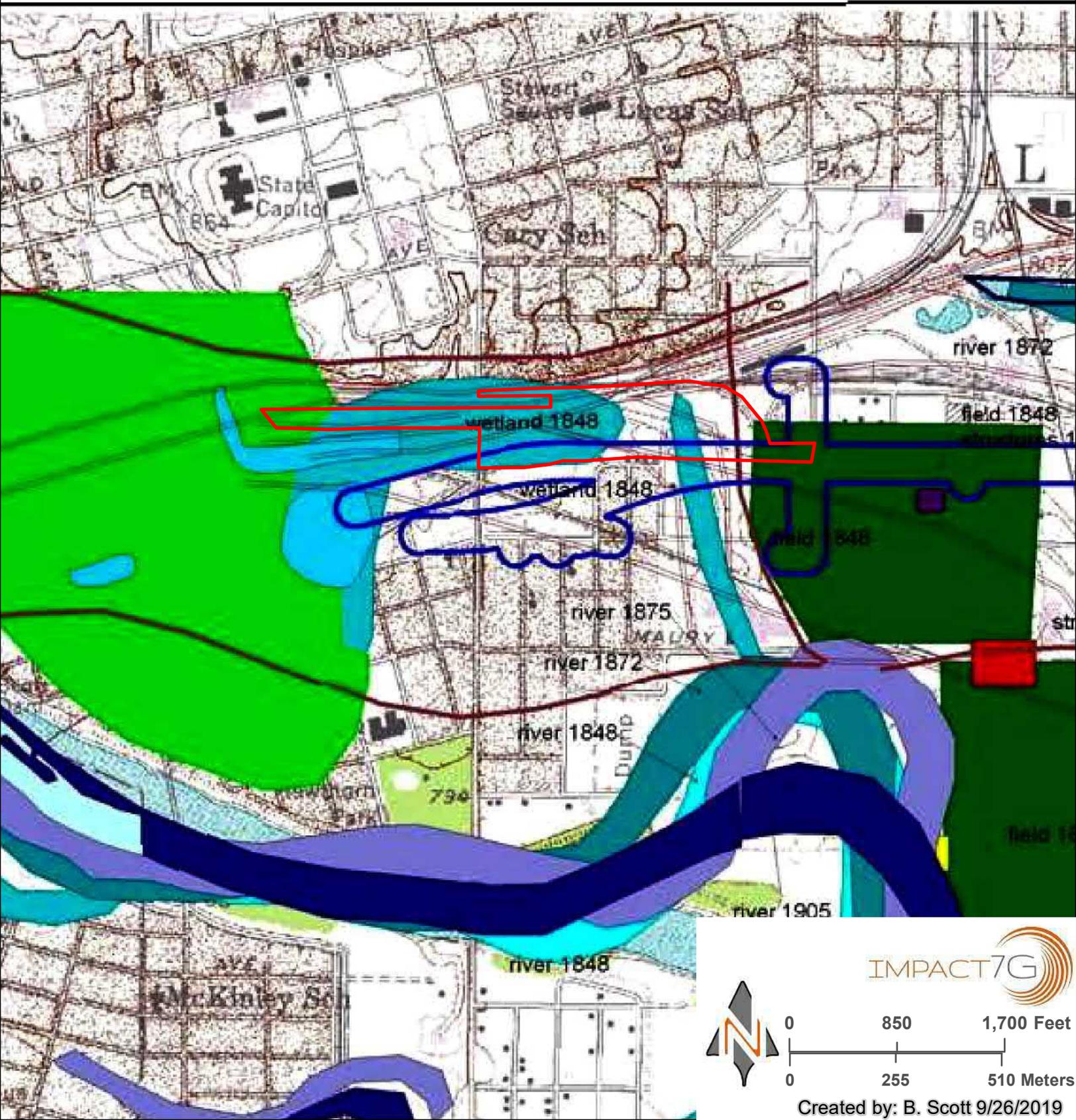
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Figure 4. Wetlands and streams mapped by Whittaker et al. (2005) within the project area

Legend

 Project Area

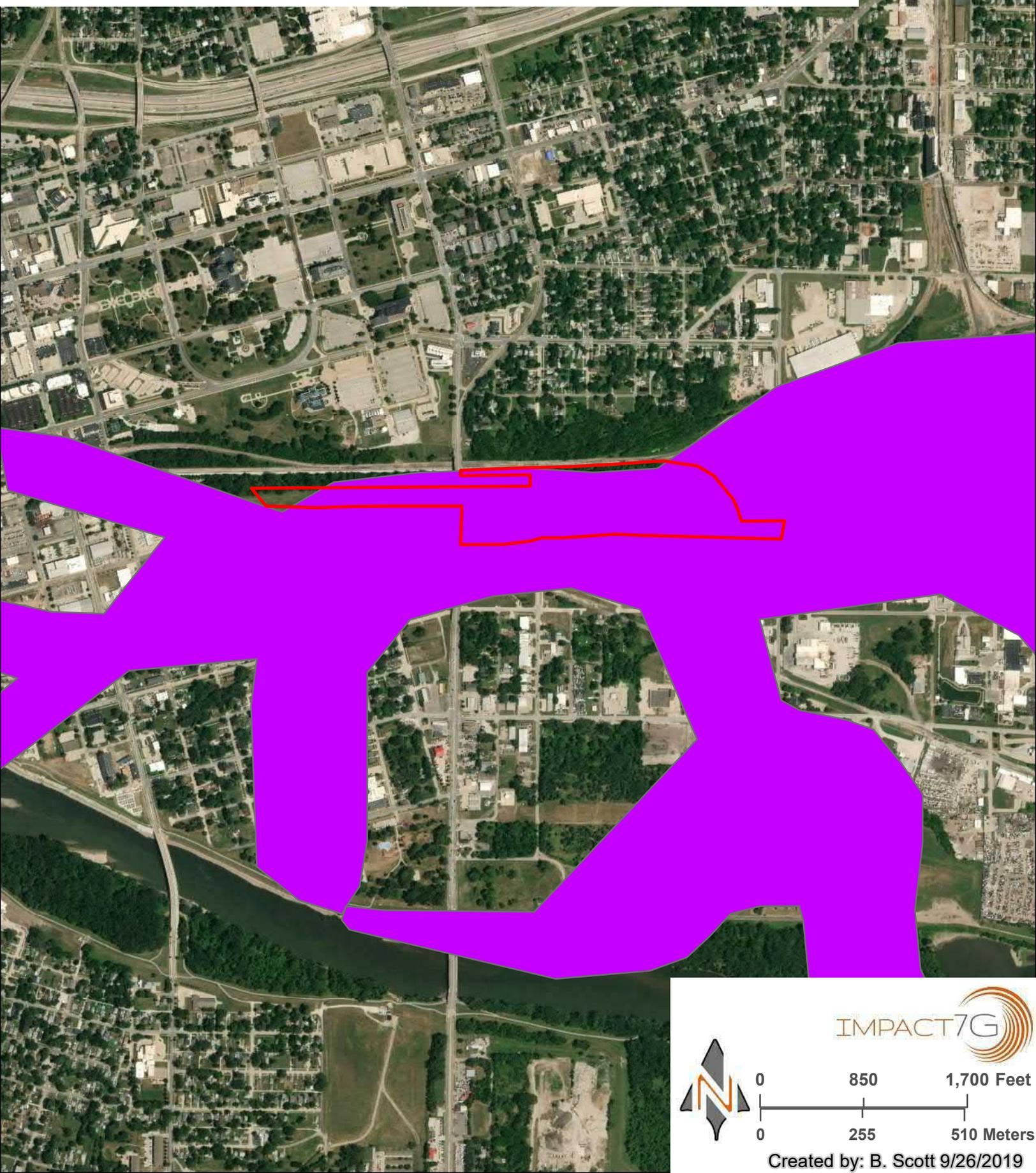



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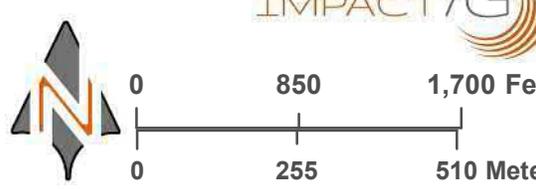
Figure 5. Proposed historic meander belts mapped by Whittaker et al. (2005) within the project area

Legend

-  Project Area
-  Proposed Meander Bends (Whittaker et al. 2007)



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0 850 1,700 Feet
0 255 510 Meters

Created by: B. Scott 9/26/2019

Figure 6. Sediment packages in the Des Moines River floodplain based on Pope et al. (2014)

Legend

 Project Area

 Area Surface Geology From Pope et al. (2014)



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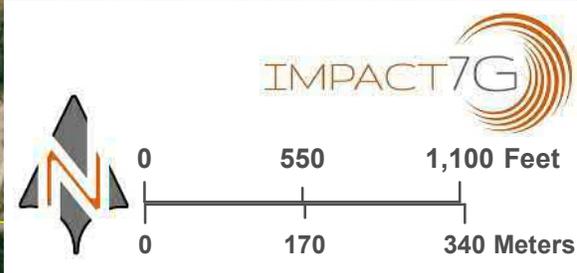
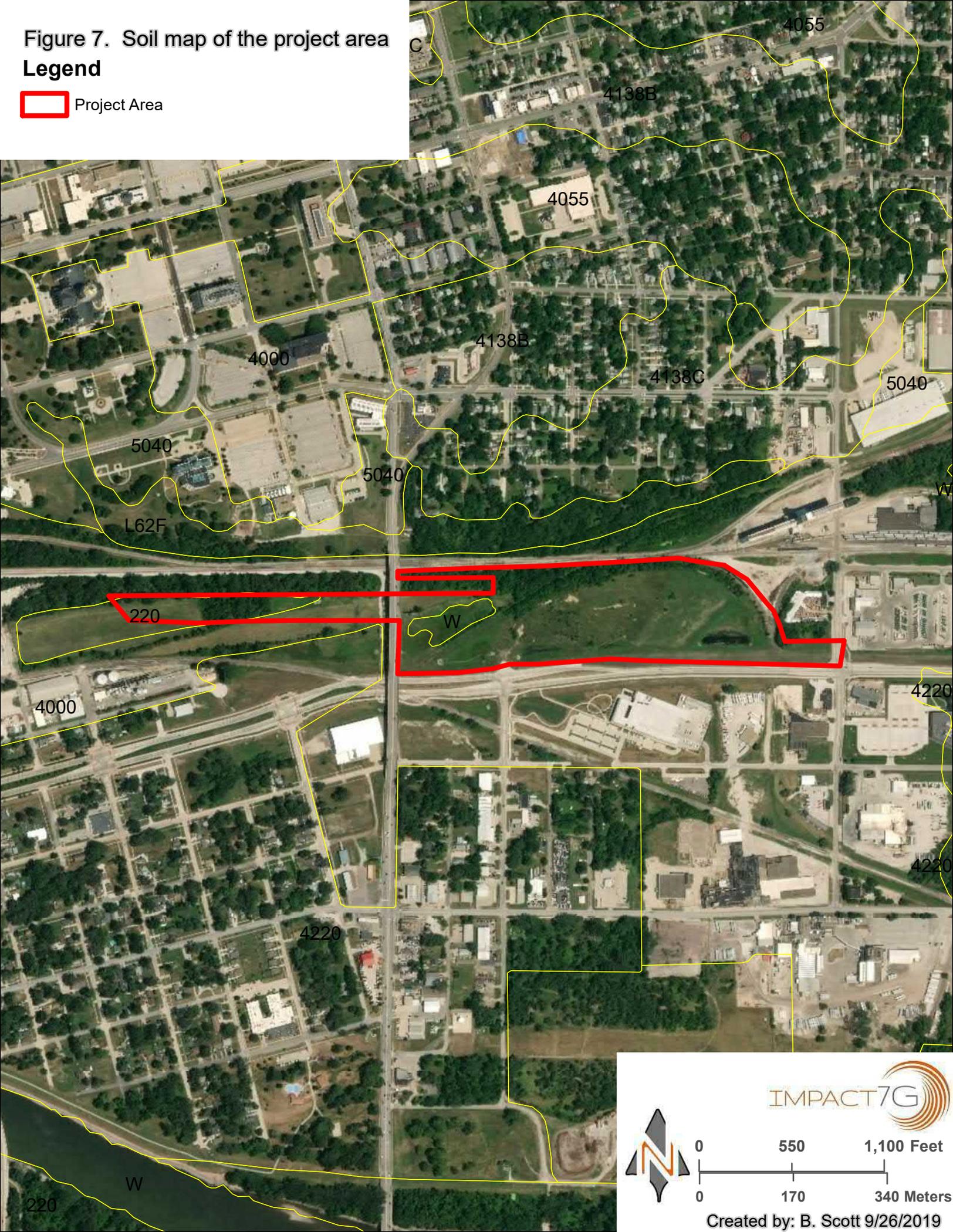
 0 850 1,700 Feet
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Figure 7. Soil map of the project area

Legend

 Project Area



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Created by: B. Scott 9/26/2019

Figure 9. 1875 map of the project area (Andreas)

Legend

 Project Area

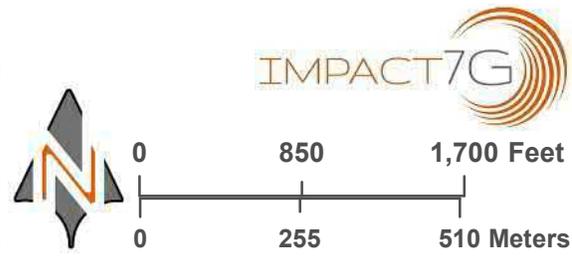
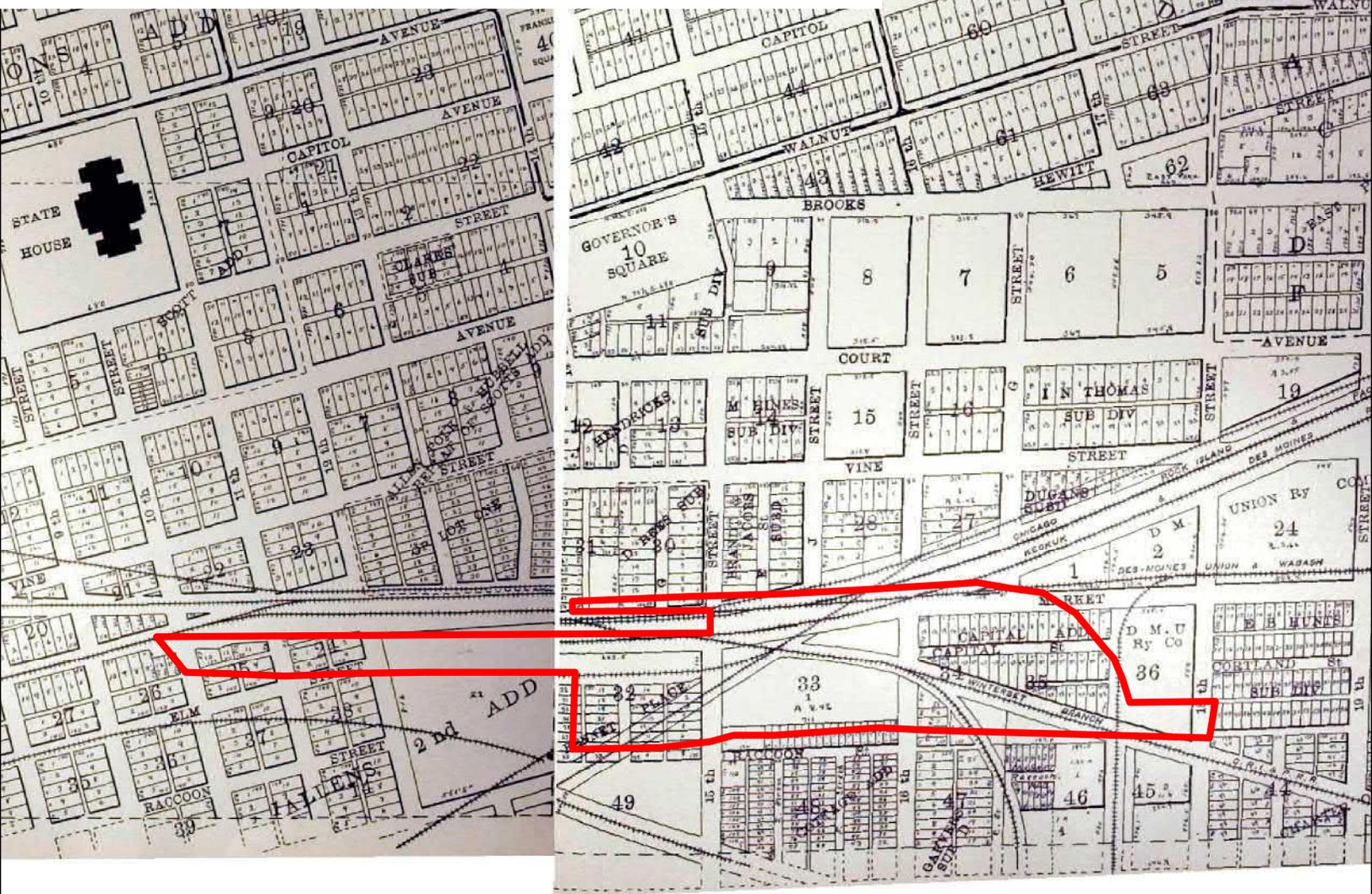


Figure 10. 1899 map of the project area (Tate and Tate)

Legend

 Project Area



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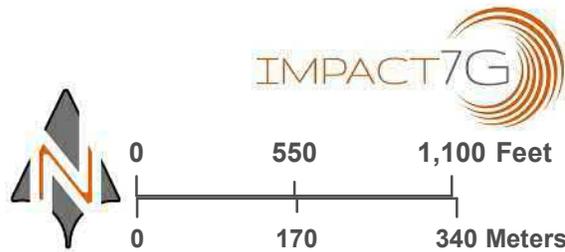


Figure 11. 1902 map of the project area (Hovey)

Legend

 Project Area

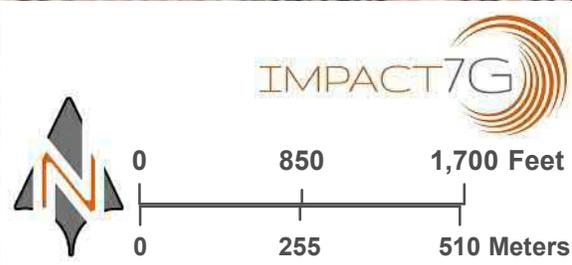
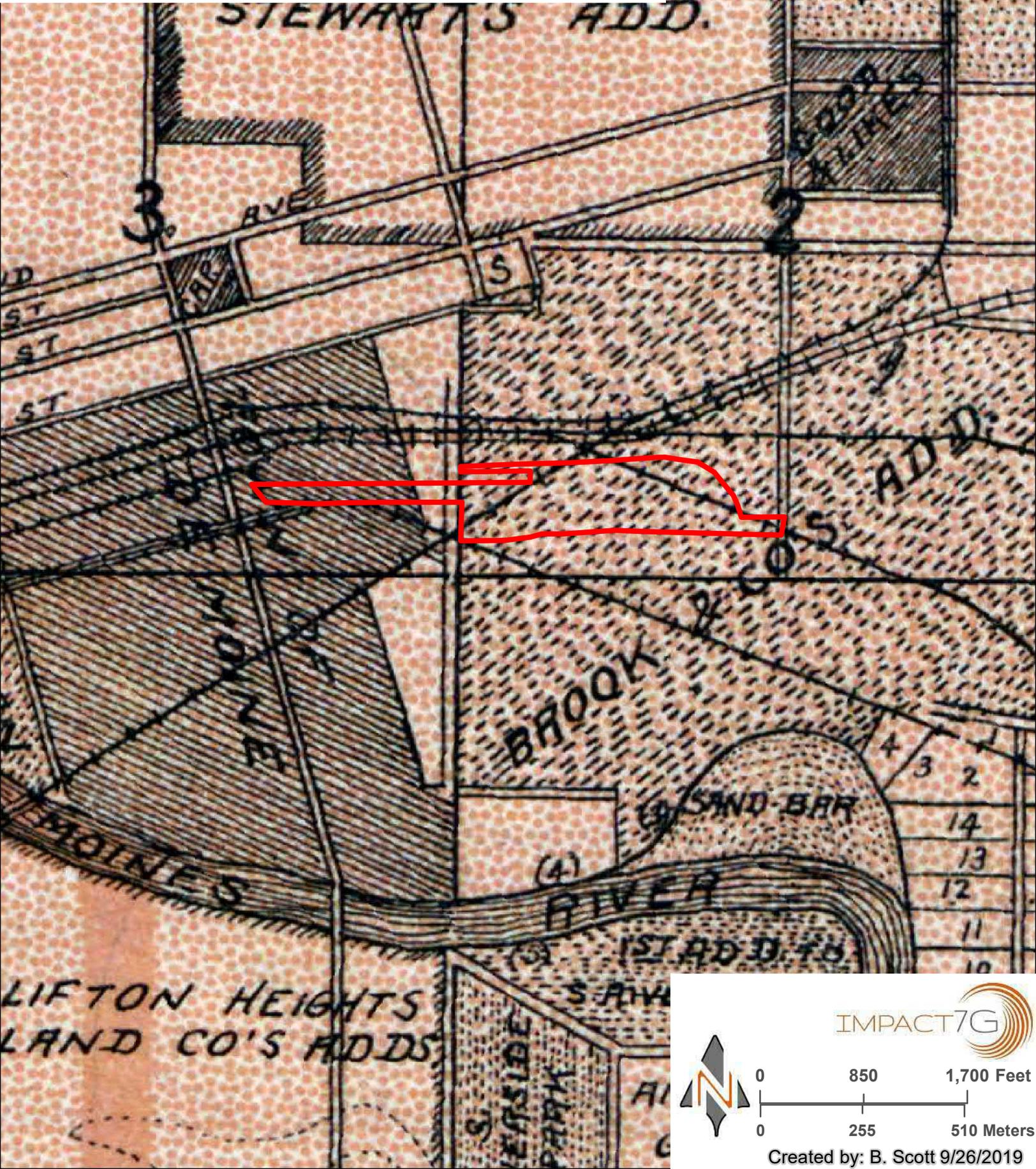


Figure 12. 1914 map of the project area (Kenyon Company)

Legend

 Project Area

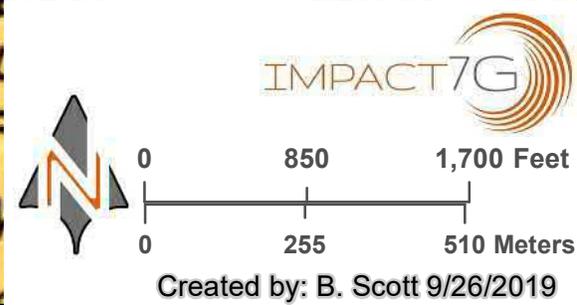
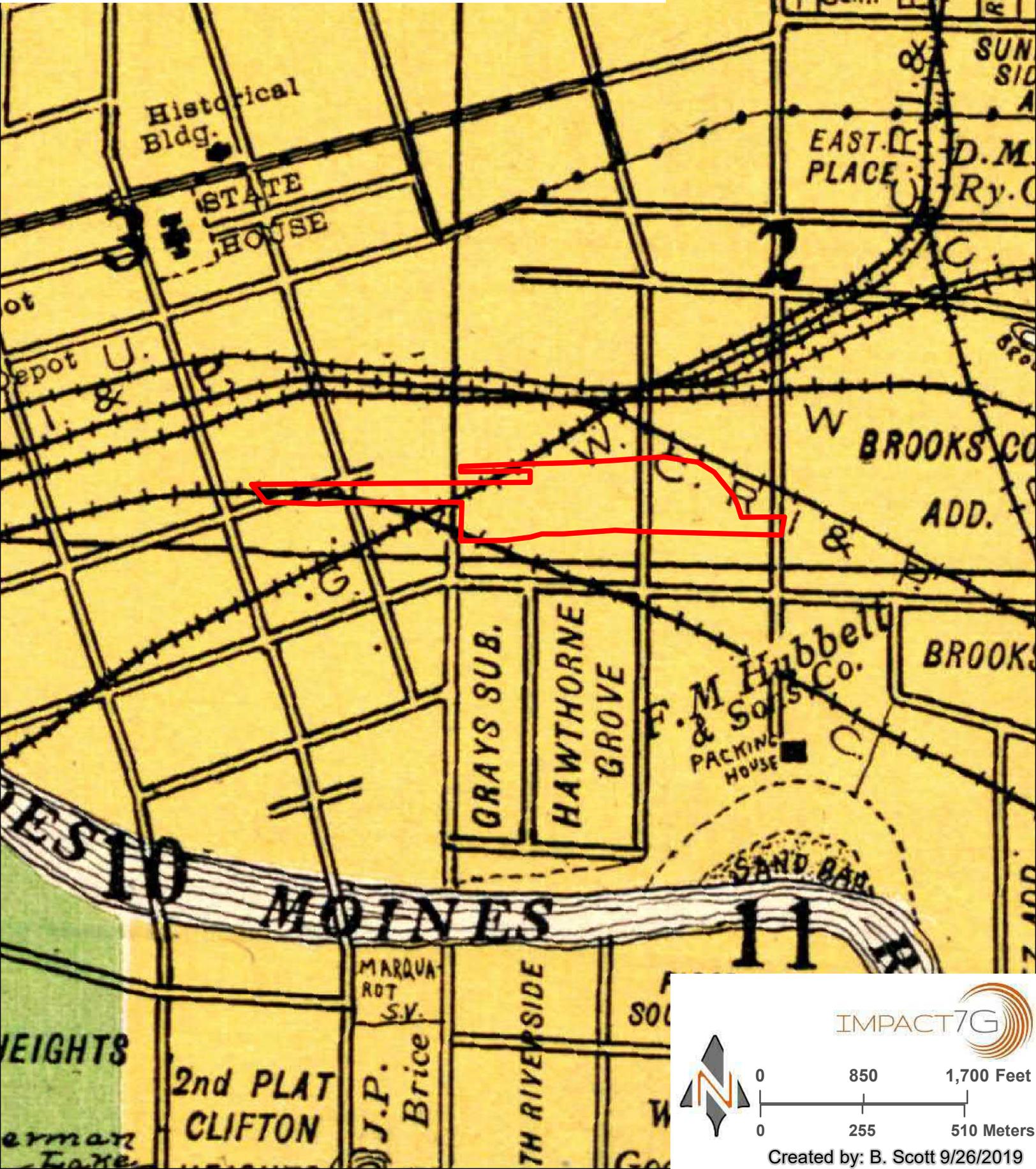
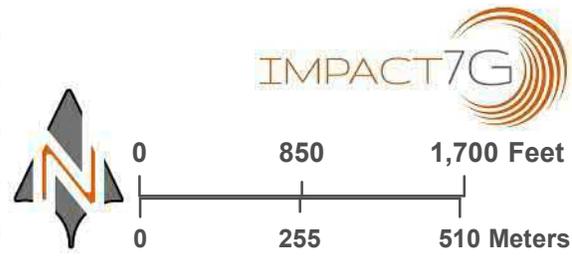
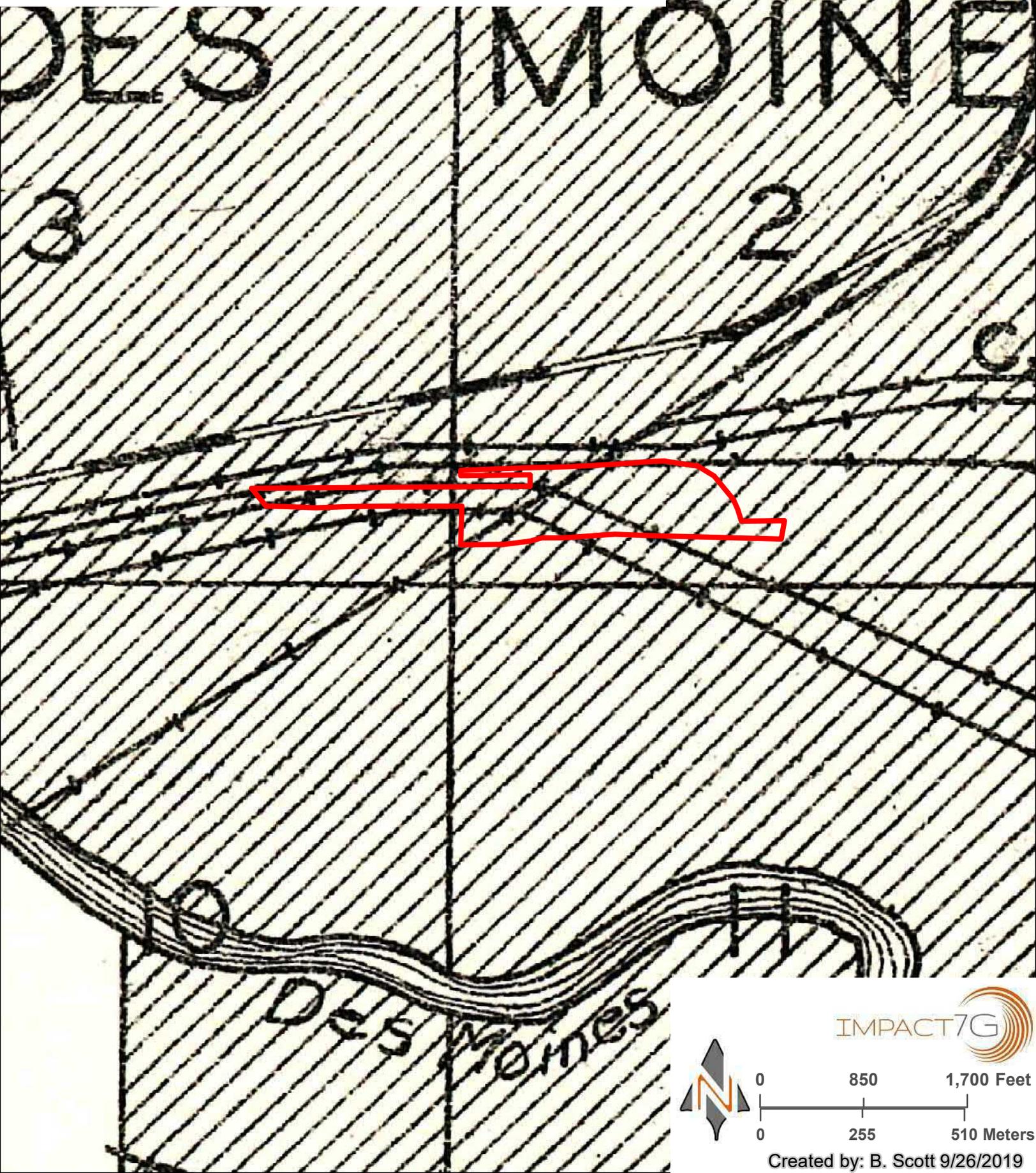


Figure 13. 1930 map of the project area (Hixson)

Legend

 Project Area



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Created by: B. Scott 9/26/2019

Figure 14. 1905 Topographic map of the project area
Des Moines, Iowa 1:65,000

Legend

 Project Area

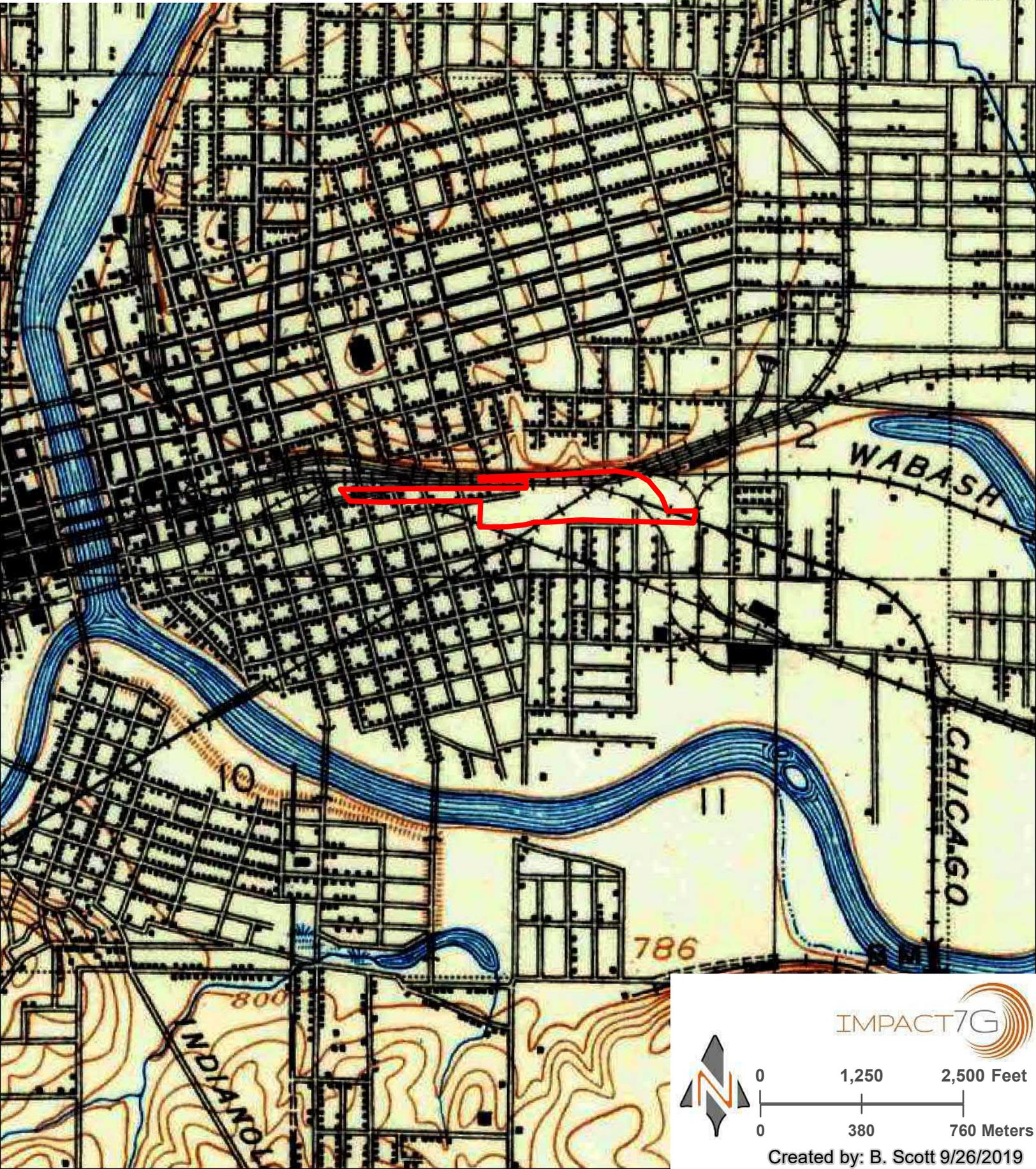
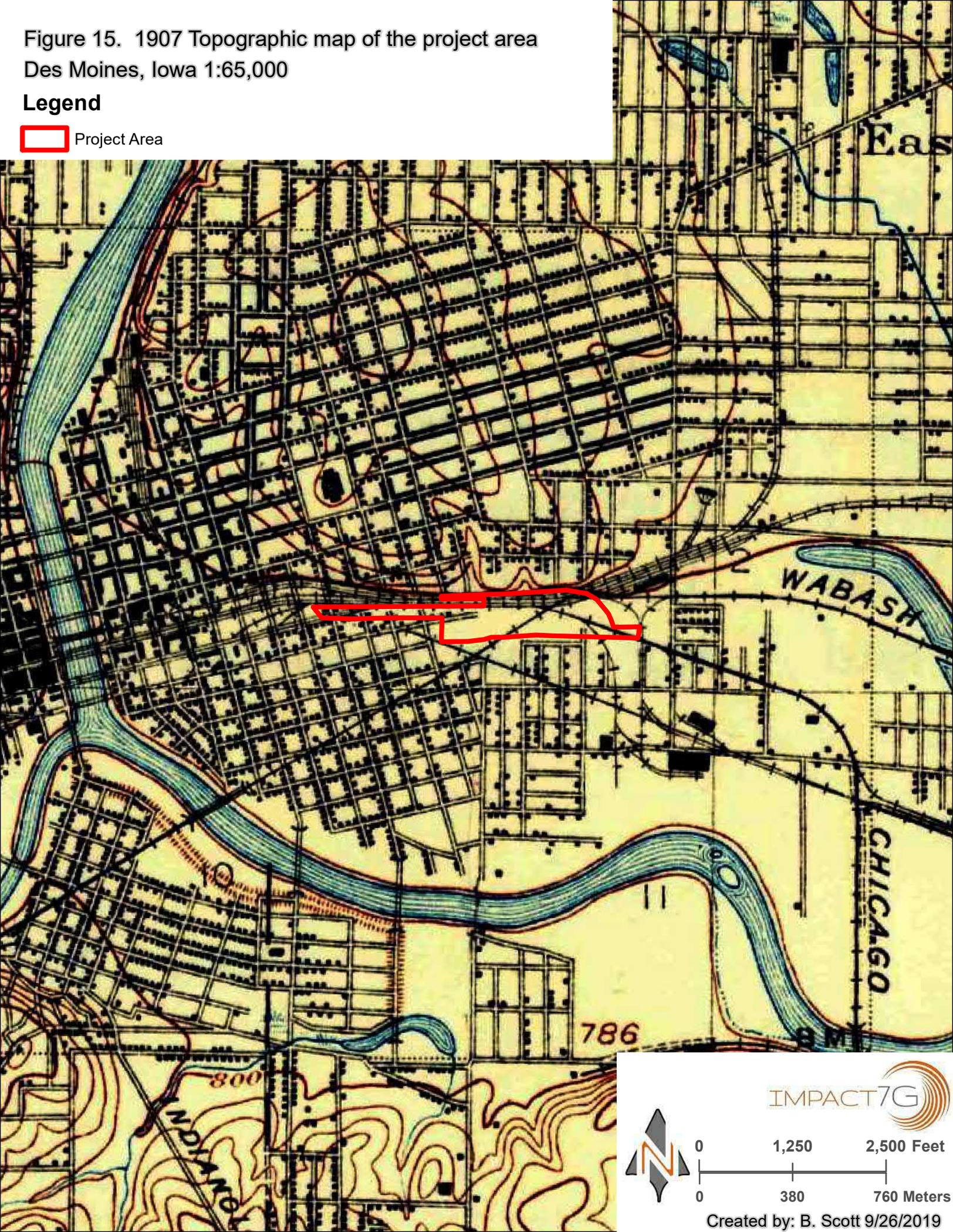


Figure 15. 1907 Topographic map of the project area
Des Moines, Iowa 1:65,000

Legend

 Project Area



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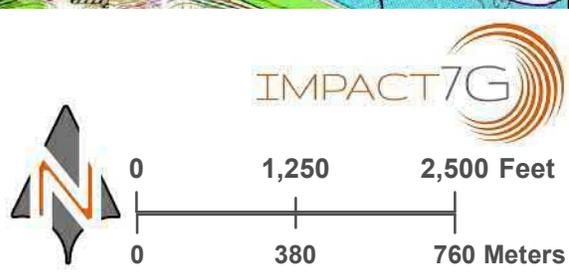
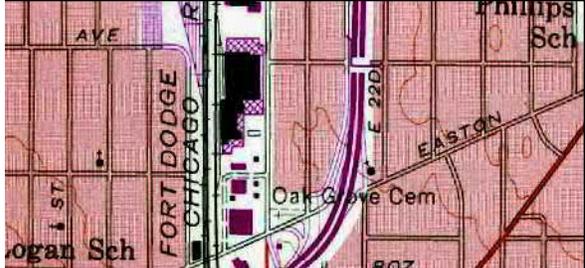
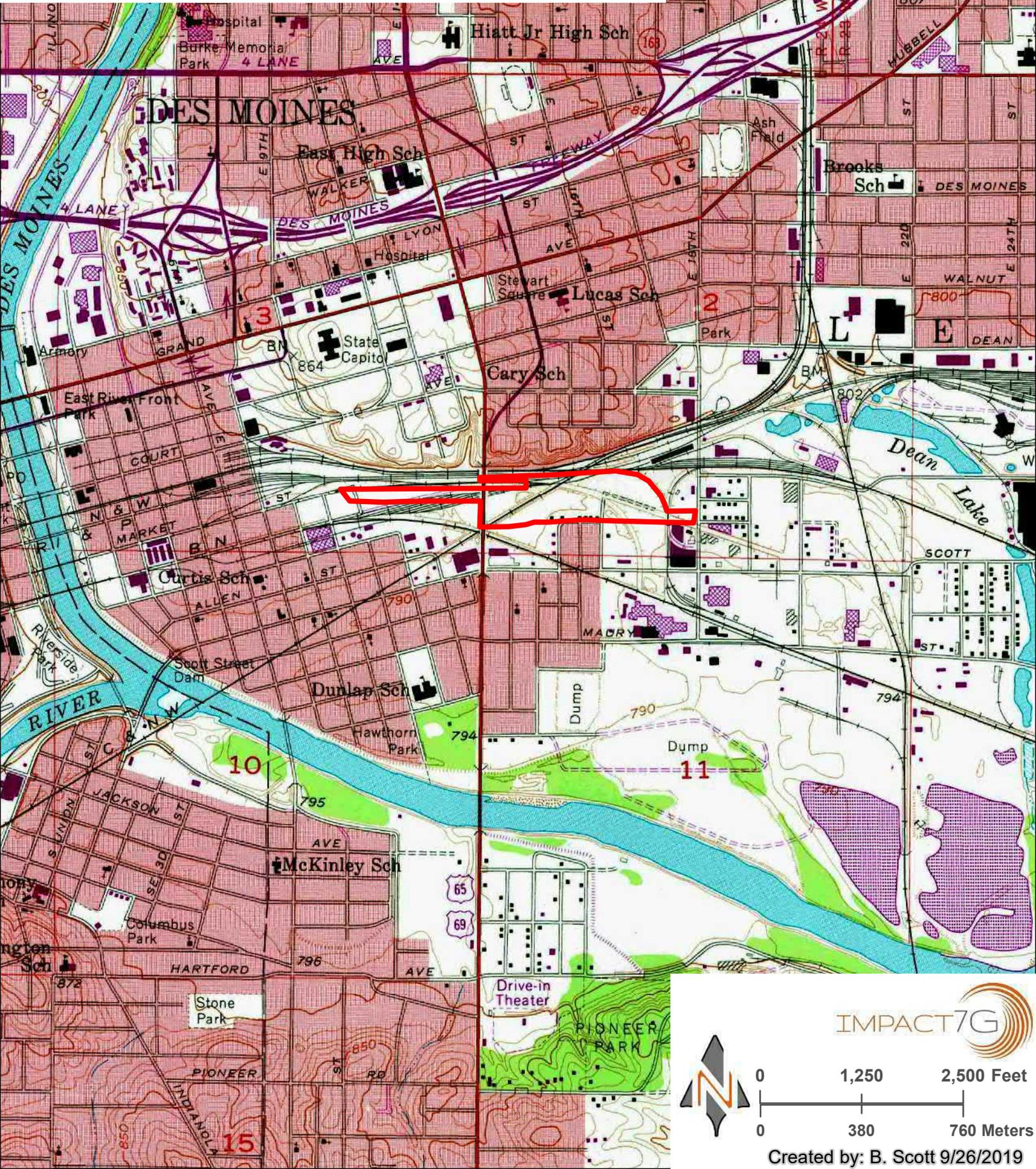
0 380 760 Meters

Created by: B. Scott 9/26/2019

Figure 16. 1956 Topographic map of the project area
Des Moines, Iowa 1:24,000

Legend

 Project Area



IMPACT7G

Created by: B. Scott 9/26/2019

Figure 17. Outlined depressional areas/stream courses based on historic maps

Legend

-  1840s Channel
-  Project Area
-  1840s Wetland
-  1956 Depressions

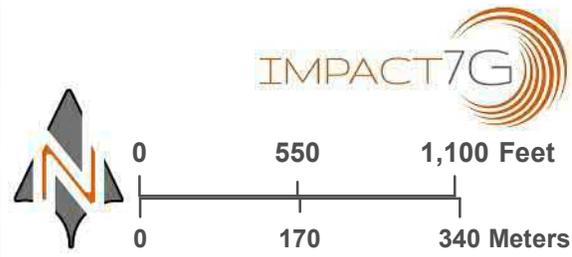
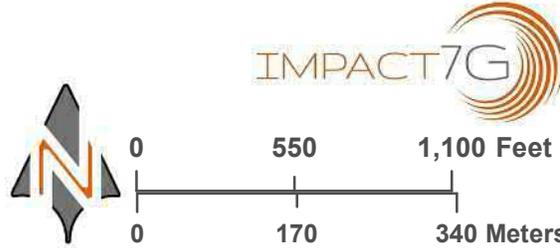


Figure 18. 1938 aerial photograph of the project area

Legend

 Project Area



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Created by: B. Scott 9/26/2019

Figure 19. 1955 aerial photograph of the project area

Legend

 Project Area

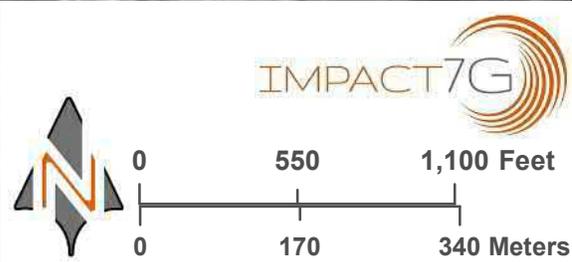



0 550 1,100 Feet
0 170 340 Meters
Created by: B. Scott 9/26/2019

Figure 20. 1961 aerial photograph of the project area

Legend

 Project Area



Created by: B. Scott 9/26/2019

Figure 21. 1974 aerial photograph of the project area

Legend

 Project Area



 IMPACT7G

 0 550 1,100 Feet
0 170 340 Meters

Created by: B. Scott 9/26/2019

Figure 22. 1983 aerial photograph of the project area

Legend

 Project Area



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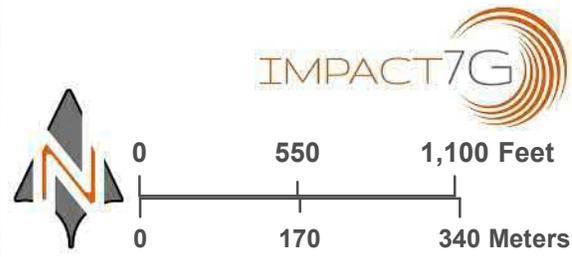
0 550 1,100 Feet
0 170 340 Meters

Created by: B. Scott 9/26/2019

Figure 23. 2013 aerial photograph of the project area

Legend

 Project Area



Created by: B. Scott 9/26/2019

Figure 24. LiDAR image of the project area

Legend

 Project Area

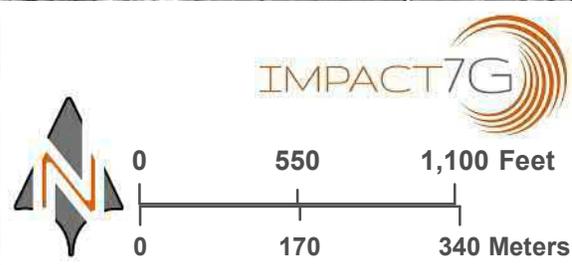
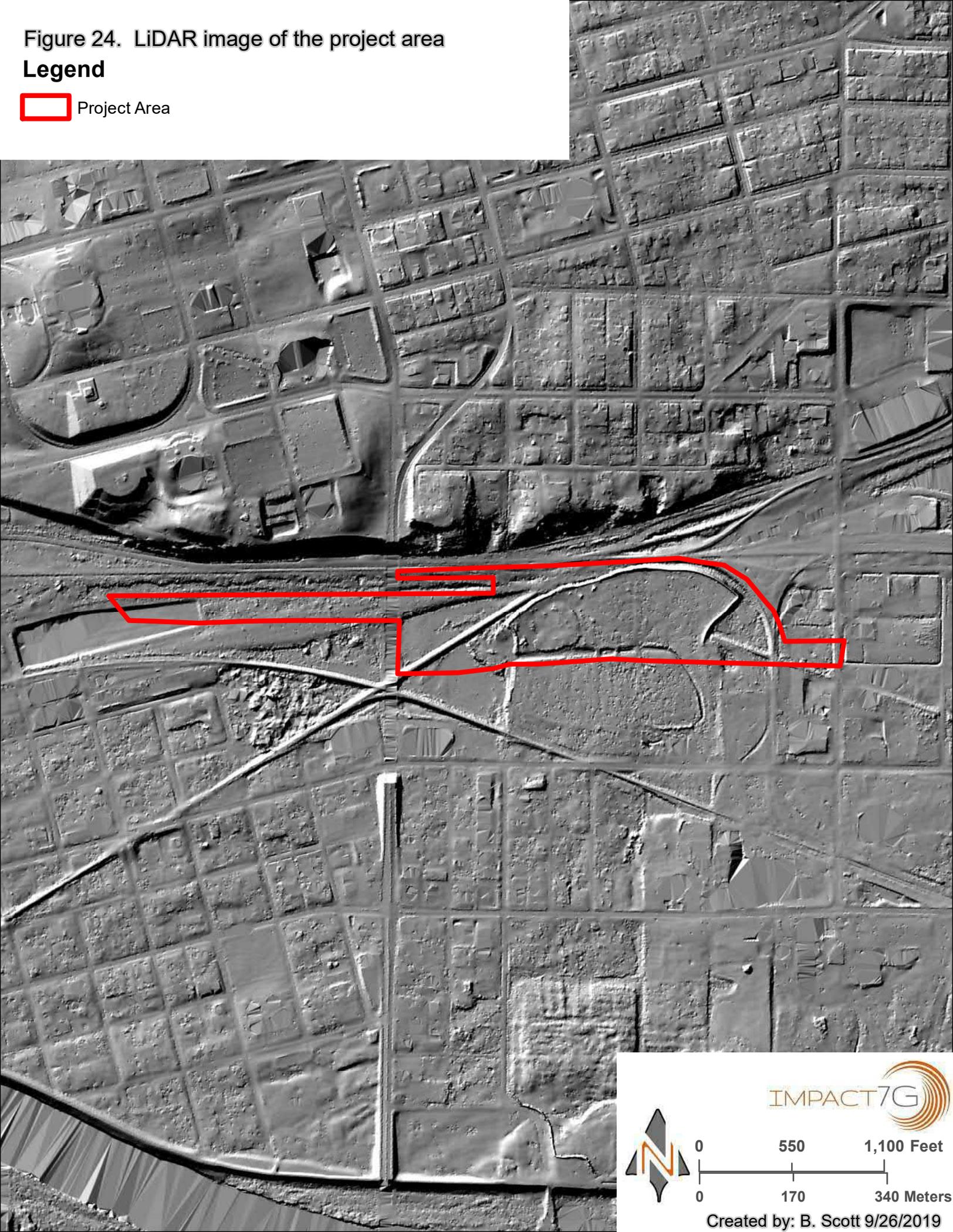


Figure 25. Proposed versus actual core locations

Legend

- Project Area
- Tree Line
- No Access
- Buried Utilities
- Core
- Proposed Core
- Borrow Area
- Retention Basin



IMPACT7G

0 550 1,100 Feet
0 170 340 Meters

Created by: B. Scott 9/26/2019

Figure 26. Scale map of the project area

Legend

- Project Area
- Tree Line
- No Access
- Buried Utilities
- Core
- Landform Boundary
- Borrow Area
- Retention Basin

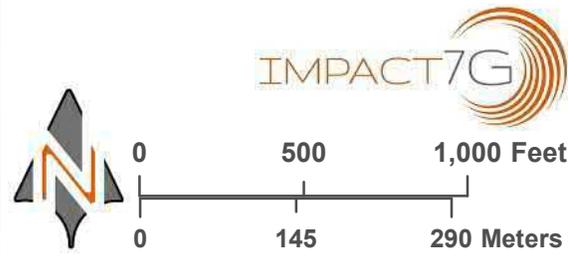


Figure 13. 1930 map of the project area (Hixson)

Legend

 Project Area

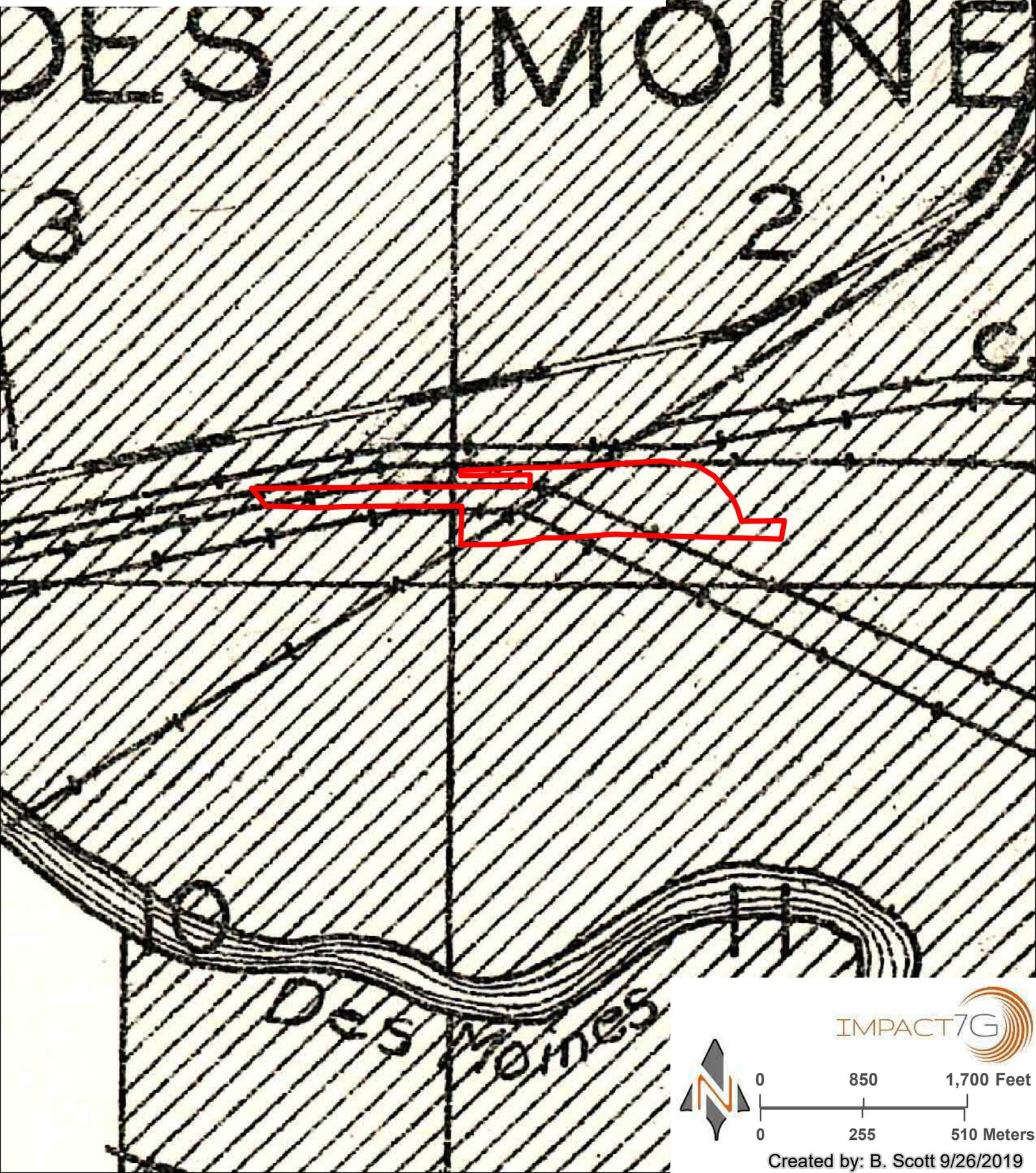




Figure 27. Retention basin in the eastern part of the project area. View southeast (9/13/2019)



Figure 28. Coverage of the project area. View west (9/13/2019)

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Figure 29. Coverage of the project area. View north (9/13/2019)



Figure 30. Coverage of the project area. View east (9/13/2019)

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Figure 31. Retention basin in the southern portion of the project area. View west (9/16/2019)



Figure 32. Disturbed utility corridor in the southern portion of the project area. View west (9/16/2019)

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Figure 33. Retention basin in the southern portion of the project area. View west (9/16/2019)



Figure 34. Example of surface fen in the project area (9/16/2019)

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Figure 35. Coverage of the project area. View west (9/16/2019)



Figure 36. Western portion of the project area showing past borrow. View west (9/16/2019)

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Figure 37. Core 1, part A (9/13/2019)



Figure 38. Core 1, part B (9/13/2019)



Figure 39. Core 1, part C (9/13/2019)



Figure 40. Core 1, part D (9/13/2019)



Figure 41. Core 1, Part E (9/13/2019)



Figure 42. Core 2, part A (9/13/2019)



Figure 43. Core 2, part B (9/13/2019)



Figure 44. Core 2, part C (9/13/2019)

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Figure 45. Core 2, part D (9/13/2019)



Figure 46. Core 3, part A (9/13/2019)

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Figure 47. Core 3, part B (9/13/2019)



Figure 48. Core 3, part C (9/13/2019)

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Figure 49. Core 3, part D (9/13/2019)



Figure 50. Core 3, part E (9/13/2019)



Figure 51. Core 3, part F (9/13/2019)



Figure 52. Core 4, part A (9/13/2019)

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Figure 53. Core 4, part B (9/13/2019)

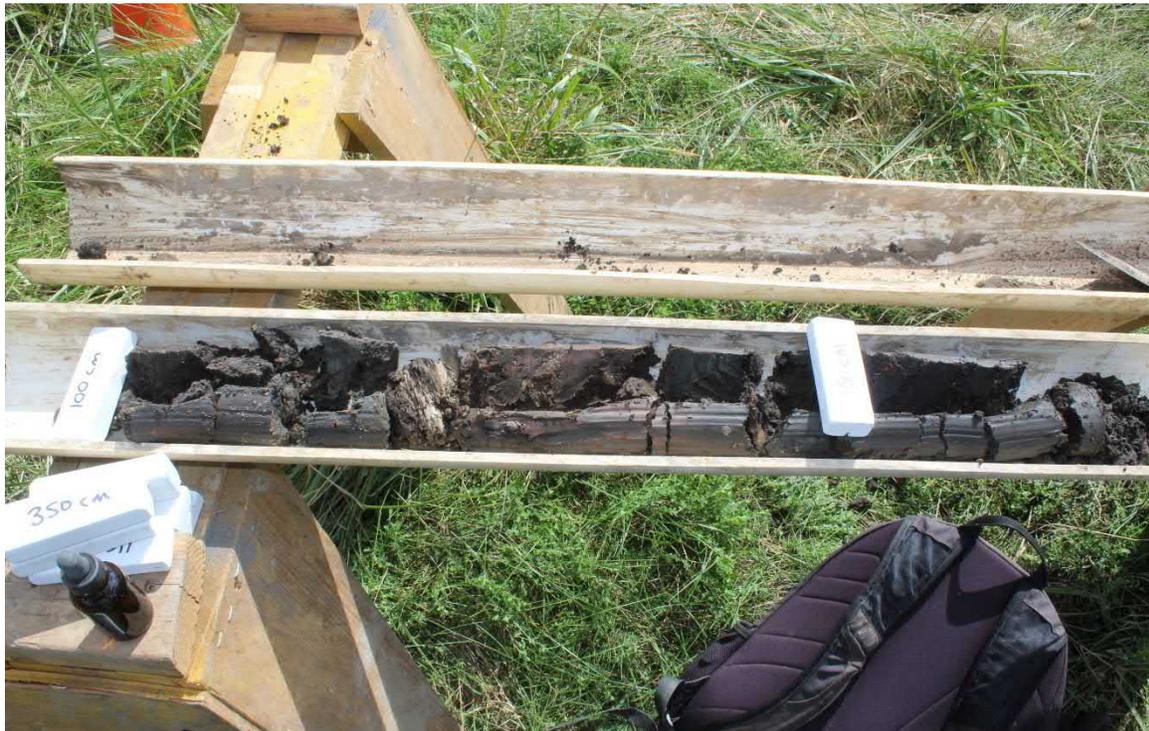


Figure 54. Core 4, part C (9/13/2019)

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Figure 55. Core 4, part D (9/13/2019)



Figure 56. Core 4, part E (9/13/2019)



Figure 57. Core 4, part F (9/13/2019)



Figure 58. Core 5, part A (9/13/2019)



Figure 59. Core 5, part B (9/13/2019)



Figure 60. Core 5, part C (9/13/2019)



Figure 61. Core 5, part D (9/13/2019)



Figure 62. Core 5, part E (9/13/2019)

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Figure 63. Core 6, part A (9/13/2019)



Figure 64. Core 6, part B (9/13/2019)



Figure 65. Core 6, part C (9/13/2019)



Figure 66. Core 6, part D (9/13/2019)



Figure 67. Core 6, part E (9/13/2019)



Figure 68. Core 7, part A (9/16/2019)

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Figure 69. Core 7, part B (9/16/2019)



Figure 70. Core 7, part C (9/16/2019)



Figure 71. Core 7, part D (9/16/2019)



Figure 72. Core 7, part E (9/16/2019)

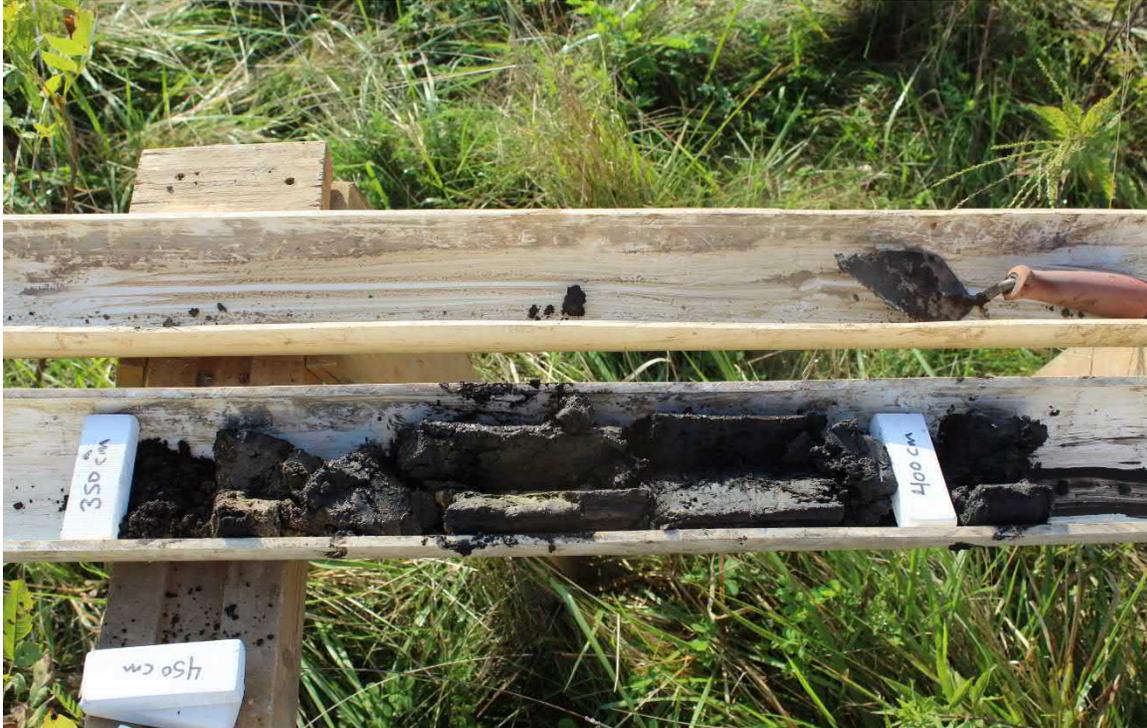


Figure 73. Core 7, part F (9/16/2019)



Figure 74. Core 7, part G (9/16/2019)



Figure 75. Core 7, part H (9/16/2019)

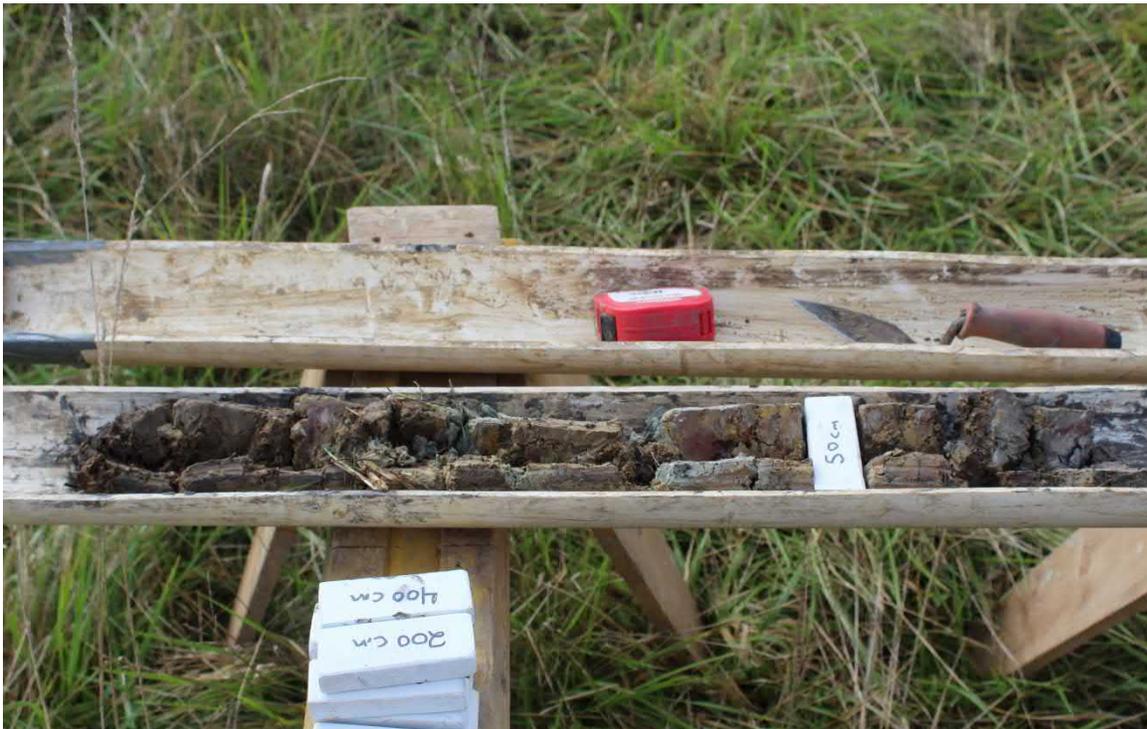


Figure 76. Core 8, part A (9/16/2019)

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Figure 77. Core 8, part B (9/16/2019)



Figure 78. Core 8, part C (9/16/2019)



Figure 79. Core 8, part D (9/16/2019)

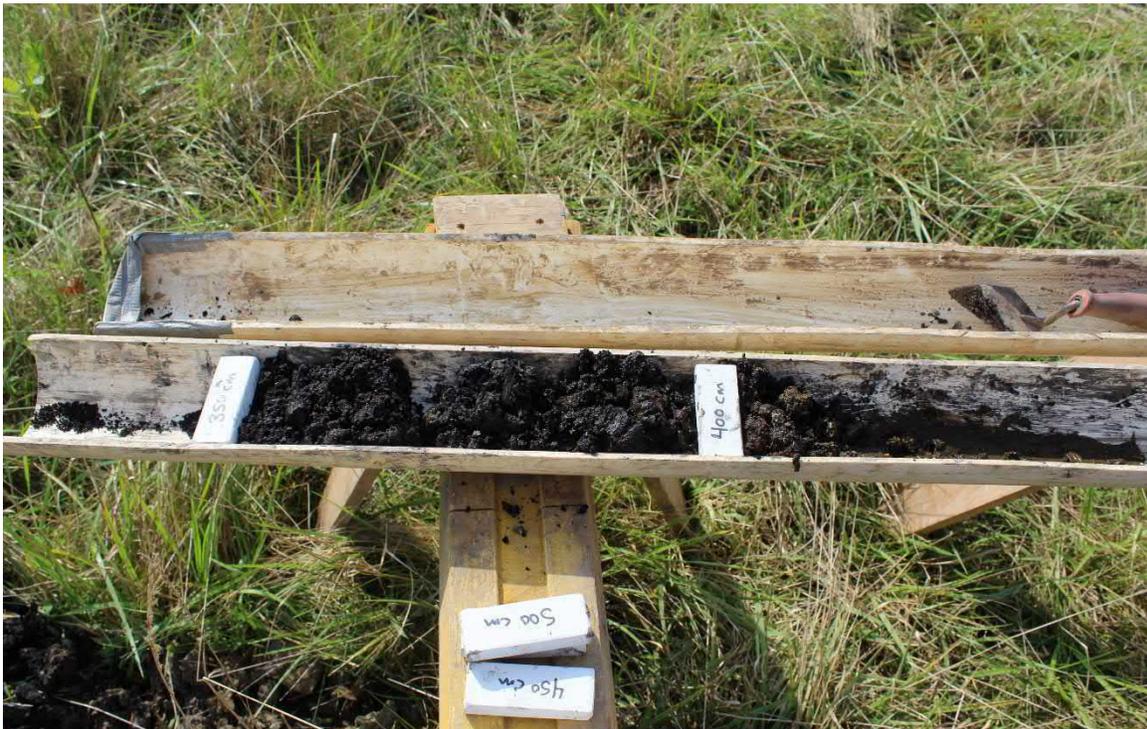


Figure 80. Core 8, part E (9/16/2019)

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Figure 81. Core 8, part F (9/16/2019)



Figure 82. Core 8, part G (9/16/2019)

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Figure 83. Core 8, part H (9/16/2019)



Figure 84. Core 9, part A (9/16/2019)

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Figure 85. Core 9, part B (9/16/2019)



Figure 86. Core 9, part C (9/16/2019)



Figure 87. Core 9, part D (9/16/2019)



Figure 88. Core 9, part E (9/16/2019)



Figure 89. Core 10, part A (9/16/2019)



Figure 90. Core 10, part B (9/16/2019)



Figure 91. Core 10, part C (9/16/2019)



Figure 92. Core 10, part D (9/16/2019)

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Figure 93. Core 10, part E (9/16/2019)



Figure 94. Core 10, part F (9/16/2019)



Figure 95. Core 10, part G (9/16/2019)



Figure 96. Core 11, part A (9/16/2019)

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Figure 97. Core 11, part B (9/16/2019)



Figure 98. Core 11, part C (9/16/2019)



Figure 99. Core 11, part D (9/16/2019)



Figure 100. Core 11, part E (9/16/2019)



Figure 101. Core 12, part A (9/16/2019)



Figure 102. Core 12, part B (9/16/2019)



Figure 103. Core 12, part C (9/16/2019)



Figure 104. Core 12, part D (9/16/2019)

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Appendix A: Core Logs and Profile Data



Terracon MLK & SE 14th Street

Described by: Branden Scott

Core: 1

Location: Des Moines, Iowa

Depth (ft)	Depth (m)	Horizon	LithoFacies	Description
0	0.0	Fill 1	Fill 1	Brownish yellow (10YR 6/6), light gray (10YR 7/1), dark greenish gray (5GY 3/1), black (10YR 2/1), and greenish gray (10GY 5/1) silty clay, clay, and brick; massive structure; loose; some cinders; abrupt boundary
1	0.5			
2				
3				
4				
5	1.5			
6	2.0	Fill 2	Fill 2	Very dark grayish brown (10YR 3/2) silt loam; massive structure; firm; frequent wood, cinders, and brick
7	2.5	Abg	Late Roberts Creek	Very dark brown (10YR 2/2) silty clay loam; moderate, medium blocky structure; firm; clear smooth boundary
8		ABgb		Grayish brown (10YR 5/2) sandy clay loam; moderate, medium subangular blocky structure; friable; faint strong brown (7.5YR 4/6) and brown (7.5YR 4/4) redoximorphic features; clear smooth boundary
9		Bgb		Dark gray (10YR 4/1) medium sand; weak, medium subangular blocky structure; friable; diffuse strong brown (7.5YR 4/6) mottles/redoximorphic features; abrupt boundary
10	3.0	2Cgb1	Channel	Brown (10YR 5/3) medium sand; massive structure; single grain sand; loose; wet
11	3.5			
12				
13	4.0	2Cgb2		Brown (10YR 4/3) medium-coarse sand; massive structure; loose; wet
14	4.5			
15				
16				
17				
18				
19				
20				
21				
22				
23				



Terracon MLK & SE 14th Street

Described by: **Branden Scott**

Core: **2**

Location: **Des Moines, Iowa**

Depth (ft)	Depth (m)	Horizon	LithoFacies	Description
0	0.0	A		Brown (10YR 4/2) loamy sand with some fill material; weak, fine subangular blocky structure; friable; clear boundary
1				
2	0.5	Fill 1	Fill 1	Light yellowish brown (10YR 6/4), yellow (2.5YR 7/6), reddish yellow (7.5YR 7/6), and greenish gray (5GY 6/1) clay loam and sand; massive structure; loose; abrupt boundary
3				
4	1.0	Fill 2	Fill 2	Greenish gray (N 5/1), dusky red (10R 3/3), and strong brown (7.5YR 4/6) silty clay; massive structure; firm; less rock than above; abrupt smooth boundary
5				
6	1.5			
7	2.0	Fill 3	Fill 3	Very dark grayish brown (10YR 3/2) sandy loam; weak, fine subangular blocky structure; friable; some rock, brick, and cinders; unclear boundary
8				
9	2.5	Ab	Camp Creek	Very dark brown (10YR 2/2) silty clay; moderate, coarse blocky structure; firm/compacted; common roots; strong marsh gas odor; clear, wavy boundary
10	3.0	Cgb		Dark gray (10YR 4/1) silty clay; weak, fine subangular blocky structure; friable; black (10YR 2/1) stratification evident; finely laminated; roots common; common brown (7.5YR 5/4) redoximorphic features; breaks on laminations; abrupt smooth boundary.
11				
12	3.5	2Cgb	Channel	Light gray (10YR 7/1 and 10YR 7/2) grading to yellowish brown (10YR 5/4) medium-coarse sand; massive structure; loose
13				
14	4.0			
15				
16	4.5			
17				
18	5.0			
19				
20	5.5			
21				
22	6.0			
23				
	6.5			
	7.0			



Terracon MLK & SE 14th Street

Described by: **Branden Scott**

Core: **3**

Location: **Des Moines, Iowa**

Depth (ft)	Depth (m)	Horizon	LithoFacies	Description
0	0.0	A		Very dark brown (10YR 2/2) loamy sand; weak, fine subangular blocky structure; friable; abrupt smooth boundary
1				
2	0.5			
3	1.0	Fill 1	Fill 1	Brown (10YR 4/2) sand, silt, clay and rocks; massive structure; firm/compacted; some brick; breaks along planes in shale/clay; unknown boundary
4				
5	1.5			
6				
7	2.0	Fill 2	Fill 2	Reddish brown (2.5YR 4/4), dark reddish brown (2.5YR 2.5/3), and light greenish gray (5GY 7/1) clay; massive structure; plastic; frequent concrete and rock; abrupt boundary
8	2.5	Ab		Very dark grayish brown (10YR 3/2) silty clay; moderate, medium subangular blocky structure; firm/compacted; significant quantities of organic/root matter; strong marsh gas odor; historic glass at 250 cm; unclear boundary
9				
10	3.0			
11				
12	3.5	UNK	Camp Creek	Not recovered
13	4.0			
14				
15	4.5			
16	5.0	Cgb		Dark gray (10YR 4/1) silty clay; no structure information available (poor recovery); black (10YR 2/1) stratification evident; roots common; common brown (7.5YR 5/4) redoximorphic features appear to have been present; appears to have dark grayish brown (10YR 4/2) and very dark brown (10YR 2/2) coarse sand lenses; unclear boundary
17				
18	5.5	2Cgb	Channel	Light gray (10YR 7/1 and 10YR 7/2) grading to yellowish brown (10YR 5/4) medium-coarse sand; massive structure; loose
19				
20	6.0			
21				
22	6.5			
23	7.0			



Terracon MLK & SE 14th Street

Described by: **Branden Scott**

Core: 4

Location: Des Moines, Iowa

Depth (ft)	Depth (m)	Horizon	LithoFacies	Description
0	0.0	A		Yellowish brown (10YR 5/4) silty clay; weak, fine subangular blocky structure; friable; abrupt boundary
1		Fill 1	Fill 1	Gray (10YR 6/1), dark reddish brown (2.5YR 3/3), and olive yellow (2.5Y 6/6) silt, clay, and rock; massive structure; friable; clear boundary
2	0.5	Fill 2	Fill 2	Very dark grayish brown (10YR 3/2), black (10YR 2/1), and yellowish brown (10YR 5/4) sandy clay loam; massive structure; firm; frequent brick; abrupt smooth boundary
3	1.0	Fill 3	Fill 3	Very dark grayish brown (10YR 3/2) and greenish gray (5G 6/1) loamy sand; massive structure; friable; large pieces of wood, some brick; strong sewer gas odor; abrupt boundary
4	1.5			
5	2.0			
6		Ab	Camp Creek	Very dark gray (10YR 3/1) silty clay; moderate, medium subangular blocky structure; firm; frequent roots/organics; compacted; some gray (10YR 6/1) silt inclusions; strong marsh gas odor; unknown boundary
7	2.5			
8				
9	3.0			
10				
11	3.5	Cb2		Very dark gray (10YR 3/1) and dark gray (10YR 4/1) silty clay; weak, fine subangular blocky structure; friable; abrupt boundary
12		2Cgb	Channel	Very dark grayish brown (10YR 3/1) silt to silty clay; massive structure; friable with plasticity; breaks across lamination planes; abrupt boundary
13	4.0			Gray (10YR 6/1) medium-coarse sand; massive structure; loose; single grain sand; wet.
14				
15	4.5			
16				
17	5.0			
18				
19	5.5			
20				
21	6.0			
22				
23	6.5			
	7.0			



Terracon MLK & SE 14th Street

Described by: **Branden Scott**

Core: 5

Location: Des Moines, Iowa

Depth (ft)	Depth (m)	Horizon	LithoFacies	Description
0	0.0	A		Grayish brown (10YR 5/2) sandy clay; weak, fine subangular blocky structure; plastic; some historic materials; clear wavy boundary
1		Fill 1	Fill 1	Greenish gray (10Y 6/1), dark reddish brown (2.5YR 3/3), light gray (10YR 7/1), brownish yellow (10YR 6/6), and brown (10YR 5/3) clay, rock, and mettle; massive structure; firm; abrupt boundary
2	0.5			
3	1.0			
4				
5	1.5	Fill 2	Fill 2	Brown (10YR 5/3) and light gray (10YR 7/1) coarse brick and concrete and some silt loam; massive structure; loose; abrupt boundary
6		Fill 3	Fill 3	Very dark grayish brown (10YR 3/2) and olive yellow (5Y 6/6) sandy loam; weak, fine subangular blocky structure; friable; frequent cinders, tar paper at 209 cm; abrupt boundary
7	2.0			
8	2.5			
9		Ab	Camp Creek	Dark gray (10YR 4/1) and very dark grayish brown (10YR 3/2) silty clay; weak, fine subangular blocky structure; friable; some brown (7.5YR 4/4) redoximorphic features; bedding planes evident; clear boundary
10	3.0	2Cgb	Channel	
11				Yellowish brown (10YR 5/4) medium-fine sand; massive structure; loose; single grain sand; strong brown (7.5YR 4/6) and light gray (10YR 7/1) thin sand lenses; stratified
12	3.5			
13	4.0			
14				
15	4.5			
16				
17	5.0			
18				
19	5.5			
20	6.0			
21				
22	6.5			
23	7.0			



Terracon MLK & SE 14th Street

Described by: **Branden Scott**

Core: **6**

Location: **Des Moines, Iowa**

Depth (ft)	Depth (m)	Horizon	LithoFacies	Description
0	0.0	A		Dark grayish brown (10YR 4/2) loamy sand; weak, fine subangular blocky structure; friable; some historic material; gradual boundary
1				
2	0.5	Fill 1	Fill 1	Brown (10YR 5/3), greenish gray (5GY 6/1), dark reddish brown (2.5YR 3/3), and yellowish brown (10YR 5/6) clay and sand; massive structure; firm; rock frequent; compacted; abrupt boundary
3				
4	1.0			
5	1.5	Fill 2	Fill 2	Dark gray (10YR 4/1), yellowish brown (10YR 5/4), and strong brown (7.5YR 5/6) sandy clay loam; massive structure; friable; frequent wood and cinders; clear boundary
6				
7	2.0			
8				
9	2.5	Fill 3	Fill 3	Very dark brown (10YR 2/2) silty clay loam; massive structure; friable; rocks and wood frequent; tin at 240 cm; strong hydrocarbon odor; unclear boundary
10				
11	3.0			
12				
13	3.5			
14	4.0			
15	4.5	2Cgb	Channel	Gray (10YR 5/1) and yellowish brown (10YR 5/6) medium-fine sand; massive structure; loose; excessively wet; tin at 422 cm (possibly pushed down by core)
16				
17	5.0			
18				
19	5.5			
20				
21	6.0			
22				
23	6.5			
	7.0			



Terracon MLK & SE 14th Street

Described by: Branden Scott

Core: 7

Location: Des Moines, Iowa

Depth (ft)	Depth (m)	Horizon	LithoFacies	Description
0	0.0	Fill 1	Fill 1	Dark yellowish brown (10YR 4/4) greenish gray (5GY 6/1), dusky red (10R 3/3), and very dark brown (10YR 2/2) sandy clay; weak, medium subangular blocky structure; firm; some rock; concrete rubble; unclear boundary
1	0.5			
2				
3				
4				
5	2.0	Fill 2	Fill 2	Very dark gray (10YR 3/1) sandy loam; weak, fine subangular blocky structure; friable; cinders, brick, and wood present; plastic at 182 cm; strong odor of creosote; unclear boundary
6				
7	2.5	Fill 3	Fill 3	Dark greenish gray (5GY 4/1) silty clay with faint olive (5Y 4/4) mottles; weak, fine subangular blocky structure; plastic; some wood with creosote odor (possibly from above); abrupt boundary
8				
9	3.0	Fill 4	Fill 4	Black (10YR 2/1) sandy loam; massive structure; loose; common cinders, glass, and brick; abrupt boundary
10				
11	3.5	Fill 5	Fill 5	Dark greenish gray (10GY 4/1), dark yellowish brown (10YR 4/4), and very dark grayish brown (10YR 3/2) sandy clay; massive structure; friable with plasticity; some brick and rock; abrupt boundary
12				
13	4.0	Ab1	Ab2	Very dark gray (10YR 3/1) silt loam; weak, fine subangular blocky structure; friable; frequent crushed aquatic gastropod shell; decaying wood common; clear boundary
14				
15	4.5	Bgb	Early Camp Creek	Very dark gray (10YR 3/1) silt loam; weak, fine subangular blocky structure; plastic; aquatic gastropod shell common; unknown boundary
16				
17	5.0	Bgb	Early Camp Creek	Dark greenish gray (5GY 3/1 and 10Y 3/1) silty clay; weak, medium subangular blocky structure; friable with plasticity; aquatic gastropod shell common; abrupt boundary
18				
19	5.5	2Cg	Channel	Dark greenish gray (10Y 3/1) medium-coarse sand; massive structure; loose; single-grain sand
20				
21	6.0	2Cg	Channel	Dark greenish gray (10Y 3/1) medium-coarse sand; massive structure; loose; single-grain sand
22				
23	6.5	2Cg	Channel	Dark greenish gray (10Y 3/1) medium-coarse sand; massive structure; loose; single-grain sand
24				
25	7.0	2Cg	Channel	Dark greenish gray (10Y 3/1) medium-coarse sand; massive structure; loose; single-grain sand
26				



Terracon MLK & SE 14th Street

Described by: **Branden Scott**

Core: **8**

Location: **Des Moines, Iowa**

Depth (ft)	Depth (m)	Horizon	LithoFacies	Description
0	0.0	Fill 1	Fill 1	Very pale brown (10YR 7/4), dark brown (10YR 3/3), very dark grayish brown (10YR 3/2), dark olive brown (2.5YR 3/3), olive (5Y 5/4), yellow (5Y 7/6), and greenish gray (5G 6/1) clay, silt, sand, and rock; massive structure; firm; brick common; interbedded with black (10YR 2/1) cinders; abrupt boundary
1	0.5			
2	1.0			
3	1.5	Fill 2	Fill 2	Yellowish brown (10YR 5/4) clay with black (10YR 2/1) beds of cinders; massive structure; firm/compacted; brick common; some greenish gray (5GY 6/1) silts/clays; abrupt boundary
4	2.0			
5	2.5	Fill 3	Fill 3	Black (10YR 2/1) silt loam; massive structure; loose; cinders, brick, and wood common; unclear boundary
6	3.0			
7	3.5			
8	4.0	Fill 4	Fill 4	Black (10YR 2/1) silt and cinders; massive structure; friable; some brick; abrupt boundary
9	4.5			
10	5.0	Fill 5	Fill 5	Black (10YR 2/1) and dark yellowish brown (10YR 4/6) sand and cinders; massive structure; loose; wet; glass common; abrupt boundary
11	5.5			
12	6.0	Abg	Early Camp Creek	Greenish black (10Y 2.5/1) silt loam; weak, fine subangular blocky structure; friable with plasticity; dense small aquatic gastropod shell; coarse sand lenses; clear boundary
13	6.5			
14	7.0	Bgb	Early Camp Creek	Greenish black (10Y 2.5/1) sandy clay loam; weak, fine subangular blocky structure; plastic; common aquatic gastropod shell; common organic material; sand lenses common
15	7.5			
16	8.0			
17	8.5			
18	9.0			
19	9.5			
20	10.0			
21	10.5			
22	11.0			
23	11.5			
24	12.0			



Terracon MLK & SE 14th Street

Described by: Branden Scott

Core: 9

Location: Des Moines, Iowa

Depth (ft)	Depth (m)	Horizon	LithoFacies	Description
0	0.0	Fill 1	Fill 1	Very dark gray (10YR 3/1), dark yellowish brown (10YR 4/6), light gray (10YR 7/2), light olive brown (2.5Y 5/6), dark reddish brown (2.5YR 3/3), and greenish gray (5GY 5/1) silt, clay, and sand; massive structure; firm; common cinders, brick, and concrete; hydrocarbon odor; abrupt boundary
1	0.5			
2	1.0			
3	1.5			
4	2.0			
6	2.0	Ab	Camp Creek	Very dark grayish brown (10YR 3/2) and brown (10YR 4/3) silt loam; weak, fine subangular blocky structure; friable; slight bedding/lamination; hydrocarbon odor; clear boundary
8	2.5	ACb		Gray (10YR 5/1) and dark grayish brown (10YR 4/2) fine sand; weak, very fine subangular blocky structure; friable; parts on laminations; clear boundary
10	3.0	2Cb	Channel	Light gray (10YR 7/1) and white (10YR 8/1) medium-coarse sand; massive structure; loose; single grain sand; gradual boundary
12	3.5			
13	4.0	2Cgb		Light gray (10YR 7/2) and light yellowish brown (10YR 6/4) coarse sand; massive structure; loose; single grain sand; wet
14	4.5			
15	5.0			
16	5.5			
17	6.0			
18	6.5			
19	7.0			
20				
21				
22				
23				



Terracon MLK & SE 14th Street

Described by: Branden Scott

Core: 10

Location: Des Moines, Iowa

Depth (ft)	Depth (m)	Horizon	LithoFacies	Description
0	0.0			
1				
2	0.5			
3				
4	1.0			
5	1.5			
6	2.0	Fill 1	Fill 1	Greenish gray (10Y 6/1), dark gray (N 4/), red (2.5YR 5/6), and strong brown (7.5YR 4/6) silt, clay, sand, and rock; massive structure; firm; cinders, concrete, and brick common; wood and glass present; creosote odor; unknown boundary
7				
8	2.5			
9				
10	3.0			
11				
12	3.5			
13	4.0	Ab		Very dark grayish brown (10YR 3/2) silt loam; weak, fine subangular blocky structure; friable with plasticity; frequent aquatic gastropod shells; strong marsh gas odor; gradual boundary
14				
15	4.5	Bgb	Roberts Creek	Very dark grayish brown (10YR 3/2) and black (10YR 2/1) silty clay loam; weak, fine subangular blocky structure; friable with plasticity; common strong brown (7.5YR 4/6) redoximorphic features; frequent organic material; clear boundary
16	5.0			
17				
18	5.5	BCgb		Very dark grayish brown (10YR 3/2) silty clay loam; massive structure; plastic; common strong brown (7.5YR 4/6) redoximorphic features; slight gray (10YR 6/1) laminations/bedding; abrupt boundary
19				
20	6.0	2Cgb	Channel	Dark gray (N 4/) medium-coarse sand; massive structure; loose
21				
22	6.5			
23	7.0			



Terracon MLK & SE 14th Street

Described by: Branden Scott

Core: 11

Location: Des Moines, Iowa

Depth (ft)	Depth (m)	Horizon	LithoFacies	Description
0	0.0			
1				
2	0.5			
3	1.0	Fill 1	Fill 1	Brick and concrete rubble; could not get description because of no recovery
4				
5	1.5			
6				
7	2.0			
8	2.5			
9				
10	3.0			
11	3.5	Fill 2	Fill 2	Yellowish brown (10YR 5/4) and light gray (10YR 7/1) sand, concrete, and brick; no structure data available; some wood; minimal recovery
12				
13	4.0			
14				
15	4.5			
16	5.0	Bgb	Roberts Creek	Dark gray (N 4/) silty clay; massive structure; plastic; common, coarse strong brown (7.5YR 4/6) redoximorphic features; common aquatic gastropod shells; abrupt boundary
17		2Cgb	Channel	Gray (10YR 5/1) medium sand; massive structure; loose; wet
18	5.5			
19				
20	6.0			
21	6.5			
22				
23	7.0			



Terracon MLK & SE 14th Street

Described by: Branden Scott

Core: 12

Location: Des Moines, Iowa

Depth (ft)	Depth (m)	Horizon	LithoFacies	Description
0	0.0	A		Very dark grayish brown (10YR 3/2) and yellowish brown (10YR 5/4) silt loam; weak, fine subangular blocky structure; friable; clear boundary
1		Fill 1	Fill 1	No description available; no recovery; abrupt boundary
2	0.5			
3		Camp Creek	Camp Creek	Grayish brown (10YR 5/2) silt with light gray (10YR 7/1) stratification; massive structure; friable with plasticity; stratified alluvial deposit; brown (7.5YR 4/4) redoximorphic features; clear boundary
4	1.0			
5		Channel	2Cgb	Grayish brown (10YR 5/2) fine sand; massive structure; friable; wet; abrupt boundary
6	1.5			
7	2.0			
8				Brown (10YR 5/3) medium sand; massive structure; single grain sand; loose; wet; lenses of strong brown (7.5YR 4/6) medium sand
9	2.5			
10				
11	3.0			
12				
13	3.5			
14				
15	4.0			
16				
17	4.5			
18				
19	5.0			
20				
21	5.5			
22				
23	6.0			
	6.5			
	7.0			

Appendix B: National Archaeological Database Form

NATIONAL ARCHAEOLOGICAL DATABASE – REPORTS; DATA ENTRY FORM

1. R and C #: _____
 2. Authors: Scott, Branden K.

Year of Publication 2019
 3. Title Geoarchaeological Investigation for the Proposed Des Moines Transload Facility along Martin Luther King Jr. Parkway, Sections 2 and 3, T79N, R24W, Lee Township, City of Des Moines, Polk County, Iowa

3. Report Title: Impact7G Reports

 Volume #: _____ Report #: CRM 88 NTIS: _____
 Publisher: Impact7G
 Place: Clive, Iowa

5. Unpublished
 Sent From: _____
 Sent To: _____
 Contract #: _____

6. Federal Agency: _____

7. State: Iowa
 County: Polk
 Town: _____

8. Work Type: 99
 9. Keyword: 0 - Types of Resources / Features 1 - Generic terms / Research Questions
 2 - Taxonomic Names 3 - Artifact Types / Material Classes
 4 - Geographic Names / Locations 5 - Time Periods
 6 - Project Names / Study Unit 7 - Other Key Words
14.5 ha (35.9 ac) [7] _____ []
Southern Iowa Drift Plain [4] _____ []
Des Moines River Valley [4] _____ []
Alluvial landforms [0] _____ []
No resources [0] _____ []
 _____ [] _____ []
 _____ [] _____ []

10. UTM Zone: 15 Easting: _____ Northing: _____
 11. Township: 79N
 Range: 24W

Historic Structures Report

Railroad Transload Facility
T78N, R24W, Section 2 and 3
Des Moines, Iowa

Written by
Patricia Davenport-Jacobs, MHP, PI
Meghan Powell, Architectural Historian
Meagan Scott, Preservation Planner
with
Samantha Hunt, Archaeological Crew Chief

for
Des Moines Industrial, LLC
and
the Federal Railroad Administration

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**ENVIRONMENTAL
SERVICES, INC.**

A Terracon COMPANY

March 2020

Information contained in this report relating to the nature and location of archaeological sites is considered private and confidential and not for public disclosure in accordance with Section 304 of the National Historic Preservation Act (54 U.S.C. § 307103); 36 CFR Part 800.6 (a)(5) of the Advisory Council on Historic Preservation's rules implementing Sections 106 and 110 of the Act; Section 9(a) of the Archaeological Resource Protection Act (54 U.S.C. § 100707) and, Chapter 22.7, subsection 20 of the Iowa Code.

ABSTRACT

In March 2020, Environmental Services Inc., a Terracon Company (ESI) conducted a Historic Structures Survey of the proposed location for construction of a railroad transload facility in Des Moines, Polk County, Iowa. Funded by a grant from the US Department of Transportation (DOT), the project as proposed will take place on an approximate forty-acre site north of Martin Luther King Parkway in the area of SE 14th Street. The undertaking involves the construction of a transload facility, including an office/warehouse, a transloading pad, proposed bulk minerals building, stormwater detention ponds, an outdoor storage area, and 12,650 feet of proposed railroad track.

The goals of this investigation were to locate historic properties within the project Area of Potential Effect (APE), defined by the Federal Rail Administration (FRA), as the immediate viewshed of the project location site, including the project location and adjacent parcels; to evaluate their significance for listing in the National Register of Historic Places (NRHP); and to assess any potential impact the undertaking may have on those resources, as mandated by federal laws and guidelines (Code of Federal Regulations [CFR], Title 36, Chapter VIII, Part 800 [36 CFR 800]). To meet these objectives and supplement both the *Phase IA Cultural Resource Survey of the Des Moines Industrial Project and the Cultural Resource Desktop Assessment*, a Historic Structures Survey was determined necessary.

In addition to the documentation and assessment of the historic resources, this report includes the survey methodology and evaluation criteria, survey methodology, and gives a historic context of the area. It also includes an analysis of the historic resources and findings.

As a result of the investigation, fourteen (14) historic resources were documented and assessed, including nine (9) previously recorded structures and five (5) newly recorded resources. Two (2) properties, the 14th Street Viaduct (77-03895) and C. Amend & Sons Meat Packing Plant (77-10700), have previously been recommended eligible for the NRHP by the State Historic Preservation Office (SHPO). The remaining twelve (12) resources appear not to meet criteria for listing in the NRHP.

It is the consultant's opinion that the project as proposed will be visible from two (2) historic properties within the APE. However, the character of the project is in keeping with that of the industrial setting, and the fundamental viewsheds from the historic properties will remain the same. It is the consultant's opinion that the project, as proposed, will have **no adverse effect** on the historic properties.

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INTRODUCTION

In March 2020, Environmental Services Inc., a Terracon Company (ESI) conducted a desktop analysis of the proposed location for development of a railroad transload facility in Des Moines, Polk County, Iowa. In July 2018, the Des Moines Area Metropolitan Planning Organization (DMAMPO) submitted an Infrastructure for Rebuilding America Grant Application (IRAGA) to the US Department of Transportation (DOT) seeking a Better Utilizing Investments to Leverage Development Grant (BUILDG) for this project. The application was selected for award of Federal funds in November 2018. In April 2019, Des Moines Industrial was formed to design, construct, operate and own the transload facility. The current undertaking, led by the Federal Railroad Association (FRA), involves the construction of a transloading facility north of Martin Luther King Parkway in the area of SE 14th Street. The site covers approximately forty-acres and is located in the SE ¼ of Section 2 and SW ¼ of Section 2, Township 78 North, Range 24 West in Des Moines, Iowa. The undertaking involves the construction of a transload facility, including an office/warehouse, a transloading pad, proposed bulk minerals building, stormwater detention ponds, an outdoor storage area, and 12,650 feet of proposed railroad track. The purpose of the undertaking is to improve the overall freight capacity and railroad options in the Des Moines metropolitan area; develop rail centric transportation options for existing businesses; to expand extant transportation options to attract new industries to the region; and to support economic development in Central Iowa.

The goals of this investigation were to locate historic properties within the Area of Potential Effects (APE), to evaluate their significance for listing in the National Register of Historic Places (NRHP), and to assess any potential impact the undertaking may have on those resources, as mandated by federal laws and guidelines (Code of Federal Regulations [CFR], Title 36, Chapter VIII, Part 800 [36 CFR 800]). To meet these objectives and supplement both the *Phase IA Cultural Resource Survey of the Des Moines Industrial Project and the Cultural Resource Desktop Assessment*, a Historic Structures Report was determined necessary.

As defined in the National Historic Preservation Act, 800.16(d), the APE is “the geographic area within which an undertaking may directly or indirectly cause alteration in the character of use of historic properties.” For this undertaking, the FRA defined the APE as the immediate viewshed of the project location site, including the project location and adjacent parcels. Desktop analysis, coupled with previous surveys and the Polk County Assessor parcel data, resulted in the identification of fourteen (14) historic resources, including nine (9) previously recorded structures and five (5) resources that were newly recorded. Two (2) historic properties found within the APE (77-03895 and 77-10700) were previously determined potentially eligible to the NRHP by the Iowa State Historic Preservation Office (SHPO). The remaining twelve (12) resources were found to be not eligible to the NRHP.

The information contained in this report relating to the nature and location of archaeological sites (none present within this report) is considered private and confidential and not for public disclosure in accordance with Section 304 of the National Historic Preservation Act (54 U.S.C. § 307103); 36 CFR Part 800.6 (a)(5) of the Advisory Council on Historic Preservation’s rules implementing Sections 106 and 110

of the Act; Section 9(a) of the Archaeological Resource Protection Act 954 U.S.C. § 100707) and, Chapter 22.7, subsection 20 of the Iowa Code.



Figure 1. APE & Project Location.

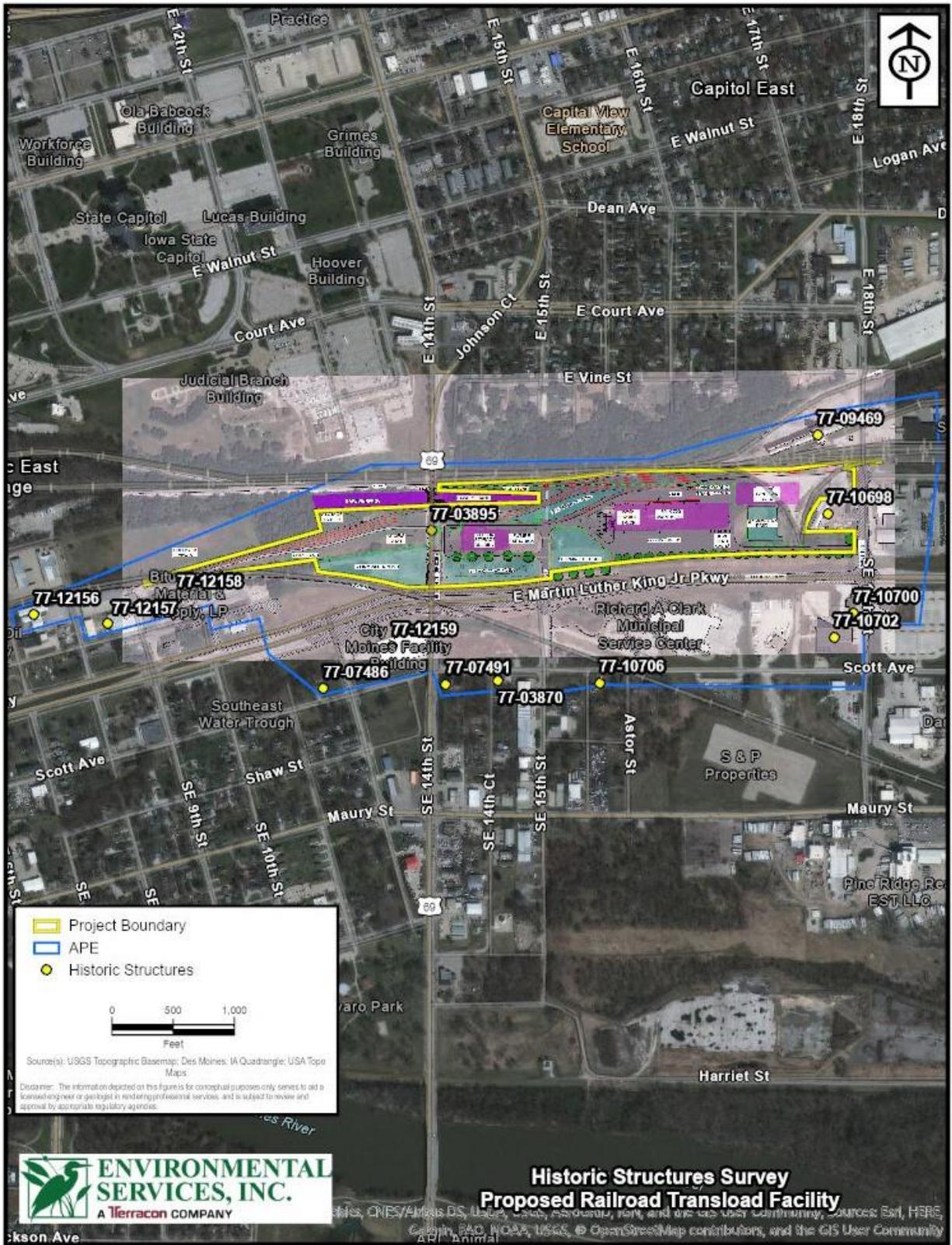


Figure 2. Project boundary and APE with Site Plan. Resources are identified with yellow points and their Site ID.



Figure 3. General project area, from center location facing east. Site 77-09469 is visible in the background.



Figure 4. General project area looking east, Site 77-09469 is visible in the distance.



Figure 5. General project area looking west. The 14th Street Viaduct, 77-03895, is visible in the distance.



Figure 6. General project area, from center location facing west. Site 77-03895 is visible.



Figure 7. General project area looking south. The City of Des Moines Office & Warehouse, 77-12159, is pictured.

ENVIRONMENTAL & GEOMORPHICAL CONTEXT

Both the environmental and geomorphological context can be found in the *Phase 1A Cultural Resources Survey, Proposed Railroad Transload Facility Report* issued in November 2019 on pages one and two.

METHODOLOGY & PREVIOUS RESEARCH

Cultural resource management involves a series of activities carried out in succession. The first activity is a survey: a systematic examination of historic properties, of which previously recorded resources are held by the Iowa Department of Cultural Affairs. Surveys are undertaken to determine the nature, extent, and character of historic properties, which includes buildings, structures, objects, sites, or districts significant in national, state, or local history. It should be clearly distinguished from registration and protection of historic buildings, which is provided through listings in the NRHP, and, just as importantly, by enacting local historic preservation ordinances.

Identifying, Documenting, and Evaluating Historic Resources

Within the context of this survey, the term “historic resource” means any prehistoric or historic district, site, building, or structure, constructed in or prior to 1970. The identification of historic resources begins with their documentation through a professional survey conducted under uniform criteria established by federal and state historic preservation offices. The term “historic property” is defined as any prehistoric or historic district, site, building, structure, or object included on, or determined eligible for inclusion on, the NRHP as defined in 36 CFR Part 800.16 – Protection of Historic Properties (as amended in August 2004). An ordinance of state and/or local government may also define a historic property or historic resources under criteria contained in that ordinance.

An architectural survey is a tool to locate, identify, and evaluate any historic resources that may be significant per the National Register criteria and when applicable, consider resources that may be eligible for a local register. A survey is a gathering of detailed information on the buildings, structures, objects, and artifacts that have potential historical significance. The information should provide the basis for making judgments about the relative value of the resources. Not all resources identified or documented in the survey process may ultimately be judged “historically significant,” protected by a historic preservation ordinance, or preserved. Still, all such resources should be subjected to a process of evaluation that results in a determination of those which should be characterized as historically significant under either federal or local criteria. Historic resource surveys are generally conducted within a geographic boundary, defined by an APE, or by collecting thematic data. The architectural survey included those historical resources located within the APE.

The Iowa Site Inventory (ISI) is the state's clearinghouse for information on archaeological sites, historical structures, and field surveys. A system of paper and computer files, the ISI is administered by the Iowa Department of Cultural Affairs (IDCA). Iowa's State Historic Preservation Office (SHPO) is housed within IDCA. The form on which a site or building is recorded is the ISI Form. Recording a site or building on that form does not mean that it is historically significant, but simply that it meets a standard for recording. A building, for example, should be at least fifty years old before it is recorded on the Iowa Site Inventory.

Relatively few buildings or sites included in the ISI are listed in the NRHP, the accepted criterion for what constitutes a “historic property.” The NRHP is the official federal list of culturally, historically, or architecturally significant properties in the United States and is maintained by the US Department

of the Interior, National Park Service (NPS). The buildings, sites, structures, objects, and districts listed in it are selected under criteria established by NPS. Inclusion on the NRHP is honorary and does not imply protection or control over private properties listed unless federal funds or activities are allocated toward them.

Background Research & Previous Survey

ESI initially performed a desktop analysis of the APE and determined fourteen (14) resources met the fifty-year cutoff date, according to NRHP criteria. The architectural survey consisted of a pedestrian investigation, specifically, to verify the presence of the architectural resources within the APE constructed up to 1970. This date was chosen as it satisfies the minimum fifty-year age requirement for historic resources set forth by National Register criteria. Data from the Polk County Property Appraiser, the Iowa Department of Cultural Affairs, Historic Preservation Office, and ISites Public Data Web Map was collected and cross referenced to insure the accuracy of information and correlation with respective buildings. The Appraiser’s Office and ISites database available online provided construction dates for all buildings within the APE. Physical characteristics of these buildings were compared to insure the architectural character of the buildings were consistent with the recorded date of construction and features. As a result of the preliminary assessment, the background data research and pedestrian investigation, fourteen (14) resources were identified (Table 1). Seven (7) of these fourteen (14) resources were previously recorded, and five (5) were newly recorded as a result of this survey, as noted in Table 1 below. Other research included an examination of the Sanborn Fire Insurance Company maps, available plat maps, historical aerials and United States Geological Survey (USGS) topographic maps, as well as recent past and current street-view images available through Google Earth.

The 2007 survey “*Des Moines SE Connector: SE 12th Street to US 65: Historical/Architectural Intensive Survey, City of Des Moines, Polk County, Iowa, HADB Report No. 77-238* found that Site 77-10700, C. Amend & Sons Meatpacking Plant, met National Register eligibility at the local level under Criteria A and Site 77-03895, the East 14th Street Viaduct, met National Register eligibility at the local level under Criteria C. Following the recommendations of the *Secretary of the Interior’s Standards for Identification* and the *National Register’s Guidelines for Local Surveys*, it was determined that both historic properties are eligible for the National Register. Based upon the results of the report, the analysis recommended avoidance of these historic properties. The Iowa SHPO concurred with these findings.

Table 1. Historic Properties within the APE.

Site Inventory No.	Property Name	Property Address	Year Built	Determination of Eligibility
77-03895	14 th Street Viaduct	SR 69, between Scott Avenue and Vine Street	1936	Recommended Eligible
77-10700	C. Amend & Sons Meat Packing Plant	410 SE 18 th Street	1929	Recommended Eligible
77-12156*	Sun Tool Warehouse	305 SE 7 th Street	1940	Not yet evaluated by SHPO

77-12157*	Husmann Warehouse	309 SE 8 th Street	1965 & 1969	Not yet evaluated by SHPO
77-12158*	Bituminous Materials & Supply	900 Raccoon Street	1950 & 1973	Not yet evaluated by SHPO
77-07486	House	1108 Scott Avenue	1882	Recommended Not Eligible
77-12159*	City of Des Moines Office & Warehouse	1300 Scott Avenue	1967 & 1973	Not yet evaluated by SHPO
77-07491	House	1401 Scott Avenue	1901	Recommended Not Eligible
77-03870	Vestal House	601 SE 14 th Court	1938	Recommended Not Eligible
77-10706	House	609 SE 15 th Court	1900	Recommended Not Eligible
77-10702	United House & Gate	500 SE 18 th Street	1941	Recommended Not Eligible
77-10698	Wolverine World Wide	302 SE 18 th Street	1958	Recommended Not Eligible
77-09469	Heartland Co-Op	118 SE 18 th Street	1930	Recommended Not Eligible
77-12160*	Iowa Interstate Railroad	Northern APE boundary	Estimated mid-1800s	Not yet evaluated by SHPO

**Newly recorded resources within the APE.*

Survey Methodology

There are several methodologies for surveying. One approach is the thematic survey, which identifies all historic properties of a specific type, such as a survey of all libraries within a county. A more common survey is the geographic type, which results in a comprehensive recording of all significant themes and associated properties within established geographic boundaries, such as a subdivision, neighborhood, or city limit. The goal of this survey was to identify and evaluate the significance of the extant historic structures within APE that were constructed in or before 1970.

After an initial review of secondary histories, previous surveys, assessor data, and the Iowa Site Inventory, additional pre-survey planning included the acquisition of a current property appraiser map, and historic and current USGS maps. Approximate dates of construction were obtained from the Polk County property appraiser's office. Historic and current USGS maps were obtained to ascertain the nature and extent of properties throughout the project area, and changes to the built environment that have occurred over the past fifty years.

Not permitted on private property, the surveyors photographed each building from the ROW as they were able, making no attempt to closely inspect foundations or wall framing for structural integrity. Additional photographs were taken of the resource from the proposed project location and from the resource towards the proposed project location. Ghost-line inspections and visual assessments provided information on alterations, additions, and the development over time. The integrity of each

building was evaluated on the guidelines established by the NRHP, and each resource was recorded on an Iowa State Inventory form.

Evaluation Criteria

As requested by the client, the survey team recorded all buildings constructed in or before 1970 within the APE. This cutoff date was selected to meet the fifty-year criteria used by NPS for assessing historic buildings. Polk County Property Appraiser construction dates were used to determine what properties were included in the survey.

The inclusion of buildings in the survey was based on criteria established by the US Department of the Interior for listing buildings and properties in the NRHP. The NPS is the regulatory body charged with final evaluation of resources by significance for inclusion in the NRHP. Significance is determined through the loss or retention of integrity. The evaluation is a subjective judgment but is grounded by seven aspects of integrity, which the NPS defines as location, design, setting, materials, workmanship, feeling and association.

The fieldwork and survey report required for this project was completed using the professional guidelines set forth in the *Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 4416)*. Field survey methods also complied with 223-41.5(303) of the *Iowa Administrative Code*. In addition, all surveys (including this survey) conducted in association with the Iowa Department of Cultural Affairs, utilize the NPS criteria for listing of historic properties in the NRHP as a basis for site evaluations. This way, the survey results can be used as an authoritative data bank for those agencies required to comply with both state and federal preservation regulations. The criteria are worded in a subjective manner in order to provide for the diversity of resources in the United States. The following is taken from criteria published by the US Department of the Interior to evaluate properties for inclusion in the NRHP:

The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, and association, and:

- A) that are associated with events that have made a significant contribution to broad patterns of our history;*
- B) that are associated with the lives of persons significant in the past;*
- C) that 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 values, or that represent a significant and distinguishable entity whose components may lack individual distinction;*
- D) that have yielded, or may be likely to yield, information important in prehistory or history.*

Certain properties shall not ordinarily be considered for inclusion in the NRHP. They include cemeteries, birthplaces, or graves of historical figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, reconstructed historic

buildings, properties primarily commemorative in nature, and properties that have achieved significance within the past fifty years. However, such properties will qualify if they are integral parts of districts that do meet the criteria or if they fall within the following categories:

- 1. a religious property deriving primary significance from architectural or artistic distinction or historical importance;*
- 2. a building or structure moved from its original location, but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event;*
- 3. a birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building directly associated with his or her productive life;*
- 4. a cemetery that derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events;*
- 5. a reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived;*
- 6. a property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own historical significance; or*
- 7. a property achieving significance within the past fifty years if it is of exceptional importance.*

The City of Des Moines has adopted the NRHP criteria for its local landmark process, with the addition of the first criteria (see below). Local criteria also includes the same language as the NRHP for those properties not ordinarily considered for inclusion (not duplicated here). The following local criteria comes from section 58-58 of the Des Moines Municipal Code:

For purpose of this article, a landmark or landmark site designation may be placed on any site, natural or improved, including any building, improvement or structure located thereon that possesses integrity of location, design, setting, materials, workmanship, feeling and association and that:

- 1. Is significant in American history, architecture, archaeology and culture;*
- 2. Is associated with events that have made a significant contribution to the broad patterns of our history;*
- 3. Is associated with the lives of persons significant in our past;*
- 4. Embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction; or*
- 5. Has yielded or may be likely to yield information important in prehistory or history.*

Although it was not within the scope of the project to evaluate the historic resources for potential eligibility on the local level, the city's adoption of the federal standard suggest similar conclusions can be drawn about local eligibility. Listing on the NRHP is strictly honorary; regulation of historic landmarks is at the local level.

The Department of Cultural Affairs employs the same criteria in a less restrictive manner for selecting properties to be placed on the Iowa Site Inventory, a repository located in Des Moines. The process allows for the recording of properties of local significance that could not be included in the NRHP. The Iowa Site Inventory is not a state historic register, but an archive that holds cultural resource documents intended for use as a planning tool and a central repository containing archival data on the physical remains of Iowa's history. Each Iowa Site Inventory form represents a permanent record of a resource.

Alterations and additions can impact the integrity of a structure. Extensive additions and modifications, the use of incompatible exterior sidings and windows, and porch removal or enclosure are typical alterations that cause a building to possibly lose its historic character. While some modifications are found to be sensitive to the historic character and do not impact the building's integrity, other more extreme modifications can diminish the integrity of the resource, therefore altering the significance. Window replacement is common in older houses as homeowners often desire a more energy efficient option. Window alterations that retain the fenestration and light pattern and use like materials typically do not alter the character of a building. Another sensitive alteration would be the enclosure of a side porch or single-car-garage with the original footprint intact; the resource may be affected but does not necessarily lose integrity. On the other hand, where buildings have had large additions or major alterations to the main façade or prominent features and the original portion or feeling of the resource has been altered, so that one cannot determine the original from the addition, then that is considered diminishing the integrity of the structure and therefore would not be a significant resource. Permanent modifications were evaluated more methodically than a reversible modification that did not alter the integrity of the structure.

HISTORIC CONTEXT

A THOROUGH HISTORY OF THE AREA CAN BE FOUND IN THE 2007 SURVEY DES MOINES SOUTHEAST CONNECTOR SE 12TH STREET TO U.S. 65 (REVIEW AND COMPLIANCE NO. 050877091).

The APE is located east of the Des Moines and Raccoon River confluences, south of Interstate 235 and east of Highway 69/E 14th Street. The area was historically known as “Southeast Bottoms” and Chesterfield, and today includes the Capitol East and Chesterfield neighborhoods (the APE borders these two neighborhoods). The overall topography of the area hindered initial development and due to the construction of the viaduct in the 1930s, created a major thoroughfare along SE 14th Street. With the separation of the railroad tracks and berms to the north, as well as the river to the south, the neighborhood is essentially boxed in (Rogers 2007).

The Chesterfield neighborhood is bordered by railroad along Market Street, the Des Moines River to the south, East 14th Street on the west and SE 30th Street on the east (Myers 1997). The neighborhood originally included a meatpacking district, grain elevators, a brick yard, a coal mine, several various businesses, a school, and many churches (Bushnell 1898-90; Denny et al 1988; Tallgrass Historians 1997).

Originally, this land was wetland, and experienced regular flooding, particular the area of SE 14th Street and south of the railroad tracks. This, in combination with the proximity to the two packing houses, made the area slow to develop (Long 1982). The neighborhoods were predominantly residential and industrial, with working-class Euro-American and European families. Many residents worked in the coal mines south of the Des Moines river, located at East 15th Street and the Rock Island railroad tracks in 1880. Census data in the late nineteenth and early twentieth centuries indicates that many residents of the area worked in the area’s coal mines (Tallgrass Historians 2007).

The railroad allowed for a natural divide between the new State Capitol (1857) and the neighborhoods of Southeast Bottoms and Chesterfield. Due to a lack of easy access to transportation these neighborhoods were sparsely populated until the 1870s. The Des Moines Valley Railroad had tracks along Market Street in 1866; the Rock Island Railroad built tracks along Vine Street in 1884; and the Chicago, Burlington & Quincy Railroad was constructed in 1884 between East 5th and 6th Streets. The next decade “sprouted so many spurs and branches that crossing East 6th Street meant bouncing over twenty-two set of tracts in a three-block stretch” (Long 1982).

The neighborhood directly south of the APE, Chesterfield, originally developed as a village named Gilbert. It was incorporated in 1882 and as early as 1885, residences had been constructed between Scott Avenue, Maury Street, SE 14th and Astor Streets (Rogers 2007, p.11; also see **Figure 8**). They were sporadically located, suggesting this was not a planned development. According to the 1920 Sanborn map, railroad tracks were not consolidated and ran in multiple directions between at least four blocks. Along with the Southeast Bottoms neighborhood, Chesterfield was also a working-class neighborhood dependent on the local industries, including distilleries and meatpacking businesses. Through the mid-20th century, the prosperity of the neighborhood was tied to the surrounding

industry, which has most notably included the railroads, mining, and the meatpacking industry. Its height occurred in the early part of the 20th century, with a brief resurgence during WWII (Rogers 2007).

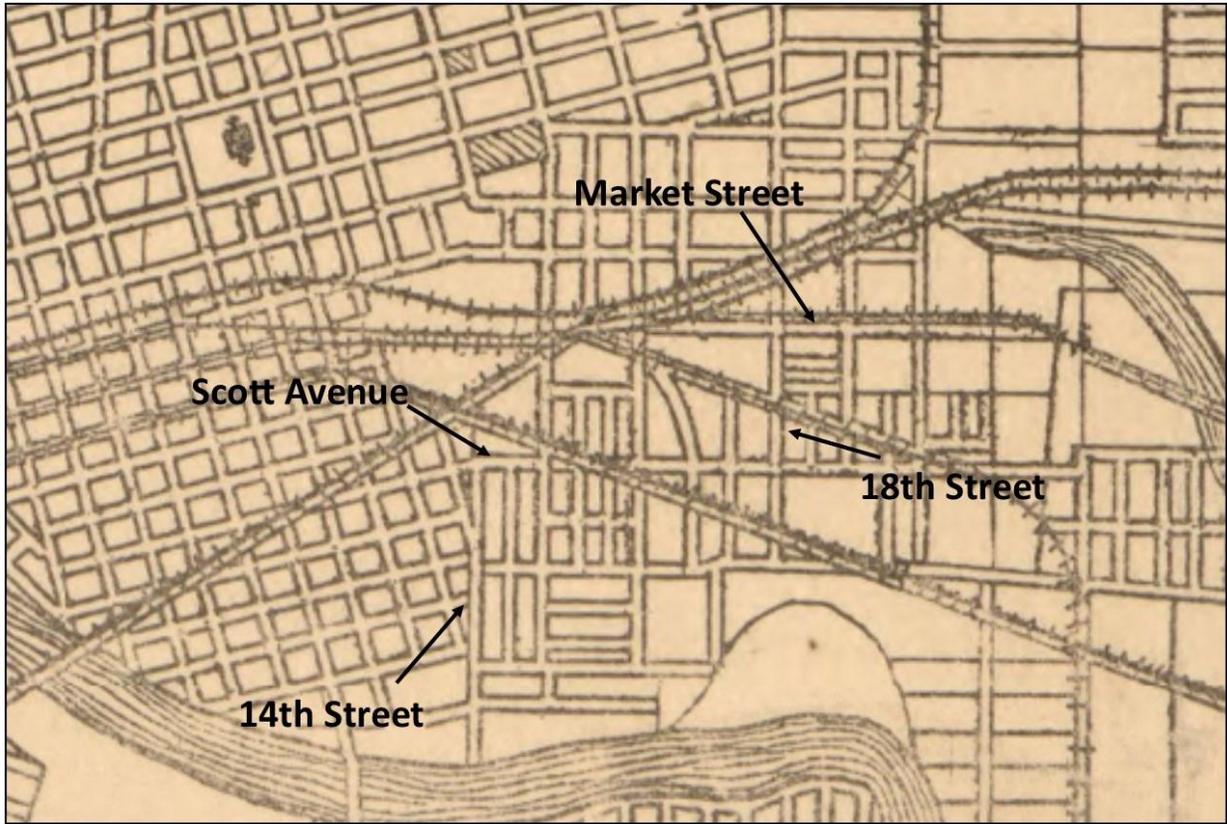


Figure 8. Excerpt of the Map of Polk County, Iowa, 1895, showing the project area.
Courtesy of the Library of Congress Geography and Map Division.

Residential development extended north of Scott Avenue by 1930 (**Figure 10**), according to aerials, along several north-south blocks that are no longer extant. Two decades later, some of the residences

began to vanish, although the streets (along with a few houses) remained through the 1970s (

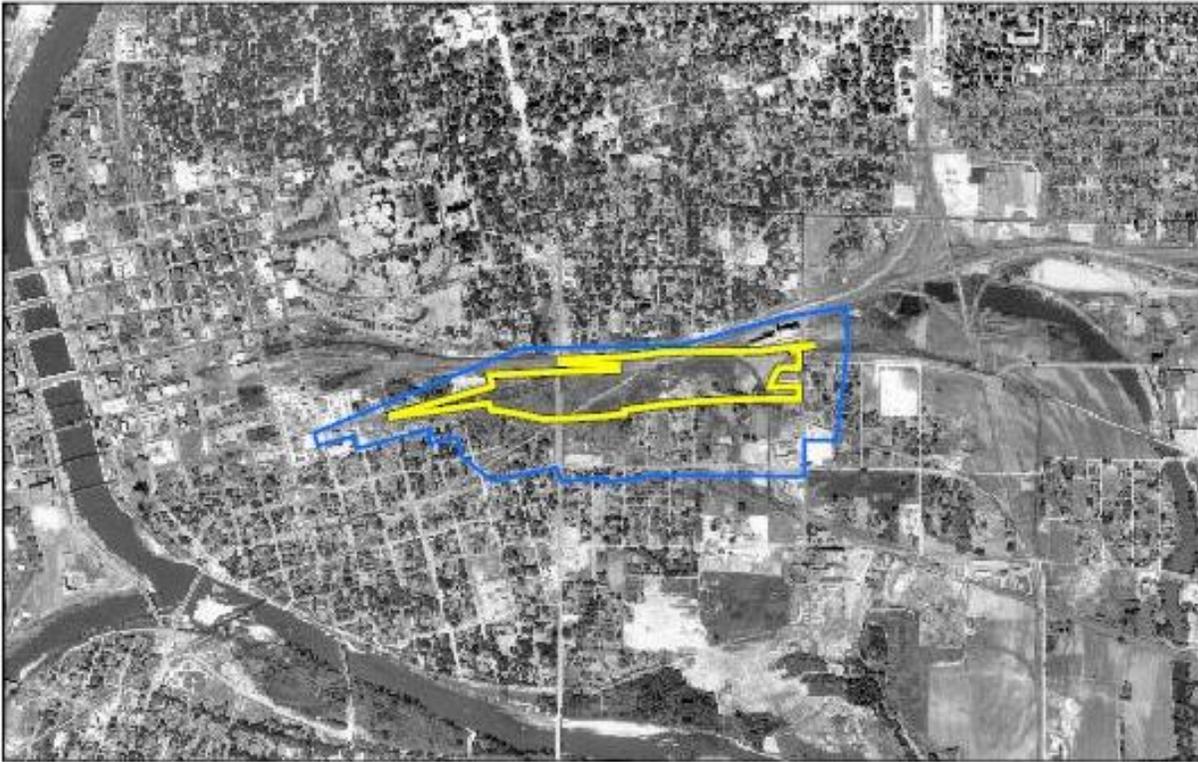


Figure 118 - **Figure 143**). Sanborn maps show the continued use of the area south of Scott Avenue as a residential area, and expansion west to at least SE 12th Street, with multiple vacant parcels evident on the 1920-1950 map. Typical buildings were small with front or rear porches, and several churches were also in the area. Streets were unpaved.

Due to the loss of most historic industries in the area and development of modern transportation to allow people to travel farther distances, the decline of the area became evident beginning in the 1960s. The ethnic neighborhood has shifted from the historic Euro-American and African American populations to an increasingly Latino population (Tallgrass Historians 2007).



Figure 9. Excerpt of the 1905 USGS Topographic Map in Des Moines, Iowa. Project area is shown in yellow and the APE is shown in blue.



Figure 10. 1930 Historic Aerial of the project location in Des Moines, Iowa. Project area is shown in yellow and the APE is shown in blue.



Figure 11. 1950 Historic Aerial of the project location in Des Moines, Iowa. Project area is shown in yellow and the APE is shown in blue.

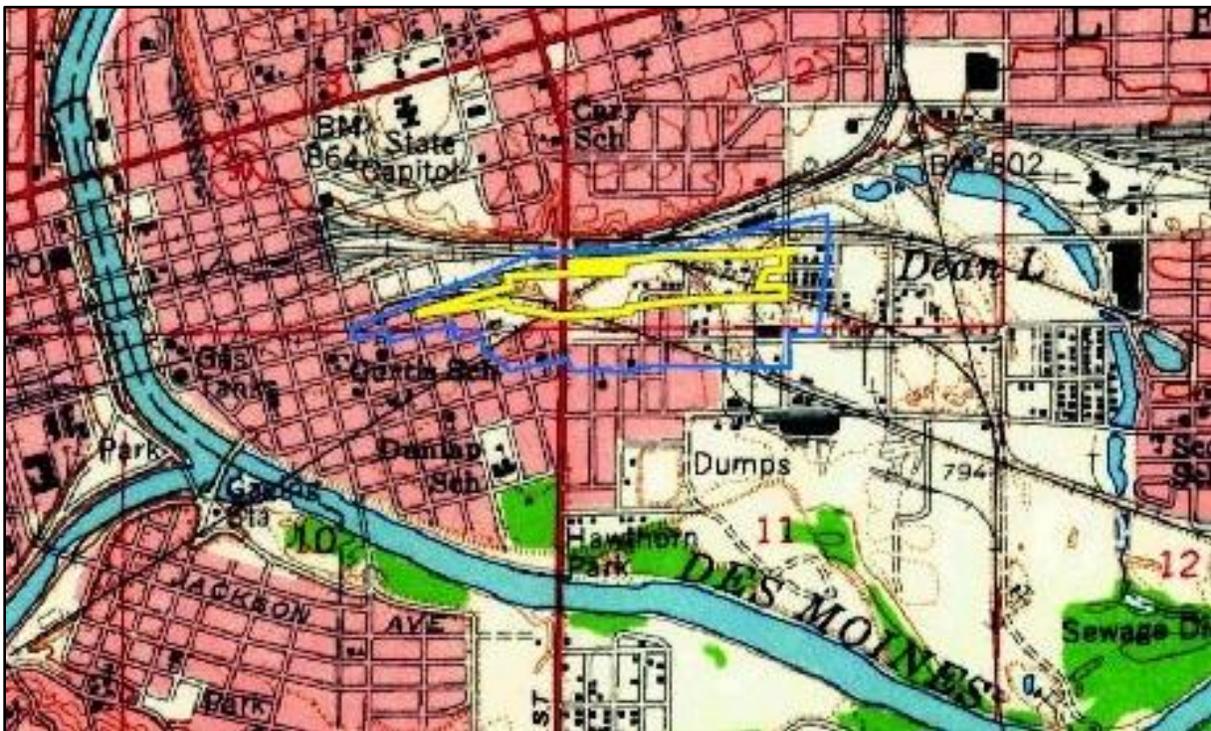


Figure 12. Excerpt of the 1956 USGS Topographic Map of Des Moines, Iowa. Project area is shown in yellow and the APE is shown in blue. For a full-scale map see Appendix A.



Figure 13. 1960 Historic Aerial of the project location in Des Moines, Iowa.
Project area is shown in yellow and the APE is shown in blue.

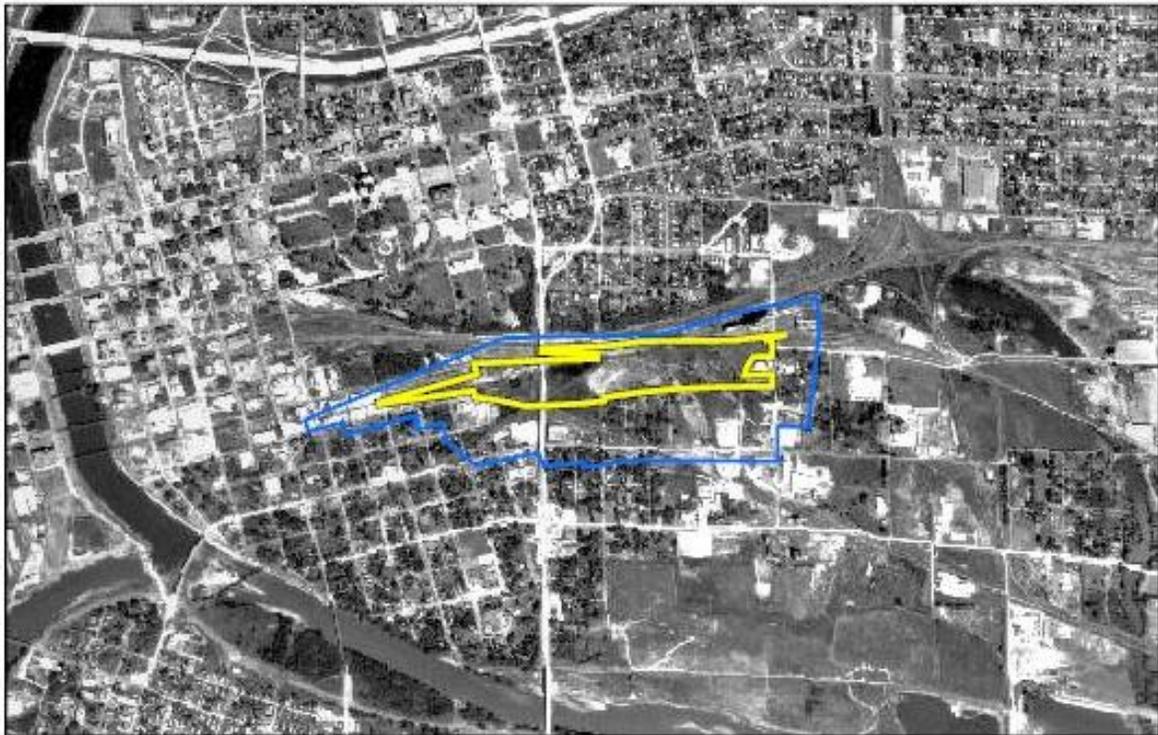


Figure 14. 1970 Historic Aerial of the project location in Des Moines, Iowa.
Project area is shown in yellow and the APE is shown in blue.

ARCHITECTURAL SURVEY

In March 2020, ESI conducted a Historic Structure Report for the proposed Des Moines Industrial transload facility located in Des Moines, Polk County, Iowa. The survey consisted of a pedestrian survey and historic architectural analysis of all buildings fifty-years or older within the project APE. Fourteen (14) resources were documented as a result of this survey, including the 14th Street Viaduct and C. Amend & Sons Meat Packing Plant, both of which have been recommended NRHP eligible by SHPO. All resources were evaluated according to the criteria laid out by NPS.

Site Inventory ID: 77-03895

14th Street Viaduct

Year Built: 1936

The 14th Street Viaduct spans the project area and will have storage tracks built beneath and around the bridge supports. An in-depth historical account of the bridges construction and evaluation is also found in the *Des Moines SE Connector: SE 12th Street to US 65: Historical/Architectural Intensive Survey, City of Des Moines, Polk County, Iowa. Report No. 77-238*. An excerpt of the Viaduct's history and evaluation from that report is found below:

The viaduct is a continuous steel plate deck girder structure built in association with the construction of the bridge carrying the SE 14th Street over the Des Moines River. It is part of the elevated portion of SE 14th Street leading up to the river bridge making the street a freeway and elevating the road over numerous railroad tracks on the north side of the river. The viaduct was built by G.G. Herrick of Des Moines and was completed in 1936.

The construction of the E. 14th Street Viaduct and Bridge in the late 1930s enabled the rerouting of US Highways 65 and 69 onto SE 14th Street across the new river bridge to the highways' previous alignment along Indianola Avenue. With the completion of the viaduct in tandem with the river bridge, SE 14th Street developed into a major thoroughfare linking the south side of the river directly with the state capitol area on the north side of the river.

In 1993-4 Clayton B. Fraser completed an inventory and evaluation of bridges in the State of Iowa for the Iowa Department of Transportation. He concluded that the E. 14th Street Viaduct were ineligible; however, that study focused solely on Criterion C (architectural/engineering significance) at the statewide level with no evaluation of these properties under Criterion A or B (historical significance or association with a significant person) or Criterion C at the local level of significance (Fraserdesign 1994:234).

In 1996, the Historic American Engineering Record (HAER) completed a documentation study for the Iowa Historic Bridges Recording Project sponsored by the Iowa Department of Transportation. The HAER documentation noted that the viaduct was a companion structure to the river bridge, with both structures redirecting traffic away from the congested downtown area and providing improved access to the state capitol building. These statements make a case for significance for the E. 14th Street Bridge and Viaduct structures under Criterion C at the local level, with the previous determination of ineligibility at the state level by Clayton Fraser left standing.

This resource bisects the APE. Portions of the APE that are visible from the resource are illustrated in **Figure 18** and **Figure 19** and are mostly empty, with scrub grass and trees along or near the property line. Lead track to the storage and pullback tracks are proposed beneath and around the viaduct piers, as well as a salt building and stormwater pond to the east.

This structure has been determined potentially eligible by the Iowa SHPO to the NRHP under Criteria C. The undertaking, as proposed, will be visible from this historic property, however, the character of the project is in keeping with that of the industrial setting and the fundamental viewsheds from the historic property will remain the same. The undertaking will pose **no adverse effect to the historic property**.



Figure 16. 14th Street Viaduct (77-03895), looking northwest.



Figure 17: 14th Street Viaduct (77-03895), looking east.



Figure 18. Looking east from the 14th Street Viaduct.



Figure 19. Looking west from the 14th Street Viaduct.

Site Inventory ID: 77-10700

C. Amend & Sons Meat Packing Plant, 410 SE 18th Street

Year Built: 1929

The history of the meatpacking plant has been documented in previous reports (*Des Moines SE Connector: SE 12th Street to US 65: Historical/Architectural Intensive Survey, City of Des Moines, Polk County, Iowa. Report No. 77-238*). A more in-depth accounting of the history of the C. Amend & Sons Meat Packing Plant can be found in that report. An excerpt of the Amend's history and evaluation from that report is found below:

Amend Packing Company was founded in 1869 by German immigrant Conrad Amend. In 1908, Amend's sons joined the business and the name changed to C. Amend & Sons. After multiple locations, Amend opened the meatpacking plant located on 18th Street in 1929. Before the construction of this plant, Des Moines had only one community packing house. An addition to the Amend packing plant was constructed in 1933. The company name changed to Amend Packing Company in 1958.

As a long-standing, family-run business in Des Moines, the Amend Packing Plant is certainly one of the oldest such businesses still operating in Des Moines. The historic plant building is considered eligible for the National Register under Criteria A for its historical significance as a surviving representative of the type of family run business that once flourished in Des Moines. This particular business is also significant for its survival for over 130 years as a family run meatpacking business surviving and thriving despite stiff competition from the major meat packers like IBP, Monfort, and others. The 1929 plant building was also constructed in the heart of the city's SE side meatpacking district and may be the only surviving packing plant to remain in the area. The building itself has been impacted by exterior modifications to the point that its integrity is too marginal for eligibility under Criterion C (architectural significance) ..."

The resource was described in the 2007 Iowa Site Inventory Form:

The main plant building was constructed in 1929, with a one-story addition made to the north end in 1933. Both the original building and the 1933 addition have concrete foundations and tile block or tile brick walls. The addition at the north end was later expanded with a second floor that houses the office. A shed-roofed addition off the north end was probably added at the same time to house the stairs to the second floor. This second-floor addition appears to have been made by the late 1940s. The buildings have since been modified with glass block window infill (original windows were hopper-type ventilation windows with fixed upper and lower panes) as well as doors and other windows that were completely bricked in. Few if any of the original doors and windows remain in place. A third addition for a larger cooler was made in the mid to late 20th century to the rear of the original building. In addition, the block walls have cracked in the modern era and were poorly repaired from an aesthetic standpoint.

A long shed was added to the southwest corner of the building and extending to the west along the property line. This shed is steel frame and has corrugated metal sheet roofing. The shed is largely open on the sides and was used for cattle pens. This shed replaced an earlier, smaller shed used for the same purpose. The current shed appears to have been added in the mid to late 20th century. A small one-story frame garage built in the 1940s and still standing in 2004 is no longer extant. A 1962 scale house and shop present in 2004 also appears to be non-extant.

The resource appears largely the same as it was described in 2007, with one exception. The second story office addition has been re-sided with stucco on the primary east façade and vertical wood siding on the north façade. There are stucco quoins on the northeast corner, and windows have been replaced with 1/1 sash.

To the northwest (**Figure 22**) a stormwater pond and temporary laydown area have been proposed, with a warehouse and loading dock beyond. The 1.14 acres of laydown area will be a temporary staging area for rail and cross ties, additional equipment and track material for the proposed construction. Resource 77-09469 (Hartland Co-Op) and Resource 77-10698 are also visible from the ROW (**Figure 23**).

This structure has been determined potentially eligible by the Iowa SHPO to the NRHP under Criteria A, at the local level as a long-running, family operated meatpacking business reminiscent of the area's original industrial setting. The undertaking, as proposed, will be visible from this historic property, however, the character of the project is in keeping with that of the industrial setting and the fundamental viewsheds from the historic property will remain the same. The undertaking will pose **no adverse effect to the historic property.**



Figure 20. C. Amend & Sons Meat Packing Plant (77-10700), looking west.



Figure 21. Amend's Meatpacking Plant (77-10700) additions and alterations.



Figure 22. Looking northwest towards the APE (across the street) from C. Amend & Sons Meat Packing Plant.



Figure 23. Looking north to the APE (across the street) from C. Amend & Sons Meat Packing Plant with Heartland Co-Op (77-09469) and Resource 77-10698 visible in the background.

Site Inventory ID: 77-12156
Sun Tool Warehouse, 305 SE 7th Street
Year Built: 1940

This 1940 welded frame industrial warehouse is a single story, T-shaped building with three (3) bays clad in corrugated metal exterior siding and medium pitch gable roofs with no overhanging eaves. On the recessed facade are garage loading bays under a pent roof extension with angled metal brackets. Centrally located is a single pedestrian entry on recessed facade, accessible by metal a metal stairway. An off-center third (3) bay extends west of the other two bays. Partially obscured windows are located on the northern bay elevation behind iron security bars.

Although dates have not been verified, there have been several additions to the original structure. The property appraiser notes a remodel date of 1970, suggesting the additions may have been at this time. While it is typical of industrial buildings and may be connected to the history of the area, this association appears to be general rather than specific and the structure is not architecturally notable. A view of the project area is partially screened by trees (**Figure 25**). Additional railroad tracks are proposed for this portion of the project area. These will not impact the current view, as there are extant tracks the proposed project is directly in line with the extant character.

While it is typical of industrial buildings and may be connected to the history of the area, this association appears to be general rather than specific and the structure is not architecturally notable. This resource does not appear to meet criteria for listing in the NRHP individually or as part of a district. Therefore, there are **no historic properties affected** by the proposed undertaking.



Figure 24.305 SE 7th Street, facing northwest.



Figure 25. Looking northeast from Resource 77-14156, 305 SE 7th Street.

Site Inventory ID: 77-12157
Husmann Warehouse, 309 SE 8th Street
Year Built: 1965 & 1969

This single-story welded frame Industrial Vernacular building has a rectangular plan and low pitch gable roof with no overhang. The structure has crimped or corrugated metal exterior siding with zero window openings. Multiple main entries appear along the south elevation. Two garage loading bays are located on the west elevation. Ancillary features include a large structure to the rear and concrete parking lot. The Burlington Northern Santa Fe Railroad track is located northeast of the structure. Additional railroad tracks are proposed for this portion of the APE. These will not impact the current view, and as there are extant tracks the proposed project is directly in line with the extant characteristics (**Figure 27**).

While it is typical of industrial buildings and may be connected to the history of the area, this association appears to be general rather than specific and the structure is not architecturally notable. This resource does not appear to meet criteria for listing in the NRHP individually or as part of a district. Therefore, there are **no historic properties affected** by the proposed undertaking.



Figure 26. 309 SE 8th Street, facing northwest.



Figure 27. Looking northeast from 309 SE 8th Street toward the APE.

Site Inventory ID: 77-12158

Bituminous Materials & Supply, 900 Raccoon Street

Year Built: 1950

This concrete block Masonry Vernacular resource is located on a corner parcel, with two (2) buildings visible from the ROW and multiple cylindrical storage tanks. The main structure is a concrete block building with a flat roof and parapet. The rear elevation addition has a shed extension roof. Windows consist of single fixed and paired sliders, all replacements with blind transoms. Multiple entries are located on the façade. This resource is located directly south of the project area across the railroad tracks (**Figure 30**).

The ancillary cylindrical storage structures vary in diameter and height and are constructed of metal or concrete. An additional ancillary single-story structure is located behind the main structure. It has a gable roof with no overhang and corrugated metal exterior siding. A large loading bay is located on the south elevation. A third structure is noted on the Property Appraiser website, constructed in 1987. It is not visible from the ROW.

While this resource is typical of industrial buildings and may be connected to the history of the area, this association appears to be general rather than specific and the structure is not architecturally notable. This resource does not appear to meet criteria for listing in the NRHP individually or as part of a district. Therefore, there are **no historic properties affected** by the proposed undertaking.



Figure 28. 900 Raccoon Street, facing northeast.



Figure 29. 900 Raccoon Street, facing northwest.



Figure 30. Looking northeast at the APE from 900 Raccoon Street. Extant rail and the 14th Street Viaduct, Site 77-03895, are visible.

Site Inventory ID: 77-07486

1108 Scott Avenue

Year Built: 1882

This 1882 single-story Frame Vernacular residential structure has horizontal wood & vinyl exterior siding and a cross-gable roof with overhanging eaves, a partial width shed extension along the façade and rear roof kick. Single and grouped 1/1 replacement windows are asymmetrically located along the façade and elevation. An off-center partial width recessed façade porch with square wood supports is located under the shed extension roof. Due to multiple additions, the structure currently has an irregular plan. An ancillary feature consists of a detached garage with gable roof at the rear of the structure.

Due to alterations and additions, this resource does not appear to meet criteria for listing in the NRHP individually or as part of a district. This resource has been recommended ineligible for listing on the NRHP by SHPO. Therefore, there are **no historic properties affected** by the proposed undertaking.



Figure 31. Looking north at 1108 Scott Avenue (77-07468).



Figure 32. Looking northwest at 1108 Scott Avenue (77-07468).



Figure 33. Looking northeast at the project location from 1108 Scott Avenue. The 14th Street Viaduct, 77-03895, is pictured in the right side of the image.

Site Inventory ID: 77-12159

City of Des Moines Office and Warehouse, 1300 Scott Avenue

Year Built: 1967 & 1973

This multi-story metal clad warehouse and masonry office building has had multiple additions. The primary mass is double height with a T-shaped footprint; the projecting mass extends south. At the southwest corner is a single-story rectangular mass that appears to serve as an office. All of the massing's together create an irregular footprint with a void in the southeast corner. A portion of the parcel is surrounded by a chain link fence, and directly to the east is the elevated SE 14th street Viaduct. Paved surfaces are present at each loading bay.

The primary mass has a low pitch gable roof with a very slight overhang; the projecting mass has a shed roof and may be an addition. Siding is corrugated metal, with painted strips on the gable mass that simulate columns. A loading bay, set at grade, is located near the southeast corner, and a pedestrian entry, also at grade, is located east of the loading bay. There are multiple loading bays of various heights located on the west façade. Here, the ground is built up to create a ramp and provide grade level, but is dug out for the smallest, southernmost bay with concrete retaining walls. Directly south of this is a pedestrian entry with shed roof and metal railing on the adjacent retaining wall. There appear to be secondary, unused entries on the north and west facades.

The office mass has a flat roof and pent roof skirt with asphalt shingles on the south facade. It is a masonry vernacular structure, primarily stucco or painted concrete block, with brick at the southeast corner. Windows, set in a mostly regular pattern, are two light metal sliding with brick sills. The entry, located off center to the west, is metal commercial with sidelights of the same size. This building is also set at grade.

While it is typical of industrial buildings and may be connected to the history of the area, this association appears to be general rather than specific and the structure is not architecturally notable. this resource lacks significance and does not appear to meet criteria for listing in the NRHP individually or as part of a district. Therefore, there are **no historic properties affected** by the proposed undertaking.



Figure 34. The western portion of 1300 Scott Avenue, looking north.



Figure 35. The eastern portion of 1300 Scott Avenue, facing north.



Figure 36. Looking northeast from 1300 Scott Avenue to the APE. The 14th Street Viaduct, 77-03895, is visible on the right (east).

Site Inventory ID: 77-07491

1401 Scott Avenue

Year Built: 1901

This single-story Frame Vernacular structure has horizontal wood and brick exterior siding with corner boards. It has a high pitch cross gable roof with overhanging eaves and an off-center partial width shed extension over the enclosed porch. The porch is enclosed with grouped 1/1 replacement sash windows and includes a brick chimney located off center of the enclosed porch. The front facing wing has infill and paired replacement slider windows along with a single panel main entry with a single square light behind a metal porch door and hip extension with braces. To the rear is a side-facing two-car garage under a shed roof. It is directly adjacent to the house, but property appraiser notes it as a separate structure.

This resource is located approximately one block south of the project area but has an unobstructed view due to the street layout (**Figure 39**). Due to alterations, this resource does not appear to meet criteria for listing in the NRHP individually or as part of a district. This resource has been recommended ineligible for listing on the NRHP by SHPO. Therefore, there are **no historic properties affected** by the proposed undertaking.



Figure 37. 1401 Scott Avenue (77-0491), looking south.



Figure 38. 1401 Scott Avenue (77-0491), southwest.



**Figure 39. Looking north to the project location from 1401 Scott Avenue.
The 14th Street Viaduct, 77-03895, is visible.**

Site Inventory ID: 77-03870
Vestal House, 601 SE 14th Court
Year built: 1938

This single-story Frame Vernacular residence is located on a corner lot with a front facing gable roof and horizontal vinyl siding with corner boards. Single and paired 1/1 and 2/2 replacement sash windows are located along the façade and elevations in an asymmetric fenestration; windows have wood surrounds. An attic window is located at the gable peak along the façade. The main entry is located off center flush with the façade behind a metal porch door and an uncovered concrete stoop and steps lead to the entry. The structure has a rear addition with a gable roof. A detached shed and a detached single car garage is located at the rear of the building. The garage has similar features to the main structure. A large concrete and gravel drive is located in front of the garage.

This resource is located approximately one block south of the project area but has an unobstructed view (**Figure 42**). Due to alterations, this resource does not appear to meet criteria for listing in the NRHP individually or as part of a district. This resource has been recommended ineligible for listing on the NRHP by SHPO. Therefore, there are **no historic properties affected** by the proposed undertaking.



Figure 40. Looking northeast at 601 SE 14th Court.



Figure 41. The detached garage and rear portion of 77-03870.



Figure 42. Looking north at the APE from 601 SE 14th Court. The 14th Street Viaduct, 77-03895, is visible to the left (west).

Site Inventory ID: 77-10706

609 SE 15th Court

Year built: 1900

This single-story Frame Vernacular residence has a rectangular plan, a front facing gable with overhanging eaves and horizontal wood siding with corner boards. Single replacement 1/1 sash windows with vinyl infill are located on the façade and elevations, along with a single bay window. A centrally located brick chimney is located at the roof peak. A rear elevation addition under a shed roof contains a semi-detached carport extension. Another addition is located at the rear under a hip roof. The main entry is located off-center along the façade behind a metal door with a single pane light, flush with the façade. An ancillary rectangular storage building is located at the rear of the structure.

Due to alterations, this resource does not appear to meet criteria for listing in the NRHP individually or as part of a district. This resource has been recommended ineligible for listing on the NRHP by SHPO. Therefore, there are **no historic properties affected** by the proposed undertaking.



Figure 43. 609 SE 15th Street, 77-10706, looking northeast.



Figure 44. 609 SE 15th Street, 77-10706, facing southeast.



Figure 45. Looking north from 609 SE 15th Street.

Site Inventory ID: 77-10702
United House & Gate, 500 SE 18th Street
Year Built: 1941

This two-story masonry vernacular industrial building has brick, concrete, and concrete masonry unit (CMU) exterior with a flat roof and capped parapet. Most windows on the first story have been enclosed with CMUs and second story windows are filled with glass block. Polk Co. Property appraiser notes the northern mass(es) were added in 1966. The original structure had a shallow L-shaped footprint, constructed of concrete block with brick cladding on the west façade and a portion of the interior of the ell. There may have been a second story addition (**Figure 46**), as there is a material change near the center of this original mass. In this original portion, there are multiple loading bays on the east façade and a single large loading bay on the west. To the north of this building is a single-story concrete block flat roof addition, with a curved north façade and large loading bays. To the south are multiple additions that lengthen the footprint of the ell. There are two loading bays and multiple entries. The foundation is continuous (concrete and brick), although grade is built up in some portions to allow grade-level access.

This resource has been recommended ineligible for listing on the NRHP by SHPO. Due to alterations and additions, this resource does not appear to meet criteria for listing in the NRHP individually or as part of a district. Therefore, there are **no historic properties affected** by the proposed undertaking

This resource is located south of the project area on the other side of E Martin Luther King Jr. Parkway. There is currently some vegetation in or bordering the project area. To the northwest (**Figure 48**) a stormwater pond and laydown area have been proposed, with a warehouse and loading dock beyond. The laydown area and warehouse will both be 1-2 stories and will affect the specific viewshed in which they are constructed, but the fundamental views from the resource will remain the same. The stormwater pond and laydown area will be set at grade and not impact views. It is unknown if the vegetation will remain for screening purposes.



Figure 46. Looking northwest at 500 SE 18th Street. Note the change of material at center portion of the primary mass.



Figure 47. Looking northeast at 500 SE 18th Street.



Figure 48. Looking northwest from 500 SE 18th Street toward the APE.

Site Inventory ID: 77-10698
Wolverine World Wide, 302 SE 18th Street
Year Built: 1958

This single-story industrial property contains a large warehouse building and manufactured home. The industrial warehouse building has a metal exterior siding and a mix of gable and shed roof lines with no overhanging eaves. Some openings appear to be boarded and visible windows are vertical ribbon s with fixed single pane lights. No entry location is evident from the ROW. The manufactured office building has a flat roof, vertical plank siding, 6/6 vinyl sash windows and a metal hollow core entry door. No clear construction date is provided on Property Appraisers website.

This resource is located directly east of the project area. The current proposal does not contain any plans to demolish or alter the existing building. Directly north of the resource, additional railroad tracks are proposed, and to the west a laydown area and stormwater pond. The stormwater pond and laydown area will be set at grade and not impact views. The railroad tracks will not impact the current view, and as there are existing tracks the proposed project is directly in line with the extant character. There is an existing pond in the approximate location of the stormwater pond on the drawings. Details do not specify if the pond will be retained or replaced, but the effect on the view is expected to be the same.

Due to alterations and additions, this resource does not appear to meet criteria for listing in the NRHP individually or as part of a district. This resource has been recommended ineligible for listing on the NRHP by SHPO. Therefore, there are **no historic properties affected** by the proposed undertaking.



Figure 49. Looking south at 302 SE 18th Street.



Figure 50. Looking southeast at 302 SE 18th Street.



Figure 51. Manufactured home/office located at the rear of the parcel.



Figure 52. Looking north from 302 SE 18th Street toward the project area.

Site Inventory ID: 77-09469
Heartland Co-Op, 118 SE 18th Street
Year Built: 1930

This resource is a series of attached concrete grain silos, two and three wide, with an attached elevator and additional detached buildings, including a scale house, shop, utility building, and attendant's booth. Attached to the sides are various machinery parts, mostly large metal pipes. A small shed roof overhang is located at the base of the tower. On the north façade is an off center shed metal roof mass (enclosed) with two large loading bays. The foundation, walls, and roofs are poured concrete. The railroad track, previously the Wabash Railroad and now Norfolk Southern Railroad, is directly south of the building.

The project area is located south and west of this property (**Figure 55**). In agreement with an evaluation completed in 2000 in association with a proposed cell tower project (R&C No. 000877193), "the facility does not appear to have any unusual characteristics and looks like every other grain elevator across Iowa." This resource does not appear to meet criteria for listing in the NRHP individually or as part of a district. This resource has been recommended ineligible for listing on the NRHP by SHPO. Therefore, there are **no historic properties affected** by the proposed undertaking.



Figure 53. 118 SE 18th Street, 77-09469 facing northeast.



Figure 54. Looking north at 118 SE 18th Street.



Figure 55. Looking southwest at the APE from 118 SE 18th Street.

Site Inventory ID: 77-12160
Iowa Interstate Railroad
Year Built: estimated mid-1800s

The railroad tracks closest to the project location are owned by the Iowa Interstate Railroad. This line was originally the Wabash Railroad (WR). The WR served Ohio, Illinois, Iowa, Indiana, Michigan, Missouri and the provenance of Ontario. It began as the Toledo and Wabash Railroad in 1858, although the first rail to use ‘Wabash’ solely in their name was the Wabash Railway in 1877. The earliest predecessor of the railway was the Northern Cross Railroad, the first railroad in Illinois (Paxson 1912). WR merged with the Norfolk & Western Railway (NWR) in 1964, to then be absorbed when NWR became Norfolk Southern Railway in 1982.

The Iowa Interstate Railroad (IAIS) was formed in 1984 in partnership with Hartland Rail. IAIS operated the recently acquired 553 miles of track formally owned by Rock Island Railroad. In 1988, Iowa Southern Railroad (ISR) took over ownership of sixty-one miles of the WR in Iowa. Iowa Interstate purchased the rail in 2006.

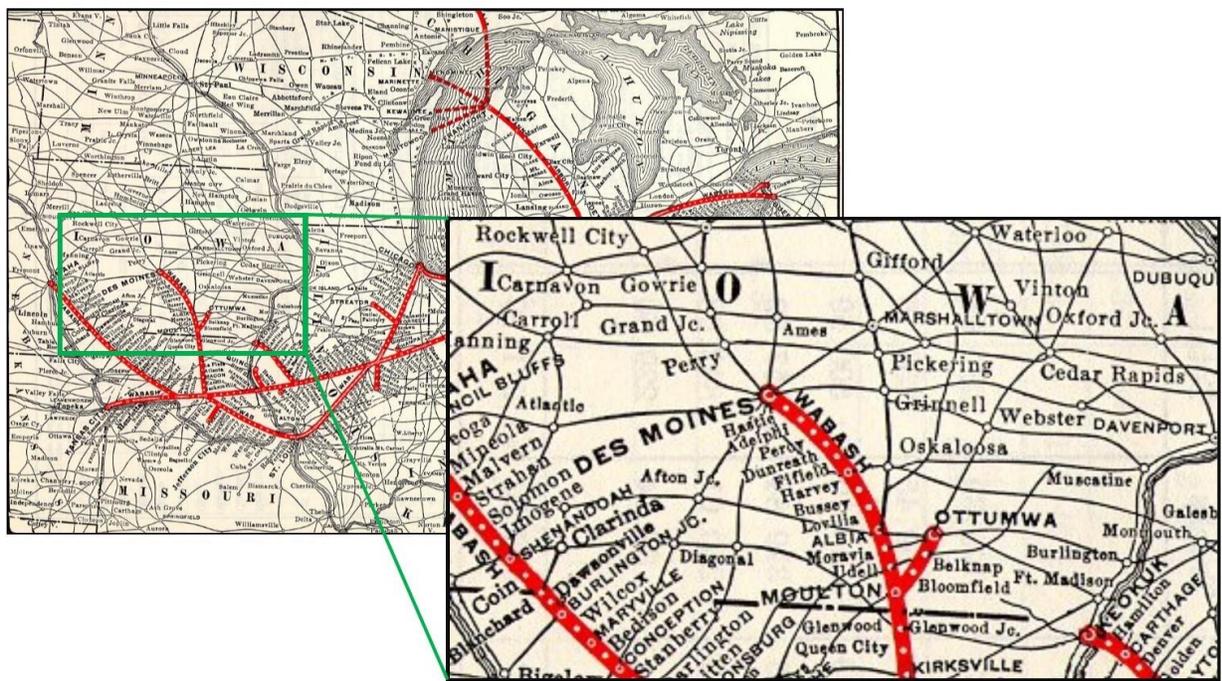


Figure 56. Wabash System Map, nd.
Courtesy of the Wabash Railroad Historical Society.

The IAIS railway runs along the northern portion of the APE. Rail lines through and around the APE have shaped the character of the neighborhood. The information found within the project scope did not result in information that would suggest this railway is eligible for listing in the NRHP, either as an individual listing or as part of a district. Therefore, there are **no historic properties affected** by the proposed undertaking.



Figure 57. 77-10698 railway facing southeast and the 14th Street Viaduct, 77-03895. The Norfolk Southern Railroad is the additional track to the far right of the image.



Figure 58. Site 77-12160 facing east towards Site 77-09469. The Norfolk Southern Railway is located at the far left of the image.



Figure 59. Facing south from Site 77-12160 towards the project area and 77-03895.

RESULTS & ANALYSIS

Of the fourteen (14) resources documented within the APE as a result of this survey, only two (2) have been recommended potentially eligible to the NRHP (**Table 2**). Background research and architectural field survey resulted in the identification, recordation and evaluation of fourteen (14), including nine (9) previously recorded resources within the APE. Two (2) of the resources recorded are potentially eligible for listing in the NRHP, both the C. Amend & Sons Meatpacking Plant (77-10700) and 14th Street Viaduct (77-03895).

The APE is located in an area that has been a mix of industrial and working-class residential uses since the mid-1800s. The resources range in date from 1882 to 1973, with no distinct concentration in any particular era. Most of the properties are industrial in use, although some of the oldest structures are simple vernacular residences. This is reflective of the nature of the area.

Table 2. Previously and Newly recorded Historic Structures within the APE.

Site Inventory No.	Name	Property Address	Year Built	Determination of Eligibility	Consultant Eligibility Recommendation
77-03895	14 th Street Viaduct	SR 69, between Scott Avenue and Vine Street	1936	Recommended Eligible	Eligible
77-10700	C. Amend & Sons Meatpacking Plant	410 SE 18 th Street	1929	Recommended Eligible	Eligible
77-12156*	Sun Tool Warehouse	305 SE 7 th Street	1940	Unknown	Not Eligible
77-12157*	Husmann Warehouse	309 SE 8 th Street	1965 & 1969	Unknown	Not Eligible
77-12158*	Bituminous Materials & Supply	900 Raccoon Street	1950 & 1973	Unknown	Not Eligible
77-07486	-	1108 Scott Avenue	1882	Recommended Not Eligible	Not Eligible
77-12159*	City of Des Moines Office & Warehouse	1300 Scott Avenue	1967 & 1973	Unknown	Not Eligible
77-07491	-	1401 Scott Avenue	1901	Recommended Not Eligible	Not Eligible
77-03870	Vestal House	601 SE 14 th Court	1938	Recommended Not Eligible	Not Eligible
77-10706	-	609 SE 15 th Court	1900	Recommended Not Eligible	Not Eligible
77-10702	United House & Gate	500 SE 18 th Street	1941	Recommended Not Eligible	Not Eligible
77-10698	Wolverine Worldwide	302 SE 18 th Street	1958	Recommended Not Eligible	Not Eligible

77-09469	Heartland Co-Op	118 SE 18 th Street	1930	Recommended Not Eligible	Not Eligible
77-12160*	Iowa Interstate Railroad	Northern APE boundary	Est. mid-1800s	Unknown	Not Eligible

**Newly recorded resources within the APE.*

The consultant acknowledges that the potential for impacts on historic properties due to construction related activities or vibrations is relative and should be considered on a case by case basis. Settling of adjacent structures with historic or unstable foundations or other impacts due to vibrations from construction related activity is possible but not likely. Regardless, the project engineer should consider the necessity for a pre and post-construction crack survey and vibration monitoring with limits not to exceed a peak particle velocity (PPV) of 0.5 in/sec.

The two (2) historic properties found within the APE, the 14th Street Viaduct (77-03896) and C. Amend & Sons Meat Packing Plant (77-10700), will not be demolished, altered, or removed as a result of the construction of the transload facility. It is the opinion of the consultant that the project, as proposed, will have **no adverse effect** on the historic properties within the APE.

CONCLUSION

In March 2020, ESI conducted a desktop analysis of the proposed location for the development of a railroad transload facility in Des Moines, Polk County, Iowa. The undertaking, led by the FRA, involves the construction of a transload facility (including an office/warehouse, a transloading pad, proposed bulk minerals building, stormwater detention ponds, an outdoor storage area, and 12,650 feet of proposed railroad track) and is funded by a DOT *Better Utilizing Investments to Leverage Development Grant*. The site covers approximately forty acres and the purpose of the undertaking is to improve the overall freight capacity and railroad options in the Des Moines metropolitan area; develop rail centric transportation options for existing businesses; to expand extant transportation options to attract new industries to the region; and to support economic development in Central Iowa.

The goal of this investigation was to locate historic properties within the APE (the immediate viewshed of the project location site, including the project location and adjacent parcels) to evaluate their significance for listing in the National Register of Historic Places (NRHP), and to assess any potential impact the undertaking may have on those resources, as mandated by federal laws and guidelines. To meet these objectives and supplement both the *Phase IA Cultural Resource Survey of the Des Moines Industrial Project and the Cultural Resource Desktop Assessment*, a Historic Structures survey and report was determined necessary.

A review of the adjacent parcels coupled with the Polk County Assessor; historic topographical maps; aerial photographs; Sanborn Maps of Des Moines, Iowa; and previous surveys identified fourteen (14) historic resources that were documented and assessed during this project. Of these, two (2) have been recommended potentially eligible for the NRHP by SHPO, the 14th Street Viaduct and C. Amend & Sons Meat Packing Plant; seven (7) have been recommended potentially ineligible for the NRHP; and the balance (five resources) have not been previously recorded. It is the consultant's opinion that the five newly recorded resources (305 SE 7th Street, 309 SE 8th Street, 900 Raccoon Street, 1300 Scott Avenue, and the Iowa Interstate Railroad) do not appear to be eligible for the NRHP. These resources were evaluated according to the criteria laid out by the National Park Service.

It is the consultant's opinion that the project as proposed will be visible from two (2) historic properties within the APE. However, the character of the project is in keeping with that of the industrial setting, and the fundamental viewsheds from the historic properties will remain the same. It is the consultant's opinion that the project, as proposed, will have **no adverse effect** on the historic properties.

BIBLIOGRAPHY

Burns, James B. *Railroad Mergers and the Language of Unification*. Greenwood Publishing Group, 1998.

Iowa Department of Transportation letter to Ralph Christian at Department of Cultural Affairs, State Historical Society of Iowa, January 14, 2008.

Iowa Department of Cultural Affairs, Historic Preservation Office. Iowa Site Inventory form 77-10700, 2007.

Iowa Department of Natural Resources. Aerial maps. 1930, 1950, 1960, 1970.
<https://programs.iowadnr.gov/maps//aerials/>

Jennings, Barton. *Iowa Interstate Railroad: History Through the Miles*. TechScribes. 2017.

Library of Congress Geography and Map Division. "Map of Polk County, Iowa, 1895." Des Moines: Iowa Engraving Company, publishers., 1895. <https://www.loc.gov/item/2012587709/>

Long, Barbara Beving. *Cultural Resources of the CBD Loop Arterial Project Area History and Architecture*. Prepared for the City of Des Moines, Iowa. Prepared by Brice, Petrides & Associates, Inc., Waterloo, Iowa. 1982.

"Map of Polk County, Iowa, 1872." Pub. George A. McVicker.

"Map of Polk County, Iowa, 1895." Pub. Iowa Engraving Company, Des Moines.

Myers, Melissa. "At last, Chesterfield neighborhood group is the real deal." *Des Moines Register*, 17 September 1997.

Paxson, Frederic L. "The Railroads of the 'Old Northwest' Before the Civil War." Reprinted from Volume XVII, Part 1, of the *Transactions of the Wisconsin Academy of Sciences, Arts, and Letters*. Issues October 1912. Accessed 29 March 2020.
<http://www.catskillarchive.com/rrextra/abonw.html>

"Plat Book of Polk County, Iowa, 1930." Pub. W.W. Hixon & Co. Courtesy of University of Iowa Libraries. <http://128.255.22.135/cdm/ref/collection/hixson/id/1446>

Polk County Assessor. Property search. Accessed March 26, 2020.
<http://web.assess.co.polk.ia.us/cgi-bin/web/tt/infoqry.cgi?tt=home/index>

Rogers, Leah D. *Des Moines SE Connector SW 2nd Street to SE 15th Street: Historical/Architectural Intensive Survey, City of Des Moines, Polk County, Iowa*. Tallgrass Historians, LLC., Iowa City, Iowa. 2007.

Sanborn Fire Insurance maps, Des Moines. 1920, 1920-1950.

“The History of IAIS,” Iowa IAIS Interstate. n.d. Accessed March 27, 2020.
<https://iaisrr.com/railroad/history-of-iais/>

USGS maps. Des Moines, Iowa quadrangle. 1905, 1956.

Wabash Railroad Historical Society. Wabash System Map. <http://www.wabashrhs.org/>



U.S. Department
of Transportation

1200 New Jersey Avenue, SE
Washington, DC 20590

**Federal Railroad
Administration**

April 24, 2020

Heather Gibb
State Historic Preservation Office of Iowa
600 East Locust Street
Des Moines, Iowa 50319

**Re: Des Moines Transloading Facility
200 SE 15th Street, Des Moines, Polk County, Iowa
Initiation of Section 106 Consultation and Finding of No Adverse Effect**

Dear Ms. Heather Gibb:

The Federal Railroad Administration (FRA) has selected the Des Moines Industrial – Transload Center to receive grant funding for the construction of a multi-modal transloading facility including trackage, docks, and warehousing within the Des Moines Metropolitan Area. Pursuant to Section 106 of the National Historic Preservation Act and its implementing regulations (36 Code of Federal Regulations [CFR] Part 800) “Protection of Historic Properties” (Section 106), this letter is being transmitted to initiate the Section 106 consultation process for the undertaking and to seek concurrence from your office with FRA’s findings.

FRA, in coordination with Des Moines Industrial, LLC., is preparing an Environmental Assessment for the Project in accordance with the National Environmental Policy Act (NEPA) and is coordinating the NEPA process with consultation pursuant to Section 106.

Project Background

The concept of a transload facility, where cargo is delivered and transferred between rail and trucks, was developed over a decade of study on goods movement in Central Iowa. Several studies have concluded that a market exists in Des Moines to support the development of a transload facility.

In July 2018, the Des Moines Area Metropolitan Planning Organization (DMAMPO) submitted an INFRA (Infrastructure for Rebuilding America) Grant Application to the U.S. Department of Transportation (DOT) seeking a Better Utilizing Investments to Leverage Development (BUILD) Grant for this project. The application was selected for award of Federal funds in November 2018. In April 2019, Des Moines Industrial was formed to design, construct, operate and own the transload facility.

Current Undertaking

FRA's current undertaking involves the construction of a transloading facility north of Martin Luther King Parkway in the area of SE 14th Street. The site covers approximately 40-acres and is located in the SE ¼ of Section 3 and the SW ¼ of Section 2, Township 78 North, Range 24 West in Des Moines, Iowa. The proposed project involves the construction of a railroad transload facility, which includes an office/warehouse, a transloading pad, proposed bulk materials building, stormwater detention ponds, and an outdoor storage area.

The purpose of the project is to improve the overall freight capacity and railroad options in the Des Moines metropolitan area; develop rail centric transportation options for existing businesses; expand existing transportation options to attract new industries to the region; and support economic development in Central Iowa.

Area of Potential Effects

As defined in National Historic Preservation Act (NHPA) § 800.16(d), the Area of Potential Effects (APE) means "the geographic area or areas within which an undertaking may directly or indirectly cause alteration in the character of use of historic properties, if such properties exist. The area of potential effects is influenced by the scale and nature of the undertaking and may be different for different kinds of effects caused by the undertaking."

The APE for archaeology was the limits of disturbance (LOD) for the project, while the APE for the built environment was the immediate viewshed of the project site location. The Project boundary and the APE are shown on Exhibit 1.

Identification and Evaluation of Historic Properties

Archaeology

A records search request was submitted to the Iowa Office of the State Archaeologist (OSA) for information regarding previously identified archaeological sites within or near the proposed project area (Iowa Site File Search No. 2020017, August 5, 2019). The records search reported that no archaeological sites have been previously recorded within the APE or within 328 feet (100 Meters) of the APE. The site file search did note that 45 archaeological sites have been identified within one mile of the APE.

Numerous archaeological sites are known to be in the general vicinity, which suggested there was a high level of archaeological potential within the APE. This area is within a former river channel of the Des Moines River, and exhibits complex depositional conditions. Because of these factors, a desktop assessment was not sufficient to make a recommendation on the possibility of cultural resources being present within the project area. Therefore, a geoarchaeological survey was recommended, which was used to guide a targeted Phase I archaeological survey of the proposed project area. A copy of the Archaeology Cultural Resources Desktop Assessment is enclosed.

A Geoarchaeological Study was conducted on September 26, 2019. A total of 12 cores were extracted and examined, which found that the geomorphological conditions and landforms identified within the limits of disturbance (LOD) for the project would not be conducive to long term human settlement or occupation of the project area. A copy of the Geoarchaeological Study can be found within the enclosed Phase IA Cultural Resources Survey described below.

A Desktop Survey was finalized on November 7, 2019. No cultural resources have been previously recorded within the LOD, though it indicated that the western portion of the APE potentially contained resources related to a Sauk and Meskwaki Camp from 1841 (HILD 1108).

A Phase IA Cultural Resources Survey was finalized on November 8, 2019. The survey found evidence of extensive ground disturbances throughout the LOD. Such disturbances included the continued use of the project area by modern railroads; prior construction and demolition of structures; utility and rainwater control infrastructure construction and expansions; and a large junkyard, which occupied the eastern half of the project area. The lack of integrity seen at the ground surface was determined to extend into subsurface conditions by the geoarchaeological report, which found extensive fill deposits overlying the natural soils within the project area. This report also found that conditions within the LOD, both in the prehistoric and historical periods, would not have been conducive to human occupation, as the landscape was primarily wetlands or marsh. The disturbances documented in both the Phase IA and geoarchaeological examination of the LOD suggest that it is unlikely for intact cultural deposits to be present which can be encountered or identified through standard survey methodologies. If extant archaeological resources are present, they are deeply buried and only accessible through extensive mechanical excavation of the fill soils within the LOD. As such, a determination of no historic properties affected is recommended for archaeology in the APE. A copy of the Phase IA Cultural Resources Survey is enclosed.

Built Environment

An informal search of the historical structural inventory maintained by the State Historic Preservation Office was conducted by the Iowa SHPO records manager for information regarding previously recorded historic properties within or near the project area. This inventory reported information on hundreds of previously-recorded historic properties within one mile of the project area but did not identify historic properties within the APE.

In March 2020, Environmental Services Inc., a Terracon Company (ESI) conducted a Historic Structures Survey of the APE. The APE is located east of the Des Moines and Raccoon River confluences, south of Interstate 235 and east of Highway 69/E 14th Street. The area was historically known as “Southeast Bottoms” and Chesterfield.

The Historic Structures Survey consisted of a pedestrian survey and historic architectural analysis of all buildings fifty years or older within the APE. Other research included an examination of the Sanborn Fire Insurance Company maps, available plat maps, historical aerials and United States Geological Survey (USGS) topographic maps, as well as recent past and current street-view images.

The survey identified fourteen historic resources within the APE for this undertaking. Nine of the properties have previous recommendations from SHPO; FRA has agreed with those previous recommendations after reviewing the resources, as detailed in the report. For the remaining five properties that were not previously recorded, FRA has made determinations of eligibility for inclusion in the National Register of Historic Places (NRHP).

Detailed descriptions of all fourteen properties are included in the Historic Structures Report and Iowa Site Inventory Forms which are included with this consultation letter. The table below summarizes the properties and FRA’s determinations of eligibility.

Table 1. Potential Historic Properties within the APE

Site Inventory No.	Property Name	Property Address	Year Built	Previous Recordation	FRA Determination of Eligibility
77-03870	Vestal House	601 SE 14th Court	1938	Yes – SHPO Recommended Ineligible	Ineligible
77-03895	14th Street Viaduct	SR 69, between Scott Avenue and Vine Street	1936	Yes - SHPO Recommended Eligible	Eligible
77-07486	House	1108 Scott Avenue	1882	Yes – SHPO Recommended Ineligible	Ineligible
77-07491	House	1401 Scott Avenue	1901	Yes – SHPO Recommended Ineligible	Ineligible
77-09469	Heartland Co-Op	118 SE 18th Street	1930	Yes – SHPO Recommended Ineligible	Ineligible
77-10698	Wolverine World Wide	302 SE 18th Street	1958	Yes – SHPO Recommended Ineligible	Ineligible
77-10700	C. Amend & Sons Meat Packing Plant	410 SE 18th Street	1929	Yes - SHPO Recommended Eligible	Eligible
77-10702	United House & Gate	500 SE 18th Street	1941	Yes – SHPO Recommended Ineligible	Ineligible
77-10706	House	609 SE 15th Court	1900	Yes – SHPO Recommended Ineligible	Ineligible
77-12156*	Sun Tool Warehouse	305 SE 7th Street	1940	No	Ineligible

77-12157*	Husmann Warehouse	09 SE 8th Street	1965 & 1969	No	Ineligible
77-12158*	Bituminous Materials & Supply	900 Raccoon Street	1950 & 1973	No	Ineligible
77-12159*	City of Des Moines Office & Warehouse	1300 Scott Avenue	1967 & 1973	No	Ineligible
77-12160*	Iowa Interstate Railroad	Northern APE boundary	Estimated mid-1800	No	Ineligible

***Newly recorded resources within the APE.**

Site Inventory ID 77-12160 is for the Iowa Interstate Railroad (IAIS), which was established in the mid-nineteenth century. The IAIS is located along the northern part of the APE. A full evaluation of the railroad was outside the scope of this project. The Historic Structures Report states that there was no information found to suggest that IAIS is eligible for the NRHP, either individually or as contributing to a district. Even if the IAIS were to be determined eligible for the NRHP, the proposed undertaking would not impact any aspects of integrity of the railroad.

The proposed undertaking will be visible from two historic properties within the APE: the 14th Street Viaduct and the C. Amend & Sons Meat Packing Plant. However, the purpose of the project is to construct a new industrial facility within an area historically used for industrial activity, and therefore the overall character of the area and the viewsheds will remain unchanged. As such, FRA has determined that no historic properties will be adversely affected. A copy of the Historic Structures Survey is enclosed.

Consulting Parties

FRA has identified the following federally-recognized Tribes who may have interest in the project:

- Apache Tribe of Oklahoma
- Iowa Tribe of Kansas and Nebraska
- Iowa Tribe of Oklahoma
- Menominee Indian Tribe of Wisconsin
- Sac & Fox Nation of Missouri in Kansas and Nebraska
- Sac & Fox Nation, Oklahoma
- Sac & Fox Tribe of the Mississippi in Iowa

Concurrent with this letter, FRA is sending consultation letters to these Tribes.

FRA has also identified the following organizations who may have an interest in this project:

- City of Des Moines
- Des Moines Area Metropolitan Planning Organization
- Des Moines Parks and Recreation Department
- Downtown Neighborhood Association

These parties that may be interested in the proposed undertaking and FRA's determination of effect. They are copied on this letter to serve as their notification of the project. Should any of the parties have concerns about the undertaking and its potential effects to historic properties, FRA will continue to consult with the parties and SHPO to resolve those issues prior to implementing the undertaking.

Determination of Effect

Given the information described above, FRA has determined that the proposed undertaking results in **No Adverse Effect**. FRA respectfully requests your concurrence with this determination. If you have any questions or concerns, please contact FRA's Environmental Protection Specialist for this project, Amanda Ciampolillo at either 617.494.2173 or amanda.ciampolillo@dot.gov.

Sincerely,

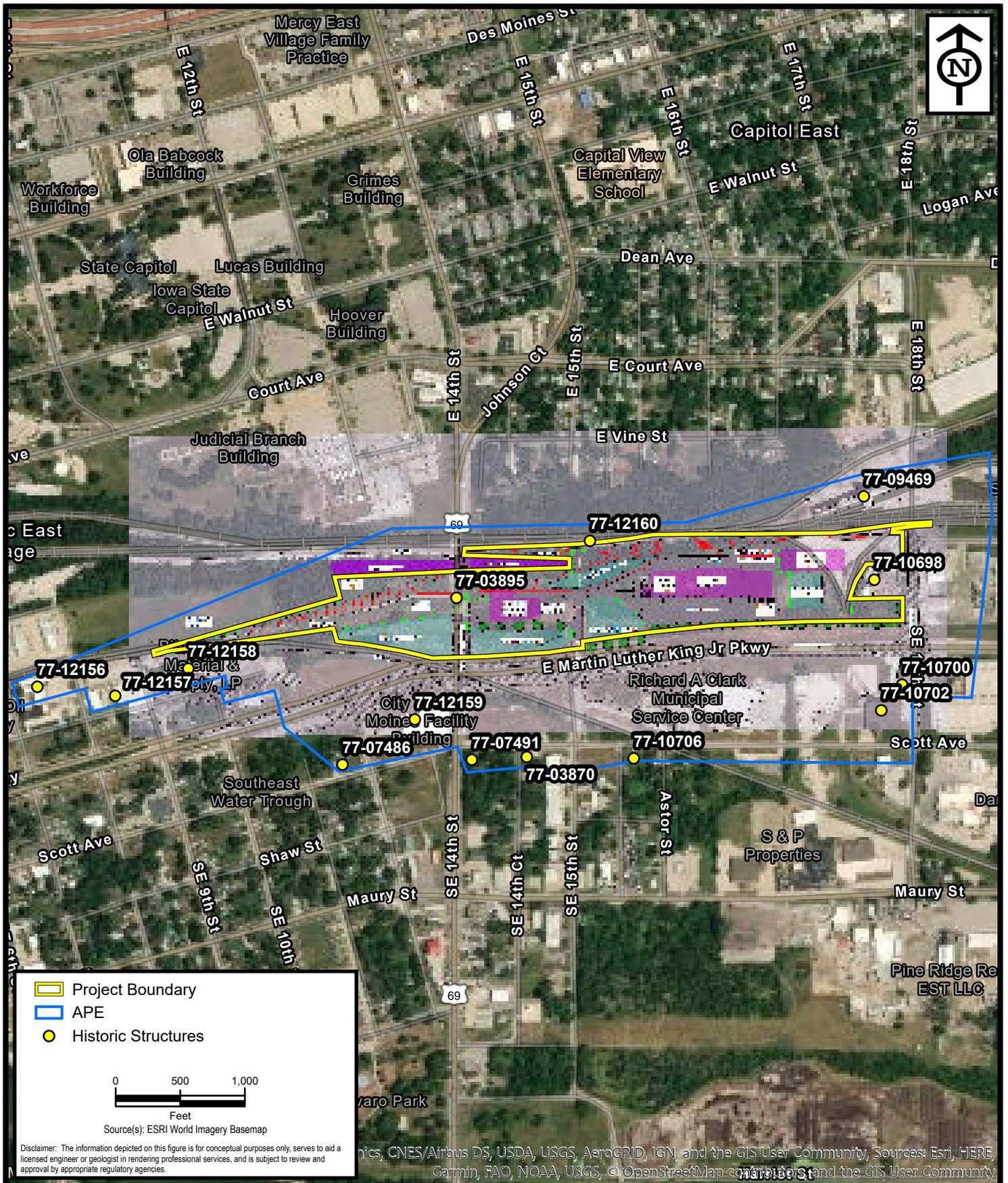


Katherine Zeringue
Federal Preservation Officer
Environment and Project Engineering Division
Office of Railroad Policy and Development
Federal Railroad Administration

cc: Des Moines Industrial, LLC
Amanda Ciampolillo, FRA
City of Des Moines
Des Moines Area Metropolitan Planning Organization
Des Moines Parks and Recreation Department
Downtown Neighborhood Association

Enclosures:

- Exhibit 1: APE Map
- Archaeology Cultural Resources Desktop Assessment
- Phase IA Cultural Resources Survey
- Historic Structures Report



Project Boundary
 APE
● Historic Structures

0 500 1,000
 Feet

Source(s): ESRI World Imagery Basemap

Disclaimer: The information depicted on this figure is for conceptual purposes only, serves to aid a licensed engineer or geologist in rendering professional services, and is subject to review and approval by appropriate regulatory agencies.

ENVIRONMENTAL SERVICES, INC.
A Terracon Company

7220 FINANCIAL WAY, SUITE 100 JACKSONVILLE, FL 32256
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Site Plan
Historic Structures Survey
Proposed Railroad Transload Facility
 Polk County, Iowa

Project No.	HK207101
Date	Apr 2020
Drawn By	AA
Checked By	JRN
Approved By	PDJ
Exhibit No.	1