

APPENDIX E

Hazardous Materials

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Appendix E.1 Environmental Site Assessment Report

Appendix E.2 Final Site Inspection Report

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Appendix E.1

Environmental Site Assessment Report

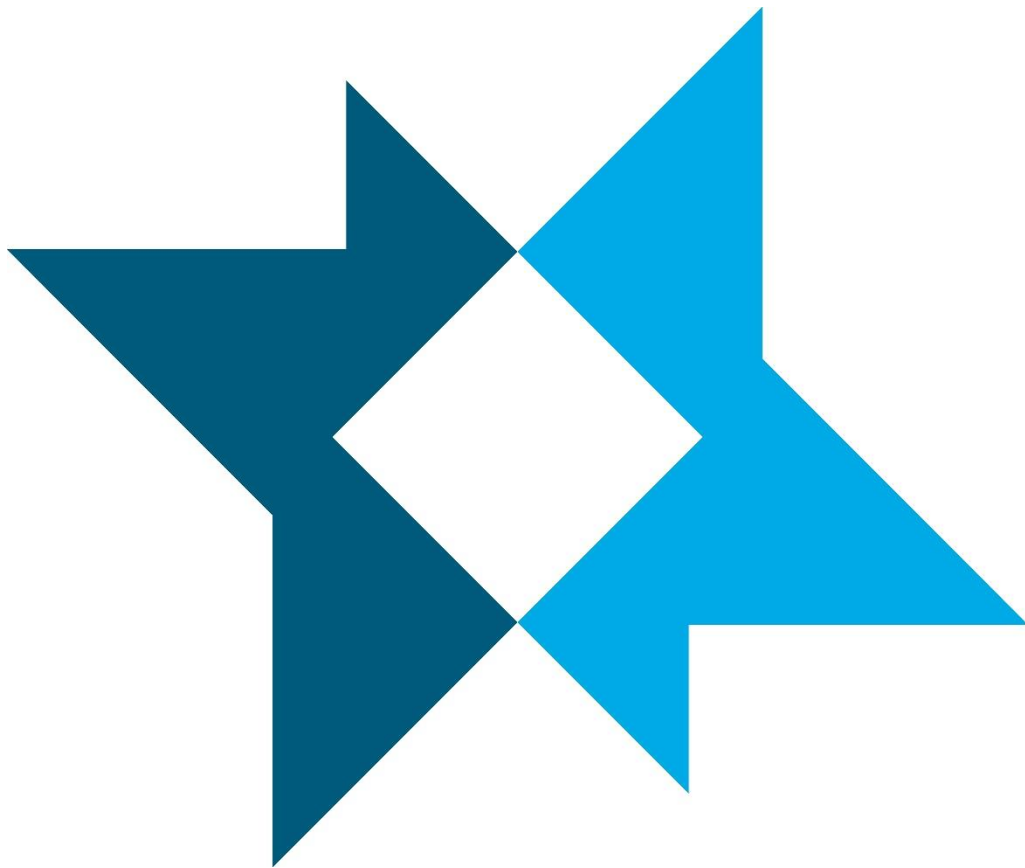
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Report

Phase I Environmental Site Assessment

Sioux Gateway Airport 2-Acre Acquisition



RS&H Iowa, P.C.

Denver, CO 80237

July 2024

Project ID: 0023S049.00

Solving our clients' toughest
science and engineering challenges.



8191 Birchwood Court, Suite L
Johnston, IA 50131
(515) 254-1642
foth.com

July 31, 2024

Julie Barrow
RS&H Iowa, P.C.
4582 S Ulster Street, Suite #1100
Denver, Colorado 80237

Re: Phase I Environmental Site Assessment – Sioux Gateway Airport, 2-Acre Acquisition

Dear Julie Barrow:

Please find the enclosed *Phase I Environmental Site Assessment (Phase I ESA) Report (Report)* for the 2-acre acquisition area located west of 5011 S. Patton Street and north-adjacent to the Sioux Gateway Airport located at 2403 Aviation Boulevard in Sioux City, Iowa. If you have any questions, please feel free to contact Elyse Kalber at elyse.kalber@foth.com or Gina Wilming at gina.wilming@foth.com.

Sincerely,

Foth Infrastructure & Environment, LLC

A handwritten signature in blue ink, appearing to read "Elyse Kalber".

Elyse Kalber
Environmental Scientist

A handwritten signature in blue ink, appearing to read "Gina Wilming".

Gina Wilming
Senior Project Manager

cc: Mike Collett, Sioux Gateway Airport

Enclosure

**Phase I Environmental Site Assessment
of
Sioux Gateway Airport, 2-Acre Acquisition
Distribution**

<u>No. of Copies</u>	<u>Sent To</u>
Electronic	Ms. Julie Barrow RS&H Iowa, P.C. 4582 S Ulster Street, Suite 1100 Denver, CO 80237
Electronic	Mr. Mike Collett Sioux Gateway Airport 405 6th Street Sioux City, IA 51102

Phase I Environmental Site Assessment of Sioux Gateway Airport, 2-Acre Acquisition

Project ID: 0023S049.00

Prepared for
RS&H Iowa, P.C.
4582 S Ulster Street, Suite #1100
Denver, CO 80237

Prepared by
Foth Infrastructure & Environment, LLC

July 2024

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Phase I Environmental Site Assessment of Sioux Gateway Airport, 2-Acre Acquisition

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List of Abbreviations, Acronyms, and Symbols

ACM	asbestos-containing materials
AIP	Airport Improvement Program
Airport Sponsor	City of Sioux City
AST	aboveground storage tank
ASTM	ASTM International
AUL	activity and use limitation
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CREC	controlled recognized environmental condition
EA	Environmental Assessment
EC	engineering control
EP	Environmental Professional
ERIS	Environmental Risk Information Services of Ontario, Canada
FAA	Federal Aviation Administration
FOIA	Freedom of Information Act
Foth	Foth Infrastructure & Environment, LLC
FUDS	Formerly Used Defense Site
GIS	Geographic Information System
HREC	historical recognized environmental condition
IDNR	Iowa Department of Natural Resources
LLP	Landowner Liability Protections
LUST	leaking underground storage tank
NPL	National Priorities List
NRCS	Natural Resources Conservation Service
PCB	polychlorinated biphenyls
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
Phase I ESA	Phase I Environmental Site Assessment
REC	recognized environmental condition
<i>Report</i>	<i>Phase I Environmental Site Assessment Report</i>
RS&H	RS&H Iowa, P.C.
RS&H and the Airport Sponsor	collectively, the Users of this <i>Report</i>
the Property	two-acre acquisition area located west of 5011 S. Patton Street and north-adjacent to the Sioux Gateway Airport and identified as a portion of Parcel ID 884826200003
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UST	underground storage tank

Phase I Environmental Site Assessment of Sioux Gateway Airport, 2-Acre Acquisition Executive Summary

Foth Infrastructure & Environment, LLC (Foth) performed a Phase I Environmental Site Assessment (Phase I ESA) in conformance with the scope and limitations of ASTM International (ASTM) Standard Practice E1527-21 for the two-acre acquisition area located north-adjacent to the Sioux Gateway Airport and west of 5011 S. Patton Street, Sioux City, Woodbury County, Iowa (i.e., the Property). RS&H Iowa, P.C., (RS&H) and City of Sioux City (Airport Sponsor), which owns and operates the Sioux Gateway Airport, are preparing an Environmental Assessment (EA) associated with Runway 13-31 reconstruction and extension, parallel taxiway extension, land acquisition, and associated developments, which will be funded through the Federal Aviation Administration's (FAA's) Airport Improvement Program (AIP). As part of the project, the Airport Sponsor is purchasing a two-acre parcel identified as a portion of Parcel ID 884826200003, owned by the Charles H. Oehlerking Revocable Trust. Specifically, this Phase I ESA and *Report* have been prepared upon request of RS&H and the Airport Sponsor (collectively, the Users of this *Report*). No physical environmental sampling was performed. Additional services are discussed in Section 4.4 of this *Report*.

This ESA was performed under the conditions of, and in accordance with ASTM E1527-21, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*, except as stated elsewhere in this *Report*. The *Report* contains the work performed, sources of information, and findings.

The order of presentation of findings is not specific to the potential liability associated with each finding. This ESA did not include sampling or analysis of any media.

Recognized Environmental Conditions (RECs)

There are no RECs associated with the Property.

Controlled Recognized Environmental Conditions (CRECs)

There are no CRECs associated with the Property.

Historical Recognized Environmental Conditions (HRECs)

There are no HRECs associated with the Property.

De minimis Conditions

There are no *de minimis* conditions associated with the Property.

The contents and order of the appendices to this *Report* are as follows:

Appendix A	ERIS Reports
Appendix B	Client-Provided Information
Appendix C	Historical Research Documentation
Appendix D	Photograph Documentation
Appendix E	Interview Documentation
Appendix F	Qualifications of the Environmental Professionals

Definitions

activity and use limitations (AUL) – legal or physical restrictions or limitations on the use of, or access to, a site or facility: (1) to reduce or eliminate potential exposure to *hazardous substances* or *petroleum products* in the soil, soil vapor, groundwater, and/or surface water on the *property*, or (2) to prevent activities that could interfere with the effectiveness of a response action, in order to ensure maintenance of a condition of no significant risk to public health or the environment. These legal or physical restrictions, which may include institutional and/or *engineering controls*, are intended to prevent adverse impacts to individuals or populations that may be exposed to *hazardous substances* and *petroleum products* in the soil, soil vapor, groundwater, and/or surface water on the *property*. (The term *AUL* is taken from ASTM Guide E2091-11 to include both legal (that is, institutional) and physical (that is, engineering) controls within its scope. Other agencies, organizations, and jurisdictions may define or utilize these terms differently).

biosolids – sewage sludge treated to meet the requirements in the EPA-issued Standards for the Use or Disposal of Sewage Sludge (40 C.F.R. Part 503) and intended to be applied to land as a soil amendment.

controlled recognized environmental condition (CREC) – recognized environmental condition affecting the subject property that has been addressed to the satisfaction of applicable regulatory authority or authorities with hazardous substances or petroleum products allowed to remain in place subject to implementation of required controls (for example, activity and use limitations or other property use limitations)

data failure – failure to achieve the historical research objective even after reviewing the standard historical resources that are reasonably ascertainable and likely to be useful. Data failure is one type of data gap.

data gap – a lack of or inability to obtain information required by this practice despite good faith efforts by the environmental professional to gather such information. Data gaps may result from incompleteness in any of the activities required by this practice, including, but not limited to, site reconnaissance (for example, an inability to conduct the site visit), and interviews (for example, an inability to interview the key site manager, regulatory officials, etc.). A significant data gap is a data gap that affects the ability of the environmental professional to identify a recognized environmental condition.

de minimis – a condition related to a release that generally does not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be *de minimis* conditions are not RECs or CRECs.

engineering controls (EC) – physical modifications to a site or facility (for example, capping, slurry walls, or point of use water treatment) to reduce or eliminate the potential for exposure to hazardous substances or petroleum products in the soil or groundwater on the property. Engineering controls are a type of AUL.

historical recognized environmental condition (HREC) – a previous release of hazardous substances or petroleum products affecting the subject property that has been addressed to the satisfaction of the applicable regulatory authority or authorities and meeting unrestricted use criteria established by the applicable regulatory authority or authorities without subjecting the subject property to any controls (for example, activity and use limitations or other property use limitations). A historically recognized environmental condition is not a recognized environmental condition.

migrate/migration – for the purposes of this practice, “migrate” and “migration” refers to the movement of *hazardous substances* or *petroleum products* in any form, including, for example, solid and liquid at the surface or subsurface, and vapor in the subsurface. Vapor migration in the subsurface is described in

ASTM Guide E 2600; however, nothing in this practice should be construed to require application of the ASTM Guide E 2600 standard to achieve compliance with all appropriate inquiries.

recognized environmental condition (REC) – the presence of hazardous substances or petroleum products in, on, or at the subject property due to a release to the environment; (2) the likely presence of hazardous substances or petroleum products in, on, or at the subject property due to a release or likely release to the environment; or (3) the presence of hazardous substances or petroleum products in, on, or at the subject property under conditions that pose a material threat of a future release to the environment. *De minimis conditions* and historical recognized environmental conditions are not *recognized environmental conditions*.

users (Users) – the parties seeking to use ASTM E1527-21 to complete an ESA of the property. A User may include, without limitation, a potential purchaser of property, a potential tenant of property, an owner of property, a lender, or a property manager. The Users have specific obligations for completing a successful application of this practice as outlined in Section 6 of ASTM E1527-21.

Statement of Environmental Professionals

We declare that, to the best of our professional knowledge and belief, we meet the definition of Environmental Professional (EP), as defined in §312.10 of 40 CFR Part 312.

We have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject Property. We have developed and performed all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.



Elyse Kalber
Environmental Scientist



Gina Wilming
Senior Project Manager

1. Introduction

Foth Infrastructure & Environment, LLC (Foth) performed a Phase I Environmental Site Assessment (ESA) in conformance with the scope and limitations of ASTM International (ASTM) Standard Practice E1527-21 for the two-acre acquisition area located west of 5011 S. Patton Street and north-adjacent to the Sioux Gateway Airport and identified as a portion of Parcel ID 884826200003 (i.e., the Property). The location of the Property is shown on the site map on Figure 1.

This Phase I ESA is developed in accordance with the basic elements as determined by the standard of care prevailing at the time the service was rendered in the area where it was rendered. Because standards of care can be identified only through retrospective inquiry, Foth has assumed that the standard of care is detailed by ASTM E1527-21. This standard allows for the use of previously completed ESAs.

1.1 Purpose

This *Phase I ESA Report (Report)* has been prepared at the request of RS&H Iowa, P.C. (RS&H) on behalf of the City of Sioux City (Airport Sponsor), which owns and operates the Sioux Gateway Airport. RS&H and the Airport Sponsor are preparing an Environmental Assessment (EA) associated with the Runway 13-31 reconstruction and extension, parallel taxiway extension, land acquisition, and associated development, which will be funded through the Federal Aviation Administration's (FAA's) Airport Improvement Program (AIP). As part of the project, the Airport Sponsor is purchasing a 2-acre parcel consisting of agricultural land located north-adjacent to the airport and identified as a portion of Parcel ID 884826200003, owned by the Charles H. Oehlerking Revocable Trust. The purpose of this Phase I ESA is to evaluate whether present or historical on-site land use activities have adversely impacted the Property through environmental contamination. Adjoining properties are also evaluated to determine if they have adversely impacted the Property.

Charles H. Oehlerking, Trustee of the Charles H. Oehlerking Revocable Trust, currently owns the Property, and the Users are seeking Landowner Liability Protections (LLP) under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

1.2 Scope of Services

This Phase I ESA was performed in general accordance with ASTM E1527-21. This work consisted of the following tasks:

Task I – Records Review

Foth performed a review of reasonably ascertainable records pertaining to the site. Activities associated with a records review include the following:

- ◆ Physical Setting Resources, such as United States Geological Survey (USGS) topographic maps geologic and hydrogeologic sources, as outlined in Table 1 of ASTM E1527-21.
- ◆ Standard federal, state, and Tribal Environmental Record Sources within the standard minimum search distance, as outlined in Table 2 of ASTM E1527-21.
- ◆ Regulatory agency files and records, as appropriate.
- ◆ Additional federal, state, Tribal, and local Environmental Record Resources, as outlined in Table 3 of ASTM E1527-21, as appropriate. This includes records including Brownfields lists, landfill and solid waste disposal sites, registered storage tanks, local land records for activity and use limitations (AULs), emergency release reports, and contaminated public wells.

- ◆ Historical Information Sources, including aerial photographs, fire insurance maps, local street directories, topographic maps, building department records, interviews, property tax files, and zoning/land use records.
- ◆ Uses of the Property back to the first developed use or 1940, whichever is earlier, as outlined in Section 8.3.8 of ASTM E1527-21. Use of adjoining properties and the surrounding area were also evaluated.

Task II – Site Reconnaissance

Foth performed a reconnaissance of the site to identify recognized environmental conditions (RECs) in connection with the Property. The reconnaissance consisted of visually and/or physically observing the site and any structures located on the Property to the extent possible. Potential areas of concern include:

- ◆ Features, activities, uses, and conditions
- ◆ Current and past uses of the property, adjoining properties, and the surrounding area
- ◆ Geologic, hydrologic, hydrologic, and topographic conditions
- ◆ Structures and other improvements
- ◆ Roads
- ◆ Potable water supply
- ◆ Hazardous substances and petroleum products
- ◆ Storage tanks
- ◆ Strong, pungent, or noxious odors
- ◆ Standing surface water and pools or sumps containing liquids likely to be hazardous substances or petroleum products
- ◆ Unidentified substance containers
- ◆ Polychlorinated biphenyl (PCB)-containing items
- ◆ Heating/cooling means
- ◆ Stains or corrosion on floors, walls, or ceilings
- ◆ Drains and sumps
- ◆ Pits, ponds, and lagoons
- ◆ Stained soil or pavement
- ◆ Stressed vegetation
- ◆ Solids waste
- ◆ Water/wastewater
- ◆ Wells
- ◆ Septic systems or cesspools

Task III – Interviews

Foth held discussions with representatives of the present and past Property owners and others who are knowledgeable regarding past or present site operations to obtain information indicating the presence of RECs at the Property.

Interviews were also conducted with state and/or local government officials to obtain information indicating the presence of RECs at the Property. Foth diligently endeavored to maintain confidentiality regarding the nature of this site investigation.

1.3 Significant Assumptions

This Phase I ESA has been performed in accordance with the following assumptions:

Foth performed this work in general accordance with ASTM E1527-21, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, except as stated elsewhere in this *Report*.

Foth has been duly informed by the Users of this *Report* and the owner of the Property as to the Property boundaries, to allow the site reconnaissance activities to be consistent with the ASTM E1527-21.

Railway and highway corridors where hazardous materials and petroleum products may be conveyed are ubiquitous. Unless information gained through site observations, interviews, or historical data reviews indicate the presence of a REC on that portion of a highway or railway on or adjacent to the Property, such thoroughfares will not be classified as a REC.

Agricultural land can be exposed to the use of pesticides and herbicides during its active use. Unless information gained through site observations, interviews, or historical data reviews indicate the presence of a REC associated with the use of such chemicals on or adjacent to the Property, the typical use of pesticides and herbicides on farm fields will not be classified as a REC.

1.4 Limitations and Exceptions

This *Report* was prepared under constraints of cost, time, and scope and reflects a limited investigation and evaluation, rather than a full, total, complete, or extensive assessment and evaluation. Our assessment was performed using the degree of care and skill ordinarily exercised under similar circumstances by Environmental Professionals (EPs) practicing in this or similar localities. No other warranty or guarantee, expressed or implied, is made as to the conclusions and professional advice included in this *Report*.

The findings of this *Report* are valid as of the date of the investigation. However, if this ESA has not been completed within 180 days prior to the date of acquisition of the Property or (for transactions not involving an acquisition) the date of the intended transaction, it may not satisfy the requirements of all appropriate inquiry. Certain information incorporated in this *Report* will only remain valid for six months, after which time it must be updated to meet the requirements of 40 Code of Federal Requirements (CFR) 312. Specifically, the following types of information have a 180-day shelf life: regulatory records review, site visit, interviews, specialized knowledge, and environmental liens. Finally, the findings of this *Report* may be invalidated wholly or partially by changes outside our control.

The assessment contained in this *Report* is based upon observation of conditions at the Property and/or information provided by the client and/or investigation of records, and it does not include sampling of soil, rock, groundwater, and surface water, air, on-site substances, or materials. Therefore, it is not possible to confirm the presence or absence of toxic or hazardous substances, wastes, or materials in the environments associated with the Property. No subsurface exploration has been performed as part of this Phase I ESA.

This *Report* is issued with the understanding that it is the responsibility of the owner(s) to ensure that the information and recommendations contained herein are brought to the attention of the appropriate regulatory agency(ies), if so required by law.

1.5 Vapor Intrusion Screening

While vapor intrusion screening, as defined by ASTM E2600-08, is not part of the scope of an ASTM E1527-21 Phase I ESA, the presence of vapors within a building that results from a “release into the environment” may be considered a REC.

1.6 Other Non-Scope Considerations

The Phase I ESA investigation is generally limited to releases of hazardous substances and petroleum compounds. It does not include non-scope considerations listed in Section 13 of ASTM E1527-21 or other emerging contaminants not defined as CERCLA hazardous substances. However, there may be other environmental issues or conditions that are outside the scope of this practice that the Users may wish to assess. A list of some of the non-scope considerations are as follows:

- ◆ Asbestos-containing building materials (ACMs)
- ◆ Biological agents
- ◆ Cultural and historical practices
- ◆ Ecological resources
- ◆ Endangered species
- ◆ Health and safety
- ◆ Indoor air quality unrelated to releases of hazardous substances or petroleum products into the environment
- ◆ Industrial hygiene
- ◆ Lead-based paint
- ◆ Lead in drinking water
- ◆ Mold
- ◆ PCB-containing building materials
- ◆ Radon
- ◆ Regulatory compliance
- ◆ Wetlands
- ◆ Substances not defined as hazardous substances, including some substances sometimes generally referred to as emerging contaminants. Note: the United States Environmental Protection Agency (USEPA) issued the final rule designating perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) as hazardous substances under CERCLA on April 19, 2024. The final rule will be effective July 8, 2024. Since PFOA and PFOS have been designated as CERCLA hazardous substances, these compounds are included in the scope of this practice and will be evaluated for RECs.

There may be other standards or protocols for assessment of potential hazards and conditions associated with non-scope conditions. If the Users have elected to investigate a non-scope consideration, this will be covered as a separate report from this *Report*.

1.7 Special Terms and Conditions

No modifications to ASTM methodologies have been applied to the manner in which this Phase I ESA was to be conducted.

1.8 User Reliance

RS&H and the Airport Sponsor are the intended beneficiaries (i.e., Users) of this *Report* and are the only parties to which Foth has explained the risks involved and which have been involved in the shaping of the scope of services needed to satisfactorily manage those risks from the point of view of the Users of this *Report*. Accordingly, reliance on this *Report* by any party other than the intended Users would necessarily result in reliance on assumptions whose extent and nature would distort the meaning and impact of the findings and opinions related herein, resulting in possible misinterpretation of these findings and opinions and unwise actions based on those misinterpretations.

2. Site Description

2.1 Property Location and Legal Description

The following table presents additional site location data.

**Table 2-1
Site Location Data**

Property Characteristic	Property-Specific Information
Current Owner Name	Charles H. Oehlerking, Trustee of the Charles H. Oehlerking Revocable Trust
Property Address	West of 5011 S. Patton Street, Sioux City, Iowa
Parcel or Tax Number	Southern portion of 884826200003
Township/Parish	Sioux City
County	Woodbury
Nearest Intersection	S. Patton Street and Seaboard Triumph Parkway
Property Size (acres)	2.02 acres
Property Type & Class Code (i.e., Agricultural, Industrial, Commercial, or Residential)	General Industrial

2.2 Site and Vicinity General Characteristics

The Property is 2.02 acres consisting of farmland. The Property is situated north-adjacent to the Sioux Gateway Airport and west of 5011 S. Patton Street in Sioux City, Iowa. Surrounding land use in the immediate vicinity is comprised of the Sioux Gateway Airport, commercial facilities, and agricultural land. The topography of the Property is generally flat and gently slopes downward to the northwest, toward the Missouri River.

2.3 Current Use of the Property

The Property is currently agricultural land.

2.4 Descriptions of Structures, Road, and Other Improvements

At the time of the site visit, there were no structures present on the Property. In addition, there were no roads or utilities serving the Property. The remaining portion of Parcel ID 884826200003 is served by S. Patton Street, which is east of the Property. The Property layout is shown in the Site Layout on Figure 2.

2.4.1 Heating/Cooling Systems

There are no fuels or heating and cooling systems that exist at the Property.

2.4.2 Sewage Disposal

There are no apparent sewer services that serve the Property.

2.4.3 Source of Potable Water

There are no apparent potable water supply services on the Property.

2.5 Current Uses of Adjoining Property

Table 2-2, presented below, provides a description of the adjoining properties or those close to the boundaries of the Property. Adjoining properties are any real property or properties, the border of which is contiguous or partially contiguous with that of the Property, or that would be contiguous or partially contiguous with that of the Property but for a street, road, or other public thoroughfare separating them.

**Table 2-2
Current Uses of Adjoining Property**

Direction from Property	Adjacent Land Use Description
North and East	The property to the north and east is the remaining portion of Parcel ID 884826200003, which is currently agricultural land. Several farm buildings are located on the southeastern portion of the property.
South and West	The property to the south and west currently contains a runway and several buildings associated with the Sioux Gateway Airport, with vegetated land in the southern half of the parcel.
Southeast	The property to the southeast is currently vegetated land and part of the Sioux Gateway Airport property.

3. User-Provided Information

Section 6 of ASTM E1527-21 states that certain tasks that will help to determine the possibility of RECs associated with the Property are generally conducted by the Users of this *Report*, including the following:

- ◆ reviewing title records for environmental liens or AULs;
- ◆ considering awareness of any specialized knowledge (e.g., information about previous ownership or environmental litigation);
- ◆ experience related to RECs at the Property; or
- ◆ knowledge of a significant reduction in the purchase price of the site.

Information, as available, related to these items was provided to Foth by the Users of this *Report*, per the agreed-upon scope-of-work. A copy of the completed ASTM E1527-21 Phase I ESA User Questionnaire is included in Appendix B.

3.1 Title Records

Environmental Risk Information Services of Ontario, Canada (ERIS) completed a Chain of Title dating back to 1980. A copy of the chain of title report for the Property, dated April 26, 2024, is included in Appendix A. Based on the review of this chain of title report, the current site owner for the Property is Charles H. Oehlerking, Trustee of the Charles H. Oehlerking Revocable Trust.

3.2 Environmental Liens

An environmental lien search was conducted by ERIS. A copy of the environmental lien search report for the Property, dated April 26, 2024, is included in Appendix A. The environmental lien search report indicates that environmental liens were not found for the Property. No response was provided by the Users regarding environmental liens.

3.3 Specialized Knowledge

Information related to specialized knowledge that was material to RECs in connection with the Property was not provided by Users' representatives.

3.4 Commonly Known or Reasonably Ascertainable Information

Information that was commonly known or reasonably ascertainable within the local community about the Property that was material to RECs in connection with the Property was not provided by the Users' representatives.

3.5 Activity and Use Limitations

For information purposes, AULs are defined as legal or physical restrictions or limitations on the use of, or access to, a site or facility:

1. to reduce or eliminate potential exposure to hazardous substances or petroleum products in the soil or groundwater on the property, or
2. to prevent activities that could interfere with the effectiveness of a response action, to ensure maintenance of a condition of no significant risk to public health or the environment. These legal or physical restrictions, which may include institutional and/or engineering controls (ECs), are intended to prevent adverse impacts to individuals or populations that may be

exposed to hazardous substances and petroleum products in the soil or groundwater on the Property.

As part of the environmental lien search, a search for AULs has been conducted by ERIS. A copy of the AULs search report for the Property, dated April 26, 2024, is included in Appendix A. The AULs search report did not identify AULs for the Property.

3.6 Valuation Reduction of Environmental Issues

Information related to valuation reduction of the Property was not provided by the Users' representatives. The Users indicated the Property was of fair market value.

3.7 Owner, Property Manager, and Occupant Information

Information regarding the ownership, tenants, and contact information of site representatives was provided by the Users of this *Report* for the purpose of conducting this Phase I ESA. The Property is currently owned by Charles H. Oehlerking, Trustee of the Charles H. Oehlerking Revocable Trust.

3.8 Reason for Performing the Phase I ESA

Foth understands that the Users requested this *Report* for the Property identified in Section 2.1, above, to identify, to the extent feasible, pursuant to the processes prescribed in ASTM E1527-21, RECs in connection with the Property. The Users are preparing an EA associated with the Runway 13-31 reconstruction and extension, parallel taxiway extension, land acquisition, and other development, which will be funded through AIP and FAA. As part of the project, the Airport Sponsor is purchasing the 2-acre acquisition area (i.e., Property), and the Users have requested this *Report* to be completed prior to acquisition of the Property.

The Users are seeking LLP under CERCLA. These protections, where desired, include bona fide prospective purchaser liability protection, contiguous property owner liability protection, and innocent landowner defense from CERCLA liability.

3.9 Other

Any additional User-provided information regarding the Property has been incorporated within the applicable sections of this *Report*.

4. Records Review

4.1 Standard Environmental Record Sources

Standard environmental record sources are defined in Section 8.2.1 of ASTM E1527-21. These records consist of selected federal and state environmental databases. ASTM also specifies the appropriate search distances from the Property for which these records should be reviewed. Foth retained the services of ERIS (the Vendor), to provide specified state and federal regulatory lists for potential sites of environmental concern located at or in the vicinity of the Property. The Vendor maintains a computerized Geographic Information System (GIS) listing of various state and federal databases in accordance with ASTM E1527-21. The database search was based upon ASTM-specified standard record sources. The specific databases and ASTM-specified search distances reviewed are identified in the Vendor's report, which is provided for review in Appendix A.

The Vendor's report includes various database information details on each of the facilities identified/geocoded within the specified radius. Occasionally, additional sites with potential RECs are identified but are not able to be mapped to specific locations due to insufficient or contradictory address information. These sites are also included in the Vendor's report as unmappable sites.

The Property was listed in the databases that were searched; however, further review of the location for the site listed at the Property indicated this site is associated with the Sioux Gateway Airport and does not include the Property. As a result, this site was included in the surrounding area records review. This site was reviewed in Table 4-1 for potential RECs, controlled recognized environmental conditions (CRECs), historical recognized environmental conditions (HRECs), or *de minimis* conditions associated with the Property. No unplotable sites were identified in the Vendor's report.

Table 4-1
Records Review Surrounding Area

Property and Map ID	Database Listing	Location and Distance	Comments
	FUDS	Unknown	Site is listed as a Formerly Used Defense Site (FUDS) Property. The Sioux City Municipal Airport was used as an Army Air Base from 1942 to 1948, then as an Air Force base from 1968 to 1969, when the property was reported as excess. According to the 2021 Management Action Plan, underground storage tanks (USTs) and petroleum issues are the subject of FUDS Program Involvement. After reviewing information provided by the Iowa Department of Natural Resources (IDNR), it was determined that no current or past USTs or leaking underground storage tanks (LUSTs) exist within the 0.5-mile radius of the Property. The Management Action Plan, as well as the airport UST records, are provided in Appendix B.

4.2 Regulatory Agency File and Records Review

Per Section 8.2.2 of ASTM E1527-21, if the target property or adjoining properties are identified on one or more of the standard environmental record sources, pertinent regulatory files and/or records associated with the listing should be reviewed in accordance with Sections 8.1.1 through 8.1.10 of the ASTM standard. The purpose of the regulatory file review is to obtain sufficient information to assist the EP in determining if a REC, CREC, HREC, or *de minimis* condition exists at the Property in connection with the

listing. If, in the EP's opinion, such a review is not warranted, the EP must explain within the *Report* the justification for not conducting the regulatory file review. As an alternative, the EP may review records from an alternative source (e.g., on-site records, user-provided records, records from local government agencies, and/or interviews with regulatory officials or other knowledgeable individuals) about the environmental conditions that resulted in the standard environmental record source listing.

The following searchable web-based databases were reviewed to verify the standard environmental record sources and gain additional information regarding the potential for environmental concerns on the Property or adjacent properties:

- ◆ IDNR Contaminated Sites database
- ◆ IDNR Facility Explorer
- ◆ IDNR Underground Storage Tank database
- ◆ USEPA Envirofacts database

The Property was not listed in the USEPA Envirofacts database. Records reviews from the remaining databases are incorporated in Tables 4-1 and 4-2.

4.3 Additional Environmental Record Sources

Per Section 8.2.3 of ASTM E1527-21, one or more additional state and/or local environmental records sources may be reviewed to enhance and supplement the ASTM-required federal and state records reviewed and discussed in Section 4.2 of this *Report*. These sources include local records such as lists of waste disposal sites; Brownfields sites; lists of hazardous waste/contaminated sites; lists of registered USTs; local land records (for AULs); records of emergency release reports; and records of contaminated public wells. Local sources that may be contacted to obtain this information include the Department of Health; Fire Department; Planning Department; Building Permit/Inspection Department; Local/Regional Pollution Control Agency; Local/Regional Water Quality Agency; and local electric utility companies (for records relating to PCBs). Review of additional records is done at the discretion of the EP performing the Phase I ESA.

To obtain further information to assist in the Phase I ESA process, Foth contacted several additional environmental sources during its investigation and requested environmental information relative to the Property and vicinity. These inquiries have been made in the form of telephone interviews, email inquiries, online records review, Freedom of Information Act (FOIA) requests, and/or in-person discussions. The results of these inquiries are summarized in the following table.

**Table 4-2
Additional Environmental Record Sources**

Local Record Source	Type of Records	Comments
IDNR Contaminated Sites database	Online database for contaminated sites within the state of Iowa	No contaminated sites were found within the search area (0.50 miles beyond the Property boundaries).
Renae Girdler, IDNR Records	Information regarding additional sites of environmental concern in the vicinity of the Property	The IDNR Records staff was contacted for any further information on the sites listed in Table 4-1; corresponding interview documentation is provided in Appendix E.

Table 4-2 (continued)

Local Record Source	Type of Records	Comments
Rick Simons, Sioux City Wastewater Treatment Plant	Information regarding current and past use of the Property	Mr. Simons was contacted to determine whether there is any record of biosolid land application on the Property. Based on information received, biosolids have not been applied in the last 2 years, and the Property was not included in the 5-year biosolids plan. Interview documentation is provided in Appendix E.
United States Army Corps of Engineers (USACE) FUDS Portal	Information regarding historical military use of the Property	Information received was used to supplement information in Table 4-1, for which documentation is provided in Appendix C.
Woodbury County Assessor	Online information regarding property ownership and buildings. https://beacon.schneidercorp.com/	The Property is comprised of Parcel ID 884826200003. As of the date of this Report, the Property is classified as general industrial land. A description of land ownership is provided in Section 3.1. A review of tax statements found that there are no overdue taxes on the Property.

4.4 Physical Setting Sources

The following table summarizes topographic, soil, and groundwater information for the Property:

Table 4-3
Physical Setting Sources

Topographic Information	
Property Elevation	Approximately 1,088 feet above mean sea level.
Property Gradient	The topography of the Property is generally flat. The nearest surface water is the Missouri River, located approximately 2,015 feet to the west-northwest. The area north of the Property is agricultural, while the area south of the Property consists of the Sioux Gateway Airport. Stormwater that leaves the Property flows into the drainage ditch along the south side of the Property, then northwest along the ditch, toward the Missouri River.

Table 4-3 (continued)

Soils Information	
Soil Types	The Property is located over soils identified as follows: Soil Component Name: Percival silty clay Soil Surface Texture: silty clay Soil Drainage Class: Somewhat poorly drained Hydrologic Group: Class D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted. Corrosion Potential - Uncoated Steel: High corrosion potential of steel Hydric Status: This soil does not meet hydric criteria. Soil Component Name: Morconick fine sandy loam Soil Surface Texture: fine sandy loam Soil Drainage Class: Well-drained Hydrologic Group: B - Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded. Corrosion Potential – Uncoated Steel: Low corrosion potential of steel Hydric Status: This soil does not meet hydric criteria.
Depth to Bedrock	The depth to bedrock was not reported for the Property. The well records in the ERIS report indicate bedrock was encountered at nearby wells around 105 feet below ground surface (bgs).
References	ERIS Physical Setting Report is in Appendix A. Natural Resources Conservation Service (NRCS) Web Soil Survey was also used (NRCS, 2023).
Hydrologic Information	
Depth to Groundwater and Groundwater Flow Direction	Depth to water table is unknown. Direction of flow from the Property is expected to be toward the west-northwest, toward the drainage ditch that leads to the Missouri River.
Significant Water Bearing Aquifers	Aquifer information was not specified in the ERIS report.
References	ERIS Physical Setting Report is provided in Appendix A.

4.5 Historical Use Information on the Property and Surrounding Areas

Information pertaining to past historical uses of the Property was obtained from various publicly available and readily reviewable sources, including interviews with the Property representatives, previous ESA reports, aerial photographs, city directory searches, Sanborn fire insurance map searches, and local building records as listed below:

- ◆ Historical aerial photographs covering the years 1938 through 2023.
- ◆ Seven 7.5-inch Quadrangle USGS topographic maps covering the years 1963 through 2018.
- ◆ City directories dated 1925 through 2022.
- ◆ Information from the Property owner.

ERIS indicated that fire insurance maps covering this Property were not found. Copies of available information are provided in Appendix A.

The historical records search results for the Property and surrounding area are provided in Table 4-4.

Table 4-4
Historical Use of the Property and Surrounding Areas

Property	Historical Land Uses
Target Property	The oldest record available was the historical aerial photograph from 1938. This and other aerials indicate the Property has been vegetated land or used for agricultural purposes since 1938.
Property to the North and East	The property has been used for agricultural purposes since the 1930s. Around the 1950s, a farmstead was built in the eastern portion of the property. The farmstead expanded west around 2004 and has not changed since then.
Property to the South and West	In 1938, the property consisted of agricultural use and vegetated land. Starting in 1949, the development of the Sioux Gateway Airport is evident, with Runway 13-31 visible in aerial images starting in 1953. According to the 2021 Management Action Plan, the airport runway was constructed in the northeastern portion of the property around the 1940s. Until around the 1960s or 1970s, the southern portion of the property was covered by the Missouri River. Some airport development has occurred incrementally in the northern half of the property, but the southern half remains vegetated land.
Property to the Southeast	The property has been used for agricultural purposes or vegetated land since the 1930s. The property was purchased as part of the Sioux Gateway Airport in 2004.

Since there is no evidence of pesticide storage or mixing on the portion of land under consideration, the use of such materials is not considered to be a REC. Based on the information reviewed, there do not appear to be environmental issues associated with the historical use of the surrounding properties that are expected to adversely impact the target Property.

4.6 Previous Environmental Reports

Foth has been provided with no previous environmental reports for the Property and is not aware of any previous environmental reports in existence.

5. Site Reconnaissance

5.1 Methodology and Limiting Conditions

On May 8, 2024, Foth representative Morgan Langer, accompanied by Rich Johnson, a consultant who has worked at the Sioux Gateway Airport for 18 years, conducted a site reconnaissance of accessible areas of the Property. All portions of the property were accessed during the site visit. Photographic documentation of the Property and surrounding properties from the visit is included in Appendix D. Figure 3 depicts the location and direction the photos were captured.

Foth's intent was to achieve the objectives and performance factors of 40 CFR §312.20(e) and (f), through:

- ◆ A visual on-site inspection of the Property and facilities and improvements on the Property, including a visual inspection of the areas where hazardous substances may be or may have been used, stored, treated, handled, or disposed. Physical limitations to the visual inspection, if any, are noted.
- ◆ A visual inspection of adjoining properties from the Property line, public rights-of-way, or other vantage point (e.g., aerial photography), including a visual inspection of areas where hazardous substances may be or may have been stored, treated, handled, or disposed. Physical limitations, if any, to the inspection of adjacent properties are noted.

5.2 General Site Setting

The current Property use is described in Section 2.3. The Property is located north-adjacent to the airport and west of 5011 S. Patton Street in Sioux City, Iowa. The Property is currently agricultural land. The Property has been vegetated land or used for agricultural purposes since at least 1938. The site surface is relatively flat. Stormwater that leaves the Property flows into the drainage ditch along the south side of the Property, then northwest along the ditch, toward the Missouri River.

5.3 Exterior Observations

Drains and Sumps

At the time of the site visit, no drains or sumps were observed on the Property.

Containers - Hazardous and Unknown Substances, Petroleum Products

At the time of the site visit, no containers were observed on the Property.

Heating/Cooling, Process and Odor Emissions

As discussed in Section 2.4.1, there are no fuels or heating and cooling systems that exist on the Property. There is no evidence of air emissions from the Property having impacted the Property or adjacent properties.

PCBs

The USEPA banned the manufacturing, processing, and distribution in commerce and use of PCB-containing equipment on May 31, 1979. In most industrial applications the pre-existing use of PCB-containing equipment was not terminated by this regulation. Foth conducted a visual survey of the exterior of the Property for evidence of PCB-containing equipment.

The Property is agricultural land that does not have pole-mounted or pad-mounted transformers. No other transformers or oil-filled equipment were observed on the Property.

Pits, Ponds, Pools of Liquid or Lagoons

At the time of the site visit, Foth did not observe any pits, ponds, or lagoons on the Property.

Solid Waste – Hazardous

At the time of the site visit, Foth did not observe any containers, lagoons, or piles of hazardous waste on the Property.

Solid Waste – Non-Hazardous

At the time of the site visit, there were no containers of non-hazardous waste observed on the Property.

Storage Tanks – Aboveground

No aboveground storage tanks (ASTs) were observed on the Property.

There was no evidence of former ASTs observed on the Property. Based on interview responses, there have been no ASTs at the Property. Reviews of other sources of information discussed elsewhere in this *Report* have not revealed the existence of ASTs.

Storage Tanks – Underground

No UST locations were observed on the Property.

There was no evidence of former USTs observed on the Property. Physical indications of USTs include warning signs, fill pipes, vent pipes, fueling locations, man-hole covers in ground surfaces, etc.

Stressed Vegetation and Stained Soil or Pavement

At the time of the site visit, there was no evidence of stained soil or environmentally stressed vegetation on the Property.

Wastewater – Storm and Surface Water and Septic Systems

There were no indications of wastewater or stormwater retention areas or septic systems on the Property. Based on interview responses, there have been none of these types of structures on the Property. Reviews of other sources of information discussed elsewhere in this *Report* have not revealed the existence of these types of structures.

Water Supply/Wells

There were no indications of water supply wells observed on the Property. Based on interview responses, there have been no water supply wells on the Property. Reviews of other sources of information discussed elsewhere in this *Report* have not revealed the existence of water supply wells at the Property.

5.4 Interior Observations

No structures are present on the Property.

6. Interviews

As part of this Phase I ESA, Foth attempted to interview individuals knowledgeable about present and past operations at the Property to obtain information that would point to RECs at the Property.

6.1 Interview with Current Owner and Site Representative

On behalf of Foth, RS&H interviewed Jon Oehlerking, a relative of the current owner and the site representative. Jon provided information regarding the history of the Property. This information has been incorporated throughout the *Report*. Information from this interview does not indicate the presence of RECs at the Property. Interview documentation can be found in Appendix E.

6.2 Interviews with Past Owners, Occupants, or Operators

During the Phase I ESA activities, Foth was not able to conduct interviews with past owners, occupants, or operators of the Property. Past owners were unable to be located for interviews.

6.3 Interviews with Others with Historical Knowledge of the Property

Foth did not identify other individuals with historical knowledge of the Property. The interviews discussed in Section 6.1 included site representatives with historical knowledge of the Property.

6.4 Interviews with Local Government Agencies

Interviews with local government agencies were conducted in conjunction with the review of additional regulatory records. Information obtained through these interviews is primarily discussed in Section 4.3, as well as other pertinent areas of this *Report*.

7. Evaluation

7.1 Findings

The findings presented here are based upon Foth's visual site inspection, interviews, and historical and environmental record reviews of the Property and adjacent properties. Per ASTM E1527-21, findings include RECs, CRECs, HRECs, and *de minimis* conditions. RECs are classified as either the presence of release, the likely presence of a release, or presence of a material threat of future release. CRECs are conditions where past contamination has been allowed to remain in place and are subject to implementation of required controls, such as property use restrictions, AULs, institutional controls, or engineering controls. HRECs are generally conditions that in the past have been remediated to the satisfaction of the responsible regulatory agency, without subjecting the property to additional controls. *De minimis* conditions are those situations that do not indicate a current material risk of harm to public health but could potentially result in exposure or release.

The order of presentation of findings is not specific to the potential liability associated with each finding. This Phase I ESA did not include sampling or analysis of any media.

Recognized Environmental Conditions

There are no RECs associated with the Property.

Controlled Recognized Environmental Conditions

There are no CRECs associated with the Property.

Historical Recognized Environmental Conditions

There are no HRECs associated with the Property.

De minimis Conditions

There are no *de minimis* conditions associated with the Property.

7.2 Opinion

This Report includes Foth's professional opinions of the impact on the Property of conditions identified in previous sections of this *Report*.

A Phase I ESA is conducted to permit formulation of an opinion as to the potential for RECs to exist at a Property. Opinions relative to the potential presence of hazardous materials, substances, wastes, or other environmental conditions given in this *Report* are based upon information derived from the most recent site reconnaissance and from other activities described herein. The Users of this *Report* are herewith advised that the conditions observed by Foth are subject to change, and the research effort conducted for a Phase I ESA is limited. Certain indicators of the presence of hazardous environmental conditions may have been latent at the time of the most recent site reconnaissance and may subsequently become observable.

The information collected during this investigation has been evaluated with the need in mind to identify RECs at the Property. RECs are defined by ASTM as the presence or likely presence of any hazardous substances or petroleum products on a property (1) due to release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. The term is not intended to include *de minimis* conditions that generally do not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be *de minimis* are not RECs.

Conditions identified by Foth as RECs are listed in Section 8.

7.3 Deviations, Data Gaps, and Data Failures

ASTM E1527-21 requires that all deletions, deviations, or additions from or to the practice (if any) shall be listed individually and in detail, including client-imposed constraints.

There are no deviations from the required practice as described in ASTM E1527-21.

7.3.1 Data Gaps

Data gaps (as defined in 40 CFR §312.10) in the information developed as part of the inquiries made during this ESA that affect the ability of persons conducting the appropriate inquiries to identify conditions indicative of releases or threatened releases in each area of inquiry under each standard and practice are identified as follows:

There are no data gaps as described in ASTM E1527-21 or 40 CFR 312.20 (g).

7.3.2 Data Failures

Data failures (as defined in ASTM E1527-21 § 3.2.21) in the information developed as part of the inquiries made during this ESA that affect the ability of persons conducting the appropriate inquiries must be commented on in the *Report*.

There are no data failures as described in ASTM E1527-21 or 40 CFR 312.20 (g).

7.4 Limiting Conditions/Deviations

No limiting conditions or deviations from ASTM E1527-21 occurred for this *Report*.

7.5 Additional Services

No additional services were performed as part of this Phase I ESA.

8. Conclusions

Foth performed a Phase I ESA of the Property located north-adjacent to the Sioux Gateway Airport and west of 5011 S. Patton Street, Sioux City, Woodbury County, Iowa. This Phase I ESA was performed in conformance with the scope and limitations of ASTM E1527-21. Any exceptions to or deletions from this practice are described in Section 4.3 of this *Report*.

This assessment has revealed no RECs, CRECs, or significant data gaps in connection with the subject Property.

9. Recommendations and Non-Scope Services

Based on the information assessed during this Phase I ESA, Foth has no recommendations for further investigations at this time.

10. References

ASTM International (ASTM), 2021. *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (E1527-21). 21 December 2021.

Environmental Risk Information Services (ERIS), 2024. *Site Evaluation: 23S049.00 Sioux Gateway Airport NEPA*. Order Number: 24041700273. 19 April 2024.

Iowa Department of Natural Resources (IDNR). *Contaminated Sites*.
<https://programs.iowadnr.gov/contaminatedsites/>.

IDNR. *Facility Explorer*. <https://facilityexplorer.iowadnr.gov/FacilityExplorer/Default.aspx>.

IDNR. *Underground Storage Tanks*. [Tanks \(iowadnr.gov\)](https://tanks.iowadnr.gov).

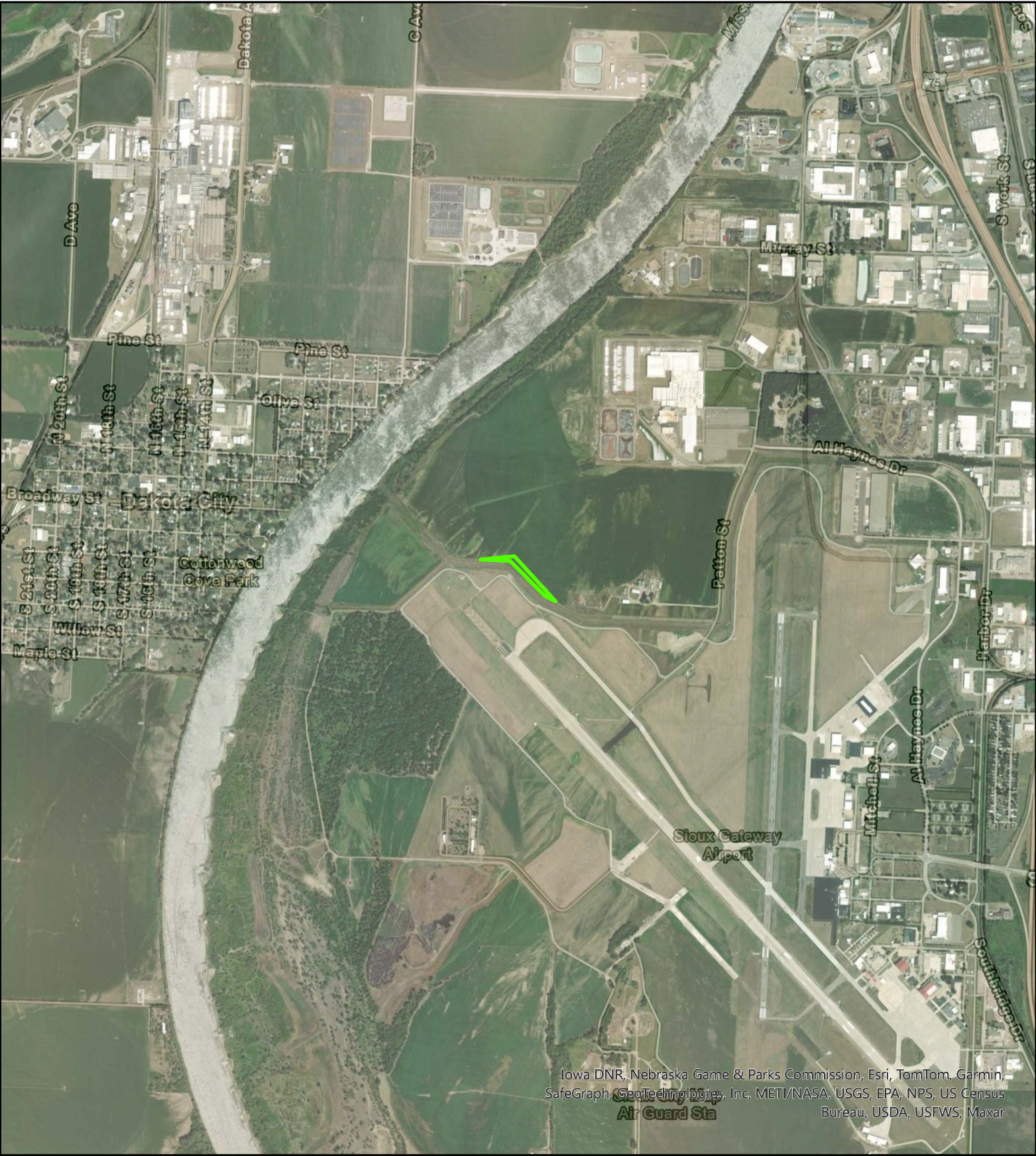
Natural Resources Conservation Service (NRCS), 2023. *Web Soil Survey*. Retrieved from
<https://websoilsurvey.nrcs.usda.gov/app/> (accessed 20 May 2024).

United States Environmental Protection Agency. *Envirofacts*. <https://enviro.epa.gov/>.

Woodbury County Assessor. <https://beacon.schneidercorp.com/>.

Figures

Figure 1
Site Location



Source: Iowa Geographic Map Server - <https://ortho.gis.iastate.edu/>

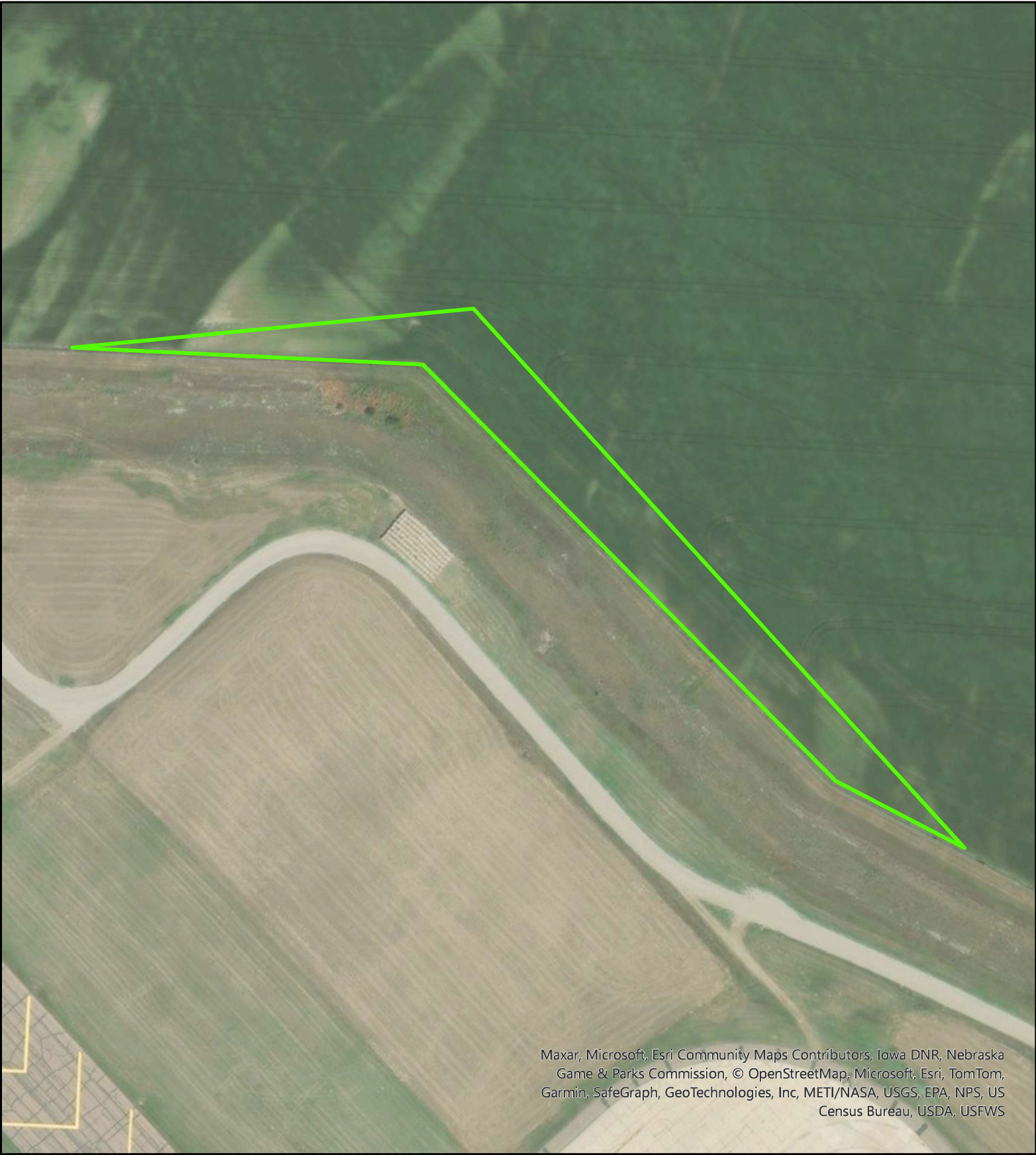
Legend

 Property Acquisition

0 1,000 2,000 Feet



Figure 2
Site Layout



Source: Iowa Geographic Map Server - <https://ortho.gis.iastate.edu/>

Legend

 Property Acquisition

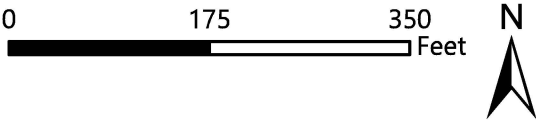
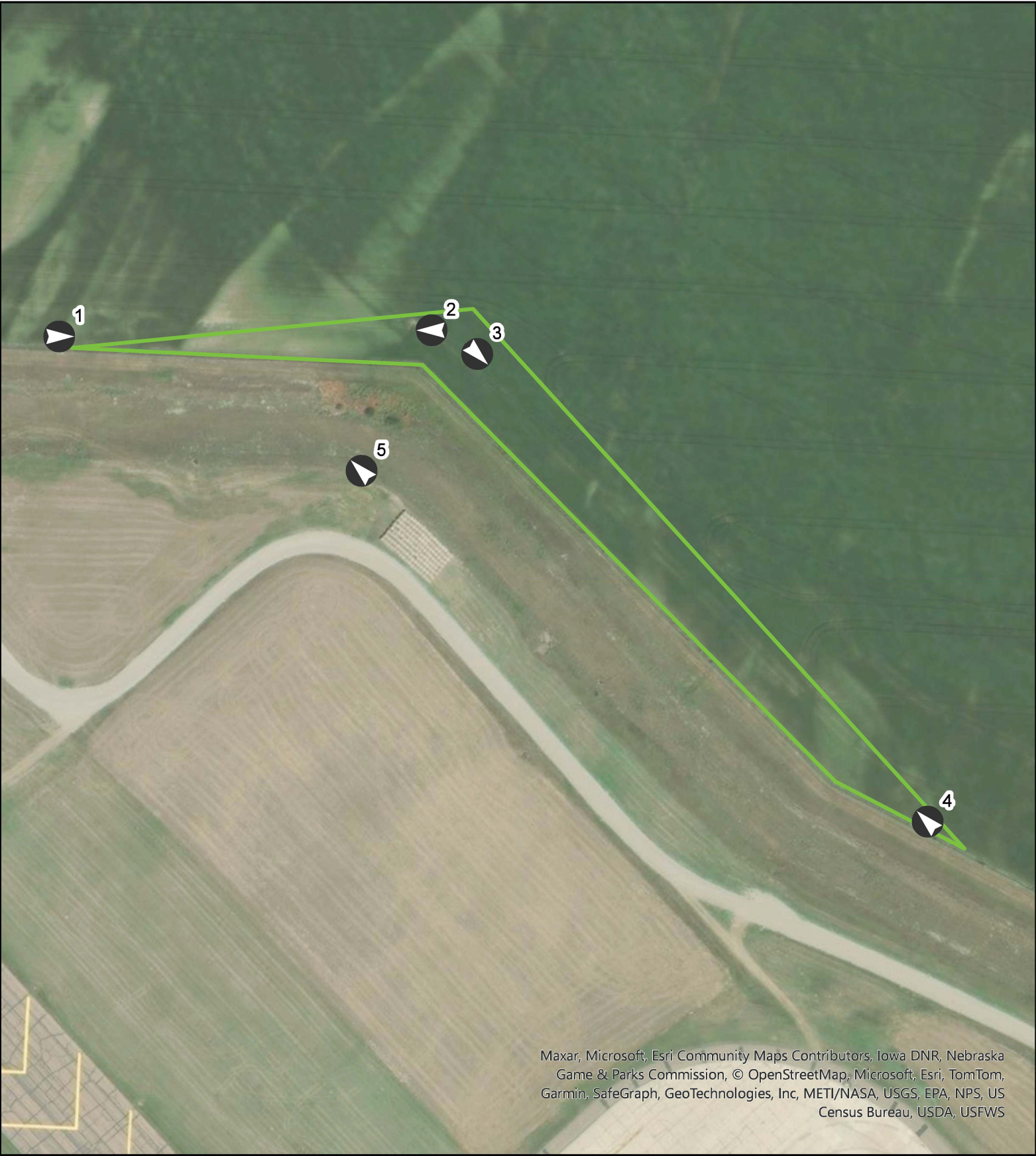


Figure 3
Photo Locations



Source: Iowa Geographic Map Server - <https://ortho.gis.iastate.edu/>

Legend

-  Property Acquisition
-  Approx. Photo Location & Direction

Appendix A

Environmental Risk Information Services (ERIS) Reports



DATABASE REPORT

Project Property:	<i>Sioux Gateway Airport NEPA n/a Sioux City IA</i>
Project No:	<i>23S049.00 Phase 130 Task 307</i>
Report Type:	<i>Database Report</i>
Order No:	<i>24041700273</i>
Requested by:	<i>Foth Infrastructure & Environment LLC</i>
Date Completed:	<i>April 19, 2024</i>

Environmental Risk Information Services

A division of Glacier Media Inc.

1.866.517.5204 | info@erisinfo.com | erisinfo.com

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Executive Summary

Property Information:

Project Property: *Sioux Gateway Airport NEPA
n/a Sioux City IA*

Project No: *23S049.00 Phase 130 Task 307*

Coordinates:

Latitude:	<i>42.4127437</i>
Longitude:	<i>-96.39699546</i>
UTM Northing:	<i>4,698,886.99</i>
UTM Easting:	<i>714,182.71</i>
UTM Zone:	<i>UTM Zone 14T</i>

Elevation: *1,088 FT*

Order Information:

Order No: *24041700273*

Date Requested: *April 17, 2024*

Requested by: *Foth Infrastructure & Environment LLC*

Report Type: *Database Report*

Historicals/Products:

Aerial Photographs	<i>Historical Aerials (with Project Boundaries)</i>
Chain of Title & Lien Searches	<i>ASTM E1527-21 Compliant Environmental Lien Search (back to 1980)</i>
City Directory Search	<i>CD - 2 Street Search</i>
ERIS Xplorer	<i>ERIS Xplorer</i>
Excel Add-On	<i>Excel Add-On</i>
Fire Insurance Maps	<i>US Fire Insurance Maps</i>
Physical Setting Report (PSR)	<i>Physical Setting Report (PSR)</i>
Product Summary	<i>Product Summary for Aerials, FIMs & Topos</i>
Topographic Map	<i>Topographic Maps</i>

Executive Summary: Report Summary

Database	Searched	Search Radius	Project Property	Within 0.12mi	0.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
<u>Standard Environmental Records</u>								
Federal								
NPL	Y	1	0	0	0	0	0	0
PROPOSED NPL	Y	1	0	0	0	0	0	0
DELETED NPL	Y	0.5	0	0	0	0	-	0
SEMS	Y	0.5	0	0	0	0	-	0
ODI	Y	0.5	0	0	0	0	-	0
SEMS ARCHIVE	Y	0.5	0	0	0	0	-	0
CERCLIS	Y	0.5	0	0	0	0	-	0
IODI	Y	0.5	0	0	0	0	-	0
CERCLIS NFRAP	Y	0.5	0	0	0	0	-	0
CERCLIS LIENS	Y	PO	0	-	-	-	-	0
RCRA CORRACTS	Y	1	0	0	0	0	0	0
RCRA TSD	Y	0.5	0	0	0	0	-	0
RCRA LQG	Y	0.25	0	0	0	-	-	0
RCRA SQG	Y	0.25	0	0	0	-	-	0
RCRA VSQG	Y	0.25	0	0	0	-	-	0
RCRA NON GEN	Y	0.25	0	0	0	-	-	0
RCRA CONTROLS	Y	0.5	0	0	0	0	-	0
FED ENG	Y	0.5	0	0	0	0	-	0
FED INST	Y	0.5	0	0	0	0	-	0
LUCIS	Y	0.5	0	0	0	0	-	0
NPL IC	Y	0.5	0	0	0	0	-	0
ERNS 1982 TO 1986	Y	PO	0	-	-	-	-	0
ERNS 1987 TO 1989	Y	PO	0	-	-	-	-	0
ERNS	Y	PO	0	-	-	-	-	0
FED BROWNFIELDS	Y	0.5	0	0	0	0	-	0
FEMA UST	Y	0.25	0	0	0	-	-	0
FRP	Y	0.25	0	0	0	-	-	0

Database	Searched	Search Radius	Project Property	Within 0.12mi	0.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
DELISTED FRP	Y	0.25	0	0	0	-	-	0
HIST GAS STATIONS	Y	0.25	0	0	0	-	-	0
REFN	Y	0.25	0	0	0	-	-	0
BULK TERMINAL	Y	0.25	0	0	0	-	-	0
SEMS LIEN	Y	PO	0	-	-	-	-	0
SUPERFUND ROD	Y	1	0	0	0	0	0	0
DOE FUSRAP	Y	1	0	0	0	0	0	0

State

SHWS	Y	1	0	0	0	0	0	0
DEL SHWS	Y	1	0	0	0	0	0	0
DELISTED SHWS	Y	1	0	0	0	0	0	0
CONT	Y	0.5	0	0	0	0	-	0
SWF/LF	Y	0.5	0	0	0	0	-	0
LUST	Y	0.5	0	0	0	0	-	0
LAST	Y	0.5	0	0	0	0	-	0
DELISTED LST	Y	0.5	0	0	0	0	-	0
UST	Y	0.25	0	0	0	-	-	0
AST	Y	0.25	0	0	0	-	-	0
SFM AST	Y	0.25	0	0	0	-	-	0
DELISTED TANK	Y	0.25	0	0	0	-	-	0
INST	Y	0.5	0	0	0	0	-	0
VCP	Y	0.5	0	0	0	0	-	0
BROWNFIELDS	Y	0.5	0	0	0	0	-	0

Tribal

INDIAN LUST	Y	0.5	0	0	0	0	-	0
INDIAN UST	Y	0.25	0	0	0	-	-	0
DELISTED INDIAN LST	Y	0.5	0	0	0	0	-	0
DELISTED INDIAN UST	Y	0.25	0	0	0	-	-	0

County

No County standard environmental record sources available for this State.

Additional Environmental Records

Federal

PFAS GHG	Y	0.5	0	0	0	0	-	0
FINDS/FRS	Y	PO	0	-	-	-	-	0

Database	Searched	Search Radius	Project Property	Within 0.12mi	0.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
TRIS	Y	PO	0	-	-	-	-	0
PFAS NPL	Y	0.5	0	0	0	0	-	0
PFAS FED SITES	Y	0.5	0	0	0	0	-	0
PFAS SSEHRI	Y	0.5	0	0	0	0	-	0
ERNS PFAS	Y	0.5	0	0	0	0	-	0
PFAS NPDES	Y	0.5	0	0	0	0	-	0
PFAS TRI	Y	0.5	0	0	0	0	-	0
PFAS WATER	Y	0.5	0	0	0	0	-	0
PFAS TSCA	Y	0.5	0	0	0	0	-	0
PFAS E-MANIFEST	Y	0.5	0	0	0	0	-	0
PFAS IND	Y	0.5	0	0	0	0	-	0
HMIRS	Y	0.125	0	0	-	-	-	0
NCDL	Y	0.125	0	0	-	-	-	0
TSCA	Y	0.125	0	0	-	-	-	0
HIST TSCA	Y	0.125	0	0	-	-	-	0
FTTS ADMIN	Y	PO	0	-	-	-	-	0
FTTS INSP	Y	PO	0	-	-	-	-	0
PRP	Y	PO	0	-	-	-	-	0
SCRD DRYCLEANER	Y	0.5	0	0	0	0	-	0
ICIS	Y	PO	0	-	-	-	-	0
FED DRYCLEANERS	Y	0.25	0	0	0	-	-	0
DELISTED FED DRY	Y	0.25	0	0	0	-	-	0
FUDS	Y	1	1	0	0	0	0	1
FUDS MRS	Y	1	0	0	0	0	0	0
FORMER NIKE	Y	1	0	0	0	0	0	0
PIPELINE INCIDENT	Y	PO	0	-	-	-	-	0
MLTS	Y	PO	0	-	-	-	-	0
HIST MLTS	Y	PO	0	-	-	-	-	0
MINES	Y	0.25	0	0	0	-	-	0
SMCRA	Y	1	0	0	0	0	0	0
MRDS	Y	1	0	0	0	0	0	0
LM SITES	Y	1	0	0	0	0	0	0
ALT FUELS	Y	0.25	0	0	0	-	-	0
CONSENT DECREES	Y	0.25	0	0	0	-	-	0
AFS	Y	PO	0	-	-	-	-	0

Database	Searched	Search Radius	Project Property	Within 0.12mi	0.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
SSTS	Y	0.25	0	0	0	-	-	0
PCBT	Y	0.5	0	0	0	0	-	0
PCB	Y	0.5	0	0	0	0	-	0

State

SPILLS	Y	0.125	0	0	-	-	-	0
DRYCLEANERS	Y	0.25	0	0	0	-	-	0
DELISTED DRYCLEANERS	Y	0.25	0	0	0	-	-	0
AIR PERMITS	Y	0.25	0	0	0	-	-	0
PFAS	Y	0.5	0	0	0	0	-	0
LIENS	Y	PO	0	-	-	-	-	0
TIER 2	Y	0.125	0	0	-	-	-	0

Tribal

No Tribal additional environmental record sources available for this State.

County

No County additional environmental record sources available for this State.

Total:	1	0	0	0	0	0	1
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* PO – Property Only

* 'Property and adjoining properties' database search radii are set at 0.25 miles.

Executive Summary: Site Report Summary - Project Property

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
1	FUDS	SIOUX CITY MUNI AIRPORT	SIOUX CITY IA <i>FUDS Property No: B07IA0131</i>	ESE	0.00 / 0.00	0	16 p1p-16-0000040083x1x

Executive Summary: Site Report Summary - Surrounding Properties

<i>Map Key</i>	<i>DB</i>	<i>Company/Site Name</i>	<i>Address</i>	<i>Direction</i>	<i>Distance (mi/ft)</i>	<i>Elev Diff (ft)</i>	<i>Page Number</i>
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No records found in the selected databases for the surrounding properties.

Executive Summary: Summary by Data Source

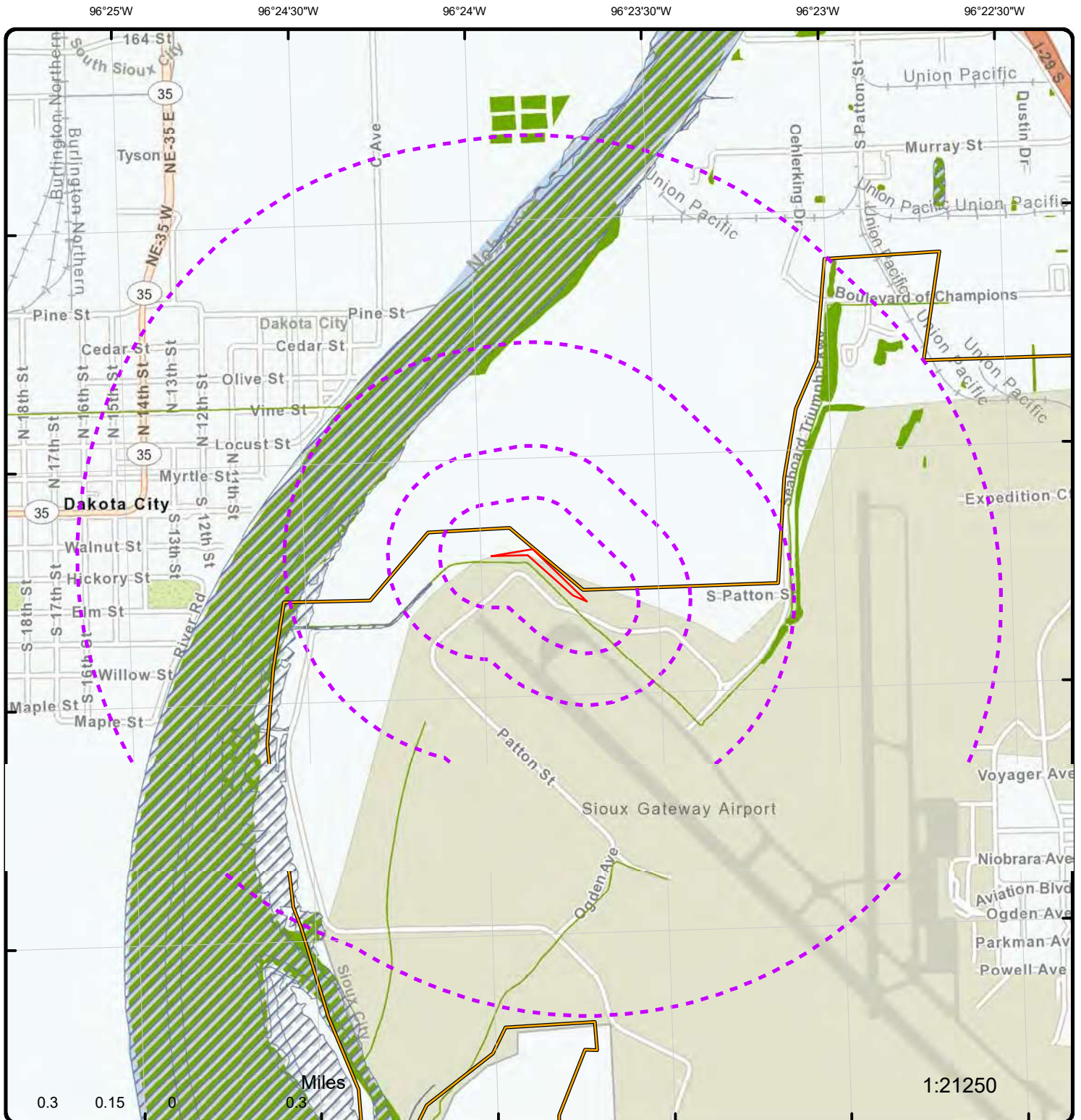
Non Standard

Federal

FUDS - Formerly Used Defense Sites

A search of the FUDS database, dated May 15, 2023 has found that there are 1 FUDS site(s) within approximately 1.00miles of the project property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
SIoux CITY MUNI AIRPORT	SIoux CITY IA	ESE	0.00 / 0.00	<u>1</u>
<i>FUDS Property No: B07IA0131</i>				



Map: 1.0 Mile Radius

Order Number: 24041700273

Address: n/a, Sioux City, IA



Project Property

Buffer Outline

Sites with Higher Elevation

Sites with Same Elevation

Sites with Lower Elevation

Sites with Unknown Elevation

Areas with Higher Elevation

Areas with Same Elevation

Areas with Lower Elevation

Areas with Unknown Elevation

Freeways; Highways

Traffic Circle; Ramp

Major & Minor Arterial

Traffic Circle; Ramp

Local Road

Rail

State

Country

National Wetland

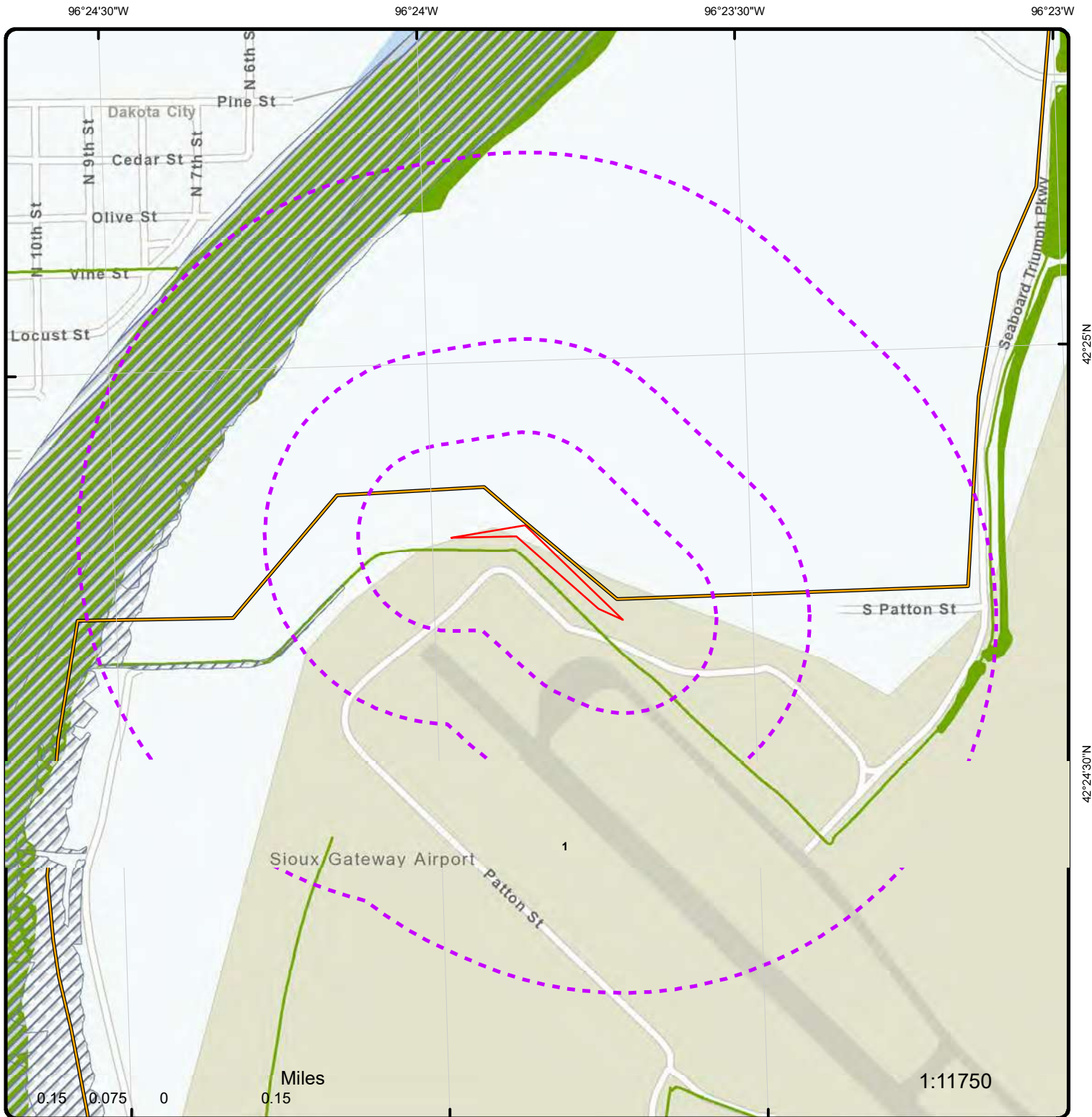
Indian Reserve Land

100 Year Flood Zone

500 Year Flood Zone

FWS Special Designation Areas

National Priorities List (Active, Delisted, Proposed, Institutional Control)



Map: 0.5 Mile Radius

Order Number: 24041700273

Address: n/a, Sioux City, IA



Project Property

Buffer Outline

▲ Sites with Higher Elevation

■ Sites with Same Elevation

▼ Sites with Lower Elevation

○ Sites with Unknown Elevation

Areas with Higher Elevation

Areas with Same Elevation

Areas with Lower Elevation

Areas with Unknown Elevation

Freeways; Highways

Traffic Circle; Ramp

Major & Minor Arterial

Traffic Circle; Ramp

Local Road

Rail

State

Country

National Wetland

Indian Reserve Land

100 Year Flood Zone

500 Year Flood Zone

FWS Special Designation Areas

National Priorities List (Active, Delisted, Proposed, Institutional Control)

96°24'W

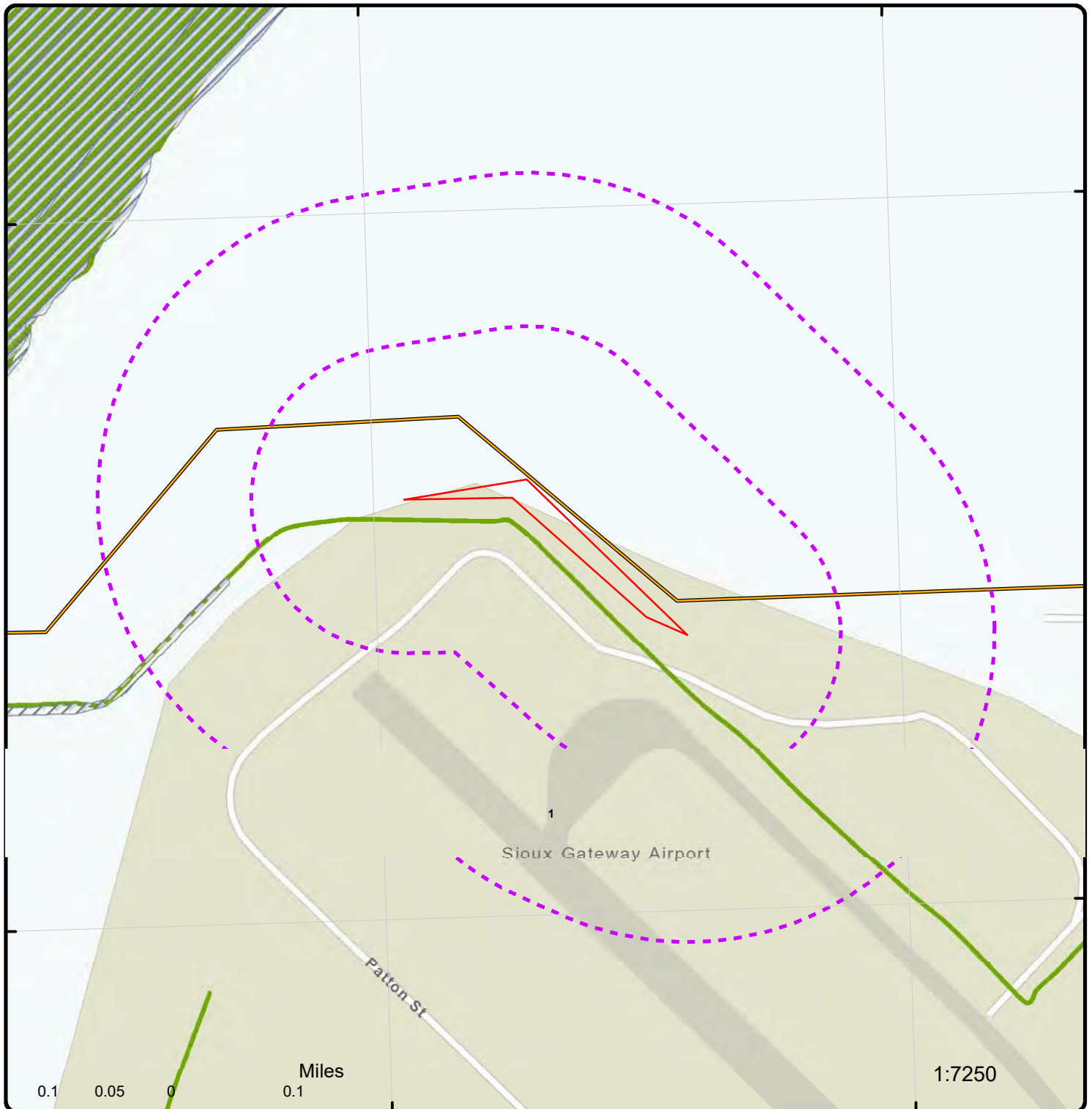
96°23'30"W

42°25'N

42°25'N

42°24'30"N

42°24'30"N



Map: 0.25 Mile Radius

Order Number: 24041700273

Address: n/a, Sioux City, IA



Project Property

Buffer Outline

▲ Sites with Higher Elevation

■ Sites with Same Elevation

▼ Sites with Lower Elevation

○ Sites with Unknown Elevation

Areas with Higher Elevation

Areas with Same Elevation

Areas with Lower Elevation

Areas with Unknown Elevation

Freeways; Highways

Traffic Circle; Ramp

Major & Minor Arterial

Traffic Circle; Ramp

Local Road

Rail

State

Country

National Wetland

Indian Reserve Land

100 Year Flood Zone

500 Year Flood Zone

FWS Special Designation Areas

National Priorities List (Active, Delisted, Proposed, Institutional Control)

96°24'30"W

96°24'W

96°23'30"W

42°25'N

42°24'30"N

42°25'N

42°24'30"N

0.1 0.05 0 0.1

1:10000

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Aerial Year: 2022

Address: n/a, Sioux City, IA

Source: ESRI World Imagery

Order Number: 24041700273



© ERIS Information Inc.

Detail Report

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
1	1 of 1	ESE	0.00 / 0.00	1,087.61 / 0	SIOUX CITY MUNI AIRPORT SIOUX CITY IA	FUDS

FUDS Property No: B07IA0131
EMS Map Link: <https://fudsportal.usace.army.mil/ems/inventory/map?id=53732>
FUDS INST ID: IA79799F021800
Status: Properties with all projects at site closeout
SDS ID:
NPL Status Code: Not Listed
Eligibility: Eligible
Site Eligib: Eligible
Current Owner: Local Government
Has Project: Yes
DOD FUDS Pro:
Project Required:
No Further Action:
Congressional District: 04
Congressional Dist 117: 04
Media ID:
Metadata ID:
Feature Desc:
EPA Region: 07
County: WOODBURY
Latitude: 42.40156
Longitude: -96.385151
Fiscal year: 2020
USACE Division: nwd
USACE District: nwo
Centroid Lat:
Centroid Long:
Se Anno Cad Data:
Shape Length: 0.251406208410704
Shape Area: 0.00114168506371592
Shape Len: .25140621
X:
Y:
Data Source: U.S. Army Corps of Engineers Geospatial Open Data
Property History:

DoD use began with construction of the Sioux City Army Air Base in 1942. The property was deeded to the city of Sioux City in 1948 but was recaptured by the Air Force in 1963. Air Force and Air National Guard missions continued until 1969 when the property was reported excess. Underground storage tanks and petroleum issues are the subject of the FUDS Program involvement.

Feature Description:

DoD use began with construction of the Sioux City Army Air Base in 1942. The property was deeded to the city of Sioux City in 1948 but was recaptured by the Air Force in 1963. Air Force and Air National Guard missions continued until 1969 when the property was reported excess. Underground storage tanks and petroleum issues are the subject of the FUDS Program involvement.

Unplottable Summary

Total: 0 Unplottable sites

DB	Company Name/Site Name	Address	City	Zip	ERIS ID
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No unplottable records were found that may be relevant for the search criteria.

Unplottable Report

No unplottable records were found that may be relevant for the search criteria.

Appendix: Database Descriptions

Environmental Risk Information Services (ERIS) can search the following databases. The extent of historical information varies with each database and current information is determined by what is publicly available to ERIS at the time of update. ERIS updates databases as set out in ASTM Standard E1527-13 and E1527-21, Section 8.1.8 Sources of Standard Source Information:

"Government information from nongovernmental sources may be considered current if the source updates the information at least every 90 days, or, for information that is updated less frequently than quarterly by the government agency, within 90 days of the date the government agency makes the information available to the public."

Standard Environmental Record Sources

Federal

National Priority List:

NPL

Sites on the United States Environmental Protection Agency (EPA)'s National Priorities List of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action under the Superfund program. The NPL, which EPA is required to update at least once a year, is based primarily on the score a site receives from EPA's Hazard Ranking System. A site must be on the NPL to receive money from the Superfund Trust Fund for remedial action. Sites are represented by boundaries where available in the EPA Superfund Site Boundaries maintained by the Shared Enterprise Geodata and Services (SEGS). Site boundaries represent the footprint of a whole site, the sum of all of the Operable Units and the current understanding of the full extent of contamination; for Federal Facility sites, the total site polygon may be the Facility boundary. Where there is no polygon boundary data available for a given site, the site is represented as a point.

Government Publication Date: Oct 26, 2023

National Priority List - Proposed:

PROPOSED NPL

Sites proposed by the United States Environmental Protection Agency (EPA), the state agency, or concerned citizens for addition to the National Priorities List (NPL) due to contamination by hazardous waste and identified by the EPA as a candidate for cleanup because it poses a risk to human health and/or the environment. Sites are represented by boundaries where available in the EPA Superfund Site Boundaries maintained by the Shared Enterprise Geodata and Services (SEGS). Site boundaries represent the footprint of a whole site, the sum of all of the Operable Units and the current understanding of the full extent of contamination; for Federal Facility sites, the total site polygon may be the Facility boundary. Where there is no polygon boundary data available for a given site, the site is represented as a point.

Government Publication Date: Oct 26, 2023

Deleted NPL:

DELETED NPL

Sites deleted from the United States Environmental Protection Agency (EPA)'s National Priorities List. The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate. Sites are represented by boundaries where available in the EPA Superfund Site Boundaries maintained by the Shared Enterprise Geodata and Services (SEGS). Site boundaries represent the footprint of a whole site, the sum of all of the Operable Units and the current understanding of the full extent of contamination; for Federal Facility sites, the total site polygon may be the Facility boundary. Where there is no polygon boundary data available for a given site, the site is represented as a point.

Government Publication Date: Oct 26, 2023

SEMS List 8R Active Site Inventory:

SEMS

The U.S. Environmental Protection Agency's (EPA) Superfund Program has deployed the Superfund Enterprise Management System (SEMS), which integrates multiple legacy systems into a comprehensive tracking and reporting tool. This inventory contains active sites evaluated by the Superfund program that are either proposed to be or are on the National Priorities List (NPL) as well as sites that are in the screening and assessment phase for possible inclusion on the NPL. The Active Site Inventory Report displays site and location information at active SEMS sites. An active site is one at which site assessment, removal, remedial, enforcement, cost recovery, or oversight activities are being planned or conducted. This data includes SEMS sites from the List 8R Active file as well as applicable sites from the SEMS GIS/REST file layer obtained from EPA's Facility Registry Service.

Government Publication Date: Jan 26, 2024

Inventory of Open Dumps, June 1985:

ODI

The Resource Conservation and Recovery Act (RCRA) provides for publication of an inventory of open dumps. The Act defines "open dumps" as facilities which do not comply with EPA's "Criteria for Classification of Solid Waste Disposal Facilities and Practices" (40 CFR 257).

Government Publication Date: Jun 1985

SEMS List 8R Archive Sites:

SEMS ARCHIVE

The U.S. Environmental Protection Agency's (EPA) Superfund Enterprise Management System (SEMS) Archived Site Inventory displays site and location information at sites archived from SEMS. An archived site is one at which EPA has determined that assessment has been completed and no further remedial action is planned under the Superfund program at this time. This data includes sites from the List 8R Archived site file.

Government Publication Date: Jan 26, 2024

Comprehensive Environmental Response, Compensation and Liability Information System - CERCLIS:

CERCLIS

Superfund is a program administered by the United States Environmental Protection Agency (EPA) to locate, investigate, and clean up the worst hazardous waste sites throughout the United States. CERCLIS is a database of potential and confirmed hazardous waste sites at which the EPA Superfund program has some involvement. It contains sites that are either proposed to be or are on the National Priorities List (NPL) as well as sites that are in the screening and assessment phase for possible inclusion on the NPL. The EPA administers the Superfund program in cooperation with individual states and tribal governments; this database is made available by the EPA.

Government Publication Date: Oct 25, 2013

EPA Report on the Status of Open Dumps on Indian Lands:

IODI

Public Law 103-399, The Indian Lands Open Dump Cleanup Act of 1994, enacted October 22, 1994, identified congressional concerns that solid waste open dump sites located on American Indian or Alaska Native (AI/AN) lands threaten the health and safety of residents of those lands and contiguous areas. The purpose of the Act is to identify the location of open dumps on Indian lands, assess the relative health and environment hazards posed by those sites, and provide financial and technical assistance to Indian tribal governments to close such dumps in compliance with Federal standards and regulations or standards promulgated by Indian Tribal governments or Alaska Native entities.

Government Publication Date: Dec 31, 1998

CERCLIS - No Further Remedial Action Planned:

CERCLIS NFRAP

An archived site is one at which EPA has determined that assessment has been completed and no further remedial action is planned under the Superfund program at this time. The Archive designation means that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL). This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Government Publication Date: Oct 25, 2013

CERCLIS Liens:

CERCLIS LIENS

A Federal Superfund lien exists at any property where EPA has incurred Superfund costs to address contamination ("Superfund site") and has provided notice of liability to the property owner. A Federal CERCLA ("Superfund") lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. This database is made available by the United States Environmental Protection Agency (EPA). This database was provided by the United States Environmental Protection Agency (EPA). Refer to SEMS LIEN as the current data source for Superfund Liens.

Government Publication Date: Jan 30, 2014

RCRA CORRACTS-Corrective Action:

RCRA CORRACTS

RCRA Info is the U.S. Environmental Protection Agency's (EPA) comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. At these sites, the Corrective Action Program ensures that cleanups occur. EPA and state regulators work with facilities and communities to design remedies based on the contamination, geology, and anticipated use unique to each site.

Government Publication Date: Jan 1, 2024

RCRA non-CORRACTS TSD Facilities:

RCRA TSD

RCRA Info is the U.S. Environmental Protection Agency's (EPA) comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. This database includes Non-Corrective Action sites that have indicated engagement in the treatment, storage, or disposal of hazardous waste which requires a RCRA hazardous waste permit.

Government Publication Date: Jan 1, 2024

RCRA Generator List:[RCRA LQG](#)

RCRA Info is the U.S. Environmental Protection Agency's (EPA) comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRA Info replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Large Quantity Generators (LQGs) generate 1,000 kilograms per month or more of hazardous waste or more than one kilogram per month of acutely hazardous waste.

Government Publication Date: Jan 1, 2024

RCRA Small Quantity Generators List:[RCRA SQG](#)

RCRA Info is the U.S. Environmental Protection Agency's (EPA) comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRA Info replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Small Quantity Generators (SQGs) generate more than 100 kilograms, but less than 1,000 kilograms, of hazardous waste per month.

Government Publication Date: Jan 1, 2024

RCRA Very Small Quantity Generators List:[RCRA VSQG](#)

RCRA Info is the U.S. Environmental Protection Agency's (EPA) comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Very Small Quantity Generators (VSQG) generate 100 kilograms or less per month of hazardous waste, or one kilogram or less per month of acutely hazardous waste. Additionally, VSQG may not accumulate more than 1,000 kilograms of hazardous waste at any time.

Government Publication Date: Jan 1, 2024

RCRA Non-Generators:[RCRA NON GEN](#)

RCRA Info is the U.S. Environmental Protection Agency's (EPA) comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRA Info replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Non-Generators do not presently generate hazardous waste.

Government Publication Date: Jan 1, 2024

RCRA Sites with Controls:[RCRA CONTROLS](#)

List of Resource Conservation and Recovery Act (RCRA) facilities with institutional controls in place. RCRA gives the U.S. Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances.

Government Publication Date: Jan 1, 2024

Federal Engineering Controls-ECs:[FED ENG](#)

List of Engineering controls (ECs) made available by the United States Environmental Protection Agency (EPA). ECs encompass a variety of engineered and constructed physical barriers (e.g., soil capping, sub-surface venting systems, mitigation barriers, fences) to contain and/or prevent exposure to contamination on a property. The EC listing includes remedy component data from Superfund decision documents for applicable sites on the final or deleted on the National Priorities List (NPL); and sites with a Superfund Alternative Approach (SAA) Agreement in place. The only sites included that are not on the NPL; proposed for NPL; or removed from proposed NPL, are those with an SAA Agreement in place.

Government Publication Date: Feb 29, 2024

Federal Institutional Controls-ICs:[FED INST](#)

List of Institutional controls (ICs) made available by the United States Environmental Protection Agency (EPA). ICs are non-engineered instruments, such as administrative and legal controls, that help minimize the potential for human exposure to contamination and/or protect the integrity of the remedy. Although it is EPA's expectation that treatment or engineering controls will be used to address principal threat wastes and that groundwater will be returned to its beneficial use whenever practicable, ICs play an important role in site remedies because they reduce exposure to contamination by limiting land or resource use and guide human behavior at a site. The IC listing includes remedy component data from Superfund decision documents for applicable sites on the final or deleted on the National Priorities List (NPL); and sites with a Superfund Alternative Approach (SAA) Agreement in place. The only sites included that are not on the NPL; proposed for NPL; or removed from proposed NPL, are those with an SAA Agreement in place.

Government Publication Date: Feb 29, 2024

Land Use Control Information System:

LUCIS

The LUCIS database is maintained by the U.S. Department of the Navy and contains information for former Base Realignment and Closure (BRAC) properties across the United States.

Government Publication Date: Sep 1, 2006

Institutional Control Boundaries at NPL sites:

NPL IC

Boundaries of Institutional Control areas at sites on the United States Environmental Protection Agency (EPA)'s National Priorities List, or Proposed or Deleted, made available by the EPA's Shared Enterprise Geodata and Services (SEGS). United States Environmental Protection Agency (EPA)'s National Priorities List of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action under the Superfund program. Institutional controls are non-engineered instruments such as administrative and legal controls that help minimize the potential for human exposure to contamination and/or protect the integrity of the remedy.

Government Publication Date: Oct 26, 2023

Emergency Response Notification System:

ERNS 1982 TO 1986

Database of oil and hazardous substances spill reports controlled by the National Response Center. The primary function of the National Response Center is to serve as the sole national point of contact for reporting oil, chemical, radiological, biological, and etiological discharges into the environment anywhere in the United States and its territories.

Government Publication Date: 1982-1986

Emergency Response Notification System:

ERNS 1987 TO 1989

Database of oil and hazardous substances spill reports controlled by the National Response Center. The primary function of the National Response Center is to serve as the sole national point of contact for reporting oil, chemical, radiological, biological, and etiological discharges into the environment anywhere in the United States and its territories.

Government Publication Date: 1987-1989

Emergency Response Notification System:

ERNS

Database of oil and hazardous substances spill reports made available by the United States Coast Guard National Response Center (NRC). The NRC fields initial reports for pollution and railroad incidents and forwards that information to appropriate federal/state agencies for response. These data contain initial incident data that has not been validated or investigated by a federal/state response agency.

Government Publication Date: Feb 20, 2024

The Assessment, Cleanup and Redevelopment Exchange System (ACRES) Brownfield Database:

FED BROWNFIELDS

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties protects the environment, reduces blight, and takes development pressures off greenspaces and working lands. This data is provided by the United States Environmental Protection Agency (EPA) and includes Brownfield sites from the Cleanups in My Community (CIMC) web application.

Government Publication Date: Feb 7, 2024

FEMA Underground Storage Tank Listing:

FEMA UST

The Federal Emergency Management Agency (FEMA) of the Department of Homeland Security maintains a list of FEMA owned underground storage tanks.

Government Publication Date: Dec 31, 2017

Facility Response Plan:

FRP

This listing contains facilities that have submitted Facility Response Plans (FRPs) to the U.S. Environmental Protection Agency (EPA). Facilities that could reasonably be expected to cause "substantial harm" to the environment by discharging oil into or on navigable waters are required to prepare and submit FRPs. Harm is determined based on total oil storage capacity, secondary containment and age of tanks, oil transfer activities, history of discharges, proximity to a public drinking water intake or sensitive environments. This listing includes FRP facilities from an applicable EPA FOIA file and Homeland Infrastructure Foundation-Level Data (HIFLD) data file.

Government Publication Date: May 2, 2023

Delisted Facility Response Plans:

DELISTED FRP

Facilities that once appeared in - and have since been removed from - the list of facilities that have submitted Facility Response Plans (FRP) to EPA. Facilities that could reasonably be expected to cause "substantial harm" to the environment by discharging oil into or on navigable waters are required to prepare and submit Facility Response Plans (FRPs). Harm is determined based on total oil storage capacity, secondary containment and age of tanks, oil transfer activities, history of discharges, proximity to a public drinking water intake or sensitive environments.

Government Publication Date: May 2, 2023

Historical Gas Stations:

HIST GAS STATIONS

This historic directory of service stations is provided by the Cities Service Company. The directory includes Cities Service filling stations that were located throughout the United States in 1930.

Government Publication Date: Jul 1, 1930

Petroleum Refineries:

REFN

List of petroleum refineries from the U.S. Energy Information Administration (EIA) Refinery Capacity Report. Includes operating and idle petroleum refineries (including new refineries under construction) and refineries shut down during the previous year located in the 50 States, the District of Columbia, Puerto Rico, the Virgin Islands, Guam, and other U.S. possessions. Survey locations adjusted using public data.

Government Publication Date: Feb 28, 2024

Petroleum Product and Crude Oil Rail Terminals:

BULK TERMINAL

A list of petroleum product and crude oil rail terminals from the U.S. Energy Information Administration (EIA), as well as petroleum terminals sourced from the Federal Communications Commission Data hosted by the Homeland Infrastructure Foundation-Level Database. Data includes operable bulk petroleum product terminals with a total bulk shell storage capacity of 50,000 barrels or more, and/or the ability to receive volumes from tanker, barge, or pipeline; also rail terminals handling the loading and unloading of crude oil with activity between 2017 and 2018. EIA petroleum product terminal data comes from the EIA-815 Bulk Terminal and Blender Report, which includes working, shell in operation, and shell idle for several major product groupings.

Government Publication Date: Sep 22, 2023

LIEN on Property:

SEMS LIEN

The U.S. Environmental Protection Agency's (EPA) Superfund Enterprise Management System (SEMS) provides Lien details on applicable properties, such as the Superfund lien on property activity, the lien property information, and the parties associated with the lien.

Government Publication Date: Jan 26, 2024

Superfund Decision Documents:

SUPERFUND ROD

This database contains a list of decision documents for Superfund sites. Decision documents serve to provide the reasoning for the choice of (or) changes to a Superfund Site cleanup plan. The decision documents include completed Records of Decision (ROD), ROD Amendments, Explanations of Significant Differences (ESD) for active and archived sites stored in the Superfund Enterprise Management System (SEMS), along with other associated memos and files. This information is maintained and made available by the U.S. Environmental Protection Agency.

Government Publication Date: Dec 26, 2023

Formerly Utilized Sites Remedial Action Program:

DOE FUSRAP

The U.S. Department of Energy (DOE) established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from the Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations. The DOE Office of Legacy Management (LM) established long-term surveillance and maintenance (LTS&M) requirements for remediated FUSRAP sites. DOE evaluates the final site conditions of a remediated site on the basis of risk for different future uses. DOE then confirms that LTS&M requirements will maintain protectiveness.

Government Publication Date: Mar 4, 2017

State**Registry of Hazardous Waste or Hazardous Substance Disposal Sites:**

SHWS

This Registry of Hazardous Waste or Hazardous Substance Disposal Sites is maintained by the Iowa Department of Natural Resources. Hazardous disposal sites may have been plotted using Township, Section and Range and display approximate locations. Please note not all the known hazardous waste or contaminated sites that exist in the state are listed on the Registry. This database is state equivalent CERCLIS.

Government Publication Date: Dec 30, 2022

Removed from the Registry of Hazardous Waste or Hazardous Substance Disposal Sites:

DEL SHWS

A list of sites that have been delisted or removed from the Registry of Hazardous Waste or Hazardous Substance Disposal Sites. This list was made available by the Department of Natural Resources (DNR). This database is state equivalent CERCLIS.

Government Publication Date: Dec 31, 2022

Delisted Registry of Hazardous Waste or Hazardous Substance Disposal Sites:

DELISTED SHWS

List of sites which once appeared on - and have since been removed from - either the Hazardous Substance Remedial Fund and Sites Registry, or the list of sites removed from it, made available by the Iowa Department of Natural Resources (DNR). The hazardous disposal sites have been plotted using Township, Section and Range and display approximate locations.

Contaminated Sites in Iowa:

[CONT](#)

The Contaminated Sites Section of the Iowa Department of Natural Resources (DNR) deals with a range of situations that involve contamination caused by a release of hazardous materials or hazardous waste products.

Government Publication Date: Jan 23, 2024

Solid Waste Management Facilities with Permits by the Iowa DNR:

[SWF/LF](#)

The Iowa Department of Natural Resources (DNR) regulates the operation of facilities that manage, process and dispose solid waste. These facilities include sanitary landfills, appliance demanufacturing facilities, transfer stations, land application sites, incinerators, composting facilities, household hazardous materials sites, waste tire management and material recovery facilities. It includes all sites which are permitted or have had permits. It does not include non-permitted closed dumps.

Government Publication Date: Sep 15, 2022

Leaking Underground Storage Tank Sites in Iowa:

[LUST](#)

A list of Leaking Underground Storage Tank (LUST) sites where petroleum contamination has been found. This list was made available by a joint venture of the Iowa Department of Natural Resources (DNR) and the Public Safety State Fire Marshal Office (SFM).

Government Publication Date: Jan 18, 2024

Leaking Aboveground Storage Tanks:

[LAST](#)

A list of leaking aboveground storage tank (LAST) sites made available by the Iowa Department of Natural Resources (DNR).

Government Publication Date: Jan 23, 2024

Delisted Leaking Storage Tanks:

[DELISTED LST](#)

List of sites removed from either the Leaking Underground Storage Tank (LUST) sites list or the Leaking Aboveground Storage Tank (LAST) sites list made available by the Iowa Department of Natural Resources (DNR).

Government Publication Date: Jan 18, 2024

Underground Storage Tanks in Iowa:

[UST](#)

The Underground Storage Tanks (UST) Section of the Department of Natural Resources (DNR) is responsible for the regulation of underground storage tank systems used for the storage of regulated substances, primarily petroleum products.

Government Publication Date: Jan 18, 2024

Aboveground Storage Tanks:

[AST](#)

A list of aboveground storage tanks (AST) that contain primarily the aboveground storage of combustible or flammable products. This list is maintained by a joint venture between the Iowa Department of Natural Resources (DNR) and the Public Safety State Fire Marshal Office (SFM).

Government Publication Date: Oct 26, 2017

Aboveground Storage Tanks (State Fire Marshal):

[SFM AST](#)

A list of aboveground storage tanks (AST) that primarily store combustible or flammable liquids. Aboveground petroleum storage tanks that are greater than 1,100 gallons in capacity must be registered with the state fire marshal's office. This list is provided by the Iowa Department of Public Safety's State Fire Marshal Division (SFM).

Government Publication Date: Mar 15, 2024

Delisted Storage Tanks:

[DELISTED TANK](#)

This database contains a list of storage tank sites that were removed by the Department of Natural Resources (DNR) from Storage Tanks Section.

Government Publication Date: Mar 15, 2024

Sites with Institutional Controls:

[INST](#)

A list of sites in the Land Recycling Program (LRP) that have Institutional Controls in place. This list was made available by the Iowa Department of Natural Resources (DNR).

Government Publication Date: Jan 23, 2024

Land Recycling Program Sites:

[VCP](#)

The Land Recycling Program (LRP) of the Iowa Department of Natural Resources (DNR) allows owners or other stakeholders of a property to voluntarily assess and implement remedial actions at a site that is contaminated or is perceived to be contaminated. The assessment of the property must address the severity of the contamination problems and the risks associated with the contamination.

Government Publication Date: Jan 23, 2024

Brownfields Sites Listing:

BROWNFIELDS

Brownfields are abandoned, idled, or under-used industrial and commercial facilities where expansion or redevelopment is complicated by real or perceived environmental contamination. The Iowa Department of Natural Resources (DNR) tracks brownfield sites as well as targeted brownfields assessment sites.

Government Publication Date: Jan 23, 2024

Tribal

Leaking Underground Storage Tanks (LUSTs) on Indian Lands:

INDIAN LUST

This list of leaking underground storage tanks (LUSTs) on Tribal/Indian Lands in Region 7, which includes Iowa, is made available by the United States Environmental Protection Agency (EPA).

Government Publication Date: Oct 12, 2017

Underground Storage Tanks on Tribal/Indian Lands:

INDIAN UST

This list of underground storage tanks (USTs) on Tribal/Indian Lands in Region 7, which includes Iowa, is made available by the United States Environmental Protection Agency (EPA).

Government Publication Date: Oct 24, 2023

Delisted Tribal Leaking Storage Tanks:

DELISTED INDIAN LST

Leaking Underground Storage Tank (LUST) facilities which once appeared on - and have since been removed from - the Regional Tribal/Indian LUST lists made available by the United States Environmental Protection Agency (EPA).

Government Publication Date: Oct 25, 2023

Delisted Tribal Underground Storage Tanks:

DELISTED INDIAN UST

Underground Storage Tank (UST) facilities which once appeared on - and have since been removed from - the Regional Tribal/Indian UST lists made available by the United States Environmental Protection Agency (EPA).

Government Publication Date: Oct 25, 2023

County

No County standard environmental record sources available for this State.

Additional Environmental Record Sources

Federal

PFAS Greenhouse Gas Emissions Data:

PFAS GHG

The U.S. Environmental Protection Agency's Greenhouse Gas Reporting Program (GHGRP) collects Greenhouse Gas (GHG) data from large emitting facilities (25,000 metric tons of carbon dioxide equivalent (CO₂e) per year), and suppliers of fossil fuels and industrial gases that results in GHG emissions when used. Includes GHG emissions data for facilities that emit or have emitted since 2010 chemicals identified in EPA's CompTox Chemicals Dashboard list of PFAS without explicit structures and list of PFAS structures by DSSTox. PFAS emissions data has been identified for facilities engaged in the following industrial processes: Aluminum Production (GHGRP Subpart F), HCFC-22 Production and HFC-23 Destruction (Subpart O), Electronics Manufacturing (Subpart I), Fluorinated Gas Production (Subpart L), Magnesium Production (Subpart T), Electrical Transmission and Distribution Equipment Use (Subpart DD), and Manufacture of Electric Transmission and Distribution Equipment (Subpart SS). Over time, other industrial processes with required GHGRP reporting may include PFAS emissions data and the list of reportable gases may change over time.

Government Publication Date: Feb 5, 2024

Facility Registry Service/Facility Index:

FINDS/FRS

The Facility Registry Service (FRS) is a centrally managed database that identifies facilities, sites, or places subject to environmental regulations or of environmental interest. FRS creates high-quality, accurate, and authoritative facility identification records through rigorous verification and management procedures that incorporate information from program national systems, state master facility records, and data collected from EPA's Central Data Exchange registrations and data management personnel. This list is made available by the U.S. Environmental Protection Agency (EPA).

Government Publication Date: Feb 9, 2024

Toxics Release Inventory (TRI) Program:

TRIS

The U.S. Environmental Protection Agency's Toxics Release Inventory (TRI) is a database containing data on disposal or other releases of toxic chemicals from U.S. facilities and information about how facilities manage those chemicals through recycling, energy recovery, and treatment. There are currently 770 individually listed chemicals and 33 chemical categories covered by the TRI Program. Facilities that manufacture, process or otherwise use these chemicals in amounts above established levels must submit annual reporting forms for each chemical. Note that the TRI chemical list does not include all toxic chemicals used in the U.S. One of TRI's primary purposes is to inform communities about toxic chemical releases to the environment. This database includes TRI Reporting Data for calendar years 1987 through 2021 and Preliminary Data for 2022.

Government Publication Date: Sep 20, 2023

PFOA/PFOS Contaminated Sites:

PFAS NPL

This list of Superfund Sites with Per- and Polyfluoroalkyl Substances (PFAS) detections is made available by the U.S. Environmental Protection Agency (EPA) in their PFAS Analytic Tools data, previously the list was obtained by EPA FOIA requests. EPA's Office of Land and Emergency Management and EPA Regional Offices maintain what is known about site investigations, contamination, and remedial actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) where PFAS is present in the environment. Limitations: Detections of PFAS at National Priorities List (NPL) sites do not mean that people are at risk from PFAS, are exposed to PFAS, or that the site is the source of the PFAS. The information in the Superfund NPL and Superfund Alternative Agreement (SAA) PFAS detection site list is years old and may not be accurate today. Site information such as site name, site ID, and location has been confirmed for accuracy; however, PFAS-related information such as media sampled, drinking water being above the health advisory, or mitigation efforts has not been verified. For Federal Facilities data, the other Federal agencies (OFA) are the lead agency for their data and provided them to EPA.

Government Publication Date: Mar 19, 2024

Federal Agency Locations with Known or Suspected PFAS Detections:

PFAS FED SITES

List of Federal agency locations with known or suspected detections of Per- and Polyfluoroalkyl Substances (PFAS), made available by the U.S. Environmental Protection Agency (EPA) in their PFAS Analytic Tools data. EPA outlines that these data are gathered from several federal entities, such as the Federal Superfund program, Department of Defense (DOD), National Aeronautics and Space Administration, Department of Transportation, and Department of Energy. The dates this data was extracted for the PFAS Analytic Tools range from March 2022 to September 2023. Sites on this list do not necessarily reflect the source/s of PFAS contamination and detections do not indicate level of risk or human exposure at the site. Agricultural notifications in this data are limited to DOD sites only. At this time, the EPA is aware that this list is not comprehensive of all Federal agencies.

Government Publication Date: Sep 5, 2023

SSEHRI PFAS Contamination Sites:

PFAS SSEHRI

This PFAS Contamination Site Tracker database is compiled by the Social Science Environmental Health Research Institute (SSEHRI) at Northeastern University. According to the SSEHRI, the database records qualitative and quantitative data from each known site of PFAS contamination, including timeline of discovery, sources, levels, health impacts, community response, and government response. The goal of this database is to compile information and support public understanding of the rapidly unfolding issue of PFAS contamination. All data presented was extracted from government websites, news articles, or publicly available documents, and this is cited in the tracker. Locations for the Known PFAS Contamination Sites are sourced from the PFAS Sites and Community Resources Map, credited to the Northeastern University's PFAS Project Lab, Silent Spring Institute, and the PFAS-REACH team. Disclaimer: The source conveys the data undergoes regular updates as new information becomes available, some sites may be missing and/or contain information that is incorrect or outdated, as well as their information represents all contamination sites SSEHRI is aware of, not all possible contamination sites. This data is not intended to be used for legal purposes. Access the following source link for the most current information:

<https://pfasproject.com/pfas-sites-and-community-resources/>

Government Publication Date: May 19, 2023

National Response Center PFAS Spills:

ERNS PFAS

This Per- and Poly-Fluoroalkyl Substances (PFAS) Spills dataset is made available via the U.S. Environmental Protection Agency's (EPA) PFAS Analytic Tools. The National Response Center (NRC), operated by the U.S. Coast Guard, is the designated federal point of contact for reporting all oil, chemical, and other discharges into the environment, for the United States and its territories. This dataset contains NRC spill information from 1990 to the present that is restricted to records associated with PFAS and PFAS-containing materials. Incidents are filtered to include only records with a "Material Involved" or "Incident Description" related to Aqueous Film Forming Foam (AFFF). The keywords used to filter the data included "AFFF," "Fire Fighting Foam," "Aqueous Film Forming Foam," "Fire Suppressant Foam," "PFAS," "PERFL," "PFOA," "PFOS," and "Genx." Limitations: The data from the NRC website contains initial incident data that has not been validated or investigated by a federal/state response agency. Keyword searches may misidentify some incident reports that do not contain PFAS. This dataset should also not be considered to be exhaustive of all PFAS spills/release incidents.

Government Publication Date: Jan 24, 2024

PFAS NPDES Discharge Monitoring:

PFAS NPDES

This list of National Pollutant Discharge Elimination System (NPDES) permitted facilities with required monitoring for Per- and Polyfluoroalkyl (PFAS) Substances is made available via the U.S. Environmental Protection Agency (EPA)'s PFAS Analytic Tools. Any point-source wastewater discharger to waters of the United States must have a NPDES permit, which defines a set of parameters for pollutants and monitoring to ensure that the discharge does not degrade water quality or impair human health. This list includes NPDES permitted facilities associated with permits that monitor for Per- and Polyfluoroalkyl Substances (PFAS), limited to the years 2007 - present. EPA further advises the following regarding these data: currently, fewer than half of states have required PFAS monitoring for at least one of their permittees, and fewer states have established PFAS effluent limits for permittees. For states that may have required monitoring, some reporting and data transfer issues may exist on a state-by-state basis.

Government Publication Date: Feb 19, 2024

Perfluorinated Alkyl Substances (PFAS) from Toxic Release Inventory:

PFAS TRI

List of Toxics Release Inventory (TRI) facilities at which the reported chemical is a per- or polyfluoroalkyl (PFAS) substance included in the U.S. Environmental Protection Agency's (EPA) consolidated PFAS Master List of PFAS Substances. Encompasses Toxics Release Inventory records included in the EPA PFAS Analytic Tools. The EPA's TRI database currently tracks information on disposal or releases of 770 individually listed toxic chemicals and 33 chemical categories from thousands of U.S. facilities and details about how facilities manage those chemicals through recycling, energy recovery, and treatment. This listing includes TRI Reporting Data for calendar years 1987 through 2021 and Preliminary Data for 2022.

Government Publication Date: Sep 20, 2023

Perfluorinated Alkyl Substances (PFAS) Water Quality:

PFAS WATER

The Water Quality Portal (WQP) is a cooperative service sponsored by the United States Geological Survey (USGS), the Environmental Protection Agency (EPA), and the National Water Quality Monitoring Council (NWQMC). This listing includes records from the Water Quality Portal where the characteristic (environmental measurement) is in the Environmental Protection Agency (EPA)'s consolidated Master List of PFAS Substances.

Government Publication Date: Jul 20, 2020

PFAS TSCA Manufacture and Import Facilities:

PFAS TSCA

The U.S. Environmental Protection Agency (EPA) issued the Chemical Data Reporting (CDR) Rule under the Toxic Substances Control Act (TSCA) and requires chemical manufacturers and facilities that manufacture or import chemical substances to report data to EPA. This list is specific only to TSCA Manufacture and Import Facilities with reported per- and poly-fluoroalkyl (PFAS) substances. Data file is sourced from EPA's PFAS Analytic Tools TSCA dataset which includes CDR/Inventory Update Reporting data from 1998 up to 2020. Disclaimer: This data file includes production and importation data for chemicals identified in EPA's CompTox Chemicals Dashboard list of PFAS without explicit structures and list of PFAS structures in DSSTox. Note that some regulations have specific chemical structure requirements that define PFAS differently than the lists in EPA's CompTox Chemicals Dashboard. Reporting information on manufactured or imported chemical substance amounts should not be compared between facilities, as some companies claim Chemical Data Reporting Rule data fields for PFAS information as Confidential Business Information.

Government Publication Date: Jan 5, 2023

PFAS Waste Transfers from RCRA e-Manifest :

PFAS E-MANIFEST

This Per- and Poly-Fluoroalkyl Substances (PFAS) Waste Transfers dataset is made available via the U.S. Environmental Protection Agency's (EPA) PFAS Analytic Tools. Every shipment of hazardous waste in the U.S. must be accompanied by a shipment manifest, which is a critical component of the cradle-to-grave tracking of wastes mandated by the Resource Conservation and Recovery Act (RCRA). According to the EPA, currently no Federal Waste Code exists for any PFAS compounds. To work around the lack of PFAS waste codes in the RCRA database, EPA developed the PFAS Transfers dataset by mining e-Manifest records containing at least one of these common PFAS keywords: • PFAS • PFOA • PFOS • PERFL • AFFF • GENX • GEN-X (plus the Vermont state-specific waste codes). Limitations: Amount or concentration of PFAS being transferred cannot be determined from the manifest information. Keyword searches may misidentify some manifest records that do not contain PFAS. This dataset should also not be considered to be exhaustive of all PFAS waste transfers.

Government Publication Date: Feb 25, 2024

PFAS Industry Sectors:

PFAS IND

This Per- and Poly-Fluoroalkyl Substances (PFAS) Industry Sectors dataset is made available via the U.S. Environmental Protection Agency's (EPA) PFAS Analytic Tools. The EPA developed the dataset from various sources that show which industries may be handling PFAS including: EPA's Enforcement and Compliance History Online (ECHO) records restricted to potential PFAS-handling industry sectors; ECHO records for Fire Training Sites identified where fire-fighting foam may have been used in training exercises; and 14 CFR Part 139 Airports compiled from historic and current records from the FAA Airport Data and Information Portal. Since July 2006, all certificated Part 139 Airports are required to have fire-fighting foam onsite that meet certain military specifications, which to date have been fluorinated (Aqueous Film Forming Foam). Limitations: Inclusion in this dataset does not indicate that PFAS are being manufactured, processed, used, or released by the facility. Listed facilities potentially handle PFAS based on their industrial profile, but are unconfirmed by the EPA. Keyword searches in ECHO for Fire Training sites may misidentify some facilities and should not be considered to be an exhaustive list of fire training facilities in the U.S.

Government Publication Date: Dec 4, 2023

Hazardous Materials Information Reporting System:

HMIRS

The Hazardous Materials Incident Reporting System (HMIRS) database contains unintentional hazardous materials release information reported to the U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration.

Government Publication Date: Nov 26, 2023

National Clandestine Drug Labs:

NCDL

The U.S. Department of Justice ("the Department"), Drug Enforcement Administration (DEA), provides this data as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy.

Government Publication Date: Jul 26, 2023

Toxic Substances Control Act:

TSCA

The U.S. Environmental Protection Agency (EPA) is amending the Toxic Substances Control Act (TSCA) section 8(a) Inventory Update Reporting (IUR) rule and changing its name to the Chemical Data Reporting (CDR) rule. The CDR enables EPA to collect and publish information on the manufacturing, processing, and use of commercial chemical substances and mixtures (referred to hereafter as chemical substances) on the TSCA Chemical Substance Inventory (TSCA Inventory). This includes current information on chemical substance production volumes, manufacturing sites, and how the chemical substances are used. This information helps the Agency determine whether people or the environment are potentially exposed to reported chemical substances. EPA publishes submitted CDR data that is not Confidential Business Information (CBI). EPA CDR collections occur approximately every four years and reporting requirements change per collection.

Government Publication Date: May 12, 2022

Hist TSCA:

HIST TSCA

The Environmental Protection Agency (EPA) is amending the Toxic Substances Control Act (TSCA) section 8(a) Inventory Update Reporting (IUR) rule and changing its name to the Chemical Data Reporting (CDR) rule.

The 2006 IUR data summary report includes information about chemicals manufactured or imported in quantities of 25,000 pounds or more at a single site during calendar year 2005. In addition to the basic manufacturing information collected in previous reporting cycles, the 2006 cycle is the first time EPA collected information to characterize exposure during manufacturing, processing and use of organic chemicals. The 2006 cycle also is the first time manufacturers of inorganic chemicals were required to report basic manufacturing information.

Government Publication Date: Dec 31, 2006

FTTS Administrative Case Listing:

FTTS ADMIN

An administrative case listing from the Federal Insecticide, Fungicide, & Rodenticide Act (FIFRA) and Toxic Substances Control Act (TSCA), together known as FTTS. This database was obtained from the Environmental Protection Agency's (EPA) National Compliance Database (NCDB). The FTTS and NCDB was shut down in 2006.

Government Publication Date: Jan 19, 2007

FTTS Inspection Case Listing:

FTTS INSP

An inspection case listing from the Federal Insecticide, Fungicide, & Rodenticide Act (FIFRA) and Toxic Substances Control Act (TSCA), together known as FTTS. This database was obtained from the Environmental Protection Agency's (EPA) National Compliance Database (NCDB). The FTTS and NCDB was shut down in 2006.

Government Publication Date: Jan 19, 2007

Potentially Responsible Parties List:

PRP

Early in the site cleanup process, the U.S. Environmental Protection Agency (EPA) conducts a search to find the Potentially Responsible Parties (PRPs). The EPA looks for evidence to determine liability by matching wastes found at the site with parties that may have contributed wastes to the site. This listing contains PRPs, Noticed Parties, at sites in the EPA's Superfund Enterprise Management System (SEMS).

Government Publication Date: Jan 26, 2024

State Coalition for Remediation of Drycleaners Listing:

SCRD DRYCLEANER

The State Coalition for Remediation of Drycleaners (SCRD) was established in 1998, with support from the U.S. Environmental Protection Agency (EPA) Office of Superfund Remediation and Technology Innovation. Coalition members are states with mandated programs and funding for drycleaner site remediation. Current members are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin. Since 2017, the SCRD no longer maintains this data, refer to applicable state source data where available.

Government Publication Date: Nov 08, 2017

Integrated Compliance Information System (ICIS):

ICIS

The Integrated Compliance Information System (ICIS) database contains integrated enforcement and compliance information across most of U.S. Environmental Protection Agency's (EPA) programs. The vision for ICIS is to replace EPA's independent databases that contain enforcement data with a single repository for that information. Currently, ICIS contains all Federal Administrative and Judicial enforcement actions and a subset of the Permit Compliance System (PCS), which supports the National Pollutant Discharge Elimination System (NPDES). This information is maintained by the EPA Headquarters and at the Regional offices. A future release of ICIS will completely replace PCS and will integrate that information with Federal actions already in the system. ICIS also has the capability to track other activities that support compliance and enforcement programs, including incident tracking, compliance assistance, and compliance monitoring.

Government Publication Date: Aug 26, 2023

Drycleaner Facilities:

FED DRYCLEANERS

A list of drycleaner facilities from Enforcement and Compliance History Online (ECHO) data as made available by the U.S. Environmental Protection Agency (EPA), sourced from the ECHO Exporter file. The EPA tracks facilities that possess NAIC and SIC codes that classify businesses as drycleaner establishments.

Government Publication Date: Jan 20, 2024

Delisted Drycleaner Facilities:

DELISTED FED DRY

List of sites removed from the list of Drycleaner Facilities (sites in the EPA's Integrated Compliance Information System (ICIS) with NAIC or SIC codes identifying the business as a drycleaner establishment).

Government Publication Date: Jan 20, 2024

Formerly Used Defense Sites:

FUDS

Formerly Used Defense Sites (FUDS) are properties that were formerly owned by, leased to, or otherwise possessed by and under the jurisdiction of the Secretary of Defense prior to October 1986, where the Department of Defense (DOD) is responsible for an environmental restoration. The FUDS Annual Report to Congress (ARC) is published by the U.S. Army Corps of Engineers (USACE). This data is compiled from the USACE's Geospatial FUDS data layers and Homeland Infrastructure Foundation-Level Data (HIFLD) FUDS dataset which applies to the Fiscal Year 2021 FUDS Inventory.

Government Publication Date: May 15, 2023

FUDS Munitions Response Sites:

FUDS MRS

Boundaries of Munitions Response Sites (MRS), published with the Formerly Used Defense Sites (FUDS) Annual Report to Congress (ARC) by the U.S. Army Corps of Engineers (USACE). An MRS is a discrete location within a Munitions response area (MRA) that is known to require a munitions response. An MRA means any area on a defense site that is known or suspected to contain unexploded ordnance (UXO), discarded military munitions (DMM), or munitions constituents (MC). This data is compiled from the USACE's Geospatial MRS data layers and Homeland Infrastructure Foundation-Level Data (HIFLD) MRS dataset.

Government Publication Date: May 15, 2023

Former Military Nike Missile Sites:

FORMER NIKE

This information was taken from report DRXTH-AS-IA-83A016 (Historical Overview of the Nike Missile System, 12/1984) which was performed by Environmental Science and Engineering, Inc. for the U.S. Army Toxic and Hazardous Materials Agency Assessment Division. The Nike system was deployed between 1954 and the mid-1970's. Among the substances used or stored on Nike sites were liquid missile fuel (JP-4); starter fluids (UDKH, aniline, and furfuryl alcohol); oxidizer (IRFNA); hydrocarbons (motor oil, hydraulic fluid, diesel fuel, gasoline, heating oil); solvents (carbon tetrachloride, trichloroethylene, trichloroethane, stoddard solvent); and battery electrolyte. The quantities of material a disposed of and procedures for disposal are not documented in published reports. Virtually all information concerning the potential for contamination at Nike sites is confined to personnel who were assigned to Nike sites. During deactivation most hardware was shipped to depot-level supply points. There were reportedly instances where excess materials were disposed of on or near the site itself at closure. There was reportedly no routine site decontamination.

Government Publication Date: Dec 2, 1984

PHMSA Pipeline Safety Flagged Incidents:

PIPELINE INCIDENT

This list of flagged pipeline incidents is made available by the U.S. Department of Transportation (US DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA). PHMSA regulations require incident and accident reports for five different pipeline system types. Accidents reported on hazardous liquid gravity lines (§195.13) and reporting-regulated-only hazardous liquid gathering lines (§195.15) and incidents reported on Type R gas gathering (§192.8(c)) are not included in the flagged incident file data.

Government Publication Date: Nov 6, 2023

Material Licensing Tracking System (MLTS):

MLTS

A list of sites that store radioactive material subject to the Nuclear Regulatory Commission (NRC) licensing requirements. This list is maintained by the NRC. As of September 2016, the NRC no longer releases location information for sites. Site locations were last received in July 2016.

Government Publication Date: May 11, 2021

Historic Material Licensing Tracking System (MLTS) sites:**HIST MLTS**

A historic list of sites that have inactive licenses and/or removed from the Material Licensing Tracking System (MLTS). In some cases, a site is removed from the MLTS when the state becomes an "Agreement State". An Agreement State is a State that has signed an agreement with the Nuclear Regulatory Commission (NRC) authorizing the State to regulate certain uses of radioactive materials within the State.

Government Publication Date: Jan 31, 2010

Mines Master Index File:**MINES**

The Master Index File (MIF) is provided by the United States Department of Labor, Mine Safety and Health Administration (MSHA). This file, which was originally created in the 1970's, contained many Mine-IDs that were invalid. MSHA removes invalid IDs from the MIF upon discovery. MSHA applicable data includes the following: all Coal and Metal/Non-Metal mines under MSHA's jurisdiction since 1/1/1970; mine addresses for all mines in the database except for Abandoned mines prior to 1998 from MSHA's legacy system (addresses may or may not correspond with the physical location of the mine itself); violations that have been assessed penalties as a result of MSHA inspections beginning on 1/1/2000; and violations issued as a result of MSHA inspections conducted beginning on 1/1/2000.

Government Publication Date: May 1, 2023

Surface Mining Control and Reclamation Act Sites:**SMCRA**

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by the Office of Surface Mining Reclamation and Enforcement (OSMRE) to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). This inventory contains information on the type and extent of Abandoned Mine Land (AML) impacts, as well as information on the cost associated with the reclamation of those problems. The data is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed. Disclaimer: Per the OSMRE, States and tribes who enter their data into eAMLIS (AML Inventory System) may truncate their latitude and longitude so the precise location of usually dangerous AMLs is not revealed in an effort to protect the public from searching for these AMLs, most of which are on private property. If more precise location information is needed, please contact the applicable state/tribe of interest.

Government Publication Date: Jun 13, 2023

Mineral Resource Data System:**MRDS**

The Mineral Resource Data System (MRDS) is a collection of reports describing metallic and nonmetallic mineral resources throughout the world. Included are deposit name, location, commodity, deposit description, geologic characteristics, production, reserves, resources, and references. This database contains the records previously provided in the Mineral Resource Data System (MRDS) of USGS and the Mineral Availability System/Mineral Industry Locator System (MAS/MILS) originated in the U.S. Bureau of Mines, which is now part of USGS. The USGS has ceased systematic updates of the MRDS database with their focus more recently on deposits of critical minerals while providing a well-documented baseline of historical mine locations from USGS topographic maps.

Government Publication Date: Mar 15, 2016

DOE Legacy Management Sites:**LM SITES**

The U.S. Department of Energy (DOE) Office of Legacy Management (LM) currently manages radioactive and chemical waste, environmental contamination, and hazardous material at over 100 sites across the U.S. The LM manages sites with diverse regulatory drivers (statutes or programs that direct cleanup and management requirements at DOE sites) or as part of internal DOE or congressionally-recognized programs, such as but not limited to: Formerly Utilized Sites Remedial Action Program (FUSRAP), Uranium Mill Tailings Radiation Control Act (UMTRCA Title I, Title II), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Resource Conservation and Recovery Act (RCRA), Decontamination and Decommissioning (D&D), Nuclear Waste Policy Act (NWPA). This site listing includes data exported from the DOE Office of LM's Geospatial Environmental Mapping System (GEMS). GEMS Data disclaimer: The DOE Office of LM makes no representation or warranty, expressed or implied, regarding the use, accuracy, availability, or completeness of the data presented herein.

Government Publication Date: Dec 12, 2023

Alternative Fueling Stations:**ALT FUELS**

This list of alternative fueling stations is sourced from the Alternative Fuels Data Center (AFDC). The U.S. Department of Energy's Office of Energy Efficiency & Renewable Energy launched the AFDC in 1991 as a repository for alternative fuel vehicle performance data, which provides a wealth of information and data on alternative and renewable fuels, advanced vehicles, fuel-saving strategies, and emerging transportation technologies. The data includes Biodiesel (B20 and above), Compressed Natural Gas (CNG), Electric, Ethanol (E85), Hydrogen, Liquefied Natural Gas (LNG), Propane (LPG), and Renewable Diesel (R20 and above) fuel type locations.

Government Publication Date: Nov 27, 2023

Superfunds Consent Decrees:**CONSENT DECREES**

This list of Superfund consent decrees is provided by the Department of Justice, Environment & Natural Resources Division (ENRD) through a Freedom of Information Act (FOIA) applicable file. This listing includes Consent Decrees for CERCLA or Superfund Sites filed and/or as proposed within the ENRD's Case Management System (CMS) since 2010. CMS may not reflect the latest developments in a case nor can the agency guarantee the accuracy of the data. ENRD Disclaimer: Congress excluded three discrete categories of law enforcement and national security records from the requirements of the FOIA; response is limited to those records that are subject to the requirements of the FOIA; however, this should not be taken as an indication that excluded records do, or do not, exist.

Government Publication Date: Apr 19, 2023

Air Facility System:

AFS

This EPA retired Air Facility System (AFS) dataset contains emissions, compliance, and enforcement data on stationary sources of air pollution. Regulated sources cover a wide spectrum; from large industrial facilities to relatively small operations such as dry cleaners. AFS does not contain data on facilities that are solely asbestos demolition and/or renovation contractors, or landfills. ECHO Clean Air Act data from AFS are frozen and reflect data as of October 17, 2014; the EPA retired this system for Clean Air Act stationary sources and transitioned to ICIS-Air.

Government Publication Date: Oct 17, 2014

Registered Pesticide Establishments:

SSTS

This national list of active EPA-registered foreign and domestic pesticide and/or device-producing establishments is based on data from the Section Seven Tracking System (SSTS). The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Section 7 requires that each producing establishment must place its EPA establishment number on the label or immediate container of each pesticide, active ingredient or device produced. An EPA establishment number on a pesticide product label identifies the EPA registered location where the product was produced. The list of establishments is made available by the U.S. Environmental Protection Agency (EPA).

Government Publication Date: Mar 1, 2023

Polychlorinated Biphenyl (PCB) Transformers:

PCBT

Locations of Transformers Containing Polychlorinated Biphenyls (PCBs) registered with the United States Environmental Protection Agency. PCB transformer owners must register their transformer(s) with EPA. Although not required, PCB transformer owners who have removed and properly disposed of a registered PCB transformer may notify EPA to have their PCB transformer de-registered. Data made available by EPA.

Government Publication Date: Oct 15, 2019

Polychlorinated Biphenyl (PCB) Notifiers:

PCB

Facilities included in the national list of facilities that have notified the United States Environmental Protection Agency (EPA) of Polychlorinated Biphenyl (PCB) activities. Any company or person storing, transporting or disposing of PCBs or conducting PCB research and development must notify the EPA and receive an identification number.

Government Publication Date: Oct 30, 2023

State

Spill incidents reported to Iowa DNR and tracked in the Hazardous Substance Incident database:

SPILLS

Spill incidents reported to the Iowa Department of Natural Resources (DNR) and tracked in the Hazardous Substance Incident database.

Government Publication Date: Oct 25, 2023

Dry Cleaning Facilities:

DRYCLEANERS

A listing of drycleaners in Iowa. This is maintained by Iowa's Department of Natural Resources's Air Bureau Quality.

Government Publication Date: Jan 16, 2024

Delisted Drycleaners:

DELISTED DRYCLEANERS

List of sites which once appeared on - and have since been removed from - the list of drycleaners made available by Iowa's Department of Natural Resources Air Quality Bureau.

Government Publication Date: Jan 16, 2024

Air Permitted Facilities:

AIR PERMITS

The Iowa Department of Natural Resources (DNR) maintains this list of facilities with operating permits for Title V of the Federal Clean Air Act, as well as facilities required to submit an air emissions inventory, and other facilities with air quality interest such as Feed Mills, Group 1 Grain Elevators, and Permit By Rule (PBR) Spray Booths.

Government Publication Date: Jan 16, 2024

Per- and Polyfluoroalkyl Substances (PFAS) Use or Release:

PFAS

List of known or suspected Per- and Polyfluoroalkyl Substances (PFAS) release locations and sites engaged in a business type that is known to use PFAS in some manner. Data made available by the Iowa Department of Natural Resources.

Government Publication Date: Jan 13, 2021

Liens Filed Listing:

LIENS

A list of Underground Storage Tank Fund Liens maintained by the Iowa Department of Natural Resources.

Government Publication Date: Dec 6, 2023

Tier 2 Report:

TIER 2

A list of Tier II facilities sourced from the Iowa Department of Natural Resources. Facilities that store hazardous chemicals above certain quantities must submit an annual emergency and hazardous chemical inventory on a Tier II form. This is a requirement of Section 311/312 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA).

Government Publication Date: Aug 14, 2023

Tribal

No Tribal additional environmental record sources available for this State.

County

No County additional environmental record sources available for this State.

Definitions

Database Descriptions: This section provides a detailed explanation for each database including: source, information available, time coverage, and acronyms used. They are listed in alphabetic order.

Detail Report: This is the section of the report which provides the most detail for each individual record. Records are summarized by location, starting with the project property followed by records in closest proximity.

Distance: The distance value is the distance between plotted points, not necessarily the distance between the sites' boundaries. All values are an approximation.

Direction: The direction value is the compass direction of the site in respect to the project property and/or center point of the report.

Elevation: The elevation value is taken from the location at which the records for the site address have been plotted. All values are an approximation. Source: Google Elevation API.

Executive Summary: This portion of the report is divided into 3 sections:

'Report Summary'- Displays a chart indicating how many records fall on the project property and, within the report search radii.

'Site Report Summary'-Project Property'- This section lists all the records which fall on the project property. For more details, see the 'Detail Report' section.

'Site Report Summary-Surrounding Properties'- This section summarizes all records on adjacent properties, listing them in order of proximity from the project property. For more details, see the 'Detail Report' section.

Map Key: The map key number is assigned according to closest proximity from the project property. Map Key numbers always start at #1. The project property will always have a map key of '1' if records are available. If there is a number in brackets beside the main number, this will indicate the number of records on that specific property. If there is no number in brackets, there is only one record for that property.

The symbol and colour used indicates 'elevation': the red inverted triangle will dictate 'ERIS Sites with Lower Elevation', the yellow triangle will dictate 'ERIS Sites with Higher Elevation' and the orange square will dictate 'ERIS Sites with Same Elevation.'

Unplottables: These are records that could not be mapped due to various reasons, including limited geographic information. These records may or may not be in your study area, and are included as reference.



Property Information

Order Number:	24041700273p
Date Completed:	April 17, 2024
Project Number:	23S049.00 Phase 130 Task 307
Project Property:	Sioux Gateway Airport NEPA n/a Sioux City IA
Coordinates:	
Latitude:	42.4127437
Longitude:	-96.39699546
UTM Northing:	4698886.98761 Meters
UTM Easting:	714182.712516 Meters
UTM Zone:	UTM Zone 14T
Elevation:	1,087.61 ft
Slope Direction:	N

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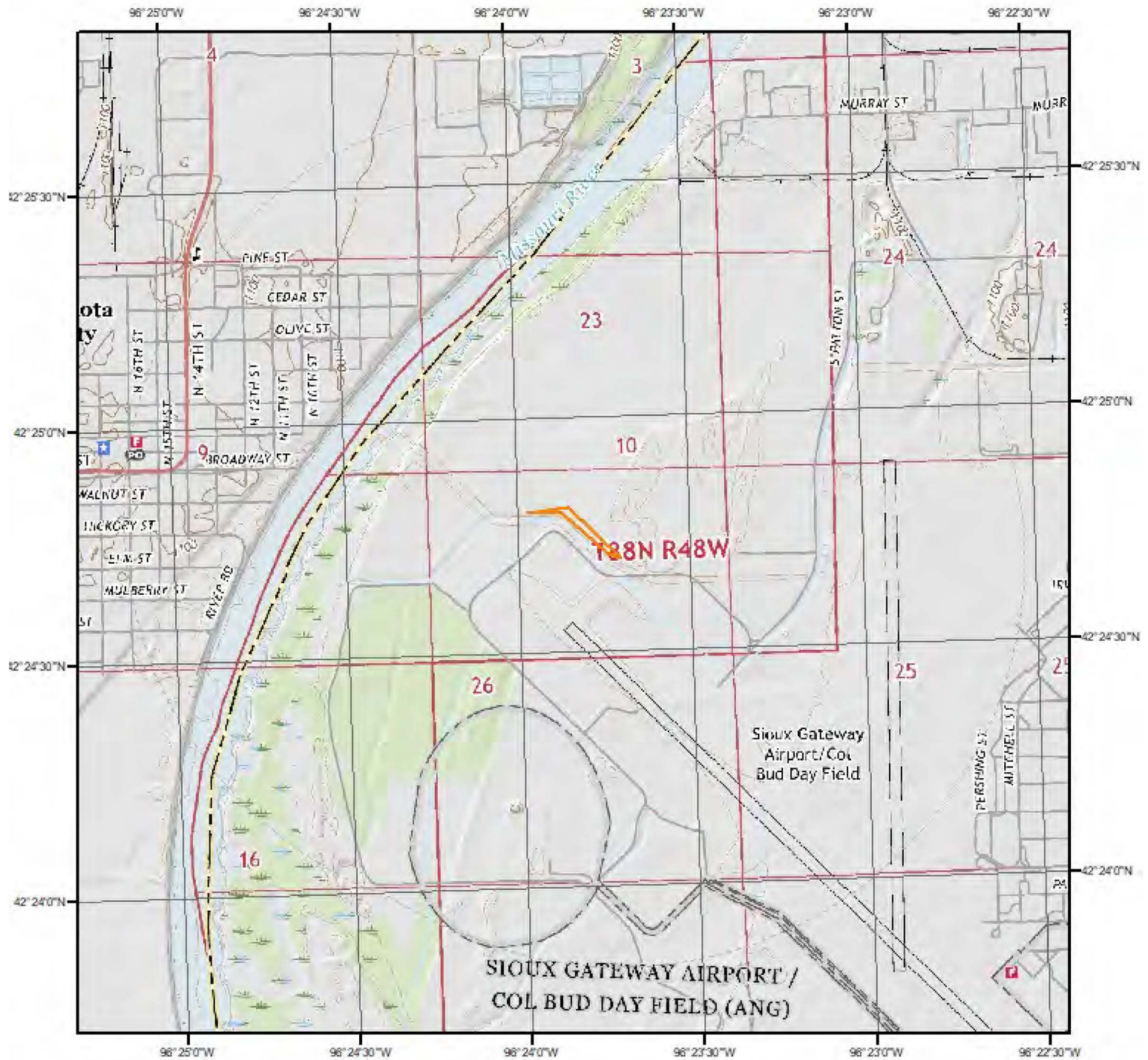
The ERIS **Physical Setting Report - PSR** provides comprehensive information about the physical setting around a site and includes a complete overview of topography and surface topology, in addition to hydrologic, geologic and soil characteristics. The location and detailed attributes of oil and gas wells, water wells, public water systems and radon are also included for review.

The compilation of both physical characteristics of a site and additional attribute data is useful in assessing the impact of migration of contaminants and subsequent impact on soils and groundwater.

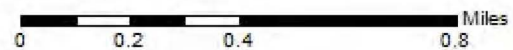
Disclaimer

This Report does not provide a full environmental evaluation for the site or adjacent properties. Please see the terms and disclaimer at the end of the Report for greater detail.

Topographic Information



Current USGS Topo (2018)



Quadrangle(s): Sergeant Bluff, IA; Sioux City South, IA

Source: USGS 7.5 Minute Topographic Map



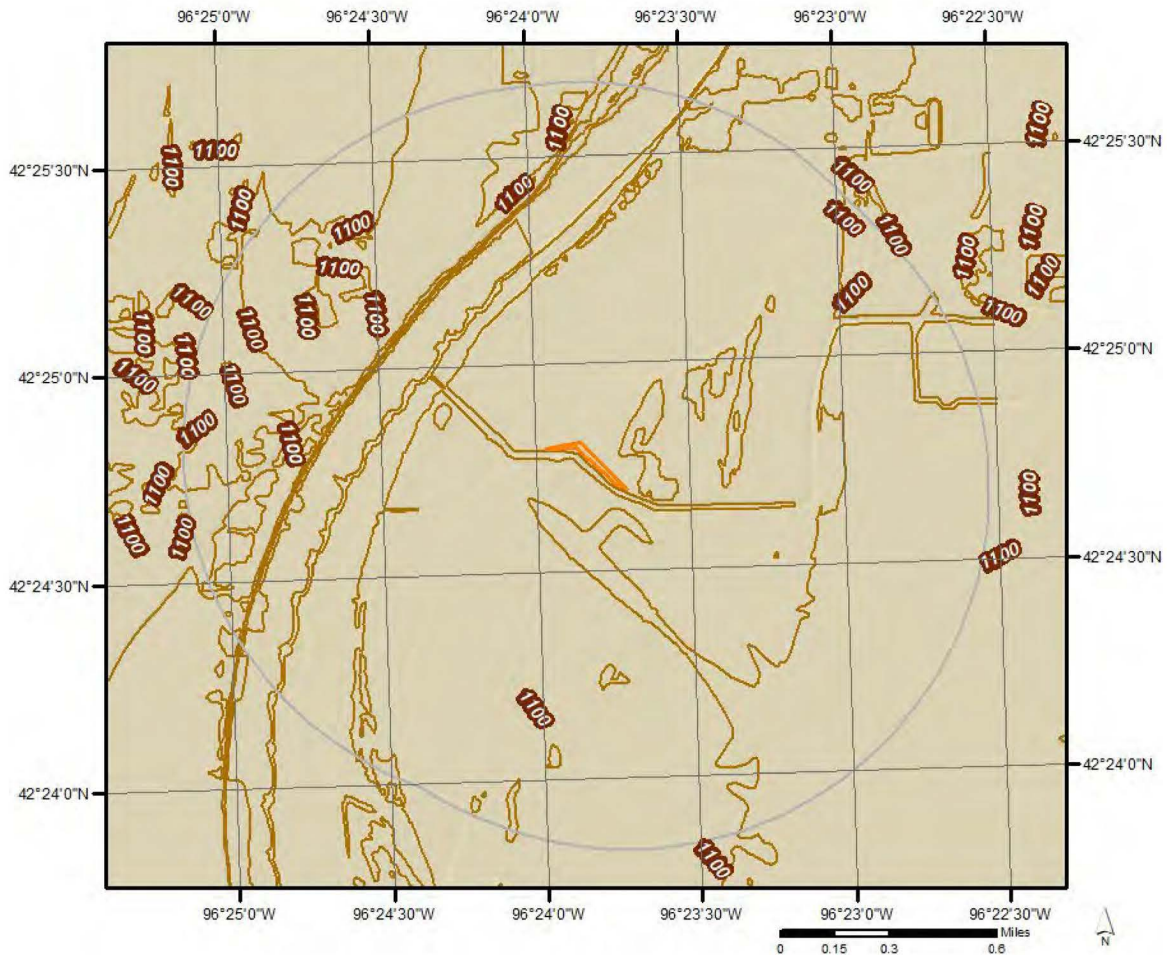
Topographic Information

The previous topographic map(s) are created by seamlessly merging and cutting current USGS topographic data. Below are shaded relief map(s), derived from USGS elevation data to show surrounding topography in further detail.

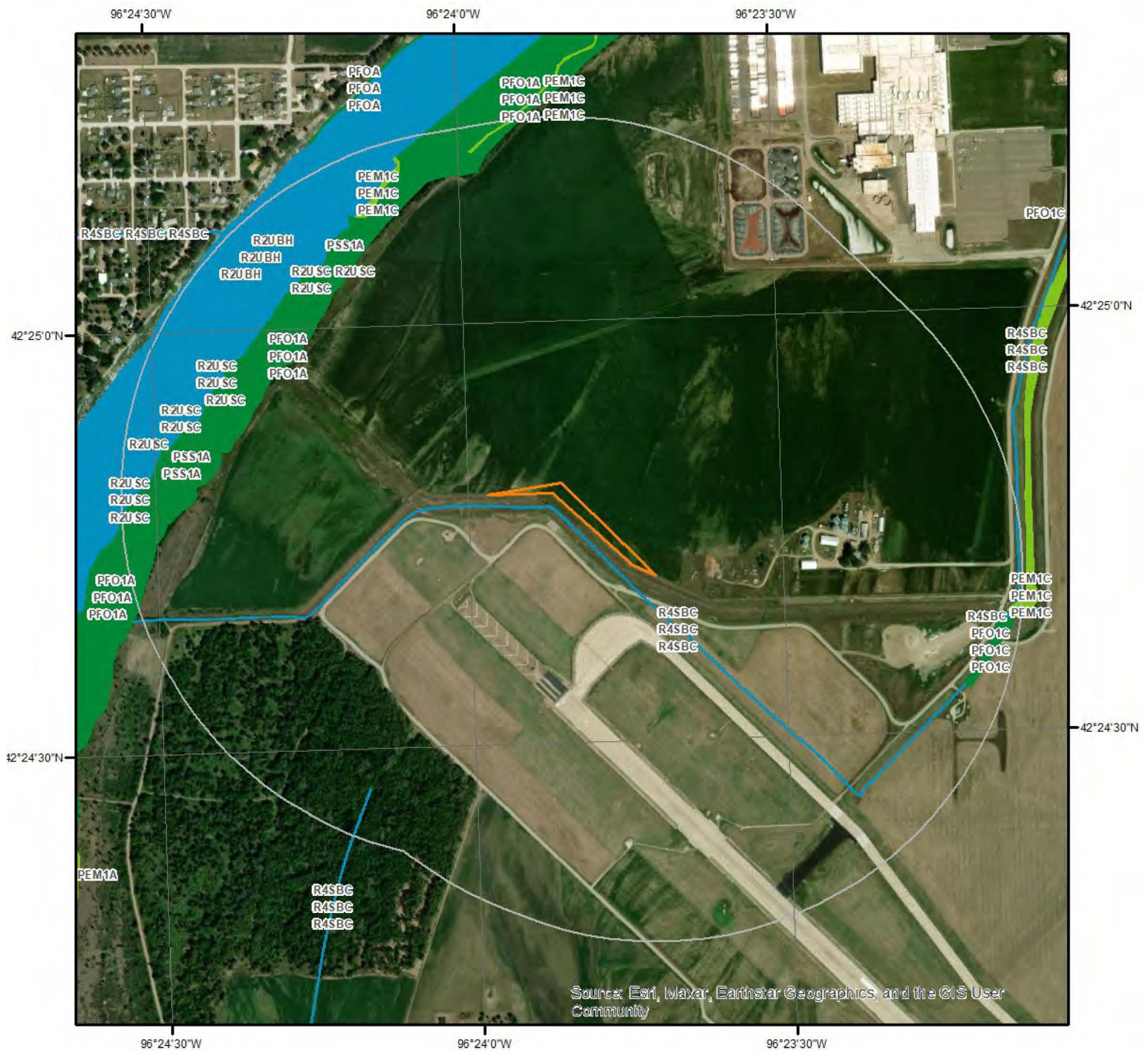
Topographic information at project property:

Elevation: 1,087.61 ft

Slope Direction: N



Hydrologic Information

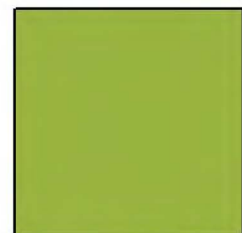


Wetland

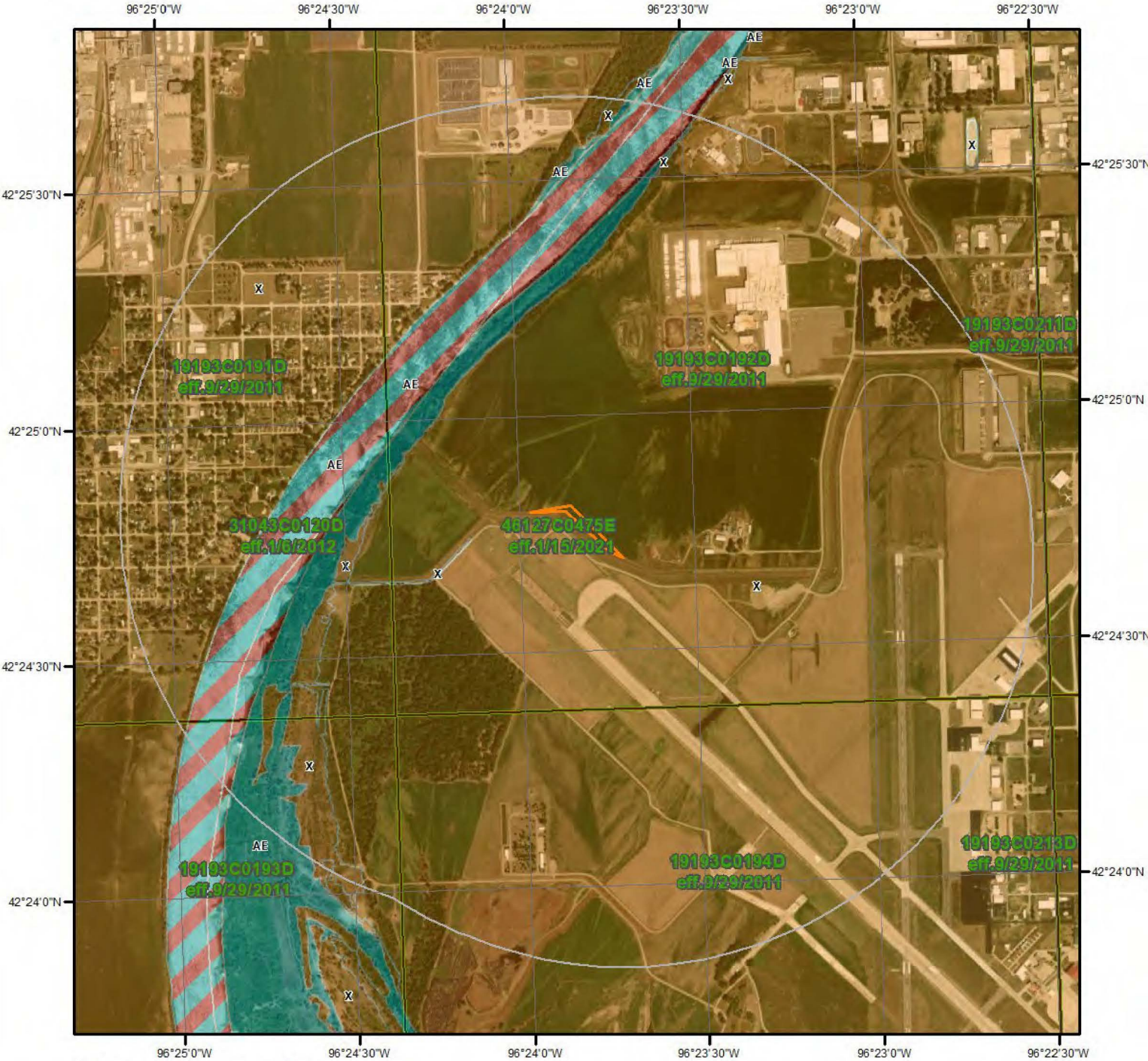
This map shows wetland existence using data from US Fish & Wildlife. Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland

- Freshwater Pond
- Lake
- Other
- Riverine



Hydrologic Information

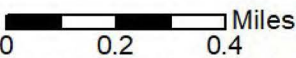


Flood Hazard Zones

This map shows FEMA flood hazard zones based on FEMA's National Flood Hazard Layer. FIRM Panels are overlaid. An absent FIRM panel represents no data available.

- 1% Annual Chance Flood Hazard
- Regulatory Floodway
- Special Floodway
- Area of Undetermined Flood Hazard

- 0.2% Annual Chance Flood Hazard
- Future Conditions 1% Annual Chance Flood Hazard
- Area with Reduced Risk Due to Levee
- Area with Risk Due to Levee
- Open Water



Quadrangle(s): Sergeant Bluff,IA; Sioux City South,IA



Hydrologic Information

The Wetland Type map shows wetland existence overlaid on an aerial imagery. The Flood Hazard Zones map shows FEMA flood hazard zones overlaid on an aerial imagery. Relevant FIRM panels and detailed zone information is provided below. For detailed Zone descriptions please click the link: <https://floodadvocate.com/fema-zone-definitions>

Available FIRM Panels in area:	46127C0475E(effective:2021-01-15) 31043C0120D(effective:2012-01-06) 19193C0194D(effective:2011-09-29) 19193C0193D(effective:2011-09-29) 19193C0192D(effective:2011-09-29) 19193C0191D(effective:2011-09-29)
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Flood Zone AE-01

Zone:	AE
Zone subtype:	

Flood Zone AE-11

Zone:	AE
Zone subtype:	FLOODWAY

Flood Zone X-01

Zone:	X
Zone subtype:	0.2 PCT ANNUAL CHANCE FLOOD HAZARD

Flood Zone X-12

Zone:	X
Zone subtype:	AREA OF MINIMAL FLOOD HAZARD

Geologic Information



Geologic Units

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.



Geologic Information

The previous page shows USGS geology information. Detailed information about each unit is provided below.

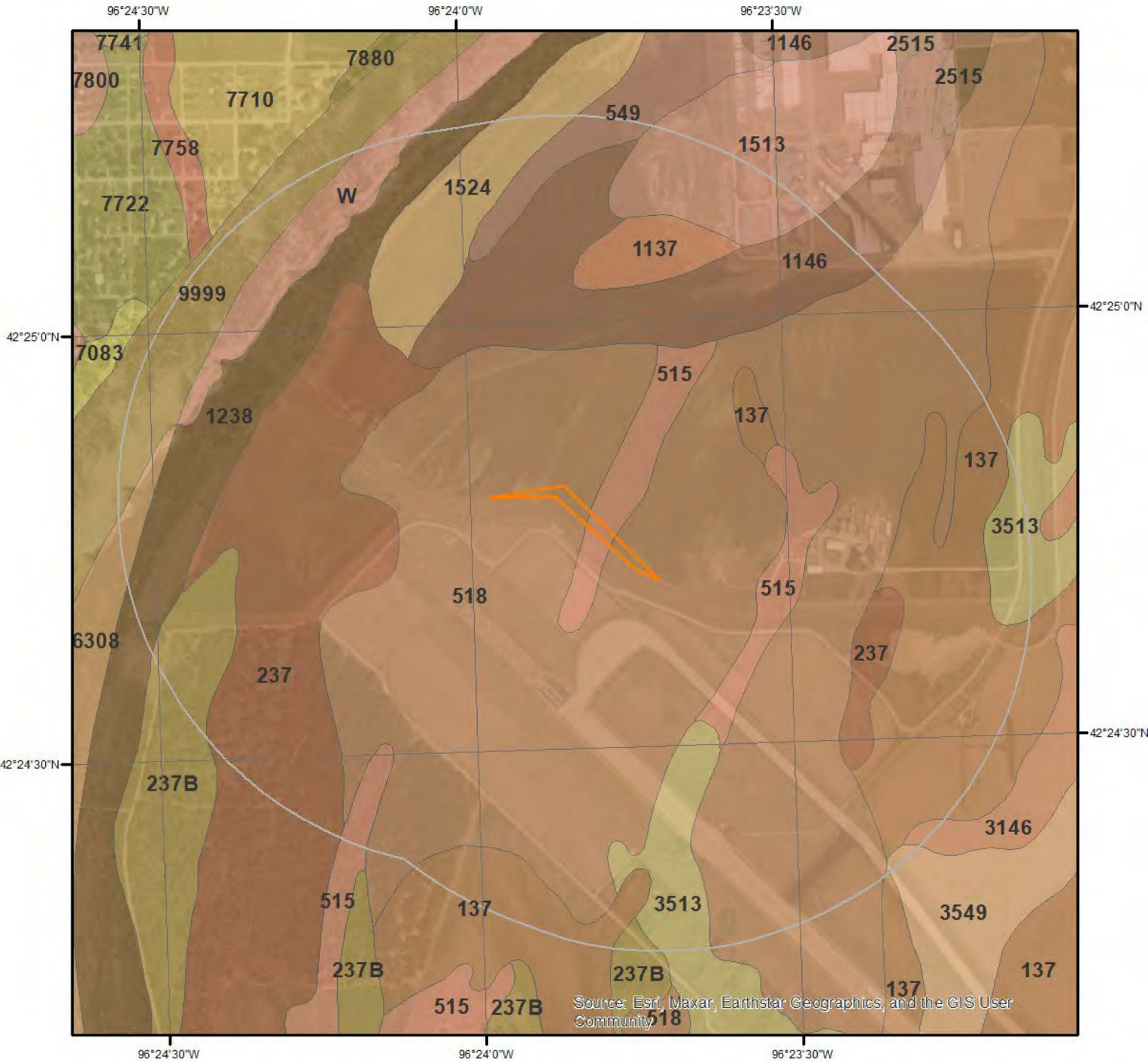
Geologic Unit Kd

Unit Name:	Dakata and Windrow Formations
Unit Age:	"Mid" Cretaceous; upper Albian-upper Cenomanian
Primary Rock Type:	Sandstone
Secondary Rock Type:	Shale
Unit Description:	Dakota Formation widespread in western Iowa, lower sandstone-dominated Nishnabotna Member, upper mudstone/shale-dominated Woodbury Member. Correlative Windrow Formation found as erosional outliers in northeastern and north-central Iowa. Primary lithologies: sandstone, quartzose, very fine to medium grained; mudstone/shale, light to dark gray, variably silty-sandy, noncalcareous (Woodbury Mbr.). Secondary lithologies: sandstone, medium to very coarse grained, part pebbly to gravelly, locally cemented by iron oxides (Nishnabotna Mbr., Windrow Fm.), gravel, quartz and chert clasts; siltstone; mudstone, red, pink, yellow-brown, black (carbonaceous). Minor: lignite; siderite (concretions, pedogenic sphaerosiderite pellets, cemented siltstone); massive iron ore, silty to sandy (Windrow Fm.). Maximum thickness Dakota Fm. 500 ft (150 m), commonly 100-300 ft (30-90 m); Windrow Fm. 40 ft (12 m).

Geologic Unit Kd

Unit Name:	Dakota Group
Unit Age:	Early Cretaceous
Primary Rock Type:	Sandstone
Secondary Rock Type:	Shale
Unit Description:	Upper part is white, light-gray, brownish-gray, yellow, redish-brown, and red sandstone and shale. Sandstone is very fine to coarse grained, friable, micaceous, crossbedded, and lenticular; locally contains gravel near base. contains numerous zones of ironstone and siltstone concretions of variable thickness. Middle part is light-gray, yellow, red brown and dark-gray, sandy carbonaceous shale; commonly contains a zone of concretions near top. Lower part is sandstone similar to that in upper except there are zones of siderite concretions and, locally a basal zone of chert pebbles. Approx. max thickness 600 ft.

Soil Information



SSURGO Soils



This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.



Soil Information

The previous page shows a soil map using SSURGO data from USDA Natural Resources Conservation Service. Detailed information about each unit is provided below.

Map Unit 1137 (0.19%)

Map Unit Name:	Haynie silt loam, 0 to 2 percent slopes, occasionally flooded
Bedrock Depth - Min:	null
Watertable Depth - Annual Min:	152cm
Drainage Class - Dominant:	Moderately well drained
Hydrologic Group - Dominant:	B - Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded.

Major components are printed below

Haynie(80%)

horizon Ap(0cm to 18cm)	Silt loam
horizon C(18cm to 152cm)	Silt loam

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 1137 - Haynie silt loam, 0 to 2 percent slopes, occasionally flooded

Component: Haynie (80%)

The Haynie, occasionally flooded component makes up 80 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on river valleys. The parent material consists of calcareous silty alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very high. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 60 inches during January, February, March, April, May, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 2 percent. This component is in the F107BY016MO Loamy Floodplain Forest Quercus Bicolor-populus Deltoides/glyceria Striata-ranunculus Hispidus Swamp White Oak-eastern Cottonwood/fowl Mannagrass-bristly Buttercup ecological site. Nonirrigated land capability classification is 2w. Irrigated land capability classification is 2w. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 18 percent. There are no saline horizons within 30 inches of the soil surface.

Component: Grable (10%)

Generated brief soil descriptions are created for major soil components. The Grable, occasionally flooded soil is a minor component.

Component: Lossing (5%)

Generated brief soil descriptions are created for major soil components. The Lossing, occasionally flooded soil is a minor component.

Component: Albaton (5%)

Generated brief soil descriptions are created for major soil components. The Albaton, occasionally flooded soil is a minor component.

Map Unit 1146 (1.28%)

Map Unit Name:	Onawa silty clay, 0 to 2 percent slopes, occasionally flooded
Bedrock Depth - Min:	null
Watertable Depth - Annual Min:	30cm
Drainage Class - Dominant:	Somewhat poorly drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Onawa(75%)

horizon Ap1,Ap2(0cm to 22cm)	Silty clay
horizon Cg1,Cg4(22cm to 91cm)	Silty clay

Soil Information

horizon 2Cg5,2Cg8(91cm to 203cm)

Silt loam

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 1146 - Onawa silty clay, 0 to 2 percent slopes, occasionally flooded

Component: Onawa (75%)

The Onawa, occasionally flooded component makes up 75 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on river valleys. The parent material consists of clayey alluvium over silty alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is moderate. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during January, February, March, April, May, June, July, November, December. Organic matter content in the surface horizon is about 3 percent. This component is in the F107BY017MO Clayey Floodplain Forest *Ulmus Americana/toxicodendron Radicans/elymus Virginicus-geum Canadense* American Elm/eastern Poison Ivy/virginia Wildrye-white Avens ecological site. Nonirrigated land capability classification is 2w. Irrigated land capability classification is 2w. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 18 percent.

Component: Onawa (10%)

Generated brief soil descriptions are created for major soil components. The Onawa, silt loam, occasionally flooded soil is a minor component.

Component: Morconick (5%)

Generated brief soil descriptions are created for major soil components. The Morconick, occasionally flooded soil is a minor component.

Component: Grable (5%)

Generated brief soil descriptions are created for major soil components. The Grable, occasionally flooded soil is a minor component.

Component: Owego (5%)

Generated brief soil descriptions are created for major soil components. The Owego, rarely flooded soil is a minor component.

Map Unit 1238 (4.22%)

Map Unit Name:	Sarpy-Morconick complex, 0 to 2 percent slopes, occasionally flooded
Bedrock Depth - Min:	null
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Excessively drained
Hydrologic Group - Dominant:	A - Soils in this group have low runoff potential when thoroughly wet. Water is transmitted freely through the soil.

Major components are printed below

Sarpy(60%)

horizon Ap(0cm to 15cm)	Loamy fine sand
horizon C(15cm to 152cm)	Fine sand

Morconick(20%)

horizon Ap(0cm to 18cm)	Fine sandy loam
horizon C1(18cm to 33cm)	Loam
horizon 2C2,2C8(33cm to 203cm)	Fine sand

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 1238 - Sarpy-Morconick complex, 0 to 2 percent slopes, occasionally flooded

Component: Sarpy (60%)

The Sarpy, occasionally flooded component makes up 60 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on river valleys. The parent material consists of sandy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is excessively drained. Water movement in the most restrictive layer is high. Available water to a depth of

Soil Information

60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the F107BY015MO Sandy/loamy Floodplain Forest Populus Deltoides-platanus Occidentalis/salix Exigua-salix Amygdaloides/c. Americana-r. Laciniata Eastern Cottonwood-am. Sycamore/sandbar Willow-peachleaf Willow/am. Bellflower-cutleaf Coneflower ecological site. Nonirrigated land capability classification is 4s. Irrigated land capability classification is 3s. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 2 percent.

Component: Morconick (20%)

The Morconick, occasionally flooded component makes up 20 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on river valleys. The parent material consists of loamy alluvium over sandy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the F107BY016MO Loamy Floodplain Forest Quercus Bicolor-populus Deltoides/glyceria Striata-ranunculus Hispidus Swamp White Oak-eastern Cottonwood/fowl Mannagrass-bristly Buttercup ecological site. Nonirrigated land capability classification is 3s. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 3 percent.

Component: Percival (12%)

Generated brief soil descriptions are created for major soil components. The Percival, occasionally flooded soil is a minor component.

Component: Modale (5%)

Generated brief soil descriptions are created for major soil components. The Modale, occasionally flooded soil is a minor component.

Component: Haynie (3%)

Generated brief soil descriptions are created for major soil components. The Haynie, occasionally flooded soil is a minor component.

Map Unit 137 (38.12%)

Map Unit Name:	Haynie silt loam, deep loess, 0 to 2 percent slopes, rarely flooded
Bedrock Depth - Min:	null
Watertable Depth - Annual Min:	152cm
Drainage Class - Dominant:	Moderately well drained
Hydrologic Group - Dominant:	B - Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded.

Major components are printed below

Haynie(90%)

horizon Ap(0cm to 18cm)	Silt loam
horizon C(18cm to 152cm)	Silt loam

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 137 - Haynie silt loam, deep loess, 0 to 2 percent slopes, rarely flooded

Component: Haynie (90%)

The Haynie, rarely flooded component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on river valleys. The parent material consists of calcareous silty alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very high. Shrink-swell potential is low. This soil is rarely flooded. It is not ponded. A seasonal zone of water saturation is at 60 inches during January, February, March, April, May, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 2 percent. This component is in the F107BY016MO Loamy Floodplain Forest Quercus Bicolor-populus Deltoides/glyceria Striata-ranunculus Hispidus Swamp White Oak-eastern Cottonwood/fowl Mannagrass-bristly Buttercup ecological site. Nonirrigated land capability classification is 1. Irrigated land capability classification is 1 This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 18 percent. There are no saline horizons within 30 inches of the soil surface.

Component: Percival (5%)

Generated brief soil descriptions are created for major soil components. The Percival, rarely flooded soil is a minor component.

Component: Sarpy (5%)

Soil Information

Generated brief soil descriptions are created for major soil components. The Sarpy, rarely flooded soil is a minor component.

Map Unit 1513 (0.88%)

Map Unit Name:	Grable-Morconick complex, 0 to 2 percent slopes, occasionally flooded
Bedrock Depth - Min:	null
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	B - Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded.

Major components are printed below

Grable(70%)

horizon Ap(0cm to 15cm)	Silt loam
horizon C1(15cm to 58cm)	Silt loam
horizon 2C2(58cm to 152cm)	Fine sand

Morconick(20%)

horizon Ap(0cm to 18cm)	Fine sandy loam
horizon C1(18cm to 33cm)	Loam
horizon 2C2,2C8(33cm to 203cm)	Fine sand

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 1513 - Grable-Morconick complex, 0 to 2 percent slopes, occasionally flooded

Component: Grable (70%)

The Grable, occasionally flooded component makes up 70 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on river valleys. The parent material consists of silty alluvium over sandy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the F107BY016MO Loamy Floodplain Forest Quercus Bicolor-populus Deltoides/glyceria Striata-ranunculus Hispidus Swamp White Oak-eastern Cottonwood/fowl Mannagrass-bristly Buttercup ecological site. Nonirrigated land capability classification is 2s. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 18 percent.

Component: Morconick (20%)

The Morconick, occasionally flooded component makes up 20 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on river valleys. The parent material consists of loamy alluvium over sandy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the F107BY016MO Loamy Floodplain Forest Quercus Bicolor-populus Deltoides/glyceria Striata-ranunculus Hispidus Swamp White Oak-eastern Cottonwood/fowl Mannagrass-bristly Buttercup ecological site. Nonirrigated land capability classification is 3s. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 3 percent.

Component: Percival (10%)

Generated brief soil descriptions are created for major soil components. The Percival, occasionally flooded soil is a minor component.

Map Unit 1524 (2.15%)

Map Unit Name:	Morconick fine sandy loam, 0 to 2 percent slopes, occasionally flooded
Bedrock Depth - Min:	null
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained

Soil Information

Hydrologic Group - Dominant:

B - Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded.

Major components are printed below

Morconick(85%)

horizon Ap(0cm to 18cm)

Fine sandy loam

horizon C1(18cm to 33cm)

Loam

horizon 2C2,2C8(33cm to 203cm)

Fine sand

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 1524 - Morconick fine sandy loam, 0 to 2 percent slopes, occasionally flooded

Component: Morconick (85%)

The Morconick, occasionally flooded component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on river valleys. The parent material consists of loamy alluvium over sandy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the F107BY016MO Loamy Floodplain Forest Quercus Bicolor-populus Deltoides/glyceria Striata-ranunculus Hispidus Swamp White Oak-eastern Cottonwood/fowl Mannagrass-bristly Buttercup ecological site. Nonirrigated land capability classification is 3s. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 3 percent.

Component: Percival (10%)

Generated brief soil descriptions are created for major soil components. The Percival, occasionally flooded soil is a minor component.

Component: Albaton (5%)

Generated brief soil descriptions are created for major soil components. The Albaton, undrained, occasionally flooded soil is a minor component.

Map Unit 237 (2.76%)

Map Unit Name:

Sarpy loamy fine sand, 0 to 2 percent slopes, rarely flooded

Bedrock Depth - Min:

null

Watertable Depth - Annual Min:

null

Drainage Class - Dominant:

Excessively drained

Hydrologic Group - Dominant:

A - Soils in this group have low runoff potential when thoroughly wet. Water is transmitted freely through the soil.

Major components are printed below

Sarpy(95%)

horizon Ap(0cm to 15cm)

Loamy fine sand

horizon C(15cm to 152cm)

Fine sand

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 237 - Sarpy loamy fine sand, 0 to 2 percent slopes, rarely flooded

Component: Sarpy (95%)

The Sarpy, rarely flooded component makes up 95 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on river valleys. The parent material consists of sandy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is excessively drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is rarely flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the F107BY015MO Sandy/loamy Floodplain Forest Populus Deltoides-platanus Occidentalis/salix Exigua-salix Amygdaloides/c. Americana-r. Laciniata Eastern Cottonwood-am. Sycamore/sandbar Willow-peachleaf Willow/am. Bellflower-cutleaf Coneflower ecological site. Nonirrigated land capability classification is 4s. Irrigated land capability classification is 3s. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 8 percent.

Soil Information

Component: Haynie (5%)

Generated brief soil descriptions are created for major soil components. The Haynie, rarely flooded soil is a minor component.

Map Unit 237B (0.87%)

Map Unit Name:	Sarpy loamy fine sand, 2 to 5 percent slopes, rarely flooded
Bedrock Depth - Min:	null
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Excessively drained
Hydrologic Group - Dominant:	A - Soils in this group have low runoff potential when thoroughly wet. Water is transmitted freely through the soil.

Major components are printed below

Sarpy(80%)

horizon Ap(0cm to 15cm)	Loamy fine sand
horizon C(15cm to 152cm)	Fine sand

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 237B - Sarpy loamy fine sand, 2 to 5 percent slopes, rarely flooded

Component: Sarpy (80%)

The Sarpy, rarely flooded component makes up 80 percent of the map unit. Slopes are 2 to 5 percent. This component is on flood plains on river valleys. The parent material consists of sandy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is excessively drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is rarely flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the F107BY015MO Sandy/loamy Floodplain Forest Populus Deltoides-platanus Occidentalis/salix Exigua-salix Amygdaloides/c. Americana-r. Laciniata Eastern Cottonwood-am. Sycamore/sandbar Willow-peachleaf Willow/am. Bellflower-cutleaf Coneflower ecological site. Nonirrigated land capability classification is 4s. Irrigated land capability classification is 3s. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 8 percent.

Component: Onawa (10%)

Generated brief soil descriptions are created for major soil components. The Onawa, rarely flooded soil is a minor component.

Component: Ticonic (10%)

Generated brief soil descriptions are created for major soil components. The Ticonic, rarely flooded soil is a minor component.

Map Unit 3146 (0.51%)

Map Unit Name:	Onawa-Albaton complex, 0 to 2 percent slopes, rarely flooded
Bedrock Depth - Min:	null
Watertable Depth - Annual Min:	0cm
Drainage Class - Dominant:	Somewhat poorly drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Onawa(55%)

horizon Ap1,Ap2(0cm to 22cm)	Silty clay
horizon Cg1,Cg4(22cm to 91cm)	Silty clay
horizon 2Cg5,2Cg8(91cm to 203cm)	Silt loam

Albaton(25%)

horizon Ap(0cm to 18cm)	Silty clay
horizon Cg(18cm to 152cm)	Silty clay

Component Description:

Soil Information

Minor map unit components are excluded from this report.

Map Unit: 3146 - Onawa-Albaton complex, 0 to 2 percent slopes, rarely flooded

Component: Onawa (55%)

The Onawa, rarely flooded component makes up 55 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on river valleys. The parent material consists of clayey alluvium over silty alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is moderate. This soil is rarely flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during January, February, March, April, May, June, July, November, December. Organic matter content in the surface horizon is about 3 percent. This component is in the F107BY017MO Clayey Floodplain Forest Ulmus Americana/toxicodendron Radicans/elymus Virginicus-geum Canadense American Elm/eastern Poison Ivy/virginia Wildrye-white Avens ecological site. Nonirrigated land capability classification is 2w. Irrigated land capability classification is 2w. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 18 percent.

Component: Albaton (25%)

The Albaton, rarely flooded component makes up 25 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on river valleys. The parent material consists of Clayey alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is very high. This soil is rarely flooded. It is not ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, July, November, December. Organic matter content in the surface horizon is about 3 percent. This component is in the F107BY017MO Clayey Floodplain Forest Ulmus Americana/toxicodendron Radicans/elymus Virginicus-geum Canadense American Elm/eastern Poison Ivy/virginia Wildrye-white Avens ecological site. Nonirrigated land capability classification is 3w. Irrigated land capability classification is 3w. This soil meets hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 18 percent.

Component: Modale (10%)

Generated brief soil descriptions are created for major soil components. The Modale, rarely flooded soil is a minor component.

Component: Grable (5%)

Generated brief soil descriptions are created for major soil components. The Grable, rarely flooded soil is a minor component.

Component: Onawa (5%)

Generated brief soil descriptions are created for major soil components. The Onawa, silt loam, rarely flooded soil is a minor component.

Map Unit 3513 (1.04%)

Map Unit Name:	Grable-Morconick complex, 0 to 2 percent slopes, rarely flooded
Bedrock Depth - Min:	null
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	B - Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded.

Major components are printed below

Grable(65%)

horizon Ap(0cm to 15cm)	Silt loam
horizon C1(15cm to 58cm)	Silt loam
horizon 2C2(58cm to 152cm)	Fine sand

Morconick(20%)

horizon Ap(0cm to 18cm)	Fine sandy loam
horizon C1(18cm to 33cm)	Loam
horizon 2C2,2C8(33cm to 203cm)	Fine sand

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 3513 - Grable-Morconick complex, 0 to 2 percent slopes, rarely flooded

Soil Information

Component: Grable (65%)

The Grable, rarely flooded component makes up 65 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on river valleys. The parent material consists of silty alluvium over sandy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is rarely flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the F107BY016MO Loamy Floodplain Forest Quercus Bicolor-populus Deltoides/glyceria Striata-ranunculus Hispidus Swamp White Oak-eastern Cottonwood/fowl Mannagrass-bristly Buttercup ecological site. Nonirrigated land capability classification is 2s. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 18 percent.

Component: Morconick (20%)

The Morconick, rarely flooded component makes up 20 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on river valleys. The parent material consists of loamy alluvium over sandy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is rarely flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the F107BY016MO Loamy Floodplain Forest Quercus Bicolor-populus Deltoides/glyceria Striata-ranunculus Hispidus Swamp White Oak-eastern Cottonwood/fowl Mannagrass-bristly Buttercup ecological site. Nonirrigated land capability classification is 3s. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 3 percent.

Component: Blake (5%)

Generated brief soil descriptions are created for major soil components. The Blake, rarely flooded soil is a minor component.

Component: Modale (5%)

Generated brief soil descriptions are created for major soil components. The Modale, loam, rarely flooded soil is a minor component.

Component: Percival (5%)

Generated brief soil descriptions are created for major soil components. The Percival, rarely flooded soil is a minor component.

Map Unit 3549 (0.73%)

Map Unit Name:	Modale complex, 0 to 2 percent slopes, rarely flooded
Bedrock Depth - Min:	null
Watertable Depth - Annual Min:	30cm
Drainage Class - Dominant:	Somewhat poorly drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Modale(35%)

horizon Ap(0cm to 18cm)	Silty clay loam
horizon Cg(18cm to 61cm)	Silt loam
horizon 2Cg,3Cg3(61cm to 152cm)	Silty clay

Modale(30%)

horizon Ap(0cm to 18cm)	Silt loam
horizon C1,C3(18cm to 61cm)	Silt loam
horizon 2Cg,3Cg3(61cm to 152cm)	Clay

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 3549 - Modale complex, 0 to 2 percent slopes, rarely flooded

Component: Modale (35%)

The Modale, silty clay loam, rarely flooded component makes up 35 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on river valleys. The parent material consists of silty alluvium over clayey alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is moderate. This soil is rarely flooded. It is not ponded. A seasonal zone of water saturation is at 24 inches during January, February, March, April, May, June, July, November, December. Organic matter content in the surface horizon is about 2 percent. This component is in the

Soil Information

F107BY016MO Loamy Floodplain Forest Quercus Bicolor-populus Deltoides/glyceria Striata-ranunculus Hispidus Swamp White Oak-eastern Cottonwood/fowl Mannagrass-bristly Buttercup ecological site. Nonirrigated land capability classification is 1. Irrigated land capability classification is 1 This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 18 percent.

Component: Modale (30%)

The Modale, silt loam, rarely flooded component makes up 30 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on river valleys. The parent material consists of silty alluvium over clayey alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is high. This soil is rarely flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during January, February, March, April, May, June, July, November, December. Organic matter content in the surface horizon is about 2 percent. This component is in the F107BY016MO Loamy Floodplain Forest Quercus Bicolor-populus Deltoides/glyceria Striata-ranunculus Hispidus Swamp White Oak-eastern Cottonwood/fowl Mannagrass-bristly Buttercup ecological site. Nonirrigated land capability classification is 1. Irrigated land capability classification is 1 This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 18 percent.

Component: Onawa (15%)

Generated brief soil descriptions are created for major soil components. The Onawa, rarely flooded soil is a minor component.

Component: Owego (10%)

Generated brief soil descriptions are created for major soil components. The Owego, rarely flooded soil is a minor component.

Component: Blake (5%)

Generated brief soil descriptions are created for major soil components. The Blake, rarely flooded soil is a minor component.

Component: Cooper (2%)

Generated brief soil descriptions are created for major soil components. The Cooper, rarely flooded soil is a minor component.

Component: Haynie (2%)

Generated brief soil descriptions are created for major soil components. The Haynie, rarely flooded soil is a minor component.

Component: Morconick (1%)

Generated brief soil descriptions are created for major soil components. The Morconick, rarely flooded soil is a minor component.

Map Unit 515 (0.99%)

Map Unit Name:	Percival silty clay, 0 to 2 percent slopes, rarely flooded
Bedrock Depth - Min:	null
Watertable Depth - Annual Min:	30cm
Drainage Class - Dominant:	Somewhat poorly drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Percival(75%)

horizon Ap(0cm to 20cm)	Silty clay
horizon Cg(20cm to 61cm)	Silty clay
horizon 2Cg(61cm to 152cm)	Stratified fine sand to loamy fine sand

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 515 - Percival silty clay, 0 to 2 percent slopes, rarely flooded

Component: Percival (75%)

The Percival, rarely flooded component makes up 75 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on river valleys. The parent material consists of clayey alluvium over sandy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is rarely flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during January, February, March, April, May, June, July, November,

Soil Information

December. Organic matter content in the surface horizon is about 2 percent. This component is in the F107BY017MO Clayey Floodplain Forest Ulmus Americana/toxicodendron Radicans/elymus Virginicus-geum Canadense American Elm/eastern Poison Ivy/virginia Wildrye-white Avens ecological site. Nonirrigated land capability classification is 2w. Irrigated land capability classification is 2w. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 13 percent.

Component: Morconick (10%)

Generated brief soil descriptions are created for major soil components. The Morconick, rarely flooded soil is a minor component.

Component: Sarpy (10%)

Generated brief soil descriptions are created for major soil components. The Sarpy, rarely flooded soil is a minor component.

Component: Albaton (5%)

Generated brief soil descriptions are created for major soil components. The Albaton, rarely flooded soil is a minor component.

Map Unit 518 (7.08%)

Map Unit Name:	Morconick fine sandy loam, 0 to 2 percent slopes, rarely flooded
Bedrock Depth - Min:	null
Watertable Depth - Annual Min:	null
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	B - Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded.

Major components are printed below

Morconick(100%)	
horizon Ap(0cm to 18cm)	Fine sandy loam
horizon C1(18cm to 33cm)	Loam
horizon 2C2,2C8(33cm to 203cm)	Fine sand

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 518 - Morconick fine sandy loam, 0 to 2 percent slopes, rarely flooded

Component: Morconick (100%)

The Morconick, rarely flooded component makes up 100 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on river valleys. The parent material consists of loamy alluvium over sandy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is rarely flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the F107BY016MO Loamy Floodplain Forest Quercus Bicolor-populus Deltoides/glyceria Striata-ranunculus Hispidus Swamp White Oak-eastern Cottonwood/fowl Mannagrass-bristly Buttercup ecological site. Nonirrigated land capability classification is 3s. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 3 percent.

Map Unit 549 (0.7%)

Map Unit Name:	Modale complex, 0 to 2 percent slopes, occasionally flooded
Bedrock Depth - Min:	null
Watertable Depth - Annual Min:	61cm
Drainage Class - Dominant:	Somewhat poorly drained
Hydrologic Group - Dominant:	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.

Major components are printed below

Modale(70%)	
horizon Ap(0cm to 18cm)	Silt loam
horizon C1,C3(18cm to 61cm)	Silt loam

Soil Information

horizon 2Cg,3Cg3(61cm to 152cm)	Silty clay
Modale(30%)	
horizon Ap(0cm to 18cm)	Silty clay loam
horizon Cg(18cm to 61cm)	Silt loam
horizon 2Cg(61cm to 152cm)	Silty clay

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 549 - Modale complex, 0 to 2 percent slopes, occasionally flooded

Component: Modale (70%)

The Modale, silt loam, occasionally flooded component makes up 70 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on river valleys. The parent material consists of silty alluvium over clayey alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is high. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 24 inches during January, February, March, April, May, June, July, November, December. Organic matter content in the surface horizon is about 2 percent. This component is in the F107BY016MO Loamy Floodplain Forest Quercus Bicolor-populus Deltoides/glyceria Striata-ranunculus Hispidus Swamp White Oak-eastern Cottonwood/fowl Mannagrass-bristly Buttercup ecological site. Nonirrigated land capability classification is 1. Irrigated land capability classification is 1 This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 18 percent.

Component: Modale (30%)

The Modale, silty clay loam, occasionally flooded component makes up 30 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on river valleys. The parent material consists of silty alluvium over clayey alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is moderate. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 24 inches during January, February, March, April, May, June, July, November, December. Organic matter content in the surface horizon is about 2 percent. This component is in the F107BY016MO Loamy Floodplain Forest Quercus Bicolor-populus Deltoides/glyceria Striata-ranunculus Hispidus Swamp White Oak-eastern Cottonwood/fowl Mannagrass-bristly Buttercup ecological site. Nonirrigated land capability classification is 2s. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 18 percent.

Map Unit 6308 (2.15%)

Map Unit Name:	Barney fine sandy loam, occasionally flooded
Bedrock Depth - Min:	null
Watertable Depth - Annual Min:	23cm
Drainage Class - Dominant:	Poorly drained
Hydrologic Group - Dominant:	A/D - These soils have low runoff potential when drained and high runoff potential when undrained.

Major components are printed below

Barney(100%)	
horizon A(0cm to 15cm)	Fine sandy loam
horizon 2Cg(15cm to 152cm)	Fine sand

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 6308 - Barney fine sandy loam, occasionally flooded

Component: Barney (100%)

The Barney component makes up 100 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on valleys. The parent material consists of loamy alluvium over sandy and gravelly alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 9 inches during January, February, March, April, May, June, November, December. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 5w. This soil meets hydric

Soil Information

criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 3 percent.

Map Unit 9999 (27.24%)

Map Unit Name: Water

No more attributes available for this map unit

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 9999 - Water

Component: Water (100%)

Generated brief soil descriptions are created for major soil components. The Water is a miscellaneous area.

Map Unit W (9.07%)

Map Unit Name: Water

No more attributes available for this map unit

Component Description:

Minor map unit components are excluded from this report.

Map Unit: W - Water

Component: Water (100%)

Generated brief soil descriptions are created for major soil components. The Water is a miscellaneous area.

Wells and Additional Sources



Wells & Additional Sources



0 0.15 0.3 0.6 Miles

- | | |
|--------------------------------|------------------------------------|
| ▲ Sites with Higher Elevation | ▲ OGW Sites with Higher Elevation |
| ■ Sites with Same Elevation | ■ OGW Sites with Same Elevation |
| ▼ Sites with Lower Elevation | ▼ OGW Sites with Lower Elevation |
| ○ Sites with Unknown Elevation | ● OGW Sites with Unknown Elevation |



Wells and Additional Sources Summary

Federal Sources

Public Water Systems Violations and Enforcement Data

Map Key	ID	Distance (ft)	Direction
	No records found		

Safe Drinking Water Information System (SDWIS)

Map Key	ID	Distance (ft)	Direction
	No records found		

USGS National Water Information System

Map Key	ID	Distance (ft)	Direction
	No records found		

State Sources

Oil and Gas Wells

Map Key	ID	Distance (ft)	Direction
	No records found		

Public Water Supply Wells

Map Key	ID	Distance (ft)	Direction
	No records found		

Water Well Database

Map Key	Well ID	Distance (ft)	Direction
1	38785	1083.21	NW
2	82378	1259.00	E
2	2170871	1259.00	E
3	33734	2178.76	SSW
4	38783	2088.04	ENE
5	38784	2337.65	N
6	2693	2396.23	ENE
6	2693	2396.23	ENE
7	29479	2441.55	ENE
7	29479	2441.55	ENE
8	5378	3354.10	NNE
8	5378	3354.10	NNE
9	29354	3767.80	NE
10	29355	3962.73	NE
11	29353	4050.11	NE
12	29352	4189.98	NE
13	29351	4291.14	NE

Wells and Additional Sources Detail Report

Water Well Database

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	NW	0.21	1,083.21	1,083.22	WATER WELLS

Well ID: 38785 Object ID: 0
 Well Type: IGS Well Database Map ID: 20458
 Well Type Abbrev: GEOU County: Woodbury
 Well Depth (Ft.): 100 Latitude: 42.4160604076298
 Elevation (Ft.): Longitude: -96.4009691837509
 Layer: Xcoord: 220167.0
 Completed date: 1/1/1976 Ycoord: 4701578.0
 Location: T88N, R48W, 23, SW SE SE NW Est Loc Accuracy: Calc. +/- 230 ft.
 Well ID Source field: wnumber
 Other Information: Bedrock Depth: 0 Well Type: Irrigation
 Owner Name: Oehlerking, Charles H.
 Well Doc Link: <https://www.iuhr.uiowa.edu/igs/geosam/well/38785/general-information>

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
2	E	0.24	1,259.00	1,089.44	WATER WELLS

Well ID: 82378 Object ID: 0
 Well Type: IGS Well Database Map ID: 20782
 Well Type Abbrev: GEOU County: Woodbury
 Well Depth (Ft.): 300 Latitude: 42.4119948559606
 Elevation (Ft.): Longitude: -96.3904934171557
 Layer: Xcoord: 221011.0
 Completed date: 7/3/2014 Ycoord: 4701092.0
 Location: T88N, R48W, 26, NE NE SE Est Loc Accuracy: Calc. +/- 470 ft.
 Well ID Source field: wnumber
 Other Information: Bedrock Depth: 105 Well Type: Private
 Owner Name: Oehlerking, Charles
 Well Doc Link: <https://www.iuhr.uiowa.edu/igs/geosam/well/82378/general-information>

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
2	E	0.24	1,259.00	1,089.44	WATER WELLS

Well ID: 2170871 Object ID: 0
 Well Type: Private well tracking system Map ID: 20781
 Well Type Abbrev: PWTS County: Woodbury
 Well Depth (Ft.): 300 Latitude: 42.4119960008523
 Elevation (Ft.): Longitude: -96.3904889937757
 Layer: Xcoord: 221011.369058
 Completed date: 7/3/2014 Ycoord: 4701092.11262

Wells and Additional Sources Detail Report

Location: T88N, R48W, S26 Est Loc Accuracy: nom. +/- 25m.
 Well ID Source field: wellnmbr
 Other Information: Status: Active Logged
 Owner Name: OEHLERKING, CHARLES
 Well Doc Link: <https://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2170871&reportName=WellPrintout>

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
3	SSW	0.41	2,178.76	1,088.39	WATER WELLS

Well ID:	33734	Object ID:	0
Well Type:	IGS Well Database	Map ID:	21088
Well Type Abbrev:	GEOU	County:	Woodbury
Well Depth (Ft.):	240	Latitude:	42.4073654779511
Elevation (Ft.):		Longitude:	-96.4011550468374
Layer:		Xcoord:	220113.0
Completed date:	5/4/1993	Ycoord:	4700613.0
Location:	T88N, R48W, 26, SE SE NW	Est Loc Accuracy:	Calc. +/- 470 ft.
Well ID Source field:	wnumber		
Other Information:	Bedrock Depth: 0 Well Type: Private		
Owner Name:	Petrik, R.J.		
Well Doc Link:	https://www.iihr.uiowa.edu/igs/geosam/well/33734/general-information		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
4	ENE	0.40	2,088.04	1,088.09	WATER WELLS

Well ID:	38783	Object ID:	0
Well Type:	IGS Well Database	Map ID:	20611
Well Type Abbrev:	GEOU	County:	Woodbury
Well Depth (Ft.):	86	Latitude:	42.4152658075632
Elevation (Ft.):		Longitude:	-96.3891994030175
Layer:		Xcoord:	221132.0
Completed date:	7/1/1968	Ycoord:	4701451.0
Location:	T88N, R48W, 24, SW SW SW	Est Loc Accuracy:	Calc. +/- 470 ft.
Well ID Source field:	wnumber		
Other Information:	Bedrock Depth: 0 Well Type: Irrigation		
Owner Name:	Oehlerking, Charles H.		
Well Doc Link:	https://www.iihr.uiowa.edu/igs/geosam/well/38783/general-information		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
5	N	0.44	2,337.65	1,085.13	WATER WELLS

Well ID:	38784	Object ID:	0
Well Type:	IGS Well Database	Map ID:	20227
Well Type Abbrev:	GEOU	County:	Woodbury

Wells and Additional Sources Detail Report

Well Depth (Ft.):	93	Latitude:	42.4195952050398
Elevation (Ft.):		Longitude:	-96.3950353345881
Layer:		Xcoord:	220671.0
Completed date:	1/1/1974	Ycoord:	4701951.0
Location:	T88N, R48W, 23, SE NW SE NE	Est Loc Accuracy:	Calc. +/- 230 ft.
Well ID Source field:	wnumber		
Other Information:	Bedrock Depth: 0 Well Type: Irrigation		
Owner Name:	Oehlerking, Charles H.		
Well Doc Link:	https://www.iihr.uiowa.edu/igs/geosam/well/38784/general-information		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
6	ENE	0.45	2,396.23	1,091.03	WATER WELLS

Well ID:	2693	Object ID:	0
Well Type:	Water Use Permit Wells	Map ID:	20559
Well Type Abbrev:	WTRU	County:	Woodbury
Well Depth (Ft.):	86	Latitude:	42.4160399995964
Elevation (Ft.):		Longitude:	-96.3885999995971
Layer:		Xcoord:	221185.0
Completed date:	7/1/1968	Ycoord:	4701535.0
Location:	T88NR48WS24	Est Loc Accuracy:	nom. +/-100m.
Well ID Source field:	wellID		
Other Information:	PermitID= 2442 Well #2		
Owner Name:	Charles Oehlerking		
Well Doc Link:			

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
6	ENE	0.45	2,396.23	1,091.03	WATER WELLS

Well ID:	2693	Object ID:	19979
Well Type:	Water Use Permit Wells	Map ID:	19979
Well Type Abbrev:	WTRU	County:	Woodbury
Well Depth (Ft.):	86	Latitude:	42.4160486499495
Elevation (Ft.):		Longitude:	-96.3886096870017
Layer:		Xcoord:	221184.0
Completed date:	7/1/1968	Ycoord:	4701536.0
Location:	T88N, R48, S24, SW, SW	Est Loc Accuracy:	nom. +/-50m.
Well ID Source field:	wellID		
Other Information:	PermitID: 2442 Well #2		
Owner Name:	Charles Oehlerking		
Well Doc Link:	http://programs.iowadnr.gov/wateruse/		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
7	ENE	0.46	2,441.55	1,088.14	WATER WELLS

Wells and Additional Sources Detail Report

Well ID:	29479	Object ID:	0
Well Type:	Water Use Permit Wells	Map ID:	20610
Well Type Abbrev:	WTRU	County:	Woodbury
Well Depth (Ft.):	100	Latitude:	42.4154299996121
Elevation (Ft.):		Longitude:	-96.3877200000058
Layer:		Xcoord:	221254.0
Completed date:		Ycoord:	4701464.0
Location:	T88NR48WS24	Est Loc Accuracy:	nom. +/-100m.
Well ID Source field:	wellID		
Other Information:	PermitID= 2442 Well #3		
Owner Name:	Charles Oehlerking		
Well Doc Link:			

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
7	ENE	0.46	2,441.55	1,088.14	WATER WELLS

Well ID:	29479	Object ID:	20038
Well Type:	Water Use Permit Wells	Map ID:	20038
Well Type Abbrev:	WTRU	County:	Woodbury
Well Depth (Ft.):	100	Latitude:	42.415435473787
Elevation (Ft.):		Longitude:	-96.3877259858907
Layer:		Xcoord:	221254.0
Completed date:		Ycoord:	4701465.0
Location:	T88N, R48, S24, SW, SW	Est Loc Accuracy:	nom. +/-50m.
Well ID Source field:	wellID		
Other Information:	PermitID: 2442 Well #3		
Owner Name:	Charles Oehlerking		
Well Doc Link:	http://programs.iowadnr.gov/wateruse/		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
8	NNE	0.64	3,354.10	1,085.15	WATER WELLS

Well ID:	5378	Object ID:	19671
Well Type:	Water Use Permit Wells	Map ID:	19671
Well Type Abbrev:	WTRU	County:	Woodbury
Well Depth (Ft.):	100	Latitude:	42.4204866139
Elevation (Ft.):		Longitude:	-96.3895659568745
Layer:		Xcoord:	221125.0
Completed date:		Ycoord:	4702032.0
Location:	T88N, R48, S23, S,	Est Loc Accuracy:	nom. +/-50m.
Well ID Source field:	wellID		
Other Information:	PermitID: 2442 well #1		
Owner Name:	Charles Oehlerking		
Well Doc Link:	http://programs.iowadnr.gov/wateruse/		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
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Wells and Additional Sources Detail Report

8 NNE 0.64 3,354.10 1,085.15 WATER WELLS

Well ID: 5378 Object ID: 0
 Well Type: Water Use Permit Wells Map ID: 20207
 Well Type Abbrev: WTRU County: Woodbury
 Well Depth (Ft.): 100 Latitude: 42.4204799998915
 Elevation (Ft.): Longitude: -96.3895600000556
 Layer: Xcoord: 221125.0
 Completed date: Ycoord: 4702031.0
 Location: T88NR48WS23 Est Loc Accuracy: nom. +/-100m.
 Well ID Source field: wellID
 Other Information: PermitID= 2442 well #1
 Owner Name: Charles Oehlerking
 Well Doc Link:

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
9	NE	0.71	3,767.80	1,088.62	WATER WELLS

Well ID: 29354 Object ID: 19703
 Well Type: Water Use Permit Wells Map ID: 19703
 Well Type Abbrev: WTRU County: Woodbury
 Well Depth (Ft.): Latitude: 42.4200643048334
 Elevation (Ft.): Longitude: -96.386796593449
 Layer: Xcoord: 221351.0
 Completed date: Ycoord: 4701976.0
 Location: T88N, R48, S24, SW, NW Est Loc Accuracy: nom. +/-100m.
 Well ID Source field: wellID
 Other Information: PermitID: 97-16-016 Dewatering Well #4
 Owner Name: LIEBER CONSTRUCTION INC (JOE WURSCHER)
 Well Doc Link: <http://programs.iowadnr.gov/wateruse/>

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
10	NE	0.75	3,962.73	1,083.09	WATER WELLS

Well ID: 29355 Object ID: 19662
 Well Type: Water Use Permit Wells Map ID: 19662
 Well Type Abbrev: WTRU County: Woodbury
 Well Depth (Ft.): Latitude: 42.4210464121942
 Elevation (Ft.): Longitude: -96.3870804214786
 Layer: Xcoord: 221332.0
 Completed date: Ycoord: 4702086.0
 Location: T88N, R48, S24, SW, NW Est Loc Accuracy: nom. +/-100m.
 Well ID Source field: wellID
 Other Information: PermitID: 97-16-016 Dewatering Well #5
 Owner Name: LIEBER CONSTRUCTION INC (JOE WURSCHER)

Wells and Additional Sources Detail Report

Well Doc Link: <http://programs.iowadnr.gov/wateruse/>

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
11	NE	0.77	4,050.11	1,087.64	WATER WELLS

Well ID:	29353	Object ID:	19696
Well Type:	Water Use Permit Wells	Map ID:	19696
Well Type Abbrev:	WTRU	County:	Woodbury
Well Depth (Ft.):		Latitude:	42.4203832120713
Elevation (Ft.):		Longitude:	-96.3857564543849
Layer:		Xcoord:	221438.0
Completed date:		Ycoord:	4702008.0
Location:	T88N, R48, S24, SW, NW	Est Loc Accuracy:	nom. +/-100m.
Well ID Source field:	wellID		
Other Information:	PermitID: 97-16-016 Dewatering Well #3		
Owner Name:	LIEBER CONSTRUCTION INC (JOE WURSCHER)		
Well Doc Link:	http://programs.iowadnr.gov/wateruse/		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
12	NE	0.79	4,189.98	1,088.00	WATER WELLS

Well ID:	29352	Object ID:	19668
Well Type:	Water Use Permit Wells	Map ID:	19668
Well Type Abbrev:	WTRU	County:	Woodbury
Well Depth (Ft.):		Latitude:	42.4210625245038
Elevation (Ft.):		Longitude:	-96.3859267306291
Layer:		Xcoord:	221427.0
Completed date:		Ycoord:	4702084.0
Location:	T88N, R48, S24, SW, NW	Est Loc Accuracy:	nom. +/-100m.
Well ID Source field:	wellID		
Other Information:	PermitID: 97-16-016 Dewatering Well #2		
Owner Name:	LIEBER CONSTRUCTION INC (JOE WURSCHER)		
Well Doc Link:	http://programs.iowadnr.gov/wateruse/		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
13	NE	0.81	4,291.14	1,087.66	WATER WELLS

Well ID:	29351	Object ID:	19654
Well Type:	Water Use Permit Wells	Map ID:	19654
Well Type Abbrev:	WTRU	County:	Woodbury
Well Depth (Ft.):		Latitude:	42.4212940980121
Elevation (Ft.):		Longitude:	-96.3857082921953
Layer:		Xcoord:	221446.0
Completed date:		Ycoord:	4702109.0
Location:	T88N, R48, S24, SW, NW	Est Loc Accuracy:	nom. +/-100m.

Wells and Additional Sources Detail Report

Well ID Source field: wellID
Other Information: PermitID: 97-16-016 Dewatering Well #1
Owner Name: LIEBER CONSTRUCTION INC (JOE WURSCHER)
Well Doc Link: <http://programs.iowadnr.gov/wateruse/>

Radon Information

This section lists any relevant radon information found for the target property.

No Radon Zone Level records found for the project property or surrounding properties.

Zone 1: Counties with predicted average indoor radon screening levels greater than 4 pCi/L

Zone 2: Counties with predicted average indoor radon screening levels from 2 to 4 pCi/L

Zone 3: Counties with predicted average indoor radon screening levels less than 2 pCi/L

No Indoor Radon Data records found for the project property or surrounding properties.

Federal Sources

FEMA National Flood Hazard Layer

FEMA FLOOD

The National Flood Hazard Layer (NFHL) data incorporates Flood Insurance Rate Map (FIRM) databases published by the Federal Emergency Management Agency (FEMA), and any Letters Of Map Revision (LOMRs) that have been issued against those databases since their publication date. The FIRM Database is the digital, geospatial version of the flood hazard information shown on the published paper FIRMs. The FIRM Database depicts flood risk information and supporting data used to develop the risk data. The FIRM Database is derived from Flood Insurance Studies (FISs), previously published FIRMs, flood hazard analyses performed in support of the FISs and FIRMs, and new mapping data, where available.

Indoor Radon Data

INDOOR RADON

Indoor radon measurements tracked by the Environmental Protection Agency(EPA) and the State Residential Radon Survey.

Public Water Systems Violations and Enforcement Data

PWSV

This list of drinking water violations and enforcement actions is sourced from the U.S Environmental Protection Agency's (EPA) Enforcement and Compliance History Online (ECHO) system that incorporates Public Water Systems data from EPA's Safe Drinking Water Information System (SDWIS) database, as part of the national download of Safe Drinking Water Act (SDWA) data. SDWIS contains information on public water systems from the Public Water System Supervision (PWSS) Program, including monitoring, enforcement, and violation data related to requirements established by the SWDA. Address information provided in SWDIS may correspond either with the physical location of the water system, or with a contact address.

Radon Zone Level

RADON ZONE

Areas showing the level of Radon Zones (level 1, 2 or 3) by county. This data is maintained by the Environmental Protection Agency (EPA).

Safe Drinking Water Information System (SDWIS)

SDWIS

This national download of Safe Drinking Water Act (SDWA) data is sourced from the U.S Environmental Protection Agency's (EPA) Enforcement and Compliance History Online (ECHO) system that incorporates Public Water Systems data from EPA's Safe Drinking Water Information System (SDWIS) database. SDWIS contains information on public water systems from the Public Water System Supervision (PWSS) Program related to requirements established by the Safe Drinking Water Act (SDWA). Address information provided in SWDIS may correspond either with the physical location of the water system, or with a contact address.

Soil Survey Geographic database

SSURGO

The Soil Survey Geographic database (SSURGO) contains information about soil as collected by the National Cooperative Soil Survey at the Natural Resources Conservation Service (NRCS). Soil maps outline areas called map units. The map units are linked to soil properties in a database. Each map unit may contain one to three major components and some minor components.

U.S. Fish & Wildlife Service Wetland Data

US WETLAND

The U.S. Fish & Wildlife Service Wetland layer represents the approximate location and type of wetlands and deepwater habitats in the United States.

USGS Current Topo

US TOPO

US Topo topographic maps are produced by the National Geospatial Program of the U.S. Geological Survey (USGS). The project was launched in late 2009, and the term "US Topo" refers specifically to quadrangle topographic maps published in 2009 and later.

USGS Geology

US GEOLOGY

Seamless maps depicting geological information provided by the United States Geological Survey (USGS).

USGS National Water Information System

FED USGS

The U.S. Geological Survey's (USGS) National Water Information System (NWIS) is the nation's principal repository of water resources data. The data includes comprehensive information of well-construction details, time-series data for gage height, streamflow, groundwater level, and precipitation and water use data. This NWIS database information is obtained through the Water Quality Data Portal (WQP). The WQP

Appendix

is a cooperative service sponsored by the USGS, the Environmental Protection Agency (EPA), and the National Water Quality Monitoring Council (NWQMC).

State Sources

Oil and Gas Wells

OGW

As of IA state regulatory agencies, FracTracker Alliance - state of Iowa confirmed not to have any active (drilled but not plugged) oil and gas wells.

Public Water Supply Wells

PWSW

The Public Water Supply Wells (PWSW) data consist of all the community water supply wells in Iowa. This data was made available by Iowa Department of Natural Resources.

Water Well Database

WATER WELLS

List of water well locations made available by the Iowa Department of Natural Resources. This listing is a compilation of records from various well databases including the Geologic Sampling Points database, the Safe Drinking Water Information System (SDWIS) Wells database, and the Water Allocation Compliance and Online Permitting (WACOP) database.

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CHAIN OF TITLE & **LIEN SEARCHES**

Project Property: 5411 PATTON ST
SIOUX CITY, IA 51111
Order No: 24041700273
Date Completed: 04/26/2024

Title to the estate or interest covered by this report appears to be vested in:
CHARLES H OEHLERKING, TRUSTEE OF THE CHARLES H OEHLERKING REVOCABLE TRUST

The following is the current property legal description (See deed for full legal description):

*LL-SC COMM 88-48 67.94 FT TO POB; THE C W 275 FT, NWLY 385 FT, & SELY 615.52 F T)
AND (EX PT FOR AI RPORT) 26-88-48 LOT 1 & LOT 2 BRASSFIELD ISLAND 26-88-48 (EX
TCT COM INTERSE CTION ON N LINE SEC 25 & E MEANDER LINE OF BRASSFIELD ISLAND
THEC S 1115 .4 FT*

Assessor's Parcel Number(s):
884826200003 AND 583201

ENVIRONMENTAL LIEN TO 1980 REPORT

Order No: 24041700273

TARGET PROPERTY INFORMATION

ADDRESS

5411 PATTON ST
SIOUX CITY, IA 51111

RESEARCH SOURCES

RECORDER: WOODBURY COUNTY RECORDER'S OFFICE
ASSESSOR: WOODBURY COUNTY ASSESSOR'S OFFICE
STATE: IOWA DEPARTMENT OF NATURAL RESOURCES
FEDERAL: UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OTHER: JUDICIAL RECORDS NOT SEARCHED. BASED ON AVAILABLE INFORMATION EVALUATED BY THE TITLE SEARCH PROFESSIONAL, THE JURISDICTION DOES NOT REQUIRE A SEARCH OF JUDICIAL RECORDS IN ORDER TO IDENTIFY ENVIRONMENTAL LIENS.
NOTES: PUBLIC RECORDS OF WOODBURY COUNTY, IA WERE SEARCHED FROM JANUARY 1, 1980 TO APRIL 8, 2024, AND NO OTHER DEEDS VESTING TITLE IN THE SUBJECT PROPERTY WERE FOUND OF RECORD DURING THE PERIOD SEARCHED.

ENVIRONMENTAL LIEN TO 1980 REPORT

Order No: 24041700273

ENVIRONMENTAL LIENS

Environmental Lien: ☒ NOT FOUND

ACTIVITY AND USE LIMITATIONS (AULs)

AULs: ☒ NOT FOUND

ENVIRONMENTAL LIEN TO 1980 REPORT

Order No: 24041700273

CHAIN OF TITLE TO 1980

1. Deed Type: WARRANTY DEED
Deed Date: 07/10/2013
Recorded: 07/18/2013
Grantor: CHARLES H OEHLERKING AND BARBARA H OEHLERKING
Grantee: CHARLES H OEHLERKING, TRUSTEE OF THE CHARLES H OEHLERKING REVOCABLE TRUST
Instrument: BOOK 730 / PAGE 9986
Notes: GRANTOR CHARLES H OEHLERKING GAINED TITLE PRIOR TO 1980
RESEARCH CONDUCTED BACK TO 1980. NO OTHER DEEDS OF RECORD FOUND POST DECEMBER 31, 1979 (BETWEEN 01/01/1980 AND 07/18/2013).

ENVIRONMENTAL LIEN TO 1980 REPORT

Order No: 24041700273

LEASES AND MISCELLANEOUS

Comments: NONE IDENTIFIED.

ENVIRONMENTAL LIEN TO 1980 REPORT

Order No: 24041700273

The ERIS Environmental Lien Search Report to 1980 provides results from a search of available current land title records for environmental cleanup liens and other activity and use limitations, such as engineering and institutional controls.

A network of professional, trained researchers, following established procedures, uses client supplied property information to:

- Search for parcel information and / or legal description
- Search for ownership information
- Research official land title documents recorded at jurisdictional agencies such as recorder's office, registries of deeds, county clerks' offices, etc.
- Access copies of deeds to 1980
- Search for environmental encumbrance(s) associated with the deeds
- Provide a copy of any environmental encumbrance(s) based upon a review of keywords in the instrument(s) (title, parties involved and description)
- Provide a copy of the deeds or cite documents reviewed

Thank You for Your Business

Please contact ERIS at **416-510-5204** or **info@erisinfo.com**
with any questions or comments

LIMITATION

This report is neither a guarantee of title, a commitment to insure, or a policy of title insurance. ERIS – Environmental Risk Information Services does not guarantee nor include any warranty of any kind whether expressed or implied, about the validity of all information included in this report since this information is retrieved as it is recorded from various agencies that make it available. The total liability is limited to the fee paid for this report.



DEED EXHIBIT



RE-RECORD

Roll 730 Image 8682-8685

Document 586 Type WD Pages 4
Date 7/12/2013 Time 3:00 PM
Rec Amt \$22.00 Aud Amt \$30.00

PATRICK F GILL, AUDITOR AND RECORDER
WOODBURY COUNTY IOWA

Roll 730 Image 9986-9990

Document 856 Type WD Pages 5
Date 7/18/2013 Time 1:23 PM
Rec Amt \$27.00 Aud Amt \$30.00

PATRICK F GILL, AUDITOR AND RECORDER
WOODBURY COUNTY IOWA



WARRANTY DEED

THE IOWA STATE BAR ASSOCIATION
Official Form #101
Recorder's Cover Sheet

Preparer Information: (Name, address and phone number)

James R. Westergaard, P. O. Box 198, 515 Main St., Mapleton, IA 51034, Phone: (712) 881-2321

Taxpayer Information: (Name and complete address)

Charles H. Oehlerking, PO Box 168, Sgt. Bluff, IA 51054

Return Document To: (Name and complete address)

James R. Westergaard, P. O. Box 198, 515 Main St., Mapleton, IA 51034, Phone: (712) 881-2321

Grantors:

Charles H. Oehlerking
Barbara Oehlerking

Grantees:

Charles H. Oehlerking, Trustee of the
Charles H. Oehlerking Revocable Trust
Dated July 10, 2013

Legal description: See Page 2

Document or instrument number of previously recorded documents:



WARRANTY DEED

For the consideration of \$1.00 Dollar(s) and other valuable consideration,
Charles H. Oehlerking & Barbara Oehlerking, husband & wife
do hereby Convey to
Charles H. Oehlerking, Trustee of the Charles H. Oehlerking Revocable Trust Dated July 10, 2013.
the
following described real estate in Woodbury County, Iowa:
See Exhibit "A" Attached

Exempt from declaration & transfer tax. Actual consideration less than \$500.00. Iowa Code Section 428A.2(21).

Grantors do Hereby Covenant with grantees, and successors in interest, that grantors hold the real estate by title in fee simple; that they have good and lawful authority to sell and Convey the real estate; that the real estate is free and clear of all liens and encumbrances except as may be above stated; and grantors Covenant to Warrant and Defend the real estate against the lawful claims of all persons except as may be above stated. Each of the undersigned hereby relinquishes all rights of dower, homestead and distributive share in and to the real estate. Words and phrases herein, including acknowledgment hereof, shall be construed as in the singular or plural number, and as masculine or feminine gender, according to the context.

Dated: July 10, 2013

Charles H. Oehlerking
Charles H. Oehlerking (Grantor)

Barbara Oehlerking
Barbara Oehlerking (Grantor)

(Grantor)

(Grantor)

STATE OF IOWA, COUNTY OF WOODBURY
This instrument was acknowledged before me on July 10, 2013, by Charles H. Oehlerking & Barbara Oehlerking, husband & wife



JAMES R. WESTERGAARD
COMMISSION NUMBER 111867
MY COMMISSION EXPIRES
DECEMBER 9, 2014

James R. Westergaard
Notary Public

RE-RECORD

Parcel I

Lots 1 & 2 in Section 23, Lots 1, 2 & 3 in Section 24, & Lot 1 partly in Section 25 & partly in Section 26, & Lot 2 in Section 26, all in Township 88 Range 48 according to the official plat of State survey returned by Martin Holmwig, County Surveyor, dated September 10, 1904; and recorded in Plat Book 13 on Page 41; all in the County of Woodbury and State of Iowa and accretions lands thereto EXCEPT a tract of land situated in the North $\frac{1}{2}$ of the North $\frac{1}{2}$ of Section 26 & accretions thereto, in Township 88 North Range 48 West of the 5th P.M.

Woodbury County, Iowa more particularly described as follows: Commencing at the Southeast corner of said North $\frac{1}{2}$ of the North $\frac{1}{2}$; thence North $89^{\circ} 56' 53''$ West, along the South line of said North $\frac{1}{2}$ of the North $\frac{1}{2}$ a distance of 1374.87 feet, to the point beginning of said tract of land to be described; thence continuing along said South line of the North $\frac{1}{2}$ of the North $\frac{1}{2}$ a distance of 2670.72 feet; thence North $45^{\circ} 53' 18''$ East a distance of 1142.61 feet; thence South $89^{\circ} 34' 16''$ East, a distance of 1001.88 feet; thence South $47^{\circ} 02' 07''$ East, a distance of 1159.50 feet to the point of beginning. ANDEXCEPT those portions of Lots 1 & 2 of Section 24 & Lot 1 of Section 23 and accreted lands thereto, Township 88 North Range 48 West of the 5th P.M., according to the official Plat of Survey of Brassfield's Island returned by Martin Holmwig, County Surveyor, dated September 10, 1904; and recorded in Plat Book 13 on Page 41; all in Woodbury County, Iowa, described as follows: Beginning at the intersection of the East-West center line of Section 24 in Township 88 North, Range 48 West of the 5th P.M., and the East Meander Line of said Brassfield's Island, said point being a found Concrete Monument; thence South $05^{\circ} 03' 42''$ West along said East Meander Line for a distance of 319.87 feet; thence North $89^{\circ} 03' 40''$ West for a distance of 4294.83 feet to the beginning of a Meander Line along the East bank of the Missouri River, said Meander Line courses are as follows; thence North $51^{\circ} 42' 39''$ East for a distance of 628.09 feet; thence North $46^{\circ} 24' 37''$ East for a distance of 1332.00 feet to the intersection of said Meander Line with the South line of Bridgeport Industrial Park 2nd Addition to the City of Sioux City, Iowa, as recorded in the Recorder's Office of the Woodbury County Courthouse; thence South $89^{\circ} 03' 40''$ East along said South line for a distance of 2714.99 feet to the intersection of said South line with the West line of the parcel of land described by survey recorded on Roll 249, Image 973 in said Recorder's Office; thence South $14^{\circ} 40' 28''$ East along said West line for a distance of 43.35 feet; thence South $15^{\circ} 18' 03''$ East along said West line for a distance of 93.85 feet; Thence South $36^{\circ} 30' 39''$ East along said West line for a distance of 162.04 feet; thence South $26^{\circ} 44' 35''$ East along said West line for a distance of 291.21 feet; thence South $10^{\circ} 57' 34''$ West along said West line for a distance of 501.22 feet to the intersection of said West line with the East-West centerline of said Sec. 24; thence South $89^{\circ} 59' 07''$ West along said East-West centerline for a distance of 17.80 feet to the Point of Beginning, containing 109.28 acres, including 0.51 acres of public right-of-way, subject to easements, if any, of record or apparent. Basis of Bearings; The South line of Bridgeport Industrial Park 2nd Addition is assumed to bear South $89^{\circ} 03' 40''$ East to conform to platted surveys of record AND EXCEPT those portions of Lot 1 & Lot 2 lying in Section 26, Township 88 North, Range 48 West of the 5th P.M., according to the official Plat of Survey of Brassfield's Island returned by Martin Holmwig, County Surveyor dated September 10, 1904, and recorded in Plat Book 13 on Page 41, field notes on record in County Engineer's GLO records book; all in Woodbury County, Iowa, described as follows: commencing at the intersection of the north line of Section 25, Township 88 North, Range 48 West of the 5th P.M., and the east meander of said Brassfield's Island, said point being a found Concrete Monument; thence South $00^{\circ} 30'$ West

RE-RECORD

along said meander line for a distance of 1115.4 feet; thence South 22° 30' West along said meander line for a distance of 222.54 feet to the South line of said Lot 1; thence South 89° 58' 50" West along the south line of said Lot 1 for a distance of 2167.94 feet to the Point of Beginning; thence continuing South 89° 58' 50" West along said south line for a distance of 275.00 feet; thence North 47° 04' 48" West for a distance of 385.00 feet; thence South 64° 47' 58" East for a distance of 615.52 feet to the Point of Beginning, containing 36,062 Sq Ft. (0.82 ac) subject to easements, if any, of record or apparent

AND EXCEPT

Those portions of Lot 2 of Section 26 & Lot 2 of Section 23 being accreted lands thereto, Township 88 North, Range 48 West of the 5th P.M., according to the official Plat of Survey of Brassfield's Island returned by Martin Holmwig, County Surveyor, dated September 10, 1904, and recorded in Plat Book 13 on Page 41, field notes on record in the County Engineer's GLO records book, all in Woodbury County, Iowa described as follows: Commencing at the intersection of the north line of Section 25, Township 88 North, Range 48 West of the 5th P.M., and the east meander line of said Brassfield's Island, said point being a found Concrete Monument; thence North 90° 00' 00" West along the north lines of said Sections 25 and 26 for a distance of 4236.51 feet to the Point of Beginning; thence South 36° 13' 00" East for a distance of 657.34 feet; thence North 89° 36' 57" West for a distance of 539.35 feet; thence South 45° 50' 37" West for a distance of 1142.61 feet to the South line of Lot 2 in said Section 26; thence South 89° 58' 50" West along said south line and an existing wire fence for a distance of 1594.85 feet to the point of beginning of a Meander Line along the east bank of the Missouri river, said Meander line courses are as follows: Thence North 15° 25' 24" East for a distance of 308.07 feet; Thence North 39° 47' 17" East for a distance of 373.51 feet; Thence North 14° 42' 27" for a distance of 160.34 feet; Thence North 42° 57' 12" East for a distance of 324.46 feet; Thence North 17° 04' 32" East for a distance of 210.58 feet; Thence North 49° 01' 08" East for a distance of 364.15 feet; Thence north 25° 49' 02" East for a distance of 170.11 feet; Thence North 46° 52' 11" East for a distance of 347.40 feet; Thence North 32° 39' 27" East for a distance of 527.83 feet; Thence North 52° 36' 54" East for a distance of 285.41 feet to the end of said Meander Line; Thence South 36° 13' 00" East for a distance of 1365.60 feet to the Point of Beginning, containing 81.99 acres subject to easements, if any, of record or apparent

AND EXCEPT

Those portions of Lots Two (2) and Three (3) of Section Twenty-four (24) and Lots One (1) and Two (2) of Section Twenty-three (23) and accreted lands thereto, Township Eighty-eight (88) North, Range Forty-eight (48) West of the 5th P.M., according to the official Plat of Survey of Brassfield's Island returned by Martin Holmwig, County Surveyor, dated September 10, 1904; and recorded in Plat Book 13 on Page 41; all in Woodbury County, Iowa, described as follows: Commencing at the intersection of the east-west center line of Section Twenty-four (24) in Township Eighty-eight (88) North, Range Forty-eight (48) West of 5th P.M., and the east meander line of said Brassfield's Island, said point being a found Concrete Monument; thence South Five Degrees Three Minutes Forty-two Seconds (S 05° 03' 42") West along said east meander line for a distance of Three Hundred Nineteen and Eighty-seven Hundredths feet (319.87') to the Point of Beginning; thence continuing South Five Degrees Three Minutes Forty-two Seconds (S 05° 03' 42") West along said east meander line for a distance of Nine Hundred Twelve and Twelve Hundredths feet (912.12'); thence South Twenty Degrees Nine Minutes Nineteen Seconds (S 20° 09' 19") West along said east meander line for a distance of Four Hundred Forty-nine and

RE-RECORD

Twenty-eight Hundredths feet (449.28'); thence North Eighty-nine Degrees Three Minutes Forty Seconds (N 89° 03' 40") West for a distance of Five Thousand One Hundred Seventy-nine and Seventy-three Hundredths feet (5179.73'); thence North Thirty-five Degrees Fifty-two Minutes Eighteen Seconds (N 35° 52' 18") West for a distance of One Hundred Twenty-nine and Eighty-seven Hundredths feet (129.87') to the beginning of a Meander Line along the east bank of the Missouri river, said Meander Line courses are as follows: thence North Thirty-five Degrees Twenty-three Minutes Seven Seconds (N 35° 23' 07") East for a distance of Two Hundred Ten and Three Tenths feet (210.3'); thence North Fifty Degrees Five Minutes Fifty-nine Seconds (N 50° 05' 59") East for a distance of Four Hundred feet (400.0'); thence North Thirty-four Degrees Twenty-five Minutes Ten Seconds (N 34° 25' 10") East for a distance of Four Hundred Seventy feet (470.0'); thence North Fifty-one Degrees Forty-eight Minutes Sixteen Seconds (N 51° 48' 16") East for a distance of Six Hundred Thirty-eight and Fifty-six Hundredths feet (638.56') to the end of said Meander Line; thence South Eighty-nine Degrees Three Minutes Forty Seconds (S 89° 03' 40") East for a distance of Four Thousand Two Hundred Ninety-four and Eighty-three Hundredths feet (4,294.83') to the Point of Beginning, containing 150.00 acres, including 2.18 acres of public right-of-way, subject to easements, if any, of record or apparent. Basis of Bearings: The south line of Bridgeport Industrial Park 2nd Addition is assumed to bear South Eighty-nine Degrees Three Minutes Forty Seconds (S 89° 03' 40") East to conform to platted surveys of record.

AND

Parcel 2

The West Half of the Southwest Quarter (W1/2 SW1/4) of Section Thirty-six (36), Township Eighty-seven (87) North, Range Forty-seven (47), West of the Fifth Principal Meridian in the County of Woodbury and State of Iowa.

Parcel 3

A parcel of land located in the Northwest Quarter (NW1/4) of the Southwest Quarter (SW1/4) of Section Twelve (12), Township Eighty-seven (87) North, Range Forty-eight (48) West of the Fifth Principal Meridian, Woodbury County, Iowa, further described as follows: Beginning at the West Quarter (W1/4) corner of said Section Twelve (12); thence South Eighty-five Degrees Thirty-nine Minutes (S 85° 39') East Five Hundred Feet (500.00') along the north line of said Northwest Quarter (NW1/4) of the Southwest Quarter (SW1/4); thence South One Thousand Three Hundred Seven and Two tenths feet (1307.20') to a point on the south line of said Northwest Quarter (NW1/4) of the Southwest Quarter (SW1/4); thence North Eighty-six Degrees Fifteen Minutes (N 85° 15') West Four Hundred Ninety-nine and Sixty-three Hundredths feet (499.63') to a point on the west line of said Northwest Quarter (NW1/4) of the Southwest Quarter (SW1/4); thence North One Thousand Three Hundred Twelve and Forty-six Hundredths feet (1,312.46') along said West line to the point of beginning, said parcel contains 15.00 acres, more or less, including 1.35 acres, more or less, of established roadway.

Exempt from declaration & transfer tax. Actual consideration less than \$500.00. Iowa Code Section 428A.2(21).

RE-RECORD



HISTORICAL AERIALS

Project Property: Sioux Gateway Airport NEPA

n/a

Sioux City IA

Project No: 23S049.00 Phase 130 Task 307

Requested By: Foth Infrastructure & Environment LLC

Order No: 24041700273

Date Completed: April 19, 2024

Aerial Maps included in this report are produced by the sources listed above and are to be used for research purposes including a phase I report. Maps are not to be resold as commercial property. ERIS provides no warranty of accuracy or liability. The information contained in this report has been produced using aerial photos listed in above sources by ERIS Information Inc. (in the US) and ERIS Information Limited Partnership (in Canada), both doing business as 'ERIS'. The maps contained in this report do not purport to be and do not constitute a guarantee of the accuracy of the information contained herein. Although ERIS has endeavored to present information that is accurate, ERIS disclaims, any and all liability for any errors, omissions, or inaccuracies in such information and data, whether attributable to inadvertence, negligence or otherwise, and for any consequences arising therefrom. Liability on the part of ERIS is limited to the monetary value paid for this report.

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Date	Source	Scale	Comments
2023	Maxar Technologies	1" = 500'	
2021	United States Department of Agriculture	1" = 500'	
2019	United States Department of Agriculture	1" = 500'	
2017	United States Department of Agriculture	1" = 500'	
2015	United States Department of Agriculture	1" = 500'	
2014	United States Department of Agriculture	1" = 500'	
2013	United States Department of Agriculture	1" = 500'	
2011	United States Department of Agriculture	1" = 500'	
2010	United States Department of Agriculture	1" = 500'	
2009	United States Department of Agriculture	1" = 500'	
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2005	United States Department of Agriculture	1" = 500'	
2004	United States Department of Agriculture	1" = 500'	
2000	United States Geological Survey	1" = 500'	
1993	United States Geological Survey	1" = 500'	
1991	United States Geological Survey	1" = 500'	
1983	United States Geological Survey	1" = 500'	
1973	Agricultural Stabilization & Conserv. Service	1" = 500'	
1966	United States Geological Survey	1" = 500'	
1960	Agricultural Stabilization & Conserv. Service	1" = 500'	
1953	Army Mapping Service	1" = 500'	Best Copy Available
1949	Agricultural Stabilization & Conserv. Service	1" = 500'	
1938	Agricultural Stabilization & Conserv. Service	1" = 500'	

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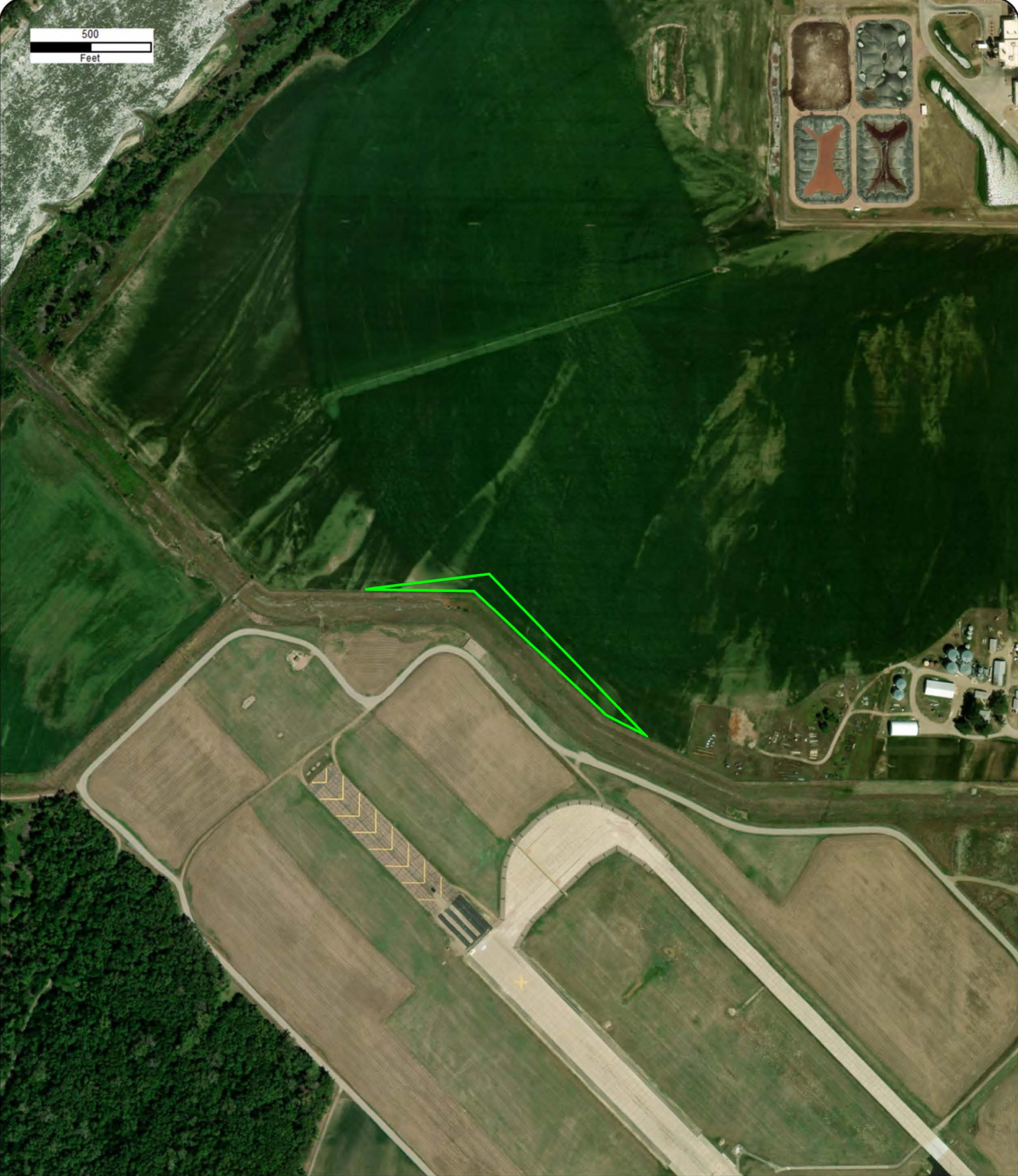
1.866.517.5204 | info@erisinfo.com | erisinfo.com



TOPOGRAPHIC MAPS

Project Property:	Sioux Gateway Airport NEPA
	n/a
	Sioux City IA None
Project No:	23S049.00 Phase 130 Task 307
Requested By:	Foth Infrastructure & Environment LLC
Order No:	24041700273
Date Completed:	April 17, 2024

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Feet



Year: 2023
Source: MAXAR
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Approx Center: -96.39699546,42.4127437

Order No: 24041700273



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Order No: 24041700273



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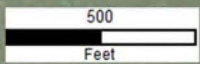


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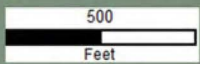


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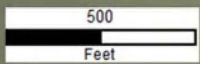


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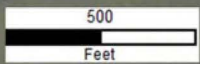


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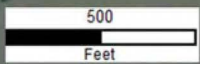


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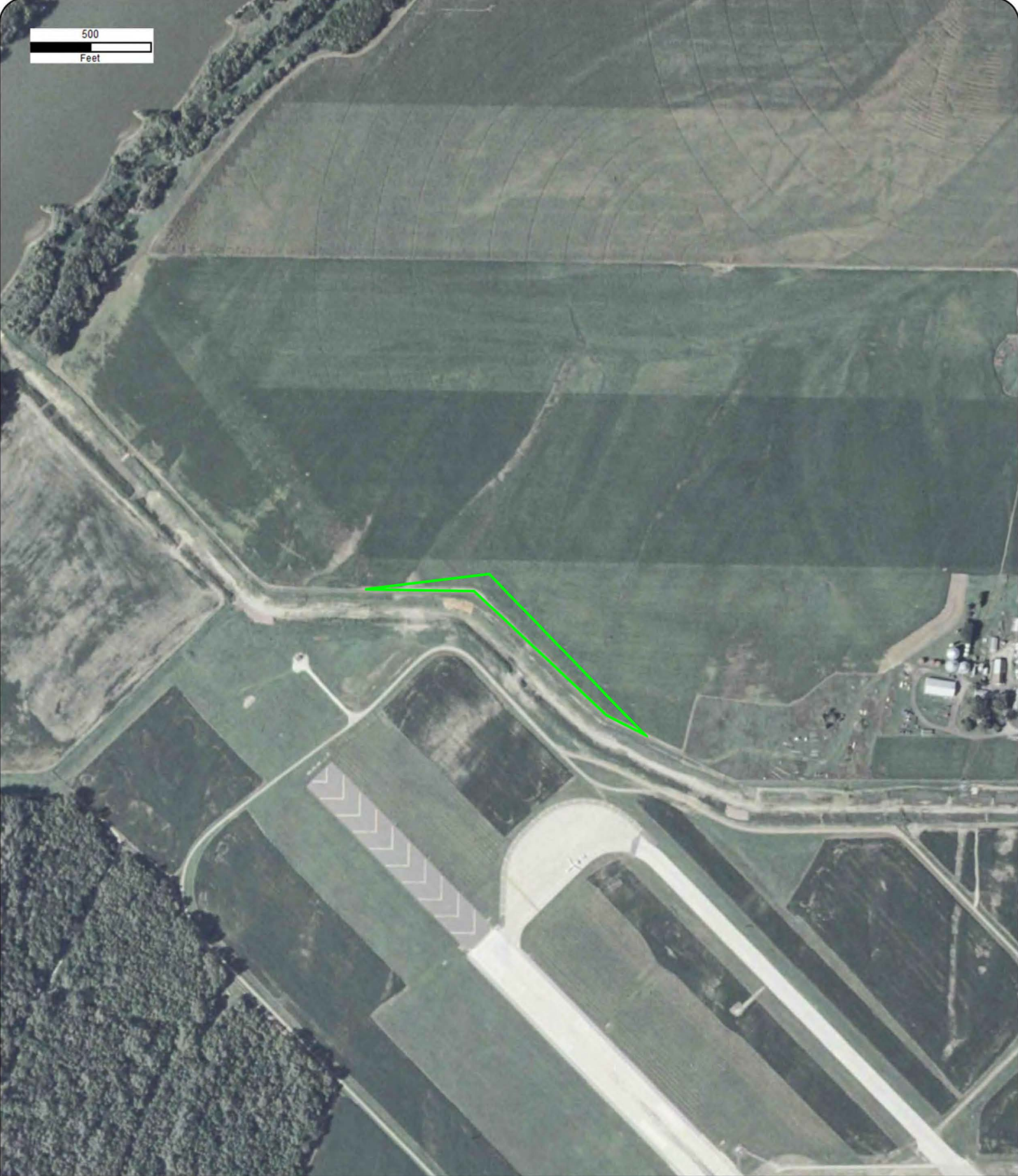
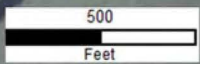


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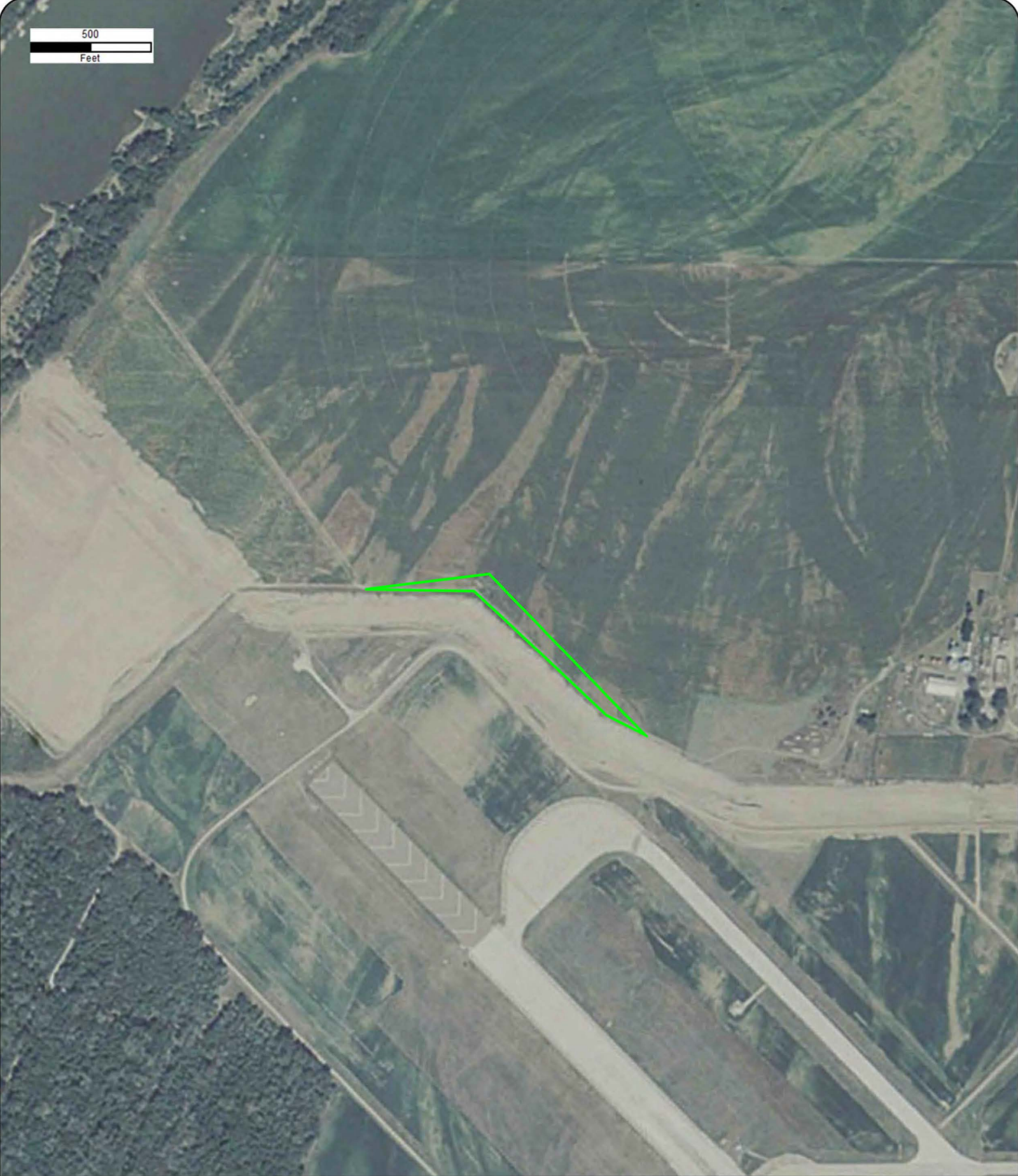
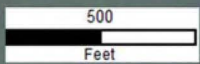


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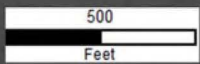


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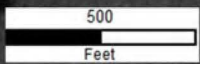


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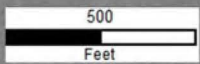


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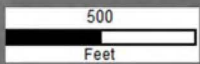


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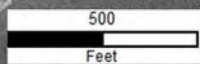


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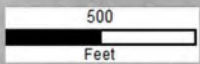


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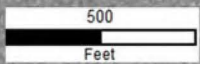


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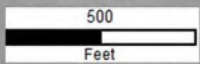


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Order No: 24041700273





Year: 1949
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Order No: 24041700273



500
Feet



Year: 1938
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Scale: 1" = 500'
Comment:

Address: n/a, Sioux City, IA
Approx Center: -96.39699546,42.4127437

Order No: 24041700273



We have searched USGS collections of current topographic maps and historical topographic maps for the project property. Below is a list of maps found for the project property and adjacent area. Maps are from 7.5 and 15 minute topographic map series, if available.

Year	Map Series
2018	7.5
2015	7.5
2013	7.5
1995	7.5
1976	7.5
1971	7.5
1963	7.5

Topographic Map Symbolology for the maps may be available in the following documents:

Pre-1947

[Page 223 of 1918 Topographic Instructions](#)

[Page 130 of 1928 Topographic Instructions](#)

1947-2009

[Topographic Map Symbols](#)

2009-present

[US Topo Map Symbols](#)

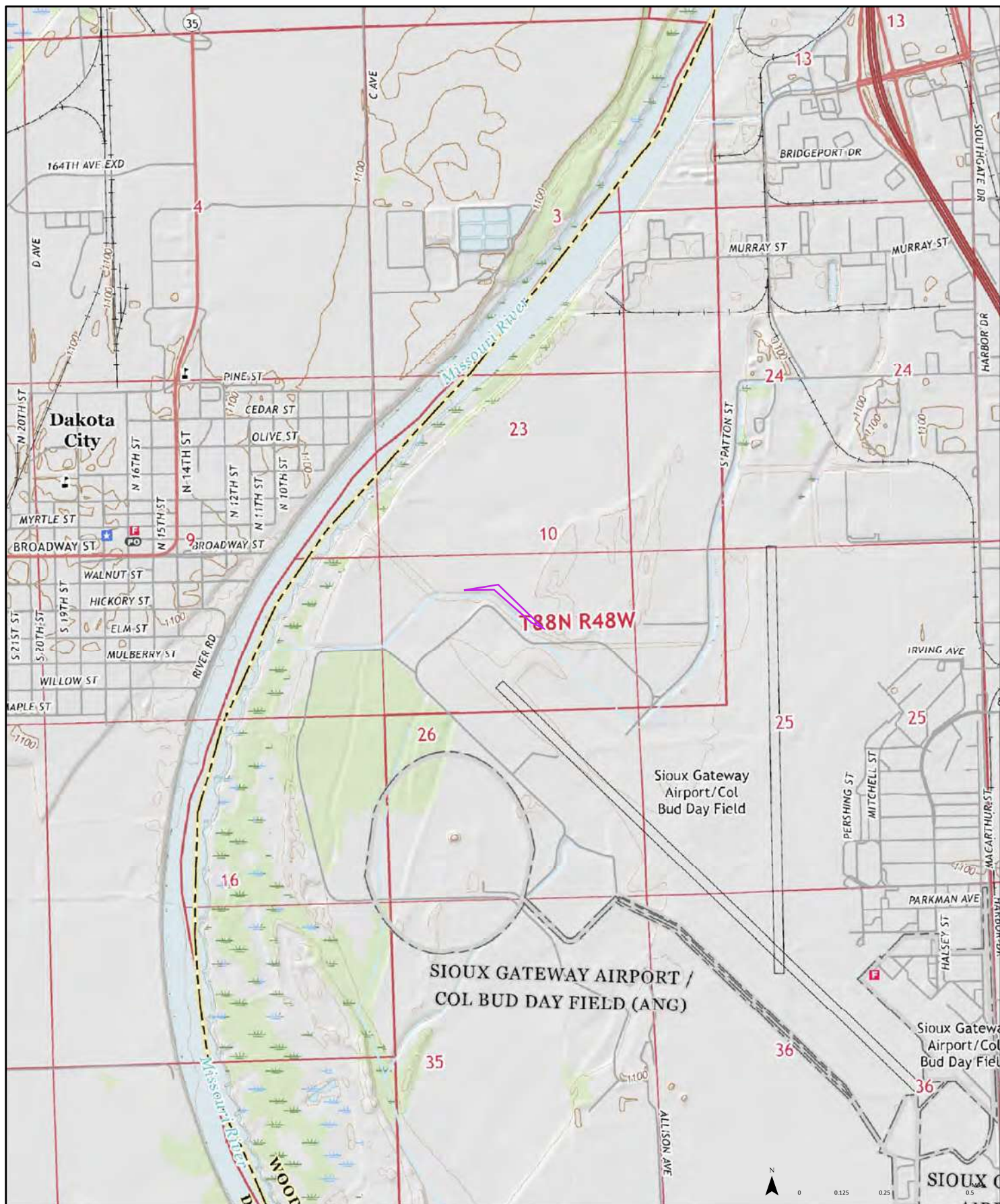
Topographic Maps included in this report are produced by the USGS and are to be used for research purposes including a phase I report. Maps are not to be resold as commercial property.

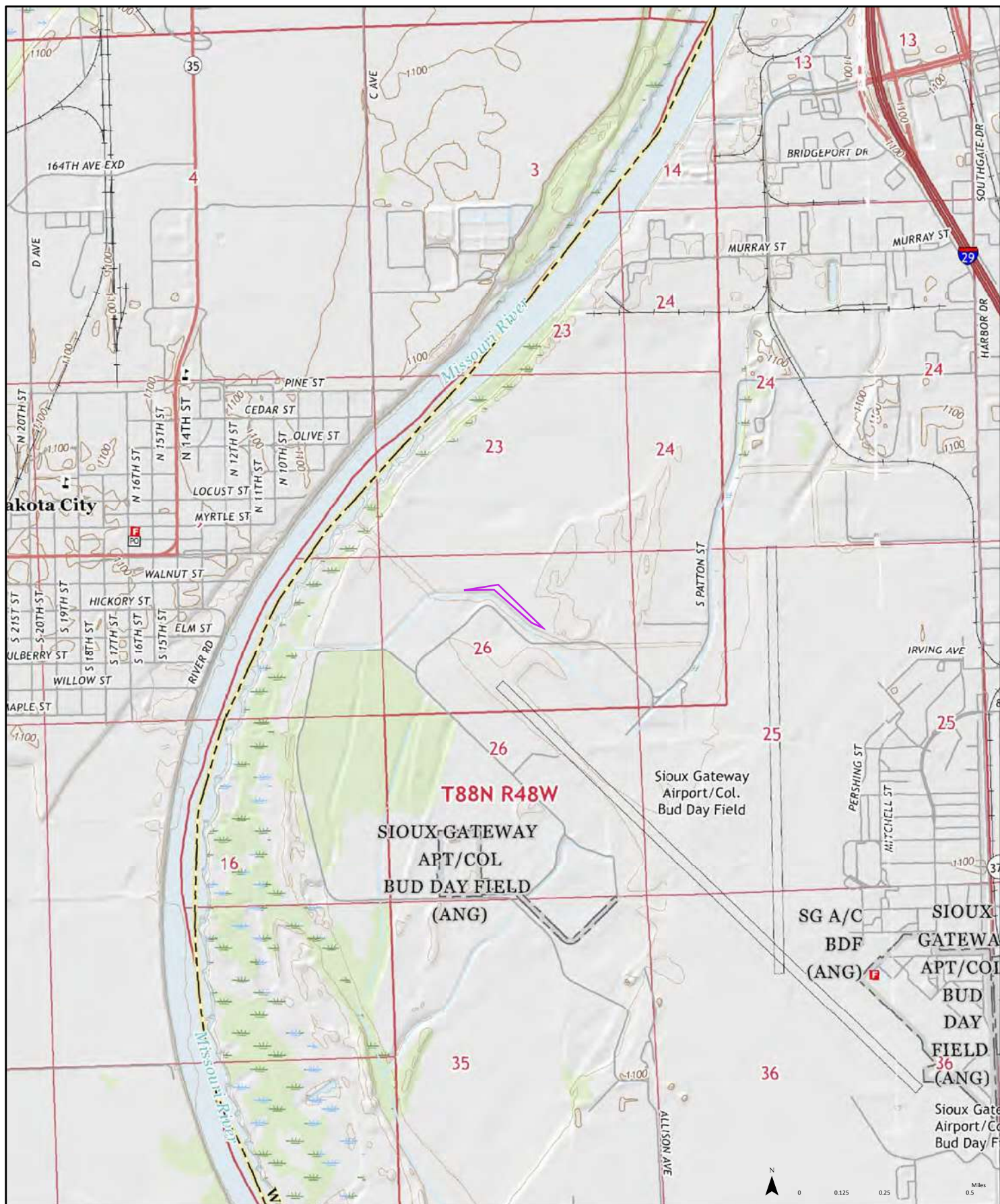
No warranty of Accuracy or Liability for ERIS: The information contained in this report has been produced by ERIS Information Inc.(in the US) and ERIS Information Limited Partnership (in Canada), both doing business as 'ERIS', using Topographic Maps produced by the USGS. This maps contained herein does not purport to be and does not constitute a guarantee of the accuracy of the information contained herein. Although ERIS has endeavored to present you with information that is accurate, ERIS disclaims, any and all liability for any errors, omissions, or inaccuracies in such information and data, whether attributable to inadvertence, negligence or otherwise, and for any consequences arising therefrom. Liability on the part of ERIS is limited to the monetary value paid for this report.

Environmental Risk Information Services

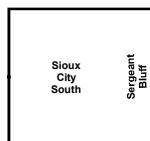
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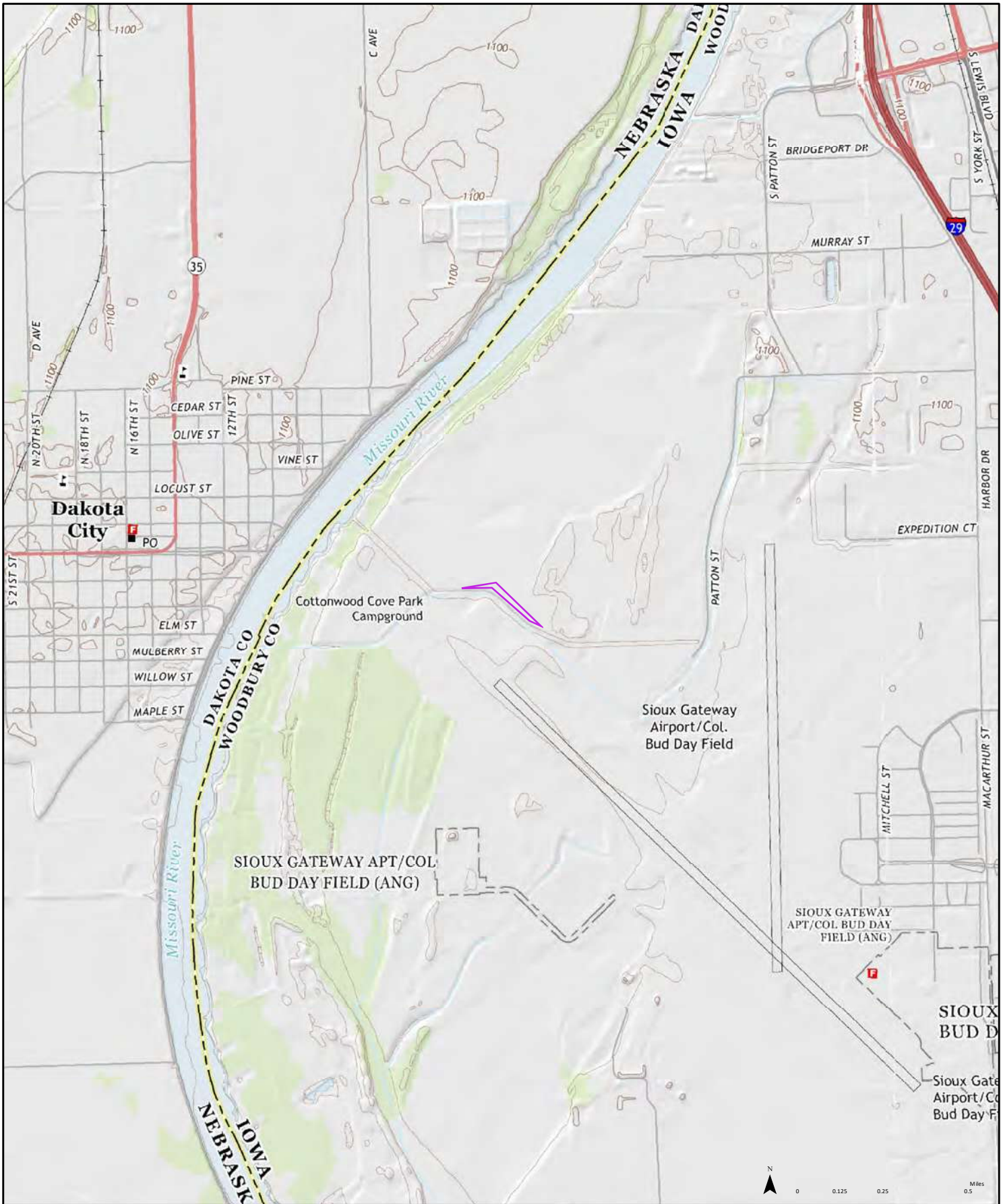
2015



Available Quadrangle(s): Sioux City South, IA
Sergeant Bluff, IA

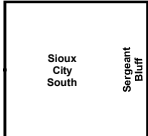
Source: USGS 7.5 Minute Topographic Map





2013

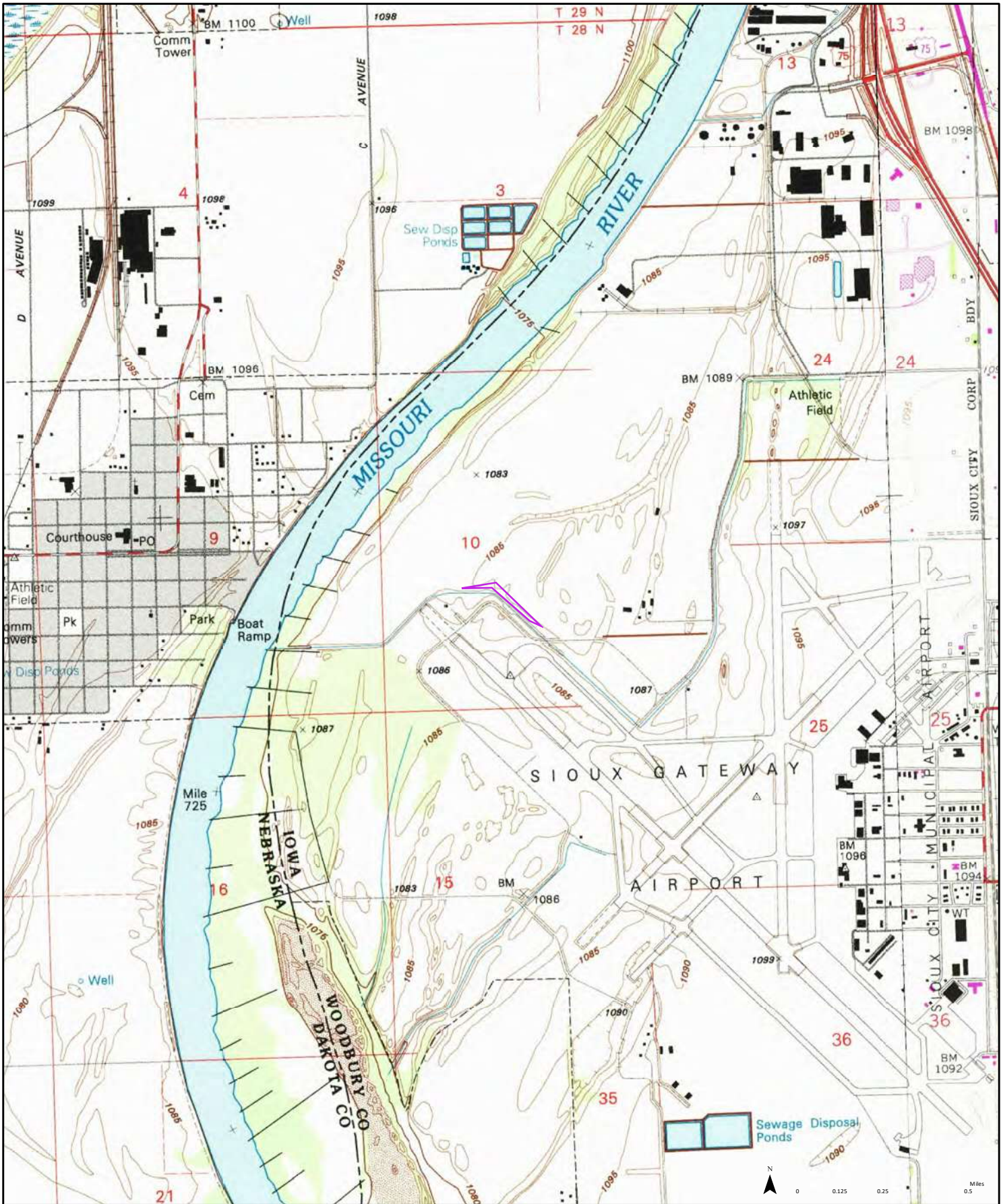
Order No. 24041700273



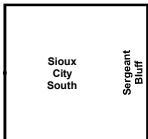
Available Quadrangle(s): Sioux City South, IA
Sergeant Bluff, IA

Source: USGS 7.5 Minute Topographic Map

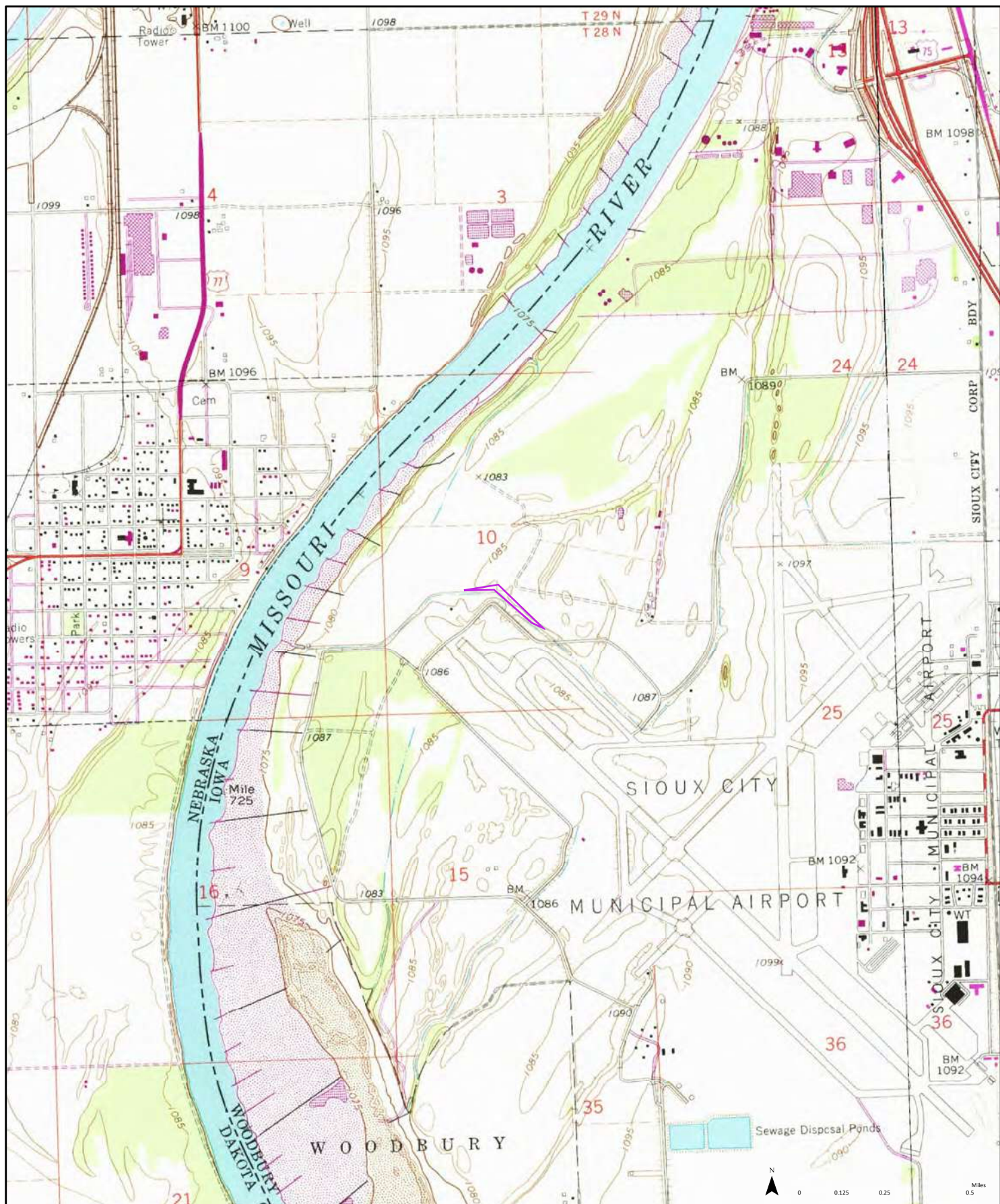




1995 (1-1995) Aerial Photo Year: 1991 (2-1976) Aerial Photo Year: 1976 Photo Revision Year: 1976 Order No. 24041700273



Available Quadrangle(s): Sioux City South, IA(1-1995)
Sergeant Bluff, IA(2-1976)

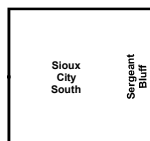


1976

(1-1976) Aerial Photo Year: 1976
Photo Revision Year: 1976

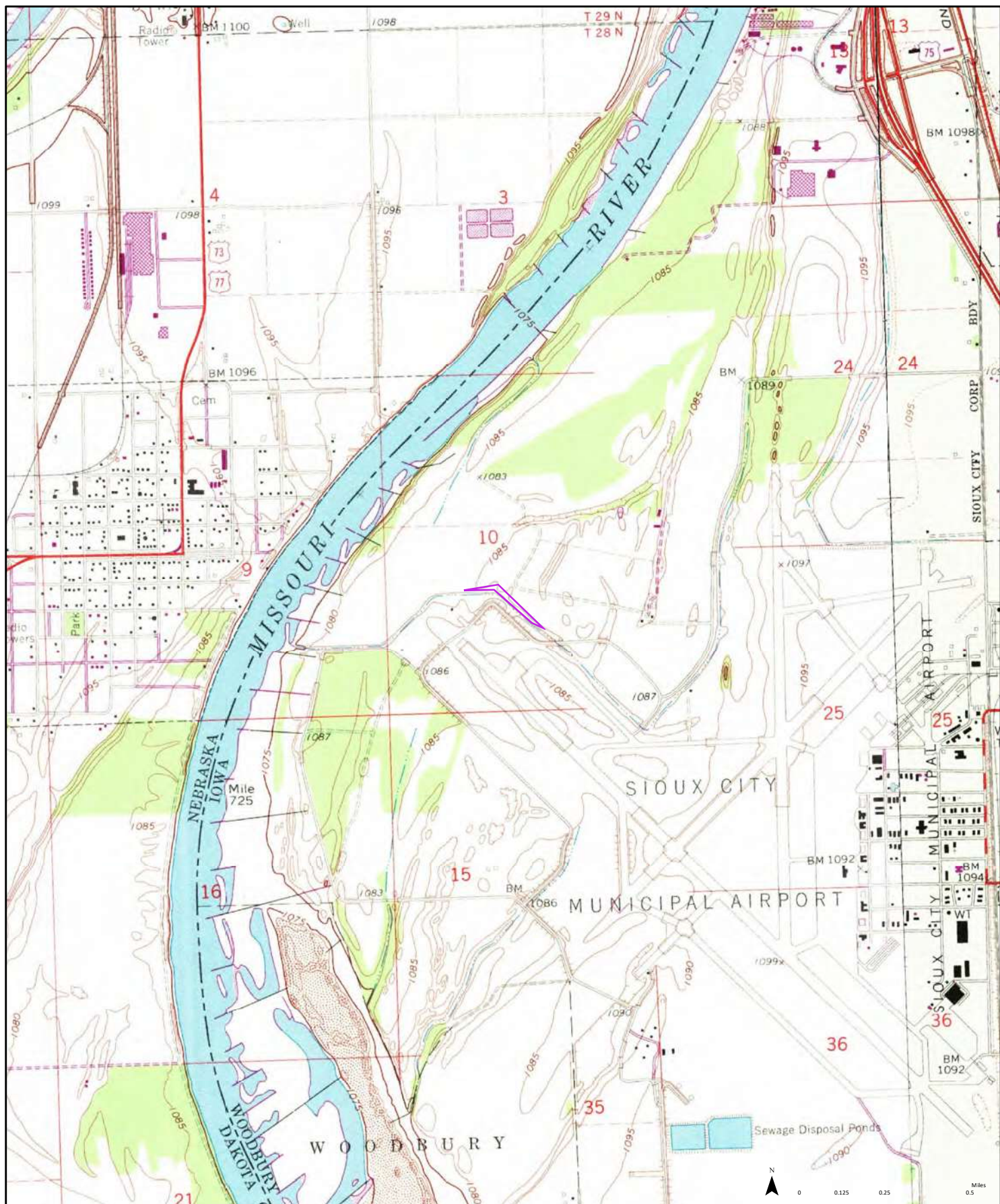
(2-1976) Aerial Photo Year: 1976
Photo Revision Year: 1976

Order No. 24041700273



Available Quadrangle(s): Sioux City South, IA (2-1976)
Sergeant Bluff, IA (1-1976)



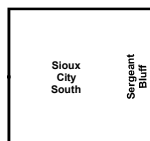


1971

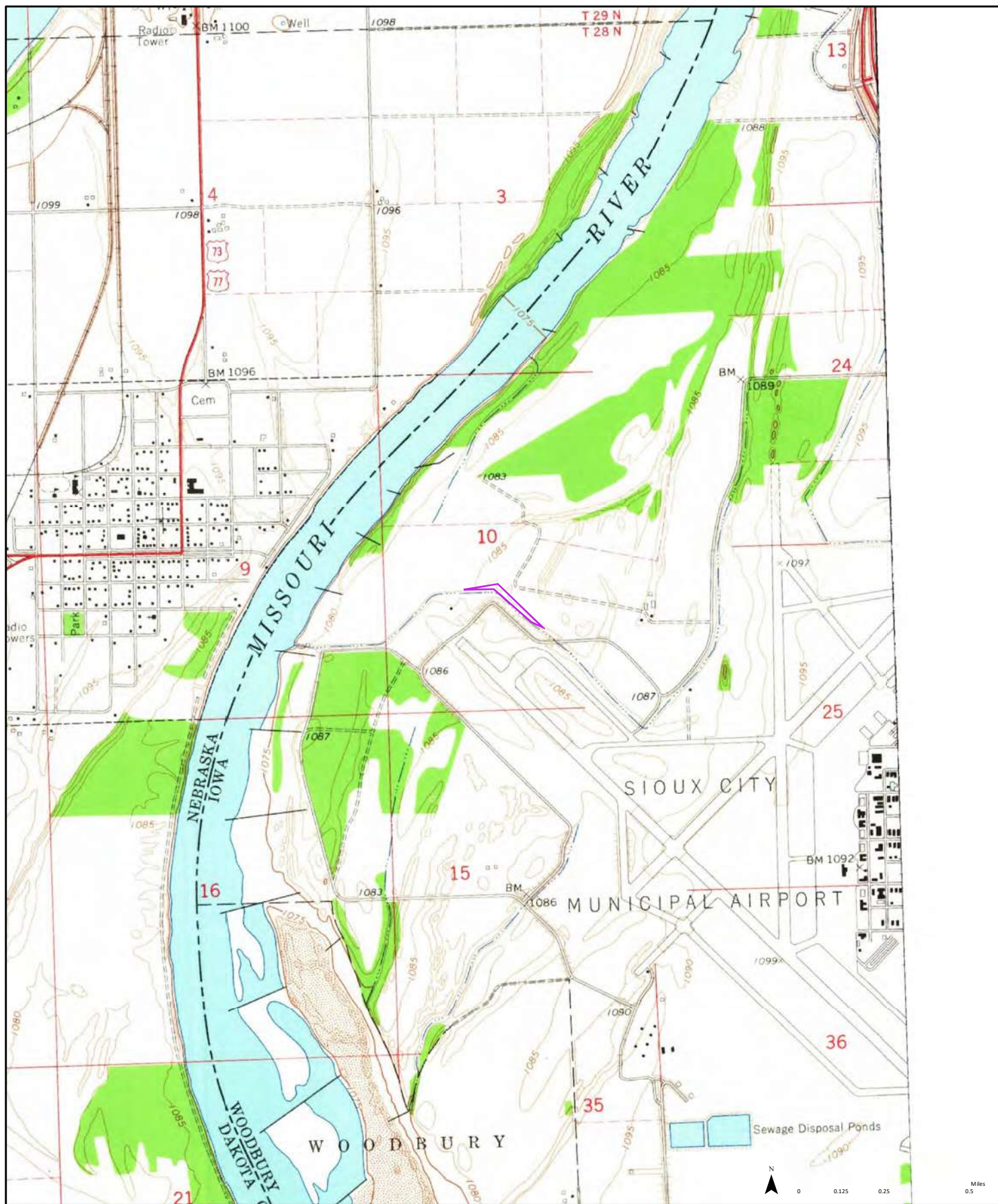
(1-1971) Aerial Photo Year: 1971
Photo Revision Year: 1971

(2-1971) Aerial Photo Year: 1971
Photo Revision Year: 1971

Order No. 24041700273



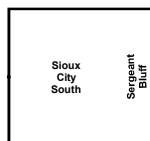
Available Quadrangle(s): Sioux City South, NE⁽²⁻¹⁹⁷¹⁾
Sergeant Bluff, IA⁽¹⁻¹⁹⁷¹⁾



1963

(1-1963)
Aerial Photo Year: 1961

Order No. 24041700273



Available Quadrangle(s): Sioux City South, NE(1-1963)

Source: USGS 7.5 Minute Topographic Map





CITY DIRECTORY

Project Property: *Sioux Gateway Airport NEPA
n/a
Sioux City, IA*

Project No: *23S049.00 Phase 130 Task 307*

Requested By: *Foth Infrastructure & Environment LLC*

Order No: *24041700273*

Date Completed: *April 24, 2024*

Environmental Risk Information Services

A division of Glacier Media Inc.

1.866.517.5204 | info@erisinfo.com | erisinfo.com

April 24, 2024
RE: CITY DIRECTORY RESEARCH
n/a
Sioux City, IA

Thank you for contacting ERIS for an City Directory Search for the site described above. Our staff has conducted a reverse listing City Directory search to determine prior occupants of the subject site and adjacent properties. We have provided the nearest addresses(s) when adjacent addresses are not listed. If we have searched a range of addresses, all addresses in that range found in the Directory are included.

Note: Reverse Listing Directories generally are focused on more highly developed areas. Newly developed areas may be covered in the more recent years, but the older directories will tend to cover only the "central" parts of the city. To complete the search, we have either utilized the ACPL, Library of Congress, State Archives, and/or a regional library or history center as well as multiple digitized directories. These do not claim to be a complete collection of all reverse listing city directories produced.

ERIS has made every effort to provide accurate and complete information but shall not be held liable for missing, incomplete or inaccurate information. To complete this search we used the general range(s) below to search for relevant findings. If you believe there are additional addresses or streets that require searching please contact us at 866-517-5204.

Search Criteria:

all of S Patton St

all of Seaboard Triumph Pkwy

Search Notes:

Search Results Summary

Date	Source	Comment
2022	DIGITAL BUSINESS DIRECTORY	
2020	DIGITAL BUSINESS DIRECTORY	
2016	DIGITAL BUSINESS DIRECTORY	
2012	DIGITAL BUSINESS DIRECTORY	
2008	DIGITAL BUSINESS DIRECTORY	
2003	DIGITAL BUSINESS DIRECTORY	
2000	DIGITAL BUSINESS DIRECTORY	
1996	POLKS	
1991	POLKS	
1986	POLKS	
1981	POLKS	
1976	POLKS	
1971	POLKS	
1967	POLKS	
1964	POLKS	
1958	POLKS	
1954	POLKS	
1950	POLKS	
1945	POLKS	
1940	POLKS	
1935	POLKS	
1930	POLKS	
1925	POLKS	

Environmental Risk Information Services

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1.866.517.5204 | info@erisinfo.com | erisinfo.com

NO LISTING FOUND

5555 SEABOARD TRIUMPH FOODS...NONCLASSIFIED ESTABLISHMENTS

NO LISTING FOUND

5555 SEABOARD TRIUMPH FOODS...NONCLASSIFIED ESTABLISHMENTS

2016

S PATTON ST

SOURCE: DIGITAL BUSINESS DIRECTORY

NO LISTING FOUND

2016

SEABOARD TRIUMPH PKWY

SOURCE: DIGITAL BUSINESS DIRECTORY

NO LISTING FOUND

NO LISTING FOUND

NO LISTING FOUND

2008

S PATTON ST

SOURCE: DIGITAL BUSINESS DIRECTORY

NO LISTING FOUND

2008

SEABOARD TRIUMPH PKWY

SOURCE: DIGITAL BUSINESS DIRECTORY

NO LISTING FOUND

2003

S PATTON ST

SOURCE: DIGITAL BUSINESS DIRECTORY

NO LISTING FOUND

2003

SEABOARD TRIUMPH PKWY

SOURCE: DIGITAL BUSINESS DIRECTORY

NO LISTING FOUND

2000

S PATTON ST

SOURCE: DIGITAL BUSINESS DIRECTORY

NO LISTING FOUND

2000

SEABOARD TRIUMPH PKWY

SOURCE: DIGITAL BUSINESS DIRECTORY

NO LISTING FOUND

1996

S PATTON ST

SOURCE: POLKS

STREET NOT LISTED

1996

SEABOARD TRIUMPH PKWY

SOURCE: POLKS

STREET NOT LISTED

1991

S PATTON ST

SOURCE: POLKS

STREET NOT LISTED

1991

SEABOARD TRIUMPH PKWY

SOURCE: POLKS

STREET NOT LISTED

1986

S PATTON ST

SOURCE: POLKS

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1986

SEABOARD TRIUMPH PKWY

SOURCE: POLKS

STREET NOT LISTED

1981

S PATTON ST

SOURCE: POLKS

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1981

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SOURCE: POLKS

STREET NOT LISTED

1976

S PATTON ST

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1976

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1971

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1967

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STREET NOT LISTED

1964

S PATTON ST

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1958

S PATTON ST

SOURCE: POLKS

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1958

SEABOARD TRIUMPH PKWY

SOURCE: POLKS

STREET NOT LISTED

1954

S PATTON ST

SOURCE: POLKS

STREET NOT LISTED

1954

SEABOARD TRIUMPH PKWY

SOURCE: POLKS

STREET NOT LISTED

1950

S PATTON ST

SOURCE: POLKS

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1950

SEABOARD TRIUMPH PKWY

SOURCE: POLKS

STREET NOT LISTED

1945

S PATTON ST

SOURCE: POLKS

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1945

SEABOARD TRIUMPH PKWY

SOURCE: POLKS

STREET NOT LISTED

1940

S PATTON ST

SOURCE: POLKS

STREET NOT LISTED

1940

SEABOARD TRIUMPH PKWY

SOURCE: POLKS

STREET NOT LISTED

1935

S PATTON ST

SOURCE: POLKS

STREET NOT LISTED

1935

SEABOARD TRIUMPH PKWY

SOURCE: POLKS

STREET NOT LISTED

1930

S PATTON ST

SOURCE: POLKS

STREET NOT LISTED

1930

SEABOARD TRIUMPH PKWY

SOURCE: POLKS

STREET NOT LISTED

1925

S PATTON ST

SOURCE: POLKS

STREET NOT LISTED

1925

SEABOARD TRIUMPH PKWY

SOURCE: POLKS

STREET NOT LISTED



FIRE INSURANCE MAPS

Project Property:	Sioux Gateway Airport NEPA n/a Sioux City IA
Project No:	23S049.00 Phase 130 Task 307
Requested By:	Foth Infrastructure & Environment LLC
Order No:	24041700273
Date Completed:	April 17, 2024

Please note that no information was found for your site or adjacent properties.

Appendix B

Client-Provided Information

Phase I ESA User Questionnaire

USER OF THIS PHASE I ESA (Client): Sioux Gateway Airport

USER REPRESENTATIVE (Please Type or Print): Mick Morgan, City of Sioux City

PROPERTY (Name & Address): Sioux Gateway Airport, 2403 Aviation Boulevard, Sioux City, IA

DATE: 7/26/24

Introduction

In order to qualify for one of the Landowner Liability Protections (LLPs) offered by the Small Business Liability Relief and Brownfields Revitalization Act of 2001 (the "Brownfields Amendments"), RS&H (the User of this Phase I ESA) must provide the following information (if available) to Foth Infrastructure & Environment, LLC (the environmental professional). Failure to provide this information could result in a determination that "all appropriate inquiry" is not complete.

1. Environmental liens that are filed or recorded against the site (40 CFR 312.25).

Did a search of recorded land title records (or judicial records where appropriate, see Note 1 below) identify any environmental liens filed or recorded against the Property under federal, tribal, state, or local law?

☒ NO

☐ YES

(or see attached)

Note 1: In certain jurisdictions, federal, tribal, state/local statutes, or regulations specify that environmental liens and activity and use limitations (AULs) be filed in judicial records rather than land title records. In such cases, judicial records must be searched for environmental liens or AULs.

2. Activity and land use limitations that are in place on the site or that have been filed or recorded in a registry (40 CFR 312.26).

Did a search of recorded land title records (or judicial records where appropriate, see Note 1 above) identify any **AULs***, such as engineering controls, land use restrictions, or institutional controls that are in place at the Property and/or have been filed or recorded against the Property under federal, tribal, state, or local law?

☒ NO

☐ YES

(or see attached)

* **AUL**—legal or physical restrictions or limitations on the use of, or access to, a site or facility:

Note 1: To reduce or eliminate potential exposure to hazardous substances or petroleum products in the soil, soil vapor, ground water, and/or surface water on the Property; or

Note 2: To prevent activities that could interfere with the effectiveness of a response action, in order to ensure maintenance of a condition of no significant risk to public health or the environment. These legal or physical restrictions, which may include institutional and/or engineering controls, are intended to prevent adverse impacts to individuals or populations that may be exposed to hazardous substances and petroleum products in the soil, soil vapor, ground water, and/or surface water on the Property.

3. Specialized knowledge or experience of the person seeking to qualify for the LLP (40 CFR 312.28).

As the User of this ESA, do you have any specialized knowledge or experience related to the Property or nearby properties? For example, are you involved in the same line of business as the current or former

occupants of the Property or an adjoining Property so that you would have specialized knowledge of the chemicals and processes used by this type of business?

☒ NO ☐ YES _____
(or see attached)

4. Relationship of the purchase price to the fair market value of the Property if it were not contaminated (40 CFR 312.29).

Does the purchase price being paid for this Property reasonably reflect the fair market value of the Property? If you conclude that there is a difference, have you considered whether the lower purchase price is because contamination is known or believed to be present at the Property?

☐ NO ☒ YES fair market value
(or see attached)

5. Commonly known or reasonably ascertainable information about the Property (40 CFR 312.30).

Are you aware of commonly known or reasonably ascertainable information about the Property that would help the environmental professional to identify conditions indicative of releases or threatened releases? For example, as User,

(a.) Do you know the past uses of the Property?

☐ NO ☒ YES Farming
(or see attached)

(b.) Do you know of specific chemicals that are present or once were present at the Property?

☒ NO ☐ YES _____
(or see attached)

(c.) Do you know of spills or other chemical releases that have taken place at the Property?

☒ NO ☐ YES _____
(or see attached)

(d.) Do you know of any environmental cleanups that have taken place at the Property?

☒ NO ☐ YES _____
(or see attached)

6. The degree of obviousness of the presence of likely presence of contamination at the Property, and the ability to detect the contamination by appropriate investigation (40 CFR 312.31).

As the User of this ESA, based on your knowledge and experience related to the Property are there any obvious indicators that point to the presence or likely presence of contamination at the Property?

☒ NO ☐ YES _____
(or see attached)

Appendix C

Historical Research Documentation

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US Army Corps of Engineers
BUILDING STRONG®

SIOUX CITY MUNI AIRPORT

Formerly Used Defense Sites Program Management Action Plan

Published by: U.S. Army Corps of Engineers, Environmental Programs

Data as of 2021 Annual Report to Congress

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I. Statement of Purpose

A. Management Action Plan

The Management Action Plan (MAP) is to outline the total multi-year environmental cleanup program for a Formerly Used Defense Site (FUDS) property. The plan will define the cleanup program requirements and propose a comprehensive approach and associated costs to conduct future investigations and response action at each cleanup site.

B. Formerly Used Defense Sites Program

During the past two centuries, the Department of Defense (DOD) has used land throughout the United States to both train Soldiers, Airmen, Sailors and Marines, and test new weapons to ensure the nation's military readiness. As training and testing needs changed, DOD obtained property or returned it to private or public uses. When no longer needed, many of these properties were cleaned up according to the best practices available at the time and then transferred to other owners such as private individuals or federal, state, tribal, or local government entities.

Today, DOD is responsible for the environmental restoration (cleanup) of properties that were formerly owned by, leased to or otherwise possessed by the United States and under the jurisdiction of the Secretary of Defense prior to October 1986. Such properties are known as Formerly Used Defense Sites or FUDS. The U.S. Army is DOD's lead agent for the FUDS Program. The U.S. Army Corps of Engineers executes the FUDS Program on behalf of the U.S. Army and DOD. The U.S. Army and DOD are dedicated to protecting human health and the environment by investigating and, if required, cleaning up potential contamination or munitions that may remain on these properties from past DOD activities.

The scope and magnitude of the FUDS Program are significant, with more than 10,000 properties identified for potential inclusion in the program. Information about the origin and extent of contamination or munitions, land transfer issues, past and present property ownership, applicable laws and DOD policies must be evaluated before DOD considers a property eligible for Defense Environment Restoration Account funding under the FUDS Program. Environmental cleanup at FUDS properties is conducted under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

C. Installation Restoration Program (IRP)

Installation Restoration Program (IRP) category projects include sites that require response actions to address releases of: (a) Hazardous substances and pollutants or contaminants; (b) Petroleum, Oil, and Lubricants (POLs); (c) Hazardous wastes or hazardous waste constituents; and (d) Explosive compounds released to soil, surface water, sediment, or groundwater as a result of ammunition or explosives production or manufacturing at ammunition plants.

The relative risk site evaluation (RRSE) framework is a methodology used by all DoD Components to evaluate the relative risk posed by a site in relation to other sites. It is a tool used across all of DoD to group sites into high, medium, and low categories based on an evaluation of site information using three factors: the contaminant hazard factor (CHF), the migration pathway factor (MPF), and the receptor factor (RF). Factors are based on a quantitative evaluation of Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) hazardous substances, pollutants, or contaminants and a qualitative evaluation of pathways and human and ecological receptors in the four media most likely to result in significant exposure groundwater, surface water, sediment, and surface soils.

D. Military Munitions Response Program (MMRP)

In 2001, DoD established the Military Munitions Response Program (MMRP). The MMRP addresses munitions response sites (MRSs) at Formerly Used Defense Site locations. MRSs are sites that are known or suspected to contain unexploded ordnance, discarded military munitions, or munitions constituents (MC). Through the MMRP, DoD complies with environmental cleanup laws, such as the Comprehensive Environmental Response, Compensation, and Liability Act, also known as Superfund.

To prioritize funding and cleanup of MRSs that pose the greatest threat to safety, human health, and the environment, DoD uses the Munitions Response Site Prioritization Protocol (MRSP). The MRSP consists of three separate modules to evaluate hazards associated with explosives, chemical warfare materiel, MC, and other incidental environmental contaminants. The MRSP scores affect how DoD sequences MRSs for cleanup. In addition to relative risk, DoD considers other factors such as economic, programmatic, and stakeholder concerns, as well as reuse and redevelopment plans, when prioritizing sites for cleanup.

II: Acronyms

BD/DR	Building Demolition and Debris Removal
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CHE	Chemical Warfare Material Hazard Evaluation
COMM/REL	Community Relations
CON/HTRW	Containerized/Hazardous, Toxic and Radioactive Waste
CTC	Cost to complete
CWM	Chemical Warfare Material
DD	Decision Document
DERP	Defense Environmental Restoration Program
DOD	Department of Defense
EE/CA	Engineer Evaluation/Cost Analysis
EHE	Explosive Hazard Factor
EP	Evaluation Pending
FFA	Federal Facilities Agreement
FUDS	Formerly Used Defense Sites
FUDSMIS	Formerly Used Defense Sites Management Information System
FS	Feasibility Study
HQDA	Headquarters, Department of the Army
HHE	Health Hazard Evaluation
IAG	Interagency Agreement
IRA	Interim remedial action
IRP	Installation Restoration Program
LTM	Long Term Management
MAP	Management Action Plan
MMRP	Military Munitions Response Program
MMRP/CWM	Military Munitions Response Program/Chemical Warfare Materials
MRSP	Military Munitions Site Prioritization Protocol
NKSH	No Known or suspected Hazard
NLR	No Longer Required
NPL	National Priorities List
PA	Preliminary Assessment
PA/INPR	Preliminary Assessment/Inventory Project Report
PCO	Project Closeout
PN	Preliminary Negotiations
QA	Quality Assurance
RA	Remedial Action
RA-C	Remedial Action-Construction
RA-O	Remedial Action-Operations
RAB	Restoration Advisory Board
RC	Response Complete

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RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RmA-C	Removal Action-Construction
RmD	Removal Design
RI/FS	Remedial Investigation/Feasibility Study
RIP	Remedy in Place
ROD	Record of Decision
RRSE	Relative Risk Site Evaluation
SI	Site Investigation
TAPP	Technical Assistance for Public Participation
TRC	Technical Review Committee

III. Property Information

FUDS Number: B07IA0131

FFID: IA79799F021800

Name: SIOUX CITY MUNI AIRPORT

A. Property Description

A major portion of the 2,318.71-acre site is currently owned by the City of Sioux City. Improvements included a hospital, housing, hangars, runways and taxiways, water supply, a sewage system, moving target and rifle ranges, and others. The site is now used as the primary municipal airport and also serves as home for the Iowa Air National Guard. Anticipate promoting project closeout/pending letters to Agencies.

IDNR POCs:

-Rochelle Cardinale

B. Locale

City: SIOUX CITY

State: IA

Latitude: 42.401559999999996

Longitude: -96.385151000000001

Congressional District: 04

Size (Acreage): 2318.71

C. Organization

Division: Northwestern Division

District: Omaha District

Phone: 402-995-2416

Current Owners:

Type	Name
Local	CITY

D. National Priorities List Status

The National Priorities List (NPL) is the list of national priorities among the known

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releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The NPL is intended primarily to guide the EPA in determining which sites warrant further investigation.

National Priorities List (NPL) Status: Not on the NPL

E. Project Summaries

The below table outlines all projects that have been identified on this FUDS property. The table provides information on the category of project, the legal driver, the RRSE or MRSP score that is used for prioritization, the total funding for the project, the status of work on the project, and the actual or anticipated remedy in place and response complete dates.

Project Number	Category	Name	Legal Driver	RRSE	MRSP	Status	RIP	RC
01	CON/HTRW	CON/HTRW	State			Complete	09/1993 Actual	09/1993 Actual
04	PRP/HTRW	PRP/HTRW	CERCLA			Complete	07/2016 Actual	07/2016 Actual

IV. Cleanup Program Summary

A. Historic Activity

DoD use began with construction of the Sioux City Army Air Base in 1942. The property was deeded to the city of Sioux City in 1948 but was recaptured by the Air Force in 1963. Air Force and Air National Guard missions continued until 1969 when the property was reported excess. Underground storage tanks and petroleum issues are the subject of the FUDS Program involvement.

V. Installation Restoration Program (IRP)

A. IRP Summary

Inception of IRP: 07/1990

Projects Identified: 2

Projects at Response Complete: 2

Remedy-in-Place (RIP): 07/2016

Response Complete (RC): 07/2016

IRP completion (including LTM): 07/2016

B. IRP Schedule

Project Schedule

Project No	Category	Site Type	Status	Response Complete
01	CON/HTRW	Underground Storage Tanks	Complete	09/1993 Actual
04	PRP/HTRW	Underground Storage Tanks	Complete	07/2016 Actual

Phase Schedule

Project No	Phase	Phase Type	Status	Start	End
01	RA-C	Remedial Action	Complete	07/1990	09/1993
04	PN	PRP	Complete	07/1992	07/2016
04	RI/FS	Remedial Response	Complete	07/1991	09/1999
04	IRA	Removal Action	Complete	07/1992	09/1992

Five-Year Review

Status: No Reviews Planned

C. Project Descriptions

Please see **Appendix I** for detailed IRP project descriptions

D. Costs**Funding To Date* (\$K): 4684****2021 Funding (\$K): 0****CTC (\$K): 0**

Project No	Phase	Status	< 2021	2021	2022	2023	2024	2025	2026	2027 +
01	RA-C	Complete								
01	IRA	Complete								
04	PN	Complete								
04	RI/FS	Complete								
04	IRA	Complete								

*Past costs are approximate and not inflated to reflect current year fiscal dollars.

 = phase funded

VI. Military Munitions Response Program (MMRP)

A. MMRP Summary

Inception of MMRP: 07/1990

Projects Identified: 0

Projects at Response Complete: 0

Remedy-in-Place (RIP): 07/2016

Response Complete (RC): 07/2016

MMRP completion (including LTM): 07/2016

B. MMRP Schedule

Project Schedule

There are no MMRP projects on this installation.

Five-Year Review

Status: No Reviews Planned

C. Project Descriptions

Please see **Appendix II** for detailed MMRP project descriptions

D. Costs

Funding To Date* (\$K): 0

2021 Funding (\$K): 0

CTC (\$K): 0

There are no MMRP project costs on this installation.

*Past costs are approximate and not inflated to reflect current year fiscal dollars.

VII. Community Involvement

Since 1993, the Department of Defense (DOD) has supported the development, implementation, and maintenance of the Restoration Advisory Board (RAB) program. Through the RAB program, communities provide input into the decision - making process of DOD's environmental cleanup program. A RAB is a group, equally co - chaired by a DOD representative and a community member, that serves as a forum for exchange of information between government officials and members of the local community on property cleanup issues. In addition to regular RAB meetings, a combination of activities may be conducted to enhance this process. Such activities may include coordinating installation site tours or providing interactive presentations with the use of cleanup technology models. Members of a RAB may include local citizens and representatives of the U.S. Environmental Protection Agency (EPA) and state, local, and tribal governments. The RAB team should reflect the diverse interests of the community and help identify possible issues associated with an installation's environmental cleanup program. RABs provide a link between the community and cleanup decision makers, and should complement other community involvement activities, such as holding public meetings, distributing informative mailings to the public on installation cleanup activities, and establishing local information repositories.

In fiscal year 1998 (FY98), DOD continued to build trust with local communities surrounding military installations by strengthening the RAB program and making new resources available; including the implementation of the Technical Assistance for Public Participation (TAPP) program. The TAPP program was designed to help community members of RABs and TRCs better understand the scientific and engineering issues underlying their properties' environmental cleanup activities. Under TAPP, the installation may contract for an independent technical consultant to advise the RAB on a specific project, which must be identified in the TAPP application. Typical projects may involve reviewing proposed remedial technologies, interpreting health and environmental effects data, or reviewing cleanup documents.

No RAB has been reported

APPENDIX I

IRP Project Descriptions

1. Identification

Project ID: 01

Project Name: CON/HTRW

Legal Driver: State

Closeout

RIP Date: 09/1993 Actual

RC Date: 09/1993 Actual

2. Project Description

No description reported.

3. Restoration History

UST removals were completed on 13 Sep 1991. Presence of free product was monitored and bailed from Sept through Nov, and evaluate rebound, and the need for an alternative free product recovery system.

Per an 8 Jun 1992 letter from the Iowa Department of Natural Resources, the Omaha District has been notified that insufficient evidence was submitted to document clean closure for the tanks that were removed as part of this contract. Need product recovery system at building 612.

4. Cleanup/Exit Strategy

No cleanup/exit strategy reported.

5. Status

RRSE: RC- 09/1993

Phases

Phase	Status
RA-C	Complete

APPENDIX II

MMRP Project Descriptions

There are no MMRP projects on this installation.



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[Report Error](#)

[Reconcile](#)

[Reports](#)

[Enforcement](#)

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ruth.hummel@dnr.iowa.gov

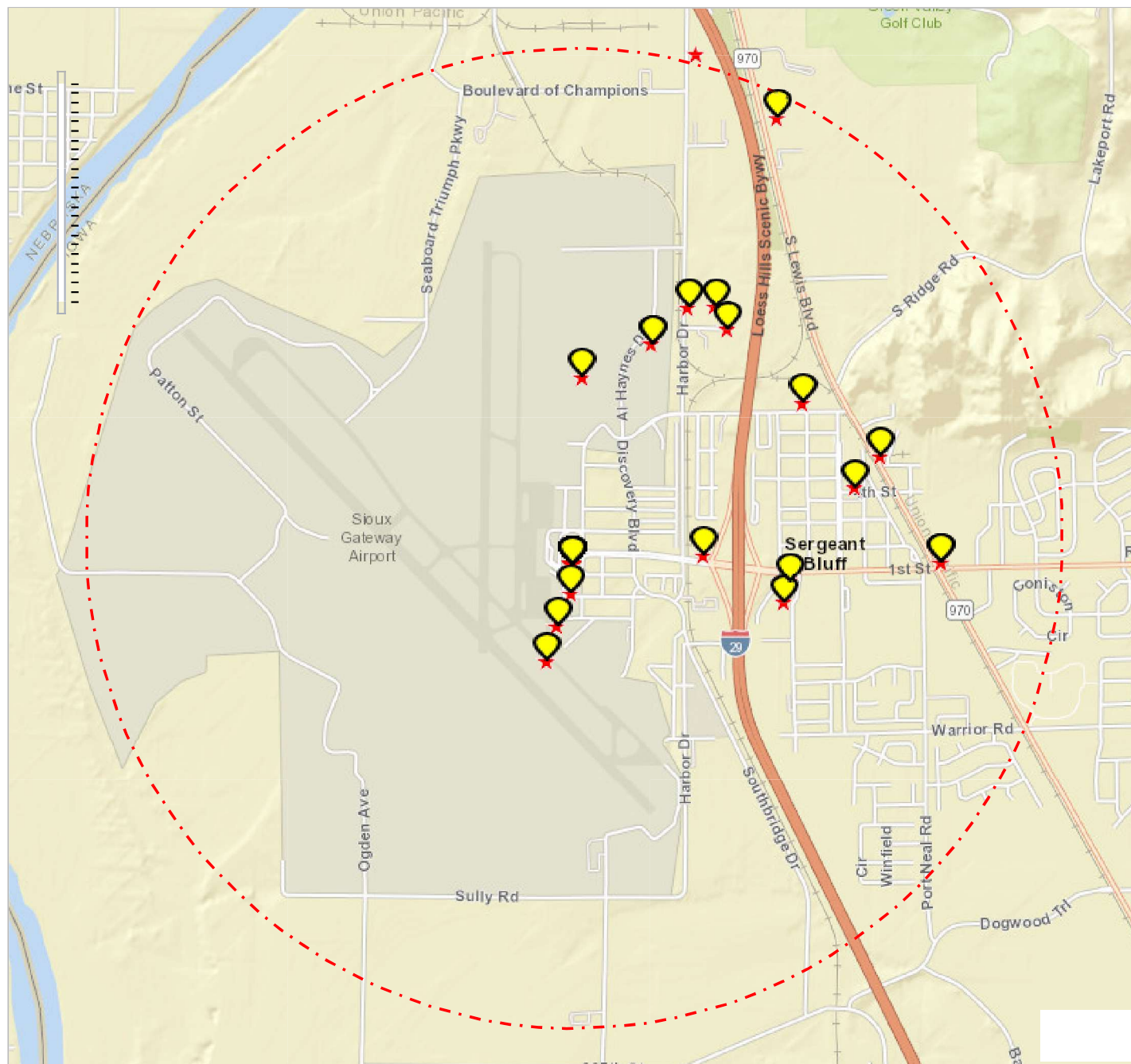
[View Map](#) [List View](#)

Iowa Department of Natural Resources
Leaking Underground Storage Tanks (LUST)

Center Latitude: 42.40181
Center Longitude: -96.37665
Radius: 8000 ft
Printed on: 5/15/2024

Legend

★ Leaking UST



Leak Number	UST Number	Facility Name	Address	Classification Date	LUST Status	Staff
9LTI02	198600419	401 Fourth Street	BOX 97 Sergeant Bluff, IA 51054	5/8/2003	No Action Required	Hummel
9LTJ82	199016963	Airport Amoco	I-29 & OGDEN AVENUE Sergeant Bluff, IA 51054	12/4/2003	No Action Required	Hummel
7LTV28	198600972	Crabbs Car Rental	6115 MITCHELL Sioux City, IA 51110	7/26/1991	No Action Required	
8LTJ21	198603590	Diosynth Inc	5500 1/2 BRADLEY STREET Sioux City, IA 51101	3/5/1991	No Action Required	
7LTT06	198608726	Former Bait Shop	502 HWY 75 Sergeant Bluff, IA 51054	10/6/2005	No Action Required	Jergenson
7LTL95	198604314	Mikes Mini-mart	100 1ST ST HWY 75 N Sergeant Bluff, IA 51054	5/29/1990	No Action Required	Cardinale
7LTL95	198604314	Mikes Mini-mart	100 S LEWIS BLVD Sergeant Bluff, IA 51054	5/29/1990	No Action Required	Cardinale
8LTZ60	198604314	Mikes Mini-mart	100 1ST ST HWY 75 N Sergeant Bluff, IA 51054	10/6/2014	No Action Required	Hummel
8LTZ60	198604314	Mikes Mini-mart	100 S LEWIS BLVD Sergeant Bluff, IA 51054	10/6/2014	No Action Required	Hummel
9LTA42	198608753	Ryder Truck Rental #0826	8TH AND C PO BOX 689 Sergeant Bluff, IA 51054	8/2/1995	No Action Required	
9LTA54	198605351	Sergeant Bluffs Cenex	200 1ST ST Sergeant Bluff, IA 51054	4/24/2002	No Action Required	Hummel
8LTO96	198811909	Sherman Building	105 SGT SQUARE DR Sergeant Bluff, IA 51054	10/26/1995	No Action Required	

9LTF25	197910348	Sioux City Airport (former Ast Site)	Sioux City, IA 51110	12/23/1999	No Action Required	Cardinale
9LTF26	197910349	Sioux City Airport Aqua-system-gp41	Sioux City, IA 51110	12/23/1999	No Action Required	Cardinale
9LTF28	197910351	Sioux City Airport Aqua-system/amw 18	Sioux City, IA 51110	12/23/1999	No Action Required	Cardinale
9LTF27	197910350	Sioux City Airport Aqua-system/gp8 & Amw8	Sioux City, IA 51110	12/23/1999	No Action Required	Cardinale
7LTL81	198601995	Sioux City Wilbert Vault	HUMBOLDT & HARBOR DRIVE Sioux City, IA 51102	1/28/2000	No Action Required	
7LTG36	198608787	Sioux Gateway Airport	2403 OGDEN AVE Sioux City, IA 51110	12/23/1999	No Action Required	Hummel
7LTG36	198608787	Sioux Gateway Airport	MUNICIPAL AIRPORT Sergeant Bluff, IA 51054	12/23/1999	No Action Required	Hummel
7LTT74	198610026	Sioux Gateway Airport	2403 OGDEN AVE Sioux City, IA 51110	5/23/1995	No Action Required	Cardinale
7LTT74	198610026	Sioux Gateway Airport	MUNICIPAL AIRPORT Sergeant Bluff, IA 51054	5/23/1995	No Action Required	Cardinale
8LTI77	198608787	Sioux Gateway Airport	2403 OGDEN AVE Sioux City, IA 51110	6/5/2019	No Action Required	Hummel
8LTI77	198608787	Sioux Gateway Airport	MUNICIPAL AIRPORT Sergeant Bluff, IA 51054	6/5/2019	No Action Required	Hummel
8LTI78	198608787	Sioux Gateway Airport	2403 OGDEN AVE Sioux City, IA 51110	9/20/2000	No Action Required	Cardinale

8LTI78	198608787	Sioux Gateway Airport	MUNICIPAL AIRPORT Sergeant Bluff, IA 51054	9/20/2000	No Action Required	Cardinale
8LTT54	198608787	Sioux Gateway Airport	2403 OGDEN AVE Sioux City, IA 51110	4/13/1999	No Action Required	
8LTT54	198608787	Sioux Gateway Airport	MUNICIPAL AIRPORT Sergeant Bluff, IA 51054	4/13/1999	No Action Required	
8LTV35	198608787	Sioux Gateway Airport	2403 OGDEN AVE Sioux City, IA 51110	9/26/1996	No Action Required	
8LTV35	198608787	Sioux Gateway Airport	MUNICIPAL AIRPORT Sergeant Bluff, IA 51054	9/26/1996	No Action Required	
8LTV38	198608787	Sioux Gateway Airport	2403 OGDEN AVE Sioux City, IA 51110	6/7/1996	No Action Required	
8LTV38	198608787	Sioux Gateway Airport	MUNICIPAL AIRPORT Sergeant Bluff, IA 51054	6/7/1996	No Action Required	
8LTV39	198608787	Sioux Gateway Airport	2403 OGDEN AVE Sioux City, IA 51110	7/24/1996	No Action Required	Cardinale
8LTV39	198608787	Sioux Gateway Airport	MUNICIPAL AIRPORT Sergeant Bluff, IA 51054	7/24/1996	No Action Required	Cardinale
8LTV82	198608787	Sioux Gateway Airport	2403 OGDEN AVE Sioux City, IA 51110	4/27/1999	No Action Required	Cardinale
8LTV82	198608787	Sioux Gateway Airport	MUNICIPAL AIRPORT Sergeant Bluff, IA 51054	4/27/1999	No Action Required	Cardinale
8LTV89	198608787	Sioux Gateway Airport	2403 OGDEN AVE Sioux City, IA 51110	12/23/1999	No Action Required	Hummel
8LTV89	198608787	Sioux Gateway Airport	MUNICIPAL AIRPORT Sergeant Bluff, IA 51054	12/23/1999	No Action Required	Hummel

8LTV90	198608787	Sioux Gateway Airport	2403 OGDEN AVE Sioux City, IA 51110	6/11/1996	No Action Required	
8LTV90	198608787	Sioux Gateway Airport	MUNICIPAL AIRPORT Sergeant Bluff, IA 51054	6/11/1996	No Action Required	
8LTV91	198608787	Sioux Gateway Airport	2403 OGDEN AVE Sioux City, IA 51110	9/25/1996	No Action Required	
8LTV91	198608787	Sioux Gateway Airport	MUNICIPAL AIRPORT Sergeant Bluff, IA 51054	9/25/1996	No Action Required	
8LTV92	198608787	Sioux Gateway Airport	2403 OGDEN AVE Sioux City, IA 51110	3/16/1999	No Action Required	
8LTV92	198608787	Sioux Gateway Airport	MUNICIPAL AIRPORT Sergeant Bluff, IA 51054	3/16/1999	No Action Required	
8LTV93	198608787	Sioux Gateway Airport	2403 OGDEN AVE Sioux City, IA 51110	4/13/1999	No Action Required	
8LTV93	198608787	Sioux Gateway Airport	MUNICIPAL AIRPORT Sergeant Bluff, IA 51054	4/13/1999	No Action Required	
8LTX25	198610026	Sioux Gateway Airport	2403 OGDEN AVE Sioux City, IA 51110	3/31/1999	No Action Required	Cardinale
8LTX25	198610026	Sioux Gateway Airport	MUNICIPAL AIRPORT Sergeant Bluff, IA 51054	3/31/1999	No Action Required	Cardinale
8LTX90	198608787	Sioux Gateway Airport	2403 OGDEN AVE Sioux City, IA 51110	3/16/1999	No Action Required	
8LTX90	198608787	Sioux Gateway Airport	MUNICIPAL AIRPORT Sergeant Bluff, IA 51054	3/16/1999	No Action Required	
9LTA01	198610026	Sioux Gateway Airport	2403 OGDEN AVE Sioux City, IA 51110	12/3/1998	No Action Required	

9LTA01	198610026	Sioux Gateway Airport	MUNICIPAL AIRPORT Sergeant Bluff, IA 51054	12/3/1998	No Action Required	
9LTA02	198610026	Sioux Gateway Airport	2403 OGDEN AVE Sioux City, IA 51110	4/1/1999	No Action Required	Cardinale
9LTA02	198610026	Sioux Gateway Airport	MUNICIPAL AIRPORT Sergeant Bluff, IA 51054	4/1/1999	No Action Required	Cardinale
9LTA11	198610026	Sioux Gateway Airport	2403 OGDEN AVE Sioux City, IA 51110	6/10/2002	No Action Required	Jergenson
9LTA11	198610026	Sioux Gateway Airport	MUNICIPAL AIRPORT Sergeant Bluff, IA 51054	6/10/2002	No Action Required	Jergenson
9LTD60	198608787	Sioux Gateway Airport	2403 OGDEN AVE Sioux City, IA 51110	6/12/1996	No Action Required	
9LTD60	198608787	Sioux Gateway Airport	MUNICIPAL AIRPORT Sergeant Bluff, IA 51054	6/12/1996	No Action Required	
9LTA43	198601855	Specialized Hauling Inc	5000 S LEWIS BLVD Sioux City, IA 51106	10/5/1995	No Action Required	
8LTV73	198606702	Van Buskirk Construction	2900 IRVING AVE BLDG 610 Sioux City, IA 51110	6/17/1996	No Action Required	
9LTD74	198606702	Van Buskirk Construction	2900 IRVING AVE BLDG 610 Sioux City, IA 51110	7/24/1996	No Action Required	

LUST Sites at Sioux City Airport

UST Reg. No.	LUST No.	RP	Location	Status Information
8608787	7LTG36	COE	Building 941	FP present (pneumatic pumps in place); T2 NAR, but no cert until FP gone.
8610026	7LTT74	LANG	Building 269	Fuel oil release. NAR 5/23/95. NFA Cert 6/28/02.
8608787	8LTI77	COE	Buildings 611/612	FP present (pneumatic pumps in place); T2 NAR, but no cert until FP gone.
8608787	8LTI78	LANG	Building 671	NAR 9/21/00 T2 NAR. NFA cert 6/28/02.
8608787	8LTT54	SUX AP	Building 357	NAR 4/13/99; NFA Cert 2/22/00.
8608787	8LTV35	COE	Building 270	NAR 9/26/99 SCR
8608787	8LTV38	COE	Building 335	NAR 6/7/96 SCR
8608787	8LTV39	COE	Buildings 606/607	NAR 7/24/96 SCR Used RBCA Criteria
8606702	8LTV73	COE	Building 609	NAR 6/17/96; reconfirmed 2/24/98
8608787	8LTV82	COE	Building 802	NAR 4/27/99; NFA Cert 2/22/00.
8608787	8LTV89	COE	Building 929/YNR Hanger	FP present (pneumatic pumps in place); T2 NAR, but no cert until FP gone.
8608787	8LTV90	COE	Building 605/Pallet Shop	NAR 6/11/96 SCR
8608787	8LTV91	COE	Building 632/AP, Gas Station	NAR 11/27/96 SCR T1 Criteria
8608787	8LTV92	SUX AP	Building 922/Airway Hanger	NAR 3/16/99; NFA Cert 2/22/00.
8608787	8LTV93	SUX AP	Building 990/Budget Rental	NAR 4/13/99; NFA Cert 2/22/00.
8610026	8LTX25	LANG	Building 241	NAR 3/31/99; NFA Cert 4/30/99.
8608787	8LTX90	SUX AP	Building 991/992/Rental Storage	NAR 3/16/99; NFA Cert 2/22/00.
8610026	9LTA01	LANG	Building 261/Fuel O&W Sep Tank	NAR 12/3/98; site check; NFA Cert 2/4/99.
8610026	9LTA02	LANG	Building 252/Fuel O&W Sep Tank	NAR 4/1/99 T1; NFA Cert 4/30/99.
8610026	9LTA11	LANG	Building 262	NAR 8/30/99. Cease FPR 10/15/07. Cert 10/15/08.
8608787	9LTD60	COE	Building 642	NAR 6/12/96 SCR
8606702	9LTD74	COE	Building 610	NAR 7/24/96; re-confirmed 2/24/98.
--	--	--	Building 509	NAR
7910348	9LTF25	COE	Aqua System AST Area	NAR 12/23/99 T2 - FP noted in 10/00; FPR req'd; FPR cease 4/25/08, NAR/cert 9/23/08
7910349	9LTF26	COE	Aqua System GP-41	NAR 12/23/99 T1
7910350	9LTF27	COE	Aqua System GP-8/AMW-8	NAR 12/23/99 T1
7910351	9LTF28	COE	AMW-18	NAR 12/23/99 T1

Appendix D

Photograph Documentation

Client's Name:
RS&H

Site Location:
Sioux Gateway Airport

Project No.
23S049.00

Photo No.
1

Date:
5/8/24

Direction Photo Taken:
East

Photo Taken By:
Morgan Langer

Description:
Western portion of Property.



Photo No.
2

Date:
5/8/24

Direction Photo Taken:
West

Photo Taken By:
Morgan Langer

Description:
Western portion of Property.



Client's Name: RS&H	Site Location: Sioux Gateway Airport	Project No. 23S049.00
-------------------------------	--	---------------------------------

Photo No. 3	Date: 5/8/24	
Direction Photo Taken: Southeast		
Photo Taken By: Morgan Langer		
Description: Eastern portion of Property.		

Photo No. 4	Date: 5/8/24
Direction Photo Taken: Northwest	
Photo Taken By: Morgan Langer	
Description: Eastern portion of Property.	

A photograph showing a wide, unpaved dirt road or path that stretches from the foreground into the distance. The ground is light brown and covered with dry, scattered leaves and twigs. To the left of the path, there is a strip of green grass and weeds. A chain-link fence runs parallel to the path on the left side, extending towards the horizon. The sky is bright blue with many white, fluffy clouds. In the far distance, a line of trees is visible on the horizon.

Client's Name: RS&H	Site Location: Sioux Gateway Airport	Project No. 23S049.00
-------------------------------	--	---------------------------------

Photo No. 5	Date: 5/8/24	
Direction Photo Taken: Northwest		
Photo Taken By: Morgan Langer		
Description: Berm along southern boundary of Property.		

Appendix E

Interview Documentation



Phase I ESA Interview Call Documentation

Client: RS&H
Project Name: Sioux Gateway Airport
Project #: 23S049.00

Call To: _____ Representing: USACE Omaha District
Phone No.: 402-995-2416 Date: 5/7/24
Call Made By: Elyse Kalber Representing: Foth Infrastructure & Environment, LLC

Reason for call:

Seeking more information regarding the FUDS site at the Sioux City Airport

Find out: where exactly the area of concern is, whether there's any other documents besides 2021 management action plan, any documents supporting 2016 PRP (petroleum....?)

Information Obtained:

FUDS Number: B07IA0131; FFID: IA79799F021800

5/7: waiting on a returned call

Further action required? ☐ Yes ☐ No

If yes, action required: _____

Action taken: _____

Who Should Be Called?

Property-related Contacts: Attempts should be made to interview the past and present owners, operators, and occupants of the Property.

State and/or Local Agency Officials: Attempts should be made to interview a knowledgeable person at each of the following types of state and/or local government agencies:

- Local fire department that serves the Property,
- State and/or local health agency serving the area in which the Property is located,
- State and/or local agency or local/regional office of state agency having jurisdiction over *hazardous waste* disposal or other environmental matters in the area in which the Property is located, or
- Local agencies responsible for the issuance of building permits or groundwater use permits that document the presence of AULs which may identify a recognized environmental condition in the area in which the Property is located.

From: Rick Simons <rsimons@sioux-city.org>
Sent: Friday, June 14, 2024 1:01 PM
To: Kalber, Elyse L
Subject: [External] Oehlerking Property

In my 5-year biosolids plan it list previous farm ground, it shows a Tom Oehlerking 36 acres plat map id 11-87N-48W, I don't know if that the address you're looking for, I cannot confirm the city has applied biosolids to the address you gave me. The city could have done the property when the wastewater plant was privatized, they spread liquid biosolids.
The city took it back in 2010, I believe around 1986, I know for sure that no biosolids we applied in the last 2 years, we do apply to airport ground that's inside the fence.

Rick Simons
Operation Supervisor

PH 712-279-6171
Cell 712-490-3638
FAX 712-2796191
Email rsimons@sioux-city.org

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Kalber, Elyse L

From: Moritz, Eva S
Sent: Thursday, July 25, 2024 9:41 AM
To: Kalber, Elyse L
Subject: FW: [External] FW: Runway property questions

Eva Moritz, PE
Foth Infrastructure & Environment, LLC

From: Barrow, Julie <Julie.Barrow@rsandh.com>
Sent: Thursday, July 25, 2024 9:35 AM
To: Moritz, Eva S <Eva.Moritz@foth.com>
Subject: [External] FW: Runway property questions

Hi Eva,

Responses for the questionnaire for the SUX Phase I.

Thanks!
Julie

Julie Barrow

Environmental Specialist
4582 South Ulster Street, Suite 1100, Denver, CO 80237
O 303-409-7940 | M 408-858-4913
Julie.Barrow@rsandh.com
rsandh.com | [Facebook](#) | [Twitter](#) | [LinkedIn](#) | [Blog](#)

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From: Mike Collett <mcollett@sioux-city.org>
Sent: Thursday, July 25, 2024 6:44 AM
To: Christopher, Darren <Darren.Christopher@rsandh.com>; Barrow, Julie <Julie.Barrow@rsandh.com>
Subject: FW: Runway property questions

From: Jon Oehlerking <jonoehlerking@gmail.com>
Sent: Wednesday, July 24, 2024 7:51 PM
To: Mike Collett <mcollett@sioux-city.org>
Subject: Re: Runway property questions

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Question 1 100 years plus
2 Yes Farming
3 No
4 No
5 No
6 No
7 No

If You need anything else let me know Thanks Jon Oehlerking 712-253-4033

From: Mike Collett <mcollett@sioux-city.org>
Sent: Wednesday, July 24, 2024 2:19 PM
To: Mark Oehlerking <mark@oehlerking.net>; jonoehlerking@gmail.com <jonoehlerking@gmail.com>
Cc: Marty Dougherty <mdougherty@sioux-city.org>
Subject: Runway property questions

Jon- Please see the attached questionnaire we are requesting you complete as part of our runway project process. I also copied the questions below.

How long have you owned this property? Did you farm it prior to owning?

Is the land currently being farmed/what is the current use of the property?

To your knowledge, have biosolids ever been applied to the land? If so, how recently, and how frequently?

To your knowledge, have there been any structures or wells on the property?

To your knowledge, has it ever been grazed?

Has there been any chemical storage/mixing on property?

Has anything been buried on the property, that you know of?

Thanks,
Mike

Mike Collett
Assistant City Manager
City of Sioux City
712 279-6408
mcollett@sioux-city.org



Mike

Attached are several question for the Oehlerking land owner to complete regarding the proposed 1 acre area. This can be emailed or I can call them if you prefer.

Darren.

Darren Christopher, PE

Senior Aviation Engineer

4525 Airport Approach Rd, Suite A, Duluth, MN 55811

O 218-722-1227 | M 218-343-9557

Darren.Christopher@rsandh.com

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Appendix F

Qualifications of the Environmental Professionals

Elyse Kalber

Elyse Kalber is an Environmental Scientist with a Bachelor of Science in Environmental Science from Drake University. Her experience includes formal training in Phase I site assessments, including completion of the ASTM Phase I Environmental Site Assessment Practices for Commercial Real Estate training. She has over two years of assessment of natural resources such as wetland delineation and threatened and endangered species and assisting design engineers in evaluating alternatives to minimize project impacts. She is also involved with stream bank restoration projects and wetland mitigation site monitoring.

Gina Wilming

Gina Wilming is a lead hydrogeologist and project manager with 17 years of environmental consulting experience. She has a Bachelor of Science in Environmental Science from the University of Iowa. Her technical experience includes Phase I and Phase II Environmental Site Assessments; due diligence site assessment/investigations; solid waste environmental compliance, monitoring, and reporting; site investigation/remediation; data management and statistics; evaluating and managing implementation of remedial alternatives; alternative source demonstrations; geochemical evaluations; permitting; construction administration; and public engagement.

Appendix E.2

Final Site Inspection Report

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March 7, 2019

Mr. Winston Crow
NGB/A4OR
Sheppard Hall
3501 Fetchet Avenue
Joint Base Andrews, Maryland 20762-5157

REFERENCE: **Contract W9133L-14-D-0007, Delivery Order 0011, FY17 Phase III
Regional Site Inspections for Perfluorinated Compounds at Multiple
Air National Guard Installations**

SUBJECT: **Final Site Inspection Report for Sioux City ANGB**

Mr. Crow

Attached please find the above referenced document.

Should you have any questions, please contact me at 606.495.5149 or by email at
vestm@leidos.com.

LEIDOS



Matthew B. Vest, PMP, PG
Project Manager

cc: Mr. Keith Freihofer – NGB/A4OR Program Manager
 Mr. Kevin Jacobson – 185ARW Environmental Manager
 Ms. Naila Hosein – BB&E Surveillance and Oversight
 Mr. Dan Cook – Iowa DNR Project Manager
 Ms. Connie Samson – Leidos Program Manager
 Mr. Selvam Arunachalam – Leidos Deputy Project Manager
 Ms. Nancy Wahlquist – Leidos Project Controller
 Leidos Project File

FINAL

**SITE INSPECTION REPORT
FOR
PERFLUOROOCTANE SULFONATE AND
PERFLUOROOCTANOIC ACID
AT
SIOUX CITY AIR NATIONAL GUARD BASE
SIOUX CITY, IOWA**



**185th Air Refueling Wing
Sioux Gateway Airport/Colonel Bud Day Field
Iowa Air National Guard
Sioux City, Iowa**

March 2019

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FINAL

**SITE INSPECTION REPORT
FOR
PERFLUOROOCTANE SULFONATE AND
PERFLUOROOCTANOIC ACID
AT
SIOUX CITY AIR NATIONAL GUARD BASE
SIOUX CITY, IOWA**

**185th Air Refueling Wing
Sioux Gateway Airport/Colonel Bud Day Field
Iowa Air National Guard
Sioux City, Iowa**

March 2019

Contract Number W9133L-14-D-0007
Task Order Number 0011

Prepared for

Air National Guard
Restoration Branch
NGB/A4OR
3501 Fetchet Avenue
Joint Base Andrews, Maryland 20762

Prepared by

Leidos
11951 Freedom Drive
Reston, Virginia 20190

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ACRONYMS

AFFF	Aqueous Film-Forming Foam
AMSL	Above Mean Sea level
ANG	Air National Guard
ANGB	Air National Guard Base
ARW	Air Refueling Wing
BB&E	BB&E, Inc.
BGS	Below Ground Surface
COC	Chemical of Concern
COPC	Chemical of Potential Concern
DoD	U.S. Department of Defense
DQO	Data Quality Objective
EPA	U.S. Environmental Protection Agency
ERP	Environmental Restoration Program
FSS	Fire Suppression System
FTA	Fire Training Area
GPS	Global Positioning System
HA	Health Advisory
HDPE	High-Density Polyethylene
HEF	High Expansion Foam
HQ	Hazard Quotient
IDNR	Iowa Department of Natural Resources
IDW	Investigation-Derived Waste
IRP	Installation Restoration Program
mg/kg	Milligrams per Kilogram
MS	Matrix Spike
MSD	Matrix Spike Duplicate
µg/kg	Micrograms per Kilogram
µg/L	Micrograms per Liter
NFA	No Further Action
ng/L	Nanograms per Liter
OWS	Oil/Water Separator
PA	Preliminary Assessment
PFAS	Per- and Polyfluoroalkyl Substances
PFBS	Perfluorobutane Sulfonate
PFHpA	Perfluoroheptanoic Acid
PFHxS	Perfluorohexane Sulfonate
PFNA	Perfluorononanoic Acid
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctane Sulfonate
PRL	Potential Release Location
QA	Quality Assurance
QC	Quality Control
QSM	Quality Systems Manual
RI	Remedial Investigation
RPD	Relative Percent Difference
RSL	Regional Screening Level
SI	Site Inspection
TestAmerica	TestAmerica Analytical Laboratories, Inc.

UCMR3	Third Unregulated Contaminant Monitoring Rule
UFP-QAPP	Uniform Federal Policy Quality Assurance Project Plan
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WP	Work Plan

EXECUTIVE SUMMARY

Leidos was contracted to conduct Phase III regional site inspections (SIs) for perfluorinated compounds at multiple Air National Guard Bases (ANGBs). This report documents SI activities conducted at nine potential release locations (PRLs) at the 185th Air Refueling Wing (ARW) of the Iowa Air National Guard (ANG) at Sioux Gateway Airport/Colonel Bud Day Field, Sioux City, Iowa. The primary objective of the SI was to determine the presence or absence of perfluorinated compounds, more specifically per- and polyfluoroalkyl substances (PFAS) on the U.S. Environmental Protection Agency (EPA) Third Unregulated Contaminant Monitoring Rule (UCMR3), including perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), perfluorobutane sulfonate (PFBS), perfluorononanoic acid (PFNA), perfluoroheptanoic acid (PFHpA), and perfluorohexane sulfonate (PFHxS), herein collectively referred to as PFOS/PFOA, at each PRL and based on the following findings:

- Determine if PFOS/PFOA-contaminated groundwater has reached the Installation boundary;
- Provide a defensible no further action (NFA) decision for qualifying PRLs; and
- Develop data quality objectives (DQOs) for additional investigation for PRLs not meeting the NFA criteria or an interim response action, if appropriate.

To meet the objectives, Leidos performed SIs at the following nine PRLs:

- PRL 1: Building 252 – Aerospace Ground Equipment,
- PRL 2: Building 261 – Main Hangar,
- PRL 3: Building 241 – ANG Paint Facility,
- PRL 4: Apron,
- PRL 5: Building 286 – Fire Station,
- PRL 6: Building 284 – Security Forces,
- PRL 7: Nozzle Testing Location,
- PRL 8: Stormwater Sewer System Outfall 1, and
- PRL 9: Stormwater Sewer System Outfall 2.

Based on recommendations from the February 2016 preliminary assessment (PA) that documented the site visit conducted by BB&E, Inc. (BB&E), soil, groundwater, sediment, and surface water samples were collected during the SI from nine PRLs (see Table 1). PRL 10 (Building 281 – Hazmart Pharmacy) and PRL 11 (Building 280 – Supply Warehouse) were recommended for NFA in the PA because no known releases of aqueous film-forming foam (AFFF) had occurred at the PRLs and the AFFF stored in these buildings were within secondary containment structures. Samples collected during the SI were analyzed for PFOS/PFOA compounds. The detected PFOS/PFOA concentrations were compared against screening criteria for PFOS, PFOA, and PFBS, including the applicable Iowa Department of Natural Resources (IDNR) action levels/statewide standards for soil and groundwater, EPA lifetime drinking water Health Advisory (HA) for PFOS and PFOA, the EPA Regional Screening Level (RSL) for PFBS in tap water, and calculated screening levels using the EPA screening level calculator for PFOS, PFOA, and PFBS in soil and sediment, as shown in Table ES-1.

PFOS/PFOA compounds were detected in the soil, groundwater, sediment, and surface water above the laboratory detection limits. Evaluation of groundwater and surface water results at sample locations adjacent to the Installation boundary (MW-SIO06-01, MW-SIO04-01, MW-SIO04-02, SIO08-SW1, MW-SIO07-01, MW-SIO03-01, SIO09-SW1) indicates PFOS/PFOA compounds are likely migrating offsite given their presence and magnitude near the Installation boundary.

Table ES-1. PFOS/PFOA SI Screening Criteria

Parameter	Chemical Abstract Service Number	EPA RSL for Tap Water^a (ng/L)	EPA Health Advisory^b (ng/L)	IDNR Action Level/Statewide Standards for Groundwater^f (ng/L)	Residential Risk-based Soil Screening Level^c (µg/kg)	IDNR Action Level/Statewide Standards for Soil^f (µg/kg)
PFOS	1763-23-1	NA	70.0 ^d	70	1,260	1,800
PFOA	335-67-1	NA		70	1,260	1,200
PFBS	375-73-5	400,000 ^e	NA	NA	1,260,000	NA

^a EPA RSL for tap water at target HQ = 1, November 2018 (EPA 2018).

^b *Drinking Water Health Advisory for Perfluorooctane Sulfonate* (EPA 2016a) and *Drinking Water Health Advisory for Perfluorooctanoic Acid* (EPA 2016b).

^c Residential risk-based soil screening levels determined by using the EPA RSL calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search) and the November 2018 EPA RSL tables (<https://epa.gov/risk/regional-screening-levels-rsls-generic-tables>) for soil and sediment at target HQ = 1 (EPA 2018).

^d When PFOA and PFOS are both present, the combined detected concentrations of the compounds are compared with the 70-ng/L health advisory value.

^e PFBS analytical results for groundwater and surface water have been compared to the tap water screening levels.

^f 2016 IDNR action levels/statewide standards for PFOS and PFOA in soil and groundwater (IDNR 2016).

µg/kg = Micrograms per kilogram.

EPA = U.S. Environmental Protection Agency.

HQ = Hazard quotient.

IDNR = Iowa Department of Natural Resources.

NA = Not available.

ng/L = Nanograms per liter.

PFBS = Perfluorobutane sulfonate.

PFOA = Perfluorooctanoic acid.

PFOS = Perfluorooctane sulfonate.

RSL = Regional screening level.

SI = Site inspection.

Leidos recommends further investigations at all nine PRLs due to PFOS and PFOA compounds being detected in soil, groundwater, surface water, and sediment. Additional investigations are recommended for soil and groundwater at PRLs 1 through 7 and surface water/sediment at PRLs 8 and 9. The recommendations are summarized in Table ES-2 and described briefly below:

- Further investigation is necessary to determine the nature and extent of PFAS contamination due to detectable levels of PFOS/PFOA at the PRLs.
- Develop an expanded conceptual site model that considers localized groundwater and surface water flow paths to select future sampling locations.
- Complete the delineation of nature and extent of PFAS as part of an Expanded SI or a remedial investigation (RI) that could consist of:
 - Additional soil and sediment sampling and analysis of an expanded list of PFAS constituents (in addition to the six UCMR3 constituents) to determine if significant source areas related to precursor substances are present. Precursor substances have been demonstrated to oxidize into PFOS and PFOA, and thus could provide a lingering source of these compounds to soil and groundwater.
 - Expanded groundwater sampling program (including analysis of an expanded list of PFAS constituents) to complete horizontal and vertical delineation of the PFAS impacts. Further groundwater investigation at the Base boundary is recommended due to the presence of PFAS in groundwater above their respective screening criteria.
 - The installation and sampling of upgradient and downgradient off-Base monitoring wells to better define the upgradient source of PFAS as well as PFAS concentrations that have migrated off Base.

- The sampling of surface water and sediment at the Base as well as upgradient and downgradient off Base (including analysis of an expanded list of PFAS constituents) to better determine if an upgradient source of PFAS exists, as well as impacts of PFAS in surface water that have migrated off Base.
- Conduct preliminary site-specific risk assessment calculations in order to identify chemicals of potential concern (COPCs) in every medium and establish preliminary remedial goals for screening purposes.

DQOs are proposed based on the results of the SI and are presented in Table ES-2. In general, additional samples are required at each PRL in order to establish the nature and extent of PFAS constituents for each applicable medium and determine if a complete receptor pathway exists. For soil, additional samples are proposed to determine if a source area exists, and if so, to determine the vertical and horizontal extent for both the vadose and saturated zones. For groundwater, additional samples are proposed to quantify potential impacts from upgradient sources and assess the nature and extent of PFAS concentrations beyond the Base boundary. Additional surface water and sediment samples should be collected at PRLs 8 and 9 to further evaluate PFOS/PFOA concentrations in surface water and sediment.

Table ES-2. SI Recommendation Summary Table

PRL No.	PRL Description	Constituents Above Screening Criteria	Sampling Recommendations and Objectives
1	Building 252 – Aerospace Ground Equipment	Groundwater: PFOS, PFOA, PFOS + PFOA	Soil: Although screening criteria were not exceeded, additional surface and subsurface soil samples are proposed to determine if an unidentified source exists, and if so, to determine the nature and extent in the vertical and horizontal directions given the potential for soil to groundwater migration. Groundwater: Determine the nature and extent both vertically and horizontally through the sampling of existing and additional new monitoring wells.
2	Building 261 – Main Hangar	Groundwater: PFOS, PFOA, PFOS + PFOA	Soil: Although screening criteria were not exceeded, additional surface and subsurface soil samples are proposed to determine if an unidentified source exists, and if so, to determine the nature and extent in the vertical and horizontal directions given the potential for soil to groundwater migration. Groundwater: Determine the nature and extent both vertically and horizontally through the sampling of existing and additional new monitoring wells.
3	Building 241 – ANG Paint Facility	None	Soil: Although screening criteria were not exceeded, additional surface and subsurface soil samples are proposed to determine if an unidentified source exists, and if so, to determine the nature and extent in the vertical and horizontal directions given the potential for soil to groundwater migration. Groundwater: Although screening criteria were not exceeded, determination of the nature and extent both vertically and horizontally of PFAS compounds should be completed through the sampling of existing and additional new monitoring wells.
4	Apron	Groundwater: PFOA, PFOS + PFOA	Soil: Although screening criteria were not exceeded, additional surface and subsurface soil samples are proposed to determine if an unidentified source exists, and if so, to determine the nature and extent in the vertical and horizontal directions given the potential for soil to groundwater migration. Groundwater: Determine the nature and extent both vertically and horizontally through the sampling of existing and additional new monitoring wells.
5	Building 286 – Fire Station	Groundwater: PFOA, PFOS + PFOA	Soil: Although screening criteria were not exceeded, additional surface and subsurface soil samples are proposed to determine if an unidentified source exists, and if so, to determine the nature and extent in the vertical and horizontal directions given the potential for soil to groundwater migration. Groundwater: Determine the nature and extent both vertically and horizontally through the sampling of existing and additional new monitoring wells.
6	Building 284 – Security Forces	Groundwater: PFOA, PFOS + PFOA	Soil: Although screening criteria were not exceeded, additional surface and subsurface soil samples are proposed to determine if an unidentified source exists, and if so, to determine the nature and extent in the vertical and horizontal directions given the potential for soil to groundwater migration. Groundwater: Determine the nature and extent both vertically and horizontally through the sampling of existing and additional new monitoring wells.

Table ES-2. SI Recommendation Summary Table (continued)

PRL No.	PRL Description	Constituents Above Screening Criteria	Sampling Recommendations and Objectives
7	Nozzle Testing Location	None	Soil: Although screening criteria were not exceeded, additional surface and subsurface soil samples are proposed to determine if an unidentified source exists, and if so, to determine the nature and extent in the vertical and horizontal directions given the potential for soil to groundwater migration. Groundwater: Although screening criteria were not exceeded, determination of the nature and extent both vertically and horizontally of PFAS compounds should be completed through the sampling of existing and additional new monitoring wells.
8	Stormwater Sewer System Outfall 1	None	Surface Water and Sediment: Although screening criteria were not exceeded, determine PFAS impact to surface water through upgradient sampling of surface water and sediment and evaluate potential downgradient impacts at locations off Base.
9	Stormwater Sewer System Outfall 2	Surface Water: PFOS + PFOA	Surface Water and Sediment: Determine PFAS impact to surface water through upgradient sampling of surface water and sediment and evaluate potential downgradient impacts at locations off Base.
General			Soil: Collect additional surface and subsurface soil samples to determine the nature and extent both vertically and horizontally of PFAS contamination. Analyze for an expanded list of PFAS compounds to evaluate for potential precursor compounds. Groundwater: (1) Collect additional groundwater samples in upgradient locations to quantify potential impacts from upgradient sources, and (2) collect additional groundwater samples off Base through the installation of a limited number of new monitoring wells to determine the nature and extent of PFAS beyond the Base boundary. Surface Water/Sediment: (1) Collect additional surface water and sediment samples in upgradient locations to quantify potential impacts from upgradient sources, and (2) collect additional surface water and sediment samples off Base to determine the nature and extent of PFAS beyond the Base boundary.

ANG = Air National Guard.
PFAS = Per- and polyfluoroalkyl substances.
PFOA = Perfluorooctanoic acid.
PFOS = Perfluorooctane sulfonate.
PRL = Potential release location.
SI = Site inspection.

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1.0 INTRODUCTION

Leidos has prepared this Site Inspection (SI) Report to satisfy the requirements of Task Order 0011 of National Guard Bureau Contract Number W9133L-14-D-0007. Under this Task Order, Leidos was contracted to conduct Phase III regional SIs for perfluorinated compounds at multiple Air National Guard Bases (ANGBs). This report documents SI activities conducted at nine potential release locations (PRLs) at the 185th Air Refueling Wing (ARW) of the Iowa Air National Guard (ANG) at Sioux Gateway Airport/Colonel Bud Day Field, Sioux City, Iowa, herein referred to as Sioux City ANGB, the Installation, or the Base (Figure 1). Note that all tables and figures are presented after Section 7. All field activities were conducted in accordance with the *Work Plan for Fiscal Year 2017 Phase III Regional Site Inspections for Perfluorooctane Sulfonate and Perfluorooctanoic Acid at Sioux City Air National Guard Base, Sioux City, Iowa* (Leidos 2018).

1.1 PROJECT OBJECTIVES AND SCOPE

The primary objective of the SI was to determine the presence or absence of perfluorinated compounds, more specifically per- and polyfluoroalkyl substances (PFAS) on the U.S. Environmental Protection Agency (EPA) Third Unregulated Contaminant Monitoring Rule (UCMR3), including perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), perfluorobutane sulfonate (PFBS), perfluorononanoic acid (PFNA), perfluoroheptanoic acid (PFHpA), and perfluorohexane sulfonate (PFHxS), herein collectively referred to as PFOS/PFOA.

Surface and subsurface soil, groundwater, and surface water and sediment (if available) were sampled and analyzed to determine the presence or absence of PFOS/PFOA in environmental media at the PRLs identified in the 2016 preliminary assessment (PA) (BB&E 2016) and to:

- Determine if PFOS/PFOA-contaminated groundwater has reached the Installation boundary;
- Provide a defensible no further action (NFA) decision for qualifying PRLs; and
- Develop data quality objectives (DQOs) for additional investigation for PRLs not meeting the NFA criteria or an interim response action, if appropriate.

The scope of work consisted of three inter-related tasks: (1) prepare an SI Work Plan (WP), (2) conduct SI and data collection activities, and (3) evaluate data from the field effort and applicable historical information to present conclusions and recommendations in an SI Report.

All sampling was performed on ANG property, and only PRLs located on ANG property were included in the project scope. Sampling of drinking water sources (other than the on-Base potable water supply that was used for decontamination activities) was not included, and determination of nature and extent of any identified contamination was not within the scope of this SI.

Nine PRLs, as listed in Table 1 and depicted in Figure 2, were selected for SI activities based upon the PA site visit conducted by BB&E, Inc. (BB&E) in November 2015 and reported in the *Perfluorinated Compounds Preliminary Assessment Site Visit Report, 185th Air Refueling Wing, Iowa Air National Guard, Sioux City, Iowa* (BB&E 2016). PRL 10 (Building 281 – Hazmart Pharmacy) and PRL 11 (Building 280 – Supply Warehouse) were recommended for NFA in the PA because no known releases of aqueous film-forming foam (AFFF) had occurred at the PRLs and the AFFF stored in these buildings were within secondary containment structures. This SI Report briefly summarizes the PA, describes SI field activities at nine PRLs, presents analytical results of environmental sampling, and provides recommendations for each PRL.

1.2 REGULATORY OVERVIEW AND SCREENING CRITERIA

In 2012, EPA published the UCMR3, which required public water supplies across the country to sample for a list of 30 unregulated contaminants, including 6 chemicals of concern (COCs) relevant to this SI (PFOS, PFOA, PFBS, PFNA, PFHpA, and PFHxS; i.e., PFOS/PFOA). Results of UCMR3-required sampling indicated detections of PFOS/PFOA at numerous locations, including several near U.S. Department of Defense (DoD) facilities. PFOS/PFOA detections at DoD facilities are often linked to the use of AFFF, which may contain one or more of these chemicals. AFFF is a firefighting agent used to suppress fires involving petroleum hydrocarbons.

Detected concentrations of PFOS/PFOA in environmental samples collected during the Sioux City ANGB SI were compared against soil and water screening criteria for PFOS, PFOA, and PFBS, as described below and listed in Table 2.

The November 2018 EPA generic regional screening level (RSL) table (EPA 2018) lists a residential risk-based screening level for tap water for PFBS of 400 micrograms per liter ($\mu\text{g/L}$) (400,000 nanograms per liter [ng/L]; target hazard quotient [HQ] = 1.0). Currently, no legally enforceable federal standards exist for PFOS/PFOA in water. However, under the Safe Drinking Water Act, EPA issued a series of Health Advisories (HAs) for PFOS/PFOA, including the most recent in May 2016 (EPA 2016a and EPA 2016b). To provide Americans, including the most sensitive populations, with a margin of protection from a lifetime of exposure to PFOS/PFOA in drinking water, EPA established an HA level for PFOS + PFOA (combined) of 70 ng/L . The HA of 70 ng/L applies to PFOS and PFOA individually as well as combined. If an individual compound is detected $>70 \text{ ng/L}$, the screening criteria is exceeded. However, if individual compounds are $<70 \text{ ng/L}$ but the sum of the compounds is $>70 \text{ ng/L}$, the screening criteria are exceeded. For example, if PFOS = 50 ng/L and PFOA = 25 ng/L , the screening criteria are exceeded. Therefore, screening levels for groundwater and surface water are as follows:

- PFOS and PFOA = 70 ng/L ; and
- PFBS = 400,000 ng/L .

No legally enforceable federal standards exist for PFOS/PFOA in soil or sediment. The November 2018 EPA generic RSL table lists a residential risk-based screening level for soil for PFBS of 1,300 milligrams per kilogram (mg/kg) (1,300,000 micrograms per kilogram [$\mu\text{g/kg}$]; target HQ = 1.0) (EPA 2018). Following the process utilized at other ANG Installations around the country, Leidos will use residential risk-based screening levels for soil determined using the EPA RSL calculator and the November 2018 RSL tables (EPA 2018) based on an HQ of 1.0. The calculated screening value for PFBS is slightly less than the value listed in the generic RSL table. RSLs are only available for three of the six COCs listed above. The calculated screening levels for these three COCs are as follows:

- PFOS = 1,260 $\mu\text{g/kg}$;
- PFOA = 1,260 $\mu\text{g/kg}$; and
- PFBS = 1,260,000 $\mu\text{g/kg}$.

The Iowa Department of Natural Resources (IDNR) has set action levels/statewide standards for soil and groundwater. The IDNR soil action level/statewide standard for PFOS is 1,800 $\mu\text{g/kg}$ and for PFOA is 1,200 $\mu\text{g/kg}$. The IDNR groundwater action level/statewide standard for PFOS is 70 ng/L and for PFOA is 70 ng/L . No surface water or sediment screening criteria have been established by EPA or the IDNR at this time; however, the groundwater and soil screening levels will be used for surface water and sediment, respectively.

Leidos will use the IDNR action levels/statewide standards for PFOS and PFOA and EPA 2016 drinking water lifetime HA levels (PFOS and PFOA) of 70 ng/L and the most conservative residential risk-based screening level for tap water (PFBS) for groundwater and surface water screening.

Leidos will use the IDNR action levels/statewide standards and the most conservative residential risk-based soil screening levels determined using the EPA RSL calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search) and the November 2018 EPA RSL tables (<https://epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2018>) for soil and sediment. For PFOS and PFOA, Leidos will utilize the lower, more conservative screening value between the IDNR action levels/statewide standards and the residential risk-based soil screening levels determined for soil and sediment; therefore, the soil screening levels for PFOS and PFOA are 1,260 and 1,200 µg/kg, respectively.

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2.0 INSTALLATION DESCRIPTION

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3.0 ENVIRONMENTAL SETTING

3.1 CLIMATE

Sioux City ANG is located approximately 7 miles south of downtown Sioux City. The climate is humid continental climate with warm humid summers and cold dry winters. The average temperature of Sioux City is 48.6°F, which is roughly the same as the Iowa average temperature, and is slightly lower than the national average temperature of 54.50°F. Annual rainfall amounts in Sioux City are 28.23 in. with 52.5 days of 0.1 in. or more of precipitation. Average wind speed for the area is 18.7 miles per hour and is usually out of the south and southeast. Sioux City is located in a region that is subject to tornado activity (USA.com 2017).

3.2 TOPOGRAPHY

Sioux City ANGB is situated on a relatively flat alluvial plain with elevations ranging from approximately 1,085 to 1,094 ft above mean sea level (AMSL). The Installation is situated approximately 2 miles east of the Missouri River. Bluffs east and west of the Missouri River are typically 100 to 150 ft in height above average ground level, with an average elevation of 1,200 ft AMSL (Weston 2014).

3.3 GEOLOGY

Sioux City ANG is situated within the Missouri Alluvial Plain Physiographic Province. The alluvial sediments extend an average of 110 ft beneath the surface and consist of unconsolidated clay, silt, sand, and gravel. The underlying bedrock consists of Cretaceous sedimentary rocks that dip toward the northwest at approximately 4 ft per mile. The uppermost bedrock unit is Carlile Shale, a thinly laminated, calcareous marine shale with a minimum thickness in Iowa of approximately 80 ft. The shale formation is underlain by approximately 30 ft of Greenhorn Limestone, a fossiliferous, chalky, shale limestone. The Greenhorn Formation is underlain by the Dakota, which consists of an upper layer of interbedded shale, siltstone and sandstone, and a lower layer of sandstone. Paleozoic limestones, dolomites, shales, and sandstones underlie the Cretaceous formations described above. These formations slope toward the south-southeast at approximately 18 ft per mile, and they occur under Sioux City ANGB at approximately 737 ft below ground surface (BGS) (Weston 2014).

3.4 SOIL

The stratigraphy consists of clays from ground surface to approximately 10 ft BGS, silty sands from 10 to 25 ft BGS, and fine to coarse sands from 25 to at least 70 ft BGS. The sediments are alluvial deposits from the Pleistocene glacial melt-water and are part of the Missouri River alluvial plain (Montgomery Watson 2001). Soils identified during the Leidos SI typically consisted of silty clay, clay, and fine to medium sand.

3.5 SURFACE WATER HYDROLOGY

Sioux City ANGB is located approximately 2 miles east of the Missouri River, which flows south along the western border of Iowa. The Big Sioux and Floyd rivers join the Missouri River in the downtown area of Sioux City, upstream of Sioux City ANGB. The Missouri River and most of its natural surface water drainage tributaries within the floodplain have been channeled and straightened. Drainage ditches along most of the roads in the area collect highway and irrigation runoff for eventual discharge to the larger, channeled tributaries (Weston 2014).

Surface water flow at Sioux City ANGB is dictated by the Base's man-made surface drainage system. Surface water enters the ANGB mainly from meteoric precipitation, and surface discharge is to the Base storm sewer network and natural small area drainages (URS 2015).

3.6 HYDROGEOLOGY

The shallow aquifer associated with the Missouri River Valley is unconfined and composed of unconsolidated gravels, sands, silts, and clays. Variations in lithology may affect the formation of localized areas with confined or semi-confined conditions. Groundwater in the aquifer occurs from just below the ground surface in topographically low areas to approximately 20 ft BGS at higher elevations. The groundwater gradient is directed toward the Missouri River or its tributaries. The Dakota Aquifer, composed of the sandstones of the Dakota Formation, is confined by the shales within the Dakota Formation and other Cretaceous shales and limestones. The aquifer is approximately 75 ft thick beneath Sioux City ANGB, occurring at about 190 ft BGS, and extends across most of northwestern Iowa. Groundwater within the aquifer flows toward the southwest, along a hydraulic gradient of approximately 5 ft per mile (Weston 2014).

The Ordovician-Cambrian Aquifer exists beneath the Dakota Formation and is confined by overlying shales. This aquifer extends over the western area of Iowa. Additional localized aquifers may occur within the Paleozoic formations beneath the Ordovician-Cambrian Aquifer (Weston 2014).

The groundwater information collected from monitoring wells installed during the Leidos SI field activities showed a general flow of shallow groundwater to the southwest. Groundwater levels measured before purging and sampling monitoring wells during the SI indicate the depth to shallow groundwater ranged from 19.73 ft BGS in MW-SIO02-01 to 22.36 ft BGS in MW-SIO07-01. A localized groundwater high was observed at MW-SIO01-01 with a depth to water of 9.55 ft BGS.

3.7 CRITICAL HABITATS AND ENDANGERED/THREATENED SPECIES

According to the U.S. Fish and Wildlife Service (USFWS), the following federally listed threatened, endangered, or proposed species are known to or are believed to occur in Woodbury County, Missouri (USFWS 2017a):

- Fish:
 - Pallid sturgeon (*Scaphirhynchus albus*) – Endangered.
- Flowering plants:
 - Prairie bush-cover (*Lespedeza leptostachya*) – Threatened, and
 - Western prairie fringe orchid (*Platanthera praeclara*) – Threatened.
- Mammals:
 - Northern long-eared bat (*Myotis septentrionalis*) – Threatened.
- Birds:
 - Piping plover (*Charadrius melodus*) – Threatened, and
 - Least tern (*Sterna antillarum*) – Endangered.

The potential for these species to occur in Woodbury County does not mean they are present at Sioux City ANGB.

The USFWS National Wetlands Inventory indicates the occurrences a 1.32-acre freshwater pond and several freshwater emergent wetlands and ravines at the Sioux Gateway Airport (USFWS 2017b). These locations are outside the Base boundary, and therefore, are not relevant to the site investigation.

3.8 WATER WELLS

The PA Report (BB&E 2016) indicates that a review of the EDR Radius Map™ Report with Geocheck® dated October 9, 2015, showed 189 wells within a 1-mile radius of the Base. Three wells were listed as U.S. Geological Survey (USGS) wells. No public water supply system was found within a 1-mile radius of the Base.

According to the Final Record of Decision for IRP Sites 1 through 5 (NGB/A70R 2013), no drinking water supply wells are currently located at the Base and the shallow groundwater system in the area of the Base is not used as the drinking water source. The nearest municipal water supply wells are located approximately 1 mile east of the Base, serving the city of Sergeant Bluff, Iowa. Sioux City obtains its potable water from groundwater wells drawing on the alluvial aquifer and the Dakota aquifer. These wells are located 1.5 miles west of the Base and 8 miles north of the Base. Several farms south of the Base obtain water from wells installed in the alluvial aquifer.

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4.0 PRELIMINARY ASSESSMENT

In November 2015, BB&E conducted a PA site visit to identify potential sites of historical environmental releases of PFOS/PFOA related to AFFF usage and storage at Sioux City ANGB (BB&E 2016). The PA evaluated a total of 11 PRLs and recommended 9 of these for further investigation under an SI (Table 1; see also Figure 2). At the time of the PA, no documentation was available showing that soil, groundwater, sediment, and surface water at Sioux City ANGB were previously tested for PFOS/PFOA; therefore, these compounds could be present in media at any of these PRLs.

BB&E researched the potential existence of any documented FTAs or any other use or release of AFFF. The PA concluded that 9 of the 11 PRLs identified at the Base may have utilized AFFF based on years of operation. PRL 10 (Building 281 – Hazmart Pharmacy) and PRL 11 (Building 280 – Supply Warehouse) were recommended for NFA in the PA because no known releases of AFFF had occurred at the PRLs and the AFFF stored in these buildings were within secondary containment structures (see Table 1).

The PA site visit included onsite interviews with active and former personnel from the ANG Installation and other parties with relevant historical site knowledge. The sections below briefly describe the operational history and waste characteristics of the PRLs included in this SI, as presented in the PA Report (BB&E 2016). PRL numbers correspond to the area of concern designation used in the PA Report (BB&E 2016).

4.1 PRL 1: BUILDING 252 – AEROSPACE GROUND EQUIPMENT

The Aerospace Ground Equipment building (Building 252) was formerly the Fuel Cell Repair Hangar. The building was constructed in 1979, and previously utilized an AFFF fire suppression system. The system was removed when the Base's mission was changed in 2004. Facility personnel recalled two inadvertent system releases, although they had no recollection of when the releases occurred. The system was tested on average annually by releasing approximately 30 gal of foam. The foam would slowly drain into the building's trench drain, which discharges to the sanitary sewer via an oil/water separator (OWS). Facility personnel believed that excess foam would likely have been pushed out of the building to the apron southwest of the building and allowed to dissipate.

4.2 PRL 2: BUILDING 261 – MAIN HANGAR

The Main Hangar (Building 261) was constructed in approximately 1957. The hangar was previously equipped with an AFFF fire suppression system (FSS); however, it was converted to a high expansion foam (HEF) system in 2003. Facility personnel recalled two inadvertent releases of AFFF that partially filled the building with foam. One release occurred in the mid-1980s and one occurred in approximately 2000. The system was tested on average biannually by releasing approximately 30 gal of foam. The foam would slowly drain into the building's trench drain, which discharges to the sanitary sewer via an OWS. Facility personnel believed that excess foam was pushed out of the building onto the apron southwest of the building and allowed to dissipate.

4.3 PRL 3: BUILDING 241 – ANG PAINT FACILITY

The ANG Paint Facility was constructed in approximately 1953. The hangar is equipped with an AFFF FSS. The system was tested on average annually by releasing approximately 30 gal of foam. The foam would slowly drain into the building's trench drain, which discharges to the sanitary sewer via an OWS. Facility personnel believed that excess foam was pushed out of the building onto the apron north of the building and allowed to dissipate.

4.4 PRL 4: APRON

The concrete apron is the parking area for aircraft. For the most part, stormwater on the apron would flow in a southern direction and enter the stormwater conveyance system. The stormwater discharges to Stormwater Sewer System Outfall 1 (PRL 8). No known releases of AFFF were reported by the 185th ARW personnel; however, due to the nature of the use of the apron for aircraft operations, the potential exists that AFFF was used in the area.

4.5 PRL 5: BUILDING 286 – FIRE STATION

The Fire Station, Building 286, was constructed in 2006. Vehicles containing AFFF are stored in the engine bay of the Fire Station where they are also refilled with AFFF using an AFFF fill system. The overhead AFFF fill system includes an elevated storage 1,000-gal, single-walled tank with no secondary containment. In 2012, a leak of approximately 50 gal of AFFF discharged to the sanitary sewer via the trench drain. Following the release, each of the trench drains has been fitted with a plug. Other than the 2012 release, facility personnel only noted small drips. At the time of the PA site visit, it was reported that vehicle washing typically occurs inside the Fire Station; however, vehicle washing occasionally occurs on concrete southwest of the overhead doors.

4.6 PRL 6: BUILDING 284 – SECURITY FORCES

The Security Forces Building was the former Fire Station until 2006. The building was constructed in 1989 and was owned by Sioux City until approximately 2003, when it was transferred to ANG. Vehicles containing AFFF were stored and refilled inside the building. Trench drains were located inside the building in the apparatus bays and removed when it was remodeled. According to Fire Station personnel, minor releases of AFFF likely occurred during filling of equipment.

4.7 PRL 7: NOZZLE TESTING LOCATION

The fire department conducted nozzle testing at the paved area southwest of Building 286 and southwest of the overhead doors at Building 284. Foam was allowed to dissipate. Typically 3 to 4 gal of AFFF per vehicle were discharged once per month.

4.8 PRL 8: STORMWATER SEWER SYSTEM OUTFALL 1

According to the 185th ARW Industrial Storm Water Management Guidance Manual, the 185th ARW property is composed of 11 drainage areas. Drainage areas 1 through 10 discharge at several locations along the main storm sewer whose eventual outlet is located at Stormwater Sewer System Outfall 1, which discharges to a ditch along Harbor Drive.

4.9 PRL 9: STORMWATER SEWER SYSTEM OUTFALL 2

According to the 185th ARW Industrial Storm Water Management Guidance Manual, the 185th ARW property is composed of 11 drainage areas. Drainage area 11, which encompasses the ANG Paint Facility (PRL 3), discharges to a single outlet at Stormwater Sewer System Outfall 2, which then discharges to a ditch along Perimeter Road

5.0 SITE INVESTIGATION FIELD PROGRAM

This section summarizes the SI field activities, including soil, groundwater, surface water, and sediment sampling, at Sioux City ANGB. Analytical results for each PRL are presented and identify the presence or absence of PFOS/PFOA and results for PFOS, PFOA, and PFBS that exceed the screening criteria shown in Table 2 and described in Section 1.2 of this SI Report.

SI field activities were conducted between September 26 and October 1, 2018, and October 9 and 10, 2018. All sampling and analytical activities were conducted in accordance with the procedures specified in the SI WP (Leidos 2018), except as noted in Section 5.1.2. Boring logs and monitoring well construction logs are provided in Appendix A, and groundwater sampling logs are provided in Appendix B. The groundwater monitoring well survey report is included in Appendix C. The data validation report is provided in Appendix D. The full data package is provided in Appendix E.

5.1 GENERAL APPROACH

5.1.1 Field Sampling

SI field activities included the following:

- Surface and subsurface soil sampling;
- Water level measurements from temporary piezometers at Sioux City ANGB to confirm local groundwater flow direction;
- Installation and sampling of groundwater from new monitoring wells located downgradient from the PRLs and/or at the Installation boundary;
- Sediment and surface water sampling (if available); and
- A global positioning system (GPS) survey of soil borings, sediment, and surface water locations (the horizontal location and elevation of all newly installed wells were surveyed by a professional licensed surveyor).

Soil, groundwater, sediment, and surface water sampling locations were based on known historical or potential releases and site conditions as observed during the PA. Table 3 summarizes the SI sampling activities at Sioux City ANGB. Figure 2 shows an overview of the Sioux City ANGB SI sample locations. Prior to intrusive activities, an underground utility locator marked and cleared all boring locations.

A total of 17 soil borings were installed. Borings were installed in grassy areas near known or likely discharges/spills, the nozzle testing area, near the concrete apron, the paint facility, the main hangar, and in the vicinity of the current and former fire stations. The borings were drilled using a track-mounted direct-push drilling system to first water. Soil borings were logged for soil lithology. Boring logs are included in Appendix A. Two grab soil samples were collected from each boring—one from within the 0- to 2-ft BGS interval and one from within the 2-ft interval immediately above the water table.

All soil samples were screened by a photoionization detector as a health and safety precaution. Following collection of soil samples, boreholes not co-located with monitoring wells were abandoned by backfilling with bentonite. Holes were capped with soil flush to the surface.

Water level measurements from the 2018 SI indicate the inferred flow of shallow groundwater at the Base is generally to the southwest. Groundwater samples were collected from seven newly installed permanent monitoring wells. The new monitoring wells were developed and sampled following ANG guidance, as prescribed in the SI WP (Leidos 2018).

Sediment and surface water sampling locations were based on the presence of drainage ditches or stormwater outfalls. One sediment and one surface water sample were collected within the Installation boundary at the drainage ditch associated with Outfall 1 (PRL 8) and from a drainage ditch that captures flow associated with Outfall 2 (PRL 9). Additional details on the field activities for each PRL are provided in Section 5.3.

5.1.2 Deviations from the Work Plan

Deviations from the SI WP during field activities included the following:

- Water quality measurements and GPS coordinates for surface water sample SIO09-SW1-01 were inadvertently not gathered during sample collection. The location of this sample is inferred from aerial photography where the drainage ditch can be seen below Outfall 2 and south of Perimeter Road (Figure 2).

5.1.3 Data Analysis

5.1.3.1 Laboratory

Environmental samples were submitted to TestAmerica Analytical Laboratories, Inc. (TestAmerica), in West Sacramento, California. TestAmerica is accredited under the DoD Environmental Laboratory Accreditation Program and maintains a National Environmental Laboratory Accreditation Program certification.

5.1.3.2 Screening criteria

Analytical data for three of the six PFOS/PFOA compounds (PFOS, PFOA, PFBS) were compared to appropriate HA or screening criteria (Section 1.2 and Table 2) to determine whether further investigation is required. No HA or screening criteria currently exist for PFHpA, PFHxS, or PFNA.

5.1.3.3 Data validation

A Uniform Federal Policy Quality Assurance Project Plan (UFP-QAPP) was developed for this project as Appendix A of the SI WP (Leidos 2018). The UFP-QAPP was written to apply to all 15 Installations included in the scope of the Phase III SI contract. Specifics on the number and type of samples to be collected in characterizing the site, and the number and type of quality assurance/quality control (QA/QC) samples to be used to evaluate the quality of the data obtained, were included in the SI WP. Soil and sediment were collected in one 4-oz. high-density polyethylene (HDPE) container with an HDPE cap.

Groundwater and surface water samples were collected in two 250-mL HDPE containers with HDPE caps. The following samples were collected during the Sioux City ANGB SI sampling conducted in September and October 2018:

- Thirty-four soil samples,
- Two sediment samples,
- Seven groundwater samples,
- Two surface water samples,
- Four soil field duplicate samples,
- One groundwater field duplicate sample,
- Five matrix spike/matrix spike duplicate (MS/MSD) pairs,
- Seven equipment rinsates,
- Two field blanks, and
- One reagent blank.

The results of the data quality evaluation indicate that the overall quality of the data enables its use to confirm the presence or absence of contamination. Through data verification, validation, and review, the analytical information has been qualified as appropriate. Data are considered usable if results are unqualified or qualified as estimated. For groundwater and surface, 100% of the data was considered usable. For sediment and soil, 100% of the data was considered usable. The overall quality of the data meets or exceeds the established project objectives.

Quality Control

Five field duplicate samples were collected, including four for soil and one for groundwater. Field duplicate analytical results were consistent with their associated parent samples with the exception of three relative percent difference (RPD) values >50%. Data are not qualified on the basis of field duplicate results alone, since the *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (EPA 1999), and DoD Quality Systems Manual (QSM) Version 5.1 (DoD 2017) do not include control limits for field duplicate RPD values. Five MS/MSD pairs, four for soil and one for water, were collected. The MS/MSD results are discussed in the “PFOS/PFOA” section of this data quality assessment.

Seven equipment rinsate samples (one for groundwater and six for soil) were collected and analyzed for PFOS/PFOA. Equipment blanks were free from contamination with the exception of PFNA in sample ER-05 for soils. Associated sample results were either above the equipment blank action level or not detected and no further qualification was required. Field blank samples FB-01 and FB-02 were collected from a deionized water source and potable water source, respectively, and analyzed for PFOS/PFOA. Field blank sample FB-02 contained PFBS, PFHpA, PFHxS, PFOA, and PFOS at low estimated concentrations; however, no qualifications were required due to the final rinse with deionized water. Field blank sample FB-01 was free from contamination. Note that decontamination procedures were followed in the field, including washing with laboratory grade, non-phosphate detergent; rinsing with potable water; final rinsing with deionized, analyte free water; and air drying. For these reasons, SI data quality was not impacted by cross-contamination during the field sampling process. One reagent blank was collected and analyzed for PFOA/PFOS. All results were non-detect for the reagent blank sample.

PFOS/PFOA

Some PFOS/PFOA compounds were qualified as estimated due to minor QC outliers. One PFBS result in sample MW-SIO07-01-01DL was qualified as estimate due to a high surrogate recovery. PFOS in parent

sample SIO02-SB2-01 was qualified as estimated (J) due to MS/MSD percent recovery outliers. PFNA was qualified as estimated (J) in sample ER-05 due to a laboratory control sample percent recovery outlier. PFOS in sample SIO03-SB3-01DL was qualified as estimated (J) due to internal standard recovery outliers. PFHxS was qualified as non-detect (U) in the field reagent blank sample due to continuing calibration blank contamination. No other QC outliers resulted in qualification of the data during the data validation process.

Except as noted above, data produced for this investigation demonstrate that it can withstand scientific scrutiny; are appropriate for its intended purpose; are technically defensible; and are of known and acceptable sensitivity, precision, and accuracy. Data integrity has been documented through proper implementation of QA and QC measures. The environmental information presented has an established confidence that allows utilization for the project objectives and provides data for future needs.

5.2 INVESTIGATION-DERIVED WASTE

Investigation-derived waste (IDW) was managed in compliance with the SI WP (Leidos 2018). Thirteen drums of non-hazardous soil IDW, seven drums of non-hazardous water IDW, and one drum of non-hazardous plastics and sediment from the decontamination pad were transported to a designated drum staging area located onsite. Two IDW samples (one aqueous and one solid) were collected for this event, and the IDW sample results in conjunction with the PFOS/PFOA results and historical site process knowledge will be used for characterization of generated IDW. Following approval of the waste profile, the IDW drums will be transported to a permitted offsite facility for disposal.

5.3 PRL 1: BUILDING 252 – AEROSPACE GROUND EQUIPEMENT

Two soil borings (SIO01-SB1, SIO01-SB2) and one groundwater monitoring well (MW-SIO01-01) were installed and sampled to evaluate PRL 1. MW-SIO01-01 was co-located with SIO01-SB1.

5.3.1 Sampling Activities

5.3.1.1 Soil

Two soil borings were installed on September 29, 2018, to evaluate PRL 1. The soil borings were installed in grassy areas between Building 252 and the Apron (Figure 3). The soil borings were advanced using a direct-push drilling system to a total depth of 30 ft BGS at SIO01-SB1 and 25 ft BGS at SIO01-SB2. Soil lithology descriptions were logged on the soil boring logs (Appendix A). A total of four soil samples were collected and analyzed for PFOS/PFOA.

5.3.1.2 Groundwater

MW-SIO01-01 was drilled on September 29, 2018. Well construction details are shown in Table 4. The well construction diagram is included in Appendix A.

MW-SIO01-01 was developed on September 30, 2018, and sampled on October 10, 2018. Water levels are shown in Table 5, and water quality parameters are shown in Table 6. Groundwater sample MW-SIO01-01-01 was collected and analyzed for PFOS/PFOA. The Groundwater Micro Purge Sheet and Groundwater Micro Purge Log are included in Appendix B.

Monitoring well MW-SIO01-01 was surveyed by a licensed surveyor, and the well survey report is included in Appendix C.

5.3.2 Analytical Results

5.3.2.1 Soil

Four soil samples were collected and analyzed from PRL 1, as described in Section 5.3.1. PFOS and PFHxS were detected above the laboratory detection limits in both surface soil samples collected at 0 to 2 ft BGS. PFOA, PFHpA, and PFNA were detected above the laboratory detection limits in SIO01-SB1-01. PFBS was detected above the laboratory detection limits in SIO01-SB2-01. No screening criteria exist for PFNA, PFHpA, or PFHxS. PFBS, PFOS, and PFOA concentrations did not exceed the soil screening criteria.

Two subsurface soil samples were collected at 16 to 18 ft BGS (SIO01-SB1-02) and 5 to 7 ft BGS (SIO01-SB2-02). Five of six PFOS/PFOA compounds (except PFNA) were detected above laboratory detection limits in SIO01-SB1-02 and PFOS, PFHxS, and PFNA were detected above the laboratory detection limits in SIO01-SB2-02. No screening criteria exist for PFNA, PFHpA, or PFHxS. PFBS, PFOS, and PFOA concentrations did not exceed the soil screening criteria. Soil analytical results for PRL 1 are presented in Table 7 and shown in Figure 3.

5.3.2.2 Groundwater

One groundwater sample was collected from MW-SIO01-01 and analyzed as described in Section 5.3.1. All six PFOS/PFOA compounds were detected above laboratory detection limits. No screening criteria exist for PFHxS, PFHpA, or PFNA. PFBS concentrations did not exceed the RSL of 400,000 ng/L. PFOS and PFOA exceeded the 70-ng/L EPA drinking water HA (EPA 2016a and 2016b) and IDNR action level at 1,300 and 350 ng/L. The combined PFOS+ PFOA concentration at MW-SIO01-01 (1,650 ng/L) exceeds screening criteria. Groundwater analytical results for PRL 1 are presented in Table 8 and shown in Figure 5.

5.4 PRL 2: BUILDING 261 – MAIN HANGAR

Two soil borings (SIO02-SB1, SIO02-SB2) and one groundwater monitoring well (MW-SIO02-01) were installed and sampled to evaluate PRL 2. MW-SIO02-01 was co-located with SIO02-SB1.

5.4.1 Sampling Activities

5.4.1.1 Soil

Two soil borings were installed on September 29, 2018, to evaluate the soil at PRL 2. The soil borings were installed within the grassy areas between Building 261 and the Apron (Figure 3). The soil borings were advanced using a direct-push drilling system to a total depth of 25 ft BGS. Soil lithology descriptions were logged on the soil boring logs (Appendix A). A total of four soil samples were collected and analyzed for PFOS/PFOA.

5.4.1.2 Groundwater

MW-SIO02-01 was drilled on September 29, 2018. Well construction details are shown in Table 4. The well construction diagram is included in Appendix A.

MW-SIO02-01 was developed on September 30, 2018, and sampled on October 10, 2018. Water levels are shown in Table 5, and water quality parameters are shown in Table 6. Groundwater sample MW-SIO02-01-01 was collected and analyzed for PFOS/PFOA. The Groundwater Micro Purge Sheet and Groundwater Micro Purge Log are included in Appendix B.

Monitoring wells MW-SIO02-01 was surveyed by a licensed surveyor, and the well survey report is included in Appendix C.

5.4.2 Analytical Results

5.4.2.1 Soil

Four soil samples were collected from SIO02-SB1 and SIO02-SB2 and analyzed as described in Section 5.4.1. PFHpA, PFHxS, PFOS, and PFOA were detected above the laboratory detection limits in both surface soil samples collected at 0 to 2 ft BGS. PFBS was detected at SIO02-SB1-01 at a concentration above the laboratory detection limit but was not detected at SIO02-SB2-01. PFNA was not detected in either of the surface soil samples. No screening criteria exist for PFHpA or PFHxS. PFBS, PFOS, and PFOA concentrations did not exceed the soil screening criteria.

Two subsurface soil samples were collected at 16 to 18 ft BGS (SIO02-SB1-02, SIO02-SB2-02). PFHpA, PFHxS, and PFOA concentrations were detected above the laboratory detection limits in both samples. PFOS and PFBS were detected at SIO02-SB1-02 above the laboratory detection limits but were not detected at SIO02-SB2-02. PFNA was not detected in either of the subsurface soil samples. No screening criteria exist for PFHpA or PFHxS. PFBS, PFOS, and PFOA concentrations did not exceed the soil screening criteria. PRL 2 soil analytical results are presented in Table 7 and shown in Figure 3.

5.4.2.2 Groundwater

One groundwater sample was collected from MW-SIO02-01 and analyzed as described in Section 5.4.1. All six PFOS/PFOA compounds were detected above laboratory detection limits. No screening criteria exist for PFHxS, PFHpA, or PFNA. PFBS concentrations did not exceed the RSL of 400,000 ng/L. PFOS and PFOA exceeded the 70-ng/L EPA drinking water HA (EPA 2016a and 2016b) and IDNR action level at 7,800 and 810 ng/L. The combined PFOS+PFOA concentration at MW-SIO02-01 (8,610 ng/L) exceeds screening criteria. This is the maximum combined concentration of PFOS+PFOA at Sioux City ANGB. Groundwater analytical results for PRL 2 are presented in Table 8 and shown in Figure 5.

5.5 PRL 3: BUILDING 241 ANG PAINT FACILITY

Three soil borings (SIO03-SB1, SIO03-SB2, SIO03-SB3) and one groundwater monitoring well (MW-SIO03-01) were installed and sampled to evaluate PRL 3. MW-SIO03-01 was also used to evaluate PFOS/PFOA concentrations near the Installation boundary. As shown in Figure 2, PRL 3 is separated from the PRLs to the north by the airport runway.

5.5.1 Sampling Activities

5.5.1.1 Soil

Three soil borings were installed on September 26, 2018, to evaluate PRL 3. Soil borings SIO03-SB1 and SIO03-SB2 were installed in the grassy area to the north of Building 241 on either side of the concrete pavement and soil boring SIO03-SB3 was installed in the grassy area to the south of Building 241 (Figure 4). The soil borings were advanced using a direct-push drilling system to total depths of 24 ft BGS (SIO03-SB2) or 25 ft BGS (SIO03-SB1, SIO03-SB3). Soil lithology descriptions were logged on the soil boring logs (Appendix A). A total of seven soil samples (including one field duplicate) were collected and analyzed for PFOS/PFOA.

5.5.1.2 Groundwater

MW-SIO03-01 was drilled on September 26, 2018. Well construction details are shown in Table 4. The well construction diagram is included in Appendix A.

MW-SIO03-01 was developed on September 30, 2018, and sampled on October 10, 2018. Water levels are shown in Table 5, and water quality parameters are shown in Table 6. Groundwater sample MW-SIO03-01-01 was collected and analyzed for PFOS/PFOA. The Groundwater Micro Purge Sheet and Groundwater Micro Purge Log are included in Appendix B.

Monitoring well MW-SIO03-01 was surveyed by a licensed surveyor, and the well survey report is included in Appendix C.

5.5.2 Analytical Results

5.5.2.1 Soil

Seven soil samples (including one field duplicate) were collected and analyzed from PRL 3, as described in Section 5.5.1. The three surface soil samples (0 to 2 ft BGS) indicate five of six PFOS/PFOA compounds (PFOS, PFOA, PFHpA, PFHxS, PFNA) were detected above the laboratory detection limits in each of the samples collected. PFBS also was detected above the laboratory detection limit in SIO03-SB3-01. No screening criteria exist for PFNA, PFHxS, or PFHpA. PFOS, PFOA, and PFBS concentrations did not exceed the soil screening criteria in surface soil at any of the sample locations.

Four subsurface soil samples (including one field duplicate sample at SIO03-SB3-02) were collected at 15 to 17 ft BGS (SIO03-SB1-02, SIO03-SB2-02, SIO03-SB3-02). Five of six PFOS/PFOA compounds (PFOS, PFOA, PFHpA, PFHxS, PFNA) were detected above the laboratory detection limits in each of the samples collected. PFBS also was detected above the laboratory detection limit in SIO03-SB3-01-02 (both primary and duplicate samples). No screening criteria exist for PFNA, PFHxS, or PFHpA. PFOS, PFOA, and PFBS concentrations did not exceed the soil screening criteria in subsurface soil at any of the sample locations. Soil analytical results for PRL 3 are presented in Table 7 and shown in Figure 4.

5.5.2.2 Groundwater

One groundwater sample was collected from MW-SIO03-01 and analyzed as described in Section 5.5.1. All six PFOS/PFOA compounds were detected above laboratory detection limits. No screening criteria exist for PFHxS, PFHpA, or PFNA. PFBS concentrations did not exceed the RSL of 400,000 ng/L. PFOS and PFOA did not exceed the 70-ng/L EPA drinking water HA (EPA 2016a and 2016b) or IDNR action level at 14 and 34 ng/L. The combined PFOS+PFOA concentration at MW-SIO03-01 (48 ng/L) does not exceed screening criteria. Groundwater analytical results for PRL 3 are presented in Table 8 and shown in Figure 5.

5.6 PRL 4: APRON

Three soil borings (SIO04-SB1, SIO04-SB2, SIO04-SB3) and two groundwater monitoring wells (MW-SIO04-01, MW-SIO04-02) were installed and sampled to evaluate PRL 4 and are located near the Installation boundary. MW-SIO04-01 was co-located with SIO04-SB1 and MW-SIO04-02 was co-located with SIO04-SB2.

5.6.1 Sampling Activities

5.6.1.1 Soil

Three soil borings were installed on September 27 through 29, 2018, to evaluate PRL 4. Soil borings SIO04-SB1 and SIO04-SB2 were installed in the grassy areas southwest of the Apron and soil boring SIO04-SB3 was installed in the grassy area off the east of the Apron facing Perimeter Road (Figure 3). The soil borings were advanced using a direct-push drilling system to a total depth of 30 ft BGS (SIO04-SB1) or 25 ft BGS (SIO04-SB2, SIO04-SB3). Soil lithology descriptions were logged on the soil boring logs (Appendix A). A total of seven soil samples were collected and analyzed for PFOS/PFOA.

5.6.1.2 Groundwater

MW-SIO04-01 was drilled on September 27, 2018, and MW-SIO4-02 was drilled on September 28, 2018. Well construction details are shown in Table 4. The well construction diagrams are included in Appendix A.

MW-SIO04-01 and MW-SIO04-02 were developed on October 1, 2018, and sampled on October 9, 2018. Water levels are shown in Table 5, and water quality parameters are shown in Table 6. Groundwater samples MW-SIO04-01-01, MW-SIO04-02-01, and MW-SIO04-02-01D (a field duplicate) were collected and analyzed for PFOS/PFOA. The Groundwater Micro Purge Sheet and Groundwater Micro Purge Log are included in Appendix B.

Monitoring wells MW-SIO04-01 and MW-SIO04-02 were surveyed by a licensed surveyor, and the well survey report is included in Appendix C.

5.6.2 Analytical Results

5.6.2.1 Soil

Seven soil samples were collected and analyzed from PRL 4, as described in Section 5.6.1. Four surface soil samples were collected (including one field duplicate sample at SIO04-SB2-01). Three of six PFOS/PFOA compounds (PFOS, PFBS, PFHxS) were detected above the laboratory detection limits in SIO04-SB1-01 and three of six PFOS/PFOA compounds (PFOS, PFHpA, PFHxS) were detected above the laboratory detection limits in SIO04-SB3-01. All six PFOS/PFOA compounds were detected above the laboratory detection limits in SIO04-SB2-01, although PFNA was detected in the duplicate sample only. No screening criteria exist for PFNA, PFHxS, or PFHpA. PFBS, PFOS, and PFOA concentrations did not exceed the soil screening criteria at any of the surface soil sample locations.

Three subsurface soil samples were collected at 16 to 18 ft BGS (SIO04-SB1-02) and 10 to 12 ft BGS (SIO04-SB2-02, SIO04-SB3-02). No PFOS/PFOA compounds were detected above the laboratory detection limits in any of the subsurface soil samples. PRL 4 soil analytical results are presented in Table 7 and shown in Figure 3.

5.6.2.2 Groundwater

One groundwater sample was collected from MW-SIO04-01 and two groundwater samples (including a field duplicate) were collected from MW-SIO04-02 and analyzed as described in Section 5.6.1. Five of six PFOS/PFOA compounds were detected above laboratory detection limits in the primary sample from MW-SIO04-01 and both the primary and duplicate samples from MW-SIO04-02. PFNA was not detected above the laboratory detection limits. No screening criteria exist for PFHxS or PFHpA. PFBS

concentrations did not exceed the RSL of 400,000 ng/L and PFOS did not exceed the 70-ng/L EPA drinking water HA (EPA 2016a and 2016b) or IDNR action level in any of the groundwater samples. In MW-SIO04-01, PFOA exceeded the 70-ng/L EPA drinking water HA (EPA 2016b) and IDNR action level at 250 ng/L. The combined PFOS+PFOA concentration (260 ng/L) exceeds screening criteria. In MW-SIO04-02, PFOA exceeded the 70-ng/L EPA drinking water HA (EPA 2016b) and IDNR action level at 180 ng/L in the primary sample and 190 ng/L in the duplicate sample. The combined PFOS+PFOA concentration (194 ng/L in the primary sample and 204 ng/L in the duplicate sample) exceeds screening criteria. Groundwater analytical results for PRL 4 are presented in Table 8 and shown in Figure 5.

5.7 PRL 5: BUILDING 286 – FIRE STATION

Three soil borings (SIO05-SB1, SIO05-SB2, SIO05-SB3) were installed and sampled to evaluate PRL 5. PRL 5 is co-located with PRLs 6 and 7, and the groundwater samples from monitoring wells at PRL 6 and PRL 7 will be used to evaluate PFOS/PFOA in groundwater at PRL 5.

5.7.1 Sampling Activities

5.7.1.1 Soil

Three soil borings were installed on September 25, 2018, to evaluate PRL 5. The soil borings were installed in the grassy area to the southwest of Building 286 (Figure 3). The soil borings were advanced using a direct-push drilling system to total depths of 25 ft BGS. Soil lithology descriptions were logged on the soil boring logs (Appendix A). A total of seven soil samples were collected and analyzed for PFOS/PFOA.

5.7.1.2 Groundwater

The groundwater at PRL 5 is co-located with PRLs 6 and 7. Groundwater sampling activities for PRLs 6 and 7 are discussed in Sections 5.8.1 and 5.9.1.

5.7.2 Analytical Results

5.7.2.1 Soil

Seven soil samples were collected and analyzed from PRL 5, as described in Section 5.7.1. The three surface soil samples (0 to 2 ft BGS) indicated five of six PFOS/PFOA compounds (except PFNA) were detected above the laboratory detection limits in SIO05-SB1-01 and SIO05-SB2-01. All six PFOS/PFOA compounds were detected in SIO05-SB3-01. No screening criteria exist for PFHxS, PFHpA, or PFNA. PFBS, PFOS, and PFOA concentrations did not exceed the soil screening criteria in surface soil at any of the sample locations.

Four subsurface soil samples were collected (including one field duplicate sample at SIO05-SB3-02) at 15 to 17 ft BGS (SIO05-SB1-02, SIO05-SB2-02, SIO05-SB2-03). No PFOS/PFOA compounds were detected in SIO05-SB2-02 and only PFHxS was detected at a concentration above the laboratory detection limit in SIO05-SB1-01. All six PFOS/PFOA compounds were detected in SIO05-SB3-02 (primary and duplicate samples). No screening criteria exist for PFHxS, PFHpA, or PFNA. PFBS, PFOS, and PFOA concentrations did not exceed the soil screening criteria in subsurface soil at any of the sample locations. Soil analytical results for PRL 5 are presented in Table 7 and shown in Figure 3.

5.7.2.2 Groundwater

The groundwater at PRL 5 is co-located with PRLs 6 and 7. One groundwater sample was collected from MW-SIO06-01 and one groundwater sample was collected from MW-SIO07-01. The samples were analyzed as described in Sections 5.8.1 and 5.9.1, respectively. All six PFOS/PFOA compounds were detected above the laboratory detection limits in both samples. No screening criteria exist for PFHxS, PFHpA, or PFNA. PFBS concentrations did not exceed the RSL of 400,000 ng/L. The concentrations of PFOS were 45 ng/L (MW-SIO06-01) and 12 ng/L (MW-SIO07-01) and do not exceed the 70-ng/L EPA drinking water HA (EPA 2016a) or IDNR action level. The concentration of PFOA (77 ng/L) at MW-SIO06-01 does exceed the 70-ng/L EPA drinking water HA (EPA 2016b) and IDNR action level; however, the concentration of PFOA (2.1 ng/L) at MW-SIO07-01 does not. The combined PFOS+PFOA concentration at MW-SIO06-01 (122 ng/L) exceeds screening criteria; however, the combined PFOS+PFOA concentration at MW-SIO07-01 (14.1 ng/L) does not. Groundwater analytical results for MW-SIO06-01 and MW-SIO07-01 are presented in Table 8 and shown in Figure 5.

5.8 PRL 6: BUILDING 284 – SECURITY FORCES

Two soil borings (SIO06-SB1, SIO06-SB2) and one groundwater monitoring well (MW-SIO06-01) were installed and sampled to evaluate PRL 6. MW-SIO06-01 was co-located with SIO06-SB1 and also used to evaluate PFOS/PFOA concentrations near the Installation boundary.

5.8.1 Sampling Activities

5.8.1.1 Soil

Two soil borings were installed on September 25 and 27 2018, to evaluate PRL 6. SIO06-SB1 was installed in the grassy area southwest of Building 284 adjacent to the taxiway and SIO06-SB2 was installed in the grassy area southwest and adjacent to Building 284 (Figure 3). The soil borings were advanced using a direct-push drilling system to a total depth of 30 ft BGS (SIO06-SB1) and 25 ft BGS (SIO06-SB2). Soil lithology descriptions were logged on the soil boring logs (Appendix A). A total of four soil samples were collected and analyzed for PFOS/PFOA.

5.8.1.2 Groundwater

MW-SIO06-01 was drilled on September 27, 2018. Well construction details are shown in Table 4. The well construction diagram is included in Appendix A.

MW-SIO06-01 was developed on October 1, 2018, and sampled on October 9, 2018. Water levels are shown in Table 5, and water quality parameters are shown in Table 6. Groundwater sample MW-SIO06-01-01 was collected and analyzed for PFOS/PFOA. The Groundwater Micro Purge Sheet and Groundwater Micro Purge Log are included in Appendix B.

Monitoring well MW-SIO06-01 was surveyed by a licensed surveyor, and the well survey report is included in Appendix C.

5.8.2 Analytical Results

5.8.2.1 Soil

Four soil samples were collected and analyzed from PRL 6, as described in Section 5.8.1. The two surface soil samples (0 to 2 ft BGS) collected indicate that all six PFOS/PFOA compounds were detected at concentrations above the laboratory detection limits except for PFBS in SIO06-SB1-01 and PFHxS in

SIO06-SB2-01. No screening criteria exist for PFHxS, PFHpA, or PFNA. PFOS, PFOA and PFBS concentrations did not exceed the soil screening criteria in surface soil at any of the sample locations.

Two subsurface soil samples were collected at 15 to 17 ft BGS (SIO06-SB1-02, SIO06-SB2-02). Five of six PFOA/PFOS compounds (except PFNA) were detected above the laboratory detection limits in SIO06-SB1-02. Only PFBS and PFHxS were detected in SIO06-SB2-02. No screening criteria exist for PFHxS or PFHpA. PFBS, PFOS, and PFOA concentrations did not exceed the soil screening criteria in subsurface soil at any of the sample locations. Soil analytical results for PRL 6 are presented in Table 7 and shown in Figure 3.

5.8.2.2 Groundwater

One groundwater sample was collected from MW-SIO06-01, located near the Installation boundary, and analyzed as described in Section 5.8.1. All six PFOS/PFOA compounds were detected above laboratory detection limits. No screening criteria exist for PFHxS, PFHpA, or PFNA. PFBS concentrations did not exceed the RSL of 400,000 ng/L. PFOS (45 ng/L) did not exceed the 70-ng/L EPA drinking water HA (EPA 2016a) or IDNR action level. PFOA did exceed the 70-ng/L EPA drinking water HA (EPA 2016b) and IDNR action level at a concentration of 77 ng/L. The combined PFOS+PFOA concentration at MW-SIO06-01 (122 ng/L) exceeds screening criteria. Groundwater analytical results for PRL 6 are presented in Table 8 and shown in Figure 5.

5.9 PRL 7: NOZZLE TESTING LOCATION

Two soil borings (SIO07-SB1, SIO07-SB2) and one groundwater monitoring well (MW-SIO07-01) were installed and sampled to evaluate PRL 7. MW-SIO07-01 was co-located with SIO07-SB1 and also was used to evaluate PFOS/PFOA concentrations near the Installation boundary.

5.9.1 Sampling Activities

5.9.1.1 Soil

Two soil borings were installed on September 27, 2018, to evaluate PRL 7. The borings were installed in the grassy area south of Building 286 adjacent to the taxiway (Figure 3). The soil borings were advanced using a direct-push drilling system to a total depth of 30 ft BGS (SIO07-SB1) and 25 ft BGS (SIO07-SB2). Soil lithology descriptions were logged on the soil boring logs (Appendix A). A total of five soil samples were collected and analyzed for PFOS/PFOA.

5.9.1.2 Groundwater

MW-SIO07-01 was drilled on September 27, 2018. Well construction details are shown in Table 4. The well construction diagram is included in Appendix A.

MW-SIO07-01 was developed on October 1, 2018, and sampled on October 9, 2018. Water levels are shown in Table 5, and water quality parameters are shown in Table 6. Groundwater sample MW-SIO07-01-01 was collected and analyzed for PFOS/PFOA. The Groundwater Micro Purge Sheet and Groundwater Micro Purge Log are included in Appendix B.

Monitoring well MW-SIO07-01 was surveyed by a licensed surveyor, and the well survey report is included in Appendix C.

5.9.2 Analytical Results

5.9.2.1 Soil

Five soil samples were collected and analyzed from PRL 7, as described in Section 5.9.1. The two surface soil samples (0 to 2 ft BGS) indicate that all six PFOS/PFOA compounds were detected at concentrations above the laboratory detection limits. No screening criteria exist for PFHxS, PFHpA, or PFNA. PFOS, PFOA and PFBS concentrations did not exceed the soil screening criteria in surface soil at any of the sample locations.

Three subsurface soil samples were collected (including one field duplicate sample at SIO07-SB1-02) at 18 to 20 ft BGS (SIO07-SB1-02) and 19 to 21 ft BGS (SIO07-SB2-02). No PFOS/PFOA compounds were detected above the laboratory detection limits in either sample collected except for PFBS in SIO07-SB1-02 (primary and duplicate samples). The PFBS concentrations did not exceed the soil screening criteria in the subsurface soil samples. Soil analytical results for PRL 7 are presented in Table 7 and shown in Figure 3.

5.9.2.2 Groundwater

One groundwater sample was collected from MW-SIO07-01 and analyzed as described in Section 5.9.1. All six PFOS/PFOA compounds were detected above laboratory detection limits. No screening criteria exist for PFHxS, PFHpA, or PFNA. PFBS concentrations did not exceed the RSL of 400,000 ng/L. PFOS (12 ng/L) and PFOA (2.1 ng/L) did not exceed the 70-ng/L EPA drinking water HA (EPA 2016a and 2016b) or IDNR action level. The combined PFOS+PFOA concentration at MW-SIO07-01 (14.1 ng/L) does not exceed screening criteria. Groundwater analytical results for PRL 7 are presented in Table 8 and shown in Figure 5.

5.10 PRL 8: STORMWATER SEWER SYSTEM OUTFALL 1

One sediment sample (SIO08-SD1) and one surface water sample (SIO08-SW1) were collected to evaluate PRL 8. SIO08-SW1 also was used to evaluate PFOS/PFOA concentrations near the Installation boundary.

5.10.1 Sampling Activities

5.10.1.1 Surface water

Surface water sample SIO08-SW1 was collected on September 30, 2018. The last significant precipitation event was 0.15 in. on September 25, 2018. A surface water sample was collected from the drainage ditch below Outfall 1 on the eastern side of the Installation near Perimeter Road. The sample location is shown in Figure 2. Sample SIO08-SW1 was analyzed for PFOS/PFOA.

5.10.1.2 Sediment

Sediment sample SIO08-SD1 was collected on September 30, 2018, from the drainage ditch below Outfall 1 on the eastern side of the Installation near Perimeter Road. The sample is shown in Figure 2. Sample SIO08-SD1 was analyzed for PFOS/PFOA.

5.10.2 Analytical Results

5.10.2.1 Surface water

Surface water sample SIO08-SW1 was collected and analyzed as described in Section 5.10.1. Five of six PFOS/PFOA compounds were detected at concentrations above the laboratory detection limits. PFNA was not detected above the laboratory detection limits. No screening criteria exist for PFHxS or PFHpA. The PFBS concentration did not exceed the RSL of 400,000 ng/L. The PFOS and PFOA concentrations (28 and 8.4 ng/L, respectively) did not exceed the EPA drinking water HA of 70 ng/L or IDNR action level. The combined PFOS+PFOA concentration at this location (37.4 ng/L) does not exceed screening criteria. PRL 8 surface water analytical results are presented in Table 8 and shown in Figure 5.

5.10.2.2 Sediment

Sediment sample SIO08-SD1 was collected and analyzed as described in Section 5.10.1. Two of six PFOS/PFOA compounds (PFOS, PFHxS) were detected above the laboratory detection limits. No screening criteria exist for PFHxS. The PFOS concentration did not exceed the soil screening criteria in the sediment sample at PRL 8. PRL 8 sediment analytical results are presented in Table 7 and shown in Figure 3.

5.11 PRL 9: STORMWATER SEWER SYSTEM OUTFALL 2

One sediment sample (SIO09-SD1) and one surface water sample (SIO09-SW1) were collected to evaluate PRL 9. SIO09-SW1 also was used to evaluate PFOS/PFOA concentrations near the Installation boundary. As shown in Figure 2, PRL 9 is separated from the PRLs to the north by the airport runway.

5.11.1 Sampling Activities

5.11.1.1 Surface water

Surface water sample SIO09-SW1 was collected on October 10, 2018. The last significant precipitation event was 1.14 in. on October 9, 2018. A surface water sample was collected from the drainage ditch, below Outfall 2, south of Perimeter Road. The sample location is shown in Figure 2. Sample SIO09-SW1 was analyzed for PFOS/PFOA.

5.11.1.2 Sediment

Sediment sample SIO09-SD1 was collected on September 30, 2018, from Outfall 2 on the northern side of Perimeter Road. The sample is shown in Figure 2. Sample SIO08-SD1 was analyzed for PFOS/PFOA.

5.11.2 Analytical Results

5.11.2.1 Surface water

Surface water sample SIO09-SW1 was collected and analyzed as described in Section 5.11.1. All six PFOS/PFOA compounds were detected at concentrations above the laboratory detection limits. No screening criteria exist for PFHxS, PFHpA, or PFNA. The PFBS concentration did not exceed the RSL of 400,000 ng/L. The PFOS and PFOA concentrations (62 and 22 ng/L, respectively) did not exceed the EPA drinking water HA of 70 ng/L or IDNR action level. The combined PFOS+PFOA concentration at this location (84 ng/L) exceeds screening criteria. PRL 9 surface water analytical results are presented in Table 8 and shown in Figure 5.

5.11.2.2 Sediment

Sediment sample SIO09-SD1 was collected and analyzed as described in Section 5.11.1. Five of six PFOS/PFOA compounds were detected above the laboratory detection limits. PFBS was not detected above the laboratory detection limit. No screening criteria exist for PHFpA, PFHxS, or PFNA. The PFOS and PFOA concentrations did not exceed the soil screening criteria in the sediment sample at PRL 9. PRL 8 sediment analytical results are presented in Table 7 and shown in Figure 4.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSIONS

This section presents the SI conclusions for each PRL and an evaluation of PFOS/PFOA contamination near the Installation boundary. The recommended DQOs are based on data collected by Leidos during this SI and an evaluation of the analytical results compared to applicable screening criteria.

6.1.1 PRL 1: Building 252 – Aerospace Ground Equipment

Although PFOS/PFOA compounds were detected in PRL 1 soil samples, evaluation of soil analytical data compared to soil screening criteria indicates there are no calculated residential risk-based screening level exceedances for PFBS, PFOS, or PFOA for soil in PRL 1.

Evaluation of groundwater data compared to screening criteria indicates an exceedance of the screening criteria in MW-SIO01-01 for PFOS+PFOA (combined) with a result of 1,650 ng/L.

Based on the SI results, the following DQOs are recommended for PRL 1:

- Additional surface and subsurface soil samples to determine if a previously undetected source area exists that is contributing to the groundwater exceedances; and
- Additional investigation to determine the nature and extent of PFAS in groundwater (both laterally and vertically), through sampling of additional new monitoring wells located both upgradient of and downgradient from PRL 1.

6.1.2 PRL 2: Building 261 – Main Hangar

Although PFOS/PFOA compounds were detected in PRL 2 soil samples, evaluation of soil analytical data compared to soil screening criteria indicates there are no calculated residential risk-based screening level exceedances for PFBS, PFOS, or PFOA for soil in PRL 2.

Evaluation of groundwater data compared to screening criteria indicates an exceedance of the screening criteria in MW-SIO02-01 for PFOS+PFOA (combined) with a result of 8,610 ng/L.

Based on the SI results, the following DQOs are recommended for PRL 2:

- Additional surface and subsurface soil samples to determine if a previously undetected source area exists that is contributing to the groundwater concentrations; and
- Additional investigation to determine the nature and extent of PFAS in groundwater (both laterally and vertically), through sampling of additional new monitoring wells located both upgradient of and downgradient from PRL 2.

6.1.3 PRL 3: Building 241 – ANG Paint Facility

Although PFOS/PFOA compounds were detected in PRL 3 soil samples, evaluation of soil analytical data compared to soil screening criteria indicates there are no calculated residential risk-based screening level exceedances for PFBS, PFOS, and PFOA for soil in PRL 3.

Although PFOS/PFOA compounds were detected in the groundwater sample from MW-SIO03-01, evaluation of groundwater analytical data compared to screening criteria indicates there is no exceedance of the screening criteria for PFOS+PFOA (combined).

Based on the SI results, the following DQOs are recommended for PRL 3:

- Additional surface and subsurface soil samples to determine if a previously undetected source area exists that is contributing to the groundwater concentrations; and
- Additional investigation to determine the nature and extent of PFAS in groundwater (both laterally and vertically), through sampling of additional new monitoring wells located both upgradient of and downgradient from PRL 3.

6.1.4 PRL 4: Apron

Although PFOS/PFOA compounds were detected in PRL 4 soil samples, evaluation of soil analytical data compared to soil screening criteria indicates there are no calculated residential risk-based screening level exceedances for PFBS, PFOS, or PFOA for soil in PRL 4.

Evaluation of groundwater data compared to screening criteria indicates an exceedance of the screening criteria in MW-SIO04-01, MW-SIO04-02, and MW-SIO04-02D for PFOS+PFOA (combined) with results of 260, 194, and 2,014 ng/L, respectively.

Based on the SI results, the following DQOs are recommended for PRL 4:

- Additional surface and subsurface soil samples to determine if a previously undetected source area exists that is contributing to the groundwater exceedances; and
- Additional investigation to determine the nature and extent of PFAS in groundwater (both laterally and vertically), through sampling of additional new monitoring wells located both upgradient of and downgradient from PRL 4.

6.1.5 PRL 5: Building 286 – Fire Station

Although PFOS/PFOA compounds were detected in PRL 5 soil samples, evaluation of soil analytical data compared to soil screening criteria indicates there are no calculated residential risk-based screening level exceedances for PFBS, PFOS, and PFOA for soil in PRL 5.

The groundwater at PRL 5 is co-located with PRLs 6 and 7. Evaluation of groundwater data compared to screening criteria indicates an exceedance of the screening criteria in MW-SIO06-01 for PFOS+PFOA (combined) with a result of 122 ng/L. No exceedance of the screening criteria was observed for the groundwater sample from MW-SIO07-01.

Based on the SI results, the following DQOs are recommended for PRL 5:

- Additional surface and subsurface soil samples to determine if a previously undetected source area exists that is contributing to the groundwater exceedances; and
- Additional investigation to determine the nature and extent of PFAS in groundwater (both laterally and vertically), through sampling of additional new monitoring wells located both upgradient of and downgradient from PRL 5.

6.1.6 PRL 6: Building 284 – Security Forces

Although PFOS/PFOA compounds were detected in PRL 6 soil samples, evaluation of soil analytical data compared to soil screening criteria indicates there are no calculated residential risk-based screening level exceedances for PFBS, PFOS, or PFOA for soil in PRL 6.

Evaluation of groundwater data compared to screening criteria indicates an exceedance of the screening criteria in MW-SIO06-01 for PFOS+PFOA (combined) with a result of 122 ng/L.

Based on the SI results, the following DQOs are recommended for PRL 6:

- Additional surface and subsurface soil samples to determine if a previously undetected source area exists that is contributing to the groundwater exceedances; and
- Additional investigation to determine the nature and extent of PFAS in groundwater (both laterally and vertically), through sampling of additional new monitoring wells located both upgradient of and downgradient from PRL 6.

6.1.7 PRL 7: Nozzle Testing Location

Although PFOS/PFOA compounds were detected in PRL 7 soil samples, evaluation of soil analytical data compared to soil screening criteria indicates there are no calculated residential risk-based screening level exceedances for PFBS, PFOS, and PFOA for soil in PRL 7.

Although PFOS/PFOA compounds were detected in the groundwater sample from MW-SIO07-01, evaluation of groundwater analytical data compared to screening criteria indicates there is no exceedance of the screening criteria for PFOS+PFOA (combined).

Based on the SI results, the following DQOs are recommended for PRL 7:

- Additional surface and subsurface soil samples to determine if a previously undetected source area exists that is contributing to the groundwater exceedances; and
- Additional investigation to determine the nature and extent of PFAS in groundwater (both laterally and vertically), through sampling of additional new monitoring wells located both upgradient of and downgradient from PRL 7.

6.1.8 PRL 8: Stormwater Sewer System Outfall 1

Five of six PFOS/PFOA compounds were detected at concentrations above the laboratory detection limit in surface water location SIO08-SW1. Evaluation of the surface water results compared to groundwater screening criteria indicated no exceedance of the screening criteria for PFOS+PFOA (combined), with a result of 37.4 ng/L.

Sediment results from the outfall indicated two of six PFOS/PFOA compounds were detected. Evaluation of sediment analytical data compared to soil screening criteria indicates there are no calculated residential risk-based screening level exceedances for sediment at PRL 8.

Based on the SI results, the following DQO is recommended for PRL 8:

- Additional investigation to further evaluate the concentrations of PFAS in surface water and sediment, which should include additional sampling of surface water and sediment for PFAS at PRL 8 as well as upgradient of and downgradient from PRL 8 to further evaluate the PFAS impacts.

6.1.9 PRL 9: Stormwater Sewer System Outfall 2

All six PFOS/PFOA compounds were detected at concentrations above the laboratory detection limit in surface water location SIO09-SW1. Evaluation of the surface water results compared to groundwater screening criteria indicated an exceedance of the screening criteria for PFOS+PFOA (combined), with a result of 84 ng/L.

Sediment results from the outfall indicated five of six PFOS/PFOA compounds were detected. Evaluation of sediment analytical data compared to soil screening criteria indicates there are no calculated residential risk-based screening level exceedances for sediment at PRL 9.

Based on the SI results, the following DQO is recommended for PRL 9:

- Additional investigation to further evaluate the concentrations of PFAS in surface water and sediment, which should include additional sampling of surface water and sediment for PFAS at PRL 9 as well as upgradient of and downgradient from PRL 9 to further evaluate the PFAS impacts.

6.1.10 PFOS/PFOA Contamination Near Installation Boundary

Samples from five monitoring wells (MW-SIO03-01, MW-SIO04-01, MW-SIO04-02, MW-SIO06-01, MW-SIO07-01) and two surface water samples (SIO08-SW1, SIO09-SW1) were collected to evaluate the PFOS/PFOA contamination near the Installation boundary (Figure 5).

Five of six PFOS/PFOA compounds were detected above the laboratory detection limits in samples collected from MW-SIO04-01, MW-SIO04-02, MW-SIO06-01, MW-SIO07-01, and SIO08-SW1. PFNA was detected above the laboratory detection limits in samples from MW-SIO06-01 and MW-SIO07-01, but was not detected at MW-SIO04-01, MW-SIO04-02 or SIO08-SW1. No screening criteria exist for PFHxS, PFHpA, or PFNA.

Concentrations of PFOA exceeded the 70-ng/L EPA drinking water HA (EPA 2016b) and IDNR screening levels at MW-SIO04-01, MW-SIO04-02, and MW-SIO06-01. PFOA concentrations at MW-SIO07-01 and SIO08-SW1 were below screening levels. PFOS and PFBS concentrations did not exceed screening criteria in any of these samples. The combined PFOS+PFOA concentrations exceeded the 70-ng/L EPA drinking water HA (EPA 2016a and 2016b) at all locations except for MW-SIO07-01 and SIO08-SW1.

PRLs 3 and 9 are separated from the PRLs to the north by the airport runway. All six PFOS/PFOA compounds were detected above the laboratory detection limits in groundwater sample from MW-SIO03-01 and surface water sample from SIO09-SW1. PFOS or PFOA concentrations, either individually or combined, did not exceed screening criteria in MW-SIO03-01, but the combined PFOS+PFOA concentration exceeded screening criteria in SIO09-SW1. PFBS concentrations did not exceed screening criteria in either sample. No screening criteria exist for PFHxS, PFHpA, or PFNA.

PFOS/PFOA compounds are likely migrating offsite given their presence and magnitude near the Installation boundary.

6.2 SUMMARY AND RECOMMENDATIONS

In summary, additional investigations are recommended at each of the nine PRLs assessed during this SI due to detections of PFOS and PFOA compounds in soil, groundwater, surface water, and sediment. The recommendations are summarized in Table 9 and described briefly below:

- Further investigation is necessary to determine the nature and extent of PFAS contamination due to detectable levels of PFOS/PFOA at the PRLs.
- Develop an expanded conceptual site model that considers localized groundwater and surface water flow paths to select future sampling locations.
- Complete the delineation of nature and extent of PFAS as part of an Expanded SI or an RI that could consist of:
 - Additional soil and sediment sampling and analysis of an expanded list of PFAS constituents (in addition to the six UCMR-3 constituents) to determine if significant source areas related to precursor substances are present. Precursor substances have been demonstrated to oxidize into PFOS and PFOA, and thus could provide a lingering source of these compounds to soil and groundwater.
 - Expanded groundwater sampling program (including analysis of an expanded list of PFAS constituents) to complete horizontal and vertical delineation of the PFAS impacts. Further groundwater investigation at the Base boundary is recommended due to the presence of PFAS in groundwater above their respective screening criteria.
 - The installation and sampling of upgradient and downgradient off-Base monitoring wells to better define the upgradient source of PFAS as well as PFAS concentrations that have migrated off Base.
 - The sampling of surface water and sediment at the Base as well as upgradient and downgradient off Base (including analysis of an expanded list of PFAS constituents) to better determine if there is an upgradient source of PFAS, as well as impacts of PFAS in surface water that have migrated off Base.
- Conduct preliminary site-specific risk assessment calculations in order to identify chemicals of potential concern (COPCs) in every medium and establish preliminary remedial goals for screening purposes.

DQOs are proposed based on the results of the SI and are presented in Table 9. In general, additional samples are required at each PRL in order to establish the nature and extent of PFAS constituents for each applicable medium and determine if a complete receptor pathway exists. For soil, additional samples are proposed to determine if a source area exists, and if so, to determine the vertical and horizontal extent for both the vadose and saturated zones. For groundwater, additional samples are proposed to quantify potential impacts from upgradient sources and assess the nature and extent of PFAS concentrations beyond the Base boundary. Additional surface water and sediment samples should be collected at PRLs 8 and 9 to further evaluate PFAS concentrations in surface water and sediment.

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TABLES

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Table 1. Preliminary Assessment Report Summary and Recommendations

PRL No.	Potential AFFF PRL	Rationale	Recommendation
1	Building 252 – Aerospace Ground Equipment	Previously utilized AFFF fire suppression system. Known AFFF releases. Trench drains lead to a sanitary sewer via an OWS.	Proceed to SI. Sample soil and groundwater.
2	Building 261 – Main Hangar	Previously utilized AFFF fire suppression system. Known AFFF releases. Trench drains lead to a sanitary sewer via an OWS.	Proceed to SI. Sample soil and groundwater.
3	Building 241 – ANG Paint Facility	Current AFFF fire suppression system. Known AFFF releases. Trench drains lead to a sanitary sewer via an OWS.	Proceed to SI. Sample soil and groundwater.
4	Apron	Potential for AFFF releases in this area.	Proceed to SI. Sample soil and groundwater.
5	Building 286 – Fire Station	Potential for AFFF releases in this area.	Proceed to SI. Focus on soil and groundwater at the southern portion of the apron.
6	Building 284 – Security Forces	Potential for AFFF releases in this area.	Proceed to SI. Focus on soil and groundwater at the southern portion of the apron.
7	Nozzle Testing Location	Nozzle testing was conducted on paved area adjacent to Building 284.	Proceed to SI. Sample soil and groundwater.
8	Stormwater Sewer System Outfall 1	Potential for AFFF releases in this area.	Proceed to SI. Sample sediment and surface water.
9	Stormwater Sewer System Outfall 2	Potential for AFFF releases in this area.	Proceed to SI. Sample sediment and surface water.
10	Building 281 – Hazmart Pharmacy	55-gal drums of AFFF stored on secondary containment. No known releases.	NFA
11	Building 280 – Supply Warehouse	55-gal drums of AFFF temporarily stored on secondary containment. No known releases.	NFA

AFFF = Aqueous film-forming foam.

ANG = Air National Guard.

NFA = No further action.

OWS = Oil/water separator.

PRL = Potential release location.

SI = Site inspection.

Table 2. PFOS/PFOA SI Screening Criteria

Parameter	Chemical Abstract Service Number	EPA RSL for Tap Water ^a (ng/L)	EPA Health Advisory ^b (ng/L)	IDNR Action Level/Statewide Standards for Groundwater ^f (ng/L)	Residential Risk-based Soil Screening Level ^c (µg/kg)	IDNR Action Level/Statewide Standards for Soil ^f (µg/kg)
PFOS	1763-23-1	NA	70.0 ^d	70	1,260	1,800
PFOA	335-67-1	NA		70	1,260	1,200
PFBS	375-73-5	400,000 ^e	NA	NA	1,260,000	NA

^a EPA RSL for tap water at target HQ = 1, November 2018 (EPA 2018).

^b *Drinking Water Health Advisory for Perfluorooctane Sulfonate* (EPA 2016a) and *Drinking Water Health Advisory for Perfluorooctanoic Acid* (EPA 2016b).

^c Residential risk-based soil screening levels determined by using the EPA RSL calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search) and the November 2018 EPA RSL tables (<https://epa.gov/risk/regional-screening-levels-rsls-generic-tables>) for soil and sediment at target HQ = 1 (EPA 2018).

^d When PFOA and PFOS are both present, the combined detected concentrations of the compounds are compared with the 70-ng/L health advisory value.

^e PFBS analytical results for groundwater and surface water have been compared to the tap water screening levels.

^f IDNR action levels/statewide standards for PFOS and PFOA in soil and groundwater (IDNR 2016).

µg/kg = Micrograms per kilogram.

EPA = U.S. Environmental Protection Agency.

HQ = Hazard quotient.

IDNR = Iowa Department of Natural Resources.

NA = Not available.

ng/L = Nanograms per liter.

PFBS = Perfluorobutane sulfonate.

PFOA = Perfluorooctanoic acid.

PFOS = Perfluorooctane sulfonate.

RSL = Regional screening level.

SI = Site inspection.

Table 3. Summary of SI Activities

PRL Name	Analyzed Parameters ^a	Soil Borings	Soil Samples ^b	Groundwater Samples ^b	Surface Water Samples	Sediment Samples
1: Building 252 – Aerospace Ground Equipment	PFOS/PFOA	2	4	1	0	0
2: Building 261 – Main Hangar	PFOS/PFOA	2	4	1	0	0
3: Building 241 – ANG Paint Facility	PFOS/PFOA	3	7	1	0	0
4: Apron	PFOS/PFOA	3	7	3	0	0
5: Building 286 – Fire Station	PFOS/PFOA	3	7	0 ^c	0	0
6: Building 284 – Security Forces	PFOS/PFOA	2	4	1	0	0
7: Nozzle Testing Location	PFOS/PFOA	2	5	1	0	0
8: Stormwater Sewer System Outfall 1	PFOS/PFOA	0	0	0	1	1
9: Stormwater Sewer System Outfall 2	PFOS/PFOA	0	0	0	1	1

^a PFOS/PFOA is used generically in this SI Report to include the following six 2012 UCMR3 Rule emerging contaminants: PFOS, PFOA, perfluorobutane sulfonate, perfluorononanoic acid, perfluoroheptanoic acid, and perfluorohexane sulfonate. All samples were analyzed for PFOS/PFOA using EPA Method 537, revision 1.1.

^b Includes field duplicate.

^c PRL 5 is co-located with PRLs 6 and 7. Groundwater samples from PRLs 6 and 7 were used to evaluate PRL 5.

ANG = Air National Guard.

EPA = U.S. Environmental Protection Agency.

PFOA = Perfluorooctanoic acid.

PFOS = Perfluorooctane sulfonate.

PRL = Potential release location.

SI = Site inspection.

UCMR3 = Third Unregulated Contaminant Monitoring Rule.

Table 4. Well Construction Details for Sioux City ANGB SI

Monitoring Well	Top of Casing Elevation (ft AMSL)	Ground Elevation (ft AMSL)	Screened Interval (ft BGS)	Total Well Depth (ft BTOC)	Well Diameter (in.)	Casing
PRL 1						
MW-SIO01-01	1091.296	1091.81	20.0-30.0	30.4	2	PVC
PRL 2						
MW-SIO02-01	1091.692	1092.29	20.0-30.0	30.4	2	PVC
PRL 3						
MW-SIO03-01	1091.970	1092.22	15.0-25.0	25.4	2	PVC
PRL 4						
MW-SIO04-01	1092.143	1092.69	20.0-30.0	30.4	2	PVC
MW-SIO04-02	1091.883	1092.47	15.0-25.0	25.4	2	PVC
PRL 6						
MW-SIO06-01	1093.506	1094.03	15.0-25.0	25.4	2	PVC
PRL 7						
MW-SIO07-01	1093.793	1094.15	20.0-30.0	30.4	2	PVC

Source: TOC elevation and ground surface elevation data are from the monitoring well survey on October 15, 2018, by McClure Engineering Company (see Appendix C). Screened interval, total depth, and well diameter data in this table were obtained from the well construction diagrams provided in Appendix A.

AMSL = Above mean sea level.
 ANGB = Air National Guard Base.
 BGS = Below ground surface.

BTOC = Below top of casing.
 PRL = Potential release location.
 PVC = Polyvinyl chloride.

SI = Site inspection.
 TOC = Top of Casing.

Table 5. Water Level Measurements

Monitoring Well Identifier	TOC Elevation (ft AMSL)	Screened Interval	October 2018	
			Depth to Water (ft BTOC)	Groundwater Elevation (ft AMSL)
New Wells ^a				
MW-SIO01-01	1091.296	20.0-30.0	9.55	1081.746
MW-SIO02-01	1091.692	20.0-30.0	19.73	1071.962
MW-SIO03-01	1091.970	15.0-25.0	20.15	1071.820
MW-SIO04-01	1092.143	20.0-30.0	20.45	1071.693
MW-SIO04-02	1091.883	15.0-25.0	19.80	1072.083
MW-SIO06-01	1093.506	15.0-25.0	22.24	1071.266
MW-SIO07-01	1093.793	20.0-30.0	22.36	1071.433

^a Source: TOC elevation and ground surface elevation data are from the monitoring well survey on October 15, 2018, by McClure Engineering Company (see Appendix C). Screened intervals shown in this table for the new wells were obtained from the well construction diagrams provided in Appendix A. Depth to water information was obtained from the groundwater sampling logs in Appendix B.

AMSL = Above mean sea level.
 BTOC = Below top of casing.
 TOC = Top of casing.

Table 6. Water Quality Parameters

Parameter	Groundwater					
	MW-SIO01-01	MW-SIO02-01	MW-SIO03-01	MW-SIO04-01	MW-SIO04-02	MW-SIO06-01
Dissolved oxygen (mg/L)	2.73	0.34	0.93	1.75	0.47	3.77
ORP (mV)	23.7	9.5	6.3	-54.9	-13.5	145.4
pH (S.U.)	8.01	8.41	8.10	9.67	8.77	7.33
Conductivity (mS/cm)	1.430	0.929	1.314	1.130	1.219	1.400
Temperature (°C)	11.52	13.44	13.17	11.88	12.84	13.02
Turbidity (NTU)	86.0	22.5	24.5	16.7	33.1	19.5

Parameter	Groundwater	Surface Water	
	MW-SIO07-01	SIO08-SW1	SIO09-SW1
Dissolved oxygen (mg/L)	0.34	10.56	NM
ORP (mV)	-48.6	105.7	NM
pH (S.U.)	9.60	7.73	NM
Conductivity (mS/cm)	1.574	1.222	NM
Temperature (°C)	12.74	16.20	NM
Turbidity (NTU)	27.9	15.9	NM

mS/cm = MicroSiemens per centimeter.

mV = Millivolt.

mg/L = Milligrams per liter

NTU = Nephelometric turbidity unit.

ORP = Oxidation-reduction potential.

S.U. = Standard unit.

NM = Not measured.

Table 7. Summary of Soil and Sediment Analytical Results

Analyte						Perfluorooctane Sulfonate (PFOS)	Perfluorooctanoic Acid (PFOA)	Perfluorobutane Sulfonate (PFBS)	Perfluoroheptanoic Acid (PFHpA)	Perfluorohexane Sulfonate (PFHxS)	Perfluorononanoic Acid (PFNA)
Screening Level ^a						1,260	1,260	1,260,000	NA	NA	NA
IDNR Action Level ^b						1,800	1,200	NA	NA	NA	NA
PRL	Location	Sample Identifier	Sample Date	Sample Depth (ft)	Sample Type	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)
1	SIO01-SB1	SIO01-SB1-01	9/29/2018	0-2	REG	42	0.91	0.23 U	0.32 J	1.1	0.2 J
	SIO01-SB1	SIO01-SB1-02	9/29/2018	16-18	REG	29	0.55	0.26 J	0.11 J	5.3	0.26 U
	SIO01-SB2	SIO01-SB2-01	9/29/2018	0-2	REG	0.51 J	0.24 U	0.085 J	0.24 U	0.47	0.24 U
	SIO01-SB2	SIO01-SB2-02	9/29/2018	5-7	REG	5.3	0.23 U	0.2 U	0.23 U	0.35	0.14 J
2	SIO02-SB1	SIO02-SB1-01	9/29/2018	0-2	REG	1.6	14	0.77	3.7	24	0.26 U
	SIO02-SB1	SIO02-SB1-02	9/29/2018	16-18	REG	2.3	0.38	0.061 J	0.11 J	2.3	0.21 U
	SIO02-SB2	SIO02-SB2-01	9/29/2018	0-2	REG	0.43 J	3.8	0.24 U	1.8	2.7	0.27 U
	SIO02-SB2	SIO02-SB2-02	9/29/2018	16-18	REG	0.52 U	0.44	0.19 U	0.086 J	0.59	0.21 U
3	SIO03-SB1	SIO03-SB1-01	9/26/2018	0-2	REG	21	0.52	0.24 U	0.45	1.3	0.43
	SIO03-SB1	SIO03-SB1-02	9/26/2018	15-17	REG	140	0.7	0.21 U	0.25 J	1	2.3
	SIO03-SB2	SIO03-SB2-01	9/26/2018	0-2	REG	16	2.8	0.19 U	0.85	0.51	2.1
	SIO03-SB2	SIO03-SB2-02	9/26/2018	15-17	REG	40	0.57	0.25 U	0.44	0.72	0.59
	SIO03-SB3	SIO03-SB3-01	9/26/2018	0-2	REG	330 J	12	0.099 J	3.2	8.7	4.7
	SIO03-SB3	SIO03-SB3-02	9/26/2018	15-17	REG	24	3.4	0.48 J	2.2	18	0.38 J
	SIO03-SB3	SIO03-SB3-02D	9/26/2018	15-17	FD	24	3.5	0.56	2.4	23	0.46

Table 7. Summary of Soil and Sediment Analytical Results (continued)

Analyte						Perfluorooctane Sulfonate (PFOS)	Perfluorooctanoic Acid (PFOA)	Perfluorobutane Sulfonate (PFBS)	Perfluoroheptanoic Acid (PFHpA)	Perfluorohexane Sulfonate (PFHxS)	Perfluorononanoic Acid (PFNA)
Screening Level ^a						1,260	1,260	1,260,000	NA	NA	NA
IDNR Action Level ^b						1,800	1,200	NA	NA	NA	NA
PRL	Location	Sample Identifier	Sample Date	Sample Depth (ft)	Sample Type	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)
4	SIO04-SB1	SIO04-SB1-01	9/27/2018	0-2	REG	0.85 J	0.27 U	0.15 J	0.27 U	0.98	0.27 U
	SIO04-SB1	SIO04-SB1-02	9/27/2018	16-18	REG	0.53 U	0.21 U	0.19 U	0.21 U	0.21 U	0.21 U
	SIO04-SB2	SIO04-SB2-01	9/28/2018	0-2	REG	2.3	0.35 J	0.19 J	0.15 J	2.2	0.25 U
	SIO04-SB2	SIO04-SB2-01D	9/28/2018	0-2	FD	4.7	0.91	0.11 J	0.19 J	5.9	0.11 J
	SIO04-SB2	SIO04-SB2-02	9/28/2018	10-12	REG	0.64 U	0.26 U	0.23 U	0.26 U	0.26 U	0.26 U
	SIO04-SB3	SIO04-SB3-01	9/29/2018	0-2	REG	0.73 J	0.25 U	0.22 U	0.17 J	0.74	0.25 U
	SIO04-SB3	SIO04-SB3-02	9/29/2018	10-12	REG	0.71 U	0.28 U	0.26 U	0.28 U	0.28 U	0.28 U
5	SIO05-SB1	SIO05-SB1-01	9/25/2018	0-2	REG	5.5	0.23 J	0.7	0.16 J	12	0.27 U
	SIO05-SB1	SIO05-SB1-02	9/25/2018	15-17	REG	0.57 U	0.23 U	0.2 U	0.23 U	1.8	0.23 U
	SIO05-SB2	SIO05-SB2-01	9/25/2018	0-2	REG	0.94 J	0.16 J	1.2	0.18 J	9.5	0.28 U
	SIO05-SB2	SIO05-SB2-02	9/25/2018	15-17	REG	0.54 U	0.22 U	0.2 U	0.22 U	0.22 U	0.22 U
	SIO05-SB3	SIO05-SB3-01	9/25/2018	0-2	REG	190	6.1	0.6	2	49	1.6
	SIO05-SB3	SIO05-SB3-02	9/25/2018	15-17	REG	260	0.71	0.15 J	0.2 J	10	0.57
	SIO05-SB3	SIO05-SB3-02D	9/25/2018	15-17	FD	57	0.64	0.069 J	0.14 J	10	0.22 J
6	SIO06-SB1	SIO06-SB1-01	9/27/2018	0-2	REG	91	0.62	2.2 U	0.29 J	2.4 J	0.52
	SIO06-SB1	SIO06-SB1-02	9/27/2018	15-17	REG	14	0.34 J	0.16 J	0.22 J	4.8	0.28 U
	SIO06-SB2	SIO06-SB2-01	9/25/2018	0-2	REG	220	0.86	0.17 J	5.3 U	16	0.51
	SIO06-SB2	SIO06-SB2-02	9/25/2018	15-17	REG	0.53 U	0.21 U	0.68	0.21 U	0.29 J	0.21 U

Table 7. Summary of Soil and Sediment Analytical Results (continued)

Analyte						Perfluorooctane Sulfonate (PFOS)	Perfluorooctanoic Acid (PFOA)	Perfluorobutane Sulfonate (PFBS)	Perfluoroheptanoic Acid (PFHpA)	Perfluorohexane Sulfonate (PFHxS)	Perfluorononanoic Acid (PFNA)
Screening Level ^a						1,260	1,260	1,260,000	NA	NA	NA
IDNR Action Level ^b						1,800	1,200	NA	NA	NA	NA
PRL	Location	Sample Identifier	Sample Date	Sample Depth (ft)	Sample Type	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)	(µg/kg)
7	SIO07-SB1	SIO07-SB1-01	9/27/2018	0-2	REG	46	0.53	0.091 J	0.6	3.7	0.43
	SIO07-SB1	SIO07-SB1-02	9/27/2018	18-20	REG	0.57 U	0.23 U	2.2	0.23 U	0.23 U	0.23 U
	SIO07-SB1	SIO07-SB1-02D	9/27/2018	18-20	FD	0.57 U	0.23 U	13	0.23 U	0.23 U	0.23 U
	SIO07-SB2	SIO07-SB2-01	9/27/2018	0-2	REG	57	1.6	0.14 J	1.8	4.2	1.6
	SIO07-SB2	SIO07-SB2-02	9/27/2018	19-21	REG	0.5 U	0.2 U	0.18 U	0.2 U	0.2 U	0.2 U
Sediment											
8	SIO08-SD1	SIO08-SD1-01	9/30/2018	0	REG	3.9	0.43 U	0.39 U	0.43 U	0.34 J	0.43 U
9	SIO09-SD1	SIO09-SD1-01	9/30/2018	0	REG	3.2	0.33 J	0.23 U	0.13 J	0.16 J	0.38

^a EPA residential risk-based soil screening level determined using the EPA RSL calculator and November 2018 EPA RSL tables (EPA 2018).

^b IDNR groundwater action level/statewide standard.

Bold denotes detected concentration.

µg/kg = Micrograms per kilogram.

EPA = U.S. Environmental Protection Agency.

FD = Field duplicate.

IDNR = Iowa Department of Natural Resources.

NA = Not applicable.

PRL = Potential release location.

REG = Regular.

RSL = Regional screening level.

Data Qualifiers:

J = Estimated concentration.

U = Chemical not detected above the laboratory detection limit.

Table 8. Summary of Groundwater and Surface Water Analytical Results

Analyte						Perfluorooctane Sulfonate (PFOS)	Perfluorooctanoic Acid (PFOA)	PFOS+PFOA	Perfluorobutane Sulfonate (PFBS)	Perfluoroheptanoic Acid (PFHpA)	Perfluorohexane Sulfonate (PFHxS)	Perfluorononanoic Acid (PFNA)
Health Advisory ^a						70	70	70	NA	NA	NA	NA
EPA RSL Tap Water ^b						NA	NA	NA	400,000	NA	NA	NA
IDNR Action Level ^c						70	70	NA	NA	NA	NA	NA
PRL	Location	Sample Identifier	Sample Date	Sample Depth (ft)	Sample Type	(ng/L)	(ng/L)	(ng/L)	(ng/L)	(ng/L)	(ng/L)	(ng/L)
<i>Groundwater</i>												
1	MW-SIO01-01	MW-SIO01-01-01	10/10/2018	25.00	REG	1300	350	1650	380	100	2800	2.4
2	MW-SIO02-01	MW-SIO02-01-01	10/10/2018	25.00	REG	7800	810	8610	98	330	1400	71
3	MW-SIO03-01	MW-SIO03-01-01	10/10/2018	22.50	REG	14	34	48	190	180	830	0.72 J
4	MW-SIO04-01	MW-SIO04-01-01	10/9/2018	25.00	REG	10	250	260	180	150	600	1.5 U
	MW-SIO04-02	MW-SIO04-02-01	10/9/2018	22.80	REG	14	180	194	44	73	540	1.2 U
	MW-SIO04-02	MW-SIO04-02-01D	10/9/2018	22.80	FD	14	190	204	44	66	510	1.3 U
6	MW-SIO06-01	MW-SIO06-01-01	10/9/2018	23.62	REG	45	77	122	840	89	4800	0.54 J
7	MW-SIO07-01	MW-SIO07-01-01	10/9/2018	26.18	REG	12	2.1	14.1	4000 J	2.1	12	0.53 J
<i>Surface Water</i>												
8	SIO08-SW1	SIO08-SW1-01	9/30/2018	NA	REG	28	9.4	37.4	14	3.4	48	1.3 U
9	SIO09-SW1	SIO09-SW1-01	10/10/2018	NA	REG	62	22	84	15	23	89	6.9

^a May 2016 EPA health advisory for PFOS + PFOA combined.

^b November 2018 EPA RSL for tap water (EPA 2018).

^c IDNR groundwater action level/statewide standard.

Bold denotes detected concentration.

Bold highlighted denotes concentration that exceeds screening criteria.

EPA = U.S. Environmental Protection Agency.

FD = Field duplicate.

IDNR = Iowa Department of Natural Resources.

NA = Not applicable.

ng/L = Nanograms per liter.

PFOA = Perfluorooctanoic acid.

PFOS = Perfluorooctane sulfonate.

PRL = Potential release location.

REG = Regular.

RSL = Regional screening level.

Data Qualifiers:

J = Estimated concentration.

U = Chemical not detected above the laboratory detection limit.

Table 9. SI Recommendation Summary Table

PRL No.	PRL Description	Constituents Above Screening Criteria	Sampling Recommendations and Objectives
1	Building 252 – Aerospace Ground Equipment	Groundwater: PFOS, PFOA, PFOS + PFOA	Soil: Although screening criteria were not exceeded, additional surface and subsurface soil samples are proposed to determine if an unidentified source exists, and if so, to determine the nature and extent in the vertical and horizontal directions given the potential for soil to groundwater migration. Groundwater: Determine the nature and extent both vertically and horizontally through the sampling of existing and additional new monitoring wells.
2	Building 261 – Main Hangar	Groundwater: PFOS, PFOA, PFOS + PFOA	Soil: Although screening criteria were not exceeded, additional surface and subsurface soil samples are proposed to determine if an unidentified source exists, and if so, to determine the nature and extent in the vertical and horizontal directions given the potential for soil to groundwater migration. Groundwater: Determine the nature and extent both vertically and horizontally through the sampling of existing and additional new monitoring wells.
3	Building 241 – ANG Paint Facility	None	Soil: Although screening criteria were not exceeded, additional surface and subsurface soil samples are proposed to determine if an unidentified source exists, and if so, to determine the nature and extent in the vertical and horizontal directions given the potential for soil to groundwater migration. Groundwater: Although screening criteria were not exceeded, determination of the nature and extent both vertically and horizontally of PFAS compounds should be completed through the sampling of existing and additional new monitoring wells.
4	Apron	Groundwater: PFOA, PFOS + PFOA	Soil: Although screening criteria were not exceeded, additional surface and subsurface soil samples are proposed to determine if an unidentified source exists, and if so, to determine the nature and extent in the vertical and horizontal directions given the potential for soil to groundwater migration. Groundwater: Determine the nature and extent both vertically and horizontally through the sampling of existing and additional new monitoring wells.
5	Building 286 – Fire Station	Groundwater: PFOA, PFOS + PFOA	Soil: Although screening criteria were not exceeded, additional surface and subsurface soil samples are proposed to determine if an unidentified source exists, and if so, to determine the nature and extent in the vertical and horizontal directions given the potential for soil to groundwater migration. Groundwater: Determine the nature and extent both vertically and horizontally through the sampling of existing and additional new monitoring wells.
6	Building 284 – Security Forces	Groundwater: PFOA, PFOS + PFOA	Soil: Although screening criteria were not exceeded, additional surface and subsurface soil samples are proposed to determine if an unidentified source exists, and if so, to determine the nature and extent in the vertical and horizontal directions given the potential for soil to groundwater migration. Groundwater: Determine the nature and extent both vertically and horizontally through the sampling of existing and additional new monitoring wells.

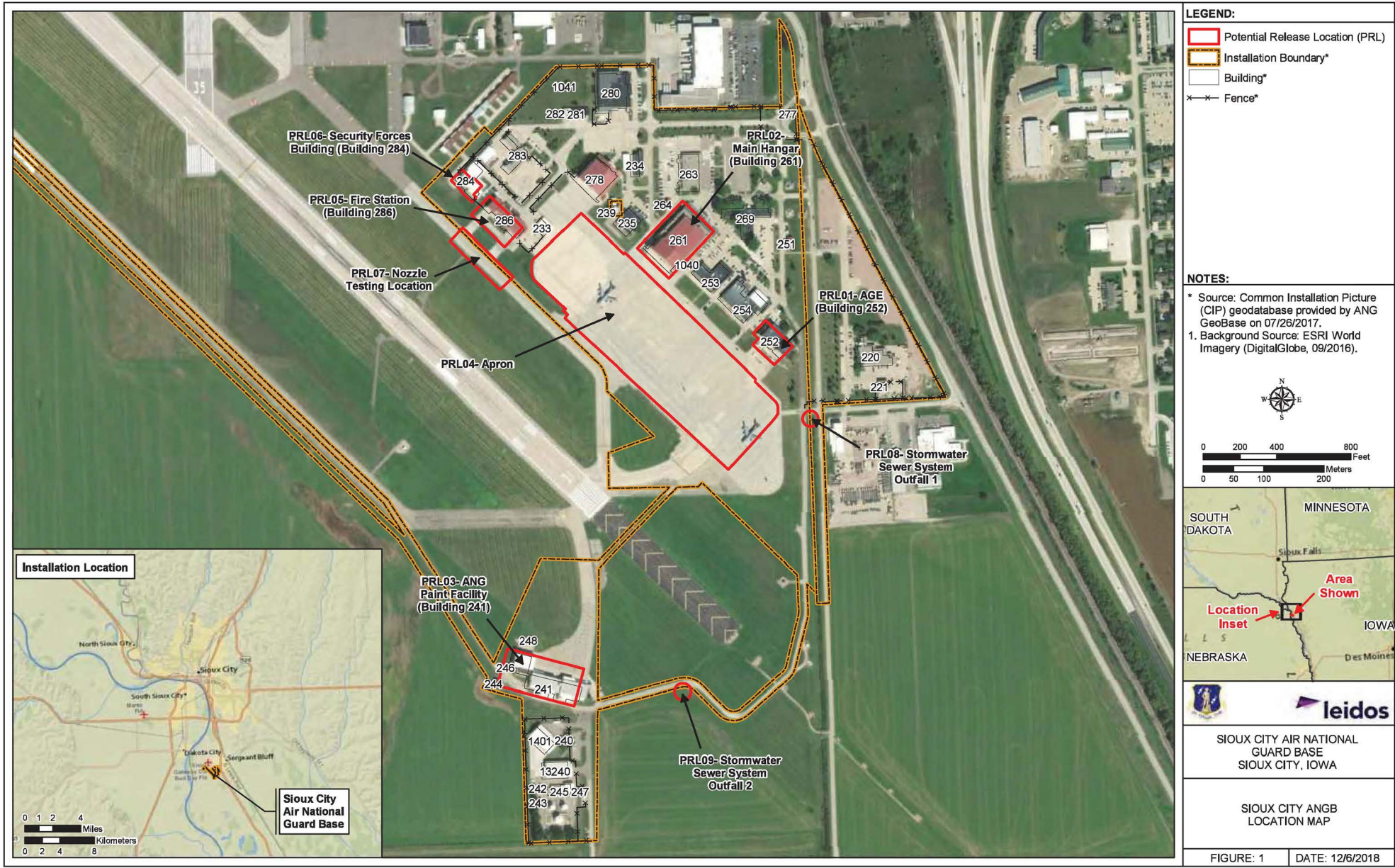
Table 9. SI Recommendation Summary Table (continued)

PRL No.	PRL Description	Constituents Above Screening Criteria	Sampling Recommendations and Objectives
7	Nozzle Testing Location	None	Soil: Although screening criteria were not exceeded, additional surface and subsurface soil samples are proposed to determine if an unidentified source exists, and if so, to determine the nature and extent in the vertical and horizontal directions given the potential for soil to groundwater migration. Groundwater: Although screening criteria were not exceeded, determination of the nature and extent both vertically and horizontally of PFAS compounds should be completed through the sampling of existing and additional new monitoring wells.
8	Stormwater Sewer System Outfall 1	None	Surface Water and Sediment: Although screening criteria were not exceeded, determine PFAS impact to surface water through upgradient sampling of surface water and sediment and evaluate potential downgradient impacts at locations off Base.
9	Stormwater Sewer System Outfall 2	Surface Water: PFOS + PFOA	Surface Water and Sediment: Determine PFAS impact to surface water through upgradient sampling of surface water and sediment and evaluate potential downgradient impacts at locations off Base.
General			Soil: Collect additional surface and subsurface soil samples to determine the nature and extent both vertically and horizontally of PFAS contamination. Analyze for an expanded list of PFAS compounds to evaluate for potential precursor compounds. Groundwater: (1) Collect additional groundwater samples in upgradient locations to quantify potential impacts from upgradient sources, and (2) collect additional groundwater samples off Base through the installation of a limited number of new monitoring wells to determine the nature and extent of PFAS beyond the Base boundary. Surface Water/Sediment: (1) Collect additional surface water and sediment samples in upgradient locations to quantify potential impacts from upgradient sources, and (2) collect additional surface water and sediment samples off Base to determine the nature and extent of PFAS beyond the Base boundary.

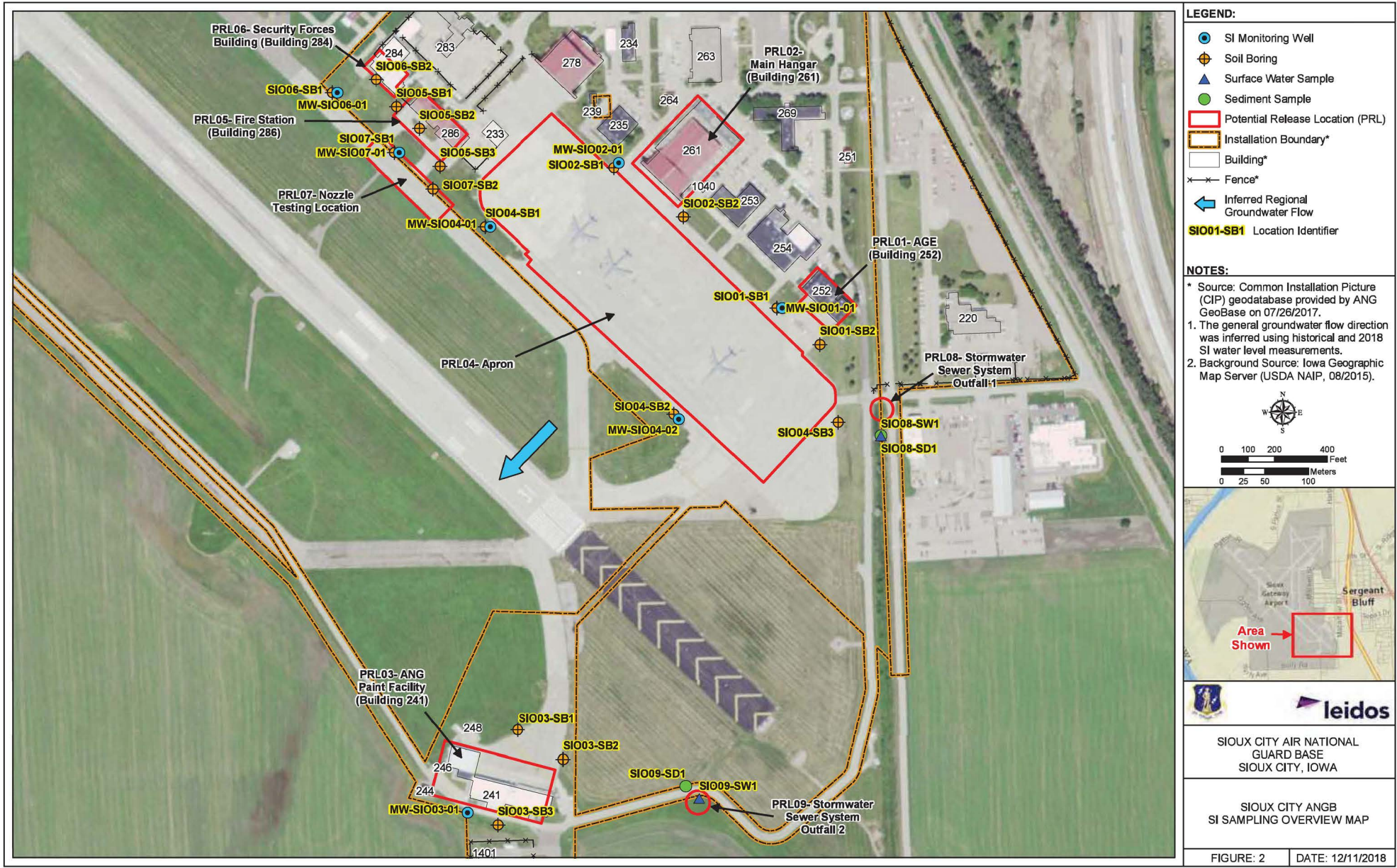
ANG = Air National Guard.
 PFAS = Per- and polyfluoroalkyl substances.
 PFOA = Perfluorooctanoic acid.
 PFOS = Perfluorooctane sulfonate.
 PRL = Potential release location.
 SI = Site inspection.

FIGURES

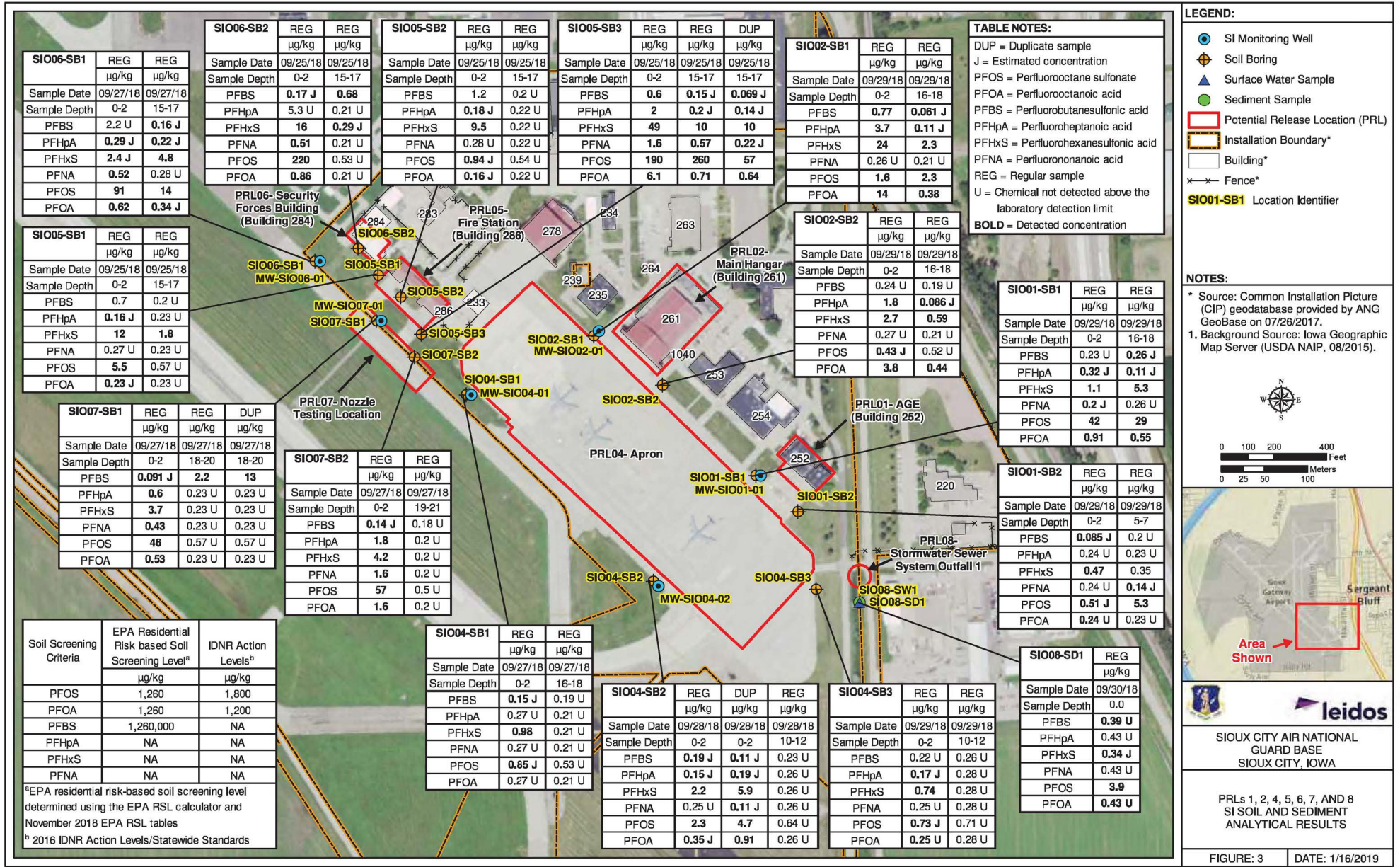
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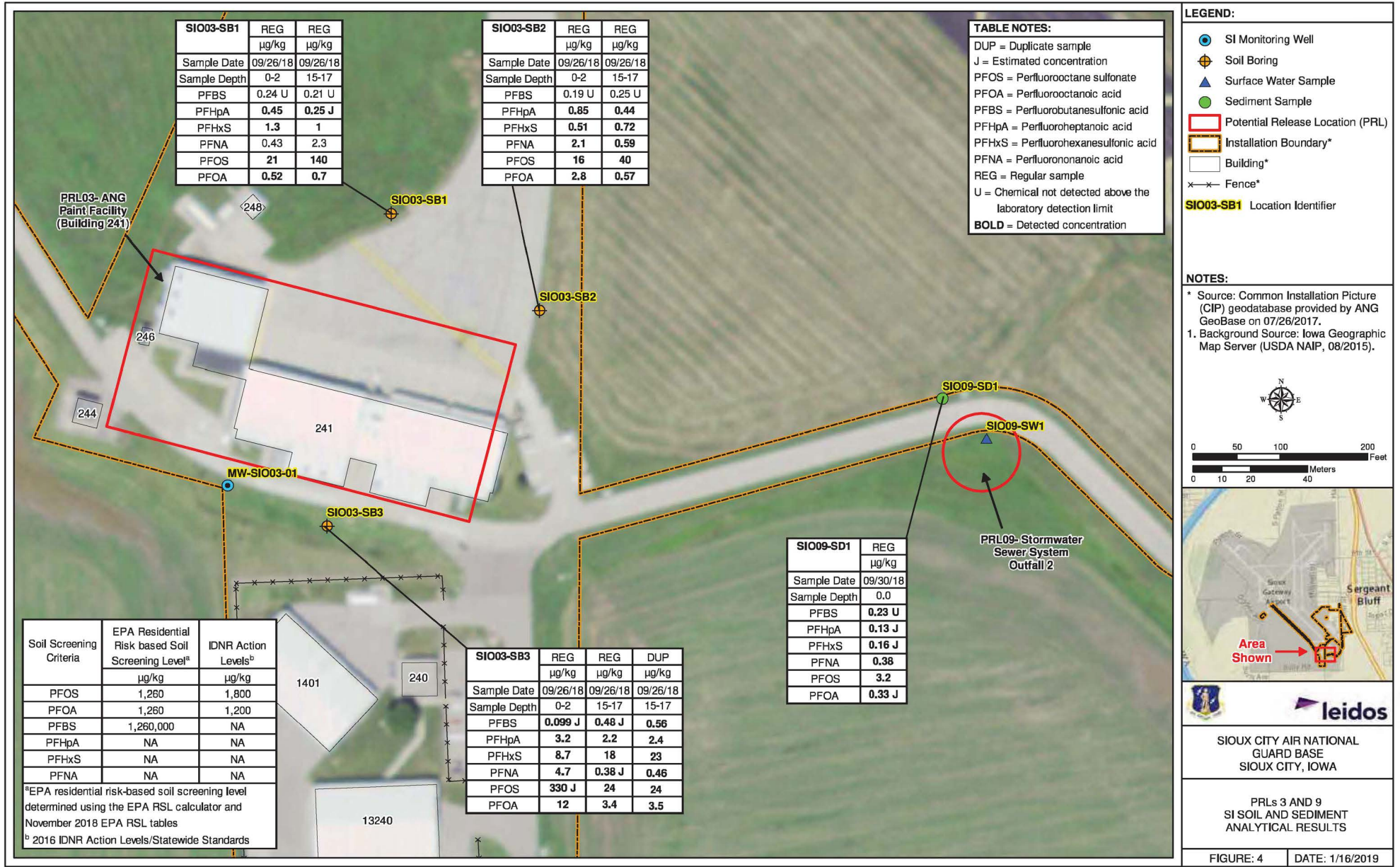
PROJECT: \\27Projects\ANG Phase 3 SI for PFC\GIS\Sioux\Projects\SI\Figure 1 Sioux Location Map_11x17.mxd



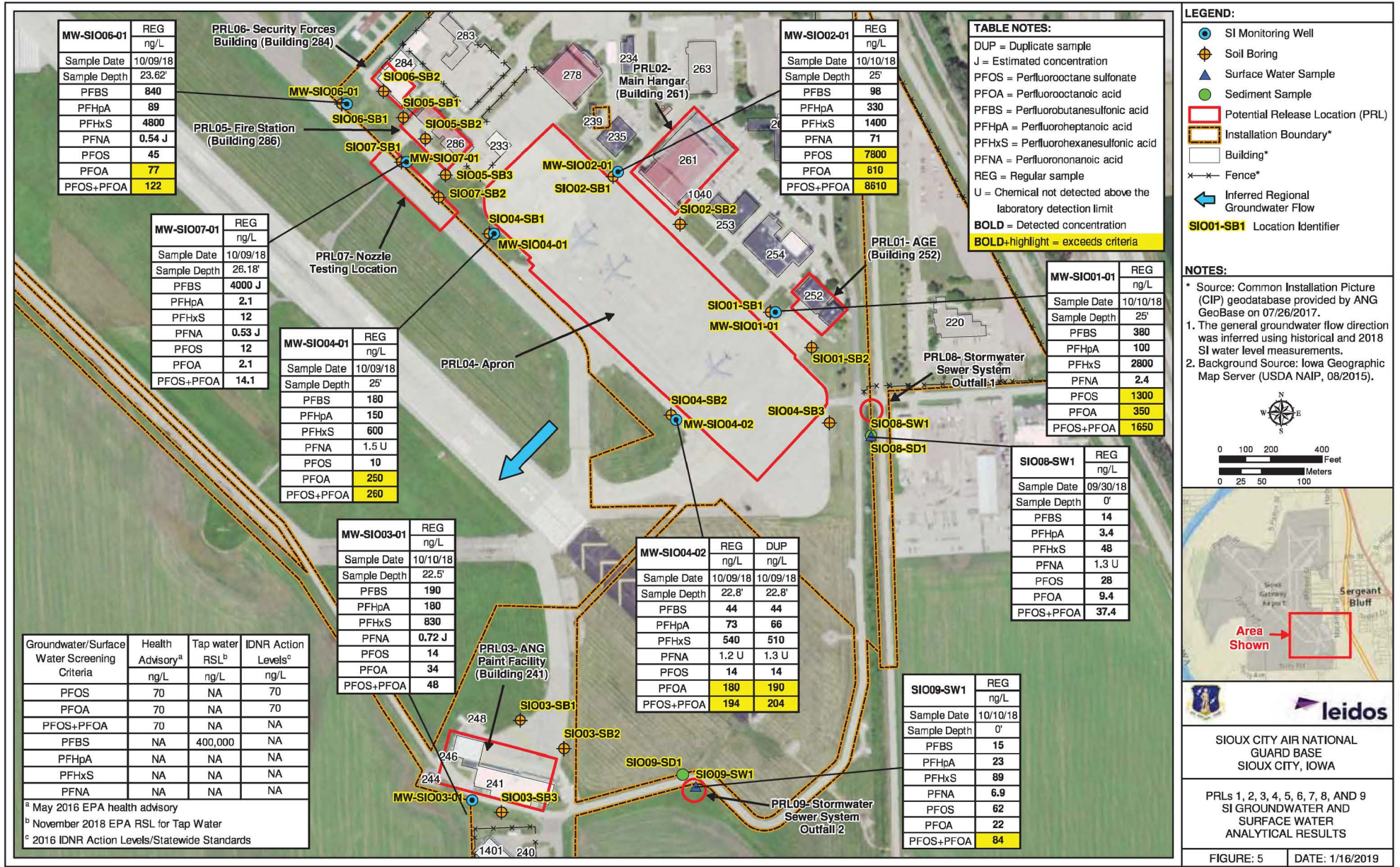
PROJECT: \\27Project\ANG Phase 3 SI for PFCs\GIS\Sioux\Projects\SI\Figure 2 Sample Location Overview_11x17.mxd



PROJECT: W272Project\ANG Phase 3 SI for PFCs\GIS\Sioux\Projects\SI\Figure 3 PRL 1 2 4 5 6 7 8 Soil Sediment Results_11x17.mxd



PROJECT: W277Project\ANG Phase 3 SI for PFCs\GIS\Sioux\Projects\SI\Figure 4 PRL 3 & 9 Soil Sediment Results_11x17.mxd



PROJECT: W277Project\ANG Phase 3 SI for PFCs\GIS\Sioux\Project\SI\Figure 5 PRL 1 2 3 4 5 6 7 8 9 GW SW Results_11x17.mxd

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APPENDIX A

SOIL BORINGS AND WELL CONSTRUCTION LOGS

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Client/Installation ANG/SIOUX CITY ANGB		Oversight Contractor Leidos	Borehole Number SIO05-SB3
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Driller : Cascade ANG/SIOUX CITY ANGB	Page Page 1 of 5
Sizes and Type of Drilling and Sampling Equipment Geoprobe		Borehole Location Description SOUTH OF BUILDING 286 OF EDGE OF CONCRETE CURBS	
Date/Time Started : 09-25-2018 13:50		Date/Time Finished : 09-25-2018	
Overburden Thickness NA	Depth to Groundwater (ft) 17'-20'	Total Depth (ft) 25'	
Sample for PFOS/PFOA Analysis Sample ID: SIO05-SB3-01 Sample Interval: 0 to 2 ft		Sample for PFOS/PFOA Analysis Sample ID: SIO05-SB3-02 Sample Interval: 15 to 17 ft	
Inspector Name Timothy Runkle		Inspector Signature <i>Timothy Runkle</i>	
Monitoring Well ID : N/A	Backfill Type BENTONITE	Date Backfilled : 9/28/18	
Latitude 42.39541364	Longitude 96.37613022	Elevation (ft) -	
Notes:			
Sketch: NOT TO SCALE			

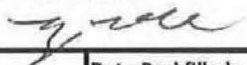
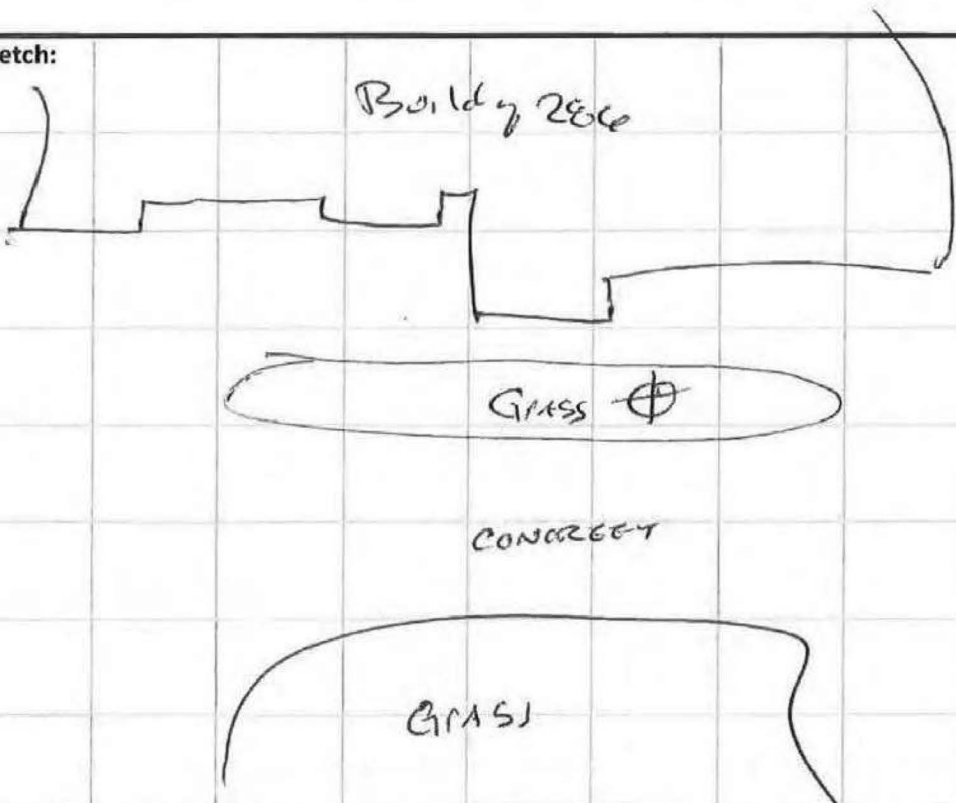
Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO25-SB 3		Page Page 2 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 09-25-2018	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
0.5	3.5/5' Recovery				
1	5" R 2.5/1 0-0.5		SIO25-SB3-01		
1.5					
2	0.5 - 2' Soft moist 1" TABS semi-plastic 104R 4/4 Silty with clay	0.0			
2.5					
3					
3.5	2' - 2.5' Dry Silty clay 1 inch TABS Some weather 104R 2/3				
4					
4.5					
5	2.5 - 5' Moist Silty clay 2" TABS, plastic 2.54 R 5/4				
5.5					
6					
6.5	3.5/5' Recovery				
7	SAA	0.0			
7.5					
8					
8.5					
9					
9.5					
10					

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO 95SB 3		Page Page 3 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 02-25-18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
10.5	3.5' of 5' Recover				
11.0	Silly sand				
11.5	Fine well rounded sand loose				
12.0	went to 12	0.0			
12.5	plastic clay at 13 to 13.5 1" tabs				
13.0	2.54 5/12				
13.5	liveray fine sand with 5/16				
14.0	1042 G/14				
14.5					
15.0	5' of 5' Recover				
15.5	Dump to wet at 17'				
16.0					
16.5	Fine to medium SS sand to				
17.0	rounded sand	0.0			
17.5	2.54 5/14				
18.0					
18.5					
19.0					
19.5					
20.0					

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO 05 SB 3		Page Page 4 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 09-25-2018	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
20.5	5' of 5'				
21	Recovery WGT				
21.5	Fine to medium sand subrounded dark gray	0.0			
22	2.54R 5/4				
22.5					
23					
23.5					
24					
24.5					
25					
25.5	END OF Boring @ 25'				
26					
26.5					
27					
27.5					
28					
28.5					
29					
29.5					
30					

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO -SB		Page Page 5 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date:	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
30.5					30.5
31					31
31.5					31.5
32					32
32.5					32.5
33					33
33.5					33.5
34					34
34.5					34.5
35					35
35.5					35.5
36					36
36.5					36.5
37					37
37.5					37.5
38					38
38.5					38.5
39					39
39.5					39.5
40					40

N
 11/15/2016
 11/15/2016

Client/Installation ANG/SIOUX CITY ANGB		Oversight Contractor Leidos	Borehole Number SIOUX-SB 2
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Driller : Cascade ANG/SIOUX CITY ANGB	Page Page 1 of 5
Sizes and Type of Drilling and Sampling Equipment Geoprobe		Borehole Location Description South Face of Bldg 286 in grassy area	
Date/Time Started : 09-25-2018 1500		Date/Time Finished : 09-25-2018	
Overburden Thickness NA	Depth to Groundwater (ft) 20'	Total Depth (ft) 25	
Sample for PFOS/PFOA Analysis		Sample for PFOS/PFOA Analysis	
Sample ID: SIOUX-SB 2-01		Sample ID: SIOUX-SB 2-02	
Sample Interval: 0 to 2 ft		Sample Interval: 15 to 17 ft	
Inspector Name Timothy Runkle		Inspector Signature 	
Monitoring Well ID : NA	Backfill Type Bentonite	Date Backfilled : 9/28/18	
Latitude 42.39579624	Longitude 96.37440931	Elevation (ft) —	
Notes:			
Sketch: 			

NOT TO SCALE



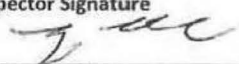
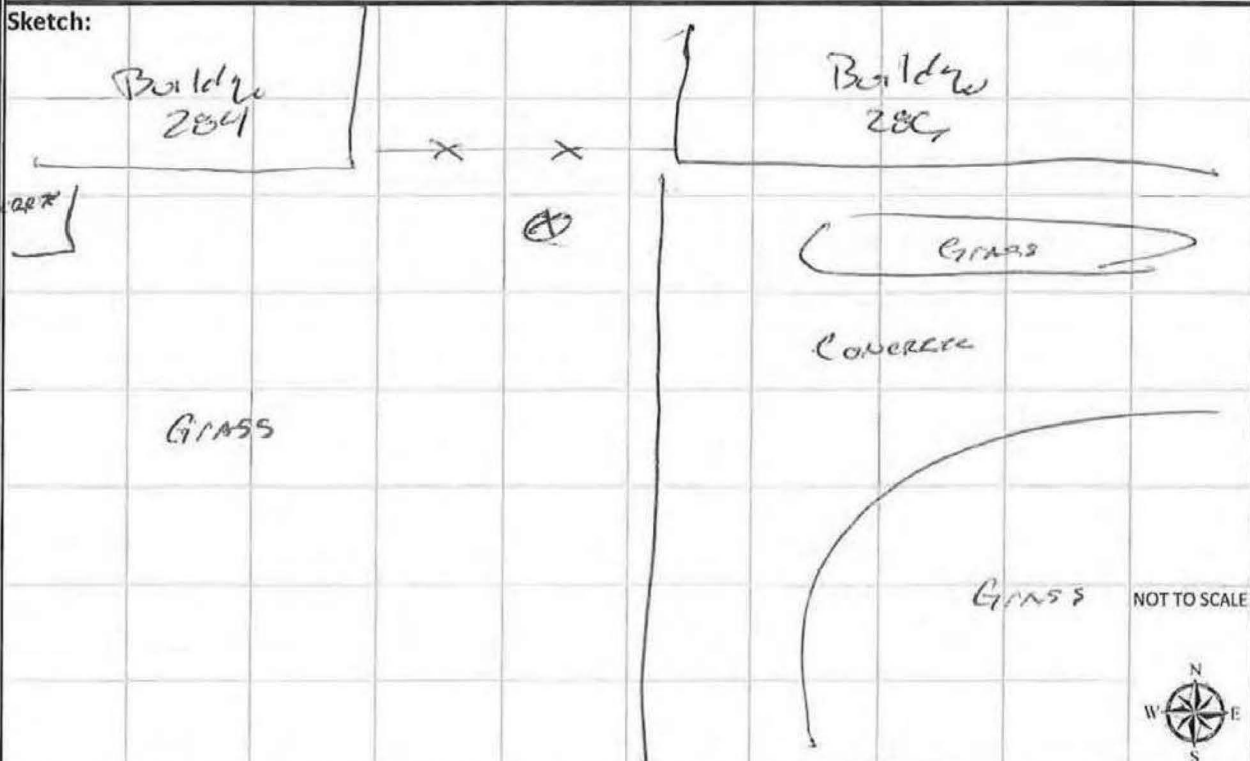
Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIOUX-SB 2		Page Page 2 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 079.25.2018	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
0.5	0-5' 4/5' Recover				
1	0-0.5' 4/5' Roads clayey Clayey Sols 2" tabs soft plastic 2.54 3/2				
1.5					
2	0.5' - 3' Stiff plastic clay w/silt 0.0 3" tabs 2.54 4/4 dump				
2.5					
3	3' - 4' Stiff plastic clay w/silt 2" tabs dump 2.54 5/4				
3.5					
4					
4.5					
5	0-5' 3/5' Recover				
5.5	Stiff clay w/silt wed plastic 2" tabs 2.54 4/4	9.0			
6					
6.5					
7					
7.5					
8					
8.5					
9					
9.5					
10					

Client/Installation ANG/SIOUX CITY ANG		Borehole Number SIO05SB 2		Page Page 3 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/25/2018	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
10.5	10-15'				
11.0	3/5' Recover				
11.5	10-11'				
12.0	SANDY silt w/ clay				
12.5	Soft plastic mud	0.0			
13.0	2.54 4/4				
13.5	11-13'				
14.0	Small FINE Subangular				
14.5	ALTERATION GRAINS				
15.0	OF 2.54 4/3				
15.5	AND 7.54R 4/6				
16.0	HARD/compact				
16.5					
17.0					
17.5					
18.0					
18.5					
19.0					
19.5					
20.0					
15.0	15-20'				
15.5	5/5 Recover				
16.0	LOOSE FINE TO				
16.5	Medium SAND	0.0			
17.0	2.54 4/4				
17.5	Damp to moist				
18.0	Subangular to				
18.5	Sub angular				
19.0					
19.5					
20.0					

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIQ 2 SB 3		Page Page 4 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 09/25/2018	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
20.5	SAA 20-25'				
21	WET - DAMP				
21.5		0.0			
22					
22.5					
23					
23.5					
24					
24.5					
25	END OF Borehole				
25.5	25'				
26					
26.5					
27					
27.5					
28					
28.5					
29					
29.5					
30					

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO25-SB 2		Page Page 5 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date:	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
30.5					30.5
31					31
31.5					31.5
32					32
32.5					32.5
33					33
33.5					33.5
34					34
34.5					34.5
35					35
35.5					35.5
36					36
36.5					36.5
37					37
37.5					37.5
38					38
38.5					38.5
39					39
39.5					39.5
40					40

Not
 8/25/18

Client/Installation ANG/SIOUX CITY ANGB		Oversight Contractor Leidos	Borehole Number SIO⁰⁵-SB₁
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Driller : Cascade ANG/SIOUX CITY ANGB	Page Page 1 of 5
Sizes and Type of Drilling and Sampling Equipment Geoprobe		Borehole Location Description INGMS Between Building 284 and 286 South Side	
Date/Time Started : 09/25/2018 1600		Date/Time Finished : 09/25/2018	
Overburden Thickness NA	Depth to Groundwater (ft) 20	Total Depth (ft) 25	
Sample for PFOS/PFOA Analysis Sample ID: SIO⁰⁵-SB₁-01 Sample Interval: 0 to 2 ft		Sample for PFOS/PFOA Analysis Sample ID: SIO⁰⁵-SB₁-02 Sample Interval: 15 to 17 ft	
Inspector Name Timothy Runkle		Inspector Signature 	
Monitoring Well ID : NA	Backfill Type Benotomite	Date Backfilled : 9/28/2018	
Latitude 42.39603841	Longitude 96.37670735	Elevation (ft) —	
Notes:			
Sketch:  The sketch is drawn on a grid. On the left, a rectangle is labeled 'Buildg 284'. To its right, two 'X' marks are placed. Further right, another rectangle is labeled 'Buildg 286'. Below Building 286, there is an oval labeled 'GRASS' and the word 'CONCRETE' written below it. A curved line is drawn in the bottom right area, also labeled 'GRASS'. A north arrow is located in the bottom right corner, pointing upwards. The text 'NOT TO SCALE' is written near the north arrow.			

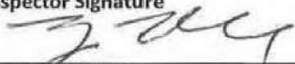
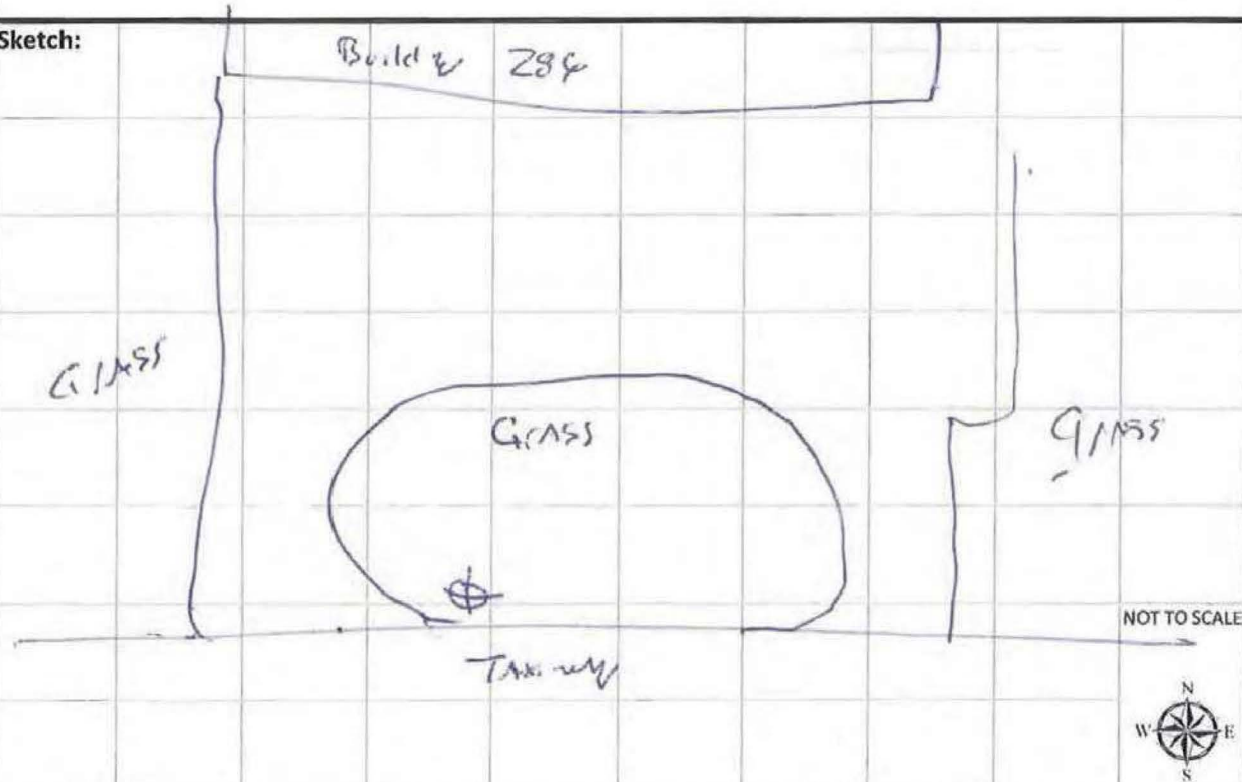
Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO05-SB4		Page Page 2 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/25/18 9/25/2018	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
0.5	0-5' 4/5' Recovery				
1	0-1' 2.54 3/2				
1.5	Shift silty clay				
2	2" TABS plastic				
2.5	1-2' SAA 2.54 4/3	0.0			
3	3-4' Moist soft plastic				
3.5	silty clay				
4	1" TABS				
4.5	2.54 5/4				
5	5-10' 3.05/5 Recovery				
5.5	SAA w increasing				
6	FINE SAND AND				
6.5	HAR. 10% SAND				
7		0.0			
7.5					
8					
8.5					
9					
9.5					
10					

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO ⁰⁵ -SB 1		Page Page 3 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 8/25/18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
10.5	10-15 SAA TA 4/5 Recover				
11.0	10-15 SAA DAMP to wet loose				
11.5	12-14 FINE SAND				
12.0	HARD	0.0			
12.5	ALTERNATING BANDS OF 2.54 & 1/8 AND 7.54 & 1/4				
13.0					
13.5					
14.0					
14.5					
15.0	15-20 5/5 Recover				
15.5	FINE to M coarse sand				
16.0	Suspended loose				
16.5	2.54 4/4	0.0	5305-531-02		
17.0					
17.5					
18.0					
18.5					
19.0					
19.5					
20.0					

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIOUX-SB 1		Page Page 4 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 5/22 9/25/18 9/28/18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
20.5	20-25' 4/5 Recomp				
21	20-23 SAA wet				
21.5	24-25				
22	SATURATED				
22.5	MEDIUM to COARSE				
23	SAND	0.06			
23.5	54 2.5/1				
24	SUB Angular -				
24.5	SUB rounded				
25					
25.5					
26	END of Bore				
26.5					
27					
27.5					
28					
28.5					
29					
29.5					
30					

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO -SB		Page Page 5 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date:	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
30.5					
31					
31.5					
32					
32.5					
33					
33.5					
34					
34.5					
35					
35.5					
36					
36.5					
37					
37.5					
38					
38.5					
39					
39.5					
40					


 9/25/18

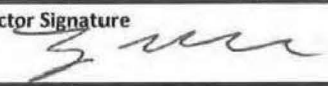
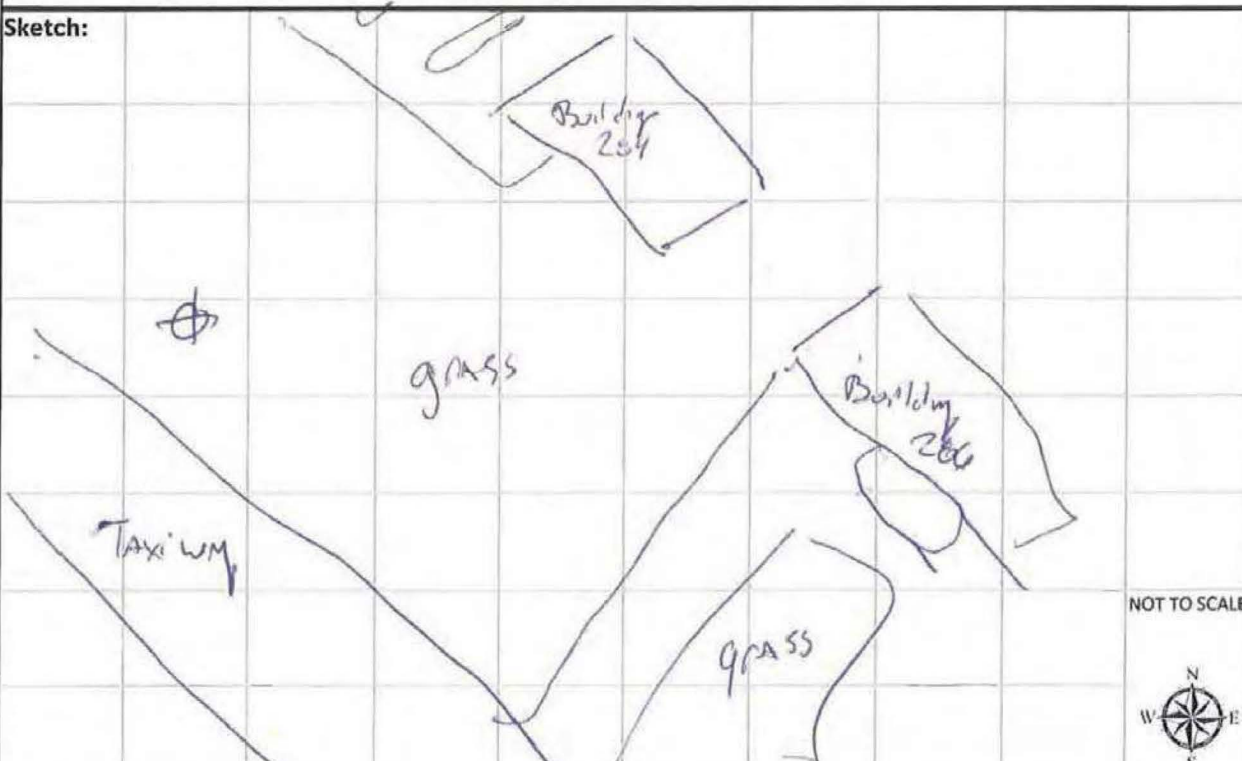
Client/Installation ANG/SIOUX CITY ANGB		Oversight Contractor Leidos	Borehole Number SIO⁰⁷-SB <u>1</u>
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Driller : Cascade ANG/SIOUX CITY ANGB	Page Page <u>1</u> of <u>5</u>
Sizes and Type of Drilling and Sampling Equipment Geoprobe		Borehole Location Description South of Building 284 North of Taxway in grass	
Date/Time Started : 9/27/18 0900		Date/Time Finished : 09/27/18	
Overburden Thickness NA	Depth to Groundwater (ft) 22'	Total Depth (ft) 301	
Sample for PFOS/PFOA Analysis		Sample for PFOS/PFOA Analysis	
Sample ID: SIO⁰⁷-SB <u>1</u> -01		Sample ID: SIO⁰⁷-SB <u>1</u> -02	
Sample Interval: 0 to 2 ft		Sample Interval: <u>18</u> to <u>20</u> ft	
Inspector Name Timothy Runkle		Inspector Signature 	
Monitoring Well ID : MW-SIO⁰⁷-01	Backfill Type NA	Date Backfilled : NA	
Latitude 42.395556	Longitude -96.3762512	Elevation (ft) —	
Notes:			
Sketch: 			

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO 7-SB 1		Page Page 2 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/27/18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
0.5	0-5 2/5' Reimp				
1	0-1 Silty clay dy compact loose 2.57 4/9				
1.5					
2	1-2 Permeable Sub-base	0.0	SIO 7-SB 1-01		
2.5					
3					
3.5					
4					
4.5					
5					
5.5	5-10 No Recovery				
6					
6.5					
7					
7.5					
8					
8.5					
9					
9.5					
10					

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO07-SB 1		Page Page 3 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/27/18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
10.5	10-15 2/5 Recover 10-12' C' layer silt with very fine sand soft moist low plasticity 2.54 4/2	0.0			
11.0					
11.5					
12.0					
12.5					
13.0					
13.5					
14.0					
14.5					
15.0	15-20 4/5 Recover Fine to medium SAND poorly sorted Damp 2.54 6/3		0.0		
15.5					
16.0					
16.5					
17.0					
17.5					
18.0					
18.5					
19.0					
19.5					
20.0					

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO27-SB_1		Page Page 4 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/27/18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
20.5	20-25 4/5'				
21	SAA				
21.5	WET AT 22'				
22		6.0			
22.5					
23					
23.5					
24					
24.5					
25					
25.5	25-30 5/5'				
26	25-26 SAA				
26.5	SATURATED	6.0			
27	FINE TO MEDIUM SAND SUBSANDAL				
27.5	SATURATED				
28	54 4/1				
28.5					
29					
29.5					
30	END OF Borehole @ 30				

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO__-SB__		Page Page __5__ of __5__	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date:	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
30.5					30.5
31					31
31.5					31.5
32					32
32.5					32.5
33					33
33.5					33.5
34					34
34.5					34.5
35					35
35.5					35.5
36					36
36.5					36.5
37					37
37.5					37.5
38					38
38.5					38.5
39					39
39.5					39.5
40					40

Client/Installation ANG/SIOUX CITY ANGB		Oversight Contractor Leidos	Borehole Number SIOUX-SB 1
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Driller : Cascade ANG/SIOUX CITY ANGB	Page Page 1 of 5
Sizes and Type of Drilling and Sampling Equipment Geoprobe		Borehole Location Description SW corner of Building 284 Right OFF OF North side of Taxiway 1 NCMS	
Date/Time Started : 9/27/2018 0930		Date/Time Finished : 9/27/2018	
Overburden Thickness NA	Depth to Groundwater (ft) 15	Total Depth (ft) 30	
Sample for PFOS/PFOA Analysis		Sample for PFOS/PFOA Analysis	
Sample ID: SIOUX-SB 1-01		Sample ID: SIOUX-SB 1-02	
Sample Interval: 0 to 2 ft		Sample Interval: 15 to 17 ft	
Inspector Name Timothy Runkle		Inspector Signature 	
Monitoring Well ID : MW-SIOUX-01	Backfill Type NA	Date Backfilled : NA	
Latitude 42.3961918	Longitude -96.3875912	Elevation (ft) —	
Notes:			
Sketch:  NOT TO SCALE			

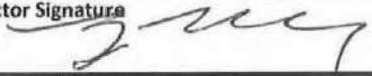
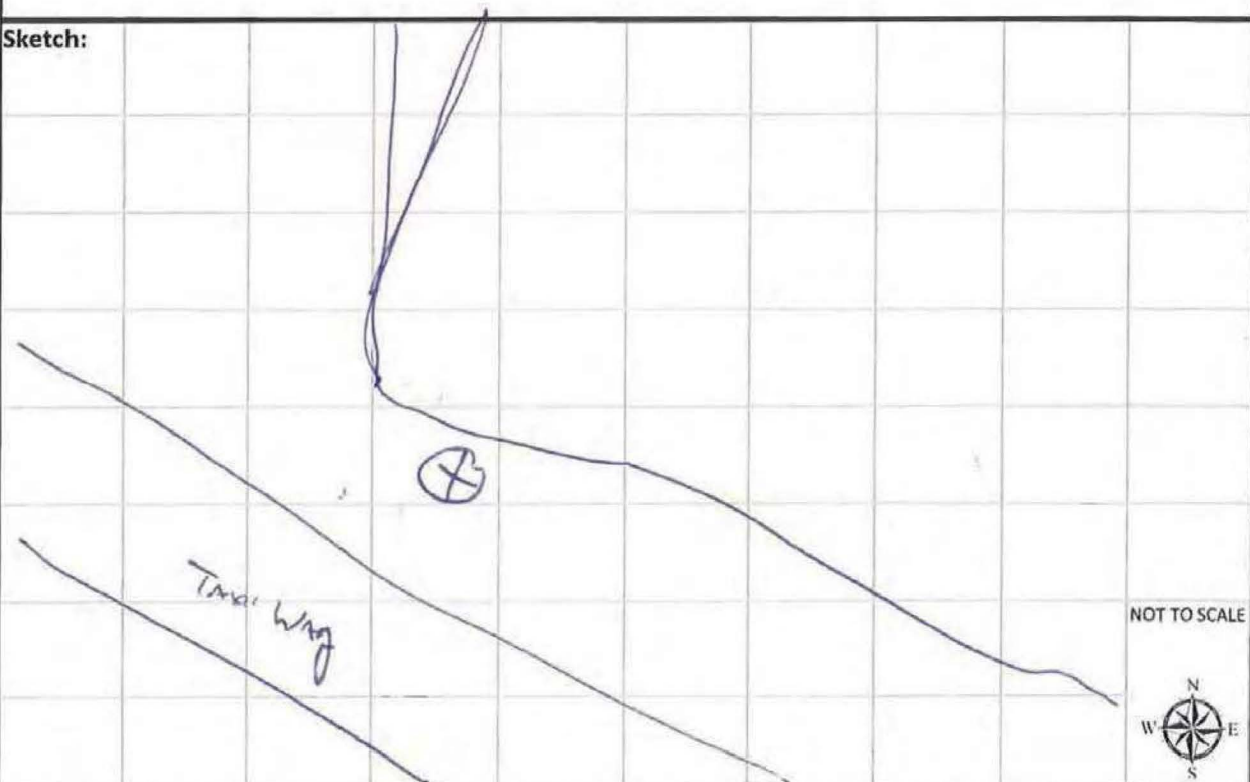
Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO CC SB 1		Page Page 2 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/27/2018	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
0.5	0-5' 1/5' Recovery Silty clay Dry compact low plasticity 2.54 S14	0.0	310016-S31-01		
1					
1.5					
2					
2.5					
3					
3.5					
4					
4.5					
5	5-10' 1/5' recovery Per gravel Road Base	0.0			
5.5					
6					
6.5					
7					
7.5					
8					
8.5					
9					
9.5					
10					

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO ASB 01		Page Page 3 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/27/18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
10.5	10-15 No Recovery				10.5
11.0					11.0
11.5					11.5
12.0					12.0
12.5					12.5
13.0					13.0
13.5					13.5
14.0					14.0
14.5					14.5
15.0					15.0
15.5					15.5
16.0	15-20 4/5				16.0
16.5	WET 15-16				16.5
17.0	DAMP 16-19				17.0
17.5	15-16	0.10	31006-SB1-02		17.5
18.0	Clayey Silt with sand very fine				18.0
18.5	loam 5/4				18.5
19.0	16-19				19.0
19.5	Silty clay				19.5
20.0	loam 5/4 with 2.54 4/2 Mottles Soft plastic				20.0

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIOUX-SB-01		Page Page 4 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/27/18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
20.5	3/5 Recovery				
21	SATURATED				
21.5	20-21.5				
22	21.5-23	0.0			
22.5	54 4/13				
23	Soft clay plastic				
23.5					
24					
24.5					
25					
25.5					
26					
26.5					
27		0.0			
27.5					
28					
28.5					
29					
29.5					
30					

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO 4 -SB 4 1		Page Page <u>5</u> of <u>5</u>	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date:	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
30.5					30.5
31					31
31.5					31.5
32					32
32.5					32.5
33					33
33.5					33.5
34					34
34.5					34.5
35					35
35.5					35.5
36					36
36.5					36.5
37					37
37.5					37.5
38					38
38.5					38.5
39					39
39.5					39.5
40					40

2-4-12
 9/27/2018

Client/Installation ANG/SIOUX CITY ANGB		Oversight Contractor Leidos	Borehole Number SIOUX-SB 1
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Driller : Cascade ANG/SIOUX CITY ANGB	Page Page <u>1</u> of <u>5</u>
Sizes and Type of Drilling and Sampling Equipment Geoprobe		Borehole Location Description SW CORNER OF RAMP IN GRASS BETWEEN TAXI-WAY	
Date/Time Started : 9/27/2018 1745		Date/Time Finished : 9/27/2018	
Overburden Thickness NA	Depth to Groundwater (ft) 20	Total Depth (ft) 30	
Sample for PFOS/PFOA Analysis		Sample for PFOS/PFOA Analysis	
Sample ID: SIOUX-SB 1-01		Sample ID: SIOUX-SB 1-02	
Sample Interval: 0 to 2 ft		Sample Interval: 16 to 18 ft	
Inspector Name Timothy Runkle		Inspector Signature 	
Monitoring Well ID : MW-SIOUX-01	Backfill Type NA	Date Backfilled : NA	
Latitude 42.3947636	Longitude -96.3757000	Elevation (ft) —	
Notes:			
Sketch: 			

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO 2 4SB 1		Page Page 2 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/27/18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
0.5	0-5 4/5 Recovery				
1	0-1' Silty clay	0.0	31004-3136-01		
1.5	Dry Compact low plasticity 2.5% 5/4				
2	2-4				
2.5	2.5% 4/1				
3	VERY STIFF CLAY HARD MAKES 2" TABS				
3.5					
4					
4.5					
5					
5.5	5-10 3/5 Recovery				
6	5-6' SAA	0.0			
6.5	6-8'				
7	Stiff compact clay 2.5% 5/4				
7.5	with 5% GREY MOTTLE				
8	plastic makes 1" tabs				
8.5	7-8'				
9	Silty clay damp				
9.5	2.5% 5/4				
10	plastic makes 1" tabs				

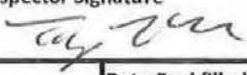
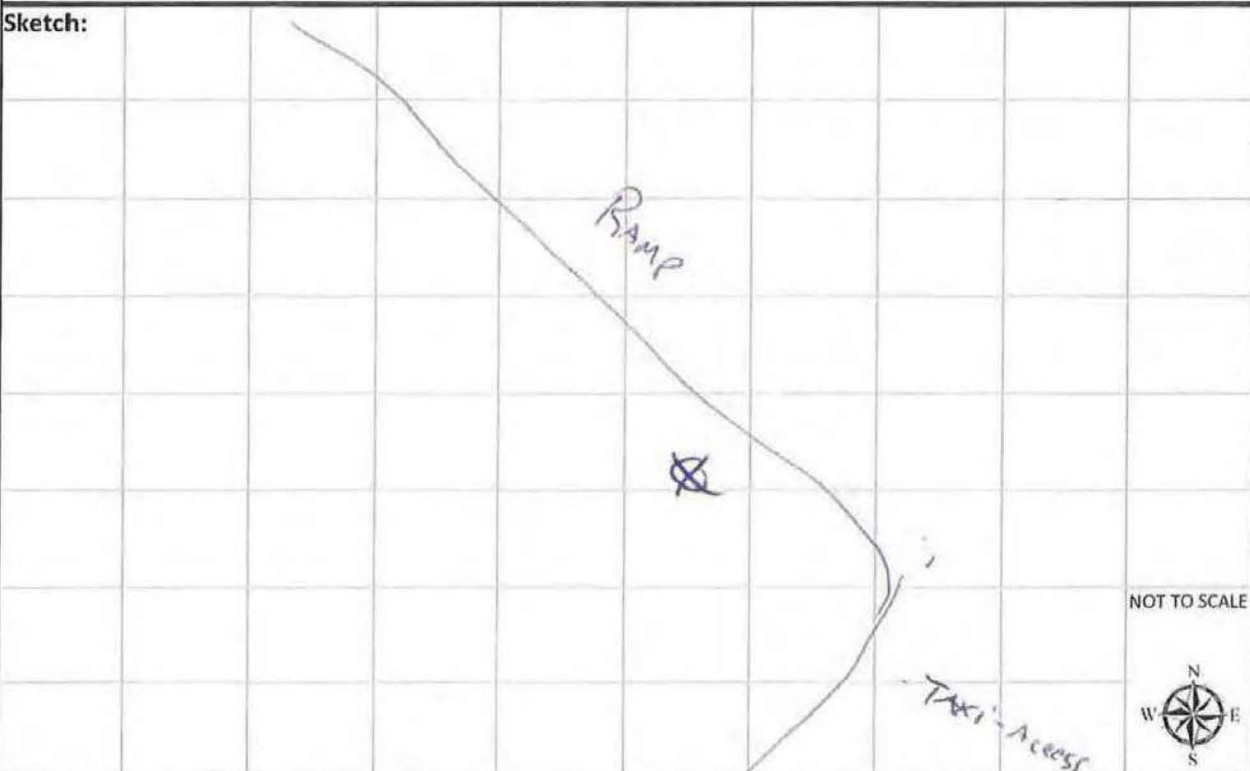
Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO ⁰⁴¹ -SB ¹		Page Page <u>3</u> of <u>5</u>	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/27/18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
10.5	10-15 3/5' recovery				
11.0	16-11' SAA				
11.5	11-10'				
12.0	Silt TSK	0.0			
12.5	Clayey Silt with				
13.0	Some very fine sand				
13.5	Alternating bands				
14.0	2.54 6/3 and				
14.5	2.54 5/4				
15.0	MED. STIFF NO				
15.5	PLASTIC				
16.0					
16.5	15-20. 5/51				
17.0	Very FINE TO	0.0			
17.5	MED coarse SAND				
18.0	Sub Rounded				
18.5	Damp				
19.0	2.54 6/4				
19.5					
20.0					

SIO⁰⁴¹-SB¹-02

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO 004 -SB 1		Page Page 4 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/27/18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
20.5	20.5-25' 4/5 Recov SAA WET				20.5
21					21.0
21.5					21.5
22					22.0
22.5					22.5
23					23.0
23.5					23.5
24					24.0
24.5	Flowing Sands At Bottom of Hole				24.5
25					25.0
25.5	End of Bore AT 25'				25.5
26					26.0
26.5					26.5
27					27.0
27.5					27.5
28					28.0
28.5					28.5
29					29.0
29.5					29.5
30					30.0

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO__-SB__		Page Page __5__ of __5__	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date:	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
30.5					30.5
31					31
31.5					31.5
32					32
32.5					32.5
33					33
33.5					33.5
34					34
34.5					34.5
35					35
35.5					35.5
36					36
36.5					36.5
37					37
37.5					37.5
38					38
38.5					38.5
39					39
39.5					39.5
40					40

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 9/27/18

Client/Installation ANG/SIOUX CITY ANGB		Oversight Contractor Leidos	Borehole Number SIO04-SB 2
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Driller : Cascade ANG/SIOUX CITY ANGB	Page Page <u>1</u> of <u>5</u>
Sizes and Type of Drilling and Sampling Equipment Geoprobe		Borehole Location Description South End of Ramp West of Taxi Way Access in Grass	
Date/Time Started : 9/28/18 0800		Date/Time Finished : 09/28/18	
Overburden Thickness NA	Depth to Groundwater (ft) 16	Total Depth (ft) 25	
Sample for PFOS/PFOA Analysis		Sample for PFOS/PFOA Analysis	
Sample ID: SIO04-SB 2-01		Sample ID: SIO04-SB 2-02	
Sample Interval: 0 to 2 ft		Sample Interval: 10 to 12 ft	
Inspector Name Timothy Runkle		Inspector Signature 	
Monitoring Well ID : MW-SIO1-02	Backfill Type NA	Date Backfilled : NA	
Latitude 42.3927821	Longitude -96.3729546	Elevation (ft) —	
Notes:			
Sketch: 			

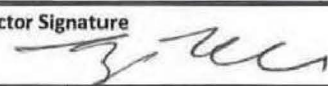
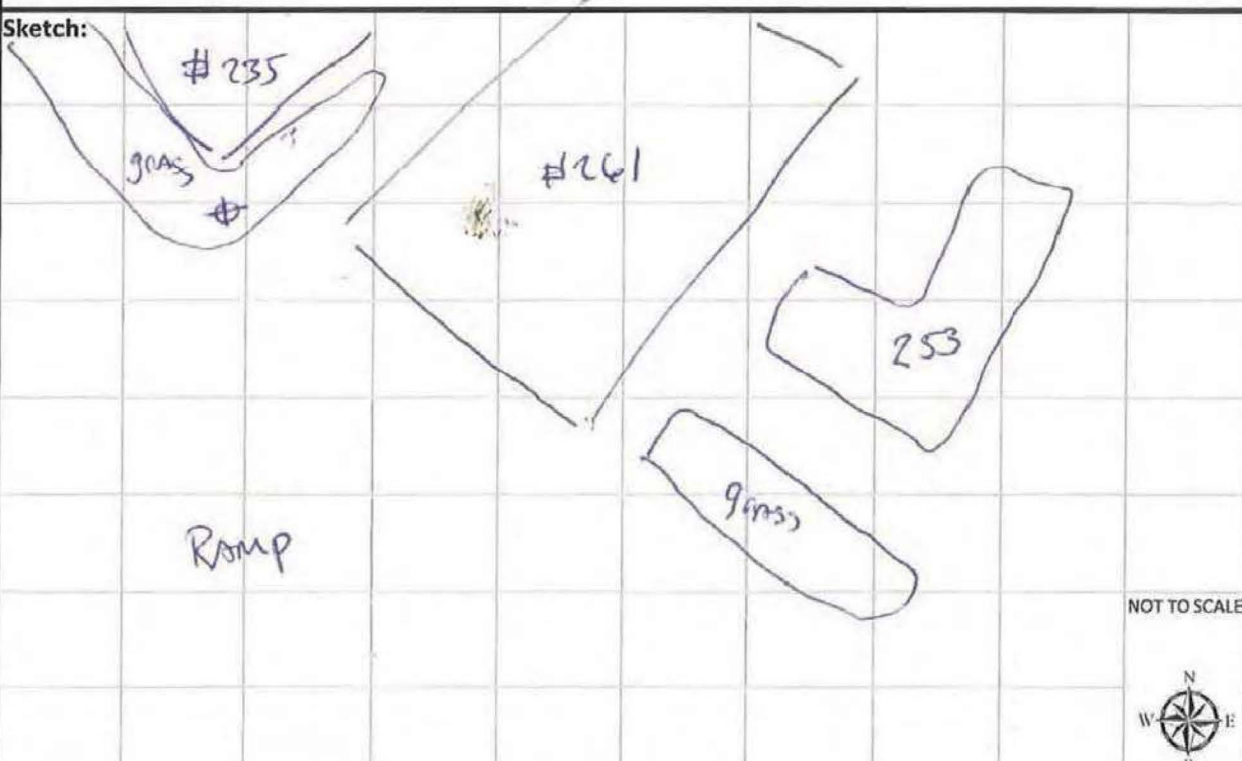
Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIOUX-SB 2		Page Page 2 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/28/18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
0.5	0-5 4/5 Recovery				
1	0-1 Silty clay, damp Some pebbles STIFF, plastic makes 1" tabs	0.0	SIOUX-SB-01		
1.5	2.54 4/2				
2	1-3'				
2.5	Dry, Very HARD + compacted clay plastic makes 1" tabs				
3					
3.5	3'-4'				
4	SAA but 2.54 5/4				
4.5					
5	5-10' 5/5 Recovery				
5.5	5-6 SAA				
6					
6.5	6-10				
7	clay, Very stiff makes 1" tabs	0.0			
7.5	plastic 2.54 5/2				
8	with 5%				
8.5	loose 5/4 mottles				
9					
9.5					
10					

Client/Installation ANG/SIOUX CITY ANG8		Borehole Number SIOUX-SB 2		Page Page 3 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/28/19	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
10.5	10-15 4/5' Recovery				
11.0	10-11 2.545/4				
11.5	Sandy clay, VERY FINE SAND MED PLASTIC 1/2" TABS	0.0	SIOUX-SB-02		
12.0					
12.5	11-19 2.545/4				
13.0	Clayey silt with Fines and loose WET				
13.5					
14.0	13-14 2.545/4				
14.5	Silty clay WET, SOFT MED PLASTIC				
15.0					
15.5	15-20 5/5 Recovery				
16.0	15-16 2.545/4				
16.5	WITH 20% 10/4R 4/6 Mottler clay plastic MAKES 4" worms DAMP	0.0			
17.0	16-19'				
17.5	WET, SOFT, LOOSE clay very plastic				
18.0	50/50 10/4R 4/6 And 54 51				
18.5					
19.0	19-20'				
19.5	54 51 Silty with VERY FINE SAND Moist, loose				
20.0					

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO 94-SB 2		Page Page 4 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/28/18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
20.5	20-25 4/5' Recovery MEDIUM to COARSE SAND Sub rounded to Sub angular 2.54 5/4 Color change At 23' 2.54 G/1 WGT	0.0			
21					
21.5					
22					
22.5					
23					
23.5					
24					
24.5					
25					
25.5					
26	END OF CORE 25'				
26.5					
27					
27.5					
28					
28.5					
29					
29.5					
30					

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO__-SB__		Page Page __5__ of __5__	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date:	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
30.5					30.5
31					31
31.5					31.5
32					32
32.5					32.5
33					33
33.5					33.5
34					34
34.5					34.5
35					35
35.5					35.5
36					36
36.5					36.5
37					37
37.5					37.5
38					38
38.5					38.5
39					39
39.5					39.5
40					40


 9/29/18

Client/Installation ANG/SIOUX CITY ANGB		Oversight Contractor Leidos	Borehole Number SIOUX-SB01
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Driller : Cascade ANG/SIOUX CITY ANGB	Page Page 1 of 5
Sizes and Type of Drilling and Sampling Equipment Geoprobe		Borehole Location Description South of Bailey 235 IN CORNER OF GRASS NEXT TO RAMP	
Date/Time Started : 9/29/18 0800		Date/Time Finished : 9/29/18	
Overburden Thickness NA	Depth to Groundwater (ft) 20'	Total Depth (ft) 25'	
Sample for PFOS/PFOA Analysis		Sample for PFOS/PFOA Analysis	
Sample ID: SIOUX-SB01-01		Sample ID: SIOUX-SB01-02	
Sample Interval: 0 to 2 ft		Sample Interval: 16 to 18 ft	
Inspector Name Timothy Runkle		Inspector Signature 	
Monitoring Well ID : MW-SIOUX-01	Backfill Type NA	Date Backfilled : NA	
Latitude 42.3053194	Longitude -96.3736934	Elevation (ft) —	
Notes:			
Sketch: 			

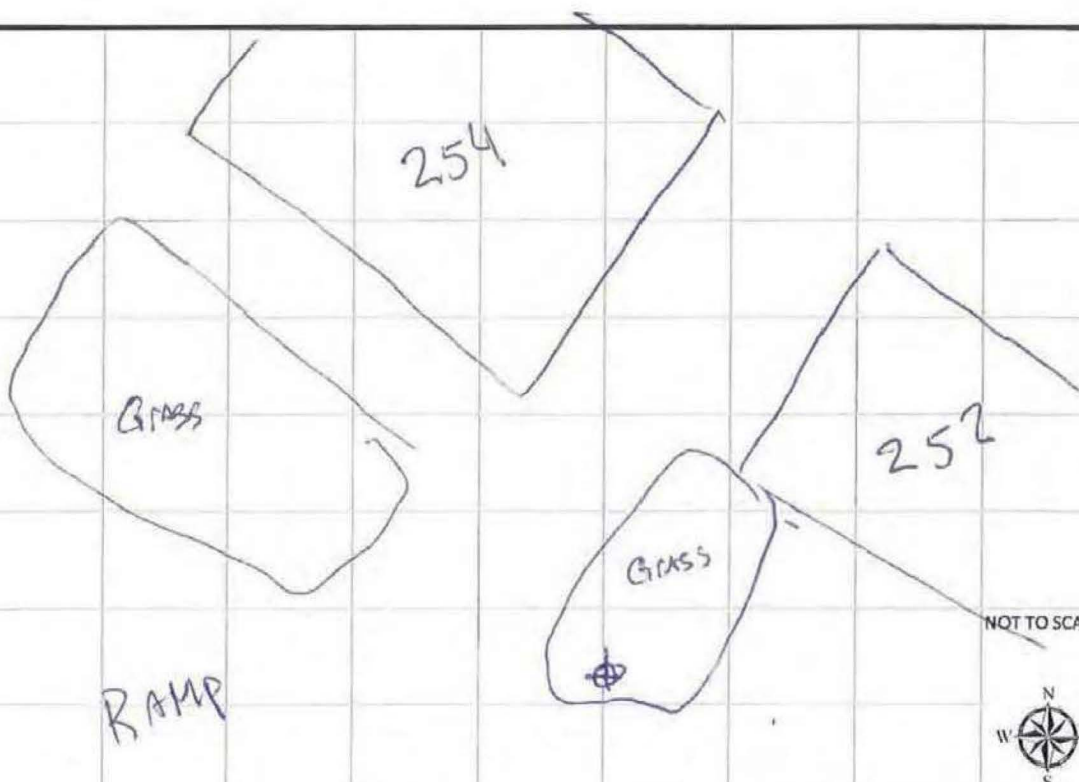
Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIOUX-SB 01		Page Page 2 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 09/29/2018	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
0.5	0-5 3/5 Recovery 0.5' Clayey Silt dry, loose 2.54 4/4				
1.5	0.5'-1'				
2.0	SAA with gravel 20% subregular to subangular	0.0			
2.5	1'-3'				
3.0	2.54 4/2 STIFF CLAY CLUMP MARKS 3" TABS plastic				
5.5	5-10 2.5/5 Recovery				
6.0	5-6 SAA				
6.5	6-7.5 Clayey Silt with SAND 2.54 5/4 Dry Compact	0.0			

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO02-SB01		Page Page 3 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 09/29/2018	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
10.5	10-15 4/5'				
11.0	10-11 SAA	0.0			
11.5	11-12				
12.0	Very FINE SAND				
12.5	WBT loose				
	WBC rounded				
	2.54 5/4				
13.0	12-14'				
13.5	2.54 5/3				
14.0	clay very plastic				
	makes 5" worms				
	soft				
15.0	15-20 5/5'				
15.5	15-16				
16.0	SAA				
16.5	16-20				
17.0	M20 to coarse				
	SAND				
	Subangular to subangular	0.0			
	Range				
	2.54 6/4				
18.0					
18.5					
19.0					
19.5					
20.0					

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO 02 -SB 01		Page Page <u>4</u> of <u>5</u>	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/27/2018	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
20.5	20-25 SAA, wet				
21					
21.5					
22					
22.5					
23					
23.5					
24					
24.5					
25	Floury sands in next push.				
25.5	END Boring AT 25'				
26					
26.5					
27					
27.5					
28					
28.5					
29					
29.5					
30					

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO __ -SB __		Page Page __5__ of __5__	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date:	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
30.5					30.5
31					31
31.5					31.5
32					32
32.5					32.5
33					33
33.5					33.5
34					34
34.5					34.5
35					35
35.5					35.5
36					36
36.5					36.5
37					37
37.5					37.5
38					38
38.5					38.5
39					39
39.5					39.5
40					40

2 MW
9/29/2018

Client/Installation ANG/SIOUX CITY ANGB		Oversight Contractor Leidos	Borehole Number SIO01-SB1
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Driller : Cascade ANG/SIOUX CITY ANGB	Page Page <u>1</u> of <u>5</u>
Sizes and Type of Drilling and Sampling Equipment Geoprobe		Borehole Location Description South of building 254 in Grass next to Ramp	
Date/Time Started : 9/29/2018		Date/Time Finished : 9/29/2018	
Overburden Thickness NA	Depth to Groundwater (ft) 22'	Total Depth (ft) 30'	
Sample for PFOS/PFOA Analysis		Sample for PFOS/PFOA Analysis	
Sample ID: SIO01-SB1-01		Sample ID: SIO01-SB1-02	
Sample Interval: 0 to 2 ft		Sample Interval: 16 to 18 ft	
Inspector Name Timothy Runkle		Inspector Signature 	
Monitoring Well ID : MW-SIO01-01	Backfill Type NA	Date Backfilled : NA	
Latitude 42.3938259	Longitude -96.3714880	Elevation (ft)	
Notes:			
Sketch: 			

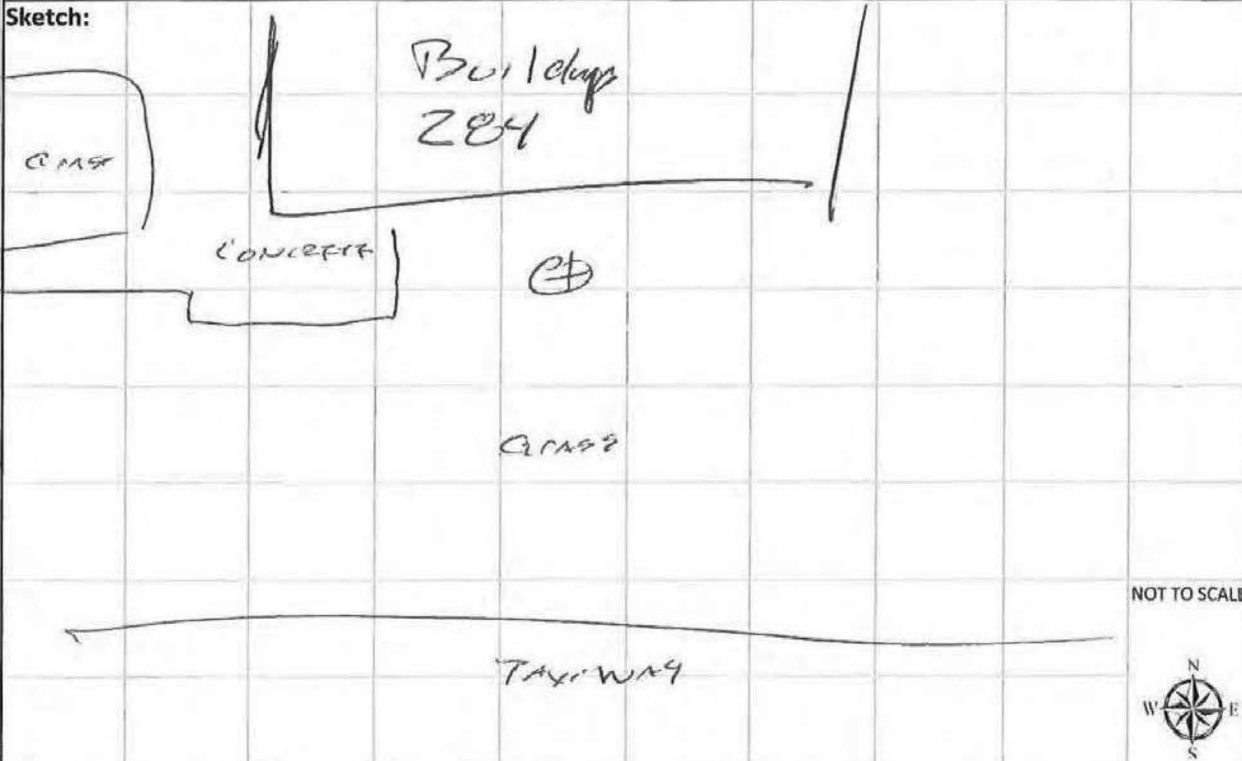
Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO 01 -SB 1		Page Page <u>2</u> of <u>5</u>	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/29/2018	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
0.5	0-5' 3/5' Recovery				
1	0-0.5" 2.54 43 clayey silt damp loose, hard plastic				
1.5	0.5-1"				
2	Sand FINE TO MEDIUM WITH 5% Rounded Pebbles				
2.5	2.54 5/4 Damp	0.0			
3	1"-2" Silty clay TDR clayey silt compact friable, low plastic damp				
3.5					
4	2"-3" 54 4/1 clay, STIFF plastic, MAKES 3" worms				
4.5					
5					
5.5	5-10" 5/5 Recovery				
6	5-10 clay 2.54 4/4 STIFF, plastic MAKES 2" worms damp	0.0			
6.5					
7					
7.5					
8					
8.5					
9					
9.5					
10					

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO21-SB 1		Page Page 3 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/29/2018	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
10.5	10-15 4/5 Recover				
11.0	10-11 50/50 MOTTLE				
11.5	10-11 4/6 AND				
12.0	2.54 4/11				
	Soft clay w v. fine SAND				
12.5	12-12 2.54 5/4				
13.0	Soft Clay	0.6			
13.5	plastic makes 2" worm dump				
14.0	13-14				
14.5	VERY Fine Silty Sand				
15.0	2.54 5/4				
	WBT				
15.5	15-20 4/5 "Recovery"				
16.0	15-17 2.54 5/4	0.10	9.52 8.0		
16.5	Silty clay,				
17.0	Soft plastic makes				
17.5	1" tabs				
18.0	17-19				
18.5	2.54 3/2 TH				
19.0	Silty clay, wet dump				
19.5	Soft red plastic				
20.0					

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO01-SB 1		Page Page 4 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/29/2018	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
20.5	20-25' 5/5' Silty clay 54 3/1 Soft/loose, Plastic WET at 17'	0.0			
21.0					
21.5					
22.0					
22.5					
23.0					
23.5					
24.0					
24.5					
25.0	25-30 5/5 Silty clay saturated loose/soft plastic	0.0			
25.5					
26.0					
26.5					
27.0					
27.5					
28.0					
28.5					
29.0	END of Borehole ⑦ 30'				
29.5					
30.0					

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO -SB		Page Page 5 of 5	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date:	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
30.5					30.5
31					31
31.5					31.5
32					32
32.5					32.5
33					33
33.5					33.5
34					34
34.5					34.5
35					35
35.5					35.5
36					36
36.5					36.5
37					37
37.5					37.5
38					38
38.5					38.5
39					39
39.5					39.5
40					40

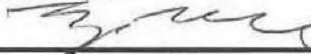
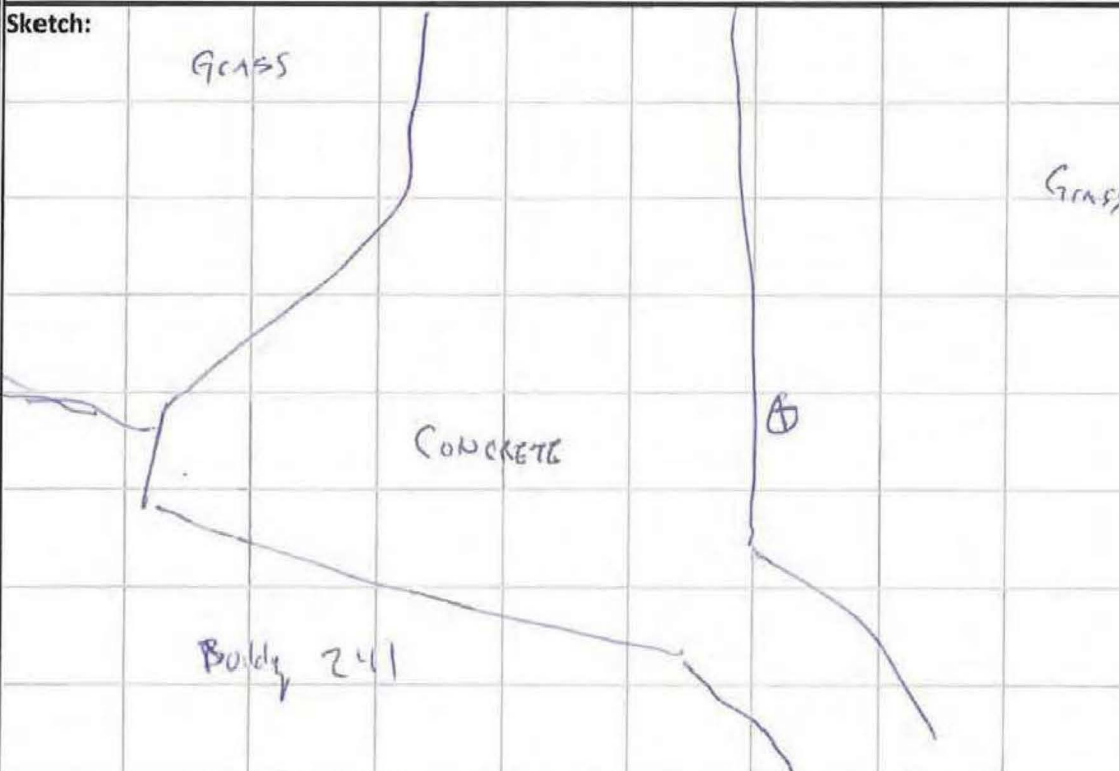
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 8/29/2018

Client/Installation ANG/SIOUX CITY ANGB		Oversight Contractor Leidos	Borehole Number SIOUX-SB 2
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Driller : Cascade ANG/SIOUX CITY ANGB	Page Page 1 of 4
Sizes and Type of Drilling and Sampling Equipment Geoprobe		Borehole Location Description IN FRONT of BUILDING 284 IN THE GRASS South Side	
Date/Time Started : 09/25/18 1645		Date/Time Finished : 09/25/18	
Overburden Thickness NA	Depth to Groundwater (ft) 20	Total Depth (ft) 25	
Sample for PFOS/PFOA Analysis		Sample for PFOS/PFOA Analysis	
Sample ID: SIOUX-SB 2-01		Sample ID: SIOUX-SB 2-02	
Sample Interval: 0 to 2 ft		Sample Interval: 15 to 17 ft	
Inspector Name Timothy Runkle		Inspector Signature 	
Monitoring Well ID : NA	Backfill Type Bentonite	Date Backfilled : 09/25/2018	
Latitude 42.39632576	Longitude 96.37697846	Elevation (ft) —	
Notes:			
Sketch:  Building 284 CONCRETE GRASS TAXIWAY NOT TO SCALE N W E S			

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIOUX-SB 2		Page Page 2 of 4	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/25/18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
0.5	0-5' 4/5' Recovery				
1	0-0.5' 704R1211				
1.5	HARD Silty clay, RORS SEMI-PLASTIC 1" TABS CONCRETE AT 0.5'				
2	0.5'-2'				
2.5	MOTTLES 2.543/2 AND 54R 3/2	0.0			
3	HARD SEMI PLASTIC Silty clay 2" tabs				
3.5	2-4'				
4	SOFT, DAMP 2.544/4 Silty clay				
4.5	PLASTIC 2" TABS				
5	5-10' 3.5/5 Recovery				
5.5	SAA HARD				
6	5-6' 2.544/4				
6.5	6-7'				
7	Increasingly silty clay Silt SAND SAND Some FINE SAND Soft	0.0			
7.5					
8					
8.5					
9					
9.5					
10					

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIOUX-SB 2		Page Page 3 of 4	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/25/18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
10.5	10-15 4/5 Recovery				
11.0	10-12' SAA				
11.5	12-14'	G.O	7.8 G.O		
12.0	Fine to Med SAND				
12.5	Alternating Bands				
13.0	2.5 Y 4/8 and				
13.5	7.5 YR 4/6				
14.0	Moist				
14.5					
15.0	15-20 5/5' Recovery				
15.5	Fine to Medium				
16.0	SAND				
16.5	Subsidence - Subirregular	G.O	7.8 G.O SIOUX-SB-02		
17.0	2.5 Y 4/4				
17.5	Damp, loose				
18.0					
18.5					
19.0					
19.5					
20.0					

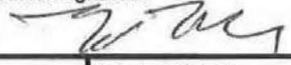
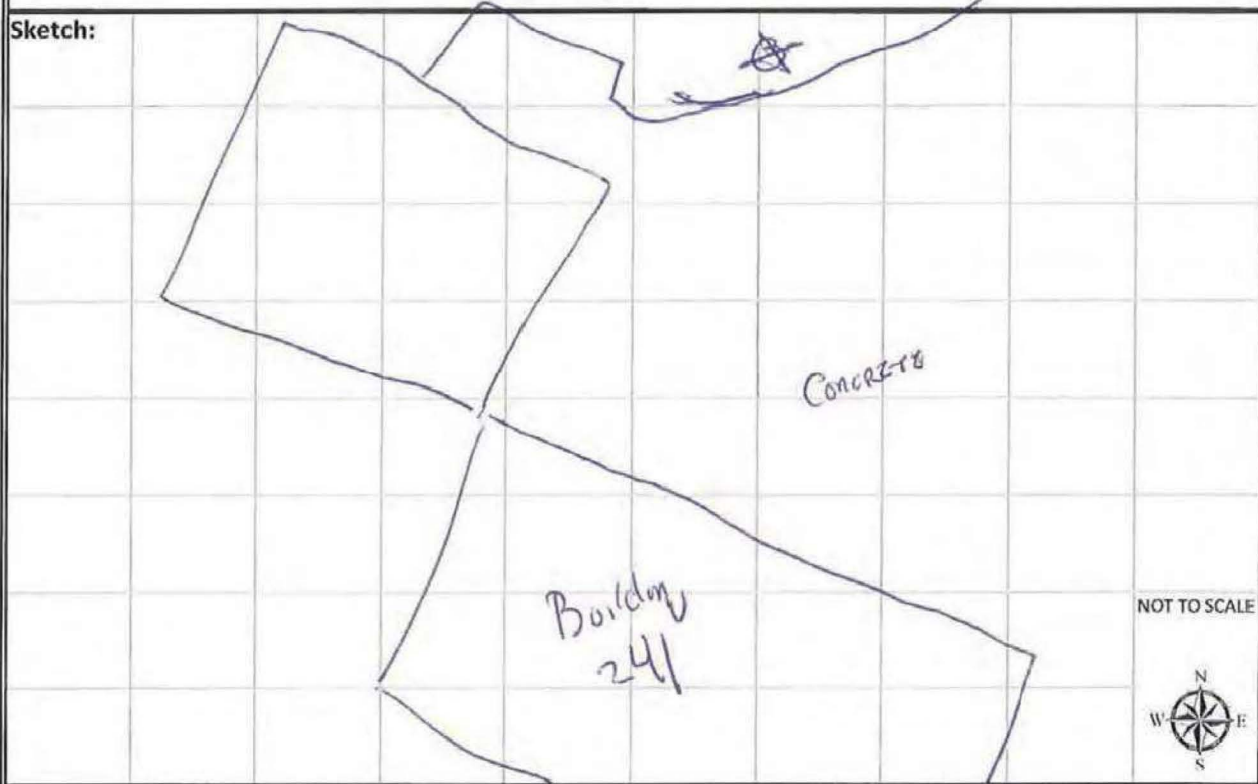
Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIOUX-SB 2		Page Page 4 of 4	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/25/16	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
20.5	20-25 5/5 recovery SAA				
21	SATURATED				
21.5		0.0			
22					
22.5					
23					
23.5					
24					
24.5					
25	END OF BOREHOLE @ 25				
25.5					
26					
26.5					
27					
27.5					
28					
28.5					
29					
29.5					
30					

Client/Installation ANG/SIOUX CITY ANGB		Oversight Contractor Leidos	Borehole Number SIO03-SB <u>2</u>
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Driller : Cascade ANG/SIOUX CITY ANGB	Page Page <u>1</u> of <u>4</u>
Sizes and Type of Drilling and Sampling Equipment Geoprobe		Borehole Location Description NORTH EAST OF BUILDING 241 IN GRASS ON EDGE OF PAVEMENT	
Date/Time Started : 09/26/18 0900		Date/Time Finished : 9/26/18	
Overburden Thickness N/A	Depth to Groundwater (ft) 20	Total Depth (ft) 24	
Sample for PFOS/PFOA Analysis		Sample for PFOS/PFOA Analysis	
Sample ID: SIO03-SB <u>2</u>-01		Sample ID: SIO03-SB <u>2</u>-02	
Sample Interval: 0 to 2 ft		Sample Interval: 15 to 17 ft	
Inspector Name Timothy Runkle		Inspector Signature 	
Monitoring Well ID : N/A	Backfill Type Bentonite	Date Backfilled : 9/26/18	
Latitude 42.38925800	Longitude 96.37466430	Elevation (ft) 1092.00	
Notes:			
Sketch:  NOT TO SCALE			

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIOB-SB 2		Page Page 2 of 4	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 09/29/18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
0.5	0-5' 5/5 Recovery				
1	0-1'				
1.5	10YR 3/2				
2	STIFF silty clay				
2.5	MED PLASTIC				
3	MAKES 2" TABS				
3.5	1'-3'	0.0	3'00-3'22-04		
4	COARSE SAND				
4.5	with 5% pebbles				
5	Sub-Rounded				
5.5	DAMP				
6	10YR 4/6				
6.5	3'-5'				
7	2.5Y 3/2 CLAY				
7.5	Silty 3'-4' and damp/silt				
8	VERY HARD OR AT MED PLASTIC				
8.5	4'-5'				
9	5-10'				
9.5	NO RECOVERY				
10	STEP OF HOLE 6" KUD				
	REQUIRE				
	5-10' 4/5 Recovery	0.0			
	2.5Y 4/4				
	Clay damp				
	MED PLASTIC				
	STIFF				

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO03-SB 2		Page Page 3 of 4	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 09/26/18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
10.5	10-15' 4 1/5' Recovery	0.0			
11.0	10-12' SAA				
11.5	12'-14' SAA SOFTER				
12.0	14' TSA				
12.5					
13.0					
13.5					
14.0					
14.5					
15.0					
15.5	15-20' 4 1/5' Recovery	0.0	SIO03-SB2-02		
16.0	15-15.5 Silt with VERY FINE SAND 2.5% 5/4				
16.5	Rounded damp silt				
17.0	15.5-17.5 CLAY				
17.5	2.5% 4/3 Soft plastic 1" tabs				
18.0					
18.5	17.5-19' VERY soft CLAY - Very plastic 3 1/4" worms				
19.0	54% mat				
19.5	2.5% 4/4 "worms"				
20.0	damp				

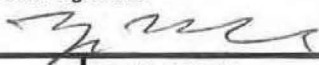
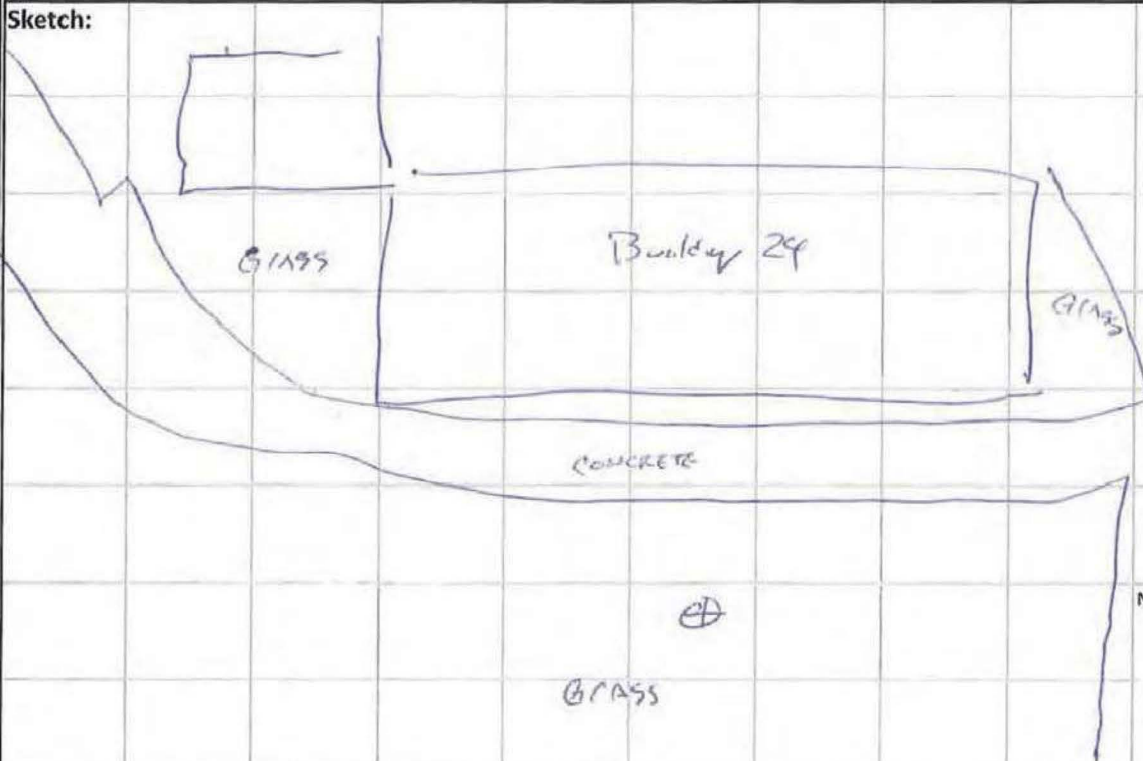
Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIOUX-SB 1		Page Page 4 of 4	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 09-26-2012	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
20.5	20-24 4 1/4' Recovery				20.5
21	20-21' 54 G/I Clay				21.0
21.5	WET VERY SOFT + PLASTIC 3" Worms				21.5
22	21'-22.5'				22.0
22.5	Silty clay with SAND, Very fine SAND 54 3/4 WET	Geo			22.5
23	22.5-24'				23.0
23.5	2.54 5/4 MEDIUM SAND loose SOFT, WET				23.5
24	END OF Borehole @ 241'				24.0
24.5	MEDIUM SAND ISR				24.5
25					25.0
25.5					25.5
26					26.0
26.5					26.5
27					27.0
27.5					27.5
28					28.0
28.5					28.5
29					29.0
29.5					29.5
30					30.0

Client/Installation ANG/SIOUX CITY ANGB		Oversight Contractor Leidos	Borehole Number SIO03-SB 1
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Driller : Cascade ANG/SIOUX CITY ANGB	Page Page <u>1</u> of <u>4</u>
Sizes and Type of Drilling and Sampling Equipment Geoprobe		Borehole Location Description NORTH OF BUILDING 241 TO THE LEFT OF THE RAMP ALONG FENCE LINE	
Date/Time Started : 9/26/2018 1000		Date/Time Finished : 9/26/18	
Overburden Thickness NA	Depth to Groundwater (ft) 17	Total Depth (ft) 25'	
Sample for PFOS/PFOA Analysis Sample ID: SIO03-SB 1-01 Sample Interval: 0 to 2 ft		Sample for PFOS/PFOA Analysis Sample ID: SIO03-SB 1-02 Sample Interval: 15 to 17 ft	
Inspector Name Timothy Runkle		Inspector Signature 	
Monitoring Well ID : N/A	Backfill Type Bentonite	Date Backfilled : 9/26/18	
Latitude 42.38953938	Longitude 46.37526826	Elevation (ft) 1098.65	
Notes:			
Sketch: 			

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO 23 -SB 1		Page Page 2 of 4	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/26/2018	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes	
0.5	0-10' TR 0-5' 3/5 Recovery				
1	0-1' ^{TJA} clayey silty silty clay 2.5 3/3				
1.5	DRY STIFF MATS 1" TABS	0.0	51005-231-01		
2					
2.5	1'-2' COARSE silty SAND WITH 5% PEBBLES 10%R 3/3				
3					
3.5	DAMP, loose				
4	2-3' CLAY WITH SPARSE COARSE SAND lenses MOIST mats 1" TABS 2.5 4/4				
4.5	SEM PLASTIC				
5					
5.5	5-10' 3/5 Recovery CLAY WITH SPARSE COARSE TJA SAND lenses MOIST MATES				
6					
6.5	CLAY 2.5 4/4 HARD, STIFF				
7	PLASTIC mats 1" TABS				
7.5					
8					
8.5					
9					
9.5					
10					

Client/Installation ANG/SIOUX CITY ANG		Borehole Number SIO 03 -SB 1		Page Page 3 of 4	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/26/2018	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes	
10.5	10-15 2 1/5' Recovery				
11.0	10-11' SAA				
11.5	11-12' SAA 2.5 4 4/4				
12.0	clayey silt with very fine sand	0.0			
12.5	Most loose NOT PLASTIC				
13.0					
13.5					
14.0					
14.5					
15.0	15-20 3/5 Recovery	0.0			
15.5	15-16 clayey silt with fine sand	10424/6			
16.0	Most loose, not plastic				
16.5	16-16.2 Black with hydrocarbons color	5.9			
17.0	Fine silty sand Rounded to sub rounded wet				
17.5	16.2-23				
18.0	Fine to medium sand Rounded to sub Rounded some silt	0.0			
18.5	10425/6				
19.0					
19.5					
20.0					

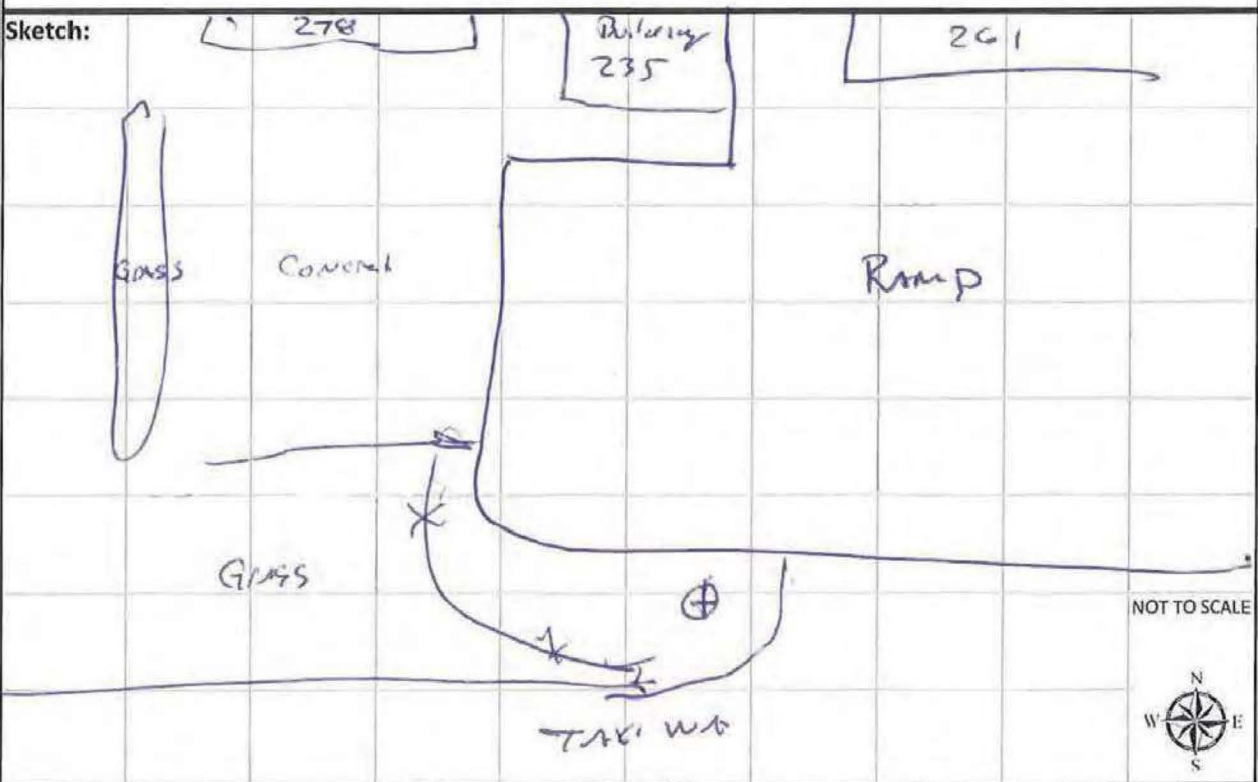
Client/Installation ANG/SIOUX CITY ANG		Borehole Number SIO 03SB 1		Page Page 4 of 4	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/26/2018	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
20.5	20-25 4/5' Recovery				
21	20-21.5 Silty clay				
21.5	254 5/7	0.0			
22					
22.5					
23	21.5-24				
23.5	COARSE FINE SAND LOOSE, 104R 5/6				
24	PLASTIC, SOFT MAKES 4" WORMS 1" TUBES				
24.5	END OF BORING AT 24'				
25					
25.5					
26					
26.5					
27					
27.5					
28					
28.5					
29					
29.5					
30					

Client/Installation ANG/SIOUX CITY ANGB		Oversight Contractor Leidos	Borehole Number SIO03-SB <u>5</u>
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Driller : Cascade ANG/SIOUX CITY ANGB	Page Page <u>1</u> of <u>4</u>
Sizes and Type of Drilling and Sampling Equipment Geoprobe		Borehole Location Description SOUTH OF Building 241 IN GRASS OFF OF CONCRETE	
Date/Time Started : 9/26/18		Date/Time Finished : 9/26/18	
Overburden Thickness NA	Depth to Groundwater (ft) 19	Total Depth (ft) 25	
Sample for PFOS/PFOA Analysis Sample ID: SIO03-SB <u>5</u>-01 Sample Interval: 0 to 2 ft		Sample for PFOS/PFOA Analysis Sample ID: SIO03-SB <u>3</u>-02 Sample Interval: 15 to 17 ft	
Inspector Name Timothy Runkle		Inspector Signature 	
Monitoring Well ID : N/A	Backfill Type Bentonite 	Date Backfilled : 9/26/18	
Latitude 42.38859727	Longitude 90.37559662	Elevation (ft) 1095.73	
Notes:			
Sketch: 			

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIOUX-SB 3		Page Page 2 of 4	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 09/24/2018	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
0.5	0-5 5/5 Recovery				
1	0-25 Clay, Stiff 2.54 3/2 MAKES 1" TABS	0.0	SIOUX-SB3-01		
1.5	2.5-2.7				
2	2.54 2.5/1 DRY PLYMATIC clay WITH RESSLES				
2.5					
3	2.7-5'				
3.5	2.54 4/4 STIFF CLAY MAKES 1" TABS				
4					
4.5					
5					
5.5	5-10' 4/5' Recovery				
6	SAA 4/5	0.0			
6.5	5-7 SAA				
7	7-9 Soft Silty Clay 2.54 4/2 MAKES 3" TABS				
7.5					
8					
8.5					
9					
9.5					
10					

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO ⁰³ SB ³		Page Page <u>3</u> of <u>4</u>	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 09/26/2018	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
10.5	10-15 4/5 Recomp				
11.0	10-11 SAA				
11.5	11-11.5 TJA clayey silt Silty clay with VERY FINE SAND SAME COLOR AS ABOVE WET	0.0			
12.0					
12.5	11.5-18				
13.0	VERY SOFT clay with silt DAMP SAME COLOR AS ABOVE				
13.5					
14.0					
14.5					
15.0	15-20 5/51 SAA TJA				
15.5	15-17.5 SAA				
16.0					
16.5	17.5-20				
17.0	WET AT 191 54 4/1 WITH 10% 4/4 Mottle Clay very soft Plastic 3" worms	0.0			
17.5					
18.0					
18.5	18-20 Sandy Silty clay WITH increase down Fine Sand 2.54 5/4 WET				
19.0					
19.5					
20.0					

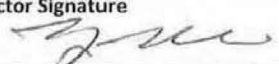
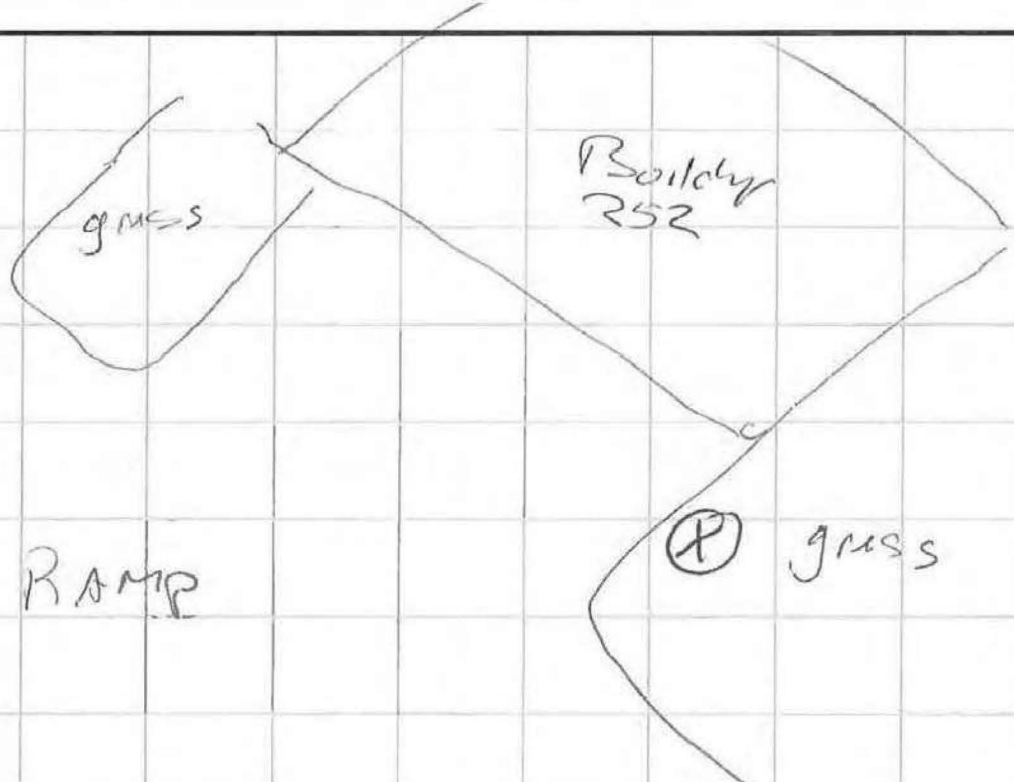
Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO23-SB3		Page Page 4 of 4	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 09/26/18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
20.5	20-25' 5/5 Saturated Poorly Sorted Coarse to Fine Sand 2.5T 5/4	0.0			
21					
21.5					
22					
22.5					
23					
23.5					
24					
24.5					
25	END OF BORING AT 25'				
25.5					
26					
26.5					
27					
27.5					
28					
28.5					
29					
29.5					
30					

Client/Installation ANG/SIOUX CITY ANGB		Oversight Contractor Leidos	Borehole Number SIO07-SB 2
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Driller : Cascade ANG/SIOUX CITY ANGB	Page Page <u>1</u> of <u>4</u>
Sizes and Type of Drilling and Sampling Equipment Geoprobe		Borehole Location Description SE of Ramp in Grass Area Between Ramp and Two-Way	
Date/Time Started : 9/27/18 1710		Date/Time Finished : 9/27/18 1740	
Overburden Thickness NA	Depth to Groundwater (ft) 23'	Total Depth (ft) 25	
Sample for PFOS/PFOA Analysis Sample ID: SIO07-SB 2-01 Sample Interval: 0 to 2 ft		Sample for PFOS/PFOA Analysis Sample ID: SIO07-SB 2-02 Sample Interval: 19 to 21 ft	
Inspector Name Timothy Runkle		Inspector Signature 	
Monitoring Well ID : NA/	Backfill Type Bentonite	Date Backfilled : 9/27/18	
Latitude 42.39516674	Longitude 96.37627892	Elevation (ft) 1,089.62	
Notes:			
Sketch: 			

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO 07 -SB <u>2</u>		Page Page <u>2</u> of <u>4</u>	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: <u>9/27/18</u>	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
0.5	<u>0-5</u> → <u>2/5'</u> Recovery				
1	<u>0-1'</u> Silty clay Dry compact plastic 2.54 4/4	0.0	31007-382-01		
1.5					
2	<u>1-2'</u> Pea Gravel				
2.5					
3					
3.5					
4					
4.5					
5	<u>5-10</u> No Recovery Gravel clapping core				
5.5					
6					
6.5					
7					
7.5					
8					
8.5					
9					
9.5					
10					

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO07-SB 2		Page Page 3 of 4	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/27/18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
10.5	No Recovery 10-15				10.5
11.0					11.0
11.5					11.5
12.0					12.0
12.5					12.5
13.0					13.0
13.5					13.5
14.0					14.0
14.5					14.5
15.0					15.0
15.5	15-20 5/5 Recovery 2.5Y 5/4 Very Fine to Medium Sand loose, damp	0.0	SIO07-SB2-02		15.5
16.0					16.0
16.5					16.5
17.0					17.0
17.5					17.5
18.0					18.0
18.5					18.5
19.0					19.0
19.5					19.5
20.0					20.0

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO 07 -SB <u>2</u>		Page Page <u>4</u> of <u>4</u>	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/27/18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
20.5	20-25' 5/5 Recovery 2.54 G/4 MEDIUM TO COARSE SAND LOOSE WEST AT 23'	GIB			
21					
21.5					
22					
22.5					
23					
23.5					
24					
24.5					
25	STOP AT 25'				
25.5					
26					
26.5					
27					
27.5					
28					
28.5					
29					
29.5					
30					

Client/Installation ANG/SIOUX CITY ANGB		Oversight Contractor Leidos	Borehole Number SIO01-SB 2
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Driller : Cascade ANG/SIOUX CITY ANGB	Page Page 1 of 4
Sizes and Type of Drilling and Sampling Equipment Geoprobe		Borehole Location Description SOUTH OF BUILDING 252 OFF CONCRETE/ACCESS TO RAMP IN GRASS	
Date/Time Started : 9/29/2018 1810		Date/Time Finished : 09/29/2018	
Overburden Thickness NA	Depth to Groundwater (ft) 101	Total Depth (ft) 25	
Sample for PFOS/PFOA Analysis Sample ID: SIO01-SB 2-01 Sample Interval: 0 to 2 ft		Sample for PFOS/PFOA Analysis Sample ID: SIO01-SB 2-02 Sample Interval: 5 to 7 ft	
Inspector Name Timothy Runkle		Inspector Signature 	
Monitoring Well ID : NA	Backfill Type Bentonite	Date Backfilled : 9/29/2018	
Latitude 42.3934472	Longitude -96.3209145	Elevation (ft) 1	
Notes:			
Sketch: 			

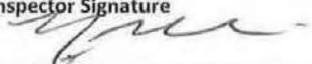
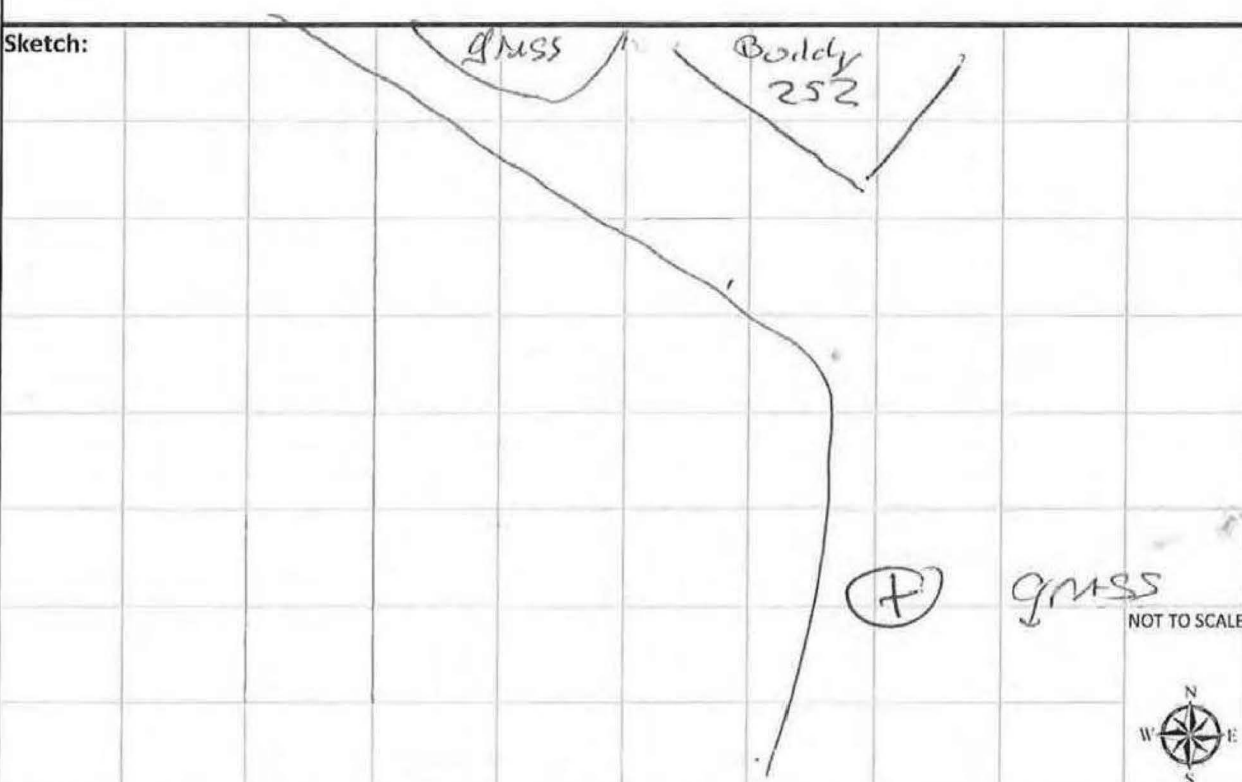
NOT TO SCALE



Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIOUX -SB 2		Page Page 2 of 4	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/29/18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
0.5	0-5 2+TJA 2.5' / 5' Recovery				
1	0-0.5 STIFF Silty clay TJA				
1.5	clayey Silty Fragile damp 10% R 5/12				
2	0.5-1.5	0.0			
2.5	DAMP Fine to COARSE with ^{to} sandier SANDS				
3	2.54 5/3				
3.5	1.5-2.5				
4	Silty clay shd plastic damp				
4.5	54 4/1				
5	5-10 4/15'				
5.5	5-8'				
6	2.54 4/2				
6.5	STIFF damp clay plastic Makes 3" worms				
7	8-9'				
7.5	COARSE / soft clay damp plastic Makes 1" tubes				
8					
8.5					
9					
9.5					
10					

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO ⁰¹ -SB 2		Page Page 3 of 4	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/29/18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
10.5	10-15 5/5				
11.0	10-4 Sandy silt with clay plastic	8.0			
11.5	WET sand color AA				
12.0	11-15				
12.5	Fine to coarse SAND well sorted w/ silt				
13.0	SATURATION				
13.5					
14.0					
14.5					
15.0	15-20 5/5'				
15.5	15-16.5 S				
16.0	Silty clay	0.0			
16.5	2.54 5/4 WET plastic soft				
17.0					
17.5	16.5 - 20'				
18.0	SATURATED Sandy clay 54/3/1 plastic				
18.5					
19.0					
19.5					
20.0					

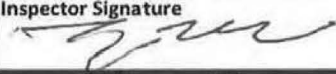
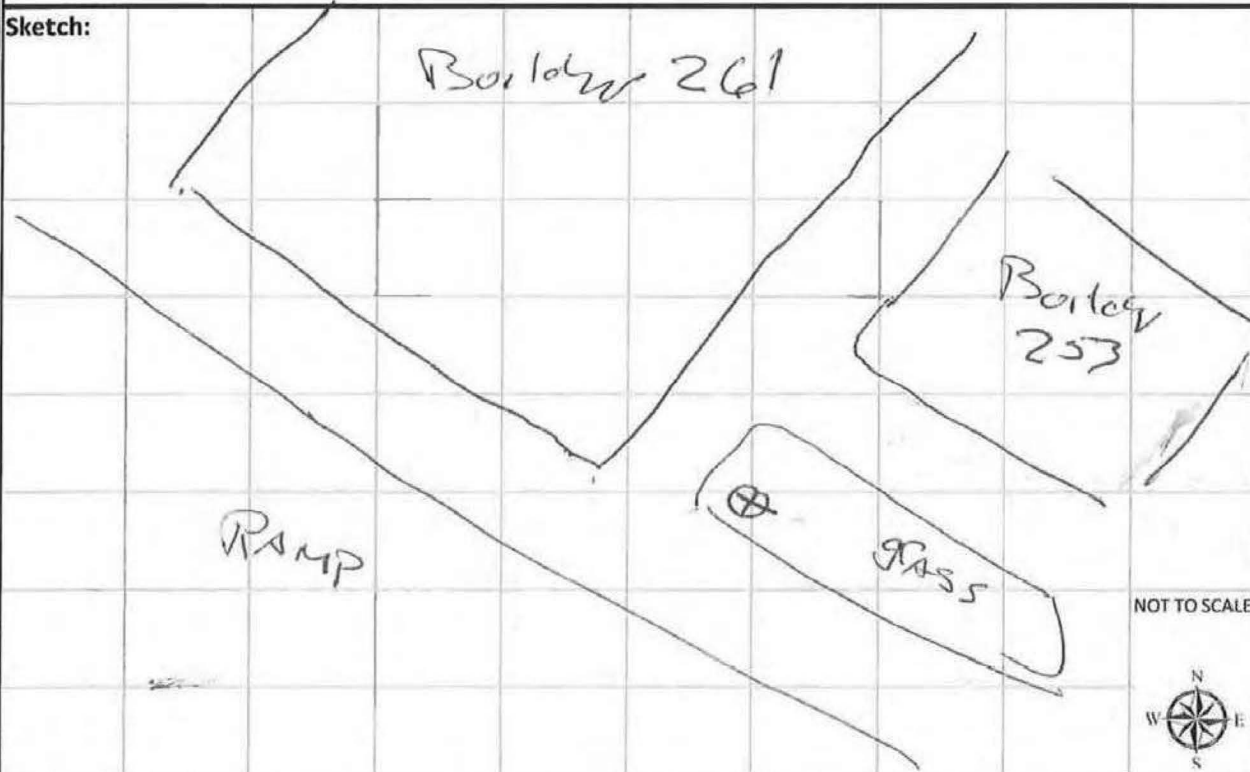
Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO D -SB 2		Page Page 4 of 4	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/29/2018	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
20.5	20-25 STIFF DAMP PLASTIC CLAY makes 4" worms 54 4/1				20.5
21					21.0
21.5					21.5
22					22.0
22.5					22.5
23					23.0
23.5					23.5
24					24.0
24.5					24.5
25					25.0
25.5					25.5
26					26.0
26.5					26.5
27					27.0
27.5					27.5
28					28.0
28.5					28.5
29					29.0
29.5					29.5
30					30.0

Client/Installation ANG/SIOUX CITY ANGB		Oversight Contractor Leidos	Borehole Number SIOUX-SB3
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Driller : Cascade ANG/SIOUX CITY ANGB	Page Page 1 of 4
Sizes and Type of Drilling and Sampling Equipment Geoprobe		Borehole Location Description IN MASS OF THE EAR NE SIDE OF THE RAMP	
Date/Time Started : 9/29/18		Date/Time Finished : 9/29/18	
Overburden Thickness NA	Depth to Groundwater (ft) 10	Total Depth (ft) 25	
Sample for PFOS/PFOA Analysis		Sample for PFOS/PFOA Analysis	
Sample ID: SIOUX-SB3-01		Sample ID: SIOUX-SB3-02	
Sample Interval: 0 to 2 ft		Sample Interval: 10 to 12 ft	
Inspector Name Timothy Runkle		Inspector Signature 	
Monitoring Well ID : NA	Backfill Type Bentonite Chip	Date Backfilled : 9/29/2018	
Latitude 42.3926345	Longitude -96.3706982	Elevation (ft) 5	
Notes:			
Sketch: 			

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIOUX-SB 3		Page Page 2 of 4	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/29/18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes: 9/29/18	
0.5	0-5 3/5 Recovery				
1	0-2' 104R 3/3	0.0			
1.5	HARD dry clay				
2	MAKES 1" TABS				
2.5	2'-3'				
3	104R 4/4				
3.5	Silty clay				
4	MOIST semi plastic				
4.5	MAKES 1" TABS				
5	5-10 3/5 Recovery				
5.5	Silty clay				
6	clump soft				
6.5	soft JR makes				
7	2" worms	0.0			
7.5					
8					
8.5					
9					
9.5					
10					

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SI04-SB 3		Page Page 3 of 4	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/29/18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
10.5	10-15' 5/5 Recovery				
11.0	SATURATED				
11.5	10-11				
12.0	Silty clay 2.54 4/4				
12.5	semi-plastic				
13.0	Soft				
13.5	SATURATED				
14.0	11-12				
14.5	Sandy clay with silt	2.54 4/4			
15.0	semi-plastic				
15.5	Soft, very fine sand				
16.0	SATURATED				
16.5	12-15				
17.0	Silty clay	2.54 4/4			
17.5	Soft to stiff				
18.0	WET				
18.5	15-20' 4/5 Recovery				
19.0	15-17'				
19.5	SATURATED				
20.0	Silty clay				
	Plastic, Parakeet 2" anchor	6.0			
	Stiff				
	2.54 4/2				
	17-24'				
	Damp clay				
	54 4/4				
	Makes 5" worms				
	1" tabs				

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIOUX-SB 3		Page Page 4 of 4	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/29/18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
20.5	20-25 3.5/5 Recovery				
21	SAA	0.0			
21.5					
22					
22.5					
23					
23.5					
24					
24.5					
25					
25.5					
26					
26.5					
27					
27.5					
28					
28.5					
29					
29.5					
30					

Client/Installation ANG/SIOUX CITY ANGB		Oversight Contractor Leidos	Borehole Number SIO⁰²-SB <u>3</u>
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Driller : Cascade ANG/SIOUX CITY ANGB	Page Page <u>1</u> of <u>4</u>
Sizes and Type of Drilling and Sampling Equipment Geoprobe		Borehole Location Description IN GRASS IN FRONT OF BUILDING 253 AND THE RAMP	
Date/Time Started : 9/29/18 1925		Date/Time Finished : 9/29/18 1955	
Overburden Thickness NA	Depth to Groundwater (ft) 20'	Total Depth (ft) 25	
Sample for PFOS/PFOA Analysis		Sample for PFOS/PFOA Analysis	
Sample ID: SIO⁰²-SB <u>3</u>-01		Sample ID: SIO⁰²-SB <u>3</u>-02	
Sample Interval: 0 to 2 ft		Sample Interval: 14 to 18 ft	
Inspector Name Timothy Runkle		Inspector Signature 	
Monitoring Well ID : NA	Backfill Type Portland chip	Date Backfilled : 9/29/2018	
Latitude 42.374763	Longitude -96.3777791	Elevation (ft) —	
Notes:			
Sketch:  The sketch is drawn on a grid. It shows a large area labeled 'RAMP' on the left. To the right of the ramp is a rectangular area labeled 'GRASS'. Above the grass area, there are two points marked with circles and crosses, labeled 'Borehole 261' and 'Borehole 253'. A north arrow is located in the bottom right corner of the sketch area, with the text 'NOT TO SCALE' above it.			

Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIOP-SB 2		Page Page 2 of 4	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/29/18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
0.5	0-5 3/5'				
1	0-1 2.54 3/2				
1.5	clayey silt				
2	dry silt plaster				
2.5	small 2" sand				
3	fine coarse to medium				
3.5	subrounded at 1'				
4	1'-3'				
4.5	clay still dry	GO			
5	2.54 4/3				
5.5	MAKES 3" tabs				
6					
6.5					
7	5-10' 4/5 Recovery				
7.5	5-8'				
8	SAN				
8.5					
9	9'-9'				
9.5	clayey silt	GO			
10	loose damp				
	not plaster				
	2.54 4/3				

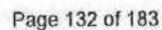
Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIOCE-SB2		Page Page 3 of 4	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 7/29/18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
10.5	10-15 4/5 Recovery				
11.0	10-12 2.54 4/3				
11.5	Silty clay loose soft wet				
12.0	12-14 2.54 4/3				
12.5	Soft clay TOR	0.0			
13.0	Silty clay, soft				
13.5	plastic damp				
14.0	some dark brown matter 5%				
14.5					
15.0	15-20 4.5/5 Recovery				
15.5	Fine to coarse subrounded sand				
16.0	2.54 RSH				
16.5	Damp	0.0			
17.0					
17.5					
18.0					
18.5					
19.0					
19.5					
20.0					

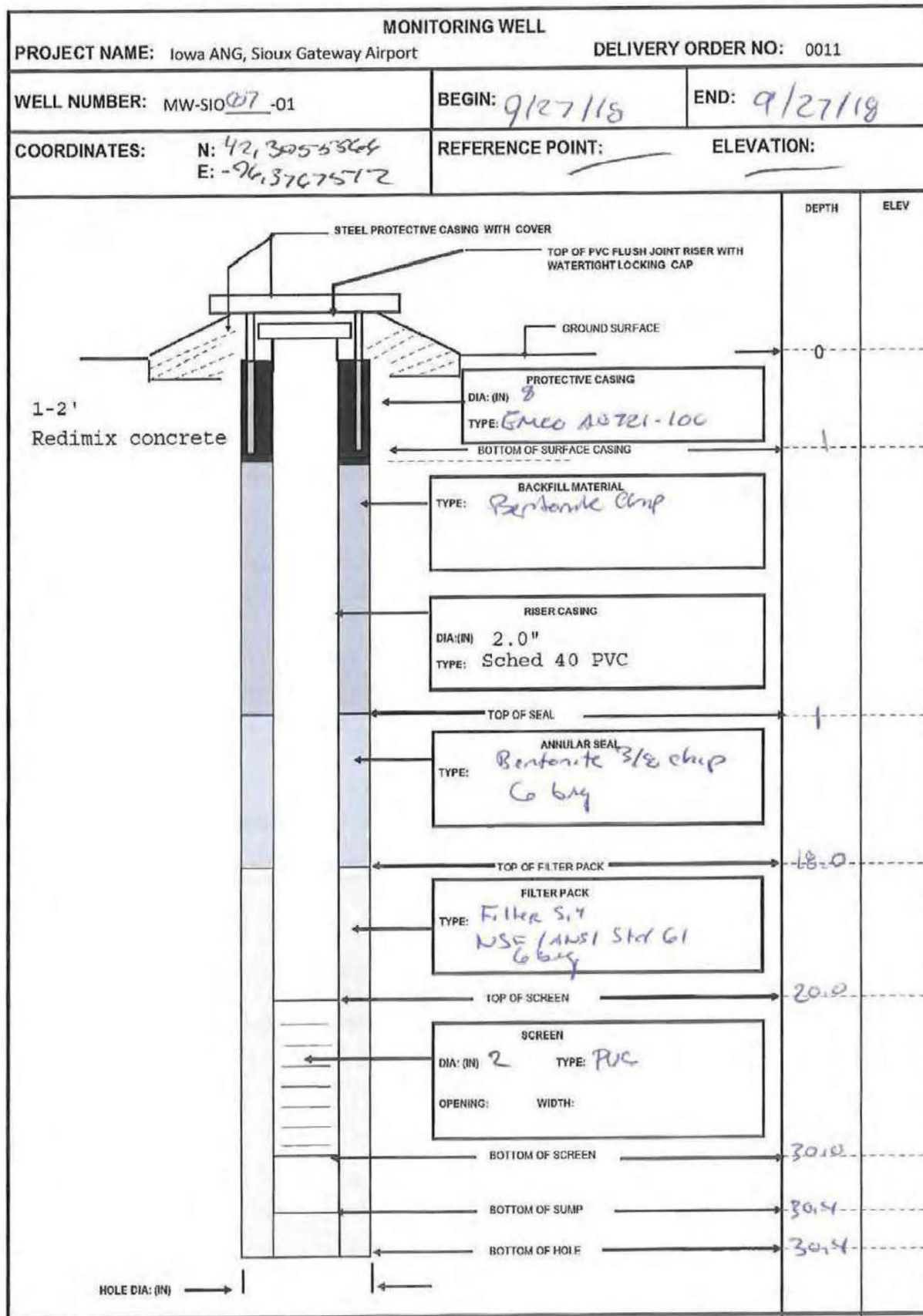
Client/Installation ANG/SIOUX CITY ANGB		Borehole Number SIO ⁰² SB_2		Page Page 4 of 4	
Project FY17 Phase 3 Regional SI for PFOS/PFOA		Inspector Name Timothy Runkle		Date: 9/29/18	
Depth	Description of Materials	Headspace Reading (ppm)	Analytical Sample Interval	Notes:	
20.5	20-25 4/5 Recovery SATURATED MED. COARSE SUB angular to sub rounded SAND 2.54R 5/4	0.0			
21.0					
21.5					
22.0					
22.5					
23.0					
23.5					
24.0					
24.5					
25.0					
25.5					
26.0					
26.5					
27.0					
27.5					
28.0					
28.5					
29.0					
29.5					
30.0					

DELIVERY ORDER NO: 0011

END: 9/27/82

ELEVATION:





MONITORING WELL		
PROJECT NAME: Iowa ANG, Sioux Gateway Airport		DELIVERY ORDER NO: 0011
WELL NUMBER: MW-SIO03-01	BEGIN: 9/26/18	END: 9/26/18
COORDINATES: N: 42.38875714 E: 96.37601802	REFERENCE POINT: ELEVATION: 1097.75'	

	DEPTH	ELEV
1-2' Redimix concrete	GROUND SURFACE → 0 BOTTOM OF SURFACE CASING → 1 TOP OF SEAL → 13 TOP OF FILTER PACK → 13 TOP OF SCREEN → 15 BOTTOM OF SCREEN → 25 BOTTOM OF SUMP → 25.2 BOTTOM OF HOLE → 25.2	
STEEL PROTECTIVE CASING WITH COVER TOP OF PVC FLUSH JOINT RISER WITH WATERTIGHT LOCKING CAP PROTECTIVE CASING DIA: (IN) 8 TYPE: Gaco 10721-106 BACKFILL MATERIAL TYPE: Bentonite 3/8 chips RISER CASING DIA: (IN) 2.0" TYPE: Sched 40 PVC ANNULAR SEAL TYPE: Bentonite 3/8 chips 2 1/2 bags 50 lbs FILTER PACK TYPE: Filter Sil NSF/ANOSI Std. 61 50 Bags - 50 lbs SCREEN DIA: (IN) 2 TYPE: RVC OPENING: WIDTH:		

HOLE DIA: (IN) →

MONITORING WELL			
PROJECT NAME: Iowa ANG, Sioux Gateway Airport		DELIVERY ORDER NO: 0011	
WELL NUMBER: MW-SIO <u>04</u> -01	BEGIN: <u>9/27/18</u>	END: <u>9/27/18</u>	
COORDINATES: N: <u>42,3747436</u> E: <u>-96,3755108</u>	REFERENCE POINT: _____ ELEVATION: _____		

	DEPTH	ELEV
1-2' Redimix concrete	0 1 1 18.0 20.0 30.0 30.4 32	
STEEL PROTECTIVE CASING WITH COVER TOP OF PVC FLUSH JOINT RISER WITH WATERTIGHT LOCKING CAP GROUND SURFACE PROTECTIVE CASING DIA: (IN) <u>8</u> TYPE: <u>Emco A0721-108</u> BOTTOM OF SURFACE CASING BACKFILL MATERIAL TYPE: <u>Bentonite chip</u> RISER CASING DIA: (IN) <u>2.0"</u> TYPE: <u>Sched 40 PVC</u> TOP OF SEAL ANNULAR SEAL TYPE: <u>Bentonite 3/8 chip & bags</u> TOP OF FILTER PACK FILTER PACK TYPE: <u>Fisher Sol NSF/ANSI Std 41 & bags</u> TOP OF SCREEN SCREEN DIA: (IN) <u>2</u> TYPE: <u>PVC</u> OPENING: _____ WIDTH: _____ BOTTOM OF SCREEN BOTTOM OF SUMP BOTTOM OF HOLE HOLE DIA: (IN) _____		

MONITORING WELL			
PROJECT NAME: Iowa ANG, Sioux Gateway Airport		DELIVERY ORDER NO: 0011	
WELL NUMBER: MW-SIO <u>004-02</u>	BEGIN: <u>9/28/18</u>	END: <u>9/28/18</u>	
COORDINATES: N: <u>42.3727821</u> E: <u>-96.2729564</u>	REFERENCE POINT: _____ ELEVATION: _____		

	DEPTH	ELEV
STEEL PROTECTIVE CASING WITH COVER TOP OF PVC FLUSH JOINT RISER WITH WATERTIGHT LOCKING CAP GROUND SURFACE PROTECTIVE CASING DIA: (IN) <u>8</u> TYPE: <u>ENCL A0721-106</u> BOTTOM OF SURFACE CASING BACKFILL MATERIAL TYPE: <u>Bentonite chip</u> RISER CASING DIA: (IN) <u>2.0"</u> TYPE: <u>Sched 40 PVC</u> TOP OF SEAL ANNULAR SEAL TYPE: <u>Bentonite 3/8 chip</u> TOP OF FILTER PACK FILTER PACK TYPE: <u>Filter Sil NSF/ANSI Std 61</u> TOP OF SCREEN SCREEN DIA: (IN) <u>2</u> TYPE: <u>PVC</u> OPENING: _____ WIDTH: _____ BOTTOM OF SCREEN BOTTOM OF SUMP BOTTOM OF HOLE	0 1 13 15 25 25.4 25.4	0 1 13 15 25 25.4 25.4

HOLE DIA: (IN) → _____

MONITORING WELL		DELIVERY ORDER NO: 0011	
PROJECT NAME: Iowa ANG, Sioux Gateway Airport		DELIVERY ORDER NO: 0011	
WELL NUMBER: MW-SIO-02-01	BEGIN: 9/29/18	END: 9/29/18	
COORDINATES: N: 42.34753104 E: -96.13734834	REFERENCE POINT:	ELEVATION:	

1-2' Redimix concrete

STEEL PROTECTIVE CASING WITH COVER

TOP OF PVC FLUSH JOINT RISER WITH WATERTIGHT LOCKING CAP

GROUND SURFACE

PROTECTIVE CASING
DIA: (IN) 8
TYPE: Gmco A0721-106

BOTTOM OF SURFACE CASING

BACKFILL MATERIAL
TYPE: Bentonite chip

RISER CASING
DIA: (IN) 2.0"
TYPE: Sched 40 PVC

TOP OF SEAL

ANNULAR SEAL
TYPE: Bentonite 3/8 chip

TOP OF FILTER PACK

FILTER PACK
TYPE: Filter Silt
NSF/ANSI Std G1

TOP OF SCREEN

SCREEN
DIA: (IN) 2 TYPE: PVC
OPENING: WIDTH:

BOTTOM OF SCREEN

BOTTOM OF SUMP

BOTTOM OF HOLE

DEPTH

ELEV

0

18

20

30

30.4

32.4

HOLE DIA: (IN)

MONITORING WELL			
PROJECT NAME: Iowa ANG, Sioux Gateway Airport		DELIVERY ORDER NO: 0011	
WELL NUMBER: MW-SIO 31-01	BEGIN: 9/29/2018	END: 9/29/2018	
COORDINATES: N: 42,3938259 E: -96,3714920	REFERENCE POINT: ELEVATION:		

	DEPTH	ELEV
1-2' Redimix concrete STEEL PROTECTIVE CASING WITH COVER TOP OF PVC FLUSH JOINT RISER WITH WATERTIGHT LOCKING CAP GROUND SURFACE PROTECTIVE CASING DIA: (IN) 8 TYPE: EMCO A0721-100 BOTTOM OF SURFACE CASING BACKFILL MATERIAL TYPE: Bentonite clay RISER CASING DIA: (IN) 2.0 TYPE: Sched 40 PVC TOP OF SEAL ANNULAR SEAL TYPE: Bentonite 3/4 chip TOP OF FILTER PACK FILTER PACK TYPE: Filter Sil NSF/MSI G1 TOP OF SCREEN SCREEN DIA: (IN) 2 TYPE: PVC OPENING: WIDTH: BOTTOM OF SCREEN BOTTOM OF SUMP BOTTOM OF HOLE HOLE DIA: (IN)	0 1 18 20 30 30.4 30.4	

APPENDIX B

GROUNDWATER SAMPLING LOGS

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GROUND WATER LOW-FLOW PURGE/DEVELOPMENT SHEET

PROJECT NAME: Iowa ANG, Sioux Gateway Airport

DELIVERY ORDER 0011

DATE: 10/10/19

TIME: 1130

WELL ID NUMBER: MW-SIO03-01

DEPTH OF SCREENED INTERVAL (to notch): 15 ft. to 25 ft.

INNER CASING: TYPE: PVC ID: 2 inches / 4 inches

WATER QUALITY METER ID: YSI

WATER LEVEL INDICATOR ID: Solinst

PUMP ID: Sample Pro

TURBIDITY ID: Hanna

PID ID: Mini RAC

DEPTH TO WATER: 20.15 FT FROM MEASURE POINT

DEPTH TO TOP OF SCREEN: 15 FT FROM MEASURE POINT

DEPTH TO PUMP INTAKE: 22.5 FT FROM MEASURE POINT

PURGE/SAMPLE METHOD: ☐ Monsoon ☐ Peristaltic Pump ☒ Other Pump Type _____

PURGE START TIME: 1145 PURGE END TIME: 1224

TOTAL VOLUME PURGED: 142 (ml)

S&A PLAN SAMPLING PROCEDURE FOLLOWED: ☒ Yes ☐ No IF NO, WHY WAS A DEVIATION NECESSARY: _____

RECORDED BY: [Signature]

(Signature)

QA CHECKED BY: _____

(Signature)

GROUND WATER LOW-FLOW PURGE/DEVELOPMENT LOG

WELL ID: MW-SIO2301

PROJECT NAME: Iowa ANG, Sioux Gateway Airport

DELIVERY ORDER 0011

[illegible]

RECORDED BY:

(Signature)

QA CHECKED BY:

(Signature)

SAMPLE COLLECTION-NEW WELL

PROJECT NAME: Iowa ANG, Sioux Gateway Airport

DELIVERY ORDER 0011

DATE: 10/10/18

TIME: 1220

Sample Location: MW-SIO03-01

SAMPLE ID NUMBER:	MW-SIO03-01-01
SAMPLE LOCATION:	MW-SIO03-01
SAMPLE DEPTH:	22.5
SAMPLING POINT:	TOC
SAMPLE MEDIA:	GW
SAMPLE TYPE	Grab

FIELD	READING	UNITS	H&S (Y/N)
Conductivity	1314	μS/cm	Y
DO	0.93	mg/L	Y
ORP	6.3	mV	Y
Temperature	13.17	°C	N
Turbidity	24.5	NTUs	Y
pH	8.10	S.U.	Y
PID	0.0	ppm	X

COMMENTS: Collect FB-02 @ 1155

NO. CONTAINERS & VOLUME	CONTAINER TYPE	ANALYSIS	PRESERVATION TYPE (TYPE/VOL)	LABORATORY	COLLECTION CODE**
2 ea - 250-mL polypropylene with polypropylene cap		PFOS/PFOA	Cool to 4°C ±2°	SAC	X

** "X" analysis collected; "IS" insufficient volume; "NR" not required; define other code as appropriate

SAC - TestAmerica Sacramento

GROUND WATER LOW-FLOW PURGE/DEVELOPMENT SHEET

PROJECT NAME: Iowa ANG, Sioux Gateway Airport

DELIVERY ORDER 0011

DATE: 10/10/2018

TIME: 0810

WELL ID NUMBER: MW-SIO 02-01

DEPTH OF SCREENED INTERVAL (to notch): 20 ft. to 30 ft.

INNER CASING: TYPE: PVC ID: 2 inches / 4 inches

WATER QUALITY METER ID: YSI

WATER LEVEL INDICATOR ID: Selinst

PUMP ID: Sample Pic

TURBIDITY ID: Hanna

PID ID: Mini-RAE

CPM = 4
PSI = 20

DEPTH TO WATER: 19.73 FT FROM MEASURE POINT

DEPTH TO TOP OF SCREEN: 20 FT FROM MEASURE POINT

DEPTH TO PUMP INTAKE: 30" ~ 25' FT FROM MEASURE POINT

PURGE/SAMPLE METHOD: ☐ Monsoon ☐ Peristaltic Pump ☒ Other Pump Type Bladder

PURGE START TIME: 0930

PURGE END TIME: 0930

TOTAL VOLUME PURGED: 200 gals

S&A PLAN SAMPLING PROCEDURE FOLLOWED: ☒ Yes ☐ No IF NO, WHY WAS A DEVIATION NECESSARY: _____

RECORDED BY: Tina M. [Signature]
(Signature)

QA CHECKED BY: _____
(Signature)

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Appendix E.3

Preliminary Site Inspection Report

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FINAL

**PERFLUORINATED COMPOUNDS PRELIMINARY ASSESSMENT
SITE VISIT REPORT**

**IOWA AIR NATIONAL GUARD
185TH AIR REFUELING WING
SIOUX CITY, IOWA**



Prepared For:

**Headquarters Air National Guard
Joint Base Andrews, Maryland**

February 2016

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FINAL

**PERFLUORINATED COMPOUNDS PRELIMINARY ASSESSMENT
SITE VISIT REPORT**

**IOWA AIR NATIONAL GUARD
185TH AIR REFUELING WING
SIOUX CITY, IOWA**



Prepared For:

**Headquarters Air National Guard
Joint Base Andrews, Maryland**

Prepared By:

**BB&E, Inc.
February 2016**

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LIST OF ACRONYMS

185 th ARW	185 th Air Refueling Wing
AFFF	Aqueous Film Forming Foam
AGE	Aerospace Ground Equipment
ANGB	Air National Guard Base
AOC	Area of Concern
BB&E	BB&E, Inc.
bgs	below ground surface
FTA	Fire Training Area
HEF	high expansion foam
IRP	Installation Restoration Program
OWS	oil water separator
PA	Preliminary Assessment
PFCs	Perfluorinated Compounds
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
PHAL	Provisional Health Advisory Levels
SI	Site Investigation
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey

1.0 INTRODUCTION

A preliminary assessment (PA) site visit was conducted by BB&E, Inc. (BB&E) on 3 November 2015 at the 185th Air Refueling Wing (185th ARW) located at Sioux Gateway Airport/Colonel Bud Day Field in Sioux City, Iowa. The site location is shown on Figure 1. The purpose of the trip was to identify potential sites of historic environmental releases of perfluorinated compounds (PFCs), specifically from Aqueous Film Forming Foam (AFFF) usage and storage, as shown on Figure 2. Prior to the site visit, BB&E conducted research of any documented Fire Training Areas (FTAs) in operation since 1970, or any other use or release of AFFF in accordance with the Final PFC Preliminary Assessment Work Plan (BB&E, 2015). During the site visit, BB&E conducted personnel interviews, reviewed on-site documentation and toured each potential site.

Individuals contributing to this PA effort included the following:

- Lieutenant Colonel Neil Stockfleth – 185th ARW Environmental Manager
- Chief Master Sergeant Mike Albrecht – 185th ARW Fire Chief
- Mr. Mark Kock – Fire Prevention Program, Inspection and Maintenance
- Mr. David Miller – Paint Facility Manager
- Mr. Mike Dietrich – Real Property Manager
- Lieutenant Colonel Gary Prescott - Base Engineer
- Major Kris Aldrich – Base Engineer
- Captain Adam McIntyre – Deputy Base Engineer

Representative photos of the subject sites taken during the site visit are attached as Appendix A.

Sections 2.0 and 3.0 of this report outline the potential PFC sources identified on the 185th ARW property during the records review and site visit, while Section 4.0 provides conclusions and recommendations for potential follow-on actions. References are included in Section 5.0 and supporting documentation in the Appendices.

1.1 Hydrogeologic Setting

The following information was obtained from the Final Work Plan for the Regional Compliance Restoration Program Preliminary Assessment/Site Investigation dated September 2015 (URS 2015). The Sioux City Air National Guard Base (ANGB) is situated within the Missouri Alluvial Plain Physiographic Province. The alluvial sediments extend an average of 110 feet beneath the surface and consist of unconsolidated clay, silt, sand, and gravel. The underlying bedrock consists of Cretaceous sedimentary rocks that dip toward the northwest at approximately 4 feet per mile. The uppermost bedrock unit is Carlile Shale, a thinly laminated, calcareous marine shale with a minimum thickness in Iowa of approximately 80 feet. The shale formation is underlain by approximately 30 feet of Greenhorn Limestone, a fossiliferous, chalky, shale limestone. The Greenhorn Formation is underlain by the Dakota, which consists of an upper layer of interbedded shale, siltstone and sandstone, and a lower layer of sandstone. Paleozoic limestones, dolomites, shales, and sandstones underlie the Cretaceous formations described above. These formations slope toward the south-southeast at approximately 18 feet per mile, and they occur under the airport at approximately 737 feet below ground surface (bgs).

The airport is located approximately 2 miles east of the Missouri River, which flows south along the western border of Iowa. The Big Sioux and Floyd Rivers join the Missouri River in the downtown area of Sioux City, upstream of Sioux City ANGB. The Missouri River and most of its natural surface water drainage tributaries within the floodplain have been channeled and straightened. Drainage ditches along most of the roads in the area collect highway and crop land runoff for eventual discharge to the larger, channeled tributaries.

The shallow aquifer associated with the Missouri River Valley is unconfined, comprised of unconsolidated gravels, sands, silts, and clays. Variations in lithology may affect the formation of localized areas with confined or semi-confined conditions. Groundwater in the aquifer occurs from just below the ground surface in topographically low areas to approximately 20 feet bgs at higher elevations. The groundwater gradient is directed toward the Missouri River or its tributaries. The Dakota Aquifer, comprised of the sandstones of the Dakota Formation, is confined by the shales within the Dakota Formation and other Cretaceous shales and limestones.

The aquifer is approximately 75 feet thick beneath the airport, occurring at about 190 feet bgs, and extends across most of northwestern Iowa. Groundwater within the aquifer flows toward the southwest, along a hydraulic gradient of approximately 5 feet per mile.

The Ordovician-Cambrian Aquifer exists beneath the Dakota Formation and is confined by overlying shales. This aquifer extends over the western area of Iowa. Additional localized aquifers may occur within the Paleozoic formations beneath the Ordovician-Cambrian Aquifer.

Surface water information is included in Section 3.2.4.

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2.0 FIRE TRAINING AREAS

Based on this PA investigation, there is no evidence that a FTA is, or was located, within the current footprint of the 185th ARW site boundary. Two historic FTAs were noted by facility personnel; however they are not located within the current boundary. A map of these FTAs was provided by facility personnel and has been included in Appendix B.

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3.0 NON-FIRE TRAINING AREAS

Non-FTA Areas of Concern (AOCs) are sites where AFFF has been released and may include crash sites, hangars, fuel spill areas, hazardous waste storage facilities, firefighting equipment testing areas, etc. The following section includes a description of any non-fire training AOCs, operational history, waste characteristics, and pathway evaluations.

3.1 AOC Description, Operational History, and Waste Characteristics

The following are the Non-FTA AOCs that were identified during this PA Investigation.

3.1.1 Aerospace Ground Equipment (AGE) (Building 252)

The Aerospace Ground Equipment (AGE) (Building 252), was formerly the Fuel Cell Repair Hangar. The building was constructed 1979, and previously utilized an AFFF suppression system. The system was removed when the mission was changed in 2004. Facility personnel recalled two inadvertent system releases, although had no recollection of when they occurred. The system was tested on average annually by releasing approximately 30 gallons of foam. The foam would slowly drain into the building's trench drain which discharges to the sanitary sewer via an oil water separator (OWS). Facility personnel believed that excess foam would likely have been pushed out of the building to the apron southwest of the building and allowed to dissipate.

3.1.2 Main Hangar (Building 261)

The Main Hangar (Building 261) was constructed in approximately 1957. The hangar was previously equipped with an AFFF fire suppression system, however it was converted to a High Expansion Foam (HEF) system in 2003. Facility personnel recalled two inadvertent releases of AFFF that partially filled the building with foam. One release occurred in the mid-1980s and one occurred in approximately 2000. The system was tested on average biannually by releasing approximately 30 gallons of foam. The foam would slowly drain into the building's trench drain which discharges to the sanitary sewer via an OWS. Facility personnel believed that excess foam was pushed out of the building onto the apron southwest of the building and allowed to dissipate.

3.1.3 ANG Paint Facility (Building 241)

The ANG Paint Facility (Building 241) was constructed in approximately 1953. The hangar is equipped with an AFFF fire suppression system. The system was tested on average annually by releasing approximately 30 gallons of foam. The foam would slowly drain into the building's trench drain which discharges to the sanitary sewer via an OWS. Facility personnel believed that excess foam was pushed out of the building onto the apron north of the building and allowed to dissipate.

3.1.4 Apron

The concrete apron is the parking area for aircraft. For the most part, stormwater on the apron would flow in a southern direction and enter the stormwater conveyance system. The stormwater discharges to Stormwater Sewer System Outfall 1 (See Section 3.1.8). No known releases of AFFF were reported by 185th ARW personnel, however due to the nature of the use of the apron for aircraft operations, there is the potential that AFFF was used in the area.

3.1.5 Fire Station (Building 286)

The Fire Station, Building 286, was constructed in 2006. Vehicles containing AFFF are stored in the engine bay of the Fire Station where they are also refilled with AFFF using an AFFF fill system. The overhead AFFF fill system includes an elevated storage 1000-gallon, single walled tank with no secondary containment. In 2012, a leak of approximately 50 gallons of AFFF discharged to the sanitary sewer via the trench drain. The release report has been included in Appendix C-1. Following the release, each of the trench drains has been fitted with a plug. Other than the 2012 release, facility personnel only noted small drips. Typically vehicle washing occurs inside the Fire Station, however occasionally vehicle washing occurs on concrete southwest of the overhead doors.

3.1.6 Security Forces (Building 284)

The Security Forces Building was the former Fire Station until 2006. The building was constructed in 1989 and was owned by Sioux City until approximately 2003, when it was transferred to the ANG. Vehicles containing AFFF were stored and refilled inside the building. Trench drains were located inside the building in the apparatus bays and removed when it was

remodeled. According to Fire Station personnel, minor releases of AFFF likely occurred during filling of equipment.

3.1.7 Nozzle Testing Location

The fire department conducted nozzle testing at the paved area southwest of Building 286 and southwest of the overhead doors at Building 284. Foam was allowed to dissipate. Typically 3-4 gallons of AFFF per vehicle were discharged once per month.

3.1.8 Stormwater Sewer System Outfall 1

According to the 185th ARW Industrial Storm Water Management Guidance Manual, the 185th ARW property is comprised of eleven drainage areas. Drainage areas 1-10 discharge at several locations along the main storm sewer whose eventual outlet is located at Stormwater Sewer System Outfall 1, which discharges to a ditch along Harbor Drive.

3.1.9 Stormwater Sewer System Outfall 2

According to the 185th ARW Industrial Storm Water Management Guidance Manual, the 185th ARW property is comprised of eleven drainage areas. Drainage area 11, which encompasses the ANG Paint Facility, discharges to a single outlet (Stormwater Sewer System Outfall 2), which then discharges to a ditch along Perimeter Road.

3.1.10 Hazmart Pharmacy (Building 281)

55-gallon containers of AFFF are stored in this building on secondary containment pallets. No known releases have occurred at this location.

3.1.11 Supply Warehouse (Building 280)

The installation receives shipments of AFFF at this building. Storage is short term (less than 48 hours), then the containers are transferred to the Hazmart Pharmacy or the Fire Station. AFFF is typically stored on secondary containment, no known releases of AFFF have occurred here.

3.2 Pathway and Environmental Hazard Assessment

The following is a preliminary evaluation of the threats and targets associated with each exposure pathway.

3.2.1 Groundwater

No documentation was available showing that groundwater at the 185th ARW has been tested for PFCs; therefore it is unknown whether PFCs are present in the groundwater. Based on historical practices, PFCs may be present in the groundwater in the areas of the AGE (Building 252), the Main Hangar (Building 261), ANG Paint Facility (Building 241), the Apron, the Fire Station (Building 286), the Security Forces (Building 284), the Nozzle Testing Location, Stormwater Sewer Outfall 1, and Stormwater Sewer Outfall 2.

3.2.1.1 Water Wells

A review of the EDR Radius MapTM Report with Geocheck® dated October 9, 2015 shows 189 wells within a one-mile radius of the 185th ARW as listed in the Federal Reporting Data System database, United States Geological Survey (USGS) database, and the Iowa Well Registration Database (EDR, 2015). Three wells are listed as USGS wells. No public water supply system was found within a one mile radius of the 185th ARW. The EDR Radius MapTM Report has been included as Appendix C-3.

The following was obtained from the Final Record of Decision IRP Sites 1 through 5 dated January 2013 (NGB/A7OR 2013). There are currently no drinking water supply wells at the Base and the shallow groundwater system in the area of the Base is not used as a drinking water source. The nearest municipal water supply wells are located approximately one mile east of the Base, serving the City of Sergeant Bluff, Iowa. Sioux City obtains its potable water from groundwater wells drawing on the alluvial aquifer and the Dakota aquifer. These wells are located 1.5 miles west of the Base and eight miles north of the Base. Several farms south of the Base obtain water from wells installed in the alluvial aquifer. Per information provided at a meeting of the Sioux City Source Water Protection Team on 3 December 2015, the city has long-term plans to expand the collector well field in the alluvial aquifer 1.5 miles west of the Base.

3.2.2 Soil

No documentation was available showing that soils at the 185th ARW have been tested for PFCs; therefore it is unknown whether PFCs are present in the soil. Based on historical practices, they may be present in the soil in the areas of the AGE (Building 252), the Main Hangar (Building 261), the ANG Paint Facility (Building 241), the Apron, the Fire Station (Building 286), the Security Forces Building (Building 284), the Nozzle Testing Location, Stormwater Sewer Outfall 1, and Stormwater Sewer Outfall 2.

In their anionic forms, perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) are water soluble and can migrate readily from soil to groundwater. The United States Environmental Protection Agency (USEPA) has not established Provisional Health Advisory Levels (PHALs) for PFOS and PFOA in soil (USEPA, 2014). The primary exposure pathway for PFOS and PFOA would be the ingestion of contaminated drinking water.

3.2.3 Sediment

No documentation was available showing that sediments at the 185th ARW have been tested for PFCs; therefore it is unknown whether PFCs are present in sediments. Based on historical practices, PFCs could be present in sediment in locations that have received drainage from the site, including the stormwater sewer system and the stormwater sewer system outfalls.

3.2.4 Surface Water

According to the Final Record of Decision Installation Restoration Program (IRP) Sites 1 through 5 dated January 2013 (NGB/A7OR 2013), the surface water hydrology of the area around the Base is dominated by the Missouri River located two miles west of the Base and its numerous tributaries. On the Base itself, surface water runoff is controlled by pavement, collected by the stormwater system, and is discharged to a ditch which parallels Harbor Drive east of the Base. Until 1984, water within the ditch had no downstream outlet and either evaporated or recharged into the alluvial aquifer. In 1984, the Harbor Drive ditch was reconstructed to provide a discharge to the Missouri River.

Based upon reported AFFF usage at the 185th ARW, PFCs could be present in surface water within the stormwater sewer system. According to the 185th ARW Industrial Storm Water Management Guidance Manual, the 185th ARW property is comprised of eleven drainage areas. Drainage areas 1-10 discharge at several locations along the main storm sewer, whose eventual outlet is located at Stormwater Sewer System Outfall 1, which discharges to a ditch along Harbor Drive. Drainage area 11, which encompasses the ANG Paint Facility, discharges to a single outlet that then discharges to a ditch along Perimeter Road (Stormwater Sewer System Outfall 2). It is important to note that the ditch along Harbor Drive receives drainage from many facilities in addition to the drainage from the 185th ARW property, including the Sioux Gateway Airport.

A figure showing the stormwater sewer system, including drainage basins and outfalls is included in Appendix C-2.

4.0 FINDINGS AND CONCLUSIONS

Eleven potential AOCs have been identified at the 185th ARW during this PA. Of these eleven sites, nine are recommended for further investigation.

Further investigation is recommended at the 185th ARW to characterize potential soil, groundwater, surface water, and sediment PFC contamination. In addition, verification of the structural integrity of the existing OWS systems and connected sanitary sewer is also advised.

Table 1 summarizes the recommendation and rationale for each potential AOC identified at the Base.

Table 1: Preliminary Assessment Report Summary and Recommendations

No.	Potential AFFF PFC AOC	GPS Coordinates		Rationale	Recommendation
		Latitude	Longitude		
1	AGE (Building 252)	42.393864°	-96.370806°	Previously utilized AFFF fire suppression system. Known AFFF releases. Trench drains lead to sanitary via an OWS.	Proceed to SI, focus on soil and groundwater.
2	Main Hangar (Building 261)	42.395417°	-96.372651°	Previously utilized AFFF fire suppression system. Known AFFF releases. Trench drains lead to sanitary via OWS.	Proceed to SI, focus on soil and groundwater.
3	ANG Paint Facility (Building 241)	42.389079°	-96.375408°	Current AFFF fire suppression system. Known AFFF releases. Trench drains lead to sanitary via OWS.	Proceed to SI, focus on soil and groundwater.
4	Apron	42.394150°	-96.373444°	Potential for AFFF releases in this area.	Proceed to SI. Focus on soil and groundwater.
5	Fire Station (Building 286)	42.395917°	-96.376051°	Potential for AFFF releases in this area.	Proceed to SI. Focus on soil and groundwater at the southern portion of the apron.
6	Security Forces (Building 284)	42.396479°	-96.376749°	Potential for AFFF releases in this area.	Proceed to SI. Focus on soil and groundwater at the southern portion of the apron.
7	Nozzle Testing Location	42.395212°	-96.376373°	Nozzle testing was conducted on paved area adjacent to Building 284.	Proceed to SI. Focus on soil and groundwater.

AFFF – Aqueous Film Forming Foam

PFC – Perfluorinated Compound

AOC – Area of Concern

GPS – Global Positioning System

NFA- No Further Action

OWS – Oil/Water Separator

SI – Site Investigation

Table 1 Continued: Preliminary Assessment Report Summary and Recommendations

No.	Potential AFFF PFC AOC	GPS Coordinates		Rationale	Recommendation
		Latitude	Longitude		
8	Stormwater Sewer System Outfall 1	42.392771°	-96.370118°	Potentially received stormwater impacted with AFFF.	Proceed to SI, focus on surface water and sediment.
9	Stormwater Sewer System Outfall 2	42.388817°	-96.372800°	Potentially received stormwater impacted with AFFF.	Proceed to SI, focus on surface water and sediment.
10	Hazmart Pharmacy (Building 281)	42.397395°	-96.374585°	55-gallon drums of AFFF stored on secondary containment. No known releases.	NFA
11	Supply Warehouse (Building 280)	42.397688°	-96.373903°	55-gallon drums of AFFF temporarily stored on secondary containment. No known releases.	NFA

AFFF – Aqueous Film Forming Foam

PFC – Perfluorinated Compound

AOC – Area of Concern

GPS – Global Positioning System

NFA- No Further Action

OWS – Oil/Water Separator

SI – Site Investigation

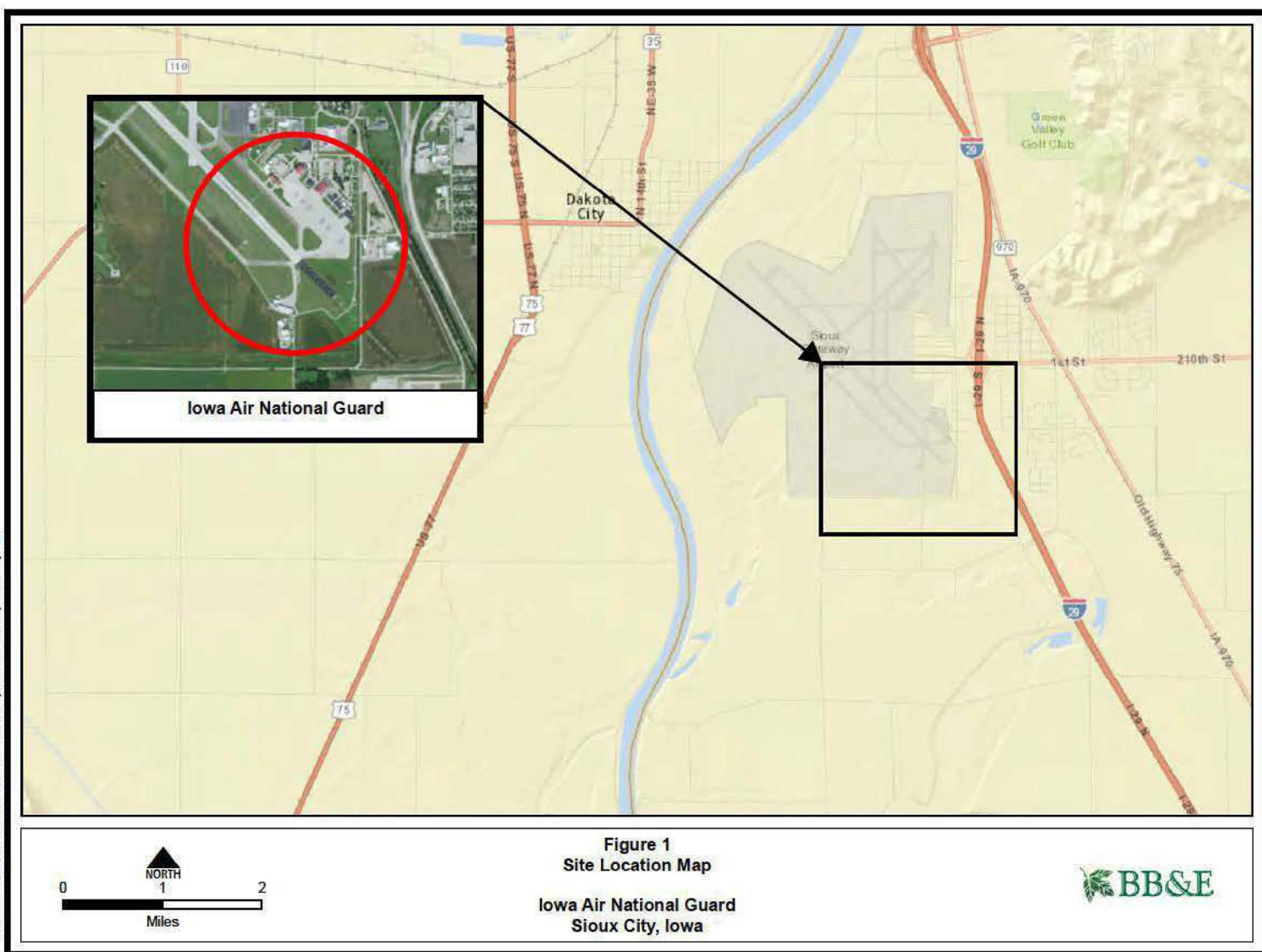
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5.0 REFERENCES

- BB&E, 2015. Final Perfluorinated Compound (PFC) Preliminary Assessment Work Plan, Prepared for Headquarters Air National Guard Andrews AFB, Maryland. July.
- EDR, 2015. EDR Radius Map™ Report with Geocheck®. September.
- NGB/A7OR, 2013. Final Record of Decision IRP Sites 1 through 5. January.
- URS, 2015. Final Work Plan for the Regional Compliance Restoration Program Preliminary Assessment/Site Investigation. September.
- USEPA, 2014. Peer Review of Health Effects Documents for PFOA and PFOS. February.

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FIGURES



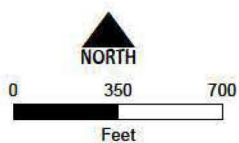
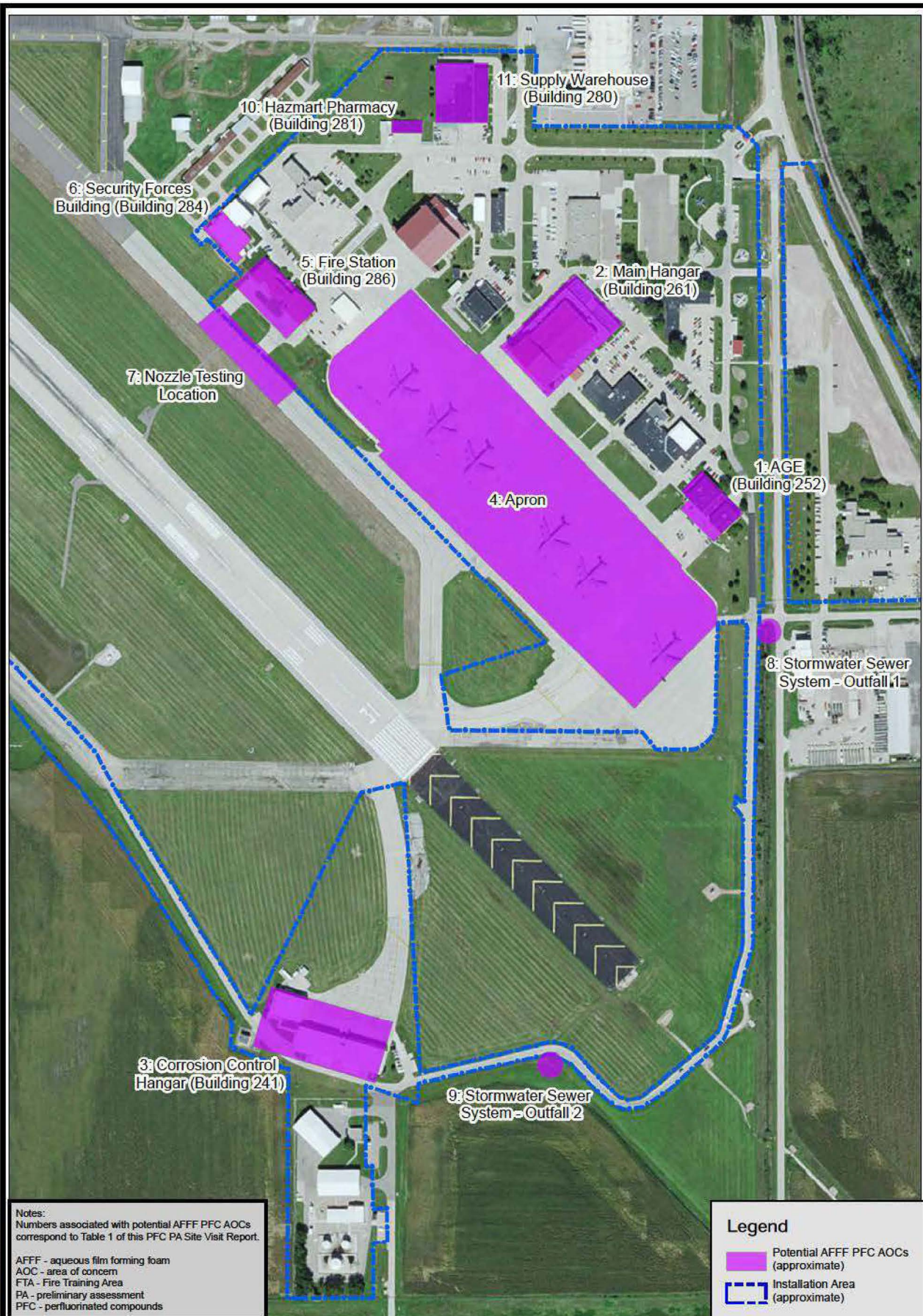


Figure 2
Site Features and Potential AOCs

Iowa Air National Guard
Sioux City, Iowa



APPENDIX A

PHOTO DOCUMENTATION

Appendix A
185th Air Refueling Wing, PFC PA Site Visit, Sioux City Iowa – November 3, 2015



Photo 1: Trench drain in Building 252



Photo 2: Location where AFFF would have been pushed out of Building 252

Appendix A
185th Air Refueling Wing, PFC PA Site Visit, Sioux City Iowa – November 3, 2015



Photo 3: Floor drain in Building 261 – Main Hangar



Photo 4: Inside Building 261 – Main Hangar

Appendix A
185th Air Refueling Wing, PFC PA Site Visit, Sioux City Iowa – November 3, 2015



Photo 5: HEF discharge system inside Building 261 – Main Hangar (former location of AFFF storage)



Photo 6: Northwest portion of the location where AFFF would have been pushed out of Building 261 –
Main Hangar

Appendix A
185th Air Refueling Wing, PFC PA Site Visit, Sioux City Iowa – November 3, 2015



Photo 7: Building 241 – ANG Paint Facility

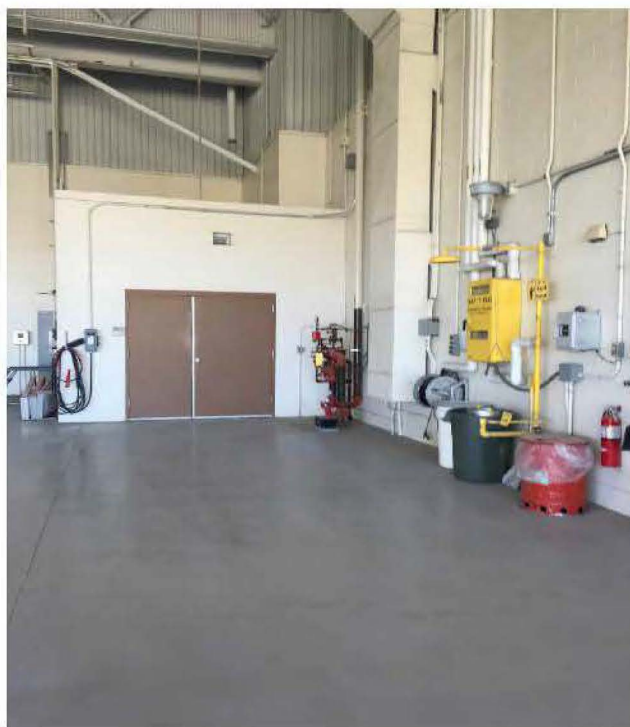


Photo 8: Foam cannon in Bay 1 of Building – 241 ANG Paint Facility

Appendix A
185th Air Refueling Wing, PFC PA Site Visit, Sioux City Iowa – November 3, 2015

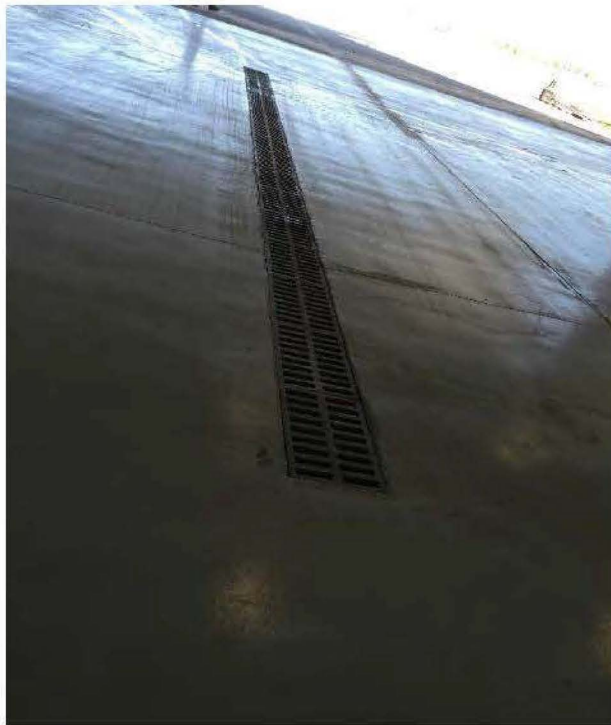


Photo 9: Trench drain by Bay 1 of Building 241 – ANG Paint Facility



Photo 10: AFFF storage tank in Building 241 – ANG Paint Facility

Appendix A
185th Air Refueling Wing, PFC PA Site Visit, Sioux City Iowa – November 3, 2015



Photo 11: Ditch southeast of Building 241 – ANG Paint Facility drainage



Photo 12: Concrete apron north of Building 241 – ANG Paint Facility (Bays 1 and 2)

Appendix A
185th Air Refueling Wing, PFC PA Site Visit, Sioux City Iowa – November 3, 2015



Photo 13: Building 286 – Current Fire Station

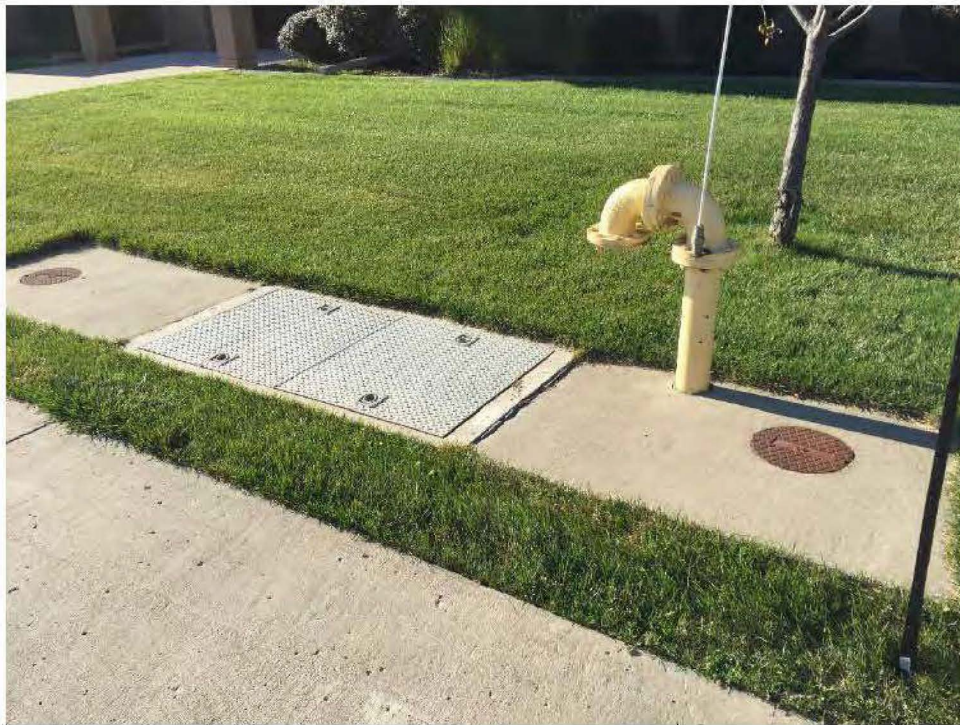


Photo 14: One of two sand traps associated with Building 286 – Current Fire Station

Appendix A
185th Air Refueling Wing, PFC PA Site Visit, Sioux City Iowa – November 3, 2015

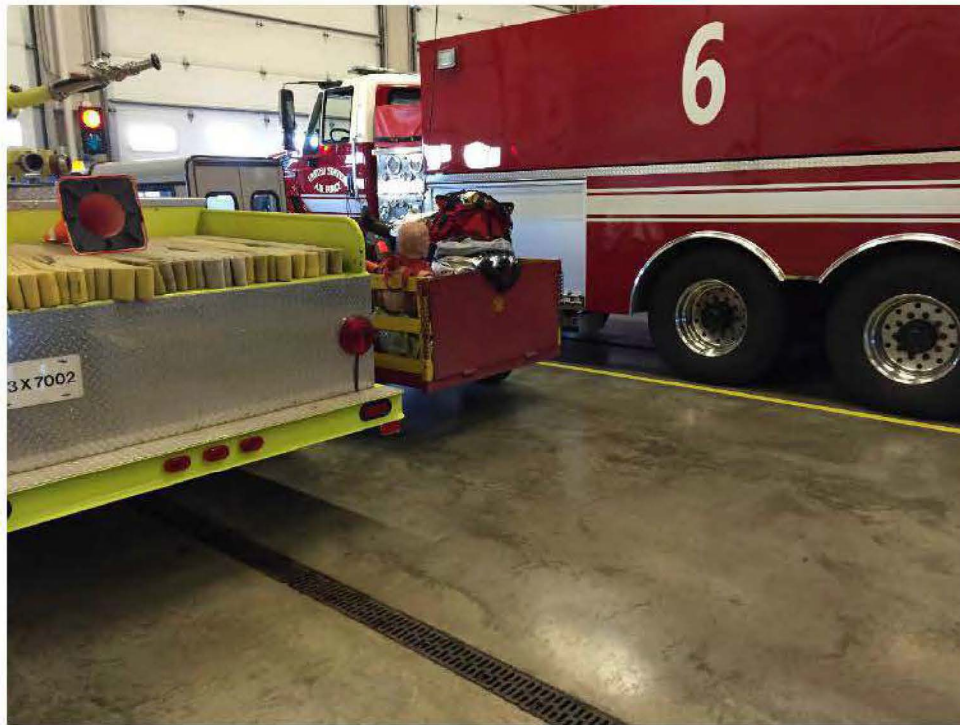


Photo 15: Trench drain and foam trailer inside Building 286 – Current Fire Station

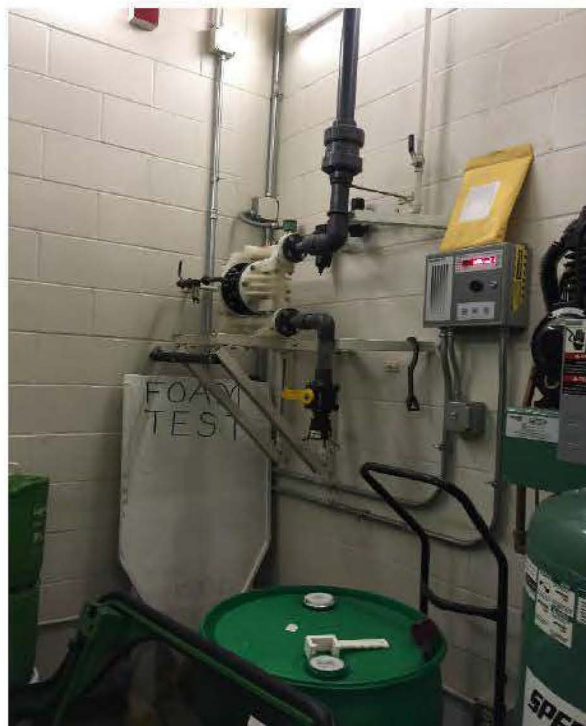


Photo 16: Pump for filling overhead AFFF fill system from drum in Building 286 – Current Fire Station

Appendix A
185th Air Refueling Wing, PFC PA Site Visit, Sioux City Iowa – November 3, 2015



Photo 17: Trench train with drain plug in Building 286 – Current Fire Station



Photo 18: Trench train across drive at Building 286 – Current Fire Station (adjacent to nozzle testing area)

Appendix A
185th Air Refueling Wing, PFC PA Site Visit, Sioux City Iowa – November 3, 2015



Photo 19: Building 284 – Former Fire Station (Current Security Forces Building)



Photo 20: Lawn area southwest of Building 284 – Current Fire Station where nozzle testing occurred

Appendix A
185th Air Refueling Wing, PFC PA Site Visit, Sioux City Iowa – November 3, 2015



Photo 21: Lawn area northwest of Building 284 – Former Fire Station where nozzle testing occurred



Photo 22: Stormwater Sewer System outfall (looking south where sewer daylights)

Appendix A
185th Air Refueling Wing, PFC PA Site Visit, Sioux City Iowa – November 3, 2015

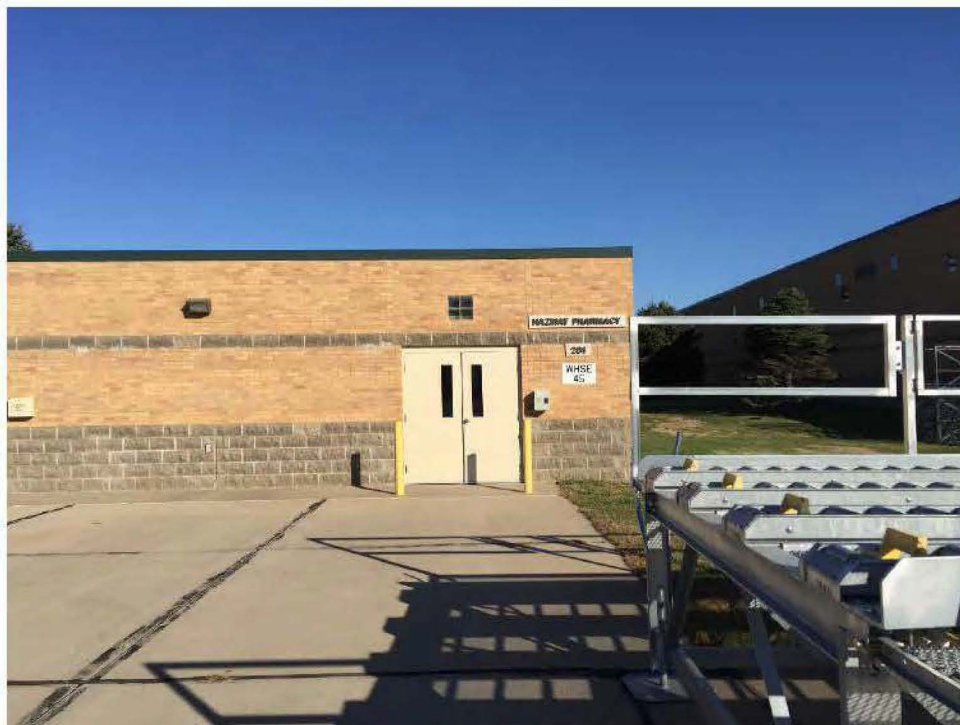


Photo 23: Building 281 – Hazmat Pharmacy (location of AFFF drum storage)



Photo 24: AFFF drum storage in Building 281 – Hazmat Pharmacy

APPENDIX B

RECORDS OF COMMUNICATION

**Interview Questions regarding AFFF use
(At Present and back to 1970)**

1. When did AFFF first start being used on this installation?

1977 when the unit converted to A-7's.

2. What are the years of active use for each Fire Training Area (FTA), Aircraft Hangar, Fire Department, other places AFFF may have been used (collectively Potential Areas of Concern (PAOC))?

1970's up to 1990

3. What type of AFFF is used or has been used on this installation (i.e. 3%, 6%, High Expansion Foam)?

3% and HEF

4. What manufacturer's AFFF products are used or were used on this installation (i.e. 3M, Ansul, Chemguard, etc.)?

3M and Ansul

5. Did you ever dispose of old bulk AFFF, if so, when and where?

No, too expensive

6. Is the AFFF stored as a mixed solution (3% or 6%) or do you formulate the AFFF on the installation?

Stored as 3% mixed solution

7. If AFFF is formulated on base, where is the solution mixed, contained, transferred, etc.?

N/A

8. Are your automated fire suppression systems currently charged with AFFF or have they been retrofitted for use of high expansion foam?

1 system has AFFF, installed in 2000 and 2 systems with HEF

9. If retrofitted, when was that done?

10. Do you have an inventory of the amount of AFFF stored on the installation, now and in the past, or present in automated fire suppression systems? Were retention ponds built to store discharged AFFF? Was the AFFF trickled to the sanitary sewer or left in the pond to infiltrate?

Yes we keep an inventory of AFFF. Retention ponds were never built in the past.

11. Provide a list of vehicles that carried AFFF, now and in the past, and where are/were they located? Any vehicles have a history of leaking AFFF?

C-3, C-5, C-7, C-10, and C-11 currently. Historically all ARFF vehicles have been located in the fire stations.

12. How much AFFF (gallons) is/was carried/stored in the specified vehicles?

Currently approx. 2465 gallons

13. Do you ever dispose of unused AFFF? If so, how and where?

No

14. Has unused AFFF ever been disposed of in the past? If so, how and where?

No

15. Do you/did you test the vehicles spray patterns to make sure equipment is working properly?

Yes

16. How often are/were these spray tests performed and can you provide the locations of these tests, now and in the past?

Monthly, we can provide locations back to 1987.

17. Can you describe the procedure on how vehicles and systems are/were supplied with AFFF?

Overhead fill stands currently for ARFF vehicles, also AFFF trailer and pump. In the past it was done using 5 gallon buckets by hand.

18. Can you provide the procedures on how these vehicles are/were cleaned/decontaminated and where vehicle cleaning is performed currently as well as performed in the past?

Vehicle cleaning is done in the wash bay located in the fire station or at the vehicles assigned bay. Occasionally vehicles are pulled outside and done on the concrete outside the parking bays.

19. Is/was there a specified area on the installation where vehicles are filled with AFFF and does this area have secondary containment in case of spills?

Vehicles are filled with AFFF at the fire station and there is secondary containment.

*trench drains modified w/ pipe to be secondary for SS spill on drums
Containment. Swepped & inspected for foam per release.*

20. When a release of AFFF occurs during a fire training exercise, now and in the past, how is the AFFF cleaned and disposed of?

Currently there are no releases of AFFF. In the past the product was allowed to filter into the ground.

21. How many FTAs are/were on this installation and where are they?

2 see attached map.

22. How many FTAs are active and inactive?

2 and they are inactive.

23. What types of fuels/flammables were used at the FTAs?

JP-4

24. For inactive FTAs, when was the last time that fire training using AFFF was conducted at them? Find out ahead of time in Admin Record for former FTAs.

To the best of my knowledge 1990. — foam was used with foam applicator.
3-4 times per year

25. What are/were the non-FTA locations where PFCs or AFFF release systems are installed (i.e. Hangars, Wastewater Treatment Plants, Fire Stations, etc.)? Where are/were these locations (Building numbers)?

See attachment

26. Do you have a list (Building names and numbers, current and demolished) where the fire suppression systems either currently contain or have contained AFFF?

N/A

27. Do you have records of fuel spill logs and emergency response logs? Knowledge of aircraft mishaps/crashes?

No - not used as precautionary measure

28. Do you have recollection or records of AFFF being used as a precaution in response to fuel releases to prevent fires?

No

29. Do you have recollection or records of historical emergency response sites (i.e. crash sites and fires) where AFFF was used?

See attachment no responses onsite

30. Do you have recollection or record of emergency runway landings where foam might have been used as a precaution?

No

31. If not written records or incomplete written records, do you have anecdotal/verbal information and locations of spills or other emergency response incidents where AFFF was used?

No

32. What is the typical procedure for removing dispensed AFFF from an area where it has been used?

Currently we would have to use an outside contractor for any releases. ✓

33. Can you provide any other locations where AFFF has been stored, released, or used (i.e. hangars, buildings, fire stations, firefighting equipment testing and maintenance areas, emergency response sites, storm water/surface water, waste water treatment plants, and AFFF ponds)?

34. Do you have or did you have a chrome plating shop on base? If no, skip to Question #38.

No

35. What were/are the years of operation of that chrome plating shop?

36. Do you know whether the shop has/had a foam blanket mist suppression system or used a fume hood for emissions control?

37. If foam blanket mist suppression was used, where was the foam stored, mixed, applied, etc.?

38. Is there anyone else or other base organization personnel that you would recommend we interview? Name, organization, position, phone number, e-mail.

No

39. Was it common practice to wash away fuel spills with AFFF?

No, we used absorbent materials.

40. Identify drainage patterns around flightline/ramp area. Point source discharge is likely AFFF Area of Concern (AOC).

See environmental personnel.

Interview with the following on 12/3/15:

Lieutenant Colonel Neil Stockfleth - 185th ARW Environmental Manager

Chief Master Sergeant Mike Albrecht - 185th ARW Fire Chief

Mr. Mike Kock - Fire Prevention Program, Inspection and Maintenance

Mr. David Miller - Paint Facility Manager

Mr. Mike Dietrich - Real Property Manager

Lieutenant Colonel Gary Prescott - Base Engineer

Major Kris Aldrich - Base Engineer

Captain Adam McIntyre - Deputy Base Engineer





- Sioux City Water System
- Sioux City Water System Potw. (
- A number of outfalls
Missouri river via open ditch (1/2 mile away)
- Lift Station exists
- No oil water separator - at fire station - filtration system (2)
installed when building was installed (10-15 years) one for each bay.

Lt. Col
Neil Stockfleth - 29 years, 4 years as environmental manager.
Full time last 8 years.

- No disposal of AFFF during through environmental, so no disposal area.

- Mike Albrecht, Chief Master Sergeant, Fire Chief, January 1990.
Chief since October 1999.

- Mark Kock, 26 years, Fire prevention program, inspection
maintenance of system

- David Miller, Plant facility manager at Gen, 40 years;
since 2010.

- Mike Dietrich Real Property Manager, 7 mos.

Captain

Adam McIntire, Deputy BC, 3 years.

Majors

Kris Aldridge, Base Engineer in waiting, 12 years,

Gary Prescott, 11 Col Base Engineer, 1984.

Removal Systems Previous

- * Building 252 - Fuel cell repair hangar - system was removed
- * Building 261 - AFFF to high exposure

When removed a contractor removed AFFF & any tanks in place

short-term storage overnight moved to hazmat

- * Supply Warehouse 280
 - * Hazmat Pharmacy 281
 - Fire Station 286
- } no known releases typically stored in secondary containment

- * Fire Station 286 (current), 286 (historic), previous is now office & classroom space, previously owned by city, now owned by AFB.

- Building 241. Paint (241)

- Annual Testing

- 241, - with ~ 2000, fill the building - at least two full

- scale, annually
(30-35 gallons)

- Acceptance testing is full scale (~100 gallons), 26A (contractor conducted)

& trench drains in paint building (sealed during last few tests)

- Apron out front (no catch basins or drains) pushed out & allowed to dissipate.
- 252- with two inadvertent dumps recalled, no time recalled, any foam was likely pushed out to apron.
- Building 261 - ~2000-2001, shut down fairly quick, mid 1980s⁸⁶⁻⁸⁷, larger release. Likely most foam pushed onto apron.
- Nozzle testing - 3-4 gallons per vehicle, first Tuesday of the month.
- Small spills when filling vehicles. nothing notable.
- All trench drains within the building drain to sanitary system.
- 261 has oil/water separator - was there when system contained AFFF.
- 252 has oil/water separator -
- No retention/detention ponds outside.
- Always used 3% solution.

Pump operates under airport storm water permit, no knowledge if any surges occur.

- P.S. 1000 gal storage tank, likely single walled w/
no secondary containment

horizontal on paved area & allowed to dissipate

- Old fire station - directly in front overhead doors, or in area
with hydrant

- no recollection of trenching at doors.

- outfall 1, S.W., discharges to pipe - following gate valve
which discharges to ditch.

- Water at main outfall, intermittent, no known pump
stand location - likely city property

- Storm outfall is on ANU property.
- have access
- outfalls at ~~city~~ paint building are outside the lease property (including ditch)
-
- Building 261, Axx would be PEA that wasn't expanded.
- Old trench drain (water line)
- 4 square drains
- APPE, num.

APPENDIX C

SUPPORTING DOCUMENTATION

APPENDIX C-1

NOTICE OF DISCHARGE DOCUMENTATION

HAZARDOUS MATERIAL RELEASE REPORT FOR SIOUX CITY WASTE TREATMENT PLANT
POC: MS. DESIREE McCASLEN

Date and Time of the Release: **The release was discovered by Fire Department personnel on Sunday, August 19, 2012 at approximately 7:30 a.m.**

Exact Location of the Release: **Bay 3 of Building 286, the base's Fire Department facility.**

Type of Release:

Leak: **X** Fire: _____ Spill: _____ Explosion: _____ Other: _____

Date and Time of Verbal Report to the IA DNR: **Tuesday, August 21, 2012 at approximately 2:30 p.m.**

Name, Mailing Address, and Telephone Number of Responsible Party: **Iowa Air National Guard – 185th Air Refueling Wing, 2920 Headquarters Avenue, Sioux City, IA 51111-1300. (712) 233-0690.**

Name, Mailing Address, and Telephone Number of Person Reporting Incident: **Kevin Jacobson, Environmental Specialist, IA ANG-185ARW, 2920 Headquarters Avenue, Sioux City, IA 51111-1300. (712) 233-0727.**

Name/Telephone Number of On-Scene Contact: **CMS Michael Albrecht, Fire Chief, (712) 233-0778.**

Name of Materials Released, if known: **Ansulite 3% AFFF (Aqueous Film Forming Foam).**

Manifest/Shipping Invoice/Billing Label: **NA.**

Shipper/Manufacturer Identification: **Ansul Incorporated, One Stanton Street, Marinette, WI 54143, (715) 735-7411.**

Container Type: Vehicle **X** Bowser _____ Pipeline _____ Container _____

Placard/Label Information: **NA.**

Characteristics of Material, only if Readily Detectable:

Color: **Straw Yellow, Clear Liquid.**

Odor: **Mild, sweet odor.**

Physical Effects: **None.**

Physical State of Material: Gas _____ Liquid **X** Solid _____

Potential Amount of Material Which May Have Been Released: **Approximately 50 gallons of 3% AFFF, flushed with an undetermined amount of water, through the base's sanitary sewer system to the city's on-base lift station and through the city's sanitary sewer system to the waste treatment plant.**

Current Amount of Material Released: **Same as above.**

Other Hazardous Materials in the Area: **None, besides fuel in Fire Department vehicles/equipment.**

Significant Amounts of Material Entering:

Atmosphere: **At waste treatment plant?** Storm Water Drains: **No.** Sanitary Sewer Drains: **Yes.**

Surface Water: **No.** Soil: **No.**

Direction, Height, Color and Order of Vapor Cloud: **NA.**

Weather Conditions: **NA.**

Wind Direction and Speed: **NA.**

Local Terrain Conditions: **Floodplain Flat.**

Circumstances leading to the Release: **One of the base's fire-fighting vehicles, which holds separate containers of water and 3% AFFF, developed a leak in a valve of the 3% AFFF line. The valve is positioned under the vehicle, directly behind the cab. The vehicle was positioned over a trench-**

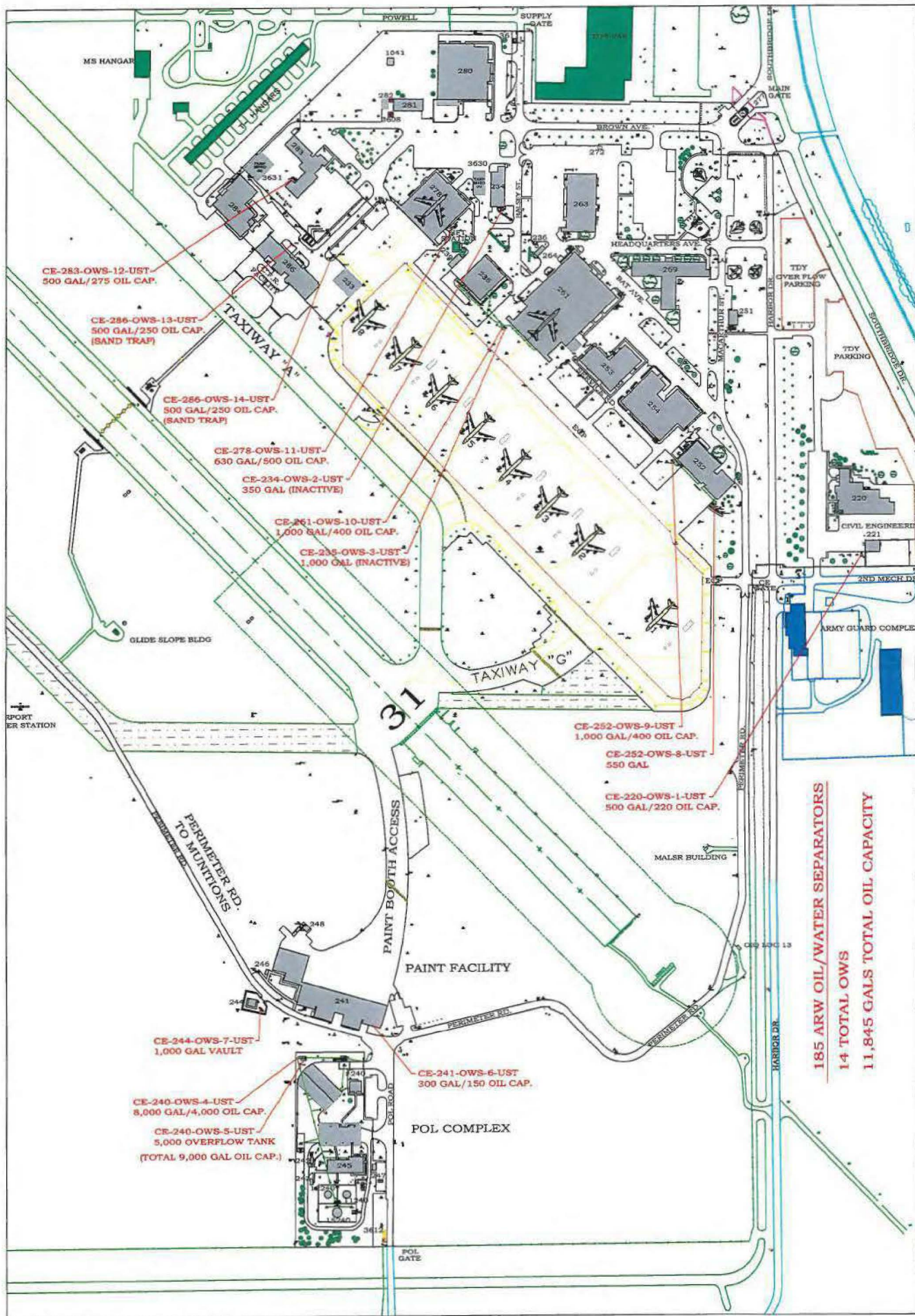
type floor drain; the leaking 3% AFFF traveled about 1 foot to the drain. With the vehicle being parked in this location and the leak's proximity to the drain, it's not difficult to see why the leak wasn't discovered until the shift change inspection of vehicles that Sunday morning. Once discovered, the fire department employee immediately tightened the valve to stop the leak and reported the incident to his superiors. The vehicle was moved and the visible release was cleaned up, using water from a garden-type hose in the work bay. An undetermined amount of water was used to clean up the release of 3% AFFF and flush the trench drain area.

Visible Effects and Containment Measures Taken: The 3% AFFF stained the floor where it leaked, but there were no other on-site visible effects. The leak was stopped by tightening the AFFF line valve.

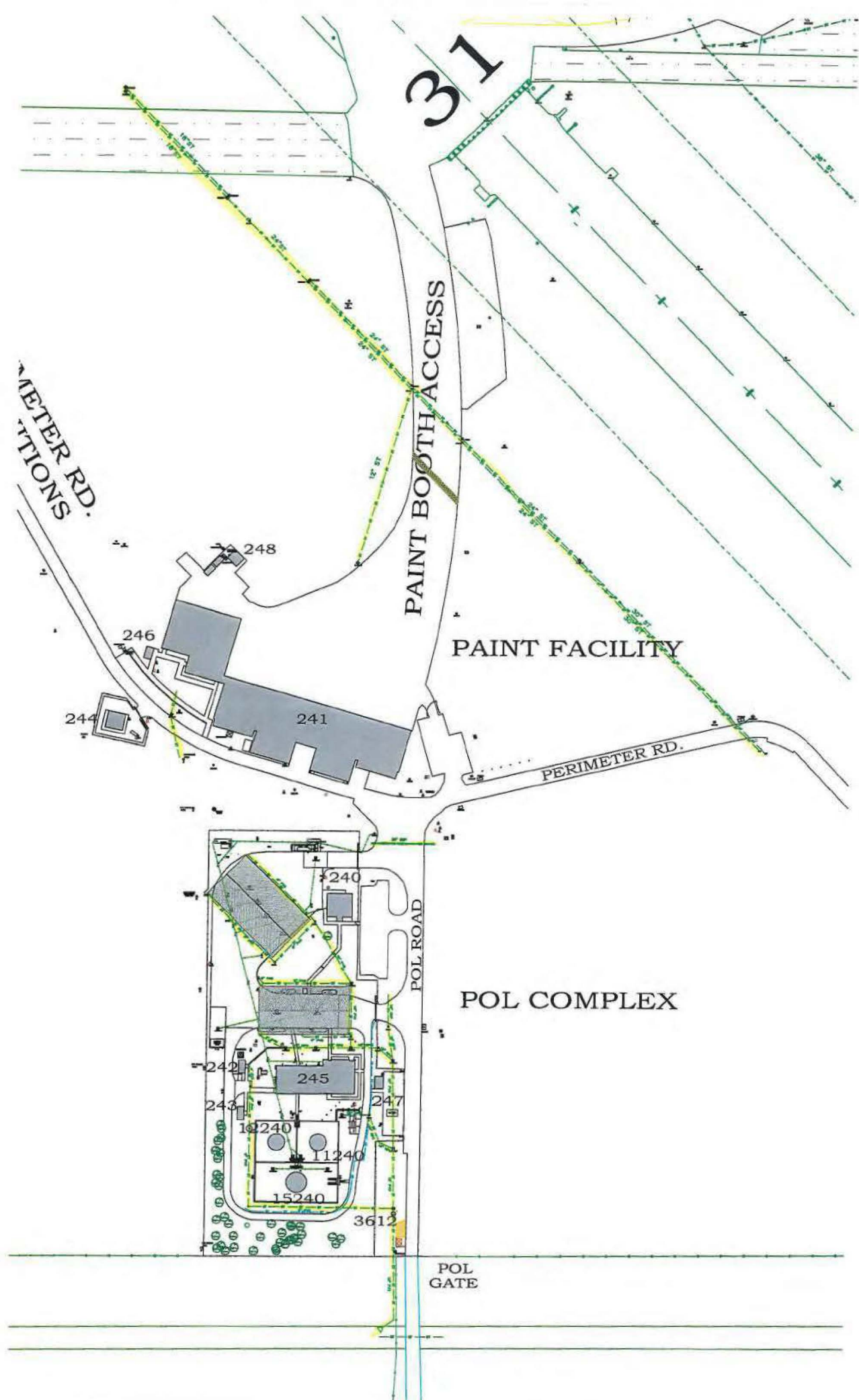
After-Action (Lessons Learned) Report: Representatives from the 185ARW Fire Department, and Civil Engineering and Environmental offices will be meeting in the immediate future to develop a new policy and/or set of procedures to follow regarding releases of 3% AFFF and HEF (High Expansion Foam) on base. The Sioux City Waste Treatment Plant's POC will be given an opportunity to review and comment on any drafts of the proposed policy and/or procedures.

APPENDIX C-2

STORMWATER SEWER SYSTEM MAP



185 ARW OIL/WATER SEPARATORS
 14 TOTAL OWS
 11,845 GALS TOTAL OIL CAPACITY



APPENDIX C-3

EDR ONE-MILE RADIUS WATER WELLS MAP

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

WELL SEARCH DISTANCE INFORMATION

<u>DATABASE</u>	<u>SEARCH DISTANCE (miles)</u>
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1.000 miles
State Database	1.250

FEDERAL USGS WELL INFORMATION

<u>MAP ID</u>	<u>WELL ID</u>	<u>LOCATION FROM TP</u>
A5	USGS40000318437	1/8 - 1/4 Mile ESE
63	USGS40000318528	1/2 - 1 Mile North
92	USGS40000318534	1/2 - 1 Mile NNE

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

<u>MAP ID</u>	<u>WELL ID</u>	<u>LOCATION FROM TP</u>
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

<u>MAP ID</u>	<u>WELL ID</u>	<u>LOCATION FROM TP</u>
A1	IAPU30000013511	0 - 1/8 Mile ESE
A2	IAPU30000013491	0 - 1/8 Mile ESE
B3	IAPU30000013423	0 - 1/8 Mile ENE
B4	IAPU30000013435	0 - 1/8 Mile ENE
C6	IAUS20000004509	1/4 - 1/2 Mile North
C7	IAPU30000013177	1/4 - 1/2 Mile North
C8	IAUS200000002138	1/4 - 1/2 Mile North
C9	IAPU30000013172	1/4 - 1/2 Mile North
C10	IAUS20000001382	1/4 - 1/2 Mile North
C11	IAPU30000013166	1/4 - 1/2 Mile North
C12	IAUS20000001634	1/4 - 1/2 Mile North
C13	IAPU30000013167	1/4 - 1/2 Mile North
C14	IAUS20000001221	1/4 - 1/2 Mile North
C15	IAPU30000013155	1/4 - 1/2 Mile North
C16	IAPU30000013151	1/4 - 1/2 Mile North
C17	IAUS200000002451	1/4 - 1/2 Mile North
18	IAPU30000013561	1/4 - 1/2 Mile East
D19	IAPU30000013154	1/4 - 1/2 Mile NNE
D20	IAPU30000013145	1/4 - 1/2 Mile NNE
D21	IAPU30000013141	1/4 - 1/2 Mile NNE
D22	IAPU30000013157	1/4 - 1/2 Mile NNE
D23	IAPU30000013147	1/4 - 1/2 Mile NNE
D24	IAPU30000013140	1/4 - 1/2 Mile NNE

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
D25	IAPU30000013146	1/4 - 1/2 Mile NNE
E26	IAPU30000013676	1/2 - 1 Mile ESE
E27	IAPW30000004938	1/2 - 1 Mile ESE
F28	IAPU30000013095	1/2 - 1 Mile NNE
F29	IAPU30000013091	1/2 - 1 Mile NNE
G30	IAPW30000007559	1/2 - 1 Mile South
G31	IAPU30000013892	1/2 - 1 Mile South
F32	IAPU30000013080	1/2 - 1 Mile NNE
F33	IAPU30000013092	1/2 - 1 Mile NNE
F34	IAPU30000013084	1/2 - 1 Mile NNE
F35	IAPU30000013082	1/2 - 1 Mile NNE
H36	IAPU30000013204	1/2 - 1 Mile West
H37	IAPU30000013227	1/2 - 1 Mile West
H38	IAPU30000013215	1/2 - 1 Mile West
H39	IAPU30000013224	1/2 - 1 Mile West
H40	IAPU30000013226	1/2 - 1 Mile West
41	IAPW300000094380	1/2 - 1 Mile East
I42	IAPU30000012959	1/2 - 1 Mile North
I43	IAPW300000064973	1/2 - 1 Mile North
44	IAPU30000012980	1/2 - 1 Mile NNE
J45	IAPU30000013602	1/2 - 1 Mile SW
J46	IAPU30000013601	1/2 - 1 Mile SW
J47	IAPU30000013604	1/2 - 1 Mile SW
J48	IAPU30000013603	1/2 - 1 Mile SW
J49	IAPU30000013600	1/2 - 1 Mile SW
J50	IAPU30000013595	1/2 - 1 Mile SW
J51	IAPU30000013594	1/2 - 1 Mile SW
J52	IAPU30000013599	1/2 - 1 Mile SW
J53	IAPU30000013597	1/2 - 1 Mile SW
J54	IAPU30000013616	1/2 - 1 Mile SW
J55	IAPU30000013615	1/2 - 1 Mile SW
J56	IAPU30000013620	1/2 - 1 Mile SW
J57	IAPU30000013618	1/2 - 1 Mile SW
J58	IAPU30000013613	1/2 - 1 Mile SW
J59	IAPU30000013608	1/2 - 1 Mile SW
J60	IAPU30000013606	1/2 - 1 Mile SW
J61	IAPU30000013611	1/2 - 1 Mile SW
J62	IAPU30000013609	1/2 - 1 Mile SW
K64	IAPR30000001113	1/2 - 1 Mile East
K65	IAPU30000013607	1/2 - 1 Mile East
L66	IAPW300000087300	1/2 - 1 Mile WNW
L67	IAPU30000013086	1/2 - 1 Mile WNW
L68	IAPW300000060185	1/2 - 1 Mile WNW
M69	IAPU30000014037	1/2 - 1 Mile South
L70	IAPU30000013071	1/2 - 1 Mile WNW
N71	IAPU30000014071	1/2 - 1 Mile South
N72	IAPW30000013313	1/2 - 1 Mile South
L73	IAPW300000060184	1/2 - 1 Mile WNW
L74	IAPU30000013088	1/2 - 1 Mile WNW
O75	IAUS20000002885	1/2 - 1 Mile ENE
O76	IAPU30000013415	1/2 - 1 Mile ENE
M77	IAPW300000033866	1/2 - 1 Mile South

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
M78	IAPU30000014099	1/2 - 1 Mile South
P79	IAPU30000014093	1/2 - 1 Mile South
P80	IAPR30000000003	1/2 - 1 Mile South
81	IAPW300000067684	1/2 - 1 Mile SE
82	IAPU30000012867	1/2 - 1 Mile North
83	IAPU30000012851	1/2 - 1 Mile North
Q84	IAPU30000012888	1/2 - 1 Mile NNE
Q85	IAPU30000012881	1/2 - 1 Mile NNE
Q86	IAPU30000012904	1/2 - 1 Mile NNE
Q87	IAPU30000012891	1/2 - 1 Mile NNE
Q88	IAPU30000012908	1/2 - 1 Mile NNE
Q89	IAPU30000012906	1/2 - 1 Mile NNE
Q90	IAPU30000012901	1/2 - 1 Mile NNE
91	IAPW300000098224	1/2 - 1 Mile ENE
R93	IAPU30000014148	1/2 - 1 Mile SE
R94	IAPR300000061584	1/2 - 1 Mile SE
S95	IAUS20000004879	1 - 2 Miles South
S96	IAPU30000014255	1 - 2 Miles South
T97	IAPU30000014257	1 - 2 Miles SSE
T98	IAPR300000071956	1 - 2 Miles SSE
U99	IAPU30000014157	1 - 2 Miles SSW
U100	IAPR30000015440	1 - 2 Miles SSW
R101	IAPW300000096312	1 - 2 Miles SE
V102	IAPU30000014247	1 - 2 Miles South
W103	IAPU30000013318	1 - 2 Miles ENE
V104	IAPU30000014254	1 - 2 Miles South
W105	IAPR300000061321	1 - 2 Miles ENE
106	IAPU30000012802	1 - 2 Miles North
107	IAPU30000014250	1 - 2 Miles South
108	IAPU30000012830	1 - 2 Miles NNE
W109	IAPU30000013387	1 - 2 Miles ENE
X110	IAPW300000064263	1 - 2 Miles SSE
X111	IAPU30000014331	1 - 2 Miles SSE
V112	IAPU30000014279	1 - 2 Miles South
X113	IAPR300000069719	1 - 2 Miles SSE
X114	IAPU30000014351	1 - 2 Miles SSE
Y115	IAUS20000003971	1 - 2 Miles ENE
Y116	IAPU30000013261	1 - 2 Miles ENE
Y117	IAPU30000013275	1 - 2 Miles ENE
Y118	IAPU30000013277	1 - 2 Miles ENE
X119	IAPU30000014346	1 - 2 Miles SSE
Y120	IAPU30000013252	1 - 2 Miles ENE
Z121	IAPU30000013533	1 - 2 Miles WSW
Z122	IAPW300000035450	1 - 2 Miles WSW
AA123	IAPU30000013118	1 - 2 Miles NE
AA124	IAUS20000001550	1 - 2 Miles NE
AA125	IAPU30000013105	1 - 2 Miles NE
AA126	IAPU30000013112	1 - 2 Miles NE
AA127	IAPU30000013115	1 - 2 Miles NE
AA128	IAPU30000013116	1 - 2 Miles NE
AA129	IAPU30000013109	1 - 2 Miles NE
AA130	IAPU30000013113	1 - 2 Miles NE

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

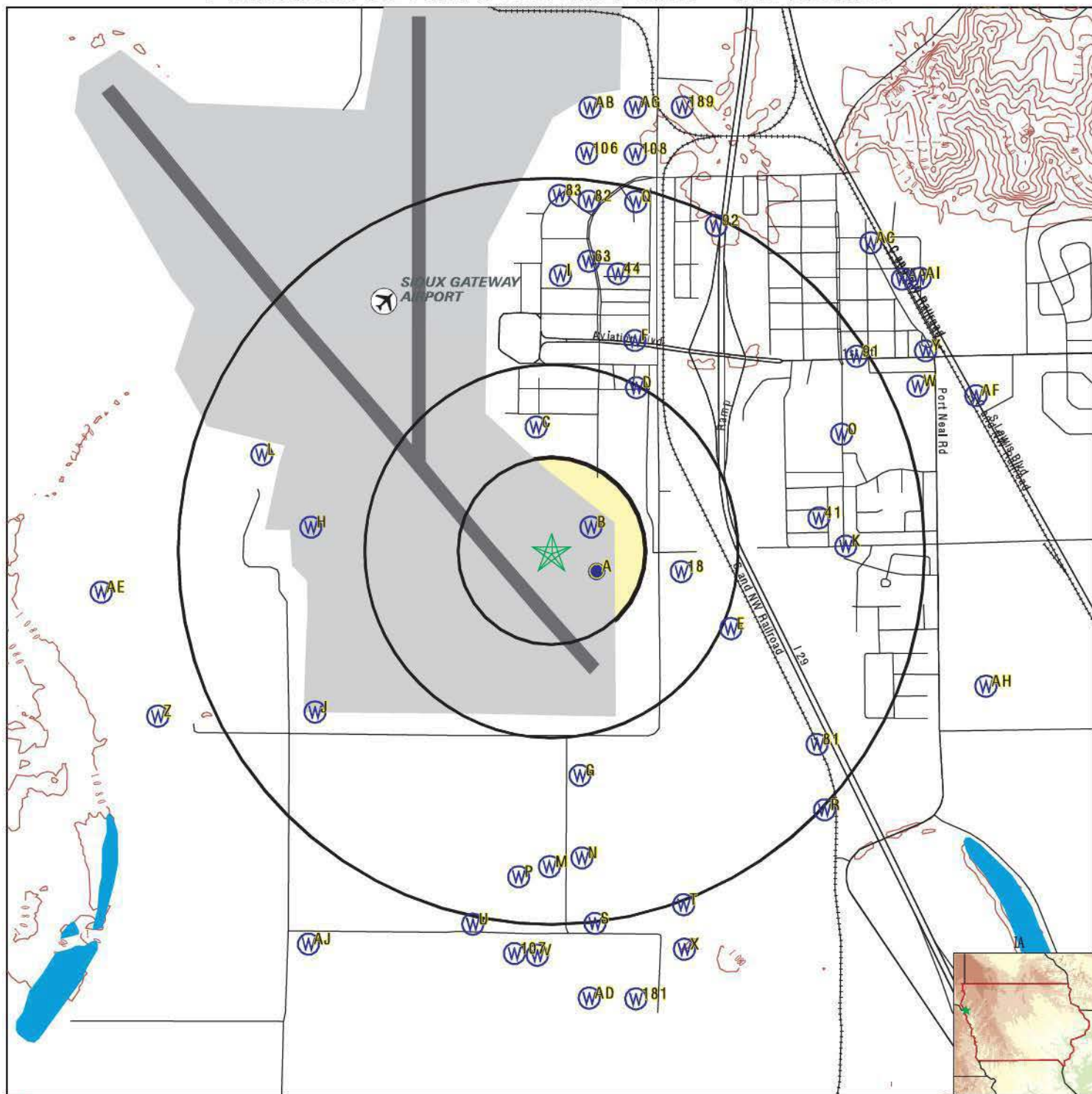
MAP ID	WELL ID	LOCATION FROM TP
AB131	IAPU30000012734	1 - 2 Miles North
AB132	IAPU30000012731	1 - 2 Miles North
AC133	IAUS200000005917	1 - 2 Miles NE
AC134	IAPU30000013063	1 - 2 Miles NE
AC135	IAPU30000013067	1 - 2 Miles NE
AC136	IAPU30000013064	1 - 2 Miles NE
AA137	IAUS20000001447	1 - 2 Miles NE
AA138	IAPU30000013117	1 - 2 Miles NE
AB139	IAPU30000012718	1 - 2 Miles North
AB140	IAPU30000012724	1 - 2 Miles North
AB141	IAPU30000012720	1 - 2 Miles North
AB142	IAPU30000012709	1 - 2 Miles North
AD143	IAPU30000014377	1 - 2 Miles South
AE144	IAPU30000013203	1 - 2 Miles West
AD145	IAPU30000014378	1 - 2 Miles South
AF146	IAPU30000013394	1 - 2 Miles ENE
AF147	IAPU30000013405	1 - 2 Miles ENE
AG148	IAPU30000012748	1 - 2 Miles North
AG149	IAPU30000012772	1 - 2 Miles North
AG150	IAPU30000012767	1 - 2 Miles North
AG151	IAPU30000012756	1 - 2 Miles North
AG152	IAPU30000012764	1 - 2 Miles North
AG153	IAPU30000012751	1 - 2 Miles North
AG154	IAPU30000012757	1 - 2 Miles North
AG155	IAPU30000012768	1 - 2 Miles North
AG156	IAPU30000012754	1 - 2 Miles North
AG157	IAPU30000012771	1 - 2 Miles North
AG158	IAPU30000012755	1 - 2 Miles North
AG159	IAPU30000012750	1 - 2 Miles North
AG160	IAPU30000012760	1 - 2 Miles North
AG161	IAPU30000012762	1 - 2 Miles North
AG162	IAPU30000012761	1 - 2 Miles North
AG163	IAPU30000012763	1 - 2 Miles North
AG164	IAPU30000012746	1 - 2 Miles North
AG165	IAPU30000012744	1 - 2 Miles North
AG166	IAPU30000012758	1 - 2 Miles North
AG167	IAPU30000012749	1 - 2 Miles North
AG168	IAPU30000012747	1 - 2 Miles North
AE169	IAUS20000000109	1 - 2 Miles West
AE170	IAPU30000013213	1 - 2 Miles West
AH171	IAPR30000017381	1 - 2 Miles ESE
AG172	IAPU30000012743	1 - 2 Miles North
AG173	IAPU30000012752	1 - 2 Miles North
AA174	IAPU30000013125	1 - 2 Miles NE
AA175	IAPU30000013127	1 - 2 Miles NE
AA176	IAPU30000013133	1 - 2 Miles NE
AA177	IAPW30000010995	1 - 2 Miles NE
AA178	IAPW30000010996	1 - 2 Miles NE
AA179	IAPW30000016881	1 - 2 Miles NE
AF180	IAPU30000013429	1 - 2 Miles ENE
181	IAPU30000014390	1 - 2 Miles South
AF182	IAPU30000013427	1 - 2 Miles ENE

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
AH183	IAPU30000013980	1 - 2 Miles ESE
AI184	IAPW30000013356	1 - 2 Miles NE
AI185	IAPU30000013126	1 - 2 Miles NE
AJ186	IAPU30000014094	1 - 2 Miles SSW
AJ187	IAPU30000014081	1 - 2 Miles SSW
AJ188	IAPR30000071943	1 - 2 Miles SSW
189	IAPU30000012778	1 - 2 Miles NNE

PHYSICAL SETTING SOURCE MAP - 4434731.2s



- County Boundary
- Major Roads
- Contour Lines
- Airports
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons

- Groundwater Flow Direction
- Indeterminate Groundwater Flow at Location
- Groundwater Flow Varies at Location

SITE NAME: Sioux City ANGB
 ADDRESS: 2920 Headquarters Avenue
 Sioux City IA 51111
 LAT/LONG: 42.3929 / -96.3756

CLIENT: B.B. & E
 CONTACT: Nalla Hoseln
 INQUIRY #: 4434731.2s
 DATE: October 09, 2015 7:51 pm

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database EDR ID Number

A1
ESE
0 - 1/8 Mile
Lower

IA WELLS IAPU30000013511

Mapid:	13511	Wellid:	27613
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 36, SE, NE, NW
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	28	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-r31-2		
Other info:	Well plugged: 9/27/1996; Well type: < 18" dia.		
Xcoord:	222311.83		
Ycoord:	4698822		
Hlink:	Not Reported		
Site id:	IAPU30000013511		

A2
ESE
0 - 1/8 Mile
Lower

IA WELLS IAPU30000013491

Mapid:	13491	Wellid:	27612
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 36, SE, NE, NW
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	27	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-r31-1		
Other info:	Well plugged: 9/27/1996; Well type: < 18" dia.		
Xcoord:	222318.83		
Ycoord:	4698829		
Hlink:	Not Reported		
Site id:	IAPU30000013491		

B3
ENE
0 - 1/8 Mile
Lower

IA WELLS IAPU30000013423

Mapid:	13423	Wellid:	1717
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 88N., R. 48W., Sec. 36, NE, SE, SW
County:	WOODBURY	Est loc ac:	Calc. +/- 140 m.
Depth:	235	C p date:	07/01/1943
Owner name:	SIOUX CITY AIR BASE		
Other info:	Well type: Public access		
Xcoord:	222327.12		
Ycoord:	4699020.39		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=1717		
Site id:	IAPU30000013423		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database EDR ID Number

B4
ENE
0 - 1/8 Mile
Lower

IA WELLS IAPU30000013435

Mapid:	13435	Wellid:	1713
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 88N., R. 48W., Sec. 36, NE, SE, SW
County:	WOODBURY	Est loc ac:	Calc. +/- 140 m.
Depth:	285	C p date:	07/01/1943
Owner name:	SIOUX CITY AIR BASE		
Other info:	Bedrock depth: 215; Well type: Test (water only)		
Xcoord:	222327.12		
Ycoord:	4699020.39		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=1713		
Site id:	IAPU30000013435		

A5
ESE
1/8 - 1/4 Mile
Higher

FED USGS USGS40000318437

Org. Identifier:	USGS-IA		
Formal name:	USGS Iowa Water Science Center		
Monloc Identifier:	USGS-422332096222001		
Monloc name:	088N48W36ADCA 01713 1943Sioux City Air Base Test 3		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	10230001	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	42.3922157
Longitude:	-96.3725291	Sourcemap scale:	24000
Horiz Acc measure:	Unknown	Horiz Acc measure units:	Unknown
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	1090
Vert measure units:	feet	Vertacc measure val:	1
Vert accmeasure units:	feet		
Vertcollection method:	Unknown		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Lower Cretaceous aquifers		
Formation type:	Dakota Group		
Aquifer type:	Not Reported		
Construction date:	19430701	Welldepth:	285
Welldepth units:	ft	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 0

C6
North
1/4 - 1/2 Mile
Lower

IA WELLS IAUS20000004509

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Maplabelna:	City Of Sioux City-W3752	Publicview:	0
Legendtype:	39		
Locid:	20000321634		
Stfacid:	310429928		
Progid:	7547		
Facname:	City Of Sioux City		
Opstatus:	Drilled	Pistartdat:	12-JUL-05
Subname:	W3752		
Subprogid:	4945	Subaltidnu:	Not Reported
Wellname:	Not Reported		
Wellstatus:	Not Reported		
Totaldepth:	50		
Drilldate:	30-DEC-99	Aquifertyp:	Unconsolidated - Drift, Alluv, Bur
Aquiferran:	Primary	Countyname:	Woodbury
Fo:	3	Accuracy:	20
Colmthtxt:	INTERPOLATION-PHOTO	Refpnttxt:	WELL
Verifytxt:	Not Reported	Collectby:	WKTU
Coldate:	14-MAR-05		
Loccomment:	placed based on map, wrong legal desc		
Congress:	5	Sthouse:	054
Stsenate:	27	Huc:	1023000108
Hyperlink:	http://programs.iowadnr.gov/wateruse/		
Lat:	42.39749		
Lon:	-96.37625		
Xcoord:	222119		
Ycoord:	4699435		
Site id:	IAUS20000004509		

C7 North 1/4 - 1/2 Mile Lower

IA WELLS IAPU30000013177

Mapid:	13177	Wellid:	W3752
Id src fld:	subname	Datasrc:	WTRU
Well type:	Water Use Permit Wells	Location:	T88N, R48W, Sec. 36, NE, NW, SE
County:	Woodbury	Est loc ac:	+/-20
Depth:	50	C p date:	Not Reported
Owner name:	City Of Sioux City		
Other info:	Water Use Permit 7547; Primary use: Aquifer remediation		
Xcoord:	222119		
Ycoord:	4699435		
Hlink:	https://facilityexplorer.iowadnr.gov/FacilityExplorer/SiteDetail.aspx?facID=310429928		
Site id:	IAPU30000013177		

C8 North 1/4 - 1/2 Mile Lower

IA WELLS IAUS20000002138

Maplabelna:	City Of Sioux City-W3337	Publicview:	0
Legendtype:	39		
Locid:	20000321636		
Stfacid:	310429928		
Progid:	7547		
Facname:	City Of Sioux City		
Opstatus:	Drilled	Pistartdat:	12-JUL-05
Subname:	W3337		
Subprogid:	4944	Subaltidnu:	Not Reported
Wellname:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Wellstatus:	Not Reported		
Totaldepth:	50		
Drilldate:	30-DEC-99	Aquifertyp:	Unconsolidated - Drift, Alluv, Bur
Aquiferran:	Primary	Countyname:	Woodbury
Fo:	3	Accuracy:	20
Colmthtxt:	INTERPOLATION-PHOTO	Refpnttxt:	WELL
Verifytxt:	Not Reported	Collectby:	WKTU
Coldate:	14-MAR-05		
Loccomment:	placed based on map, wrong legal desc		
Congress:	5	Sthouse:	054
Stsenate:	27	Huc:	1023000108
Hyperlink:	http://programs.iowadnr.gov/wateruse/		
Lat:	42.39765		
Lon:	-96.37609		
Xcoord:	222133		
Ycoord:	4699452		
Site id:	IAUS20000002138		

C9
North
1/4 - 1/2 Mile
Lower

IA WELLS **IAPU30000013172**

Mapid:	13172	Wellid:	W3337
Id src fld:	subname	Datasrc:	WTRU
Well type:	Water Use Permit Wells	Location:	T88N, R48W, Sec. 36, NE, NW, SE
County:	Woodbury	Est loc ac:	+/-20
Depth:	50	C p date:	Not Reported
Owner name:	City Of Sioux City		
Other info:	Water Use Permit 7547; Primary use: Aquifer remediation		
Xcoord:	222133		
Ycoord:	4699452		
Hlink:	https://facilityexplorer.iowadnr.gov/FacilityExplorer/SiteDetail.aspx?facID=310429928		
Site id:	IAPU30000013172		

C10
North
1/4 - 1/2 Mile
Lower

IA WELLS **IAUS20000001382**

Maplabelna:	City Of Sioux City-W5615		
Legendtype:	39	Publicview:	0
Locid:	20000321635		
Stfacid:	310429928		
Progid:	7547		
Facname:	City Of Sioux City		
Opstatus:	Drilled: No/Unknown	Pistartdat:	12-JUL-05
Subname:	W5615	Subaltidnu:	Not Reported
Subprogid:	4943		
Wellname:	Not Reported		
Wellstatus:	Not Reported		
Totaldepth:	50		
Drilldate:	30-DEC-99	Aquifertyp:	Unconsolidated - Drift, Alluv, Bur
Aquiferran:	Primary	Countyname:	Woodbury
Fo:	3	Accuracy:	20
Colmthtxt:	INTERPOLATION-PHOTO	Refpnttxt:	WELL
Verifytxt:	Not Reported	Collectby:	WKTU
Coldate:	14-MAR-05		
Loccomment:	placed based on map, wrong legal desc		
Congress:	5	Sthouse:	054

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Stsenate:	27	Huc:	1023000108
Hyperlink:	http://programs.iowadnr.gov/wateruse/		
Lat:	42.39765		
Lon:	-96.37668		
Xcoord:	222084		
Ycoord:	4699454		
Site id:	IAUS20000001382		

C11 North 1/4 - 1/2 Mile Lower

IA WELLS IAPU30000013166

Mapid:	13166	Wellid:	W5615
Id src fld:	subname	Datasrc:	WTRU
Well type:	Water Use Permit Wells	Location:	T88N, R48W, Sec. 36, NE, NW, SE
County:	Woodbury	Est loc ac:	+/-20
Depth:	50	C p date:	Not Reported
Owner name:	City Of Sioux City		
Other info:	Water Use Permit 7547; Primary use: Aquifer remediation		
Xcoord:	222084		
Ycoord:	4699454		
Hlink:	https://facilityexplorer.iowadnr.gov/FacilityExplorer/SiteDetail.aspx?facID=310429928		
Site id:	IAPU30000013166		

C12 North 1/4 - 1/2 Mile Lower

IA WELLS IAUS20000001634

Maplabelna:	City Of Sioux City-W3564		
Legendtype:	39	Publicview:	0
Loid:	20000321637		
Stfacid:	310429928		
Progid:	7547		
Facname:	City Of Sioux City		
Opstatus:	Drilled	Pistartdat:	12-JUL-05
Subname:	W3564		
Subprogid:	4947	Subaltidnu:	Not Reported
Wellname:	Not Reported		
Wellstatus:	Not Reported		
Totaldepth:	50		
Drilldate:	30-DEC-99	Aquifertyp:	Unconsolidated - Drift, Alluv, Bur
Aquiferran:	Primary	Countyname:	Woodbury
Fo:	3	Accuracy:	20
Colmthtxt:	INTERPOLATION-PHOTO	Repnttxt:	WELL
Verifytxt:	Not Reported	Collectby:	WKTU
Coldate:	14-MAR-05		
Loccomment:	placed based on map, wrong legal desc		
Congress:	5	Sthouse:	054
Stsenate:	27	Huc:	1023000108
Hyperlink:	http://programs.iowadnr.gov/wateruse/		
Lat:	42.39771		
Lon:	-96.37639		
Xcoord:	222109		
Ycoord:	4699459		
Site id:	IAUS20000001634		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database EDR ID Number

C13
North
1/4 - 1/2 Mile
Lower

IA WELLS IAPU30000013167

Mapid:	13167	Wellid:	W3564
Id src fld:	subname	Datasrc:	WTRU
Well type:	Water Use Permit Wells	Location:	T88N, R48W, Sec. 36, NE, NW, SE
County:	Woodbury	Est loc ac:	+/-20
Depth:	50	C p date:	Not Reported
Owner name:	City Of Sioux City		
Other info:	Water Use Permit 7547; Primary use: Aquifer remediation		
Xcoord:	222109		
Ycoord:	4699459		
Hlink:	https://facilityexplorer.iowadnr.gov/FacilityExplorer/SiteDetail.aspx?facID=310429928		
Site id:	IAPU30000013167		

C14
North
1/4 - 1/2 Mile
Lower

IA WELLS IAUS20000001221

Maplabelna:	City Of Sioux City-W3565		
Legendtype:	39	Publicview:	0
Locid:	20000321638		
Stfacid:	310429928		
Progid:	7547		
Facname:	City Of Sioux City		
Opstatus:	Drilled	Pistartdat:	12-JUL-05
Subname:	W3565		
Subprogid:	4948	Subaltidnu:	Not Reported
Wellname:	Not Reported		
Wellstatus:	Not Reported		
Totaldepth:	50		
Drilldate:	30-DEC-99	Aquifertyp:	Unconsolidated - Drift, Alluv, Bur
Aquiferran:	Primary	Countyname:	Woodbury
Fo:	3	Accuracy:	20
Colmthtxt:	INTERPOLATION-PHOTO	Refpnttxt:	WELL
Verifytxt:	Not Reported	Collectby:	WKTU
Coldate:	14-MAR-05		
Loccomment:	placed based on map, wrong legal desc		
Congress:	5	Sthouse:	054
Stsenate:	27	Huc:	1023000108
Hyperlink:	http://programs.iowadnr.gov/wateruse/		
Lat:	42.39787		
Lon:	-96.37666		
Xcoord:	222087		
Ycoord:	4699478		
Site id:	IAUS20000001221		

C15
North
1/4 - 1/2 Mile
Lower

IA WELLS IAPU30000013155

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Mapid:	13155	Wellid:	W3565
Id src fld:	subname	Datasrc:	WTRU
Well type:	Water Use Permit Wells	Location:	T88N, R48W, Sec. 36, NE, NW, SE
County:	Woodbury	Est loc ac:	+/-20
Depth:	50	C p date:	Not Reported
Owner name:	City Of Sioux City		
Other info:	Water Use Permit 7547; Primary use: Aquifer remediation		
Xcoord:	222087		
Ycoord:	4699478		
Hlink:	https://facilityexplorer.iowadnr.gov/FacilityExplorer/SiteDetail.aspx?facID=310429928		
Site id:	IAPU30000013155		

C16 North 1/4 - 1/2 Mile Lower

IA WELLS IAPU30000013151

Mapid:	13151	Wellid:	W3753
Id src fld:	subname	Datasrc:	WTRU
Well type:	Water Use Permit Wells	Location:	T88N, R48W, Sec. 36, NE, NW, SE
County:	Woodbury	Est loc ac:	+/-20
Depth:	50	C p date:	Not Reported
Owner name:	City Of Sioux City		
Other info:	Water Use Permit 7547; Primary use: Aquifer remediation		
Xcoord:	222117		
Ycoord:	4699487		
Hlink:	https://facilityexplorer.iowadnr.gov/FacilityExplorer/SiteDetail.aspx?facID=310429928		
Site id:	IAPU30000013151		

C17 North 1/4 - 1/2 Mile Lower

IA WELLS IAU20000002451

Maplabelna:	City Of Sioux City-W3753		
Legendtype:	39	Publicview:	0
Locid:	20000321639		
Stfacid:	310429928		
Progid:	7547		
Facname:	City Of Sioux City		
Opstatus:	Drilled	Pistartdat:	12-JUL-05
Subname:	W3753		
Subprogid:	4946	Subaltidnu:	Not Reported
Wellname:	Not Reported		
Wellstatus:	Not Reported		
Totaldepth:	50		
Drilldate:	30-DEC-99	Aquifertyp:	Unconsolidated - Drift, Alluv, Bur
Aquiferran:	Primary	Countyname:	Woodbury
Fo:	3	Accuracy:	20
Colmthtxt:	INTERPOLATION-PHOTO	Repnttxt:	WELL
Verifytxt:	Not Reported	Collectby:	WKTU
Coldate:	14-MAR-05		
Loccomment:	placed based on map, wrong legal desc		
Congress:	5	Sthouse:	054

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Stsenate: 27 Huc: 1023000108
Hyperlink: <http://programs.iowadnr.gov/wateruse/>
Lat: 42.39796
Lon: -96.3763
Xcoord: 222117
Ycoord: 4699487
Site id: IAUS20000002451

18 East 1/4 - 1/2 Mile Higher

IA WELLS IAPU30000013561

Mapid: 13561 Wellid: 13853
Id src fld: recordno Datasrc: PLUG
Well type: Registered abandoned wells Location: T. 88 N., R. 47 W., Sec. 31, SW, NW, NW
County: Woodbury Est loc ac: Calc. +/- 140m.
Depth: 13 C p date: n.a.
Owner name: Iowa Army National Guard, Iowa Army National
Other info: Well plugged: 11/13/1991; Well type: < 18" dia.
Xcoord: 222709.02
Ycoord: 4698813
Hlink: Not Reported
Site id: IAPU30000013561

D19 NNE 1/4 - 1/2 Mile Lower

IA WELLS IAPU30000013154

Mapid: 13154 Wellid: 33537
Id src fld: recordno Datasrc: PLUG
Well type: Registered abandoned wells Location: T. 88 N., R. 48 W., Sec. 36, NE, NE, NE
County: Woodbury Est loc ac: Calc. +/- 140m.
Depth: 33 C p date: n.a.
Owner name: Sioux Gateway Airport
Other info: Well plugged: 10/28/1998; Well type: < 18" dia.
Xcoord: 222542.53
Ycoord: 4699608.5
Hlink: Not Reported
Site id: IAPU30000013154

D20 NNE 1/4 - 1/2 Mile Lower

IA WELLS IAPU30000013145

Mapid: 13145 Wellid: 33534
Id src fld: recordno Datasrc: PLUG
Well type: Registered abandoned wells Location: T. 88 N., R. 48 W., Sec. 36, NE, NE, NE
County: Woodbury Est loc ac: Calc. +/- 140m.
Depth: 31 C p date: n.a.
Owner name: Sioux Gateway Airport
Other info: Well plugged: 10/28/1998; Well type: < 18" dia.
Xcoord: 222546.53
Ycoord: 4699606.5
Hlink: Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000013145

D21
NNE
1/4 - 1/2 Mile
Lower

IA WELLS IAPU30000013141

Mapid:	13141	Wellid:	33531
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 36, NE, NE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	34	C p date:	n.a.
Owner name:	Sioux Gateway Airport		
Other info:	Well plugged: 10/20/1998; Well type: < 18" dia.		
Xcoord:	222540.53		
Ycoord:	4699610.5		
Hlink:	Not Reported		
Site id:	IAPU30000013141		

D22
NNE
1/4 - 1/2 Mile
Lower

IA WELLS IAPU30000013157

Mapid:	13157	Wellid:	33532
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 36, NE, NE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	33	C p date:	n.a.
Owner name:	Sioux Gateway Airport		
Other info:	Well plugged: 10/20/1998; Well type: < 18" dia.		
Xcoord:	222548.53		
Ycoord:	4699610.5		
Hlink:	Not Reported		
Site id:	IAPU30000013157		

D23
NNE
1/4 - 1/2 Mile
Lower

IA WELLS IAPU30000013147

Mapid:	13147	Wellid:	33536
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 36, NE, NE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	32	C p date:	n.a.
Owner name:	Sioux Gateway Airport		
Other info:	Well plugged: 10/28/1998; Well type: < 18" dia.		
Xcoord:	222554.53		
Ycoord:	4699614.5		
Hlink:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000013147

D24
NNE
1/4 - 1/2 Mile
Lower

IA WELLS **IAPU30000013140**

Mapid:	13140	Wellid:	33535
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 36, NE, NE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	33	C p date:	n.a.
Owner name:	Sioux Gateway Airport		
Other info:	Well plugged: 10/28/1998; Well type: < 18" dia.		
Xcoord:	222547.53		
Ycoord:	4699620.5		
Hlink:	Not Reported		
Site id:	IAPU30000013140		

D25
NNE
1/4 - 1/2 Mile
Lower

IA WELLS **IAPU30000013146**

Mapid:	13146	Wellid:	33533
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 36, NE, NE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	33	C p date:	n.a.
Owner name:	Sioux Gateway Airport		
Other info:	Well plugged: 10/28/1998; Well type: < 18" dia.		
Xcoord:	222547.53		
Ycoord:	4699621.5		
Hlink:	Not Reported		
Site id:	IAPU30000013146		

E26
ESE
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000013676**

Mapid:	13676	Wellid:	2081350
Id src fld:	wellnbr	Datasrc:	PWTS
Well type:	Private well tracking system	Location:	T. 88 N., R. 47W., Sec. 31, SE, NW, SW, SE, NE
County:	Woodbury	Est loc ac:	nom. +/- 25m.
Depth:	193	C p date:	10/31/2001
Owner name:	Not Reported		
Other info:	Status: Active; Well use: Commercial		
Xcoord:	222912.888944		
Ycoord:	4698558.67489		
Hlink:	http://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNbr%5ct2081350&reportName=WellPrintout		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000013676

E27
ESE
1/2 - 1 Mile
Lower

IA WELLS

IAPW30000004938

Objectid:	4938	Iwellid:	2083993
Wellnmb:	2081350	Pmtnmb:	Not Reported
Twp:	88		
Rge:	47		
Ew:	W		
Sec:	31		
Qqqqq:	SE, NW, SW, SE, NE		
Elev:	0		
Elev acc:	Not Reported		
Well depth:	193		
Br depth:	0		
Wtr depth:	0		
Latitude:	42.3899		
Longitude:	-96.3662		
Dte done:	31-OCT-01		
Cty num:	97		
County:	Woodbury		
Drlr name:	Not Reported		
Owner name:	,		
Cnstr mthd:	Other		
Fm mk:	Not Reported		
Well use:	Commercial		
Status:	Active		
Ht pmp no:	0		
Permit:	Not Reported	Plugging:	Not Reported
Renovate:	Not Reported	Test:	Not Reported
Xcoord:	222912.888944		
Ycoord:	4698558.67489		
Horiz acc:	Not Reported	Has litho:	1
Has prod:	1	Has wq:	0
Has constr:	1		
Wnumber:	0		
Hlink:	https://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2081350&reportName=WellPrintout		
Site id:	IAPW30000004938		

F28
NNE
1/2 - 1 Mile
Lower

IA WELLS

IAPU30000013095

Mapid:	13095	Wellid:	27550
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, SE, SE, SE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	28	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-335-8		
Other info:	Well plugged: 9/5/1996; Well type: < 18" dia.		
Xcoord:	222546.84		
Ycoord:	4699811.5		
Hlink:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000013095

F29
NNE
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000013091**

Mapid:	13091	Wellid:	27545
Id src fld:	recordno	Datascr:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, SE, SE, SE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	33	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-335-1		
Other info:	Well plugged: 9/5/1996; Well type: < 18" dia.		
Xcoord:	222544.84		
Ycoord:	4699812.5		
Hlink:	Not Reported		
Site id:	IAPU30000013091		

G30
South
1/2 - 1 Mile
Lower

IA WELLS **IAPW30000007559**

Objectid:	7559	lwellid:	2087616
Wellnmb:	2084118	Pmntnmb:	12402
Twp:	87		
Rge:	48		
EW:	W		
Sec:	1		
Qqqqq:	NE, NE, NW, SE, SW		
Elev:	0		
Elev acc:	Not Reported		
Well depth:	0		
Br depth:	0		
Wtr depth:	0		
Latitude:	42.3842		
Longitude:	-96.3741		
Dte done:	30-DEC-99		
Cty num:	97		
County:	Woodbury		
Drlr name:	Soole Well Drilling		
Owner name:	DEROCHER, RICH		
Cnstr mthd:	Not Reported		
Fm rmk:	Not Reported		
Well use:	Household		
Status:	Retired		
Ht pmp no:	0		
Permit:	X	Plugging:	Not Reported
Renovate:	Not Reported	Test:	Not Reported
Xcoord:	222237.375969		
Ycoord:	4697951.48601		
Horiz acc:	Not Reported	Has litho:	0
Has prod:	0	Has wq:	0

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Has constr: 0
Wnumber: 0
Hlink: <https://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2084118&reportName=WellPrintout>
Site id: IAPW30000007559

G31 South 1/2 - 1 Mile Lower

IA WELLS IAPU30000013892

Mapid: 13892 Wellid: 2084118
Id src fld: wellnmbr Datasrc: PWTS
Well type: Private well tracking system Location: T. 87 N., R. 48W., Sec. 1, NE, NE, NW, SE, SW
County: Woodbury Est loc ac: nom. +/- 25m.
Depth: 0 C p date: Not Reported
Owner name: DEROCHER, RICH
Other info: Status: Retired; Well use: Household
Xcoord: 222237.375969
Ycoord: 4697951.48601
Hlink: <http://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2084118&reportName=WellPrintout>
Site id: IAPU30000013892

F32 NNE 1/2 - 1 Mile Lower

IA WELLS IAPU30000013080

Mapid: 13080 Wellid: 27546
Id src fld: recordno Datasrc: PLUG
Well type: Registered abandoned wells Location: T. 88 N., R. 48 W., Sec. 25, SE, SE, SE
County: Woodbury Est loc ac: Calc. +/- 140m.
Depth: 33 C p date: n.a.
Owner name: City Of Sioux City, Mw-335-2
Other info: Well plugged: 9/5/1996; Well type: < 18" dia.
Xcoord: 222550.84
Ycoord: 4699812.5
Hlink: Not Reported
Site id: IAPU30000013080

F33 NNE 1/2 - 1 Mile Lower

IA WELLS IAPU30000013092

Mapid: 13092 Wellid: 27547
Id src fld: recordno Datasrc: PLUG
Well type: Registered abandoned wells Location: T. 88 N., R. 48 W., Sec. 25, SE, SE, SE
County: Woodbury Est loc ac: Calc. +/- 140m.
Depth: 25 C p date: n.a.
Owner name: City Of Sioux City, Mw-335-4
Other info: Well plugged: 9/5/1996; Well type: < 18" dia.
Xcoord: 222545.84
Ycoord: 4699820.5
Hlink: Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000013092

F34
NNE
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000013084**

Mapid:	13084	Wellid:	27549
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, SE, SE, SE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	30	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-335-7		
Other info:	Well plugged: 9/5/1996; Well type: < 18" dia.		
Xcoord:	222551.84		
Ycoord:	4699821.5		
Hlink:	Not Reported		
Site id:	IAPU30000013084		

F35
NNE
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000013082**

Mapid:	13082	Wellid:	27548
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, SE, SE, SE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	30	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-335-6		
Other info:	Well plugged: 9/5/1996; Well type: < 18" dia.		
Xcoord:	222549.84		
Ycoord:	4699822.5		
Hlink:	Not Reported		
Site id:	IAPU30000013082		

H36
West
1/2 - 1 Mile
Higher

IA WELLS **IAPU30000013204**

Mapid:	13204	Wellid:	27609
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 36, NW, SW, SW
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	31	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-1109-3		
Other info:	Well plugged: 9/26/1996; Well type: < 18" dia.		
Xcoord:	221125.33		
Ycoord:	4699072		
Hlink:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000013204

H37
West
1/2 - 1 Mile
Higher

IA WELLS **IAPU30000013227**

Mapid:	13227	Wellid:	27611
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 36, NW, SW, SW
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	31	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-1109-5		
Other info:	Well plugged: 9/26/1996; Well type: < 18" dia.		
Xcoord:	221121.33		
Ycoord:	4699067		
Hlink:	Not Reported		
Site id:	IAPU30000013227		

H38
West
1/2 - 1 Mile
Higher

IA WELLS **IAPU30000013215**

Mapid:	13215	Wellid:	27607
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 36, NW, SW, SW
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	30	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-1109-1		
Other info:	Well plugged: 9/26/1996; Well type: < 18" dia.		
Xcoord:	221119.33		
Ycoord:	4699072		
Hlink:	Not Reported		
Site id:	IAPU30000013215		

H39
West
1/2 - 1 Mile
Higher

IA WELLS **IAPU30000013224**

Mapid:	13224	Wellid:	27610
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 36, NW, SW, SW
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	31	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-1109-4		
Other info:	Well plugged: 9/26/1996; Well type: < 18" dia.		
Xcoord:	221116.33		
Ycoord:	4699060		
Hlink:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000013224

H40
West
1/2 - 1 Mile
Higher

IA WELLS IAPU30000013226

Mapid:	13226	Wellid:	27608
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 36, NW, SW, SW
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	27	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-1109-2		
Other info:	Well plugged: 9/26/1996; Well type: < 18" dia.		
Xcoord:	221117.33		
Ycoord:	4699069		
Hlink:	Not Reported		
Site id:	IAPU30000013226		

41
East
1/2 - 1 Mile
Lower

IA WELLS IAPW30000094380

Objectid:	94380	lwellid:	2215990
Wellnmb:	2159251	Pmntnmb:	36027
Twp:	88		
Rge:	47		
EW:	W		
Sec:	31		
Qqqq:	NW, SW, NE, NW, SW		
Elev:	0		
Elev acc:	Not Reported		
Well depth:	0		
Br depth:	0		
Wtr depth:	0		
Latitude:	42.3941993713		
Longitude:	-96.3615951538		
Dte done:	30-DEC-99		
Cty num:	97		
County:	Woodbury		
Drlr name:	Not Reported		
Owner name:	,		
Cnstr mthd:	Not Reported		
Fm rmk:	Not Reported		
Well use:	Dewatering		
Status:	Permitted		
Ht pmp no:	0		
Permit:	X	Plugging:	Not Reported
Renovate:	Not Reported	Test:	Not Reported
Xcoord:	223310.882949		
Ycoord:	4699021.11545		
Horiz acc:	Not Reported	Has litho:	0
Has prod:	0	Has wq:	0

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Has constr: 0
Wnumber: 0
Hlink: <https://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2159251&reportName=WellPrintout>
Site id: IAPW30000094380

I42
North
1/2 - 1 Mile
Lower

IA WELLS IAPU30000012959

Mapid:	12959	Wellid:	2151539
Id src fld:	wellnmbr	Datasrc:	PWTS
Well type:	Private well tracking system	Location:	T. 88 N., R. 48W., Sec. 25, SW, NW, SW, NE, NW
County:	Woodbury	Est loc ac:	nom. +/- 25m.
Depth:	0	C p date:	Not Reported
Owner name:	Not Reported		
Other info:	Status: Permitted; Well use: Heat pump		
Xcoord:	222238.278676		
Ycoord:	4700109.59675		
Hlink:	http://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2151539&reportName=WellPrintout		
Site id:	IAPU30000012959		

I43
North
1/2 - 1 Mile
Lower

IA WELLS IAPW30000064973

Objectid:	64973	lwellid:	2198435
Wellnmbr:	2151539	Pmtnmbr:	33644
Twp:	88		
Rge:	48		
Ew:	W		
Sec:	25		
Qqqqq:	SW, NW, SW, NE, NW		
Elev:	0		
Elev acc:	Not Reported		
Well depth:	0		
Br depth:	0		
Wtr depth:	0		
Latitude:	42.4036026001		
Longitude:	-96.3751296997		
Dte done:	30-DEC-99		
Cty num:	97		
County:	Woodbury		
Drlr name:	Jensen Well Co.		
Owner name:	,		
Cnstr mthd:	Not Reported		
Fm rmk:	Not Reported		
Well use:	Heat pump		
Status:	Permitted		
Ht pmp no:	1		
Permit:	X	Plugging:	Not Reported
Renovate:	Not Reported	Test:	Not Reported
Xcoord:	222238.278652		
Ycoord:	4700109.59674		
Horiz acc:	Not Reported	Has litho:	0
Has prod:	0	Has wq:	0

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Has constr: 0
Wnumber: 0
Hlink: <https://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2151539&reportName=WellPrintout>
Site id: IAPW30000064973

44
NNE
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000012980**

Mapid:	12980	Wellid:	1762
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 88N., R. 48W., Sec. 25, SE, NE
County:	WOODBURY	Est loc ac:	Calc. +/- 280 m.
Depth:	307	C p date:	Not Reported
Owner name:	SIOUX CITY AIR BASE		
Other info:	Bedrock depth: 113; Well type: Public access		
Xcoord:	222487.5		
Ycoord:	4700107.75		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=1762		
Site id:	IAPU30000012980		

J45
SW
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000013602**

Mapid:	13602	Wellid:	57429
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 88N., R. 48W., Sec. 36, SW, SW, SW
County:	WOODBURY	Est loc ac:	Calc. +/- 140 m.
Depth:	26	C p date:	04/15/2003
Owner name:	IOWA AIR GUARD		
Other info:	Well type: Monitor		
Xcoord:	221106.36		
Ycoord:	4698270.4		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=57429		
Site id:	IAPU30000013602		

J46
SW
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000013601**

Mapid:	13601	Wellid:	57433
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 88N., R. 48W., Sec. 36, SW, SW, SW
County:	WOODBURY	Est loc ac:	Calc. +/- 140 m.
Depth:	50	C p date:	04/15/2003
Owner name:	IOWA AIR GUARD		
Other info:	Well type: Monitor		
Xcoord:	221106.36		
Ycoord:	4698270.4		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=57433		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000013601

J47
SW
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000013604**

Mapid:	13604	Wellid:	57438
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 88N., R. 48W., Sec. 36, SW, SW, SW
County:	WOODBURY	Est loc ac:	Calc. +/- 140 m.
Depth:	51	C p date:	04/15/2003
Owner name:	IOWA AIR GUARD		
Other info:	Well type: Monitor		
Xcoord:	221106.36		
Ycoord:	4698270.4		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=57438		
Site id:	IAPU30000013604		

J48
SW
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000013603**

Mapid:	13603	Wellid:	57440
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 88N., R. 48W., Sec. 36, SW, SW, SW
County:	WOODBURY	Est loc ac:	Calc. +/- 140 m.
Depth:	49	C p date:	04/15/2003
Owner name:	IOWA AIR GUARD		
Other info:	Well type: Monitor		
Xcoord:	221106.36		
Ycoord:	4698270.4		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=57440		
Site id:	IAPU30000013603		

J49
SW
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000013600**

Mapid:	13600	Wellid:	57437
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 88N., R. 48W., Sec. 36, SW, SW, SW
County:	WOODBURY	Est loc ac:	Calc. +/- 140 m.
Depth:	51	C p date:	04/15/2003
Owner name:	IOWA AIR GUARD		
Other info:	Well type: Monitor		
Xcoord:	221106.36		
Ycoord:	4698270.4		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=57437		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000013600

J50
SW
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000013595**

Mapid:	13595	Wellid:	57426
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 88N., R. 48W., Sec. 36, SW, SW, SW
County:	WOODBURY	Est loc ac:	Calc. +/- 140 m.
Depth:	35	C p date:	04/15/2003
Owner name:	IOWA AIR GUARD		
Other info:	Well type: Monitor		
Xcoord:	221106.36		
Ycoord:	4698270.4		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=57426		
Site id:	IAPU30000013595		

J51
SW
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000013594**

Mapid:	13594	Wellid:	57436
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 88N., R. 48W., Sec. 36, SW, SW, SW
County:	WOODBURY	Est loc ac:	Calc. +/- 140 m.
Depth:	50	C p date:	04/15/2003
Owner name:	IOWA AIR GUARD		
Other info:	Well type: Monitor		
Xcoord:	221106.36		
Ycoord:	4698270.4		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=57436		
Site id:	IAPU30000013594		

J52
SW
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000013599**

Mapid:	13599	Wellid:	57441
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 88N., R. 48W., Sec. 36, SW, SW, SW
County:	WOODBURY	Est loc ac:	Calc. +/- 140 m.
Depth:	51	C p date:	04/15/2003
Owner name:	IOWA AIR GUARD		
Other info:	Well type: Monitor		
Xcoord:	221106.36		
Ycoord:	4698270.4		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=57441		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000013599

J53
SW
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000013597**

Mapid:	13597	Wellid:	57434
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 88N., R. 48W., Sec. 36, SW, SW, SW
County:	WOODBURY	Est loc ac:	Calc. +/- 140 m.
Depth:	51	C p date:	04/15/2003
Owner name:	IOWA AIR GUARD		
Other info:	Well type: Monitor		
Xcoord:	221106.36		
Ycoord:	4698270.4		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=57434		
Site id:	IAPU30000013597		

J54
SW
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000013616**

Mapid:	13616	Wellid:	57431
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 88N., R. 48W., Sec. 36, SW, SW, SW
County:	WOODBURY	Est loc ac:	Calc. +/- 140 m.
Depth:	48	C p date:	04/15/2003
Owner name:	IOWA AIR GUARD		
Other info:	Well type: Monitor		
Xcoord:	221106.36		
Ycoord:	4698270.4		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=57431		
Site id:	IAPU30000013616		

J55
SW
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000013615**

Mapid:	13615	Wellid:	57424
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 88N., R. 48W., Sec. 36, SW, SW, SW
County:	WOODBURY	Est loc ac:	Calc. +/- 140 m.
Depth:	35	C p date:	04/15/2003
Owner name:	IOWA AIR GUARD		
Other info:	Well type: Monitor		
Xcoord:	221106.36		
Ycoord:	4698270.4		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=57424		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000013615

J56
SW
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000013620**

Mapid:	13620	Wellid:	57425
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 88N., R. 48W., Sec. 36, SW, SW, SW
County:	WOODBURY	Est loc ac:	Calc. +/- 140 m.
Depth:	35	C p date:	04/15/2003
Owner name:	IOWA AIR GUARD		
Other info:	Well type: Monitor		
Xcoord:	221106.36		
Ycoord:	4698270.4		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=57425		
Site id:	IAPU30000013620		

J57
SW
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000013618**

Mapid:	13618	Wellid:	57432
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 88N., R. 48W., Sec. 36, SW, SW, SW
County:	WOODBURY	Est loc ac:	Calc. +/- 140 m.
Depth:	51	C p date:	04/15/2003
Owner name:	IOWA AIR GUARD		
Other info:	Well type: Monitor		
Xcoord:	221106.36		
Ycoord:	4698270.4		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=57432		
Site id:	IAPU30000013618		

J58
SW
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000013613**

Mapid:	13613	Wellid:	57427
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 88N., R. 48W., Sec. 36, SW, SW, SW
County:	Woodbury	Est loc ac:	Calc. +/- 140 m.
Depth:	25	C p date:	04/15/2003
Owner name:	IOWA AIR GUARD		
Other info:	Well type: Monitor		
Xcoord:	221106.36		
Ycoord:	4698270.4		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=57427		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000013613

J59
SW
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000013608**

Mapid:	13608	Wellid:	57439
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 88N., R. 48W., Sec. 36, SW, SW, SW
County:	WOODBURY	Est loc ac:	Calc. +/- 140 m.
Depth:	49	C p date:	04/15/2003
Owner name:	IOWA AIR GUARD		
Other info:	Well type: Monitor		
Xcoord:	221106.36		
Ycoord:	4698270.4		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=57439		
Site id:	IAPU30000013608		

J60
SW
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000013606**

Mapid:	13606	Wellid:	57428
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 88N., R. 48W., Sec. 36, SW, SW, SW
County:	WOODBURY	Est loc ac:	Calc. +/- 140 m.
Depth:	26	C p date:	04/15/2003
Owner name:	IOWA AIR GUARD		
Other info:	Well type: Monitor		
Xcoord:	221106.36		
Ycoord:	4698270.4		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=57428		
Site id:	IAPU30000013606		

J61
SW
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000013611**

Mapid:	13611	Wellid:	57430
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 88N., R. 48W., Sec. 36, SW, SW, SW
County:	WOODBURY	Est loc ac:	Calc. +/- 140 m.
Depth:	26	C p date:	04/15/2003
Owner name:	IOWA AIR GUARD		
Other info:	Well type: Monitor		
Xcoord:	221106.36		
Ycoord:	4698270.4		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=57430		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000013611

J62
SW
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000013609**

Mapid:	13609	Wellid:	57435
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 88N., R. 48W., Sec. 36, SW, SW, SW
County:	WOODBURY	Est loc ac:	Calc. +/- 140 m.
Depth:	51	C p date:	04/15/2003
Owner name:	IOWA AIR GUARD		
Other info:	Well type: Monitor		
Xcoord:	221106.36		
Ycoord:	4698270.4		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=57435		
Site id:	IAPU30000013609		

63
North
1/2 - 1 Mile
Lower

FED USGS **USGS40000318528**

Org. Identifier:	USGS-IA		
Formal name:	USGS Iowa Water Science Center		
Monloc Identifier:	USGS-422415096222401		
Monloc name:	088N48W25DBAA 01574 1942Sioux City Air Base 2		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	10230001	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	42.4041602
Longitude:	-96.3736402	Sourcemap scale:	24000
Horiz Acc measure:	5	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refs:	NAD83	Vert measure val:	1091.20
Vert measure units:	feet	Vertacc measure val:	01
Vert accmeasure units:	feet		
Vertcollection method:	Altimeter		
Vert coord refs:	NGVD29	Countrycode:	US
Aquifername:	Lower Cretaceous aquifers		
Formation type:	Dakota Group		
Aquifer type:	Not Reported		
Construction date:	19420601	Welldepth:	250
Welldepth units:	ft	Wellholedepth:	250
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1942-07-30	18.50	

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database EDR ID Number

K64
East
1/2 - 1 Mile
Lower

IA WELLS IAPR30000001113

Recordno:	1113	Twp:	88
N s:	N	Rge:	47
E w:	W	Sec:	31
Qqqqq:	Not Reported	Q abc:	Not Reported
Checked:	Not Reported	Ownerfirst:	KENNETH
Ownerlast:	LURCK	Owneraddr:	1284 WARRIOR RD
Ownercity:	SERGEANT BLUFF	Ownerst:	IA
Ownerzip:	51054	Ownerphone:	7129433960
County:	97	Legal:	31 8847W
Depth:	25	Dpth rel:	E
Permit:	Not Reported	Sampldte:	29-JUN-94
Lab:	Not Reported		
Lab no:	Not Reported		
Anal dte:	01-JUL-94	Smplsce:	PRESSURE TANK
Bact ltb:	Not Reported	Bact bgb:	Not Reported
Bactr:	<	Bact:	2.20000004768372
Bctcolml:	0	Bact s u:	S
No3r:	Not Reported	No3:	0
No3 s u:	S	Nitrogen:	0
Drl mthd:	DRIVEN	Drlmth rel:	K
Case mat:	Not Reported	Cs mt rel:	Not Reported
Case diam:	0	Csdia rel:	Not Reported
Year cons:	0	Yr rel:	U
Agentfirst:	Not Reported	Agentlast:	Not Reported
Created:	Not Reported	Updated:	TALT 11/28/94 13:38:42
Flag:	Not Reported		
Utm x:	223436		
Utm y:	4698676.5		
Site id:	IAPR30000001113		

K65
East
1/2 - 1 Mile
Lower

IA WELLS IAPU30000013607

Mapid:	13607	Wellid:	1113
Id src fld:	recordno	Datasrc:	TEST
Well type:	Wells registered for testing	Location:	T. 88 N., R. 47 W., Sec. 31
County:	Woodbury	Est loc ac:	Calc. +/- 1135m.
Depth:	25	C p date:	unkn
Owner name:	Lurck, Kenneth		
Other info:	Drilling method: Driven; Estimated well depth		
Xcoord:	223425.44		
Ycoord:	4698899.5		
Hlink:	Not Reported		
Site id:	IAPU30000013607		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database EDR ID Number

L66
WNW
1/2 - 1 Mile
Lower

IA WELLS IAPW30000087300

Objectid:	87300	Wellid:	2183590
Wellnmb:	2144928	Pmntnmb:	31474
Twp:	88		
Rge:	48		
Ew:	W		
Sec:	35		
Qqqq:	NE, NE, SW, NE, SE		
Elev:	0		
Elev acc:	Not Reported		
Well depth:	0		
Br depth:	0		
Wtr depth:	0		
Latitude:	42.3962898254		
Longitude:	-96.3907318115		
Dte done:	30-DEC-99		
Cty num:	97		
County:	Woodbury		
Drlr name:	* Unknown		
Owner name:			
Cnstr mthd:	Not Reported		
Fm rnk:	Not Reported		
Well use:	Monitoring		
Status:	Permitted		
Ht pmp no:	0		
Permit:	X	Plugging:	Not Reported
Renovate:	Not Reported	Test:	Not Reported
Xcoord:	220921.69545		
Ycoord:	4699348.66913		
Horiz acc:	Not Reported	Has litho:	0
Has prod:	0	Has wq:	0
Has constr:	0		
Wnumber:	0		
Hlink:	https://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2144928&reportName=WellPrintout		
Site id:	IAPW30000087300		

L67
WNW
1/2 - 1 Mile
Lower

IA WELLS IAPU30000013086

Mapid:	13086	Wellid:	2144928
Id src fld:	wellnmb	Datasrc:	PWTS
Well type:	Private well tracking system	Location:	T. 88 N., R. 48W., Sec. 35, NE, NE, SW, NE, SE
County:	Woodbury	Est loc ac:	nom. +/- 25m.
Depth:	0	C p date:	Not Reported
Owner name:	Not Reported		
Other info:	Status: Permitted; Well use: Monitoring		
Xcoord:	220921.695492		
Ycoord:	4699348.66918		
Hlink:	http://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2144928&reportName=WellPrintout		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000013086

L68
WNW
1/2 - 1 Mile
Lower

IA WELLS

IAPW30000060185

Objectid:	60185	Iwellid:	2183591
Wellnbr:	2144929	Pmtnbr:	31474
Twp:	88		
Rge:	48		
Ew:	W		
Sec:	35		
Qqqqq:	NE, NE, NE, SW, SE		
Elev:	0		
Elev acc:	Not Reported		
Well depth:	0		
Br depth:	0		
Wtr depth:	0		
Latitude:	42.3971862793		
Longitude:	-96.3903274536		
Dte done:	30-DEC-99		
Cty num:	97		
County:	Woodbury		
Drlr name:	* Unknown		
Owner name:	,		
Cnstr mthd:	Not Reported		
Fm mk:	Not Reported		
Well use:	Monitoring		
Status:	Permitted		
Ht pmp no:	0		
Permit:	X	Plugging:	Not Reported
Renovate:	Not Reported	Test:	Not Reported
Xcoord:	220958.956875		
Ycoord:	4699446.89471		
Horiz acc:	Not Reported	Has litho:	0
Has prod:	0	Has wq:	0
Has constr:	0		
Wnumber:	0		
Hlink:	https://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2144929&reportName=WellPrintout		
Site id:	IAPW30000060185		

M69
South
1/2 - 1 Mile
Lower

IA WELLS

IAPU30000014037

Mapid:	14037	Wellid:	60094
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 87N., R. 48W., Sec. 1, NE, SW, NE
County:	WOODBURY	Est loc ac:	Calc. +/- 140 m.
Depth:	100	C p date:	05/05/2005
Owner name:	LEUENHAGEN, RANDY		
Other info:	Well type: Other		
Xcoord:	222059.3		
Ycoord:	4697622.3		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=60094		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000014037

L70
WNW
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000013071**

Mapid:	13071	Wellid:	2144929
Id src fld:	wellnbr	Datasrc:	PWTS
Well type:	Private well tracking system	Location:	T. 88 N., R. 48W., Sec. 35, NE, NE, NE, SW, SE
County:	Woodbury	Est loc ac:	nom. +/- 25m.
Depth:	0	C p date:	Not Reported
Owner name:	Not Reported		
Other info:	Status: Permitted; Well use: Monitoring		
Xcoord:	220958.956908		
Ycoord:	4699446.89474		
Hlink:	http://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNbr%5ct2144929&reportName=WellPrintout		
Site id:	IAPU30000013071		

N71
South
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000014071**

Mapid:	14071	Wellid:	2090247
Id src fld:	wellnbr	Datasrc:	PWTS
Well type:	Private well tracking system	Location:	T. 87 N., R. 48W., Sec. 1, NE, SW, NW, SE, NE
County:	Woodbury	Est loc ac:	nom. +/- 25m.
Depth:	120	C p date:	01/01/1978
Owner name:	MCQUADE, DOUG		
Other info:	Status: Active; Well use: Household		
Xcoord:	222231.486187		
Ycoord:	4697595.78575		
Hlink:	http://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNbr%5ct2090247&reportName=WellPrintout		
Site id:	IAPU30000014071		

N72
South
1/2 - 1 Mile
Lower

IA WELLS **IAPW30000013313**

Objectid:	13313	Iwellid:	2096174
Wellnbr:	2090247	Pmntnbr:	Not Reported
Twp:	87		
Rge:	48		
Ew:	W		
Sec:	1		
Qqqqq:	NE, SW, NW, SE, NE		
Elev:	0		
Elev acc:	Not Reported		
Well depth:	120		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Br depth:	0		
Wtr depth:	0		
Latitude:	42.381		
Longitude:	-96.374		
Dte done:	01-JAN-78		
Cty num:	97		
County:	Woodbury		
Drlr name:	Not Reported		
Owner name:	MCQUADE, DOUG		
Cnstr mthd:	Rotary Drill		
Fm mk:	Not Reported		
Well use:	Household		
Status:	Active		
Ht pmp no:	0		
Permit:	Not Reported	Plugging:	Not Reported
Renovate:	Not Reported	Test:	X
Xcoord:	222231.486187		
Ycoord:	4697595.78575		
Horiz acc:	Not Reported	Has litho:	0
Has prod:	0	Has wq:	1
Has constr:	0		
Wnumber:	0		
Hlink:	https://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2090247&reportName=WellPrintout		
Site id:	IAPW30000013313		

L73
WNW
1/2 - 1 Mile
Lower

IA WELLS

IAPW30000060184

Objectid:	60184	Iwellid:	2183589
Wellnmbr:	2144927	Pmtnmbr:	31474
Twp:	88		
Rge:	48		
Ew:	W		
Sec:	35		
Qqqqq:	NE, NE, SW, NW, NE		
Elev:	0		
Elev acc:	Not Reported		
Well depth:	0		
Br depth:	0		
Wtr depth:	0		
Latitude:	42.3964805603		
Longitude:	-96.391204834		
Dte done:	30-DEC-99		
Cty num:	97		
County:	Woodbury		
Drlr name:	* Unknown		
Owner name:	,		
Cnstr mthd:	Not Reported		
Fm mk:	Not Reported		
Well use:	Monitoring		
Status:	Permitted		
Ht pmp no:	0		
Permit:	X	Plugging:	Not Reported
Renovate:	Not Reported	Test:	Not Reported
Xcoord:	220883.604944		
Ycoord:	4699371.40669		
Horiz acc:	Not Reported	Has litho:	0
Has prod:	0	Has wq:	0

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Has constr: 0
Wnumber: 0
Hlink: <https://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2144927&reportName=WellPrintout>
Site id: IAPW30000060184

L74
WNW
1/2 - 1 Mile
Lower

IA WELLS IAPU30000013088

Mapid: 13088 Wellid: 2144927
Id src fld: wellnmbr Datasrc: PWTS
Well type: Private well tracking system Location: T. 88 N., R. 48W., Sec. 35, NE, NE, SW, NW, NE
County: Woodbury Est loc ac: nom. +/- 25m.
Depth: 0 C p date: Not Reported
Owner name: Not Reported
Other info: Status: Permitted; Well use: Monitoring
Xcoord: 220883.604947
Ycoord: 4699371.40672
Hlink: <http://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2144927&reportName=WellPrintout>
Site id: IAPU30000013088

O75
ENE
1/2 - 1 Mile
Lower

IA WELLS IAUS20000002885

Maplabelna: City Of Sergeant Bluff-W28474
Legendtype: 39 Publicview: 0
Locid: 20000325420
Stfacid: 311974299
Progid: 97-12-006
Facname: City Of Sergeant Bluff
Opstatus: Drilled: No/Unknown Pistartdat: 28-FEB-12
Subname: W28474
Subprogid: 18366 Subaltidnu: Dewatering Wells
Wellname: Dewatering Wells
Wellstatus: Not Reported
Totaldepth: 0
Drilldate: 30-DEC-99 Aquifertyp: Unconsolidated - Drift, Alluv, Bur
Aquiferran: Primary Countyname: Woodbury
Fo: 3 Accuracy: 20
Colmthtxt: INTERPOLATION-PHOTO Refpnttxt: CENTER OF FACILITY
Verifytxt: Not Reported Collectby: JNeleigh
Coldate: 28-FEB-12
Loccomment: First point clicked in WUSE map applet
Congress: 5 Sthouse: 54
Stsenate: 27 Huc: 102300040302
Hyperlink: <http://programs.iowadnr.gov/wateruse/>
Lat: 42.39744
Lon: -96.3604
Xcoord: 223423
Ycoord: 4699378
Site id: IAUS20000002885

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database EDR ID Number

O76
ENE
1/2 - 1 Mile
Lower

IA WELLS IAPU30000013415

Mapid:	13415	Wellid:	W28474
Id src fld:	subname	Datasrc:	WTRU
Well type:	Water Use Permit Wells	Location:	T88N, R47W, Sec. 31, NW, NE, SE
County:	Woodbury	Est loc ac:	+/-20
Depth:	unkn	C p date:	Not Reported
Owner name:	City Of Sergeant Bluff		
Other info:	Water Use Permit 97-12-006; Primary use: Dewatering		
Xcoord:	223423		
Ycoord:	4699378		
Hlink:	https://facilityexplorer.iowadnr.gov/FacilityExplorer/SiteDetail.aspx?facID=311974299		
Site id:	IAPU30000013415		

M77
South
1/2 - 1 Mile
Lower

IA WELLS IAPW30000033866

Objectid:	33866	lwellid:	2121797
Wellnmb:	2108564	Pmtnmbr:	19331
Twp:	87		
Rge:	48		
Ew:	W		
Sec:	1		
Qqqqq:	NE, SE, NE, SW, SW		
Elev:	0		
Elev acc:	Not Reported		
Well depth:	0		
Br depth:	0		
Wtr depth:	0		
Latitude:	42.3804		
Longitude:	-96.3755		
Dte done:	30-DEC-99		
Cty num:	97		
County:	Woodbury		
Drlr name:	Not Reported		
Owner name:	LEUENHAGEN, RANDY		
Cnstr mthd:	Not Reported		
Fm rmk:	Not Reported		
Well use:	Heat pump		
Status:	Retired		
Ht pmp no:	1		
Permit:	X	Plugging:	Not Reported
Renovate:	Not Reported	Test:	Not Reported
Xcoord:	222105.334618		
Ycoord:	4697534.06235		
Horiz acc:	Not Reported	Has litho:	0
Has prod:	0	Has wq:	0

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Has constr: 0
Wnumber: 60094
Hlink: <https://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2108564&reportName=WellPrintout>
Site id: IAPW30000033866

M78
South
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000014099**

Mapid: 14099 Wellid: 2108564
Id src fld: wellnmbr Datasrc: PWTS
Well type: Private well tracking system Location: T. 87 N., R. 48W., Sec. 1, NE, SE, NE, SW, SW
County: Woodbury Est loc ac: nom. +/- 25m.
Depth: 0 C p date: Not Reported
Owner name: LEUENHAGEN, RANDY
Other info: Status: Retired; Well use: Heat pump
Xcoord: 222105.334618
Ycoord: 4697534.06235
Hlink: <http://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2108564&reportName=WellPrintout>
Site id: IAPU30000014099

P79
South
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000014093**

Mapid: 14093 Wellid: 3
Id src fld: recordno Datasrc: TEST
Well type: Wells registered for testing Location: T. 87 N., R. 48 W., Sec. 1, NE, SW
County: Woodbury Est loc ac: Calc. +/- 285m.
Depth: 100 C p date: 1979
Owner name: Const. Co., Elk Horn
Other info: Drilling method: Drilled; Known well depth
Xcoord: 221955.33
Ycoord: 4697526.5
Hlink: Not Reported
Site id: IAPU30000014093

P80
South
1/2 - 1 Mile
Lower

IA WELLS **IAPR30000000003**

Recordno: 3 Twp: 87
N s: N Rge: 48
E w: W Sec: 1
Qqqqq: NE SW Q abc: AC
Checked: Not Reported Ownerfirst: ELK HORN
Ownerlast: CONST. CO. Owneraddr: 2243 ANDREW AVE.
Ownercity: SGT. BLUFF Ownerst: IA
Ownerzip: 51054 Ownerphone: 7129434430
County: 97 Legal: SWNE 1 8748W
Depth: 100 Dpth rel: K

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Permit:	Not Reported	Sampldte:	26-JUL-94
Lab:	Not Reported		
Lab no:	Not Reported		
Anal dte:	28-JUL-94	Smpls rce:	SINK FAUCET
Bact ltb:	Not Reported	Bact bgb:	Not Reported
Bact r:	<	Bact:	2.200000004768372
Bctcolml:	0	Bact s u:	S
No3r:	<	No3:	.100000001490116
No3 s u:	S	Nitrogen:	0
Drl mthd:	DRILLED	Drlmth rel:	K
Case mat:	Not Reported	Cs mt rel:	U
Case diam:	0	Cs dia rel:	U
Year cons:	1979	Yr rel:	K
Agentfirst:	D.V.	Agentlast:	WEAKLEY
Created:	Not Reported	Updated:	RTALCOT 10/27/94 09:59:38
Flag:	YNNNNNNNNNNNNNNNNNNNN		
Utm x:	221972.88		
Utm y:	4697309.69		
Site id:	IAPR300000000003		

81
SE
1/2 - 1 Mile
Lower

IA WELLS

IAPW30000067684

Objectid:	67684	lwellid:	2206723
Wellnmb:	2155163	Pmtnmbr:	34746
Twp:	88		
Rge:	47		
Ew:	W		
Sec:	31		
Qqqqq:	SE, SW, SW, NW, NW		
Elev:	0		
Elev acc:	Not Reported		
Well depth:	0		
Br depth:	0		
Wtr depth:	0		
Latitude:	42.3854064941		
Longitude:	-96.3616867065		
Dte done:	30-DEC-99		
Cty num:	97		
County:	Woodbury		
Drlr name:	Not Reported		
Owner name:	,		
Cnstr mthd:	Not Reported		
Fm rnk:	Not Reported		
Well use:	Dewatering		
Status:	Permitted		
Ht pmp no:	0		
Permit:	X	Plugging:	Not Reported
Renovate:	Not Reported	Test:	Not Reported
Xcoord:	223264.676744		
Ycoord:	4698044.92936		
Horiz acc:	Not Reported	Has litho:	0
Has prod:	0	Has wq:	0

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Has constr: 0
Wnumber: 0
Hlink: <https://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2155163&reportName=WellPrintout>
Site id: IAPW30000067684

82
North
1/2 - 1 Mile
Lower

IA WELLS IAPU30000012867

Mapid:	12867	Wellid:	27596
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, SE, NE, NW
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	32	C p date:	n.a.
Owner name:	City Of Sioux City, Amw-10		
Other info:	Well plugged: 9/13/1996; Well type: < 18" dia.		
Xcoord:	222374.34		
Ycoord:	4700426		
Hlink:	Not Reported		
Site id:	IAPU30000012867		

83
North
1/2 - 1 Mile
Lower

IA WELLS IAPU30000012851

Mapid:	12851	Wellid:	1574
Id src fld:	Wnumber	Datasrc:	PUB
Well type:	Public wells	Location:	T. 88N., R. 48W., Sec. 25
County:	Woodbury	Est loc ac:	Meas. +/- 115'
Depth:	250	C p date:	06/01/1942
Owner name:	Sioux City, City Of		
Other info:	Local name: Sioux City Airport #2; Status: Not Used		
Xcoord:	222247.93		
Ycoord:	4700455.51		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=1574		
Site id:	IAPU30000012851		

Q84
NNE
1/2 - 1 Mile
Lower

IA WELLS IAPU30000012888

Mapid:	12888	Wellid:	27584
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, SE, NE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	31	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-642-1		
Other info:	Well plugged: 8/29/1996; Well type: < 18" dia.		
Xcoord:	222573.94		
Ycoord:	4700412.5		
Hlink:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000012888

Q85
NNE
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000012881**

Mapid:	12881	Wellid:	27585
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, SE, NE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	30	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-642-2		
Other info:	Well plugged: 8/29/1996; Well type: < 18" dia.		
Xcoord:	222567.94		
Ycoord:	4700414.5		
Hlink:	Not Reported		
Site id:	IAPU30000012881		

Q86
NNE
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000012904**

Mapid:	12904	Wellid:	27586
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, SE, NE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	30	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-642-3		
Other info:	Well plugged: 8/29/1996; Well type: < 18" dia.		
Xcoord:	222583.94		
Ycoord:	4700411.5		
Hlink:	Not Reported		
Site id:	IAPU30000012904		

Q87
NNE
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000012891**

Mapid:	12891	Wellid:	27587
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, SE, NE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	33	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-642-4		
Other info:	Well plugged: 8/29/1996; Well type: < 18" dia.		
Xcoord:	222569.94		
Ycoord:	4700416.5		
Hlink:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000012891

Q88
NNE
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000012908**

Mapid:	12908	Wellid:	27553
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, SE, NE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	30	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-509-3		
Other info:	Well plugged: 9/16/1996; Well type: < 18" dia.		
Xcoord:	222580.94		
Ycoord:	4700413.5		
Hlink:	Not Reported		
Site id:	IAPU30000012908		

Q89
NNE
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000012906**

Mapid:	12906	Wellid:	27551
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, SE, NE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	33	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-509-1		
Other info:	Well plugged: 8/30/1996; Well type: < 18" dia.		
Xcoord:	222574.94		
Ycoord:	4700419.5		
Hlink:	Not Reported		
Site id:	IAPU30000012906		

Q90
NNE
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000012901**

Mapid:	12901	Wellid:	27552
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, SE, NE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	31	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-509-2		
Other info:	Well plugged: 8/30/1996; Well type: < 18" dia.		
Xcoord:	222580.94		
Ycoord:	4700418.5		
Hlink:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000012901

91
ENE
1/2 - 1 Mile
Lower

IA WELLS

IAPW30000098224

Objectid:	98224	Iwellid:	2232866
Wellnubr:	2167154	Pmtnubr:	Not Reported
Twp:	88		
Rge:	47		
Ew:	W		
Sec:	30		
Qqqqq:	SW, SE, NW, SE, SE		
Elev:	0		
Elev acc:	Not Reported		
Well depth:	20		
Br depth:	0		
Wtr depth:	0		
Latitude:	42.40047		
Longitude:	-96.35962		
Dte done:	01-JAN-11		
Cty num:	97		
County:	Woodbury		
Drlr name:	Not Reported		
Owner name:	Not Reported		
Cnstr mthd:	Rotary Drill		
Fm mk:	Not Reported		
Well use:	Monitoring		
Status:	Plugged		
Ht pmp no:	0		
Permit:	Not Reported	Plugging:	X
Renovate:	Not Reported	Test:	Not Reported
Xcoord:	223501.037079		
Ycoord:	4699711.05744		
Horiz acc:	Not Reported	Has litho:	0
Has prod:	0	Has wq:	0
Has constr:	0		
Wnumber:	0		
Hlink:	https://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2167154&reportName=WellPrintout		
Site id:	IAPW30000098224		

92
NNE
1/2 - 1 Mile
Higher

FED USGS

USGS40000318534

Org. Identifier:	USGS-IA		
Formal name:	USGS Iowa Water Science Center		
Monloc Identifier:	USGS-422420096220001		
Monloc name:	088N47W30DBCA	1981Sergeant Bluff 3	
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	10230001	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	42.405549
Longitude:	-96.3669733	Sourcemap scale:	24000

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	1094
Vert measure units:	feet	Vertacc measure val:	5
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Cretaceous System		
Aquifer type:	Not Reported		
Construction date:	1981	Welldepth:	245
Welldepth units:	ft	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 0

R93
SE
1/2 - 1 Mile
Lower

IA WELLS **IAPU30000014148**

Mapid:	14148	Wellid:	61584
Id src fld:	recordno	Datasrc:	TEST
Well type:	Wells registered for testing	Location:	T. 87 N., R. 47 W., Sec. 6, NW, NE, SE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	100	C p date:	1991
Owner name:	Blenderman, Bob		
Other info:	Drilling method: Unknown; Known well depth		
Xcoord:	223286.33		
Ycoord:	4697782		
Hlink:	Not Reported		
Site id:	IAPU30000014148		

R94
SE
1/2 - 1 Mile
Lower

IA WELLS **IAPR30000061584**

Recordno:	61584	Twp:	87
N s:	N	Rge:	47
E w:	W	Sec:	6
Qqqqq:	NW NE SE	Q abc:	BAD
Checked:	toehler 02/11/00 11:23:12	Ownerfirst:	BOB
Ownerlast:	BLENDERMAN	Owneraddr:	7415 OLD LANKEPORT RD.
Ownercity:	SERGEANT BLUFF	Ownerst:	IA
Ownerzip:	51054	Ownerphone:	7129432678
County:	97	Legal:	SENENW 6 8747W
Depth:	100	Dpth rel:	K
Permit:	Not Reported	Sampldte:	05-NOV-99
Lab:	IOWA TESTING LABORATORIES, INC.		
Lab no:	024		
Anal dte:	30-DEC-99	Smplsrce:	KITCHEN FAUCET
Bact ltb:	Not Reported	Bact bgb:	Not Reported
Bactr:	Not Reported	Bact:	0
Bctcolml:	0	Bact s u:	S
No3r:	Not Reported	No3:	0
No3 s u:	S	Nitrogen:	.200000002980232
Drl mthd:	UNKNOWN	Drlmth rel:	Not Reported
Case mat:	PLASTIC	Cs mt rel:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Case diam:	0	Cs dia rel:	U
Year cons:	1991	Yr rel:	E
Agentfirst:	Not Reported	Agentlast:	Not Reported
Created:	kwillet 02/08/00 15:51:03	Updated:	toehler 02/11/00 11:23:12
Flag:	NYNNYYNNYYNNNNNNNNNN		
Utm x:	223295.94		
Utm y:	4697559.75		
Site id:	IAPR30000061584		

S95 South 1 - 2 Miles Lower

IA WELLS IAUS20000004879

Maplabelna:	Southbridge Sanitary Sewer Construction-W28585		
Legendtype:	39	Publicview:	0
Locid:	20000330612		
Stfacid:	312038618		
Progid:	97-12-073		
Facname:	Southbridge Sanitary Sewer Construction		
Opstatus:	Drilled: No/Unknown	Pistartdat:	01-OCT-12
Subname:	W28585		
Subprogid:	18754	Subaltidnu:	19 Dewatering Wells
Wellname:	19 Dewatering Wells		
Wellstatus:	Not Reported		
Totaldepth:	0		
Drilldate:	30-DEC-99	Aquifertyp:	Unconsolidated - Drift, Alluv, Bur
Aquiferran:	Primary	Countyname:	Woodbury
Fo:	3	Accuracy:	20
Colmthtxt:	INTERPOLATION-PHOTO	Refpnttxt:	CENTER OF FACILITY
Verifytxt:	Not Reported	Collectby:	JNeleigh
Coldate:	01-OCT-12		
Loccomment:	First point clicked in WUSE map applet		
Congress:	5	Sthouse:	55
Stsenate:	28	Huc:	1023000108
Hyperlink:	http://programs.iowadnr.gov/wateruse/		
Lat:	42.37845		
Lon:	-96.37331		
Xcoord:	222277		
Ycoord:	4697311		
Site id:	IAUS20000004879		

S96 South 1 - 2 Miles Lower

IA WELLS IAPU30000014255

Mapid:	14255	Wellid:	W28585
Id src fld:	subname	Datasrc:	WTRU
Well type:	Water Use Permit Wells	Location:	T87N, R48W, Sec. 1, NE, SE, SW
County:	Woodbury	Est loc ac:	+/-20
Depth:	unkn	C p date:	Not Reported
Owner name:	Southbridge Sanitary Sewer Construction		
Other info:	Water Use Permit 97-12-073; Primary use: Dewatering		
Xcoord:	222277		
Ycoord:	4697311		
Hlink:	https://facilityexplorer.iowadnr.gov/FacilityExplorer/SiteDetail.aspx?facID=312038618		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000014255

T97
SSE
1 - 2 Miles
Lower

IA WELLS **IAPU30000014257**

Mapid:	14257	Wellid:	71956
Id src fld:	recordno	Datasrc:	TEST
Well type:	Wells registered for testing	Location:	T. 87 N., R. 47 W., Sec. 6, NW, SW, SW
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	93	C p date:	2000
Owner name:	Williams, Linda		
Other info:	Drilling method: Drilled; Known well depth		
Xcoord:	222664.63		
Ycoord:	4697379		
Hlink:	Not Reported		
Site id:	IAPU30000014257		

T98
SSE
1 - 2 Miles
Lower

IA WELLS **IAPR30000071956**

Recordno:	71956	Twp:	87
N s:	N	Rge:	47
E w:	W	Sec:	6
Qqqqq:	NW SW SW	Q abc:	BCC
Checked:	jswan 08/07/00 15:21:57	Ownerfirst:	LINDA
Ownerlast:	WILLIAMS	Owneraddr:	2294 ALICIA AVE.
Ownercity:	SERGEANT BLUFF	Ownerst:	IA
Ownerzip:	51054	Ownerphone:	7129434735
County:	97	Legal:	SWSWNW 6 8747W
Depth:	93	Dpth rel:	K
Permit:	Not Reported	Sampldte:	26-JUN-00
Lab:	IA024		
Lab no:	Not Reported		
Anal dte:	30-DEC-99	Smpls rce:	KITCHEN FAUCET
Bact ltb:	Not Reported	Bact bgb:	Not Reported
Bactr:	Not Reported	Bact:	0
Bctcolml:	0	Bact s u:	U
No3r:	Not Reported	No3:	0
No3 s u:	S	Nitrogen:	.100000001490116
Drl mthd:	DRILLED	Drlmth rel:	Not Reported
Case mat:	PLASTIC	Cs mt rel:	Not Reported
Case diam:	0	Cs dia rel:	U
Year cons:	2000	Yr rel:	K
Agentfirst:	Not Reported	Agentlast:	Not Reported
Created:	kmckine 08/03/00 09:07:11	Updated:	jswan 08/07/00 15:21:57
Flag:	YYNYYNNNNNNNNNNNNNN		
Utm x:	222677.19		
Utm y:	4697160		
Site id:	IAPR30000071956		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database EDR ID Number

U99
SSW
1 - 2 Miles
Lower

IA WELLS IAPU30000014157

Mapid:	14157	Wellid:	15440
Id src fld:	recordno	Datasrc:	TEST
Well type:	Wells registered for testing	Location:	T. 87 N., R. 48 W., Sec. 1
County:	Woodbury	Est loc ac:	Calc. +/- 1135m.
Depth:	24	C p date:	unkn
Owner name:	Nelson, Grace M.		
Other info:	Drilling method: Point		
Xcoord:	221749.91		
Ycoord:	4697333		
Hlink:	Not Reported		
Site id:	IAPU30000014157		

U100
SSW
1 - 2 Miles
Lower

IA WELLS IAPR30000015440

Recordno:	15440	Twp:	87
N s:	N	Rge:	48
E w:	W	Sec:	1
Qqqqq:	Not Reported	Q abc:	Not Reported
Checked:	libey 10/11/96 10:52:17	Ownerfirst:	GRACE M.
Ownerlast:	NELSON	Owneraddr:	2290 ALICIA AVE.
Ownercity:	SGT. BLUFF	Ownerst:	IA
Ownerzip:	51054	Ownerphone:	9435617
County:	97	Legal:	1 8748W
Depth:	24	Dpth rel:	Not Reported
Permit:	Not Reported	Sampldte:	17-NOV-94
Lab:	SIOUXLAND DISTRICT HEALTH DEPARTMENT		
Lab no:	Not Reported		
Anal dte:	21-NOV-94	Smplsce:	FAUCET
Bact ltb:	Not Reported	Bact bgb:	Not Reported
Bactr:	Not Reported	Bact:	0
Bctcolml:	0	Bact s u:	U
No3r:	Not Reported	No3:	0
No3 s u:	U	Nitrogen:	30
Drl mthd:	POINT	Drlmth rel:	Not Reported
Case mat:	Not Reported	Cs mt rel:	Not Reported
Case diam:	0	Csdia rel:	Not Reported
Year cons:	0	Yr rel:	Not Reported
Agentfirst:	D.V.	Agentlast:	WEAKLY
Created:	Not Reported	Updated:	libey 10/15/96 11:06:06
Flag:	YNNNNNNNNNNNNNNNNNNNNNN		
Utm x:	221767.5		
Utm y:	4697109.75		
Site id:	IAPR30000015440		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database EDR ID Number

R101
SE
1 - 2 Miles
Lower

IA WELLS IAPW30000096312

Objectid:	96312	Wellid:	2225027
Wellnmbr:	2163643	Pmntnmbr:	37743
Twp:	87		
Rge:	47		
Ew:	W		
Sec:	6		
Qqqq:	NW, NE, NE, SW, NW		
Elev:	0		
Elev acc:	Not Reported		
Well depth:	0		
Br depth:	0		
Wtr depth:	0		
Latitude:	42.3825683594		
Longitude:	-96.3611984253		
Dte done:	30-DEC-99		
Cty num:	97		
County:	Woodbury		
Drlr name:	Not Reported		
Owner name:			
Cnstr mthd:	Not Reported		
Fm rnk:	Not Reported		
Well use:	Dewatering		
Status:	Permitted		
Ht pmp no:	0		
Permit:	X	Plugging:	Not Reported
Renovate:	Not Reported	Test:	Not Reported
Xcoord:	223292.398065		
Ycoord:	4697728.15151		
Horiz acc:	Not Reported	Has litho:	0
Has prod:	0	Has wq:	0
Has constr:	0		
Wnumber:	0		
Hlink:	https://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2163643&reportName=WellPrintout		
Site id:	IAPW30000096312		

V102
South
1 - 2 Miles
Lower

IA WELLS IAPU30000014247

Mapid:	14247	Wellid:	22214
Id src fld:	recordno	Datasrc:	PVTP
Well type:	Permitted private wells	Location:	T. 87 N., R. 48 W., Sec. 1, SE, NW, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	100	C p date:	3/17/1998
Owner name:	Twenty-seven Flags Golf		
Other info:	Primary use: commercial		
Xcoord:	222034.5		
Ycoord:	4697218.5		
Hlink:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000014247

W103
ENE
1 - 2 Miles
Lower

IA WELLS **IAPU30000013318**

Mapid:	13318	Wellid:	61321
Id src fld:	recordno	Datasrc:	TEST
Well type:	Wells registered for testing	Location:	T. 88 N., R. 47 W., Sec. 31, NE, NW, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	88	C p date:	1979
Owner name:	Burns, Jim		
Other info:	Drilling method: Drilled; Estimated well depth		
Xcoord:	223731.53		
Ycoord:	4699590		
Hlink:	Not Reported		
Site id:	IAPU30000013318		

V104
South
1 - 2 Miles
Lower

IA WELLS **IAPU30000014254**

Mapid:	14254	Wellid:	45496
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 87N., R. 48W., Sec. 1, SE, NW, NE
County:	WOODBURY	Est loc ac:	Calc. +/- 140 m.
Depth:	100	C p date:	04/13/1998
Owner name:	27 FLAGS GOLF COURSE		
Other info:	Well type: Private		
Xcoord:	222040.54		
Ycoord:	4697209.79		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=45496		
Site id:	IAPU30000014254		

W105
ENE
1 - 2 Miles
Lower

IA WELLS **IAPR30000061321**

Recordno:	61321	Twp:	88
N s:	N	Rge:	47
E w:	W	Sec:	31
Qqqqq:	NE NW NE	Q abc:	ABA
Checked:	cpatai 02/04/00 13:33:27	Ownerfirst:	JIM
Ownerlast:	BURNS	Owneraddr:	3631 VIRGINIAN
Ownercity:	SIOUX CITY	Ownerst:	IA
Ownerzip:	51104	Ownerphone:	7122772683
County:	97	Legal:	NENWNE31 8847W
Depth:	88	Dpth rel:	E

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Permit:	Not Reported	Sampldte:	27-DEC-99
Lab:	IOWA TESTING LABORATORIES, INC.		
Lab no:	IA024		
Anal dte:	30-DEC-99	Smpls rce:	KITCHEN FAUCET
Bact ltb:	Not Reported	Bact bgb:	Not Reported
Bact r:	Not Reported	Bact:	0
Bctcolml:	0	Bact s u:	S
No3r:	<	No3:	0
No3 s u:	S	Nitrogen:	.100000001490116
Drl mthd:	DRILLED	Drlmth rel:	Not Reported
Case mat:	PLASTIC	Cs mt rel:	Not Reported
Case diam:	5	Cs dia rel:	K
Year cons:	1979	Yr rel:	K
Agentfirst:	Not Reported	Agentlast:	Not Reported
Created:	nreimer 02/04/00 10:33:59	Updated:	cpartai 02/04/00 13:33:27
Flag:	YYNYNNNNNNNNNNNNNNNN		
Utm x:	223756.13		
Utm y:	4699380.63		
Site id:	IAPR30000061321		

106
North
1 - 2 Miles
Lower

IA WELLS **IAPU30000012802**

Mapid:	12802	Wellid:	27595
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, SW
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	32	C p date:	n.a.
Owner name:	City Of Sioux City, Amw-9		
Other info:	Well plugged: 9/13/1996; Well type: < 18" dia.		
Xcoord:	222372.73		
Ycoord:	4700632		
Hlink:	Not Reported		
Site id:	IAPU30000012802		

107
South
1 - 2 Miles
Lower

IA WELLS **IAPU30000014250**

Mapid:	14250	Wellid:	2585235
Id src fld:	tinwsf_is_number	Datasrc:	SDWI
Well type:	SDWIS well	Location:	T87N, R48W, Sec. 1, SE, NW, NW
County:	Woodbury	Est loc ac:	+/- 15 m.
Depth:	unkn	C p date:	Not Reported
Owner name:	Twenty-Seven Flags Golf Course		
Other info:	Well #3 (1998); PWSID: 9774201; Status: Inactive		
Xcoord:	221924		
Ycoord:	4697195		
Hlink:	https://facilityexplorer.iowadnr.gov/FacilityExplorer/SiteDetail.aspx?facID=310343721		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000014250

108
NNE
1 - 2 Miles
Higher

IA WELLS IAPU30000012830

Mapid:	12830	Wellid:	17718
Id src fld:	recordno	Datasrc:	PVTP
Well type:	Permitted private wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, SE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	50	C p date:	unkn
Owner name:	Unkn		
Other info:	Primary use: Monitoring/observation		
Xcoord:	222582.34		
Ycoord:	4700621		
Hlink:	Not Reported		
Site id:	IAPU30000012830		

W109
ENE
1 - 2 Miles
Lower

IA WELLS IAPU30000013387

Mapid:	13387	Wellid:	12790
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 88N., R. 47W., Sec. 31, SE, SW, SE, SE
County:	WOODBURY	Est loc ac:	Calc. +/- 230 ft
Depth:	250	C p date:	04/26/1961
Owner name:	SERGEANT BLUFF, CITY OF		
Other info:	Bedrock depth: 112; Well type: Test (water only)		
Xcoord:	223810.81		
Ycoord:	4699530.75		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=12790		
Site id:	IAPU30000013387		

X110
SSE
1 - 2 Miles
Lower

IA WELLS IAPW30000064263

Objectid:	64263	lwellid:	2196259
Wellnmbr:	2150547	Pmtnmbr:	33274
Twp:	87		
Rge:	47		
Ew:	W		
Sec:	6		
Qqqqq:	NW, SE, SE, SE, NE		
Elev:	0		
Elev acc:	Not Reported		
Well depth:	0		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Br depth: 0
Wtr depth: 0
Latitude: 42.3777160645
Longitude: -96.3685531616
Dte done: 30-DEC-99
Cty num: 97
County: Woodbury
Drlr name: Not Reported
Owner name: ,
Cnstr mthd: Not Reported
Fm mk: Not Reported
Well use: Dewatering
Status: Permitted
Ht pmp no: 0
Permit: X
Renovate: Not Reported
Xcoord: 222665.482322
Ycoord: 4697213.28412
Horiz acc: Not Reported
Has prod: 0
Has constr: 0
Wnumber: 0
Hlink: <https://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2150547&reportName=WellPrintout>
Site id: IAPW30000064263

Plugging: Not Reported
Test: Not Reported
Has litho: 0
Has wq: 0

X111
SSE
1 - 2 Miles
Lower

IA WELLS **IAPU30000014331**

Mapid: 14331
Id src fld: wellnmbr
Well type: Private well tracking system
County: Woodbury
Depth: 0
Owner name: Not Reported
Other info: Status: Permitted; Well use: Dewatering
Xcoord: 222665.482356
Ycoord: 4697213.28417
Hlink: <http://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2150547&reportName=WellPrintout>
Site id: IAPU30000014331

Wellid: 2150547
Datsrc: PWTS
Location: T. 87 N., R. 47W., Sec. 6, NW, SE, SE, SE, NE
Est loc ac: nom. +/- 25m.
C p date: Not Reported

V112
South
1 - 2 Miles
Lower

IA WELLS **IAPU30000014279**

Mapid: 14279
Id src fld: wnumber
Well type: IGS well database
County: Woodbury
Depth: 218
Owner name: MIDAMERICAN ENERGY UNIT 3
Other info: Bedrock depth: 133; Well type: Monitor
Xcoord: 221992.787769
Ycoord: 4697123.28023
Hlink: <http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=75540>

Wellid: 75540
Datsrc: GEOU
Location: T. 87N., R. 48W., Sec. 1, SE, NW, NE
Est loc ac: Calc. +/- 140 m.
C p date: 10/08/2012

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000014279

X113
SSE
1 - 2 Miles
Lower

IA WELLS **IAPR30000069719**

Recordno:	69719	Twp:	87
N s:	N	Rge:	47
E w:	W	Sec:	6
Qqqqq:	SW NW NW	Q abc:	CBB
Checked:	jswan 07/06/00 12:06:56	Ownerfirst:	LINDA
Ownerlast:	WILLIAMS	Owneraddr:	2294 ALICIA AVE
Ownercity:	SERGEANT BLUFF	Ownerst:	IA
Ownerzip:	51054	Ownerphone:	7129434735
County:	97	Legal:	NWNWSW 6 8747W
Depth:	100	Dpth rel:	K
Permit:	Not Reported	Sampldte:	26-APR-00
Lab:	IA024		
Lab no:	Not Reported		
Anal dte:	30-DEC-99	Smplsce:	BATHROOM SINK
Bact ltb:	Not Reported	Bact bgb:	Not Reported
Bactr:	Not Reported	Bact:	0
Bctcolml:	0	Bact s u:	S
No3r:	Not Reported	No3:	0
No3 s u:	S	Nitrogen:	.200000002980232
Drl mthd:	DRIVEN	Drlmth rel:	Not Reported
Case mat:	STEEL	Cs mt rel:	Not Reported
Case diam:	0	Csdia rel:	U
Year cons:	0	Yr rel:	U
Agentfirst:	Not Reported	Agentlast:	Not Reported
Created:	kmckine 06/29/00 10:58:04	Updated:	jswan 07/06/00 12:06:56
Flag:	YNYYYYNNNNNNNNNNNNNN		
Utm x:	222667.81		
Utm y:	4696953.75		
Site id:	IAPR30000069719		

X114
SSE
1 - 2 Miles
Lower

IA WELLS **IAPU30000014351**

Mapid:	14351	Wellid:	27069
Id src fld:	recordno	Datasrc:	PVTP
Well type:	Permitted private wells	Location:	T. 87 N., R. 47 W., Sec. 6, SW, NW, NW
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	unkn	C p date:	5/23/2000
Owner name:	William S		
Other info:	Primary use: household		
Xcoord:	222657.22		
Ycoord:	4697168		
Hlink:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000014351

Y115
ENE
1 - 2 Miles
Lower

IA WELLS IAUS20000003971

Maplabelna:	Sergeant Bluff WS-W3900		
Legendtype:	39	Publicview:	0
Locid:	20000315476		
Stfacid:	310349361		
Progid:	5411		
Facname:	Sergeant Bluff Water Supply		
Opstatus:	Drilled	Pistartdat:	25-MAR-05
Subname:	W3900		
Subprogid:	10539	Subaltidnu:	Not Reported
Wellname:	Not Reported		
Wellstatus:	Not Reported		
Totaldepth:	120		
Drilldate:	30-DEC-99	Aquifertyp:	Unconsolidated - Drift, Alluv, Bur
Aquiferran:	Primary	Countyname:	Woodbury
Fo:	3	Accuracy:	20
Colmthtxt:	GPS CODE (PSEUDO RANGE) STATIONED POSITION (SA OF WELL)		
Verifytxt:	Not Reported	Collectby:	WKTU
Coldate:	18-MAY-06		
Loccomment:	Legal, map, sdwis, geosam. Abandoned.		
Congress:	5	Sthouse:	054
Stsenate:	27	Huc:	102300040302
Hyperlink:	http://programs.iowadnr.gov/wateruse/		
Lat:	42.40063		
Lon:	-96.35598		
Xcoord:	223801		
Ycoord:	4699717		
Site id:	IAUS20000003971		

Y116
ENE
1 - 2 Miles
Lower

IA WELLS IAPU30000013261

Mapid:	13261	Wellid:	2412761
Id src fld:	tinwsf_is_number	Datasrc:	SDWI
Well type:	SDWIS well	Location:	T88N, R47W, Sec. 30, SE, SW, SE
County:	Woodbury	Est loc ac:	+/- 20 m.
Depth:	120	C p date:	01/01/1981
Owner name:	Sergeant Bluff Water Supply		
Other info:	Plugged Well # 4 (1981); PWSID: 9774033; Status: Active		
Xcoord:	223801		
Ycoord:	4699717		
Hlink:	https://facilityexplorer.iowadnr.gov/FacilityExplorer/SiteDetail.aspx?facID=310349361		
Site id:	IAPU30000013261		

Y117
ENE
1 - 2 Miles
Lower

IA WELLS IAPU30000013275

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Mapid:	13275	Wellid:	W3900
Id src fld:	subname	Datasrc:	WTRU
Well type:	Water Use Permit Wells	Location:	T88N, R47W, Sec. 30, SE, SW, SE
County:	Woodbury	Est loc ac:	+/-20
Depth:	120	C p date:	Not Reported
Owner name:	Sergeant Bluff Water Supply		
Other info:	Water Use Permit 5411; Primary use: Municipal		
Xcoord:	223801		
Ycoord:	4699717		
Hlink:	https://facilityexplorer.iowadnr.gov/FacilityExplorer/SiteDetail.aspx?facID=310349361		
Site id:	IAPU30000013275		

Y118
ENE
1 - 2 Miles
Lower

IA WELLS **IAPU30000013277**

Mapid:	13277	Wellid:	41768
Id src fld:	Wnumber	Datasrc:	PUB
Well type:	Public wells	Location:	T. 88N., R. 47W., Sec. 30
County:	Woodbury	Est loc ac:	GPS +/- 20 m
Depth:	120	C p date:	01/01/1981
Owner name:	Sergeant Bluff, City Of		
Other info:	Local name: Sergeant Bluff #4; Status: Plugged		
Xcoord:	223801.35		
Ycoord:	4699716.97		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=41768		
Site id:	IAPU30000013277		

X119
SSE
1 - 2 Miles
Lower

IA WELLS **IAPU30000014346**

Mapid:	14346	Wellid:	69719
Id src fld:	recordno	Datasrc:	TEST
Well type:	Wells registered for testing	Location:	T. 87 N., R. 47 W., Sec. 6, SW, NW, NW
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	100	C p date:	unkn
Owner name:	Williams, Linda		
Other info:	Drilling method: Driven; Known well depth		
Xcoord:	222650.22		
Ycoord:	4697160		
Hlink:	Not Reported		
Site id:	IAPU30000014346		

Y120
ENE
1 - 2 Miles
Lower

IA WELLS **IAPU30000013252**

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Mapid:	13252	Wellid:	25410
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 88N., R. 47W., Sec. 30, SE, SW, SE, SE
County:	WOODBURY	Est loc ac:	Calc. +/- 230 ft
Depth:	150	C p date:	09/01/1978
Owner name:	SERGEANT BLUFF, CITY OF		
Other info:	Well type: Municipal		
Xcoord:	223793.25		
Ycoord:	4699745		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=25410		
Site id:	IAPU30000013252		

Z121 WSW 1 - 2 Miles Lower

IA WELLS IAPU30000013533

Mapid:	13533	Wellid:	2110733
Id src fld:	wellnbr	Datasrc:	PWTS
Well type:	Private well tracking system	Location:	T. 88 N., R. 48W., Sec. 35, SW, SE, SW, SW, NE
County:	Woodbury	Est loc ac:	nom. +/- 25m.
Depth:	150	C p date:	05/10/1983
Owner name:	WEIDNER, NEIL		
Other info:	Status: Active; Well use: Household		
Xcoord:	220428.0825		
Ycoord:	4698279.46186		
Hlink:	http://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2110733&reportName=WellPrintout		
Site id:	IAPU30000013533		

Z122 WSW 1 - 2 Miles Lower

IA WELLS IAPW30000035450

Objectid:	35450	lwellid:	2124760
Wellnmbr:	2110733	Pmtnmbr:	Not Reported
Twp:	88		
Rge:	48		
Ew:	W		
Sec:	35		
Qqqqq:	SW, SE, SW, SW, NE		
Elev:	0		
Elev acc:	Not Reported		
Well depth:	150		
Br depth:	0		
Wtr depth:	0		
Latitude:	42.3865		
Longitude:	-96.3962		
Dte done:	10-MAY-83		
Cty num:	97		
County:	Woodbury		
Drir name:	Not Reported		
Owner name:	WEIDNER, NEIL		
Cnstr mthd:	Rotary Drill		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Fm rnk:	Not Reported		
Well use:	Household		
Status:	Active		
Ht pmp no:	0		
Permit:	Not Reported	Plugging:	Not Reported
Renovate:	Not Reported	Test:	X
Xcoord:	220428.0825		
Ycoord:	4698279.46186		
Horiz acc:	Not Reported	Has litho:	0
Has prod:	0	Has wq:	1
Has constr:	0		
Wnumber:	0		
Hlink:	https://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2110733&reportName=WellPrintout		
Site id:	IAPW30000035450		

AA123
NE
1 - 2 Miles
Lower

IA WELLS **IAPU30000013118**

Mapid:	13118	Wellid:	2407260
Id src fld:	tinwsf_is_number	Datasrc:	SDWI
Well type:	SDWIS well	Location:	T88N, R47W, Sec. 30, SE, SW, NE
County:	Woodbury	Est loc ac:	+/- 15 m.
Depth:	186	C p date:	01/01/1953
Owner name:	Sergeant Bluff Water Supply		
Other info:	Plugged Well # 2 (1953); PWSID: 9774033; Status: Active		
Xcoord:	223669		
Ycoord:	4700028		
Hlink:	https://facilityexplorer.iowadnr.gov/FacilityExplorer/SiteDetail.aspx?facID=310349361		
Site id:	IAPU30000013118		

AA124
NE
1 - 2 Miles
Lower

IA WELLS **IAUS20000001550**

Maplabelna:	Sergeant Bluff WS-W4255		
Legendtype:	39	Publicview:	0
Loid:	20000315478		
Stfacid:	310349361		
Progid:	5411		
Facname:	Sergeant Bluff Water Supply		
Opstatus:	Drilled	Pistartdat:	25-MAR-05
Subname:	W4255		
Subprogid:	10540	Subaltidnu:	Not Reported
Wellname:	Not Reported		
Wellstatus:	Not Reported		
Totaldepth:	120		
Drilldate:	30-DEC-99	Aquifertyp:	Unconsolidated - Drift, Alluv, Bur
Aquiferran:	Primary	Countyname:	Woodbury
Fo:	3	Accuracy:	100
Colmthtxt:	INTERPOLATION-PHOTO	Refpnttxt:	WELL
Verifytxt:	Not Reported	Collectby:	WKTU
Coldate:	18-MAY-06		
Loccomment:	Legal, map, sdwis, geosam. Sdwis not gps'd. Abandoned.		
Congress:	5	Sthouse:	054

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Stsenate: 27 Huc: 102300040302
Hyperlink: <http://programs.iowadnr.gov/wateruse/>
Lat: 42.40363
Lon: -96.35792
Xcoord: 223655
Ycoord: 4700056
Site id: IAUS20000001550

AA125 NE 1 - 2 Miles Lower

IA WELLS IAPU30000013105

Mapid: 13105 Wellid: 2413648
Id src fld: tinwsf_is_number Datasrc: SDWI
Well type: SDWIS well Location: T88N, R47W, Sec. 30, SE, SW, NE
County: Woodbury Est loc ac: +/- 25 m.
Depth: 110 C p date: 01/01/1981
Owner name: Sergeant Bluff Water Supply
Other info: Plugged Well # 5 (1981); PWSID: 9774033; Status: Active
Xcoord: 223655
Ycoord: 4700056
Hlink: <https://facilityexplorer.iowadnr.gov/FacilityExplorer/SiteDetail.aspx?facID=310349361>
Site id: IAPU30000013105

AA126 NE 1 - 2 Miles Lower

IA WELLS IAPU30000013112

Mapid: 13112 Wellid: W4255
Id src fld: subname Datasrc: WTRU
Well type: Water Use Permit Wells Location: T88N, R47W, Sec. 30, SE, SW, NE
County: Woodbury Est loc ac: +/-100
Depth: 120 C p date: Not Reported
Owner name: Sergeant Bluff Water Supply
Other info: Water Use Permit 5411; Primary use: Municipal
Xcoord: 223655
Ycoord: 4700056
Hlink: <https://facilityexplorer.iowadnr.gov/FacilityExplorer/SiteDetail.aspx?facID=310349361>
Site id: IAPU30000013112

AA127 NE 1 - 2 Miles Lower

IA WELLS IAPU30000013115

Mapid: 13115 Wellid: 41769
Id src fld: Wnumber Datasrc: PUB
Well type: Public wells Location: T. 88N., R. 47W., Sec. 30
County: Woodbury Est loc ac: Meas. +/- 230'
Depth: 110 C p date: 01/01/1981
Owner name: Sergeant Bluff, City Of
Other info: Local name: Sergeant Bluff #5; Status: Plugged
Xcoord: 223655.04
Ycoord: 4700057.26
Hlink: <http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=41769>

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000013115

AA128
NE
1 - 2 Miles
Lower

IA WELLS **IAPU30000013116**

Mapid:	13116	Wellid:	41770
Id src fld:	Wnumber	Datasrc:	PUB
Well type:	Public wells	Location:	T. 88N., R. 47W., Sec. 30
County:	Woodbury	Est loc ac:	Meas. +/- 230'
Depth:	240	C p date:	01/01/1953
Owner name:	Sergeant Bluff, City Of		
Other info:	Local name: Sergeant Bluff #3 (w41770); Status: Plugged		
Xcoord:	223669.72		
Ycoord:	4700040.26		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=41770		
Site id:	IAPU30000013116		

AA129
NE
1 - 2 Miles
Lower

IA WELLS **IAPU30000013109**

Mapid:	13109	Wellid:	41771
Id src fld:	Wnumber	Datasrc:	PUB
Well type:	Public wells	Location:	T. 88N., R. 47W., Sec. 30
County:	Woodbury	Est loc ac:	Meas. +/- 230'
Depth:	440	C p date:	01/01/1925
Owner name:	Sergeant Bluff, City Of		
Other info:	Local name: Sergeant Bluff #1; Status: Not Used		
Xcoord:	223669.77		
Ycoord:	4700041.26		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=41771		
Site id:	IAPU30000013109		

AA130
NE
1 - 2 Miles
Lower

IA WELLS **IAPU30000013113**

Mapid:	13113	Wellid:	692
Id src fld:	Wnumber	Datasrc:	PUB
Well type:	Public wells	Location:	T. 88N., R. 47W., Sec. 30
County:	Woodbury	Est loc ac:	Meas. +/- 230'
Depth:	455	C p date:	01/01/1938
Owner name:	Sergeant Bluff, City Of		
Other info:	Local name: Sergeant Bluff #2; Status: Not Used		
Xcoord:	223670.94		
Ycoord:	4700040.26		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=692		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000013113

AB131
North
1 - 2 Miles
Lower

IA WELLS **IAPU30000012734**

Mapid:	12734	Wellid:	27572
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NW
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	30	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-609-1		
Other info:	Well plugged: 9/15/1996; Well type: < 18" dia.		
Xcoord:	222393.05		
Ycoord:	4700822.5		
Hlink:	Not Reported		
Site id:	IAPU30000012734		

AB132
North
1 - 2 Miles
Lower

IA WELLS **IAPU30000012731**

Mapid:	12731	Wellid:	27577
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NW
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	25	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-609-3		
Other info:	Well plugged: 9/15/1996; Well type: < 18" dia.		
Xcoord:	222394.05		
Ycoord:	4700822.5		
Hlink:	Not Reported		
Site id:	IAPU30000012731		

AC133
NE
1 - 2 Miles
Higher

IA WELLS **IAUS20000005917**

Maplabelna:	Sergeant Bluff WS-W3901		
Legendtype:	39	Publicview:	0
Locid:	20000315477		
Stfacid:	310349361		
Progid:	5411		
Facname:	Sergeant Bluff Water Supply		
Opstatus:	Drilled	Pistartdat:	25-MAR-05
Subname:	W3901		
Subprogid:	10542	Subaltidnu:	Not Reported
Wellname:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Wellstatus:	Not Reported		
Totaldepth:	245		
Drilldate:	30-DEC-99	Aquifertyp:	Cretaceous (Dakota)
Aquiferran:	Secondary	Countyname:	Woodbury
Fo:	3	Accuracy:	20
Colmthtxt:	GPS CODE (PSEUDO RANGE) STATIONED POSITION (SA OFF WELL		
Verifytxt:	Not Reported	Collectby:	WKTU
Coldate:	18-MAY-06		
Loccomment:	Legal, map, sdwis, geosam. Abandoned.		
Congress:	5	Sthouse:	054
Stsenate:	27	Huc:	102300040302
Hyperlink:	http://programs.iowadnr.gov/wateruse/		
Lat:	42.40488		
Lon:	-96.35887		
Xcoord:	223582		
Ycoord:	4700198		
Site id:	IAUS20000005917		

AC134
NE
1 - 2 Miles
Higher

IA WELLS **IAPU30000013063**

Mapid:	13063	Wellid:	W3901
Id src fld:	subname	Datasrc:	WTRU
Well type:	Water Use Permit Wells	Location:	T88N, R47W, Sec. 30, SE, NW, SW
County:	Woodbury	Est loc ac:	+/-20
Depth:	245	C p date:	Not Reported
Owner name:	Sergeant Bluff Water Supply		
Other info:	Water Use Permit 5411; Primary use: Municipal		
Xcoord:	223582		
Ycoord:	4700198		
Hlink:	https://facilityexplorer.iowadnr.gov/FacilityExplorer/SiteDetail.aspx?facID=310349361		
Site id:	IAPU30000013063		

AC135
NE
1 - 2 Miles
Higher

IA WELLS **IAPU30000013067**

Mapid:	13067	Wellid:	2407518
Id src fld:	tinwsf_is_number	Datasrc:	SDWI
Well type:	SDWIS well	Location:	T88N, R47W, Sec. 30, SE, NW, SW
County:	Woodbury	Est loc ac:	+/- 20 m.
Depth:	245	C p date:	01/01/1981
Owner name:	Sergeant Bluff Water Supply		
Other info:	Plugged Well # 3 (1981); PWSID: 9774033; Status: Active		
Xcoord:	223582		
Ycoord:	4700198		
Hlink:	https://facilityexplorer.iowadnr.gov/FacilityExplorer/SiteDetail.aspx?facID=310349361		
Site id:	IAPU30000013067		

AC136
NE
1 - 2 Miles
Higher

IA WELLS **IAPU30000013064**

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Mapid:	13064	Wellid:	41767
Id src fld:	Wnumber	Datasrc:	PUB
Well type:	Public wells	Location:	T. 88N., R. 47W., Sec. 30
County:	Woodbury	Est loc ac:	GPS +/- 20 m
Depth:	245	C p date:	01/01/1981
Owner name:	Sergeant Bluff, City Of		
Other info:	Local name: Sergeant Bluff #3 (w41767); Status: Plugged		
Xcoord:	223582.15		
Ycoord:	4700198.36		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=41767		
Site id:	IAPU30000013064		

AA137

NE

1 - 2 Miles

Lower

IA WELLS

IAUS2000001447

Maplabelna:	Sergeant Bluff WS-W4256	Publicview:	0
Legendtype:	39		
Locid:	20000315479		
Stfacid:	310349361		
Progid:	5411		
Facname:	Sergeant Bluff Water Supply		
Opstatus:	Drilled	Pistartdat:	25-MAR-05
Subname:	W4256		
Subprogid:	10541	Subaltidnu:	Not Reported
Wellname:	Not Reported		
Wellstatus:	Not Reported		
Totaldepth:	245		
Drilldate:	30-DEC-99	Aquifertyp:	Cretaceous (Dakota)
Aquiferran:	Secondary	Countyname:	Woodbury
Fo:	3	Accuracy:	100
Colmthtxt:	INTERPOLATION-PHOTO	Refpnttxt:	WELL
Verifytxt:	Not Reported	Collectby:	WKTU
Coldate:	18-MAY-06		
Loccomment:	Point taken from MW_Intake, map, geosam. Abandoned.		
Congress:	5	Sthouse:	054
Stsenate:	27	Huc:	102300040302
Hyperlink:	http://programs.iowadnr.gov/wateruse/		
Lat:	42.40362		
Lon:	-96.35733		
Xcoord:	223703		
Ycoord:	4700053		
Site id:	IAUS2000001447		

AA138

NE

1 - 2 Miles

Lower

IA WELLS

IAPU30000013117

Mapid:	13117	Wellid:	W4256
Id src fld:	subname	Datasrc:	WTRU
Well type:	Water Use Permit Wells	Location:	T88N, R47W, Sec. 30, SE, SW, NE
County:	Woodbury	Est loc ac:	+/-100
Depth:	245	C p date:	Not Reported
Owner name:	Sergeant Bluff Water Supply		
Other info:	Water Use Permit 5411; Primary use: Municipal		
Xcoord:	223703		
Ycoord:	4700053		
Hlink:	https://facilityexplorer.iowadnr.gov/FacilityExplorer/SiteDetail.aspx?facID=310349361		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000013117

AB139
North
1 - 2 Miles
Higher

IA WELLS IAPU30000012718

Mapid:	12718	Wellid:	27578
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NW
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	25	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-609-4		
Other info:	Well plugged: 9/15/1996; Well type: < 18" dia.		
Xcoord:	222394.05		
Ycoord:	4700827.5		
Hlink:	Not Reported		
Site id:	IAPU30000012718		

AB140
North
1 - 2 Miles
Higher

IA WELLS IAPU30000012724

Mapid:	12724	Wellid:	27593
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NW
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	35	C p date:	n.a.
Owner name:	City Of Sioux City, Amw-7		
Other info:	Well plugged: 9/12/1996; Well type: < 18" dia.		
Xcoord:	222396.05		
Ycoord:	4700828.5		
Hlink:	Not Reported		
Site id:	IAPU30000012724		

AB141
North
1 - 2 Miles
Higher

IA WELLS IAPU30000012720

Mapid:	12720	Wellid:	27573
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NW
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	25	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-609-2		
Other info:	Well plugged: 9/15/1996; Well type: < 18" dia.		
Xcoord:	222396.05		
Ycoord:	4700833.5		
Hlink:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000012720

AB142
North
1 - 2 Miles
Higher

IA WELLS IAPU30000012709

Mapid:	12709	Wellid:	27579
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NW
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	33	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-609-5		
Other info:	Well plugged: 9/15/1996; Well type: < 18" dia.		
Xcoord:	222392.05		
Ycoord:	4700837.5		
Hlink:	Not Reported		
Site id:	IAPU30000012709		

AD143
South
1 - 2 Miles
Lower

IA WELLS IAPU30000014377

Mapid:	14377	Wellid:	18890
Id src fld:	recordno	Datasrc:	PVTP
Well type:	Permitted private wells	Location:	T. 87 N., R. 48 W., Sec. 1, SE, NE, SW
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	125	C p date:	unkn
Owner name:	27 Flags Golf Course		
Other info:	Primary use: Irrigation		
Xcoord:	222243		
Ycoord:	4696992.5		
Hlink:	Not Reported		
Site id:	IAPU30000014377		

AE144
West
1 - 2 Miles
Lower

IA WELLS IAPU30000013203

Mapid:	13203	Wellid:	39250
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 88N., R. 48W., Sec. 35, NW, NE, SW, SE
County:	WOODBURY	Est loc ac:	Calc. +/- 230 ft
Depth:	86	C p date:	04/11/1977
Owner name:	BOYER, BERNICE C.		
Other info:	Well type: Irrigation		
Xcoord:	220219.94		
Ycoord:	4698835.79		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=39250		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000013203

AD145
South
1 - 2 Miles
Lower

IA WELLS IAPU30000014378

Mapid:	14378	Wellid:	39416
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 87N., R. 48W., Sec. 1, SE, NE, SW
County:	WOODBURY	Est loc ac:	Calc. +/- 140 m.
Depth:	97	C p date:	09/11/1996
Owner name:	JOHNSON, TERRY		
Other info:	Well type: Irrigation		
Xcoord:	222235.04		
Ycoord:	4696987.66		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=39416		
Site id:	IAPU30000014378		

AF146
ENE
1 - 2 Miles
Lower

IA WELLS IAPU30000013394

Mapid:	13394	Wellid:	2408177
Id src fld:	tinwsf_is_number	Datasrc:	SDWI
Well type:	SDWIS well	Location:	T88N, R47W, Sec. 31
County:	Woodbury	Est loc ac:	+/- 3300 m.
Depth:	unkn	C p date:	Not Reported
Owner name:	Miracle Corner Mhp		
Other info:	Well # 1 (); PWSID: 9700634; Status: Inactive		
Xcoord:	223986		
Ycoord:	4699552		
Hlink:	https://facilityexplorer.iowadnr.gov/FacilityExplorer/SiteDetail.aspx?facID=310343558		
Site id:	IAPU30000013394		

AF147
ENE
1 - 2 Miles
Lower

IA WELLS IAPU30000013405

Mapid:	13405	Wellid:	2412300
Id src fld:	tinwsf_is_number	Datasrc:	SDWI
Well type:	SDWIS well	Location:	T88N, R47W, Sec. 31
County:	Woodbury	Est loc ac:	+/- 3300 m.
Depth:	unkn	C p date:	Not Reported
Owner name:	David's Airport Standard		
Other info:	Well # 1 (); PWSID: 9700778; Status: Inactive		
Xcoord:	223986		
Ycoord:	4699552		
Hlink:	https://facilityexplorer.iowadnr.gov/FacilityExplorer/SiteDetail.aspx?facID=310344348		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000013405

AG148
North
1 - 2 Miles
Lower

IA WELLS **IAPU30000012748**

Mapid:	12748	Wellid:	27556
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	18	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-605-3		
Other info:	Well plugged: 9/15/1996; Well type: < 18" dia.		
Xcoord:	222581.75		
Ycoord:	4700815		
Hlink:	Not Reported		
Site id:	IAPU30000012748		

AG149
North
1 - 2 Miles
Lower

IA WELLS **IAPU30000012772**

Mapid:	12772	Wellid:	27566
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	25	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-607-2		
Other info:	Well plugged: 9/16/1996; Well type: < 18" dia.		
Xcoord:	222591.75		
Ycoord:	4700814		
Hlink:	Not Reported		
Site id:	IAPU30000012772		

AG150
North
1 - 2 Miles
Lower

IA WELLS **IAPU30000012767**

Mapid:	12767	Wellid:	27561
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	33	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-606-3		
Other info:	Well plugged: 9/16/1996; Well type: < 18" dia.		
Xcoord:	222587.75		
Ycoord:	4700815		
Hlink:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000012767

AG151
North
1 - 2 Miles
Lower

IA WELLS IAPU30000012756

Mapid:	12756	Wellid:	27567
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	28	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-607-3		
Other info:	Well plugged: 9/16/1996; Well type: < 18" dia.		
Xcoord:	222592.75		
Ycoord:	4700816		
Hlink:	Not Reported		
Site id:	IAPU30000012756		

AG152
North
1 - 2 Miles
Lower

IA WELLS IAPU30000012764

Mapid:	12764	Wellid:	27571
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	28	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-607-7		
Other info:	Well plugged: 9/16/1996; Well type: < 18" dia.		
Xcoord:	222585.75		
Ycoord:	4700818		
Hlink:	Not Reported		
Site id:	IAPU30000012764		

AG153
North
1 - 2 Miles
Lower

IA WELLS IAPU30000012751

Mapid:	12751	Wellid:	27564
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	33	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-606-6		
Other info:	Well plugged: 9/16/1996; Well type: < 18" dia.		
Xcoord:	222589.75		
Ycoord:	4700818		
Hlink:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000012751

AG154
North
1 - 2 Miles
Lower

IA WELLS IAPU30000012757

Mapid:	12757	Wellid:	27558
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	30	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-605-5		
Other info:	Well plugged: 9/15/1996; Well type: < 18" dia.		
Xcoord:	222583.75		
Ycoord:	4700820		
Hlink:	Not Reported		
Site id:	IAPU30000012757		

AG155
North
1 - 2 Miles
Lower

IA WELLS IAPU30000012768

Mapid:	12768	Wellid:	27568
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	30	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-607-4		
Other info:	Well plugged: 9/16/1996; Well type: < 18" dia.		
Xcoord:	222590.75		
Ycoord:	4700819		
Hlink:	Not Reported		
Site id:	IAPU30000012768		

AG156
North
1 - 2 Miles
Lower

IA WELLS IAPU30000012754

Mapid:	12754	Wellid:	27555
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	25	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-605-2		
Other info:	Well plugged: 9/15/1996; Well type: < 18" dia.		
Xcoord:	222595.75		
Ycoord:	4700819		
Hlink:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000012754

AG157
North
1 - 2 Miles
Lower

IA WELLS **IAPU30000012771**

Mapid:	12771	Wellid:	27570
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	33	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-607-6		
Other info:	Well plugged: 9/16/1996; Well type: < 18" dia.		
Xcoord:	222585.75		
Ycoord:	4700822		
Hlink:	Not Reported		
Site id:	IAPU30000012771		

AG158
North
1 - 2 Miles
Lower

IA WELLS **IAPU30000012755**

Mapid:	12755	Wellid:	27554
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	22	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-605-1		
Other info:	Well plugged: 9/15/1996; Well type: < 18" dia.		
Xcoord:	222593.75		
Ycoord:	4700822		
Hlink:	Not Reported		
Site id:	IAPU30000012755		

AG159
North
1 - 2 Miles
Lower

IA WELLS **IAPU30000012750**

Mapid:	12750	Wellid:	27569
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	28	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-607-5		
Other info:	Well plugged: 9/16/1996; Well type: < 18" dia.		
Xcoord:	222595.75		
Ycoord:	4700822		
Hlink:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000012750

AG160
North
1 - 2 Miles
Lower

IA WELLS **IAPU30000012760**

Mapid:	12760	Wellid:	27592
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	36	C p date:	n.a.
Owner name:	City Of Sioux City, Amw-6		
Other info:	Well plugged: 9/13/1996; Well type: < 18" dia.		
Xcoord:	222586.75		
Ycoord:	4700826		
Hlink:	Not Reported		
Site id:	IAPU30000012760		

AG161
North
1 - 2 Miles
Lower

IA WELLS **IAPU30000012762**

Mapid:	12762	Wellid:	27581
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	25	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-610-2		
Other info:	Well plugged: 9/15/1996; Well type: < 18" dia.		
Xcoord:	222592.75		
Ycoord:	4700825		
Hlink:	Not Reported		
Site id:	IAPU30000012762		

AG162
North
1 - 2 Miles
Lower

IA WELLS **IAPU30000012761**

Mapid:	12761	Wellid:	27565
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	37	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-607-1		
Other info:	Well plugged: 9/16/1996; Well type: < 18" dia.		
Xcoord:	222598.75		
Ycoord:	4700824		
Hlink:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000012761

AG163
North
1 - 2 Miles
Lower

IA WELLS **IAPU30000012763**

Mapid:	12763	Wellid:	27562
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	30	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-606-4		
Other info:	Well plugged: 9/16/1996; Well type: < 18" dia.		
Xcoord:	222590.75		
Ycoord:	4700827		
Hlink:	Not Reported		
Site id:	IAPU30000012763		

AG164
North
1 - 2 Miles
Lower

IA WELLS **IAPU30000012746**

Mapid:	12746	Wellid:	27583
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	38	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-610-4		
Other info:	Well plugged: 9/15/1996; Well type: < 18" dia.		
Xcoord:	222596.75		
Ycoord:	4700826		
Hlink:	Not Reported		
Site id:	IAPU30000012746		

AG165
North
1 - 2 Miles
Lower

IA WELLS **IAPU30000012744**

Mapid:	12744	Wellid:	27563
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	40	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-606-5		
Other info:	Well plugged: 9/16/1996; Well type: < 18" dia.		
Xcoord:	222592.75		
Ycoord:	4700827		
Hlink:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000012744

AG166
North
1 - 2 Miles
Lower

IA WELLS IAPU30000012758

Mapid:	12758	Wellid:	27560
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	33	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-606-2		
Other info:	Well plugged: 9/16/1996; Well type: < 18" dia.		
Xcoord:	222592.75		
Ycoord:	4700827		
Hlink:	Not Reported		
Site id:	IAPU30000012758		

AG167
North
1 - 2 Miles
Lower

IA WELLS IAPU30000012749

Mapid:	12749	Wellid:	27580
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	33	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-610-1		
Other info:	Well plugged: 9/15/1996; Well type: < 18" dia.		
Xcoord:	222584.75		
Ycoord:	4700830		
Hlink:	Not Reported		
Site id:	IAPU30000012749		

AG168
North
1 - 2 Miles
Lower

IA WELLS IAPU30000012747

Mapid:	12747	Wellid:	27559
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	27	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-606-1		
Other info:	Well plugged: 9/16/1996; Well type: < 18" dia.		
Xcoord:	222583.75		
Ycoord:	4700831		
Hlink:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Site id: IAPU30000012747

AE169
West
1 - 2 Miles
Lower

IA WELLS **IAUS2000000109**

Maplabelna:	Sally Bjork-W55		
Legendtype:	39	Publicview:	0
Locid:	20000321159		
Stfacid:	310426107		
Progid:	4373		
Facname:	Sally Bjork		
Opstatus:	Drilled	Pistartdat:	20-MAR-12
Subname:	W55		
Subprogid:	5256	Subaltidnu:	Not Reported
Wellname:	Not Reported		
Wellstatus:	Not Reported		
Totaldepth:	86		
Drilldate:	30-DEC-99	Aquifertyp:	Unconsolidated - Drift, Alluv, Bur
Aquiferran:	Primary	Countyname:	Woodbury
Fo:	3	Accuracy:	100
Colmthtxt:	INTERPOLATION-PHOTO	Refpnttxt:	CENTER OF FACILITY
Verifytxt:	Not Reported	Collectby:	CHenders
Coldate:	28-MAR-06		
Loccomment:	First point clicked in WUSE map applet		
Congress:	5	Sthouse:	054
Stsenate:	27	Huc:	1023000108
Hyperlink:	http://programs.iowadnr.gov/wateruse/		
Lat:	42.39126		
Lon:	-96.39925		
Xcoord:	220198		
Ycoord:	4698818		
Site id:	IAUS2000000109		

AE170
West
1 - 2 Miles
Lower

IA WELLS **IAPU30000013213**

Mapid:	13213	Wellid:	W55
Id src fld:	subname	Datasrc:	WTRU
Well type:	Water Use Permit Wells	Location:	T88N, R48W, Sec. 35
County:	Woodbury	Est loc ac:	+/-100
Depth:	86	C p date:	Not Reported
Owner name:	Sally Bjork		
Other info:	Water Use Permit 4373; Primary use: General farm crops		
Xcoord:	220198		
Ycoord:	4698818		
Hlink:	https://facilityexplorer.iowadnr.gov/FacilityExplorer/SiteDetail.aspx?facID=310426107		
Site id:	IAPU30000013213		

AH171
ESE
1 - 2 Miles
Lower

IA WELLS **IAPR30000017381**

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Recordno:	17381	Twp:	88
N s:	N	Rge:	47
E w:	W	Sec:	31
Qqqqq:	SE SE	Q abc:	DD
Checked:	jwycisk 09/09/96 11:09:15	Ownerfirst:	JAMES E
Ownerlast:	RUBLE	Owneraddr:	119 PIONEER VALLEY
Ownercity:	SERGEANT BLUFF	Ownerst:	IA
Ownerzip:	51054	Ownerphone:	7129434143
County:	97	Legal:	SESE31 8847W
Depth:	110	Dpth rel:	Not Reported
Permit:	Not Reported	Sampldte:	29-JUL-96
Lab:	SIOUXLAND DISTRICT HEALTH DEPT.		
Lab no:	ME		
Anal dte:	31-JUL-96	Smpls rce:	KITCHEN FAUCET
Bact ltb:	Not Reported	Bact bgb:	Not Reported
Bactr:	Not Reported	Bact:	0
Bctcolml:	0	Bact s u:	U
No3r:	<	No3:	0
No3 s u:	S	Nitrogen:	.100000001490116
Drl mthd:	Not Reported	Drlmth rel:	Not Reported
Case mat:	STEEL	Cs mt rel:	Not Reported
Case diam:	2.5	Csdia rel:	Not Reported
Year cons:	1989	Yr rel:	Not Reported
Agentfirst:	Not Reported	Agentlast:	Not Reported
Created:	pheesch 09/06/96 15:52:16	Updated:	jwycisk 09/09/96 11:09:15
Flag:	YNNNNNNNNNNNNNNNNNNNN		
Utm x:	224015.75		
Utm y:	4698057.25		
Site id:	IAPR30000017381		

AG172 North 1 - 2 Miles Lower

IA WELLS IAPU30000012743

Mapid:	12743	Wellid:	27557
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	27	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-605-4		
Other info:	Well plugged: 9/15/1996; Well type: < 18" dia.		
Xcoord:	222594.75		
Ycoord:	4700829		
Hlink:	Not Reported		
Site id:	IAPU30000012743		

AG173 North 1 - 2 Miles Lower

IA WELLS IAPU30000012752

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Mapid:	12752	Wellid:	27582
Id src fld:	recordno	Datasrc:	PLUG
Well type:	Registered abandoned wells	Location:	T. 88 N., R. 48 W., Sec. 25, NE, SE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	35	C p date:	n.a.
Owner name:	City Of Sioux City, Mw-610-3		
Other info:	Well plugged: 9/15/1996; Well type: < 18" dia.		
Xcoord:	222591.75		
Ycoord:	4700830		
Hlink:	Not Reported		
Site id:	IAPU30000012752		

AA174
NE
1 - 2 Miles
Lower

IA WELLS **IAPU30000013125**

Mapid:	13125	Wellid:	2088538
Id src fld:	wellnmbr	Datasrc:	PWTS
Well type:	Private well tracking system	Location:	T. 88 N., R. 47W., Sec. 30, SW, SE, NE, NE, SE
County:	Woodbury	Est loc ac:	nom. +/- 25m.
Depth:	250	C p date:	01/01/1960
Owner name:	SERGEANT BLUFF, CITY OF		
Other info:	Status: Active; Well use: Household		
Xcoord:	223778.502208		
Ycoord:	4700014.85434		
Hlink:	http://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2088538&reportName=WellPrintout		
Site id:	IAPU30000013125		

AA175
NE
1 - 2 Miles
Lower

IA WELLS **IAPU30000013127**

Mapid:	13127	Wellid:	2088537
Id src fld:	wellnmbr	Datasrc:	PWTS
Well type:	Private well tracking system	Location:	T. 88 N., R. 47W., Sec. 30, SW, SE, NE, NE, SE
County:	Woodbury	Est loc ac:	nom. +/- 25m.
Depth:	250	C p date:	01/01/1960
Owner name:	SERGEANT BLUFF, CITY OF		
Other info:	Status: Plugged; Well use: Household		
Xcoord:	223778.502208		
Ycoord:	4700014.85434		
Hlink:	http://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2088537&reportName=WellPrintout		
Site id:	IAPU30000013127		

AA176
NE
1 - 2 Miles
Lower

IA WELLS **IAPU30000013133**

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Mapid:	13133	Wellid:	2088539
Id src fld:	wellnmbr	Datasrc:	PWTS
Well type:	Private well tracking system	Location:	T. 88 N., R. 47W., Sec. 30, SW, SE, NE, NE, SE
County:	Woodbury	Est loc ac:	nom. +/- 25m.
Depth:	250	C p date:	01/01/1960
Owner name:	SERGEANT BLUFF, CITY OF		
Other info:	Status: Active; Well use: Household		
Xcoord:	223778.502208		
Ycoord:	4700014.85434		
Hlink:	http://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2088539&reportName=WellPrintout		
Site id:	IAPU30000013133		

AA177
NE
1 - 2 Miles
Lower

IA WELLS

IAPW30000010995

Objectid:	10995	lwellid:	2093852
Wellnmbr:	2088537	Pmntnmbr:	Not Reported
Twp:	88		
Rge:	47		
Ew:	W		
Sec:	30		
Qqqqq:	SW, SE, NE, NE, SE		
Elev:	0		
Elev acc:	Not Reported		
Well depth:	250		
Br depth:	0		
Wtr depth:	0		
Latitude:	42.4033		
Longitude:	-96.3564		
Dte done:	01-JAN-60		
Cty num:	97		
County:	Woodbury		
Drir name:	Not Reported		
Owner name:	SERGEANT BLUFF, CITY OF		
Cnstr mthd:	Rotary Drill		
Fm rmk:	Not Reported		
Well use:	Household		
Status:	Plugged		
Ht pmp no:	0		
Permit:	Not Reported	Plugging:	X
Renovate:	Not Reported	Test:	Not Reported
Xcoord:	223778.502208		
Ycoord:	4700014.85434		
Horiz acc:	Not Reported	Has litho:	0
Has prod:	0	Has wq:	0
Has constr:	0		
Wnumber:	0		
Hlink:	https://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2088537&reportName=WellPrintout		
Site id:	IAPW30000010995		

AA178
NE
1 - 2 Miles
Lower

IA WELLS

IAPW30000010996

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Objectid:	10996	Iwellid:	2093853
Wellnmbr:	2088538	Pmntnmbr:	Not Reported
Twp:	88		
Rge:	47		
Ew:	W		
Sec:	30		
Qqqqq:	SW, SE, NE, NE, SE		
Elev:	0		
Elev acc:	Not Reported		
Well depth:	250		
Br depth:	0		
Wtr depth:	0		
Latitude:	42.4033		
Longitude:	-96.3564		
Dte done:	01-JAN-60		
Cty num:	97		
County:	Woodbury		
Drir name:	Not Reported		
Owner name:	SERGEANT BLUFF, CITY OF		
Cnstr mthd:	Rotary Drill		
Fm rmk:	Not Reported		
Well use:	Household		
Status:	Active		
Ht pmp no:	0		
Permit:	Not Reported	Plugging:	Not Reported
Renovate:	Not Reported	Test:	Not Reported
Xcoord:	223778.502208		
Ycoord:	4700014.85434		
Horiz acc:	Not Reported	Has litho:	0
Has prod:	0	Has wq:	0
Has constr:	0		
Wnumber:	0		
Hlink:	https://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2088538&reportName=WellPrintout		
Site id:	IAPW30000010996		

AA179
NE
1 - 2 Miles
Lower

IA WELLS

IAPW30000016881

Objectid:	16881	Iwellid:	2093854
Wellnmbr:	2088539	Pmntnmbr:	Not Reported
Twp:	88		
Rge:	47		
Ew:	W		
Sec:	30		
Qqqqq:	SW, SE, NE, NE, SE		
Elev:	0		
Elev acc:	Not Reported		
Well depth:	250		
Br depth:	0		
Wtr depth:	0		
Latitude:	42.4033		
Longitude:	-96.3564		
Dte done:	01-JAN-60		
Cty num:	97		
County:	Woodbury		
Drir name:	Not Reported		
Owner name:	SERGEANT BLUFF, CITY OF		
Cnstr mthd:	Rotary Drill		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Fm rnk:	Not Reported		
Well use:	Household		
Status:	Active		
Ht pmp no:	0		
Permit:	Not Reported	Plugging:	Not Reported
Renovate:	Not Reported	Test:	Not Reported
Xcoord:	223778.502208		
Ycoord:	4700014.85434		
Horiz acc:	Not Reported	Has litho:	0
Has prod:	0	Has wq:	0
Has constr:	0		
Wnumber:	0		
Hlink:	https://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2088539&reportName=WellPrintout		
Site id:	IAPW30000016881		

AF180
ENE
1 - 2 Miles
Lower

IA WELLS **IAPU30000013429**

Mapid:	13429	Wellid:	230
Id src fld:	recordno	Datasrc:	PVTP
Well type:	Permitted private wells	Location:	T. 88 N., R. 47 W., Sec. 31, NENE
County:	Woodbury	Est loc ac:	Calc. +/- 285m.
Depth:	100	C p date:	unkn
Owner name:	Unkn		
Other info:	Primary use: Irrigation		
Xcoord:	224031.44		
Ycoord:	4699482.5		
Hlink:	Not Reported		
Site id:	IAPU30000013429		

181
South
1 - 2 Miles
Higher

IA WELLS **IAPU30000014390**

Mapid:	14390	Wellid:	19442
Id src fld:	recordno	Datasrc:	PVTP
Well type:	Permitted private wells	Location:	T. 87 N., R. 48 W., Sec. 1, SE, NE, SE
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	90	C p date:	10/29/1996
Owner name:	Twenty Seven Flags Course		
Other info:	Primary use: irrigation		
Xcoord:	222439.91		
Ycoord:	4696978.5		
Hlink:	Not Reported		
Site id:	IAPU30000014390		

AF182
ENE
1 - 2 Miles
Lower

IA WELLS **IAPU30000013427**

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Mapid:	13427	Wellid:	15379
Id src fld:	recordno	Datasrc:	PVTP
Well type:	Permitted private wells	Location:	T. 88 N., R. 47 W., Sec. 31, NE, NE
County:	Woodbury	Est loc ac:	Calc. +/- 285m.
Depth:	100	C p date:	unkn
Owner name:	Unkn		
Other info:	Primary use: Irrigation		
Xcoord:	224033.44		
Ycoord:	4699497.5		
Hlink:	Not Reported		
Site id:	IAPU30000013427		

AH183
ESE
1 - 2 Miles
Lower

IA WELLS **IAPU30000013980**

Mapid:	13980	Wellid:	17381
Id src fld:	recordno	Datasrc:	TEST
Well type:	Wells registered for testing	Location:	T. 88 N., R. 47 W., Sec. 31, SE, SE
County:	Woodbury	Est loc ac:	Calc. +/- 285m.
Depth:	110	C p date:	1989
Owner name:	Ruble, James E		
Other info:	;		
Xcoord:	224006.22		
Ycoord:	4698262.5		
Hlink:	Not Reported		
Site id:	IAPU30000013980		

AI184
NE
1 - 2 Miles
Lower

IA WELLS **IAPW30000013356**

Objectid:	13356	Iwellid:	2096529
Wellnmbr:	2090490	Pmtnmbr:	Not Reported
Twp:	88		
Rge:	47		
Ew:	W		
Sec:	30		
Qqqqq:	SW, SE, NE, NE, SE		
Elev:	0		
Elev acc:	Not Reported		
Well depth:	110		
Br depth:	0		
Wtr depth:	0		
Latitude:	42.4035		
Longitude:	-96.3563		
Dte done:	01-JAN-60		
Cty num:	97		
County:	Woodbury		
Drlr name:	Not Reported		
Owner name:	,		
Cnstr mthd:	Rotary Drill		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Fm rnk:	Not Reported		
Well use:	Commercial		
Status:	Plugged		
Ht pmp no:	0		
Permit:	Not Reported	Plugging:	X
Renovate:	Not Reported	Test:	Not Reported
Xcoord:	223787.611152		
Ycoord:	4700036.73967		
Horiz acc:	Not Reported	Has litho:	0
Has prod:	0	Has wq:	0
Has constr:	0		
Wnumber:	0		
Hlink:	https://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2090490&reportName=WellPrintout		
Site id:	IAPW30000013356		

AI185
NE
1 - 2 Miles
Lower

IA WELLS **IAPU30000013126**

Mapid:	13126	Wellid:	2090490
Id src fld:	wellnmbr	Datasrc:	PWTS
Well type:	Private well tracking system	Location:	T. 88 N., R. 47W., Sec. 30, SW, SE, NE, NE, SE
County:	Woodbury	Est loc ac:	nom. +/- 25m.
Depth:	110	C p date:	01/01/1960
Owner name:	Not Reported		
Other info:	Status: Plugged; Well use: Commercial		
Xcoord:	223787.611152		
Ycoord:	4700036.73967		
Hlink:	http://programs.iowadnr.gov/pwts/ViewReport.aspx?parameters=vchWellNmbr%5ct2090490&reportName=WellPrintout		
Site id:	IAPU30000013126		

AJ186
SSW
1 - 2 Miles
Higher

IA WELLS **IAPU30000014094**

Mapid:	14094	Wellid:	71943
Id src fld:	recordno	Datasrc:	TEST
Well type:	Wells registered for testing	Location:	T. 87 N., R. 48 W., Sec. 1, SW, NW, NW
County:	Woodbury	Est loc ac:	Calc. +/- 140m.
Depth:	97	C p date:	1994
Owner name:	Deirup, J.e.		
Other info:	Drilling method: Drilled; Known well depth		
Xcoord:	221040.91		
Ycoord:	4697272		
Hlink:	Not Reported		
Site id:	IAPU30000014094		

AJ187
SSW
1 - 2 Miles
Higher

IA WELLS **IAPU30000014081**

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Mapid:	14081	Wellid:	35752
Id src fld:	wnumber	Datasrc:	GEOU
Well type:	IGS well database	Location:	T. 87N., R. 48W., Sec. 1, SW, NW, NW
County:	WOODBURY	Est loc ac:	Calc. +/- 140 m.
Depth:	94	C p date:	08/10/1993
Owner name:	DEIRUP, JOHN		
Other info:	Well type: Private		
Xcoord:	221036.91		
Ycoord:	4697270.06		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=35752		
Site id:	IAPU30000014081		

AJ188
SSW
1 - 2 Miles
Higher

IA WELLS **IAPR30000071943**

Recordno:	71943	Tw:	87
N s:	N	Rge:	48
E w:	W	Sec:	1
Qqqqq:	SW NW NW	Q abc:	CBB
Checked:	jswan 08/07/00 15:07:52	Ownerfirst:	J.E.
Ownerlast:	DEIRUP	Owneraddr:	2276 ALLISON AVE.
Ownercity:	SERGEANT BLUFF	Ownerst:	IA
Ownerzip:	51054	Ownerphone:	7129435117
County:	97	Legal:	NWNWSW 1 8748W
Depth:	97	Dpth rel:	K
Permit:	Not Reported	Sampldte:	06-JUN-00
Lab:	IA024		
Lab no:	Not Reported	Smpls rce:	NOT GIVEN
Anal dte:	30-DEC-99	Bact bgb:	Not Reported
Bact ltb:	Not Reported	Bact:	0
Bactr:	Not Reported	Bact s u:	S
Bctcolml:	0	No3:	0
No3r:	Not Reported	Nitrogen:	.100000001490116
No3 s u:	S	Drlmth rel:	Not Reported
Drl mthd:	DRILLED	Cs mt rel:	Not Reported
Case mat:	PLASTIC	Csdia rel:	K
Case diam:	8	Yr rel:	K
Year cons:	1994	Agentlast:	Not Reported
Agentfirst:	Not Reported	Updated:	jswan 08/07/00 15:07:52
Created:	kmckine 08/02/00 15:42:27		
Flag:	YYNNNNYNNNNNNNNNNNNNNNN		
Utm x:	221054.5		
Utm y:	4697055.81		
Site id:	IAPR30000071943		

189
NNE
1 - 2 Miles
Higher

IA WELLS **IAPU30000012778**

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Mapid:	12778	Wellid:	1573
Id src fld:	Wnumber	Datasrc:	PUB
Well type:	Public wells	Location:	T. 88N., R. 47W., Sec. 30
County:	Woodbury	Est loc ac:	Meas. +/- 230'
Depth:	279	C p date:	05/01/1942
Owner name:	Sioux City, City Of		
Other info:	Local name: Sioux City Airport #1; Status: Not Used		
Xcoord:	222792.79		
Ycoord:	4700815.52		
Hlink:	http://www.igsb.uiowa.edu/webapps/geosam/Scripts/geocard.asp?wnumber=1573		
Site id:	IAPU30000012778		